

Haberman, Marcia H LRP

From: Hill, Jack [jahill@state.pa.us]
Sent: Thursday, June 03, 2010 2:10 PM
To: Kraeuter, John; Haberman, Marcia H LRP
Cc: Adams, Roger; Knarr, Ryan
Subject: RE: dam permit for Consol Bailey 5 & 6

Marcia,

Thanks for the previous information regarding the Indiana Bat issue and status of your resource compensation review. Based on your latest e-mail, I assume the Corps is accepting Consol's revised resource compensation plan? Thanks,

Jack

Jack D. Hill | Water Program Specialist
Department of Environmental Protection
Rachel Carson State Office Building
P.O. Box 8554
400 Market Street | Harrisburg, PA 17105-8554
Phone: 717.772.5988 | Fax: 717.772.0409
www.depweb.state.pa.us

-----Original Message-----

From: Kraeuter, John
Sent: Thursday, June 03, 2010 2:03 PM
To: 'Haberman, Marcia H LRP'; Hill, Jack
Cc: Hill, Jack; Adams, Roger; Knarr, Ryan
Subject: RE: dam permit for Consol Bailey 5 & 6

Marcia,

We have not yet issued any dam permits. Dam Permits are required for the Bailey No. 5 Sedimentation Pond Dam (D30-073) and the Bailey No. 5 Slurry Impoundment Dam (D30-075). Our permit numbers are in parentheses. Bailey No. 6 does not require a dam permit. It is a coarse refuse disposal area and the material impounded is not considered a fluid or semi-fluid requiring a dam permit.

Jack Jr. or Ryan - Anything to add?

Jack Kraeuter | Chief
Environmental and Geological Services Section Bureau of Waterways Engineering Department of Environmental Protection Rachel Carson State Office Building 400 Market Street | Harrisburg, PA 17101
Phone: 717.772.5959 | Fax: 717.772.0409
www.depweb.state.pa.us

-----Original Message-----

From: Haberman, Marcia H LRP [mailto:Marcia.H.Haberman@usace.army.mil]
Sent: Thursday, June 03, 2010 1:54 PM
To: Hill, Jack; Kraeuter, John
Subject: dam permit for Consol Bailey 5 & 6

Hi, has the department issued any permits for the proposed impoundments yet? If so, can I have the permit number? I'm writing my decision doc for the 404 fill permit and am referenceing them as the basis for issuing in light of comments we received from locals about the safety issues.

Thanks

Marcia

412 395-7361

Haberman, Marcia H LRP

From: Stanley, Mark [MarkStanley@consolenergy.com]
Sent: Tuesday, June 01, 2010 5:18 PM
To: Haberman, Marcia H LRP; Goodballet, Kerry (Kampfer)
Subject: RE: question for you

Marcia,

The refuse conveyor needs an air permit. It will be issued shortly, is not needed before earthwork can start but must be obtained prior to foundation work. The slurry impoundment (Area 5) is exempt and the coarse refuse area (Area 6) does need an air permit, but doesn't need approval until refuse placement in 2014. This is all approved through PA DEP Div of Air Quality and shouldn't have any bearing on the ACOE 404 permit.

Mark

Mark T. Stanley - Manager-Env. Permitting CONSOL Energy Inc.
CNX Center
1000 CONSOL Energy Drive
Canonsburg, PA 15317
Office: (724) 485-4498
Cell: (412)370-8895
markstanley@consolenergy.com.

-----Original Message-----

From: Haberman, Marcia H LRP [mailto:Marcia.H.Haberman@usace.army.mil]
Sent: Tuesday, June 01, 2010 5:01 PM
To: Goodballet, Kerry (Kampfer); Stanley, Mark
Subject: quesiton for you

Does the Bailey CRDA 5 & 6 project need an air quality permit? Marcia

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Haberman, Marcia H LRP

From: Goodballet, Kerry (Kampfer) [KerryGoodballet@consolenergy.com]
Sent: Wednesday, October 21, 2009 5:19 PM
To: Haberman, Marcia H LRP
Cc: Pachter, Jonathan; Delloma, Les; Stanley, Mark
Subject: RE: Bailey CRDA 5 and 6

Marcia,

In regards to your email from October 15, 2009 I felt I needed to clarify some key points of the Bailey Refuse Area project (CRDA 5 and 6).

CONSOL Pennsylvania Coal Company (CPCC) sent EPA an original copy of the 404 permit on March 25, 2009 (UPS 1Z497YR70192113112) as requested prior to receiving your comments and during the public comment period.

✓ Per your comment letter dated July 10, 2009 you stated that we could submit a reply to your comments directly to your office or address each public comment letter directly with a copy sent of each letter to your office. CPCC chose to reply to your office only. At this time CPCC was not directed to send a copy of the Cumulative Impact Analysis (CIA) or comment responses to the EPA until October 16, 2009. Per your request a copy of the CIA was sent by Fed-Ex (967236570089) on October 19, 2009 to Stephanie Chin, U.S. Environmental Protection Agency - Region III Office of Environmental Programs (3EA30) 1650 Arch Street Philadelphia, PA 19103.

✓ A delineation report entitled, "Wetland and Stream Delineation Report, Bailey Mine Coal Refuse Disposal Areas No. 5 and 6, Richhill Township, Greene County, Pennsylvania", was provided to you on April 10, 2008. On May 9, 2008, a jurisdictional determination (JD) meeting was held with representatives from the Pittsburgh District of the Army Corps of Engineers and the Pennsylvania Department of Environmental Protection California District Mining Office to verify the JD. The wetland and stream limits were determined to be accurate by both agencies with only minor changes. In a letter dated September 5, 2008 CPCC addressed revisions to the delineation report that were based on discussions during the jurisdictional determination meeting which also addressed isolated and non-jurisdictional stream lengths. We have not yet received comments from your office on that December 5, 2008 Letter. CPCC hopes that the COE will use its own long-accepted practices and policies to finish its review of the JD. The information provided to you is complete and accurate, and in our opinion, you have enough information to approve the JD - please do so. *in progress*

✓ The ACOE stated that mitigation opportunities should first be explored within the immediate Owens Run watershed, then if necessary, expanded to include the Enlow Fork watershed. Owens Run was examined for potential stream restoration and wetland mitigation opportunities; however, the land use is dominated by residential lots that are separated by blocks of forested riparian habitat. Due to current land use and limited opportunity to conduct large scale aquatic resource restoration in the Owens Run watershed, it was eliminated from further consideration. (This is addressed in the CIA narrative and also Figure 1 of CIA).

good Per your request CPCC is eliminating the "beaver dam" area, located on Rocky Run approximately 1 mile upstream of the confluence of Templeton Fork and Rocky Run, from the proposed stream restoration as discussed in the field visit on September 16, 2009. To expand and further develop a restoration plan to eliminate the segmentation of the proposed restoration areas, CPCC has been meeting with property owners and officials responsible for the operation of the East Finley Township Park to discuss and attempt to reach an agreement to include their properties as part of the proposed restoration plan. If obtained, these properties will not have conservation easements on them as previously required. Based on the information reported to us by Don Bole during our September 16, 2009 field meeting, conservation easements are no longer a requirement. CPCC will provide a map during our October 22, 2009 meeting showing the segments where CPCC is currently attempting to obtain individual restoration areas. *good mit will not be rejected based solely on lack of CE*

Per Civil and Environmental Consultants (CEC) there are no wetland replacement areas

^{no}
.available for mitigation use in the Owens Run watershed. The currently proposed wetland mitigation area is located along Crabapple Creek, which is within the same larger Wheeling Creek watershed as CRDA 5 and 6. Since it is in the same larger watershed as CRDA 5 and 6 the crabapple Creek site can serve as functional replacement for the impacts. This site was selected based on its potential to construct one large contiguous diversified (including emergent, scrub-shrub and forested) wetland mitigation area, its location within a permanent conservation easement, and its location on property owned by CPCC.

Note: 404 & 105 permit will be needed

In response to the ACOE comment letter item 3, CPCC is continuing forward with the Chartiers/Creek Mitigation Plan for PADEP and the Upper Enlow Fork Watershed Stream Restoration/Mitigation Plan. Due to the critical nature of the timing of this project CPCC needs to move forward with both mitigation plans to satisfy both agencies so permit approval can be obtained in a timely manner. A final conceptual mitigation plan will be provided prior to permit approval.

We look forward to meeting with you on Thursday October 22 at 1 pm.

Sincerely,
Kerry

-----Original Message-----

From: Haberman, Marcia H LRP [mailto:Marcia.H.Haberman@usace.army.mil]
Sent: Thursday, October 15, 2009 11:44 AM
To: Goodballet, Kerry (Kampfer)
Subject: RE: Bailey CRDA 5 and 6

Kerry, yes I received it on Monday Oct 5. Also received CEC's response to our issues letter and comments received from Public Notice. I reviewed both briefly, but have not done a comprehensive review. In the meantime, I requested you send EPA a copy, which I trust you did.

I am currently in the process of completing the jurisdictional determination to determine exactly how much stream is going to be regulated under the CWA. I think that there is the chance that EPA will elevate our determination due to non-rpw and isolated calls. I completely over looked stream 32705C, that we discussed at our mtg with DEP in Sep, as being isolated.

In regards to the actual permit, the proposed mitigation still has issues. In our letter we requested you revise the plan and look at the gaps in the proposed restoration at the watershed level, and as we further noted during our site visit, we can not support the stream restoration proposal at the site that is now undated by the beaver dam, unless you include a long term beaver mgmt plan to ensure the stream does not get flooded again. The value of doing instream habitat improvements and riparian planting that will be flooded is not apparent to me. To the best of my knowledge, based on my limited review, you have not revised the mit plan so our comments are still outstanding. We also requested wetland replacement in the Owens Run or Enlow watershed and you are still proposing the Crabapple site with justification that it is in large Wheeling Creek watershed without an explanation of how that is functional replacement for impacts in the Owens Run watershed. This is an issue in consideration that the CIA stopped at the Owens run confluence with Enlow Fork.

My plan is to review both documents and determine what should be forwarded to the mitigation review team, i.e. USEPA and USFWS, along with DEP however, as I understand it, they are not interested in stream mit at the watershed level, but rather are going with AMD restoration (?). We can then have a meeting, teleconf, with Consol and CEC, if you want, to discuss the mitigation. As I'm sure you are aware, we need a final mitigation plan prior to making a permit decision.

Jonathon contacted Scott and requested a mtg this week, but due to the NWP 21 hearings we were not able to schedule this week but are looking at next week. By that time I will have reviewed your submittals enough to discuss them. We are very sensitive to the critical nature of your activity, but as you know it would be illegal at this time to talk about the timing of issuing a permit as we have not yet made a decision in regards to the permit.

Scott and I are both available anytime Thursday, 22 Oct to discuss. Can you contact

.Jonathon and see if that works for you?

Sincerley,
Marcia

Marcia

-----Original Message-----

From: Goodballet, Kerry (Kampfer) [mailto:KerryGoodballet@consolenergy.com]

Sent: Thursday, October 15, 2009 10:38 AM

To: Haberman, Marcia H LRP

Subject: Bailey CRDA 5 and 6

Hi Marcia,

I know CEC informed you but I wanted to also follow up with an email to you. As you are probably aware we provided to your office all of the information you asked for the CRDA 5 and 6 application. We provided the CIA and responses to all comments. The information was submitted on October 1, 2009.

I know you understand how critical it is for our company to obtain approval of this application and we are asking you to aid us in expediting the review.

Thank you for your time and efforts.

Kerry

Kerry L. Goodballet, P.E.

Environmental Engineer

Consol Energy, Inc.

CNX Center

1000 Consol Energy Drive

Canonsburg, PA 15317-6506

Phone: 724-485-4267

cell: 412-225-3480

email: kerrygoodballet@consolenergy.com

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Haberman, Marcia H LRP

From: Burda, Craig [cburda@state.pa.us]
Sent: Thursday, May 14, 2009 11:19 AM
To: Haberman, Marcia H LRP; Kepler, Steven
Cc: Kernic, John
Subject: FW: Bailey Coal Refuse Disposal Area no.5 - Stream Mitigation Meeting, 5/13/09

Good Morning,

I sent this email to Consol this morning. If you have any comments, please let me know. Thank you for attending the meeting yesterday. Your input is very helpful and much appreciated.

Have a great weekend.

Craig

-----Original Message-----

From: Burda, Craig
Sent: Thursday, May 14, 2009 10:58 AM
To: 'Mark Stanley (markstanley@consolenergy.com)'
Cc: Koricich, Joel; Folman, Joel; Kernic, John
Subject: Bailey Coal Refuse Disposal Area no.5 - Stream Mitigation Meeting, 5/13/09

Mark:

Thank you for the presentation yesterday at your office regarding the Presto-Sygan Mine Drainage Treatment Plans proposed for the mitigation of stream impacts that will result from the development of coal refuse disposal area no.5. Listed below are some of the key points discussed in the meeting. An in-depth review of the proposed plan has yet to be conducted, which could result in future requests for revisions, clarifications, or information. Please be advised that the project is still under consideration in this office and that a decision for project acceptance has not been made at this time.

Meeting points:

- * Concerns were expressed regarding the large variations in mine discharge rates and how the treatment systems will manage the variations. The project consultant stated that the system will be designed for the largest flow rates.
- * Consol will be responsible for the successful implementation and operation of the mine water treatment system. A consent order and agreement or other acceptable mechanism will be required for the project to be acceptable.
- * Consol was advised that effluent limits will be assigned to the treated mine water and that a mechanism for the assignment of effluent limits has yet to be determined.
- * A sludge disposal plan must be provided.
- * Consol still must obtain ACOE and Chapter 105 approvals for regulated impacts resulting from the construction of the water treatment system.
- * A request was made for clarification regarding the proposed reduction in loading to Chartiers Creek (post treatment) with respect to the assigned TMDL. Data presented in the meeting appeared to assume total removal of iron and aluminum from the discharge.
- * It was clear that treatment of the Presto-Sygan discharge will result in reduced pollutional loading to Chartiers Creek; however, an assessment of the stream must be conducted to determine if or how pollution reduction will result in an improvement of the biological aspects of the stream. Consol agreed to demonstrate that treatment of the mine discharge will result in an improvement to Chartiers Creek that goes beyond pollution reduction.
- * Sampling information presented in the Presto-Sygan AMD Restoration Technical Report showed little or no impact to current water quality in Chartiers Creek resulting from the existing mine discharge. Additional information was requested regarding other planned mine drainage treatment projects located upstream of the Presto-Sygan discharge to Chartiers Creek. The information should be detailed and address anticipated stream improvements that should result from successful completion of the upstream projects. The

treatment of other significant sources of watershed pollutional loading should result in significant water quality improvements in Chartiers Creek. Upstream improvements in water quality may cause the existing Pesto-Sygan discharge to have a more significant adverse impact to Chartiers Creek than currently exists.

Additional comments and request for information not addressed in yesterday's meeting:

- * Please quantify how many miles of Chartiers Creek may be improved by treatment of the Presto-Sygan discharge.
- * Describe how representative stream water samples were collected downstream of the existing mine discharge. Mine discharge impacts to the stream could be exaggerated dependent on sampling methods.
- * Additional mitigation may be required in addition to treatment of the Presto-Sygan discharge to address the loss of streams in the no.5 coal refuse disposal area.
- * Consol is responsible for obtaining any additional approvals that may be necessary for the treatment system site, including but not limited to county, municipal, and PADOT approvals. Timely approvals must be obtained to prevent project delays.

Thank you again for the presentation and field meeting yesterday. If you have any questions or comments, please feel free to contact me.

Craig Burda | Underground Mine Permit Section Department of Environmental Protection
California District Mining Office
25 Technology Drive | Coal Center, PA 15423
Phone: 724.769.1100 | Fax: 724.769.1102
www.depweb.state.pa.us <<http://www.depweb.state.pa.us/>>

Haberman, Marcia H LRP

From: Haberman, Marcia H LRP
Sent: Monday, March 16, 2009 4:01 PM
To: 'jkernic@state.pa.us'; 'Burda, Craig'; 'Folman, Joel'
Subject: Consol PA Coal Bailey Disposal Area No 5, CMPANO. 30080701

Attachments: 2007-463pn.doc



2007-463pn.doc
(63 KB)

Reference your letter dated February 23, 2009 requesting comments for the subject project.

The COE Pittsburgh District has issued a Public Notice, 09-08, for the subject project in accordance with Section 404 of the Clean Water Act. A copy of the notice dated 3/16/09 was sent to your office and it will also be posted on the District's internet site. I have also attached a copy of the notice. The comment period will be open for 30 days. Within approximately 45 days of the closing of the comment period I will continue my review of the project and send Consol a letter with my comments as well as all comments received in response to the public notice received from the general public and interested resource agencies, i.e. USEPA, USFWS, PHMC, PAFBC. As I have discussed with you in previous conversations, Consol has the responsibility to document how the proposed stream compensatory mitigation, construction the Preston/Sago passive AMD treatment system to improve water quality in Chartiers Creek, will replace the functions of the 1st, 2nd, and 3rd order headwater streams they propose to fill. Chartiers Creek is maintained as a Local Flood control project upstream and downstream of this AMD discharge. Additionally, the Corps is now requiring a cumulative impact assessment of a proposed project in respect to all other adverse environmental impacts in the watershed. So that will be requested from Consol. I have advised them of these requirement during a February 3, 2009 meeting.

I will keep your office updated on any comments I receive that I think may be substantial to affect both of our processes and I will copy you on my comment letter. Until that time, it is not likely that I will have any comments to provide to you regarding this proposed project. In order for a CWA 404 permit to be valid, an applicant must receive a CWA 401, Water Quality Permit from the state. That permit, and all conditions, will be made a special condition of the 404 permit.

Marcia H. Haberman
Regulatory Project Manager
Pittsburgh District, USACOE
(412) 395-7361



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

REPLY TO

Operations Division
Regulatory Branch
LRP 2007-463

Exemption #6 - Privacy



Dear Mr. Harshman:

I am in receipt of your letter dated April 22, 2009, concerning the expansion of the Consol Pennsylvania Coal Company, LLC's ("Consol") coal refuse area, located in Richhill Township, Greene County, Pennsylvania.

On December 4, 2008, Consol submitted an application to the Pittsburgh District for a Department of the Army permit under Section 404 of the Clean Water Act to place fill material in 25,835 feet of stream channel and 5.7 acres of adjacent wetlands. The applicant proposes the fill is required to facilitate the expansion of the refuse area required for disposal of fine and coarse coal refuse generated by the Bailey Central Mine Complex, Consol's raw coal preparation facility located in Southwest Pennsylvania.

The proposed project is currently under review by the Corps' Pittsburgh District Regulatory Branch. Please be assured that all comments received in response to Public Notice No. LRP 09-08, will be considered in conjunction with our review of the project. The Pittsburgh District is aware of your concerns and is in receipt of the comments you submitted, which will be forwarded to Consol to be addressed. Please be assured that the proposed impacts of the project will be reviewed by the Corps in accordance with the Clean Water Act, the National Environmental Policy Act and other applicable laws and regulations.

Sincerely,

Lt. General Robert L. Van Antwerp
Chief of Engineers U.S. Army

**RECORD
FILE**

*recd from front
office June 2009*

READ-AHEAD
SIGNATURE FORMAT

I. Purpose/Reason for the Correspondence: Reply for Lt General Antwerp to [REDACTED]

II. Issue: [REDACTED] is an [REDACTED] to the Consol Coal proposed expanded coal refuse area. He lives downstream of a proposed "valley fill" along a small stream in a rural area. He, along with a number of his neighbors, would rather the valley not be impacted. They have a number of concerns ranging from the effect the project will have on their ground water, the flow in the stream, traffic, noise, property values, and their safety directly downstream of the impoundments. An application was received in Dec 2008 and a public notice issued March 2009. [REDACTED] has talked by phone to the project manager, Haberman, and has submitted comments.

III. Discussion: The Corps is in the review process of the proposed project for there are significant adverse aquatic impacts, approximately 25,000 feet of stream channel and 5.7 acres of adjacent wetlands will be filled by the refuse area. The public comment period has closed. All comments, as well and the Corps concerns regarding the project's aquatic impacts and proposed compensatory mitigation, will be compiled and submitted to Consol to be addressed. Based on discussions to date with the applicant and PADEP, Mining Division, there are no practicable alternative available at this time for the disposal of the refuse material other than surface landfills. In order maximize the available air space for disposal of the most amount of material, they typically utilize deep valleys. This proposed project is the 5th and 6th valleys to be utilized for the disposal of refuse from the Bailey Central Mine Complex, their raw coal processing facility in SW PA. These areas will provide disposal space for approximately 7 – 9 years and then additional fill areas will be needed. The public safety and health concerns will have to be address under the NEPA process required for a DA permit. The aquatic impacts proposed will be reviewed in accordance with the CWA Section 404 (b) (1) guidelines. Once they (Consol) document there are no practicable upland disposal areas, then they must provide compensatory mitigation to offset the aquatic impacts.

IV. Recommendation: Review attached letter for Gen Antwerp's signature to [REDACTED] make any changes you feel are appropriate, return to Haberman.

V. POC: Marcia Haberman Regulatory Project Manager, x7361

Cheek *ju* 19 MAY 09
Lockwood *NA*
Adipietro *DA*
Meeder
Auer *JA*
Wheeler
Crall *W*

SUSPENSE SHEET

TRACKING # 020

TYPE OF ACTION: Environmental Law (EL)

DATE IN: 19-May-09

DUE DATE: 20-May-09

COUNSEL: Dana Adipietro

SUBJECT: Consolidated Coal Corp

REQUESTED BY: Marcia Haberman

REQUESTORS' PHONE: x7361

COMMENTS: - ASK to see letter Electronically.

- 0 - Should this be going to the General?
- Public notice needs to be recopied (odd pages only provided)
- Elzbarate on stage in process. After Consol replies, EA?
- Significant (1) because why can't use LFs? (2) will only assist for next 7-9 years (cumulative impacts)
- Many issues - groundwater, historic, native zoned zoned....
- Is this a NWP-21?

22 April, 2009

LT GENERAL ROBERT L. VAN ANTWERP
CHIEF OF ENGINEERS U.S. ARMY
WASHINGTON, D.C. 20000

Sir:

I am writing this letter to express my concern over the expansion south of the Consolidated Coal Corporation!

The area in question is Greene County Richhill Township, Southwest Pennsylvania. Consol has published public notices of their intensions and initiated work in this area. Corp's district office Pittsburgh has not yet approved this plan.

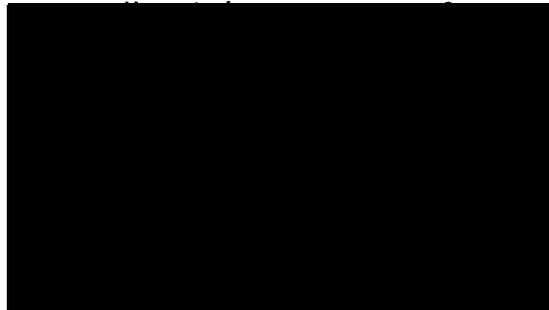
I respectfully request a review be initiated, at the highest level, to determine the legality and other conditions such as environmental impact and public interest. These factors are included in U.S. Army CE Pittsburgh district office public notice 09-08 dated 16 March 2009, and expanded in my reply to the DEP. They are included in the enclosure.

There are many citizens in this area that share these concerns.

Thank you for any consideration.

Enclosure
a/s

Exemption #6 - Privacy



ENCLOSURE

All families in this area use well water. There are no public facilities. These wells have been and will continue to be impacted by pond leakage.

[REDACTED] by Ackley Creek, and on the west by Wheeling Enlow Creek. There are no fish in Wheeling Enlow Creek except when stocked other than a few bottom feeders. Water from Consol ponds runs directly into Wheeling Enlow Creek. This would be a healthy water source if not polluted. I have personally notified the DEP of the observance of coal dust and other pollutants in this water at least five times since our arrival in Nov. of 1991. It took at least a week for the DEP to test the water. Of course by this time the visible material had been washed downstream. No further action was taken. Proposed construction of the Presto Sygan acid mine drainage project is admission by Consol that dangerous levels of acid, iron, and aluminum are in the water.

Surface and beds of major state class two and township roads are being destroyed by large trucks and equipment working for Consol. Township bond is \$12,000 which is hardly enough for all the damage done.

A four ton limit metal Greene County bridge nearby is daily crossed by heavy equipment and vehicles going to and from the mine or other Consol construction sites. It has large holes in the metal support and is in eminent danger of collapse.

Our house built circa [REDACTED] has historic value. The original owner arrived in this area in 1818. A large stone monument is [REDACTED] with a bronze plaque telling the story of Sarah Ackley, the "Great Frontier Mother." [REDACTED] runs where a 92 foot wooden covered bridge once spanned the creek. It was taken down in 1937 when a state concrete bridge was constructed to replace it. At that time [REDACTED] the owner of the house contacted [REDACTED] who came to see the bridge, and then later sent a crew to dismantle it. The bridge now stands in his Greenfield Village in Dearborn Michigan. The only evidence of a covered bridge having been there is one remaining stone abutment.

We sponsor a reunion for the [REDACTED] descendants who travel here each year. They come from all over the country (an average of 60 people.)

Another covered bridge, the Longdon Bridge was recently renovated and re-built. It is one mile north of our home and directly south on Wheeling Enlow Creek.

An historic Delaware Indian medicine camp site is located one mile south on Wheeling Enlow Creek.

There are hundreds of old houses in this entire area which are empty, have been destroyed, or burnt down when Consol purchased thousands of acres at exaggerated prices. We are all concerned about falling real estate prices in this beautiful area with families living here dating back to Revolutionary War days. Historic log cabin houses are being destroyed.

Concerning employees at the mine, we live on one of the direct routes to the mine. We noticed that approximately 85% of these vehicles bear license plates from Ohio, West Virginia, and Maryland.



A large commercial resort area called (The Four Seasons) KOA is located near West Finley and the mine area. Thousands of people visit this facility yearly.

Ryerson State Park is nearby. It contains beautiful woodlands, camp sites, picnic areas, and a large public swimming pool and is visited by many throughout the year. Unfortunately, the dam that held a large body of water called "Duke Lake" was destroyed. Also the nearby state roads have been damaged and a metal bridge near the dam has moved off-center. It seems coincidental that immediately prior to this happening, Consol was conducting longwall mining in the vicinity. All of the water in the lake has since disappeared resulting in a very large fish kill and loss of all season fishing. It took Pa. Governor Rendell to resolve the issue. Consol denies culpability, however they are providing \$15,000,000 for the dam's re-construction.

The town of West Finley within the area has lost its water and gas due to longwall mining. Water must now be trucked in and placed in large plastic containers at each house.

Wind Ridge, another town which is on state road 21 has also lost water due to mining.

There are at least 20 small cemeteries located throughout the area, some dating back to the 1700's (reference text, East and West Finley Cemeteries) by Helen Borkowski.

Consol sent a letter to me on Jan. 21 1998 requesting information for their Emergency Action Plan for the mine specifying fine coal refuse impoundment. Why is this letter necessary? Has any effort been made over the years to check the construction of any ponds, pits, and holding areas in use by Consol? Do the two large chimneys on site to wash the coal release anything but steam? If so, What? Are they properly filtered as per federal regulations?

There is an annual week-long wildflower walk starting at the state gamelands. People from Pennsylvania and surrounding states attend. There are flowers growing that are exclusive to this area which are interesting to many botanists who have been here. Wheeling Enlow Creek flows south in the entire wildflower area. Expansion of ponds, pools, and ash dumps now and in the future, will reduce the tourist business in Southwest Pennsylvania specifically Greene County. It will destroy a way of life and affect our children's future.

References include:

"Coal slurry spill poisons Tennessee River."
Dec. 23, 2008 [attp://obrag.org/?p=2828](http://obrag.org/?p=2828)

Buffalo Creek Flood Feb. 26 1972 (129 people killed)
<http://en.wikipedia.org/wiki/buffalo-creek-flood>

Coal is dirty <http://www.coal-is-dirty.com/not-ewxactly-clean-coalcoal-ash-slurry-pond-bursts-tennessee>

The Inez Coal Tailings Dam Failure (Kentucky)
<http://www.wise-uranium.org/mdafin.html>

Lone Mountain Processing Coal Slurry Impoundment Failure
<http://facultystaff.richmond.edu/~wgreen/ejds0203.html>

There are many other references to this subject on computer sites

If the permit has not yet been approved, how is it legally possible for Consol to have cleared all the land not directly connected to the belt project which I assume has been approved!

SUGGESTIONS FOR ACTIONS TO BE TAKEN:

Do not approve Consol's request for any construction until such a time that the request is thoroughly investigated on the ground by competent state and federal teams not directly connected to Consol operations such as technical representatives from the Chief Engineers Office or experienced private consultants, knowledgeable in longwall mining and the removal of coal refuse and the appropriate federal regulations pertaining to this subject.

Have more governmental personnel permanently on site to observe and report violations immediately.

Conduct aerial surveillance to assure compliance.

Most important: Require Consol to produce a master plan for any further intrusions in Greene County within the next 20 years to be made available to the proper authority.

Consol has indicated to district Corps of Engineers that design plans for the remediation project (treatment system) have not been prepared. Approval for any new work should be withheld until this project has reached construction phase to assure completion.

Township bonding should be raised to \$2,000,000

Finally, I am concerned about our elimination of the industrial capacity of this country, particularly steel production. We must now depend on foreign steel which is inferior and purchased from countries who are not always on our best friends list. Our large coal resources, many owned by foreign layers of corporations who change control periodically and send a large portion of our raw materials overseas. They constantly disregard or ignore our regulations on environmental control and successfully obtain variance for their own purposes.

Portions of the above material have not been completely verified, but in my opinion and by personal observation they are true.

April 16,2009

Mr. Theodore P. Pytash
Mine Conservation Inspector Supervisor
District Mining Operation

Re: Consol Pa. coal
Service Request # 261886
Township: Richhill
County: Greene

Mr. Pytash:

Thank you for taking time together with Timothy Hamilton, Mine Conservation Inspector, to visit my home on March 27, 2009 concerning coal ash retention ponds and clear cutting for the proposed Consol number 5 and 6 and coal refuse disposal areas.

You have not addressed my concerns. I do not consider this matter closed. There appears in your letter of April 2,2009 to be discrepancies in your presentation and my understanding of the situation. You stated in your letter of April 2,2009 that the permit is in the review process and to date has not been approved. My impression of your conversation indicated that it was a "done deal."

Public notice from the Corps of Engineers application 2007-463 dated March 16,2009 states in paragraph 4 that the requested disposal areas 5 and 6 located in two valleys contain 706 acres. Public notice by Consol only lists area 5 with 91.5 acres. The Consol location map for Pittsburgh #8 coal seam 12/3/08 shows approximately where #5 coal refuse area, sed. Pond development will be. Area 6 was not shown on the map, however according to Consol's request to the Corps of Engineers Pittsburgh for a permit, there is an area 6, unknown location, except by Mr. Hamilton's sweeping hand on the map and it would contain, if my math is correct a 614.5 acres sedimentation pond! You admitted that there has been no reconnaissance in these areas by the DEP.

I am opposed to any effort to expand Consol's control in Southwest Pa. Greene County ,Richhill Township and will do so by any legal means including and notifying all interested departments of the state and federal government as well as local and national news services. As a civil employee of the state government and attached to federal agencies, I am certain that you will appreciate my concerns. The future of this area and that of our children are at stake here. Copies of all correspondence received or sent on the subject will be forwarded in a letter to a higher authority.

I have no plans to request the voluminous paperwork procedures, as well as my time requested in paragraph 4 of your letter of April 2,2009.

Public awareness is far more powerful for resolution of these matters.

I did not receive the questionnaire indicated as an enclosure in your letter of April 2,2009. Please forward, as well as a copy of the mission statement of the Department of Environmental Protection.

I reject your implied threat, capitalized on page 2 of your letter of April 2,2009 that I need to show your important letter to a lawyer at once. I also do not feel that your reference to Pro Bono representation is appropriate.

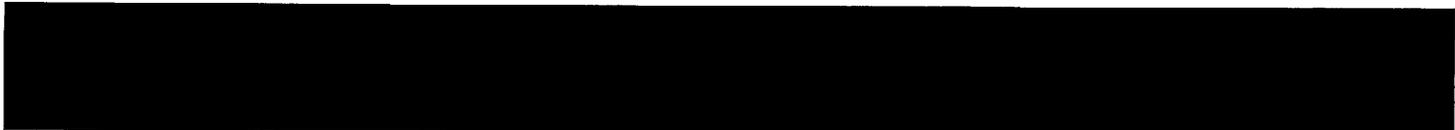
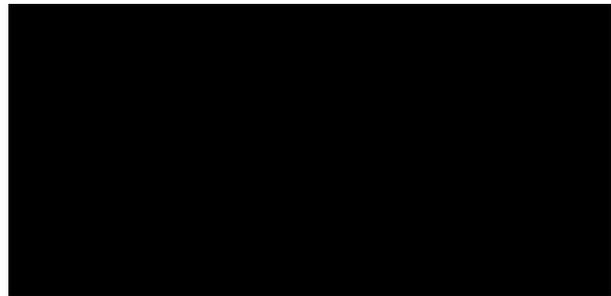
I am listing in enclosure of the basic reasons for my objections, and a few suggestions.

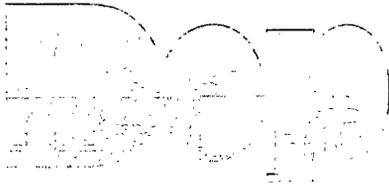
Please contact me if I can be of service to you in the future.

Enclosure

Cc:

U.S Army Corps of Engineers Pittsburgh district
Lt. General Robert L. Van Antwerp (Chief of Engineers Wash. D.C.)
Senator Spector
Senator Casey
Gov. Rendell
Rep. DeWeese
Rep.Murtha
Sect. of Interior
Sect. of Commerce
Sect. of Health Education and Welfare
Sect. of Labor
U.S. Geological Survey
U.S.Dept. of Energy
DEP
United Mine Workers
Mr. Al Gore





Pennsylvania Department of Environmental Protection

Armbrust Professional Center
8205 Route 819
Greensburg, PA 15601-7515

April 2, 2009

Greensburg District Office

724-925-5500

CERTIFIED MAIL NO. 7008 1300 0001 1937 7265



Re: Consol PA. Coal
Service Request No.: 261886
Township: Richhill
County: Greene



Thank you for contacting us on March 23, 2009, through Representative DeWeese's office, concerning coal ash retention ponds and clear cutting on the proposed Consol PA Number 5 and 6 coal refuse disposal area. An investigation was conducted by Timothy Hamilton, Mine Conservation Inspector and myself, on March 27, 2009.

We explained that the proposed No. 5 and 6 coal refuse disposal area permit application is in the review process and to date has not been approved. We also informed you of your right to submit a request in writing for an informal conference to gain more detailed information concerning this project. Lastly, there are no coal ash ponds proposed in this project only sedimentation ponds.

We trust that we have addressed your concerns. At this time, we consider this matter closed.

Any person aggrieved by this action may appeal, pursuant to Section 4 of the Environmental Hearing Board Act, 35 P. S. Section 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A, to the Environmental Hearing Board, Second Floor, Rachel Carson State Office Building, 400 Market Street, P.O. Box 8457, Harrisburg, PA 17105-8457, (717) 787-3483. TDD users may contact the Board through the Pennsylvania Relay Service, (800) 654-5984. Appeals must be filed with the Environmental Hearing Board within thirty (30) days of receipt of written notice of this action unless the appropriate statute provides a different time period. Copies of the appeal form and the Board's rules of practice and procedure may be obtained from the Board. The appeal form and the Board's rules of practice and procedure are also available in braille or on audiotape from the Secretary to the Board at (717) 787-3483. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST REACH



THE BOARD WITHIN 30 DAYS. YOU DO NOT NEED A LAWYER TO FILE AN APPEAL WITH THE BOARD.

IMPORTANT LEGAL RIGHTS ARE AT STAKE, HOWEVER, SO YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD (717-787-3483) FOR MORE INFORMATION.

Please contact us if we can be of service to you in the future.

Sincerely,



Theodore P. Pytash
Mine Conservation Inspector Supervisor
District Mining Operations

Enclosure – Questionnaire

cc: Consol PA

- U.S. Department of Labor: Mine Safety and Health Administration (MSHA) ☞:
 - News ☞
 - Coal Waste Dams and Impoundments ☞
 - Noninjury Impoundment Failure/Mine Inundation Accident Martin County Coal Corporation, released Oct. 17, 2001
 - > Download MSHA report ☞
 - > Alternate source for text-only version of MSHA report ☞ (no images, 362k PDF; Charleston Gazette)
 - Internal Review of MSHA's Actions at the Big Branch Refuse Impoundment Martin County Coal Corporation, released Jan. 21, 2003 ☞ (649k PDF)
- U.S. Department of the Interior: Office of Surface Mining (OSM) ☞
 - News ☞
 - Reports on the October 2000 Breakthrough at the Big Branch Slurry Impoundment ☞ (March 4, 2002)
- U.S. Environmental Protection Agency ☞ · Region 4 ☞
 - Martin County Coal Corp Coal Slurry Release Work Plan, April 6, 2001, Prepared for: MARTIN COUNTY COAL CORP, Prepared by: ECOLOGY AND ENVIRONMENT, INC.
 - > Download Work Plan chapters ☞
 - Martin County Coal Corporation Task Force Report, October 2001 ☞ (175k PDF)
- Kentucky Environmental Quality Commission ☞
 - EQC Resolution on environmental spills and incidents in Kentucky. January 24, 2002
 - > Download full text ☞ (110k PDF)
 - EPA response to EQC request on Martin County slurry spill proposed restoration plan. Sep 6, 2001
 - > Download full text ☞ (1.1M PDF)
 - EQC requests that the U.S. EPA consider providing opportunities for public comment and input on the proposed restoration plan for the Martin County coal slurry spill. passed Aug 2, 2001
 - > Download full text ☞ (190k PDF)
- Kentucky Natural Resources and Environmental Protection Cabinet (NREPC) ☞ · News ☞
- Kentucky Department of Environmental Protection ☞
- Kentucky Department of Fish and Wildlife Resources ☞
- Kentucky Department of Surface Mining ☞ · News ☞

Consultants and Academic

- Subsurface Investigation, Big Branch Slurry Impoundment, Martin County, Kentucky, by Triad Engineering, Inc., March 2001, 26 p.
 - > Download Triad report ☞ (MSHA)
 - > Alternate source for Triad report ☞ (2.7M PDF; Charleston Gazette)
- NAS Committee on Coal Waste Impoundments ☞
 - Coal Waste Impoundments: Risks, Responses, and Alternatives ☞, Committee on Coal Waste Impoundments, Committee on Earth Resources, Board on Earth Sciences and Resources, National Research Council, 244 pages, 2002.
 - > View report online ☞ (one by one page images)
 - > View NAS release Oct. 12, 2001 ☞

Environmental NGOs

Additional References

- [U.S. Department of Labor: Mine Safety and Health Administration \(MSHA\)](#) ☞:
 - [News](#) ☞
 - [Coal Waste Dams and Impoundments](#) ☞
 - [Noninjury Impoundment Failure/Mine Inundation Accident Martin County Coal Corporation](#), released Oct. 17, 2001
 - > [Download MSHA report](#) ☞
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- [U.S. Department of the Interior: Office of Surface Mining \(OSM\)](#) ☞
 - [News](#) ☞
 - [Reports on the October 2000 Breakthrough at the Big Branch Slurry Impoundment](#) ☞ (March 4, 2002)
- [U.S. Environmental Protection Agency](#) ☞ · [Region 4](#) ☞
 - [Martin County Coal Corp Coal Slurry Release Work Plan, April 6, 2001, Prepared for: MARTIN COUNTY COAL CORP, Prepared by: ECOLOGY AND ENVIRONMENT, INC.](#)
 - > [Download Work Plan chapters](#) ☞
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 - [EQC Resolution on environmental spills and incidents in Kentucky. January 24, 2002](#)
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- [Kentucky Natural Resources and Environmental Protection Cabinet \(NREPC\)](#) ☞ · [News](#) ☞
- [Kentucky Department of Environmental Protection](#) ☞
- [Kentucky Department of Fish and Wildlife Resources](#) ☞
- [Kentucky Department of Surface Mining](#) ☞ · [News](#) ☞

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- [NAS Committee on Coal Waste Impoundments](#) ☞
 - [Coal Waste Impoundments: Risks, Responses, and Alternatives](#) ☞, Committee on Coal Waste Impoundments, Committee on Earth Resources, Board on Earth Sciences and Resources, National Research Council, 244 pages, 2002.
 - > [View report online](#) ☞ (one by one page images)
 - > [View NAS release Oct. 12, 2001](#) ☞

Environmental NGOs

Additional References

<http://www.wise-uranium.org/mdafin.html>

3/28/2009

Public Notice

U.S. Army Corps
of Engineers
Pittsburgh District

In Reply Refer to
Notice No. below

US Army Corps of Engineers, Pittsburgh District
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Application No. 2007-463

Date: March 16, 2009

Public Notice No. 09-08

Closing Date: April 16, 2009

1. **TO WHOM IT MAY CONCERN:** The following application has been submitted for a Department of the Army Permit under the provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344).
2. **APPLICANT:** Consol Pennsylvania Coal Company, LLC.
P. O. Box J, 1525 Pleasant Grove Road
Claysville, PA 15323
POC: Mr. Ed Suter (724) 663-3034

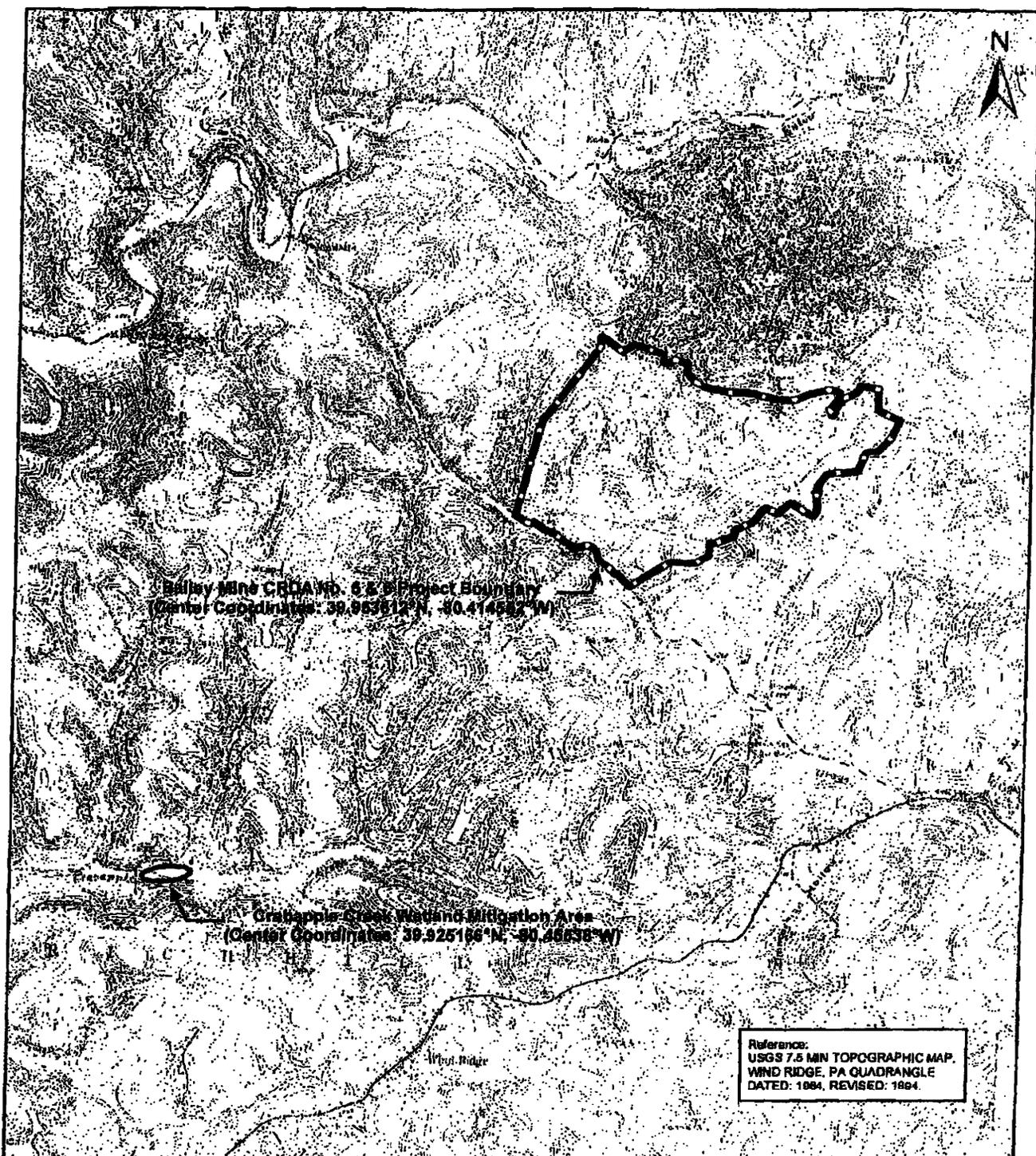
AGENT: Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205
POC: Mr. Mike Shema (412) 429-2324
3. **LOCATION:** Unnamed tributaries and adjacent wetlands to Owens Run, Richhill Township, Greene County, Pennsylvania.
4. **PURPOSE AND DESCRIPTION OF WORK:** Consol Pennsylvania Coal Company (CPCC) operates the Bailey and Enlow Fork longwall coal mines located in Washington and Greene Counties, PA. Raw coal from these mines is processed at the Bailey Central Mine Complex (BCMC). The coal cleaning process generates a byproduct of coarse and fine coal refuse as a waste product. The current permitted refuse area utilized for the fine coal refuse slurry will be exhausted in 2012 and the coarse coal refuse disposal area will reach allotted capacity by 2013. To continue long-term coal production for the BCMC, the applicant proposes to construct additional disposal areas numbers 5 & 6 located in 2 valley's containing approximately 706 acres adjacent to the existing facilities. This disposal area will provide for approximately 52.7 million cubic yards (mcy) of coarse coal refuse disposal over 13 years and 38 mcy of fine coal refuse over 7.5 years. This disposal area has been accepted by the Pennsylvania

Notice serves as a request to the U. S. Fish and Wildlife Service for any additional information they may have on whether any listed, or proposed to be listed, endangered or threatened species may be present in the area which would be affected by the activity, pursuant to Section 7(c) of the Endangered Species Act of 1972 (as amended).

7. IMPACT ON CULTURAL RESOURCES: In a letter dated June 20, 2008, the Pennsylvania Historical and Museum Commission (PHMC) determined that the project area has low archaeological potential and consequently, the project should have no effect upon significant archaeological resources. However, the PHMC has determined that potentially significant historic sites are located in or near the project area that could be adversely affected. CPCC is currently working to conduct Phase III and IV studies to address potential historic impacts. Prior to a permit decision being made, a clearance letter will be required from the PHMC. If we are made aware, as a result of comments received in response to this notice, or by other means, of specific archeological, scientific, prehistorical, or historical sites or structures which might be affected by the proposed work, the District Engineer will immediately take the appropriate action necessary pursuant to the National Historic Preservation Act of 1966 - Public Law 89-665 as amended (including Public Law 96-515).

8. PUBLIC INVOLVEMENT: Any person may request, in writing, within the comment period specified in the paragraph below entitled "RESPONSES," that a public hearing be held to consider this application. The requests for public hearing shall state, with particularity, the reasons for holding a public hearing.

9. EVALUATION: Interested parties are invited to state any objections they may have to the proposed work. The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonably may be expected to accrue from the proposals, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among these are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people. The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this



Bailey Mine CRDA No. 5 & 6 Project Boundary
 (Center Coordinates: 39.953612°N, -80.414582°W)

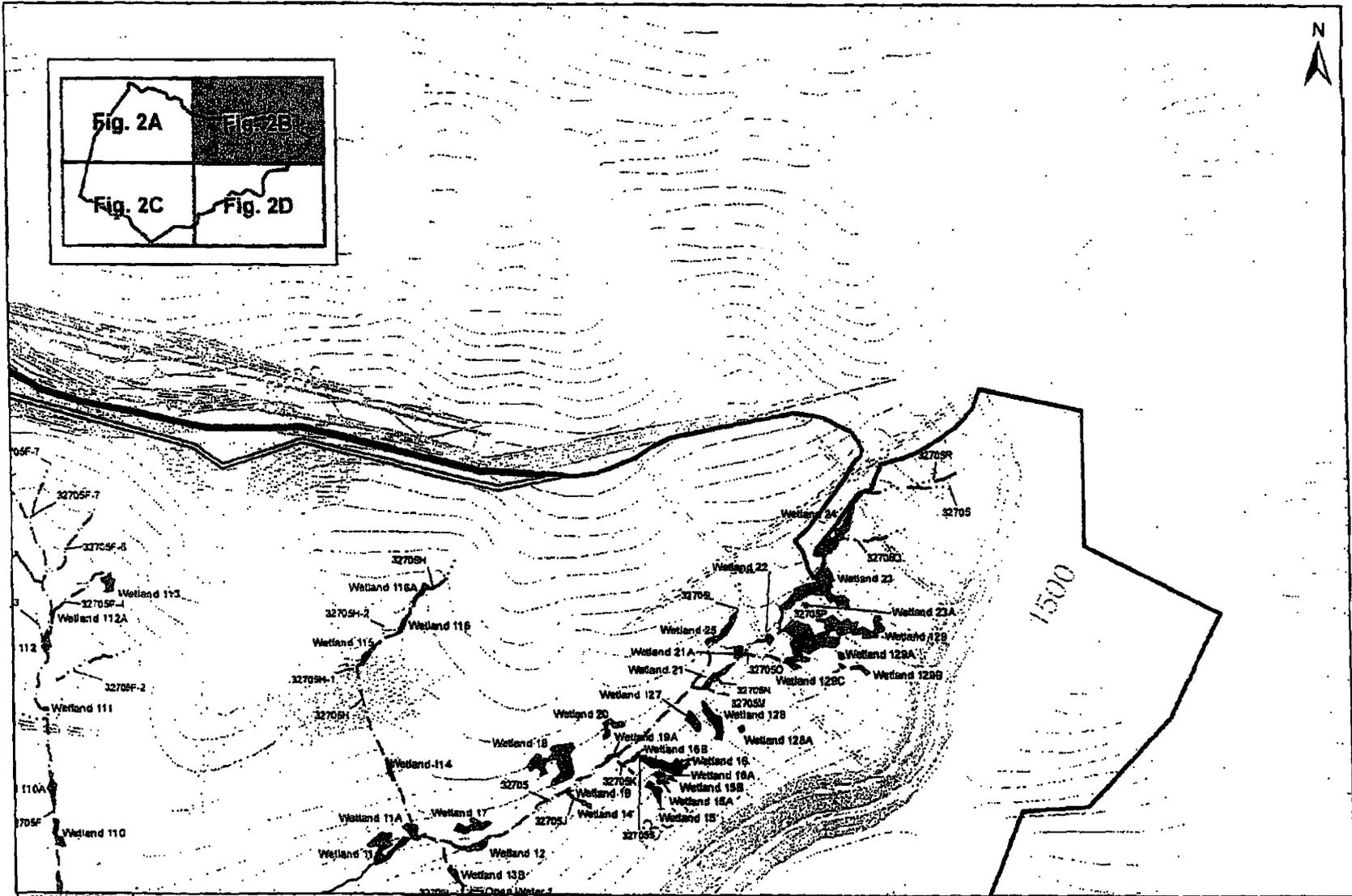
Grapple Creek Wetland Mitigation Area
 (Center Coordinates: 39.925196°N, -80.46638°W)

Reference:
 USGS 7.5 MIN TOPOGRAPHIC MAP,
 WIND RIDGE, PA QUADRANGLE
 DATED: 1984, REVISED: 1984

DRAWN BY: CLC CHECKED BY: MLS APPROVED BY: MUI SCALE: 1" = 1,000' DATE: 2/24/2008	Legend Project Boundary Wetland Mitigation Area	ISSUED FOR: CONSOL ENERGY ISSUED BY: CIVIL & ENVIRONMENTAL CONSULTANTS, INC. 233 Baldwin Road Pittsburgh, PA 15205 9702 1-800-265-2334	WETLAND MITIGATION LOCATION MAP BAILEY CRDA NO. 5 & 6 CONSOL PENNSYLVANIA COAL COMPANY LLC GREENE COUNTY, PENNSYLVANIA PROJECT NO.: 071-527,0005 FIGURE: 2
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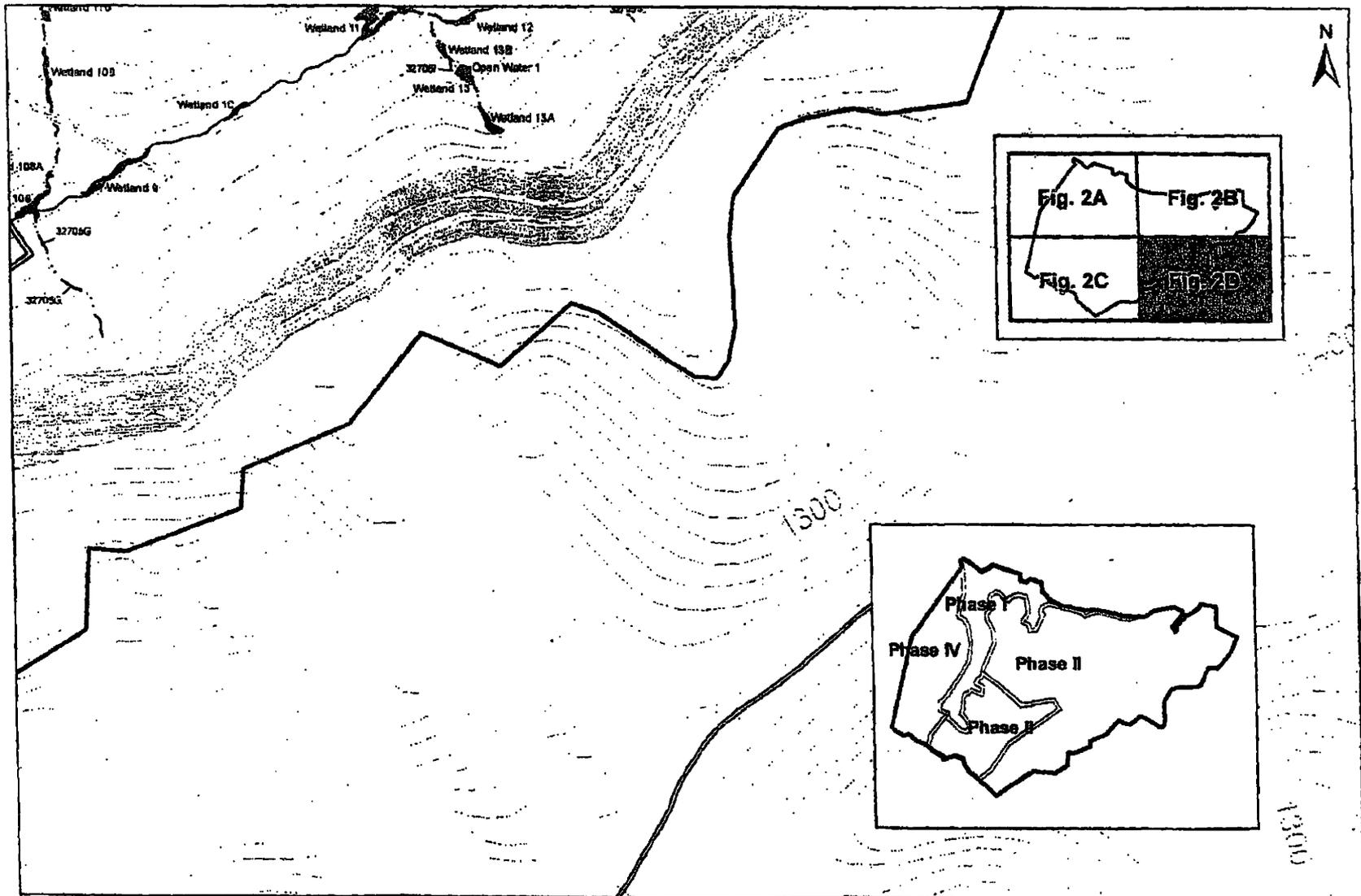
7/11
 PROJECT NO. 071-522-8805
 DRAWN BY: JCC
 CHECKED BY: H.S.
 APPROVED BY: JHW
 1 inch equals 500 feet
 DATE: 12/20/08

LEGEND
 Parcel Boundary
 Phase Boundary
 Wetland
 Biological Monitoring Station
 Proposed Wetland Grading
 Hydrographical Feature Resources
 Potential Stream
 Temporary Stream
 Ephemeral Stream
 Surface Water Connection

CONSOL ENERGY
 CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
 313 BROWN ROAD
 PITTSBURGH, PA 15205-6702
 1-800-365-2334
 PROJECT NO. 071-522-8805

STREAM AND WETLAND IMPACT PLAN
 BAILEY CRDA NO. 5 AND 6
 CONSOL PENNSYLVANIA COAL COMPANY LLC
 GREENE COUNTY, PENNSYLVANIA
 FIGURE 2B
 PROJECT NO. 071-522-8805
 FIGURE 2B

P.N. 09 08



11/6

10000 PACE CONTROLS
 PROVIDED BY CONSOLE
 PENNSYLVANIA COAL
 COMPANY LLC 2007

PROPOSED CHANNELS
 CHECKED BY
 DAVIDSON A. SIOE

DESIGNER: CJC
 CHECKED BY: MJA
 APPROVED BY: WRP
 1:1000 SCALE S.D.C. FILE
 DATE: 10/27/2008

Legend	
	Perennial Stream
	Intermittent Stream
	Seasonal Stream
	Soil as Monitoring Station
	Proposed Perennial Channel
	Proposed Perennial Channel
	Hydrologically Isolated Reservoir

ISSUED FOR: **CONSOL ENERGY**

DESIGNED BY: **CIVIL & ENVIRONMENTAL CONSULTANTS, INC.**
 313 Satterlee Road
 Pittsburgh, PA 15225-3702
 1-800-365-2874

Colombus, OH * Cleveland, OH * Indianapolis, IN * Nashville, TN * Chicago, IL * St. Louis, MO * Evans, PA * Detroit, MI

**STREAM AND WETLAND IMPACT PLAN
 BAILEY CRDA NO. 5 AND 6
 CONSOL PENNSYLVANIA COAL COMPANY LLC
 GREENE COUNTY, PENNSYLVANIA**

PROJECT NO.: 071422.0005 FIGURE: 2D

P.N. 09-08



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

July 10, 2009

Haberman 17361
return - file
on desk

REPLY TO

Operations Division
Regulatory Branch
2007-463

Consol Pennsylvania Coal Company, LLC
P.O. Box J, 1525 Pleasant Grove Road
Claysville, PA 15323

Dear Mr. Suter:

I refer to your application for a Department of the Army permit received in this office December 4, 2008, to construct the Bailey Mine Coal Refuse Disposal Areas No. 5 and 6, located in Richhill Township, Greene County, Pennsylvania.

In response to Public Notice No. 09-08 issued by this office on March 16, 2009, the following comments were submitted:

1. Correspondence dated April 2, 2009, from [REDACTED], citing health, safety, and environmental concerns with the proposed project.
2. Correspondence dated April 9, 2009, from [REDACTED] citing health, safety, and environmental concerns with the proposed project.
3. Correspondence dated April 17, 2009, from the Richhill Township Supervisors citing concerns with the project and specifically the effects of the project on water quality.
4. Correspondence dated April 21, 2009, from [REDACTED] citing health, safety, and environmental concerns with the proposed project.
5. Correspondence dated April 23, 2009, from PennFuture citing numerous concerns with the project.
6. Correspondence dated April 30, 2009, from the US Fish & Wildlife Service (FWS) stating that the proposed project will result in a take of Indiana bats (*Myotis sodalist*) due to destruction and fragmentation of foraging and roosting habitat, and citing concerns due to the loss of aquatic resources.
7. Correspondence dated June 30, 2009, for the US Environmental Protection Agency (EPA) regarding proposed aquatic resource compensatory mitigation, compliance with the 404 (b)(1) guidelines, and cumulative affects.

As a result of our review of the information submitted and of the comments received in response the public notices, we have the following comments and request the following information:

1. In order for this office to make the determination that the proposed project is in compliance with the Clean Water Act we must assess the past, presently proposed, and reasonably foreseeable cumulative impacts associated with coal refuse disposal associated with the Bailey Central Mine Complex (BCMC). Your application included a discussion of cumulative impacts of the four phases of the proposed Bailey 5 & 6 coal refuse disposal areas. This analysis must be expanded to include all direct and indirect impacts resulting from past activities, currently proposed activities, and foreseeable

RECORD
FILE

impacts from known future mining activities. The cumulative impacts assessment (CIA) should, at a minimum, focus both the Owens Run watershed, the locally proposed watershed to be impacted, and the Enlow Fork watershed, the regional watershed. The alternative analysis submitted with your application states that the Bailey and Enlow Fork Mines contain sufficient coal reserves that represent approximately 30 years of additional coal production (Section 3.0) and that the proposed Bailey 5 & 6 will provide for disposal for 12 years. Therefore, it can be construed that additional disposal areas for the remaining 18 year life of the BCMC will be required which must be addressed in the CIA.

2. The alternative analysis for the site selection states that Bailey 5 & 6 disposal area is the site approved through the Surface Mining Control and Reclamation Act (SMCRA) permit process. This office has determined that review process does not fully address the requirements of the Clean Water Act 404 (b)(1) requirements that state for non-water dependent projects it is presumed there are upland alternatives, and if aquatic impacts can not be avoided, all practicable efforts must be employed to minimize the adverse impacts. We request that you further investigate alternate site locations which may have less adverse aquatic impacts that are located within a reasonable range, even if they are outside of the review area required by the SMCRA regulations. The least damaging practicable alternative for refuse disposal could include an option to transport waste from the plant via overland conveyor belt, railroad, or truck outside of the area immediately adjacent to the BCMC. If it is reasonable to transport coal to the plant via overland conveyor belt and truck, as is the case with Crabapple Slope and the proposed Oak Spring Slope, it would stand to be reasonable that the waste generated could likewise be transported to a less damaging disposal site.

3. Proceeding with the assumption that the need for the Bailey 5 & 6 disposal area can be documented as the least practicable damaging alternative, compensatory mitigation will be required for the un-avoidable adverse aquatic impacts. Based on the information submitted for our review, this office, in conjunction with the EPA and the FWS, has determined that the proposed Presto-Sygan AMD Remediation Project located in the Chartiers Creek watershed, Allegheny County, Pennsylvania, is not adequate compensatory stream mitigation for the lost of approximately 5 miles of headwater streams in the Owens Run Watershed, a tributary to Enlow Fork, which flows to Wheeling Creek, a tributary to the Ohio River. This determination has been made in consideration that: (1) the streams proposed to be impacted are not degraded; and (2) the proposed impacts are to 1st, 2nd, and 3rd order headwaters streams located in a rural setting (Greene County) compared to the proposed mitigation to a significantly larger, degraded stream located in an urban area (Allegheny County) approximately 60 miles away. While we do acknowledge that both the Chartiers Creek and Wheeling Creek are both tributaries to the Ohio River, Chartiers Creek enters the Ohio River near river mile 3 and Wheeling Creek near river mile 91, the proposed mitigation plan will not replace the lost functions of the impacted streams nor assist in an overall "functional lift" to the quality of the Owens Run or Enlow Fork watershed. If you disagree with this determination, it is incumbent upon Consol to submitted adequate justification documenting precisely how this proposed mitigation plan will replace the lost functions of the headwater tributaries to Owens Run, including success goals, performance criteria, and measurable performance standards to document success of the stated goals. To this end, pre-existing base line data, including water quality and biological data must be studied. Additionally, the Preston-Sygan AMD Reclamation Project will impact existing waters of the United States, therefore, it will require a Department of Army. This permit must be secured prior to it being accepted as compensatory mitigation to ensure that the compensatory mitigation can be constructed prior to, or during the first year, that the adverse aquatic impacts occur at the permit site.

4. We request that a stream and wetland mitigation plan be identified that will adequately compensate for the lost functions of the 25,835 feet of headwaters streams and 5.7 acres of adjacent wetlands proposed to be impacted within the Owens Run watershed. Mitigation opportunities should first be explored within the immediate Owens Run watershed, then if necessary, expanded to include the Enlow Fork watershed. The goal of compensatory mitigation should be to replace the lost functions of the impacted aquatic resources and provide for chemical, biological, and physical functional improvements (lift) to the local and regional aquatic resources. The mitigation plan must include specific performance goals, success criteria and measureable performance standards. The plan should include specific baseline data to document the existing chemical, biological, and physical conditions of the impaired resources proposed to be improved. Portions of Enlow Fork are currently listed on the state 303(d) list as impaired for aquatic life, therefore, mitigation efforts should be guided to improve the watershed and remove the stream from the state degraded list of streams.

The initial application included a stream mitigation plan for stream restoration activities on 25,210 feet of Rocky Run and Templeton Creek, tributaries to Enlow Fork. This represents a ratio of 1:1 for the impacts to 24,585 feet of perennial and intermittent streams and a 0.5:1 ratio for impacts to 1,250 feet of ephemeral stream channel to be completely lost at the Bailey 5 & 6 site. We commend you for the development of this plan, however, the restoration plan does not address several areas of the streams that have been determined to be of "poor quality" within the proposed restoration reaches, and the study has not investigated several segments located within these reaches. While the restoration activities will address areas of concern and will most likely provide for a functional improvement to the resources, it does not appear to be sufficient to adequately compensate for the total loss of approximately 5 miles of streams at the impact site. We request that you expand and further develop a restoration plan to eliminate the segmentation of the proposed restoration areas to include a complete watershed approach to restore the degraded portions of the watershed and increase your restoration ratio to achieve an overall functional lift of the watershed proportionally to adequately compensate for the lost functions of the impacted resources and achieve an overall functional lift within the Enlow Fork watershed.

Currently, wetland mitigation is proposed adjacent to Crabapple Creek, a tributary to Dunkard Creek, which flows to Wheeling Creek. We request that you identify opportunities for wetland mitigation within the Owens Run and/or the Enlow Fork watershed which will replace the lost functions of the wetlands to be impacted within the Owens Run watershed. Wetland replacement must include emergent, shrub/scrub, and forested components and should be designed to include a 1:1 ratio for emergent wetlands, 2:1 for shrub/scrub, and 3:1 for forested wetlands. The increased ratios for the PSS and PFO wetlands are warranted to compensate for the temporal loss of function experienced until these components develop.

5. A federal permit can not be issued for this proposed activity until consultation under Section 7 of the Endangered Species Act is concluded to ensure that the project will not result in an adverse impact to the Indiana bat (*Myotis sodalists*) and concurrence is received from the FWS. A biological assessment must be conducted to assess the impacts of the project on the bat. Once completed, we request that you submit a copy to this office when submitted to the FWS so that we may continue consultation with the FWS.

You must prepare a response for all public comment letters forwarded to you to address their specific concerns. You may submit a reply to this office or you may address them directly, with a copy of each letter sent to this office.

We will continue to work with you in your development plans. Upon receipt of the requested information, we will continue our review of the proposed project. If you have any questions, please contact me at (412)395-7361 or email [marcia.h.haberman @usace.army.mil](mailto:marcia.h.haberman@usace.army.mil).

Sincerely,

Marcia H. Haberman
Chief, Southern Section
Regulatory Branch

Enclosures

Copy Furnished:

US EPA
US FWS
PA DEP, California Mining Office
PA FBC



October 1, 2009

All Redactions are Exemption #6 - Privacy

Ms. Marcia Haberman
U.S. Army Corps of Engineers
Federal Building
1000 Liberty Avenue
Pittsburgh, Pennsylvania 15222-4186

Dear Ms. Haberman:

Subject: Department of the Army Section 404 Permit Application File No. 2007-463
Response to USACE and Public Comments
Proposed Bailey Mine Coal Refuse Disposal Areas No. 5 and 6
Richhill Township, Greene County, Pennsylvania
CEC Project 071-522.0013

Civil & Environmental Consultants, Inc. (CEC), on behalf of Consol Pennsylvania Coal Company LLC (CPCC), has prepared the following responses to the comments presented in your letter dated July 10, 2009, regarding the subject permit application. As requested in your letter, we are addressing the following comments:

1. USACE comments 1-5 presented in your July 10, 2009 letter.
2. Letter from [REDACTED], dated April 2, 2009.
3. Letter from [REDACTED], dated April 9, 2009.
4. Letter from the Richhill Township Supervisors, dated April 2, 2009.
5. Letter from [REDACTED], dated April 21, 2009.
6. Letter from Penn Future, dated April 23, 2009.
7. Letter from the US Fish & Wildlife Service, dated April 30, 2009.
8. Letter from the US Environmental Protection Agency (EPA), dated June 30, 2009.

Below, we list the comments by letter and provide the response following each comment. Responses were prepared by CEC for ecological comments, Michael Baker Corporation for alternative analysis comments, D'Appolonia for comments on the coal refuse impoundment design and safety, Moody and Associates on comments on groundwater and surface water hydrology, and CPCC on comments related to the project need, mining operations, and consultation with the USFWS regarding the Indiana bat.

1. USACE comments 1-5, in letter dated July 10, 2009

USACE Comment 1: In order for this office to make the determination that the proposed project is in compliance with the Clean Water Act we must assess the past, presently proposed, and reasonably foreseeable cumulative impacts associated with coal refuse disposal associated with the Bailey Central Mine Complex (BCMC). Your application included a discussion of cumulative impacts of the four phases of the proposed Bailey 5 & 6 coal refuse disposal areas. This analysis must be expanded to include all direct and indirect impacts resulting from past activities, currently proposed activities, and foreseeable impacts from known future mining activities. The cumulative impacts assessment (CIA) should,

Civil & Environmental Consultants, Inc.

Pittsburgh 333 Baldwin Road
Pittsburgh, Pennsylvania 15205
Phone 412/429-2324
Fax 412/429-2114
Toll Free 800/365-2324
E-mail info@cecinc.com



Chicago	877/963-6026	Export	800/899-3610
Cincinnati	800/759-5614	Indianapolis	877/746-0749
Cleveland	866/507-2324	Nashville	800/763-2326
Columbus	888/598-6808	Phoenix	877/231-2324
Detroit	866/380-2324	St. Louis	866/250-3679



at a minimum, focus both the Owens Run watershed, the locally proposed watershed to be impacted, and the Enlow Fork watershed, the regional watershed. The alternative analysis submitted with your application states that the Bailey and Enlow Fork Mines contain sufficient coal reserves that represent approximately 30 years of additional coal production (Section 3.0) and that the proposed Bailey 5 & 6 will provide for disposal for 12 years. Therefore, it can be construed that additional disposal areas for the remaining 18 year life of the BCMC will be required which must be addressed in the CIA.

Response: As requested, CPCC has prepared the enclosed CIA for coal mining activities in the upper Enlow Fork watershed, which includes the Owens Run sub-watershed. As specified above, the CIA includes an evaluation of all direct and indirect impacts and mitigation activities resulting from past activities, currently proposed activities, and foreseeable impacts from known future mining activities. The estimates of future impacts include additional disposal areas for the remaining 18 year life of the BCMC.

USACE Comment 2: The alternative analysis for the site selection states that Bailey 5 & 6 disposal area is the site approved through the Surface Mining Control and Reclamation Act (SMCRA) permit process. This office has determined that review process does not fully address the requirements of the Clean Water Act 404 (b)(1) requirements that state for non-water dependent projects it is presumed there are upland alternatives, and if aquatic impacts can not be avoided, all practicable efforts must be employed to minimize the adverse impacts. We request that you further investigate alternate site locations which may have less adverse aquatic impacts that are located within a reasonable range, even if they are outside of the review area required by the SMCRA regulations. The least damaging practicable alternative for refuse disposal could include an option to transport waste from the plant via overland conveyor belt, railroad, or truck outside of the area immediately adjacent to the BCMC. If it is reasonable to transport coal to the plant via overland conveyor belt and truck, as is the case with Crabapple Slope and the proposed Oak Spring Slope, it would stand to be reasonable that the waste generated could likewise be transported to a less damaging disposal site.

Response: CPCC believes the least environmentally damaging practicable alternative has been chosen, even if the search area is expanded as requested.

Suitable upland disposal sites are not available for development, and characteristics of valleys within the expanded area are not expected to be significantly different from those of the site proposed for development. Also, waste transport to distant sites will cause additional aquatic impacts not associated with the proposed alternative. Refer to the following subsections for more detailed discussion.

CPCC is proposing a site that already will receive discharges from two existing coal refuse disposal areas even if the site is not developed as a disposal facility. The proposed site includes an existing NPDES point that would be replaced as a result of proposed operations. Development of a new disposal site adjacent to BCMC's existing disposal sites will result in one large disposal area, the top of which could provide substantial capacity for future coarse coal refuse disposal with no additional aquatic impacts.



Use of Upland Disposal Sites

Upland disposal sites, i.e., those sites whose development will not involve aquatic impacts, are not present within the area defined by a 5-mile radius around BCMC. Fine coal refuse will be delivered to an impoundment as slurry. This coupled with the magnitude of the waste to be disposed precludes use of upland disposal sites. Consequently, the only suitable sites within a one mile radius of the BCMC, or even a 5 mile radius, are valley fill sites. Development of any of the valley fill sites within a 5 mile radius of BCMC would result in aquatic impacts.

Use of Sites Outside the Review Area Required by SMCRA Regulations

A reduction in aquatic impacts is not expected if a disposal site located outside the non-HQ watershed portion of the SMCRA search area is selected for coal refuse disposal. Existing data presented in the Alternatives Analysis Report indicate area valleys exhibit similar aquatic resources unless conditions allowing a site to be characterized as preferred are present, and no preferred sites are present. Also, waste transport by trucks, railroads, conveyors etc. to sites remote from the plant area will impact additional aquatic resources as well, increasing rather than decreasing the overall impact.

There are no preferred sites within the expanded area as described in the Alternatives Analysis report. No abandoned mine land, Brownfield or hazardous waste sites providing the required capacity are located within a 5-mile radius. Sections of Enlow Fork, Rocky Run, Templeton Fork, and Robinson Run are included on PADEP's list of impaired waters, but "siltation" is listed as the sole cause of impairment for all and Robinson Run also reportedly exhibits "Organic Enrichment/Low DO".

As with any disposal facility, development will require transport of waste materials to the disposal site. For sites immediately surrounding BCMC, waste transport generally can be accomplished with truck transport on mine complex roads or conveyors constructed on mine property that can be accessed for maintenance primarily from mine complex roads. Waste transport to sites remote from the plant, say at a distance of 5 miles, will require transport facilities such as trucks, railroads, conveyors etc. that will have a greater impact on the infrastructure of the community and these facilities will cause additional aquatic impacts.

USACE Comment 3: Proceeding with the assumption that the need for the Bailey 5 & 6 disposal area can be documented as the least practicable damaging alternative, compensatory mitigation will be required for the un-avoidable adverse aquatic impacts. Based on the information submitted for our review, this office, in conjunction with the EPA and the FWS, has determined that the proposed Presto-Sygan AMD Remediation Project located in the Chartiers Creek watershed, Allegheny County, Pennsylvania, is not adequate compensatory stream mitigation for the lost of approximately 5 miles of headwater streams in the Owens Run Watershed, a tributary to Enlow Fork, which flows to Wheeling Creek, a tributary to the Ohio River. This determination has been made in consideration that: (1) the streams proposed to be impacted are not degraded; and (2) the proposed impacts are to 1st, 2nd, and 3rd order headwaters streams located in a rural setting (Greene County) compared to the proposed mitigation to a significantly larger, degraded stream located in an urban area (Allegheny County)

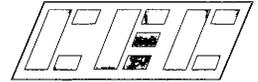


approximately 60 miles away. While we do acknowledge that both the Chartiers Creek and Wheeling Creek are both tributaries to the Ohio River, Chartiers Creek enters the Ohio River near river mile 3 and Wheeling Creek near river mile 91, the proposed mitigation plan will not replace the lost functions of the impacted streams nor assist in an overall "functional lift" to the quality of the Owens Run or Enlow Fork watershed. If you disagree with this determination, it is incumbent upon Consol to submitted adequate justification documenting precisely how this proposed mitigation plan will replace the lost functions of the headwater tributaries to Owens Run, including success goals, performance criteria, and measurable performance standards to document success of the stated goals. To this end, pre-existing base line data, including water quality and biological data must be studied. Additionally, the Preston-Sygan AMD Reclamation Project will impact existing waters of the United States; therefore, it will require a Department of Army permit. This permit must be secured prior to it being accepted as compensatory mitigation to ensure that the compensatory mitigation can be constructed prior to, or during the first year, that the adverse aquatic impacts occur at the permit site.

Response: A discussion of potential stream restoration/mitigation options for the development of CRDA No. 5 & 6 is provided in Section 6.6 of the Cumulative Impact Assessment. This section addresses consideration of the Presto-Sygan AMD Remediation Project and the Gladden Discharge Stream Sealing Project (Chartiers Creek mitigation plans). CPCC is continuing forward with the Chartiers Creek mitigation plans for PADEP and the upper Enlow Fork watershed stream restoration/mitigation plan for USACE.

USACE Comment 4: We request that a stream and wetland mitigation plan be identified that will adequately compensate for the lost functions of the 25,835 feet of headwaters streams and 5.7 acres of adjacent wetlands proposed to be impacted within the Owens Run watershed. Mitigation opportunities should first be explored within the immediate Owens Run watershed, then if necessary, expanded to include the Enlow Fork watershed. The goal of compensatory mitigation should be to replace the lost functions of the impacted aquatic resources and provide for chemical, biological, and physical functional improvements (lift) to the local and regional aquatic resources. The mitigation plan must include specific performance goals, success criteria and measurable performance standards. The plan should include specific baseline data to document the existing chemical, biological, and physical conditions of the impaired resources proposed to be improved. Portions of Enlow Fork are currently listed on the state 303(d) list as impaired for aquatic life, therefore, mitigation efforts should be guided to improve the watershed and remove the stream from the state degraded list of streams.

The initial application included a stream mitigation plan for stream restoration activities on 25,210 feet of Rocky Run and Templeton Creek, tributaries to Enlow Fork. This represents a ratio of 1:1 for the impacts to 24,585 feet of perennial and intermittent streams and a 0.5:1 ratio for impacts to 1,250 feet of ephemeral stream channel to be completely lost at the Bailey 5 & 6 site. We commend you for the development of this plan, however, the restoration plan does not address several areas of the streams that have been determined to be of "poor quality" within the proposed restoration reaches, and the study has not investigated several segments located within these reaches. While the restoration activities will address areas of concern and will most likely provide for a functional improvement to the resources, it does not appear to be sufficient to adequately compensate for the total loss of



approximately 5 miles of streams at the impact site. We request that you expand and further develop a restoration plan to eliminate the segmentation of the proposed restoration areas to include a complete watershed approach to restore the degraded portions of the watershed and increase your restoration ratio to achieve an overall functional lift of the watershed proportionally to adequately compensate for the lost functions of the impacted resources and achieve an overall functional lift within the Enlow Fork watershed.

Currently, wetland mitigation is proposed adjacent to Crabapple Creek, a tributary to Dunkard Creek, which flows to Wheeling Creek. We request that you identify opportunities for wetland mitigation within the Owens Run and/or the Enlow Fork watershed which will replace the lost functions of the wetlands to be impacted within the Owens Run watershed. Wetland replacement must include emergent, shrub/scrub, and forested components and should be designed to include a 1:1 ratio for emergent wetlands, 2:1 for shrub/scrub, and 3:1 for forested wetlands. The increased ratios for the PSS and PFO wetlands are warranted to compensate for the temporal loss of function experienced until these components develop.

Response: Owens Run was examined for potential stream restoration and wetland mitigation opportunities; however, the land use is dominated by residential lots that are separated by blocks of forested riparian habitat (see Figure 1 in the enclosed CIA). Due to land use restrictions and limited opportunity to conduct large scale aquatic resource restoration in the Owens Run watershed, it was eliminated from further consideration.

Water chemistry measurements (e.g., pH, DO, conductivity, temperature, and discharge), pebble counts, habitat assessments, and channel stability evaluations will be recorded within each proposed active stream channel restoration reach. Appropriate USEPA habitat evaluation data sheets (i.e., high-gradient or low-gradient) will be used to score habitat quality. These baseline stream condition data are currently being collected and will be used to document the physical deficiencies within each restoration area. These methods and data will be incorporated into the stream mitigation plan and will be used to establish proposed mitigation success criteria for stream restoration.

Restoration efforts will target the deficient characteristics, and success of the restoration will be determined by comparing the post-restoration monitoring data to the baseline conditions. Success criteria can be refined once the agencies reach agreement on the type of mitigation that will be accepted. CEC is currently working to collect baseline data and develop more detailed stream restoration plans for the sites identified in the original Section 404 application.

The sections of stream in the upper Enlow Fork watershed that are on the 303(d) list streams are listed as being impaired due to sedimentation. Active stream channel restoration activities will help reduce the sediment load in the watershed, even if located upstream of the impaired reach; which in turn, will help improve conditions within the impaired reaches.

The proposed stream restoration plan utilizes properties currently owned by CPCC; however, the areas were selected based on the opportunity to conduct restoration on long contiguous reaches of stream as



opposed to numerous smaller segments. Gaps within individual restoration areas are the result of either a change in ownership (e.g., Restoration Area 1) or where restoration activities have already occurred (e.g., Restoration Area 3). CPCC has also identified other potential restoration projects that are not on their property, and CPCC land agents are approaching those land owners about participation in a restoration project.

40 CFR Part 230 (Compensatory Mitigation for Losses of Aquatic Resources; Final Rule) states that, "If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio must be used". CPCC is exploring opportunities to conduct an additional 625 linear feet of restoration in order to satisfy the one-to-one ratio. If the USACE does not believe this is adequate compensation, then CPCC requests that the USACE provide recommended ratios and justification.

The wetland mitigation area is located along Crabapple Creek, which is within the larger Wheeling Creek watershed, as is CRDA 5 & 6. The site was selected based on its potential to construct one large contiguous wetland mitigation area, its location within a permanent conservation easement, and its location on property that is owned by CPCC. Based on the mitigation ratios listed in this comment, at least 6.23 acres of wetland will need to be created. The conceptual wetland mitigation plan provided for the creation of 6.2 acres of diverse wetland habitat (deep marsh, shallow marsh, wet meadow-shrub) and riparian buffer at the Crabapple Creek site; however, the grading plan has not been finalized. If during the final design of the mitigation area, the required mitigation acreage cannot be provided at this site, then a second mitigation site within the upper Enlow Fork watershed will be used to provide the balance of the wetland mitigation acreage.

*USACE Comment 5: A federal permit can not be issued for this proposed activity until consultation under Section 7 of the Endangered Species Act is concluded to ensure that the project will not result in an adverse impact to the Indiana bat (*Myotis sodalists*) and concurrence is received from the FWS. A biological assessment must be conducted to assess the impacts of the project on the bat. Once completed, we request that you submit a copy to this office when submitted to the FWS so that we may continue consultation with the FWS.*

Response: A biological assessment was conducted and concurrence was received for the Area 1 and 2 Refuse Conveyor (Phase 1) and the Treatment Pond (Phase 2) area. Negotiations are currently taking place for the Slurry Impoundment Area 5 (Phase 3) and Coarse Coal Area 6 (Phase 4). Please see the attached concurrence letter dated March 20, 2009 from the USFWS for Phase 1 and 2 Refuse Conveyor and Treatment Pond.

2. Comments from [REDACTED], in letter dated April 2, 2009

[REDACTED] Comment 1: The 24,585 feet of intermittent streams and 1,250 feet of ephemeral streams that will be covered with valley fill will no longer feed the stream that flows through the middle of my property. The beautiful stream and natural waterfall that adds a large amount of value to my property (stated at my appraisal) will dry up completely or almost completely.



Response: The proposed refuse disposal areas occupy 706 acres, which is approximately 29% of the watershed area of Owens Run (2,433 acres). Therefore, the majority of the contributing watershed to Owens Run will be maintained. While some reduction of stream flows within Owens Run will likely occur as a result of retaining storm water runoff within the lined disposal areas, the design of the CRDAs include the following features that will continue to provide some groundwater base flow and surface runoff to Owens Run from the project area:

- A network of spring collectors and rock underdrains will be installed beneath the lined disposal areas and downstream ponds to collect groundwater base flow from beneath the liner and discharge this water to Owens Run.
- As a safety feature, the major dams for the disposal areas are designed with internal drains to collect and discharge seepage through the dam in a controlled manner. This water, along with storm water runoff from the dam face, embankment out slopes, and other tributary areas will be collected in a sedimentation/treatment pond and released to Owens Run following treatment.
- CPCC is currently progressing with capping and reclamation of their existing CRDA 1 impoundment and remaining embankment surfaces. As currently planned, stormwater runoff from roughly 170 acres of the reclaimed CRDA 1 site will initially be routed into the CRDA 5 impoundment. After the CRDA 5 embankments are completed, runoff from this area will be routed around the CRDA 5 impoundment and into the downstream sedimentation/treatment pond, thereby providing an additional source of water for release to Owens Run. Similarly, later in the life of CRDA 5, the existing CRDA 3 impoundment will be capped and reclaimed, resulting in roughly 117 additional acres tributary to the CRDA 5 sedimentation/treatment pond.
- CRDA 6 is not designed to impound water, so stormwater runoff from CRDA 6 will be routed into the downstream sedimentation/treatment pond for treatment and subsequent release to Owens Run.

After the refuse areas reach capacity, they will be capped and storm water runoff from the entire 706-acre post-development drainage area (a larger area than the combined CRDA 5 and CRDA 6 sites) will contribute flow to Owens Run.

Comment 2: *The fish under my bridge will die and the wildlife that drinks from Owens Run (Ackley Creek) will leave or be poisoned by the mineral and acid run off. My well will almost certainly dry up or be contaminated. I have a fantastic well, being able to wash clothes and my car even in a drought. It is drinkable and endless.*

Response: The water discharged from the disposal areas will be treated and monitored to meet state water quality standards, which are protective of aquatic life. The PADEP is requiring that the disposal areas be constructed with a low permeability liner to protect groundwater quality. CPCC is also required to install groundwater monitoring wells and test groundwater quality to demonstrate that groundwater quality is not significantly diminished by the disposal areas.



Moody and Associates, Inc. (Moody) was retained by CONSOL Energy Inc (CONSOL) to provide for the collection of ground and surface water data, a description of the geologic and hydrologic system, and an evaluation of potential impacts associated with the proposed Bailey Mine Coal Refuse Disposal Areas No. 5 and 6 (CRDA). This information was prepared and provided in accordance with the appropriate requirements as set forth in the Pennsylvania Department of Environmental Protection (PA DEP) Application for Bituminous Underground Mines (5600-PM-MR0324). The collection of geologic and hydrologic data included a ground water inventory conducted by a door-to-door survey of property owners within 1000 feet of the proposed Bailey 5 & 6 coal refuse disposal areas, the monitoring of flow and quality for select streams within and adjacent to the 5 & 6 areas and the installation, monitoring, and sampling of ground water monitoring wells.

Collected data, in addition to historical information, was utilized to understand and describe the existing groundwater and surface water resources and conditions of the area to be affected and adjacent area. Based on the nature of the geologic and hydrologic system and supporting environmental data, an evaluation was undertaken to predict the hydrologic consequences and protect the hydrologic balance of the area within the prescribed limits of potential impacts relative to the proposed Bailey 5 & 6 coal refuse disposal area. Factors significant to the evaluation included the local geology, distance from the proposed impoundments to the water supplies, the design of the facility and the comprehensive monitoring program. After the data collection and evaluation, it was determined that based on the above factors, water supplies located adjacent to the proposed Bailey 5 & 6 coal refuse disposal areas are not expected to be impacted.

A water supply inventory for property 2205-122C [REDACTED] was conducted by Moody on October 31, 2007 to obtain specific information on any wells and springs on the property. It was determined that one (1) well used for domestic purposes existed on the property. During the time of the ground water inventory, the screws to the well cap were completely rusted making the well inaccessible and the depth to ground water could not be determined. In addition, the landowner did not know the depth of the well. This information would be helpful in pinpointing the potential recharge area for the well. As such, a review of historical information as well as consideration of the local geology and hydrology is used to provide a sound basis for the evaluation of the water supply relative to the proposed Bailey 5 and 6 coal refuse disposal area.

The primary geologic units in the area are the Monongahela and Dunkard Groups. While these units are correlated across the proposed permit area and are recognized on a regional basis, the hydrologic properties are highly variable and they cannot be viewed as continuous aquifers.

The [REDACTED] property is located near Owens Run. Based on core logs and monitoring wells located near the Owens Run valley, the primary water bearing units are of the Greene or Washington Formation in the Dunkard Group. According to a study conducted by Stoner (1987), the median reported yield of wells in the Greene Formation is 2.0 gallons per minute (gpm) and for the Washington Formation is 3.0 gpm. These units commonly have iron and manganese concentrations above recommended EPA limits because of oxidation processes, unrelated to coal mining. In addition, many wells and springs have hard to very hard water.



The shallow aquifer system consists of soils or weathered bedrock overlying the hilltops and the valley walls and the alluvial deposits on the valley bottoms. The surface of the shallow, unconfined water table roughly mirrors the surface topography. The ground water in this shallow flow system typically flows from the recharge areas located on the hilltops and valley walls and discharges into the valley bottoms and possibly to Owens Run. Without knowing the depth of the Toland well or the static water level, it is assumed that the recharge area for this well is the shallow ground water flow system associated with the Owens Run watershed.

Deeper or regional ground water typically flows in the direction of the dip of the strata. Also, water in the deeper bedrock aquifers tend to pass under the first and second order streams, such as Owens Run, as underflow and discharge to third or higher order streams such as Enlow Fork. Based on available data, the direction of the regional flow system is assumed to be towards and discharging to Enlow Fork.

The [REDACTED] is over one-half mile from the proposed discharge of the sediment pond and slurry impoundment (see attached Exhibit 1 – Property Location Map). This distance will limit any potential migration of contaminants from the impoundments associated with the slurry and sediment pond.

Best Management Practices (BMPs) will be utilized throughout the life of the facility to control erosion and sedimentation (E & S), which will minimize impacts to the aquatic environment. The E&S control plan will include reclamation and revegetation of disturbed areas. E&S controls will be maintained on the site to meet the discharge standards that are established for this activity. Sediment Pond discharges will be sampled and tested in accordance with permit (NPDES) criteria. After the refuse areas reach capacity in 10-15 years, they will be capped and runoff from the entire 706-acre drainage area will again contribute runoff and surface flow to Owens Run.

Along with these design measures, a comprehensive monitoring program is proposed for the detection of any changes in ground water or surface water quality or quantity.

Background flow and quality information has been obtained for six (6) streams within and adjacent to the proposed area 5 & 6. Several months of background data has been collected and submitted with the permit application to the PA DEP. This background data will be used to evaluate changes and trends in the flow and quality. Data will be collected for streams in the proposed monitoring plan quarterly throughout the life of the permit.

CONSOL will monitor the discharge from the main sediment pond before it discharges to the tributary to Owens Run and the monitoring will follow specifications in the permit document.

Seventeen (17) monitoring wells have been installed to monitor the quality and quantity of the ground water up-gradient and down-gradient of the permit area as well as along the ridge between the slurry impoundment and Fletcher Run. These monitoring wells will detect unexpected changes to the ground water throughout the proposed surface permit area. Several months of background data has been collected and submitted with the permit application to the PA DEP. This background data will be used to evaluate changes and trends in the water level and quality. Data will be collected for monitoring wells in the proposed monitoring plan quarterly throughout the life of the permit.



In the unlikely event that a disruption of a water supply would occur as a result of this construction, CONSOL would immediately take steps to provide an alternate water supply for domestic or agricultural uses during the period that water supplies are affected. Typically, where a municipal or public service district supply is not available, a water tank would be installed and water trucked to the site until the permanent water supply is restored. This hauled water is paid for by the Bailey Mine for the duration of the disruption.

Restoration of a well typically includes re-drilling in its original location or nearby. The new well may be deepened to provide an improved pocket and may be of a larger bore than the original well. Improved casing and well packing techniques are utilized. New wells are tested for production as well as quality. Springs which are used for domestic or agricultural purposes would be reestablished at the same location or new springs developed where applicable.

Comment 3: *The only state-owned road leading from West Finley to Graysville will be blocked or completely closed. By Consol Mines proposal, it will have two large entrances to the site on this road. And from what I understand, it will be altered, making it possibly unusable.*

Response: Ackley Creek Road will remain in service.

Comment 4: *The property value of my home will drop to Zero. The right of way they are currently building is about 1/2 a mile from my bedroom window. The traffic and noise will be unbearable. Most homes on this road are well maintained and have kept this area desirable which will, of course, change if this valley fill is allowed to be constructed.*

Response: Consol Pennsylvania Coal Company, LLC and [REDACTED] have negotiated an agreement for the purchase of their home and property along Ackley Creek Road. In addition to the purchase price, [REDACTED] are allowed to occupy the property rent-free for a short time period following the closing. Additionally, [REDACTED] can choose to rent the premises for a nominal monthly fee. All was mutually agreed upon.

Comment 5: *The constant fear of breastworks of the slurry pond breaching. With extreme weather we have had in recent years, that is a strong possibility. The current slurry pond was determined (by mine representatives at the time of construction) to only reach basement levels if breached. With a much larger pond being constructed, you could only image the devastation, not to mention lives lost that would occur. [The commenter listed several examples of several impoundment failures in Kentucky, Tennessee, and Maryland].*

Response: The design and safety of the dams and disposal areas are rigorously reviewed both by the Pennsylvania Department of Environmental Protection's (PADEP) Division of Dam Safety and the federal Mine Safety and Health Administration (MSHA). The dams and disposal areas are designed to meet or exceed regulatory-prescribed and widely accepted margins of safety. Additionally, the critical dams on the sites are covered by Operation and Maintenance Manuals to guide the operator in monitoring, operating, and maintaining the structures and impoundments properly. The critical dams



are also covered by Emergency Action Plans, which address monitoring, warning, and evacuation procedures in the highly unlikely event that any serious problems are observed.

3. Comments from [REDACTED], in letter dated April 9, 2009

Comment 1: The first issue that this proposal arises is the fact that we use a well to get our water. This water is now going to be polluted with numerous chemicals and poisons in which the result could be detrimental to my family and my animals. This alone should be a strong reason as to why this proposal should not be approved. It endangers the lives of human and animals, but no one seems to be thinking in a logical manner if they are still going through with the proposal. The only option my family could be left with is to bring in an outside water source, such as a buffalo. Not only will this cost money that we do not have, it also will take up space in my yard and will not look very nice.

Response: The water discharged from the disposal areas will be treated and monitored to meet state water quality standards, which are protective of aquatic life. The PADEP is requiring that the disposal areas be constructed with a low permeability liner to protect groundwater quality. CPCC is also required to install groundwater monitoring wells and test groundwater quality to demonstrate that groundwater quality is not significantly diminished by the disposal areas.

Moody and Associates, Inc. (Moody) was retained by CONSOL Energy Inc (CONSOL) to provide for the collection of ground and surface water data, a description of the geologic and hydrologic system, and an evaluation of potential impacts associated with the proposed Bailey Mine Coal Refuse Disposal Areas No. 5 and 6 (CRDA). This information was prepared and provided in accordance with the appropriate requirements as set forth in the Pennsylvania Department of Environmental Protection (PA DEP) Application for Bituminous Underground Mines (5600-PM-MR0324). The collection of geologic and hydrologic data included a ground water inventory conducted by a door-to-door survey of property owners within 1000 feet of the proposed Bailey 5 & 6 coal refuse disposal areas, the monitoring of flow and quality for select streams within and adjacent to the 5 & 6 areas and the installation, monitoring, and sampling of ground water monitoring wells.

Collected data, in addition to historical information, was utilized to understand and describe the existing groundwater and surface water resources and conditions of the area to be affected and adjacent area. Based on the nature of the geologic and hydrologic system and supporting environmental data, an evaluation was undertaken to predict the hydrologic consequences and protect the hydrologic balance of the area within the prescribed limits of potential impacts relative to the proposed Bailey 5 & 6 coal refuse disposal area. Factors significant to the evaluation included the local geology, distance from the proposed impoundments to the water supplies, the design of the facility and the comprehensive monitoring program. After the data collection and evaluation, it was determined that based on the above factors, water supplies located adjacent to the proposed Bailey 5 & 6 coal refuse disposal areas are not expected to be impacted.



Access was not granted to perform a water supply inventory for the [REDACTED] [REDACTED] to obtain specific information for any wells and springs on the property. On November 1, 2007, [REDACTED] verbally refused Moody's request for the inventory and a certified letter was mailed on December 6, 2007 acknowledging the verbal refusal. The letter was received by [REDACTED] on December 8, 2007 and no response from the request was received. This water supply inventory would be helpful in pinpointing the potential recharge area for any supplies located on the properties. As such, a review of historical information as well as consideration of the local geology and hydrology is used to provide a sound basis for the evaluation of the potential water supplies relative to the proposed Bailey 5 and 6 coal refuse disposal area.

The primary geologic units in the area are the Monongahela and Dunkard Groups. While these units are correlated across the proposed permit area and are recognized on a regional basis, the hydrologic properties are highly variable and they cannot be viewed as continuous aquifers.

The [REDACTED] [REDACTED] is located near Owens Run. Based on core logs and monitoring wells located near the Owens Run valley, the primary water bearing units are of the Greene or Washington Formation in the Dunkard Group. According to a study conducted by Stoner (1987), the median reported yield of wells in the Greene Formation is 2.0 gallons per minute (gpm) and for the Washington Formation is 3.0 gpm. These units commonly have iron and manganese concentrations above recommended EPA limits because of oxidation processes, unrelated to coal mining. In addition, many wells and springs have hard to very hard water.

The shallow aquifer system consists of soils or weathered bedrock overlying the hilltops and the valley walls and the alluvial deposits on the valley bottoms. The surface of the shallow, unconfined water table roughly mirrors the surface topography. The ground water in this shallow flow system typically flows from the recharge areas located on the hilltops and valley walls and discharges into the valley bottoms and possibly to Owens Run. Without knowing the type of supplies or any details about the supplies for the Furmanek properties, it is assumed that the recharge area for any supplies located on these properties is the shallow ground water flow system associated with the Owens Run watershed.

Deeper or regional ground water typically flows in the direction of the dip of the strata. Also, water in the deeper bedrock aquifers tend to pass under the first and second order streams, such as Owens Run, as underflow and discharge to third or higher order streams such as Enlow Fork. Based on available data, the direction of the regional flow system is assumed to be towards and discharging to Enlow Fork.

The [REDACTED] [REDACTED] is over one-half mile from the proposed discharge of the sediment pond and slurry impoundment (see attached Exhibit 1 – Property Location Map). This distance will limit any potential migration of contaminants from the impoundments associated with the slurry and sediment pond.

Best Management Practices (BMPs) will be utilized throughout the life of the facility to control erosion and sedimentation (E & S), which will minimize impacts to the aquatic environment. The E&S control plan will include reclamation and revegetation of disturbed areas. E&S controls will be maintained on the



site to meet the discharge standards that are established for this activity. Sediment Pond discharges will be sampled and tested in accordance with permit (NPDES) criteria. After the refuse areas reach capacity in 10-15 years, they will be capped and runoff from the entire 706-acre drainage area will again contribute runoff and surface flow to Owens Run.

Along with these design measures, a comprehensive monitoring program is proposed for the detection of any changes in ground water or surface water quality or quantity.

Background flow and quality information has been obtained for six (6) streams within and adjacent to the proposed area 5 & 6. Several months of background data has been collected and submitted with the permit application to the PA DEP. This background data will be used to evaluate changes and trends in the flow and quality. Data will be collected for streams in the proposed monitoring plan quarterly throughout the life of the permit.

CONSOL will monitor the discharge from the main sediment pond before it discharges to the tributary to Owens Run and the monitoring will follow specifications in the permit document.

Seventeen (17) monitoring wells have been installed to monitor the quality and quantity of the ground water up-gradient and down-gradient of the permit area as well as along the ridge between the slurry impoundment and Fletcher Run. These monitoring wells will detect unexpected changes to the ground water throughout the proposed surface permit area. Several months of background data has been collected and submitted with the permit application to the PA DEP. This background data will be used to evaluate changes and trends in the water level and quality. Data will be collected for monitoring wells in the proposed monitoring plan quarterly throughout the life of the permit.

In the unlikely event that a disruption of a water supply would occur as a result of this construction, CONSOL would immediately take steps to provide an alternate water supply for domestic or agricultural uses during the period that water supplies are affected. Typically, where a municipal or public service district supply is not available, a water tank would be installed and water trucked to the site until the permanent water supply is restored. This hauled water is paid for by the Bailey Mine for the duration of the disruption

Restoration of a well typically includes re-drilling in its original location or nearby. The new well may be deepened to provide an improved pocket and may be of a larger bore than the original well. Improved casing and well packing techniques are utilized. New wells are tested for production as well as quality. Springs which are used for domestic or agricultural purposes would be reestablished at the same location or new springs developed where applicable.

Comment 2: *Secondly, my husband and I moved to this area for a reason. We enjoy the outdoors and living in the country. My husband loves to fish and the population of fish in this area has shrunk significantly due to decisions made by the coal mine. We also used to have a beautiful waterfall behind our home which is no longer there because of its source being cut off. This new proposal will result in the creek that flows behind my home ceasing, which in my opinion is not an option. This will unavoidably lower the property value of my home and the surrounding area.*



Response: The proposed refuse disposal areas occupy 706 acres, which is approximately 29% of the watershed area of Owens Run (2,433 acres). Therefore, the majority of the contributing watershed to Owens Run will be maintained. While some reduction of stream flows within Owens Run will likely occur as a result of retaining storm water runoff within the lined disposal areas, the design of the CRDAs include the following features that will continue to provide some groundwater base flow and surface runoff to Owens Run from the project area:

- A network of spring collectors and rock underdrains will be installed beneath the lined disposal areas and downstream ponds to collect groundwater base flow from beneath the liner and discharge this water to Owens Run.
- As a safety feature, the major dams for the disposal areas are designed with internal drains to collect and discharge seepage through the dam in a controlled manner. This water, along with storm water runoff from the dam face, embankment out slopes, and other tributary areas will be collected in a sedimentation/treatment pond and released to Owens Run following treatment.
- CPCC is currently progressing with capping and reclamation of their existing CRDA 1 impoundment and remaining embankment surfaces. As currently planned, stormwater runoff from roughly 170 acres of the reclaimed CRDA 1 site will initially be routed into the CRDA 5 impoundment. After the CRDA 5 embankments are completed, runoff from this area will be routed around the CRDA 5 impoundment and into the downstream sedimentation/treatment pond, thereby providing an additional source of water for release to Owens Run. Similarly, later in the life of CRDA 5, the existing CRDA 3 impoundment will be capped and reclaimed, resulting in roughly 117 additional acres tributary to the CRDA 5 sedimentation/treatment pond.
- CRDA 6 is not designed to impound water, so stormwater runoff from CRDA 6 will be routed into the downstream sedimentation/treatment pond for treatment and subsequent release to Owens Run.

After the refuse areas reach capacity, they will be capped and storm water runoff from the entire 706-acre post-development drainage area (a larger area than the combined CRDA 5 and CRDA 6 sites) will contribute flow to Owens Run.

Biological surveys performed in Enlow Fork by aquatic biologists with Civil & Environmental Consultants, Inc. have shown that this stream supports a moderately diverse assemblage of fish, amphibians, and aquatic insects (CEC 1999, 2002). Portions of the stream are stocked with trout for recreational purposes, indicating that the stream has adequate water quality to support trout.

Comment 3: *Another risk factor that is already present is the fact that there is already a 100 acre lake across the hill from me. If the dam on this lake breaks, it will come down through the hollow and flood my home. Not only will this kill my animals and destroy my home and my vehicles, it could possibly also result in the death of my family. The water would be coming down the hollow with such force that we would have no chance to escape and protect ourselves.*



Response: The design and safety of the dams and disposal areas are rigorously reviewed both by the Pennsylvania Department of Environmental Protection's (PADEP) Division of Dam Safety and the federal Mine Safety and Health Administration (MSHA). The dams and disposal areas are designed to meet or exceed regulatory-prescribed and widely accepted margins of safety. Additionally, the critical dams on the sites are covered by Operation and Maintenance Manuals to guide the operator in monitoring, operating, and maintaining the structures and impoundments properly. The critical dams are also covered by Emergency Action Plans, which address monitoring, warning, and evacuation procedures in the highly unlikely event that any serious problems are observed.

4. Comments from the Richhill Township Supervisors, in letter dated April 2, 2009

Richhill Township Supervisors Comment 1: *Residents from the Ackley Creek area expressed concerns about the decreased property values of their homes.*

Response: Consol Pennsylvania Coal Company LLC is in the process of discussing this matter with the concerned residents in the Ackley Creek area. Meetings have taken place with the Toland and Furmanek property owners. John Harshman has been contacted about a meeting, but has declined. An offer to purchase is always extended at these meetings with acceptance or refusal by the residents being voluntary. There is no evidence to suggest that the presence of the existing refuse disposal facility has adversely affected property values in the area.

Richhill Township Supervisors Comment 2: [REDACTED] *s from the Ackley Creek area expressed concerns about environmental issues - such as loss of clean water and fish.*

Response: See the response to [REDACTED] Comment 1 and 2 and [REDACTED] Comment 1 and 2 regarding surface water and groundwater quality standards and monitoring.

Richhill Township Supervisors Comment 3: [REDACTED] *from the Ackley Creek area expressed concerns about potential hazards with the ponds-breach in the breastworks-such as leaks, which could lead to the most important concern they had which was the loss and quality and/or contamination of their water.*

Response: See the response to [REDACTED] Comment 3 and [REDACTED] Comment 5 regarding dam safety in addition to the responses noted above.

5. Comments from [REDACTED], in letter dated April 21, 2009

[REDACTED] Comment 1: *All families in this area use well water. There are no public facilities. These wells have been and will continue to be impacted by pond leakage.*

Response: The water discharged from the disposal areas will be treated and monitored to meet state water quality standards, which are protective of aquatic life. The PADEP is requiring that the disposal areas be constructed with a low permeability liner to protect groundwater quality. CPCC is also



required to install groundwater monitoring wells and test groundwater quality to demonstrate that groundwater quality is not significantly diminished by the disposal areas.

Moody and Associates, Inc. (Moody) was retained by CONSOL Energy Inc (CONSOL) to provide for the collection of ground and surface water data, a description of the geologic and hydrologic system, and an evaluation of potential impacts associated with the proposed Bailey Mine Coal Refuse Disposal Areas No. 5 and 6 (CRDA). This information was prepared and provided in accordance with the appropriate requirements as set forth in the Pennsylvania Department of Environmental Protection (PA DEP) Application for Bituminous Underground Mines (5600-PM-MR0324). The collection of geologic and hydrologic data included a ground water inventory conducted by a door-to-door survey of property owners within 1000 feet of the proposed Bailey 5 & 6 coal refuse disposal areas, the monitoring of flow and quality for select streams within and adjacent to the 5 & 6 areas and the installation, monitoring, and sampling of ground water monitoring wells. The Harshman property was not inventoried because it was much greater than 1000 feet from the proposed refuse disposal area.

Collected data, in addition to historical information, was utilized to understand and describe the existing groundwater and surface water resources and conditions of the area to be affected and adjacent area. Based on the nature of the geologic and hydrologic system and supporting environmental data, an evaluation was undertaken to predict the hydrologic consequences and protect the hydrologic balance of the area within the prescribed limits of potential impacts relative to the proposed Bailey 5 & 6 coal refuse disposal area. Factors significant to the evaluation included the local geology, distance from the proposed impoundments to the water supplies, the design of the facility and the comprehensive monitoring program. After the data collection and evaluation, it was determined that based on the above factors, water supplies located adjacent to the proposed Bailey 5 & 6 coal refuse disposal areas are not expected to be impacted.

The primary geologic units in the area are the Monongahela and Dunkard Groups. While these units are correlated across the proposed permit area and are recognized on a regional basis, the hydrologic properties are highly variable and they cannot be viewed as continuous aquifers.

Based on core logs and monitoring wells located near the Owens Run valley, the primary water bearing units are of the Greene or Washington Formation in the Dunkard Group. According to a study conducted by Stoner (1987), the median reported yield of wells in the Greene Formation is 2.0 gallons per minute (gpm) and for the Washington Formation is 3.0 gpm. These units commonly have iron and manganese concentrations above recommended EPA limits because of oxidation processes, unrelated to coal mining. In addition, many wells and springs have hard to very hard water.

The shallow aquifer system consists of soils or weathered bedrock overlying the hilltops and the valley walls and the alluvial deposits on the valley bottoms. The surface of the shallow, unconfined water table roughly mirrors the surface topography. The ground water in this shallow flow system typically flows from the recharge areas located on the hilltops and valley walls and discharges into the valley bottoms and possibly to Owens Run. Without knowing the type of supplies or any details about the supplies for



the [REDACTED] properties, it is assumed that the recharge area for any supplies located on these properties is the shallow ground water flow system associated with the Owens Run watershed.

Deeper or regional ground water typically flows in the direction of the dip of the strata. Also, water in the deeper bedrock aquifers tend to pass under the first and second order streams, such as Owens Run, as underflow and discharge to third or higher order streams such as Enlow Fork. Based on available data, the direction of the regional flow system is assumed to be towards and discharging to Enlow Fork.

The [REDACTED] property is approximately 1.6 miles from the proposed discharge of the sediment pond and slurry impoundment (see attached Exhibit 1 – Property Location Map). This distance will limit any potential migration of contaminants from the impoundments associated with the slurry and sediment pond.

Best Management Practices (BMPs) will be utilized throughout the life of the facility to control erosion and sedimentation (E & S), which will minimize impacts to the aquatic environment. The E&S control plan will include reclamation and revegetation of disturbed areas. E&S controls will be maintained on the site to meet the discharge standards that are established for this activity. Sediment Pond discharges will be sampled and tested in accordance with permit (NPDES) criteria. After the refuse areas reach capacity in 10-15 years, they will be capped and runoff from the entire 706-acre drainage area will again contribute runoff and surface flow to Owens Run.

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In the unlikely event that a disruption of a water supply would occur as a result of this construction, CONSOL would immediately take steps to provide an alternate water supply for domestic or agricultural uses during the period that water supplies are affected. Typically, where a municipal or public service district supply is not available, a water tank would be installed and water trucked to the site until the



permanent water supply is restored. This hauled water is paid for by the Bailey Mine for the duration of the disruption

Restoration of a well typically includes re-drilling in its original location or nearby. The new well may be deepened to provide an improved pocket and may be of a larger bore than the original well. Improved casing and well packing techniques are utilized. New wells are tested for production as well as quality. Springs which are used for domestic or agricultural purposes would be reestablished at the same location or new springs developed where applicable.

Comment 2: [REDACTED] on the north by Ackley Creek, and on the west by Wheeling Enlow Creek. There are no fish in Wheeling Enlow Creek except when stocked other than a few bottom feeders. Water from Consol ponds runs directly into Wheeling Enlow Creek. This would be a healthy water source if not polluted. I have personally notified the DEP of the observance of coal dust and other pollutants in this water at least five times since our arrival in Nov. of 1991. It took at least a week for the DEP to test the water. Of course by this time the visible material had been washed downstream. No further action was taken.

Response: Biological surveys performed previously in Enlow Fork by aquatic biologists with Civil & Environmental Consultants, Inc. have indicated that this stream supports a moderately diverse assemblage of fish, amphibians, and aquatic insects (CEC 1999, 2002). Portions of the stream are stocked with trout for recreational purposes, indicating that the stream has adequate water quality to support trout.

Comment 3: Proposed construction of the Presto Sygan acid mine drainage project is admission by Consol that dangerous levels of acid, iron, and aluminum are in the water.

Response: The Presto-Sygan remediation project is an abandoned mine discharge located in South Fayette Township in Allegheny County and is not related to the Bailey Mine or Enlow Fork. CONSOL is considering funding this project at the request of the PADEP to partially mitigate the proposed stream impacts for the CRDAs 5 and 6.

Comment 4: Surface and beds of major state class two and township roads are being destroyed by large trucks and equipment working for Consol. Township bond is \$12,000 which is hardly enough for all the damage done.

Response: CPCC continues to meet the road bonding requirements set forth at both the Township and State levels. We have positive working relationships with both Richhill Twp. and PENNDOT and meet with them on a regular basis to review damage to roads. We make necessary repairs in a timely manner. As for the bond amounts, [REDACTED] opinion that \$12,000 is too low is not under the control or direction of CPCC.



Comment 5: *A four ton limit metal Greene County bridge nearby is daily crossed by heavy equipment and vehicles going to and from the mine or other Consol construction sites. It has large holes in the metal support and is in eminent danger of collapse.*

Response: CPCC recognizes that there is a weight limit on the bridge and that the bridge is not in good condition. Vehicle traffic has increased in recent months due to construction of the overland belt in this area. We do not know of any heavy equipment crossing this bridge. We will reiterate the bridge condition and weight limit to our personnel and contractors.

Comment 6 [series of historical comments]: *Our house built circa 1840, (Ackley House) has historic value. The original owner arrived in this area in 1818. A large stone monument with a bronze plaque telling the story of the "Great Frontier Mother." state road 44007 runs where a 92 foot wooden covered bridge once spanned the creek. It was taken down in 1937 when a state concrete bridge was constructed to replace it. At that time of the house contacted who came to see the bridge, and then later sent a crew to dismantle it. The bridge now stands in his Greenfield Village in Dearborn Michigan. The only evidence of a covered bridge having been there is one remaining stone abutment.*

We sponsor a reunion for the descendants who travel here each year. They come from all over the country (an average of 60 people.)

Another covered bridge, the Longdon Bridge was recently renovated and re-built. It is one mile north of our home and directly south on Wheeling Enlow Creek.

A historic Delaware Indian medicine camp site is located one mile south on Wheeling Enlow Creek.

There are hundreds of old houses in this entire area which are empty, have been destroyed, or burnt down when Consol purchased thousands of acres at exaggerated prices. We are all concerned about falling real estate prices in this beautiful area with families living here dating back to Revolutionary War days. Historic log cabin houses are being destroyed.

There are at least 20 small cemeteries located throughout the area, some dating back to the 1700's (reference text, East and West Finley Cemeteries) by Helen Borkowski.

Response: The proposed project will not affect any of the historic resources discussed in these comments. There are no previously recorded archeological sites or historical structures within the Area of Potential Effect (APE). The Longdon Bridge is not within the APE for this project. The Ackley House is not recorded within the APE or on the Pennsylvania Historic Sites Survey. Clearance has been received from the Pennsylvania Historical Museum Commission for all of the proposed CRDA 5 and 6 areas.



Comment 7: *Concerning employees at the mine, we live on one of the direct routes to the mine. We noticed that approximately 85% of these vehicles bear license plates from Ohio, West Virginia, and Maryland.*

Response: CPCC employs over 1400 direct employees as well as a number of local contractors that are on the various sites daily. These personnel are highly skilled and are drawn from a pool of qualified individuals throughout the tri-state area; primarily PA, WV and OH. Currently 55% of the CPCC employees are from Pennsylvania.

Comment 8 [series of recreation-related comments]: *A large commercial resort area called (The Four Seasons) KOA is located near West Finley and the mine area. Thousands of people visit this facility yearly.*

Ryerson State Park is nearby. It contains beautiful woodlands, camp sites, picnic areas, and a large public swimming pool and is visited by many throughout the year. Unfortunately, the dam that held a large body of water called "Duke Lake" was destroyed. Also the nearby state roads have been damaged and a metal bridge near the dam has moved off—center. It seems coincidental that immediately prior to this happening, Consol was conducting longwall mining in the vicinity. All of the water in the lake has since disappeared resulting in a very large fish kill and loss of all season fishing. It took Pa. Governor Rendell to resolve the issue. Consol denies culpability, however they are providing \$15,000,000 for the dam's re-construction.

Response: The Duke Lake dam was not “destroyed.” It was breached by the Pa. Department of Environmental Protection (“DEP”) in 2005 because it was leaking. The dam, which was constructed in 1960, had been leaking from several joints and cracks since the early 1960s.

CPCC conducted mining according to its approved permit, with no mining under the dam, and the nearest longwall mining being 850 feet away, well outside the area where ground movements associated with full extraction mining are known to occur.

The dam owner, the Department of Conservation and Natural Resources (DCNR), has filed a subsidence claim with DEP. DEP is currently reviewing that claim. Consol has denied responsibility and has provided responses to information requests from DEP in connection with DEP’s evaluation of DCNR’s subsidence claim. Consol believes that the evidence clearly demonstrates that mine subsidence did not damage the dam.

Consol is not providing \$15,000,000 for reconstruction of the dam. Governor Rendell did not resolve the issue. The agency that is responsible for determining if mining damaged the dam is DEP. Consol and DCNR are currently awaiting DEP’s decision whether mining damaged the dam.

Comment 9 [two comments related to water/gas loss]: *The town of West Finley within the area has lost its water and gas due to longwall mining. Water must now be trucked in and placed in large plastic containers at each house.*



Wind Ridge, another town which is on state road 21 has also lost water due to mining.

Response: As per Act 54, CPCC is required to establish temporary water (large plastic containers) within 24 hours of a reported water loss. Subsequently, CPCC has to re-establish permanent water supplies promptly after the effects of mining have ceased. Usually, this is accomplished within a 2-3 year period from the initial loss whenever public water is not available. CPCC is not aware of any known water containers remaining in West Finley or Wind Ridge at this time. Wells were replaced in West Finley and Wind Ridge was never undermined. Public water is also available in Wind Ridge.

CPCC strongly disagrees with Mr. Harshman's assertion that mining resulted in the loss of natural gas in the West Finley area. This is evidenced by the fact that several large oil & gas operators are in the area attempting to sign oil & gas leases on the same properties that were once undermined.

Comment 10: *Consol sent a letter to me on Jan. 21 1998 requesting information for their Emergency Action Plan for the mine specifying fine coal refuse impoundment. Why is this letter necessary? Has any effort been made over the years to check the construction of any ponds, pits, and holding areas in use by Consol? Do the two large chimneys on site to wash the coal release anything but steam? If so, what? Are they properly filtered as per federal regulations?*

Response: CONSOL is required by the PADEP and MSHA to prepare an Emergency Action Plan as part of the dam safety requirements for the proposed coal refuse disposal areas. The design and safety of the dams and disposal areas are rigorously reviewed both by the Pennsylvania Department of Environmental Protection's (PADEP) Division of Dam Safety and the federal Mine Safety and Health Administration (MSHA). The dams and disposal areas are designed to meet or exceed regulatory-prescribed and widely accepted margins of safety. Additionally, the critical dams on the sites are covered by Operation and Maintenance Manuals to guide the operator in monitoring, operating, and maintaining the structures and impoundments properly. The critical dams are also covered by Emergency Action Plans, which address monitoring, warning, and evacuation procedures in the highly unlikely event that any serious problems are observed.

Two coal burning thermal dryers are located on the Bailey Preparation Plant site and work in conjunction with the cleaning plant to dry a portion of the final clean coal product to meet coal quality specifications. The emissions from these dryers are permitted by the Pennsylvania DEP and are continuously monitored with emissions within required permit parameters.

Comment 11: *There is an annual week-long wildflower walk starting at the state game lands. People from Pennsylvania and surrounding states attend There are flowers growing that are exclusive to this area which are interesting to many botanists who have been here. Wheeling Enlow Creek flows south in the entire wildflower area. Expansion of ponds, pools, arid ash dumps now and in the future, will reduce the tourist business in Southwest Pennsylvania specifically Greene County. It will destroy a way of life and affect our children's future.*



Response: CONSOL helped establish the State Game Land 302/Enlow Fork Natural Area with an initial land donation to the Western Pennsylvania Conservancy in the early 1980s. The proposed project will not affect this natural area or its unique flora. The annual week long wildflower walks have continued since the Bailey Mine and Preparation Plant complex was constructed including the CRDA Nos. 1, 2, 3, and 4.

Comment 12: *If the permit has not yet been approved, how is it legally possible for Consol to have cleared all the land not directly connected to the belt project which I assume has been approved!*

Response: CPCC obtained permission from USFWS to cut the trees within the proposed refuse conveyor and treatment pond boundaries. The trees were cut prior to March 31, 2009, which is not within the restricted time of year. The areas were not cleared since the trees were only cut, the trunks were not removed and no grubbing took place.

6. Comments from Penn Future, in letter dated April 23, 2009

Penn Future Comment 1(A, B, and C): *The Application is incomplete, and ACOE must issue another public notice and accept additional public comment when CPCC submits the missing components. {Comment includes discussion of cumulative impacts on water quality, streams and wetlands, and potential stream mitigation}.*

Response: This response includes a Cumulative Impact Assessment (CIA) that specifically addressed the cumulative impacts that past, present, and reasonably foreseeable future mining activities will have on the upper Enlow Fork watershed. The discussion addresses hydrologic impacts to water quality, physical impacts to Waters of the United States, and potential stream restoration projects that are being considered to mitigate for the impacts associated with CRDA No. 5 & 6. A work group of agency representatives has been assembled to discuss the stream mitigation options for this project. Until such time that the agencies collectively agree to a restoration strategy, CPCC is proceeding forward with all proposed mitigations plan as previously provided.

Penn Future Comment 2: *ACOE must prepare an EIS because the issuance of the permit would be a major federal action significantly affecting the quality of the human environment.*

Response: The ACOE required CPCC to prepare a CIA in order to assess the potential effects that the proposed action would have on resources within the regional watershed. CPCC anticipates that the CIA will be sufficient to address the concerns of the ACOE.

Penn Future Comment 3: *When the arbitrary limits on the alternatives analysis under Pennsylvania law are ignored, there has to be a more suitable place to dispose of coal refuse than the healthy, life-sustaining waters of the Owens Run watershed.*

Response: Refer to response for USACE Comment 2.



Penn Future Comment 4: ACOE may not act on the Application until CPCC submits a Section 401 water quality certification for the entire CRDAs 5 & 6 project.

Response: CPCC has submitted to the PADEP permit applications for all proposed development within CRDA No. 5 (which when approved will contain a Section 401 water quality certification). CPCC anticipates that it will submit the permit application for CRDA No. 6 to PADEP early in the fourth quarter of 2009 (which when approved will contain a Section 401 water quality certification).

Penn Future Comment 5(A, B, and C): Treatment of the Presto-Sygan discharge near a new housing and commercial development in Allegheny County would not offset the obliteration of five miles of healthy, headwater streams in an Environmental Justice Area in Greene County. [Comment discusses whether mine drainage treatment is adequate mitigation, the benefits of the Presto-Sygan discharge treatment, and functional replacement of the impacted streams].

Response: Refer to Response to USACE Comment 3.

Penn Future Comment 6: The Wetland Mitigation Plan would not replicate the functions and values of the isolated vernal pools that would be filled.

Response: No vernal pools will be filled as a result of the proposed action. The vernal pools listed in the wetland and stream delineation report are located in a valley west of the CRDA No. 5 & 6 permit boundary. As such, CPCC agrees with the remainder of Penn Future's comment that, "For other varieties of wetlands, it may be true that one big, contiguous complex is better than a series of many small wetlands".

Penn Future Comment 7: Perpetual fills with perpetual impacts require perpetual mitigation.

Response: CPCC anticipates that they will be required to monitor the approved mitigation projects and perform corrective actions until a time when the resources are self-sustaining and attaining the mitigation success criteria listed in the approved permit conditions.

Penn Future Comment 7A: The mine drainage treatment trust amounts presented in the Presto-Sygan Technical Report are inadequate to guarantee perpetual treatment of the Presto-Sygan discharge.

Response: The Total Trust amounts for the various treatment options are presented in the table "Cost Estimates for Selected Treatment Options" on page 28 of the 2008 Presto-Sygan Technical Report (Report). The passive treatment option has been selected by CONSOL as a proposed mitigation project and the treatment trust related to the passive treatment system is discussed below.

Detailed cost estimates were developed using the cost modeling software, AMDTreat (v. 4.1b) and are provided in the appendix of the report, AMDTreat Forms Completed for Treatment Options, Passive Treatment (pages 84 – 96). AMDTreat was developed by the US Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSM), The Pennsylvania Department of Environmental



Protection (PADEP) and West Virginia Department of Environmental Protection and is the “industry standard” used by OSM, PADEP, the mining industry, and watershed groups to calculate the capital (Construction) costs, annual operation and maintenance (O&M) and future system reconstruction (Recap) costs related to perpetual treatment of mine drainage.

Typical “default database values” provided in AMDTreat were used for cost calculations as well as other current prices and costs associated with construction of similar treatment systems in the greater Pittsburgh area. The present value (PV) of both O&M and Recap was calculated using the Inflation Rate (3.1%) and Net Rate of Return (8.43 %) typically recommended and accepted by the PADEP for post-mining discharge trust fund accounts. The calculated trust amount is the sum of the PV for both O&M and Recap.

The O&M amount includes costs associated with performing routine inspections (labor) and sampling of the treatment system (estimated to be \$544/year) in addition the amount needed to perform routine maintenance on the treatment system (estimated to be \$6,499/year). This routine maintenance may include items such as cleaning debris and sediment from pipes and spillways, making minor adjustments to the vertical flow ponds, and stirring/cleaning the limestone treatment medium in the vertical flow ponds (VFPs) on a periodic basis.

The largest anticipated O&M expense will be the stirring/cleaning of the limestone with a medium-size excavator (16- to 25-ton weight class) and pumps as needed. The anticipated stirring frequency is no more than once per year based on experience with similar treatment component installed 2005 at the Bear Hill site, Bradford Township, Clearfield County, PA . Please note that the stirring in the first 1-2 years will most likely not be needed and funds would remain in the trust account and continue to accrue interest. To illustrate that the maintenance portion of the O&M trust amount is sufficient to provide for perpetual treatment, a detailed estimate for limestone stirring is provided below.

- Assume that the entire 11,400 tons (8,400 cubic yards) of limestone is stirred.
- Assume typical production rate of 300 cy/hr (2-cubic yard capacity bucket, 24-second cycle time).
- Total stirring time for both VFPs: 28 hours.
- Estimated equipment rental cost (21-ton excavator): \$2,000/week (up to 40 hours).
- Estimated fuel cost: 4 gallons/hour fuel consumption x 28 hours = 112 gallons x \$3/gallon = \$336.
- Estimated labor cost: 28 hours x \$35/hour = \$980.
- Pumps/other miscellaneous costs: \$500.
- Total cost: \$2000 + \$336 + \$980 + \$500 = \$3,816 (\$6,499 per year available from the trust)

In addition to the annual O&M expenses, the projected Recap costs are also included in the trust. (See page 95 of the Report.) The Recap costs provide the funds needed to both replace the limestone that will be consumed as well as remove and dispose of the sludge that will accumulate in the settling pond and treatment wetlands. The Recap module in AMDTreat takes into account both the net rate of return and the inflation rate.



The Recap portion of the trust provides \$100,000 (current value - increases with inflation over time) to be withdrawn every 15 years to replace the limestone that is consumed (approximately 3,000 tons every 15 years). Sludge disposal is anticipated to be needed every 20 years at an estimated cost of \$300,000 that is accounted for in the Recap portion of the trust.

Based on the above information provided and the details provided in the Report, the total trust amount provides sufficient funding for perpetual treatment of the Presto-Sygan discharge.

Penn Future Comment 7B: Perpetual maintenance of the wetland mitigation area should be guaranteed by a financial assurance mechanism.

Response: CPCC believes the duration of the monitoring period for this mitigation project should be the same as that required for mitigation projects constructed for other non-mining related activities. As such, CPCC proposes to monitor the mitigation area for a minimum of 5 years or until the mitigation project is deemed successful by the regulatory agencies. Perpetual maintenance using a financial assurance mechanism is not required by the USACE for other projects and is not proposed for this project.

Penn Future Comment 8: ACOE should revise the wetland mitigation success criteria and incorporate the approved wetland and stream mitigation success criteria into permit conditions.

Response: CPCC will recommend specific measurable success criteria in the final wetland and stream mitigation plan. These criteria will be robust enough to document that functional replacement of the resources has occurred.

7. Comments from the US Fish & Wildlife Service, in letter dated April 30, 2009

USF&WS Comment 1: The proposed disposal area clearly contains the Indiana bat, a federally listed, endangered species. Furthermore, the proposed activity is likely to adversely affect this species via the destruction of several hundred acres of its foraging and roosting habitat. Therefore, it appears the subject site is not eligible for use as a coal refuse disposal area.

Response: A biological assessment was conducted and concurrence was received for the Area 1 and 2 Refuse Conveyor (Phase 1) and the CRDA 5 Treatment Pond (Phase 2) area. A biological assessment is currently being prepared by ESI, for CPCC, for the Slurry Impoundment Area 5 (Phase 3) and Coarse Coal Area 6 (Phase 4). Once the biological assessment is complete, negotiations will begin with USFWS. Please see the attached concurrence letter dated March 20, 2009 from the USFWS for Phase 1 and 2 Refuse Conveyor and Treatment Pond. PADEP has issued the Phase 1 Refuse Conveyor based on their determination that the area does not contain Indiana Bats. Review of Phase 3 area is pending. Phase 4 is to be submitted for PADEP review early fourth quarter of 2009.



USF&WS Comment 2: The proposed project may also adversely affect the chemical water quality of Owens Run and Enlow Fork. Since 2004, Consol has been conducting quarterly water quality and sediment chemistry monitoring at its existing disposal facility's Talley Run discharge, and upstream and downstream of Talley Run in Enlow Fork. Copies of those quarterly monitoring reports have been provided to the Fish and Wildlife Service, as well as to the Corps (to Christina Schroeder's attention). Examination of the data reveals that sediment concentrations of polycyclic aromatic hydrocarbons (PAHs) and water conductivity are elevated in Talley Run, and in Enlow Fork downstream of Talley Run, relative to upstream Enlow Fork stations. Conductivity in Talley Run and the two stations in Enlow Fork downstream of Talley Run were typically greater than 1000 uS/cm; conductivity greater than 500 uS/cm is associated with impaired benthic invertebrate communities (Pond et al., 2008). Adding another source of high-conductivity water and PAHs to the Enlow Fork watershed should not be authorized until the project's potential cumulative effects on water quality and aquatic life have been fully assessed.

Response: Section 5 of the CIA specifically addresses the effects of the existing refuse disposal areas with regard to PAHs and conductivity. A summary of the discussion regarding conductivity and PAHs is provided below.

Site specific benthic data collected from Enlow Fork show somewhat different results than the study by Pond et al. (2008), referenced above. Benthic macroinvertebrate samples were collected at two locations downstream of CRDA 3 & 4 and a reference stream during the spring 2005 in a DEP-required stream study. The two downstream stations had field conductivity measurements of 1,324 and 625 uS/cm and corresponding biological index scores of 59 and 50, respectively. The reference stream had a field conductivity measurement of 254 uS/cm and a biological index score of 66. The station with the highest conductivity also had a similar percent EPT (28.5%) compared with the reference stream (33.5%). These results indicate that the 500 μ S/cm conductivity threshold may not be a good predictor of impairment to streams in southwestern Pennsylvania. Furthermore, a study by Kimmel and Argent (2009) suggests that the threshold for in-stream conductivity impairment to fish communities is in the range of 3,000-3,500 μ S/cm.

CPCC has performed on-going sediment sampling for PAHs in Enlow Fork. None of the results to date exceeded the Probable Effects Concentration of 22,800 μ g/kg and greater than 85% of the samples were less than the Threshold Effects Concentration of 1,610 μ g/kg proposed by MacDonald et al. (2000). Therefore, the average PAH results indicate that adverse effects should not occur to aquatic life.

USF&WS Comment 3: Because of their unique position on the landscape and unique ecological values, we also do not believe that the loss of headwater streams can ever be fully "mitigated," unless it is avoided. However, should the Corps decide to permit this project and accept compensatory mitigation, such mitigation should focus on replacing the water quality services of the lost streams and wetlands to the Enlow Fork watershed. Out-of watershed compensation such as that proposed by the applicant is not appropriate in this case.

Response: Refer to responses to USACE Comments 3 & 4.



USF&WS Comment 4: The proposed project would destroy valuable fish and wildlife habitat (including habitat containing a federally-listed, endangered species), it is non-water dependent, and its authorization would be inconsistent with the 404(b)(1) guidelines. Moreover, permit issuance would not be in the public interest with respect to fish and wildlife resources. If you believe there is not sufficient information to support permit denial, we recommend that further action on this permit application not be taken until an Environmental Impact Statement has been prepared that will address the full environmental, economic, and social effects of this project for its projected 25 years of operation, as well as its permanent effects beyond the life of the project.

Response: Refer to Penn Future comment 1 and 2 and USFWS comment 1 response. The proposed site will be designed to minimize disturbances and adverse impacts on fish and wildlife to the surrounding area. Adequate drainage and sedimentation control systems will be provided to minimize erosion and sediment from the site. The construction sequence incorporates erosion and sedimentation controls to minimize adverse impacts on the stream and associated aquatic life.

USF&WS Comment 5: In addition, should the Corps and Department of Environmental Protection determine it is lawful and appropriate to proceed with permitting CRDA 5 and 6, further consultation with the Service will be necessary prior to permit issuance due to anticipated adverse effects on Indiana bats. This consultation would be conducted with the State regulatory authority pursuant to the terms of the 1996 biological opinion on the approval and implementation of surface coal mining and reclamation operations under State and Federal regulatory programs adopted pursuant to the Surface Mining Control and Reclamation Act of 1977 (SMCRA).

Response: Refer to USFWS comment 1 response.

8. Comments from the US Environmental Protection Agency (EPA), in letter dated June 30, 2009

USEPA Comment 1: To reiterate EPA's position from the June 11, 2009 conference call, EPA does not believe that the treatment of acid mine drainage (AMD) from the Presto-Sygan source is in compliance with Federal mitigation guidelines. EPA recognizes that the Presto-Sygan discharge has one of the highest acidity loading of AMD sources in the Chartiers Creek Watershed, and while we fully support passive treatment systems to minimize the effects of AMID, treatment will not adequately replace the functions and values of aquatic resources affected by the direct loss of 25,835 linear feet of headwater streams within the Robinson Fork-Enlow Fork Watershed, which are not AMD-impacted. EPA recommends the applicant seek opportunities to compensate for impacts within the watershed through in-kind functional replacement of lost aquatic resource functions. Portions of Enlow Fork located downstream from the proposed project are currently listed on the State's 303(d) list as impaired for aquatic life, caused by siltation due to subsurface mining activities. Addressing this impairment may provide a viable mitigation option as part of a larger plan to replace lost functions in the watershed. Opportunities to treat AMD in other watersheds, such as the proposed stream mitigation project above, may be best supported through other avenues such as Section 319 grant funds.

Response: Refer to responses to USACE Comments 3 & 4.



USEPA Comment 2: Although EPA did not issue comments on the public notice for the Bailey Mine Coal Refuse Disposal Areas, EPA has concerns that it may be difficult to identify adequate compensatory mitigation considering the magnitude of the proposed aquatic resource impacts from this project. The permit, if issued as currently proposed, will eliminate 25,835 linear feet of headwater streams, of which 24,585 feet are perennial and intermittent streams, and 1,250 feet of ephemeral streams. Headwater streams collectively provide high levels of water quality and quantity, sediment control, nutrients, and organic matter, and as a result, are largely responsible for maintaining the quality of downstream riverine systems. Even ephemeral and intermittent streams that may go dry during a portion of the year continue to provide habitat for macroinvertebrates and amphibians that utilize the interstitial water flows in the substrate below the stream. Furthermore, according to Pennsylvania's list of Regulated Trout Waters, an approximately 30,000 lf segment of Enlow Fork is classified as "approved trout waters," which indicates that the waters contain significant portions that are open to public fishing. This portion is annually stocked with trout and is also recognized by Pennsylvania Fish and Boat Commission as a stream fishery for small-mouth and rock bass. Approximately 25,500 lf of these classified waters occur directly downstream of where Owens Run drains to Enlow Fork. EPA believes that the proposed activities may cause or contribute to an excursion of water quality standards downstream.

Response: Section 5 of the CIA describes the effects on water quality and Section 7 describes the potential cumulative effect of mining activities on the Enlow Fork watershed. This document concludes that no major impairment to Enlow Fork is anticipated as a result of the proposed action.

USEPA Comment 3: According to the Section 404(b)(1) Guidelines, compensatory mitigation can only be considered when it has been determined that impacts are unavoidable. Identifying the least environmentally damaging practicable alternative (LEDPA) will minimize the amount of mitigation that will be required to compensate for lost functions. EPA recommends that consideration be given to determining whether the required quantity of compensatory mitigation can be reduced by further reducing impacts. For example, while EPA acknowledges that the applicant sought a disposal facility to "provide a sizeable amount of storage capacity", only valley type sites that would provide a minimum disposal life of approximately 12 years were reviewed as potential sites in the "Alternatives Analysis & Site Selection Study." In addition to consideration of alternative disposal sites, the applicant should also consider creating smaller impoundments, and reconfiguring or re-engineering the design of the disposal areas to minimize aquatic resource impacts, thereby minimizing mitigation needs.

Response: Refer to response to USACE Comment 2.

USEPA Comment 4: EPA also believes mitigation should address cumulative impacts within the Enlow Fork Subwatershed, which contains the Enlow Fork and Bailey Mines, as well as four existing coal refuse disposal areas resulting from valley fills — two slurry impoundments (Disposal Area Numbers 1 and 3), and two coarse refuse disposal areas (Disposal Area Numbers 2 and 4). In addition, the applicant's "Alternative Analysis & Site Selection Study" states that several other sites within the subwatershed are anticipated to be developed as coarse refuse disposal areas when additional

Ms. Marcia Haberman
CEC Project 071-522.0013
Page 29
October 1, 2009



capacity is needed. Given past, present, and potential future mining in the area, the cumulative loss of these aquatic and forest habitats is a significant concern and should be taken into account when identifying appropriate mitigation in order to address the cumulative effects of mining within this watershed.

Response: Refer to response to USACE Comment 1.

LITERATURE CITED

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Civil & Environmental Consultants, Inc. 2002. Enlow Fork Stream Mitigation Monitoring Report, 9C and 10C Panels, Bailey Mine, Greene and Washington Counties, Pennsylvania. Prepared for Consol Pennsylvania Coal Company. 30 pp.+Appendices

Kimmel, W.G. and D.G. Argent. 2009. Stream fish community responses to a gradient of specific conductance. Water Air Soil Poll. DOI 10.1007/s11270-009-0085-x. Published on-line May 12. 8 p.

MacDonald, D.D., C.G. Ingersoll and T.A. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Arch. Environ. Contam. Toxicol. 39: 20-31.

Pond, G.J., M.E. Passmore, F.A. Borsuk, L. Reynolds, and C.J. Rose. 2008. Downstream effects of mountaintop coal mining: comparing biological conditions using family- and genus-level macroinvertebrate bioassessment tools. J.N. Am. Benthol. Soc. 27(3): 717-737.

CLOSING

Please call if you have any questions or require additional information. Thank you.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Michael L. Shema
Michael L. Shema *MLH*
Project Manager

Mark R. Haibach
Mark R. Haibach, M.S., P.W.S.
Vice President

Enclosures

cc: Ed Suter – CPCC
Kerry Goodballet – CPCC

071-522.0013.RC.10.1.09/W



Reference:
 USGS 7.5 Minute Topographic Map
 Wind Ridge, PA Quadrangle
 Dated: 1964, Photorevised: 1994.

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DATE: 9/30/2009													

ISSUED FOR: **CONSOL ENERGY**

ISSUED BY: **CEC**

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
 333 Baldwin Road
 Pittsburgh, PA 15205-9702
 1-800-365-2324
www.cecinc.com

PROPERTY LOCATION MAP
RESPONSE TO COMMENTS - SECTION 404 APPLICATION
BAILEY CRDA 5 & 6
RICHHILL TOWNSHIP, GREENE COUNTY, PENNSYLVANIA

PROJECT NO.: 071-522 EXHIBIT: 1



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

Hoberman
re: [unclear]

May 7, 2010

REPLY TO

Operations Division
Regulatory Branch
2007-463

Consol Pennsylvania Coal Company, LLC
P.O. Box J, 1525 Pleasant Grove Road
Claysville, PA 15323

Dear Ms. Goodballet:

I refer to your application for a Department of the Army permit to construct the Bailey Mine Coal Refuse Disposal Areas No. 5 and 6, located in Richhill Township, Greene County, Pennsylvania. As a result of our review and agency coordination of the proposed stream and wetland compensatory mitigation proposals received in this office on February 3, 2010, with revisions received March 10, and April 19, 2010, we submit the following comments. Copies of comments from the USEPA, USFWS, and PAFBC are attached. A response to each of these comments must be submitted to this office.

1. **Compensatory Mitigation Wetlands:** The project will impact 5.87 acres of wetlands, including 5.68 acres that are considered jurisdictional under the Clean Water Act. These federally regulated wetlands consist of 5.40 acres of emergent wetland (PEM), 0.014 acres of shrub/scrub wetland (PSS) and 0.266 acres of forested wetland (PFO). The proposed wetland mitigation plans proposes to construct 5.87 acres of wetland to equal a 1:1 replacement ratio in three areas within the Templeton Fork watershed. The replacement wetland plan includes shrub/wet meadow, shallow, intermediate, and deep marsh, and mound forest habitat components. In order to compensate for the temporal loss of habitat while the shrub and forest components develop, we request that you replace the PSS habitat at a ratio of 2:1 and the PFO at a 3:1 ratio. Therefore, the plan should be modified to include at a minimum 0.028 acres of PSS and 0.798 acres of PFO wetland for a total wetland acreage of 6.23 acres. Any planned non-vegetated open water habitat and upland buffer will be in addition to the 6.23 acres of replacement wetland.

The plan states that tree and shrub planting will not occur in the wetland mitigation area until the fall of year 2. We appreciate the need to ensure the correct hydrologic conditions of the grading prior to planting. Once completed, as built drawings, including planting schematics must be submitted to this office by December 31 of the year planted. The monitoring period will not begin until all required vegetation has been planted. Additionally, the monitoring period for the PFO wetland may be extended to 10 years in order to confirm the successful construction of forested wetland. This decision will be made after the 5th year of monitoring.

Record file

2. Compensatory stream mitigation: The plan proposes to restore 40,880 feet of stream channel, including 15,883 feet of Templeton Fork and 24,997 feet of 11 unnamed tributaries, to compensate for impacts to 25,835 feet of federally jurisdictional stream channel.

a. For each of the 17 adjacent watershed benthic study reference stations cited in your proposal, provide the location, including the latitude and longitude, on a topographic or aerial map, the field data sheets identifying the taxa collected, and the survey protocol used. Additionally, please describe the relationship between the reference reaches to the impact site and the proposed restoration sites.

b. In order to fully evaluate the proposed stream mitigation plan to determine its sufficiency to replace the impacted resources, please submit the results of the macroinvertebrate studies and habitat evaluation assessments done for each of the 12 streams proposed for restoration; Templeton Fork and the 11 unnamed tributaries, located within the 10 proposed restoration reaches, as identified on Table 4-1. If multiple surveys were done within one stream, i.e. Templeton Fork, at different locations, that data should be submitted. Each station should be identified on a map with the latitude and longitude provided. You may submit a summary table, but should also submit the field data sheets listing the taxa collected and the survey protocol used.

c. Riparian corridor fencing is required for any sites that will continue to be utilized for livestock grazing. For stream riparian areas that will not include fencing, describe the method that will be used to ensure the riparian zones are protected from disturbance including vegetation removal and mowing.

d. Table 4-5, Stream Restoration Measure Summary, identifies 126 trees to be planted in parcel ID 27-21-4.05 East Finley Township Park. Riparian plantings should include trees in addition to shrubs, sedges, and other herbaceous material in all restoration segments proposed for riparian planting, currently proposed for 17,063 feet. Revise plan accordingly.

e. Gravel bars vegetated with woody plants are viewed as special aquatic sites; therefore, we suggest eliminating their removal from the restoration plans. If you determine that this would compromise the integrity of the restoration plan for a given reach, please address each bar individually. If the gravel bars must be removed to contribute to the success of the restoration activities, they should be removed to leave 6 inches above the low water elevation.

f. Performance Goals and Standards: The compensatory mitigation plan must include measurable performance standards that can be monitored to ensure the goals of the mitigation plan were met and the site has provided adequate functional replacement for the impacted resource.

1. You have proposed a 1.99:1 ratio in the net gain of the standing crop of all benthics for a total of 1.4 million additional organisms in the existing streams after the restoration activities have taken place. This is acceptable as one performance measure provided that you compare the gain to the actual number of organisms in the restored streams compared to the pre-project stream condition. However, in addition to density, it is imperative that the quality of the benthic community improve also. Therefore, you must include a meaningful biological assessment tool that will measure and clearly document the improvement of a pollution intolerant benthic community. Based on your projections of the improvements that lead to the 1.5:1

mitigation ratio (40,880 feet:25,835 feet) the success criteria will be a 50% improvement rate for pollution intolerant taxa, ETPs and/or PADEP listed Pollution Tolerance Value 0-6 organisms. This criteria will be applied on the overall watershed level, but each of the individual stream reaches proposed for restoration and the individual reaches of Templeton Fork will be required to attain an improvement level of within 20% of this goal.

2. We concur with the 6 performance measures proposed to document success of the bank stabilization with the goal to reduce sediment loading in Templeton Fork, a major tributary in the upper Enlow Fork watershed, by 1,923 tons per year, a 3.4:1 ratio. However, in addition to the physical measurements, we request that you add quarterly water quality monitoring of nitrite-nitrate nitrogen, total phosphorus, and total suspended solids. The performance criteria for the water quality will be an overall reduction of 25% of each respective element over current baseline conditions, attained when looked at as an annual average by year 2 of completion of all restoration activities and maintained throughout the monitoring period.

3. We appreciate the efforts Consol has taken to formulate a watershed wide restoration plan that is anticipated to lead to an improvement in the upper Enlow Fork watershed through these improvements to the main stem of Templeton Fork and 11 unnamed tributaries. We support the overall restoration ratio goals identified in the proposal and agree that these are the performance goals that will be used to measure the overall success of the entire project, with the addition of utilizing multimetric biological indices. However, in order to verify the success of each specific restoration reach, we request that monitoring stations be established within each stream restoration reach not only to measure the benthic community but also the success of the bank stabilization, the reduction in the sediment loading, and creation of vegetated riparian corridors.

4. You propose to construct the stream restoration over a period of time as the impacts occur. As built drawings of the restored segments should be submitted to this office annually by December 31 of the year constructed. The proposed 5 year monitoring period will begin with each segment as constructed. As with the forested wetland replacement, given that a goal of the plan is to establish a forested riparian corridor, the monitoring period may be extended beyond the original 5 years as specific site conditions may require.

3. Site Protection: In accordance with 33 CFR 332.7 Management (a) Site protection: compensatory mitigation projects must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate. The compensatory mitigation plan submitted included a typical stream access agreement and memorandum of agreement for site access for stream restoration reaches located on 3rd party owner properties. The agreement provides for site access for a year, renewal annually for 4 years. This office has determined that this is not adequate site protection to protect the stream riparian restoration sites for the long term. Attached are sample conservation easement and deed restriction documents that have been approved by the Corps of Engineers Districts with authority in Pennsylvania for use in Pennsylvania. The protective covenant should be used for each of the three wetland mitigation areas and for the stream restoration sites. The stream restoration sites should include a riparian zone that is a minimum of 50 feet, with approximately 25 foot on each stream side. The mitigation areas should include a provision to prohibit vegetation removal and/or mowing,

grading, filling and construction activities. In the event that Consol believes that upland stream riparian site protection with a perpetual conservation easement is not necessary for specific sites, each site should be addressed separately as to the specific reason long term site protection is not warranted.

4. You propose to initiate construction of the wetland and stream compensatory mitigation prior to or concurrent with construction activities at the Bailey 5 & 6 impact site. Based on input from Consol, construction activities that will impact waters of the United States are expected to occur in the summer of 2010. The federal permit to authorize impacts will also authorize the restoration activities. Please be advised that you will also need a Pennsylvania DEP Chapter 105 permit to construct the wetland and stream mitigation areas within state jurisdictional waters.

5. National Historic Preservation Act: Provide a clearance letter from the Pennsylvania Historical and Museum Commission (PHMC) for the entire 709 acre Bailey 5 and 6 site. The letter submitted with your application is for phase 1 & 2 of the 4 phased project development. Additionally, in correspondence dated April 28, 2010, to Civil & Environmental Consultants, the PHMC stated that there are potentially significant archaeological sites located within the proposed mitigation areas and a Phase 1 archaeological survey is required. Please be advised that cultural resource clearance must be provided to this office for all construction and mitigation areas prior to disturbance.

In order to expedite our review and partner agency coordination, please send a copy of all requested information to each reviewing agency.

We will continue to work with you in your development plan. Upon receipt of the requested information, we will continue our review of the proposed project. If you have any questions, please contact me at (412)395-7361 or email [marcia.h.haberman @usace.army.mil](mailto:marcia.h.haberman@usace.army.mil).

Sincerely,



Marcia H. Haberman
Chief, Southern Section
Regulatory Branch

Enclosures

Copy Furnished:
US EPA, Region 3
US FWS, State College Field Office
PA DEP, California Mining Office
PA FBC
Civil & Environmental Consultants



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

30 APR 2010

Mr. Scott Hans, Chief
U.S. Army Corps of Engineers – Pittsburgh District
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Re: Mitigation Comments - Bailey Mine Coal Refuse Disposal Areas Nos. 5 and 6
Consol Pennsylvania Coal Company, LLC

Dear Mr. Hans:

The U.S. Environmental Protection Agency (EPA) has reviewed the proposed mitigation for Consol Pennsylvania Coal Company's (the Applicant) construction of Coal Refuse Disposal Areas Numbers 5 and 6 for the Bailey underground mine. Construction of the disposal areas for fine coal refuse slurry and coarse coal refuse will fill 25,835 linear feet of stream channel and 5.68 acres of wetlands.

The Applicant is proposing to offset the loss of functions and values provided by the affected streams by restoring stream segments in the Templeton Fork watershed. Templeton Fork is a tributary to Enlow Fork, which drains to Wheeling Creek, and then to the Ohio River. Portions of Enlow Fork located downstream from the proposed project are currently listed on the State's 303(d) list as impaired for aquatic life, caused by siltation due to subsurface mining activities.

After a review of the Applicant's "Revised Stream Restoration and Wetland Mitigation Plan" dated February 3, 2010, EPA voiced concerns with the stream mitigation plan during a field view conducted jointly with the U.S. Army Corps of Engineers on April 28, 2010. EPA has concerns that the proposed stream restoration success criteria does not adequately ensure that a "functional lift" would be provided by the proposed mitigation. Furthermore, EPA does not believe that the proposed mitigation site protection instruments are in accordance with the 2008 Mitigation Rule's goal to provide permanent protection of the mitigation sites.

Stream Mitigation Success Criteria

EPA believes that measurements of bank stability, riparian vegetation, and rapid visual habitat assessment scores as proposed by the applicant are suitable endpoints for evaluating the physical improvements of the mitigation streams over time. However, one proposed success criterion is based upon the standing crop of benthic macroinvertebrates increasing by a minimum of 700,000 organisms. EPA does not believe that increased benthic macroinvertebrate productivity as measured by standing crop is an appropriate stand-alone indicator of improved stream health. In fact, it is known that some pollution tolerant organisms (e.g., tolerant of



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sediments or nutrients) can respond positively to increased stream degradation; therefore, the proposed indicator is inadequate. The success criteria should include more robust indicators of stream health and document improvements in additional metrics such as species richness; species diversity; and an increase in percentage of Ephemeroptera, Plecoptera, and Tricoptera (EPT) taxa. A more holistic indicator of benthic health, and thus a measure of mitigation success, would be to use a multimetric index. EPA recommends that the monitoring plan and mitigation success criteria include the multimetric indices routinely used by PA Department of Environmental Protection for freestone streams, or low-gradient streams, depending on stream classification within the project area. The applicant must be able to show significant increases in benthic community health as measured by the indices at all mitigation sites.

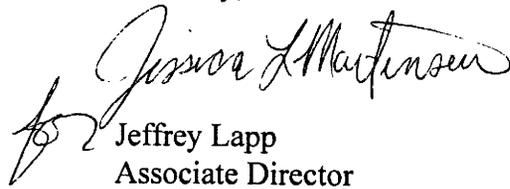
During the April 28, 2010 site visit, EPA noted that many of the Templeton Fork's tributaries as well as its main-stem demonstrated excess sediment deposition. According to the submitted mitigation plan, "one of the primary objectives of the stream restoration plan is to reduce sediment loading by improving bank stability and establishing riparian vegetation." Planted woody riparian vegetation is expected to "improve the sediment, nutrient, and toxicant retention capability of the streams." However, no water chemistry parameters are proposed to be monitored for the restoration reaches. EPA recommends that, at a minimum, nitrite-nitrate nitrogen (NO₂-NO₃-N), total phosphorus (P), and total suspended solids (TSS) are monitored to support decreasing trends in these parameters for the mitigation reaches. These parameters should be monitored quarterly in accordance with State field and laboratory protocols.

Site Protection Mechanism

The 2008 Mitigation Rule states that "[t]he goal of the rule is to ensure permanent protection of all compensatory mitigation project sites" and "[t]he aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments or other available mechanisms." Currently, conservation easements are proposed for those properties owned by the Applicant, only 38% (15,550 lf) of the stream mitigation segments. Approximately 32% (12,953 lf) of the stream mitigation segments will be under a 20-year landowner memorandum of agreement (MOA) to protect the site and 30% (12,377 lf) will be under a 10-year MOA. While EPA recognizes the Applicant's efforts to acquire permission from landowners to perform restorative work on their land; conservation easements are necessary on all properties to ensure that functions and values of the impacted aquatic resources are adequately replaced in the long-term.

If you have any questions, please feel free to contact Ms. Stephanie Chin at (215) 814-2747 or by email at chin.stephanie@epa.gov.

Sincerely,



Jeffrey Lapp
Associate Director
Office of Environmental Programs



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

April 30, 2010

Colonel Michael P. Crall, District Engineer
(ATTN: Marcia H. Haberman, Regulatory Branch)
U.S. Army Corps of Engineers
Pittsburgh District, Regulatory Branch
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

RE: CELRP-OP-F 2007-463
USFWS Project #2007-1928

Dear Colonel Crall:

This is in further reference to the subject Corps of Engineers Public Notice of March 16, 2009, concerning Consol Pennsylvania Coal Company's proposed coal refuse disposal areas 5 and 6, located in Greene County, Pennsylvania. The project would destroy 4.9 miles of headwater streams and 5.68 acres of wetlands.

We had previously commented on this project in a letter to you dated April 30, 2009. As stated in that letter, we do not believe that the proposed destruction of headwater streams is consistent with the Clean Water Act's goals of maintaining the chemical, physical, and biological integrity of waters of the United States. Because of their unique position on the landscape and unique ecological values, we also do not believe that the loss of headwater streams can ever be fully "mitigated," unless it is avoided. We also continue to believe (as stated in our April 2009 letter) that the fish and wildlife habitat impacts of the proposed project and the possible adverse water quality effects (e.g., conductivity and polycyclic aromatic hydrocarbons) of the existing refuse disposal areas within this watershed warrant further investigation through the preparation of an Environmental Impact Statement. However, should the Corps decide to permit this project and accept compensatory mitigation, it is critical to the health of the watershed that the biological functions of the lost streams and wetlands be replaced. We have reviewed Consol's proposed compensatory mitigation plan, dated March 4, 2010, and revised April 16, 2010, and have the following comments. *This letter does not address ongoing issues with this project concerning the federally-listed, endangered Indiana bat.*

Based on conversations between Marcia Haberman of your staff and Cindy Tibbott of my staff, we understand that Consol is in the process of preparing revisions to the mitigation plan, so the versions we reviewed may already be out of date. Consequently, at this time we are limiting our

comments to a few overarching concerns, and will provide more detailed comments when we receive a revised plan.

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Thank you for the opportunity to comment. Please contact Jennifer Kagel of my staff at 814-234-4090 if you have any questions or require further assistance.

Sincerely,



Clinton Riley
Field Office Supervisor

Haberman, Marcia H LRP

From: Kepler, Steven [skepler@state.pa.us]
Sent: Friday, April 30, 2010 9:36 AM
To: Folman, Joel; Burda, Craig
Cc: Keller, David (Habitat Management); Haberman, Marcia H LRP; DiMatteo, Michael R; Havens, Nathan
Subject: Stream Mitigation for Consol refuse disposal areas 5&6

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Steven Kepler

Pennsylvania Fish and Boat Commission

Fisheries Biologist

814-359-5117

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Pennsylvania Fish and Boat Commission

Fisheries Biologist

814-359-5117



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

April 30, 2010

Colonel Michael P. Crall, District Engineer
(ATTN: Marcia H. Haberman, Regulatory Branch)
U.S. Army Corps of Engineers
Pittsburgh District, Regulatory Branch
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

RE: CELRP-OP-F 2007-463
USFWS Project #2007-1928

Dear Colonel Crall:

This is in further reference to the subject Corps of Engineers Public Notice of March 16, 2009, concerning Consol Pennsylvania Coal Company's proposed coal refuse disposal areas 5 and 6, located in Greene County, Pennsylvania. The project would destroy 4.9 miles of headwater streams and 5.68 acres of wetlands.

We had previously commented on this project in a letter to you dated April 30, 2009. As stated in that letter, we do not believe that the proposed destruction of headwater streams is consistent with the Clean Water Act's goals of maintaining the chemical, physical, and biological integrity of waters of the United States. Because of their unique position on the landscape and unique ecological values, we also do not believe that the loss of headwater streams can ever be fully "mitigated," unless it is avoided. We also continue to believe (as stated in our April 2009 letter) that the fish and wildlife habitat impacts of the proposed project and the possible adverse water quality effects (e.g., conductivity and polycyclic aromatic hydrocarbons) of the existing refuse disposal areas within this watershed warrant further investigation through the preparation of an Environmental Impact Statement. However, should the Corps decide to permit this project and accept compensatory mitigation, it is critical to the health of the watershed that the biological functions of the lost streams and wetlands be replaced. We have reviewed Consol's proposed compensatory mitigation plan, dated March 4, 2010, and revised April 16, 2010, and have the following comments. *This letter does not address ongoing issues with this project concerning the federally-listed, endangered Indiana bat.*

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2007-463 MARCIA-PM

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Sincerely,



Clinton Riley
Field Office Supervisor



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

30 APR 2010

Mr. Scott Hans, Chief
U.S. Army Corps of Engineers – Pittsburgh District
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Re: Mitigation Comments - Bailey Mine Coal Refuse Disposal Areas Nos. 5 and 6
Consol Pennsylvania Coal Company, LLC

Dear Mr. Hans:

The U.S. Environmental Protection Agency (EPA) has reviewed the proposed mitigation for Consol Pennsylvania Coal Company's (the Applicant) construction of Coal Refuse Disposal Areas Numbers 5 and 6 for the Bailey underground mine. Construction of the disposal areas for fine coal refuse slurry and coarse coal refuse will fill 25,835 linear feet of stream channel and 5.68 acres of wetlands.

The Applicant is proposing to offset the loss of functions and values provided by the affected streams by restoring stream segments in the Templeton Fork watershed. Templeton Fork is a tributary to Enlow Fork, which drains to Wheeling Creek, and then to the Ohio River. Portions of Enlow Fork located downstream from the proposed project are currently listed on the State's 303(d) list as impaired for aquatic life, caused by siltation due to subsurface mining activities.

After a review of the Applicant's "Revised Stream Restoration and Wetland Mitigation Plan" dated February 3, 2010, EPA voiced concerns with the stream mitigation plan during a field view conducted jointly with the U.S Army Corps of Engineers on April 28, 2010. EPA has concerns that the proposed stream restoration success criteria does not adequately ensure that a "functional lift" would be provided by the proposed mitigation. Furthermore, EPA does not believe that the proposed mitigation site protection instruments are in accordance with the 2008 Mitigation Rule's goal to provide permanent protection of the mitigation sites.

Stream Mitigation Success Criteria

EPA believes that measurements of bank stability, riparian vegetation, and rapid visual habitat assessment scores as proposed by the applicant are suitable endpoints for evaluating the physical improvements of the mitigation streams over time. However, one proposed success criterion is based upon the standing crop of benthic macroinvertebrates increasing by a minimum of 700,000 organisms. EPA does not believe that increased benthic macroinvertebrate productivity as measured by standing crop is an appropriate stand-alone indicator of improved stream health. In fact, it is known that some pollution tolerant organisms (e.g., tolerant of

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sediments or nutrients) can respond positively to increased stream degradation; therefore, the proposed indicator is inadequate. The success criteria should include more robust indicators of stream health and document improvements in additional metrics such as species richness; species diversity; and an increase in percentage of Ephemeroptera, Plecoptera, and Tricoptera (EPT) taxa. A more holistic indicator of benthic health, and thus a measure of mitigation success, would be to use a multimetric index. EPA recommends that the monitoring plan and mitigation success criteria include the multimetric indices routinely used by PA Department of Environmental Protection for freestone streams, or low-gradient streams, depending on stream classification within the project area. The applicant must be able to show significant increases in benthic community health as measured by the indices at all mitigation sites.

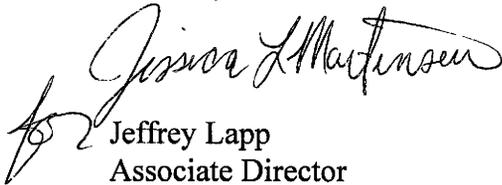
During the April 28, 2010 site visit, EPA noted that many of the Templeton Fork's tributaries as well as its main-stem demonstrated excess sediment deposition. According to the submitted mitigation plan, "one of the primary objectives of the stream restoration plan is to reduce sediment loading by improving bank stability and establishing riparian vegetation." Planted woody riparian vegetation is expected to "improve the sediment, nutrient, and toxicant retention capability of the streams." However, no water chemistry parameters are proposed to be monitored for the restoration reaches. EPA recommends that, at a minimum, nitrite-nitrate nitrogen (NO₂-NO₃-N), total phosphorus (P), and total suspended solids (TSS) are monitored to support decreasing trends in these parameters for the mitigation reaches. These parameters should be monitored quarterly in accordance with State field and laboratory protocols.

Site Protection Mechanism

The 2008 Mitigation Rule states that "[t]he goal of the rule is to ensure permanent protection of all compensatory mitigation project sites" and "[t]he aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments or other available mechanisms." Currently, conservation easements are proposed for those properties owned by the Applicant, only 38% (15,550 lf) of the stream mitigation segments. Approximately 32% (12,953 lf) of the stream mitigation segments will be under a 20-year landowner memorandum of agreement (MOA) to protect the site and 30% (12,377 lf) will be under a 10-year MOA. While EPA recognizes the Applicant's efforts to acquire permission from landowners to perform restorative work on their land; conservation easements are necessary on all properties to ensure that functions and values of the impacted aquatic resources are adequately replaced in the long-term.

If you have any questions, please feel free to contact Ms. Stephanie Chin at (215) 814-2747 or by email at chin.stephanie@epa.gov.

Sincerely,



Jeffrey Lapp
Associate Director
Office of Environmental Programs





United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

May 18, 2010

Colonel Michael P. Crall, District Engineer
(ATTN: Marcia Haberman)
U.S. Army Corps of Engineers
Pittsburgh District, Regulatory Branch
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Dear Colonel Crall:

The Fish and Wildlife Service has reviewed the proposal for compensatory mitigation associated with the Corps of Engineers Public Notice of March 16, 2010. Consol Pennsylvania Coal Company proposes to dispose of coal refuse in disposal areas 5 and 6 located in Greene County, Pennsylvania. The project would destroy 4.9 miles of headwater streams and 5.68 acres of wetlands. The applicant has proposed to construct about 5.87 acres of wetlands as compensatory mitigation for wetland impacts (about a 1:1 ratio), and restore/enhance about 40,880 feet (7.74 miles) of stream channel to offset impacts to headwater streams. Candidates for stream restoration include Templeton Fork, a third order stream, and 11 unnamed tributaries, which are first order streams.

We have previously commented on this project in a letter dated April 30, 2010 (enclosed). Since that time, on May 13, 2010, we have been to the site to evaluate the proposed compensatory mitigation plan. We offer the following comments and concerns on the proposed mitigation plan as result of that field view.

Stream Mitigation

1. **Biological Monitoring.** As stated in our April 30, letter, we recommend that success criteria for the stream mitigation be based not on increases in biomass or numbers of aquatic organisms alone, but on increases in pollution-intolerant species. As discussed in the field, the applicant's consultant described the use of the Pennsylvania Department of Environmental Protection's IBI protocol as a monitoring strategy, which takes into account six metrics including intolerant taxa (with low index values), EPT taxa (with low index values), total species richness, a weighted Hilsenhoff and Beck's assessment index, and a Shannon-Weaver index. We support this approach.
2. **Success Criteria/Attainment.** Success criteria along the lines recommended by the Corps were discussed in the field. The Corps would consider the overall project a

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success if there were a 50 percent improvement in pollution intolerant taxa (EPT taxa or those with low pollution tolerance values) on a watershed basis, as long as each of the individual stream reaches within the overall project were to attain at least a 20 percent improvement. We concur with this approach. However, in your letter of May 7, 2010, the Corps mentions pollution tolerance values of 0-6 being acceptable. We do disagree with this aspect, and recommend that only those taxa with pollution tolerance values from 0-4 be considered.

3. **Reference Stream (Biological/Water Quality Parameters).** As discussed during the site review, the applicant should consider the use of a reference stream containing good water quality as a benchmark for comparison to assess water quality improvements in the project streams. We would not be opposed to using a stream such as Buffalo Run for water quality/biological comparison, even though it is situated in an adjoining watershed.
4. **Coir Logs.** The stream mitigation plan includes extensive use of coir logs to alleviate erosive forces on the streambanks. Installing coir logs alone for stabilization purposes is not appropriate. In our experience, when used alone, these devices wash out with the first high flow event. They are meant for streambank enhancements only, not for stabilization; so the applicant should consider each situation/application where they will be used. When used in conjunction with instream structures (*i.e.*, J-hooks, log vanes, etc.), and installed at the correct elevation, they can be effective at enhancing riparian areas.
5. **Channel Blocks.** The applicant has not detailed plans for the existing channel meander once those stream reaches are abandoned (channel relocations). If left intact, the abandoned stream channel would act as an alternative flow path during flood conditions, especially if stream channel changes within the relocated reach triggers accumulation of materials in the newly-constructed channel. We request that the applicant detail their plans for the abandoned stream channels and that those plans include backfilling, or installing channel blocks within, the abandoned stream channel.
6. **Streambank Fencing.** To protect newly revegetated areas from indiscriminant mowing and livestock grazing, and allow riparian plants the opportunity to establish and mature, we concur with the applicant's plan for streambank fencing. The fencing plan should include a designated livestock crossing or stream access site (using either clean rocks and geotextile, or hog slats set parallel to stream flow). The stone or slats installed at crossings or access points should be depressed so as not to interfere with aquatic life movements or stream hydraulics or to obstruct stream flow. As discussed, the stream crossing should also include a "quick release" fence section (acts as a "breakaway" section without taking the entire fence with it). The breakaway section, in combination with drop wire (for flexibility in high water events), should prevent debris buildups at livestock crossings or access points.
7. **Root Wads.** We advise caution concerning the applicant's proposed use of root wads. If installed improperly, they can often cause more streambank instability than they intend to remedy. As drainage size increases, the utility of root wads decreases, and success with these structures can be limited. We offer a few techniques that may improve root wad satiability (in order of most stable to most vulnerable), 1) root wad clusters with woody

plant transplants directly behind the root wad (most stable), 2) root wad clusters with a brush layer directly behind the root wad (containing live cuttings of willow/dog wood/elderberry), and 3) root wads with reverse slopes (banks slope away from the stream, most vulnerable).

8. **Oversight.** We recommend that a qualified practitioner be present on the site during stream restoration construction.
9. **Geomorphological Monitoring.** Although the applicant has proposed post-construction monitoring of the stream restoration they have not detailed the important components in a stream restoration monitoring plan. Specifically, the applicant should develop a monitoring plan for the project that clearly defines the thresholds of success and failure from a physical standpoint. Additionally, the monitoring plan should identify the party(ies) responsible for conducting the monitoring (preferably an impartial third party). The monitoring plan should include the following: a post-construction as-built survey; stream characterization; longitudinal profile; structure and bank stability evaluations using monumented cross-sections and monumented benchmarks; photo documentation with monumented photo points; and visual inspections of stream stability, all comparable to the design criteria.
10. **Maintenance Plan.** If the applicant has not already done so, they should develop a maintenance plan that clearly states how erosion will be addressed; who will address erosion problems; when maintenance will be required; the source of maintenance funding; means/methods/plans for structure repair in the event that a structure would be altered or destroyed by large storm events or ice (*e.g.*, a maintenance bond); and a contingency plan should the project not attain a stable cross section, profile and pattern or streambanks are not stabilized.

Wetland Mitigation

1. **Construction.** For added habitat diversification, we recommend that construction contractors leave the bottom of the three wetland mitigation sites roughened, with pockets and hummocks (do not leave it smooth). The roughened terrain will produce microhabitats conducive to a diverse assemblage of plants and wildlife.
2. **Berms.** If berms are necessary to retain water on the site, follow existing contour line elevations and “tie in” to existing slopes.
3. **Water depth.** To maximize the value of the constructed wetlands to wildlife, we recommend that the applicant design a wetlands featuring water less than 18 inches deep. Additionally, we recommend that the applicant limit open water areas to 10 percent or less.
4. **Upland Buffers.** For upland buffer areas around the constructed wetlands, we recommend a mixture of native warm-season grasses, including big blue stem (*Andropogon gorardii*), little blue stem (*Schizachyrium scoparium*), and Indian grass (*Sorghastrum nutans*), and an annual cover crop (*e.g.*, native riverbank (*Elymus riparius*), Canadian (*E. canadensis*), or Virginia wild rye (*E. virginicus*), respectively), with a

native legume, such as the partridge pea (*Chamaecrista fasciculata*). Mixes of native grasses are commercially available from Pennsylvania seed companies.

5. **Water Level Management.** Water level management of constructed wetlands receiving surface hydrology is key to water quality enhancement and vegetative success. Water control structures are important for invasive plant management, avoiding vegetative monocultures in the finished projects, allowing for success of ground-nesting birds, and slow summer draw-downs and fall/winter wetland flooding. We understand that the applicant is considering an Agri Drain® inline water level control structure to fulfill these purposes. We support the use of this structure.

6. **Invasive Plant Management.** We recommend that care be taken not to spread or introduce invasive plant species into the three constructed wetlands (e.g. multiflora rose, Japanese knotweed, autumn olive, etc.). At a minimum, we recommend that the applicant develop a management plan to control invasive species. If an herbicide such as glyphosate (the common ingredient found in Roundup®) or triclopyr (the common ingredient found in Garlon®) would be under consideration for invasive species management, it is important to consider the effects on the aquatic community when spraying herbicides in the vicinity of a water body (i.e., Templeton Fork or its tributaries). Due to the toxic nature of carriers or surfactants usually used in conjunction with herbicides, we recommend these compounds not be used with any herbicide choice. Surfactants, or carriers, can often be more environmentally detrimental than the treatment. In addition, certain surfactants are more toxic and persistent in the environment than the herbicide itself, and may have adverse indirect effects on the aquatic life. Glyphosate (Roundup®) or triclopyr (Garlon®) can be successfully applied in upland areas. However, Garlon® has limited use on or near aquatic resources, due to its potential toxicity to fish. We recommend that the applicant use the aquatic formulation of any herbicide chosen when herbicide use is anticipated around streams or wetlands. The aquatic formulations of glyphosate (Rodeo®), or triclopyr (Renovate 3®) are acceptable, less toxic alternatives, and recommended for use around aquatic resources.

Thank you for the opportunity to comment on this project. Please contact Jennifer Kagel of my staff at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,



Clinton Riley
Field Office Supervisor

Enclosure



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

April 30, 2010

Colonel Michael P. Crall, District Engineer
(ATTN: Marcia H. Haberman, Regulatory Branch)
U.S. Army Corps of Engineers
Pittsburgh District, Regulatory Branch
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

RE: CELRP-OP-F 2007-463
USFWS Project #2007-1928

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Sincerely,



Clinton Riley
Field Office Supervisor

Haberman, Marcia H LRP

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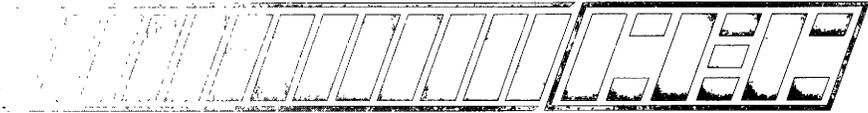
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Steven Kepler

Pennsylvania Fish and Boat Commission

Fisheries Biologist

814-359-5117



May 14, 2010

Ms. Marcia Haberman
U.S. Army Corps of Engineers
Federal Building
1000 Liberty Avenue
Pittsburgh, Pennsylvania 15222-4186

Dear Ms. Haberman:

Subject: Department of the Army Section 404 Permit Application
File No. 2007-463
Response to USACE, USEPA, USFWS, and PAFBC Comments
Bailey Mine Coal Refuse Disposal Areas No. 5 and 6
Richhill Township, Greene County, Pennsylvania
CEC Project 071-522.0013

Civil & Environmental Consultants, Inc. (CEC), on behalf of Consol Pennsylvania Coal Company LLC (CPCC), has prepared the following responses to the comments presented in your letter dated May 7, 2010, regarding the subject permit application. As requested in your letter, we are also addressing the following comments:

1. USACE comments presented in your May 7, 2010 letter.
2. Letter from the US Environmental Protection Agency (EPA), dated April 30, 2010.
3. Letter from the US Fish & Wildlife Service, dated April 30, 2010.
4. E-mail from the Pennsylvania Fish and Boat Commission, dated April 30, 2010.

Below, we list the comments by number and provide the response following each comment.

These responses to comments are being provided to all of the regulatory and resource agencies reviewing the permit application, including USEPA, USFWS, PADEP, and PAFBC. In addition to providing you with these responses to comments, CEC and CPCC are also currently incorporating the changes and additional information, presented in these responses to comments and those recently provided in response to comments by the PADEP, into a comprehensive revision of the mitigation plan. Copies of the plan will submitted to all of the reviewing agencies within the next week.

1. USACE Comments in Letter Dated May 7, 2010

USACE Comment 1. Compensatory Mitigation Wetlands: The project will impact 5.87 acres of wetlands, including 5.68 acres that are considered jurisdictional under the Clean Water Act.

Civil & Environmental Consultants, Inc.

Pittsburgh 333 Baldwin Road
Pittsburgh, Pennsylvania 15205
Phone 412/429-2324
Fax 412/429-2114
Toll Free 800/365-2324
E-mail info@cecinc.com

Chicago 877/963-6026
Cincinnati 800/759-5614
Cleveland 866/507-2324
Columbus 888/598-6808
Detroit 866/380-2324

Export 800/899-3610
Indianapolis 877/746-0749
Nashville 800/763-2326
Phoenix 877/231-2324
St. Louis 866/250-3679

Civil & Environmental Consultants, Inc. 333 Baldwin Road Pittsburgh, PA 15205-1751 Phone: 412-429-2324 · Toll Free: 800-365-2324 Fax: 412-429-2114	<h2 style="margin:0;">Letter of Transmittal</h2>
	Date: 5/14/2010 Job No.: 071-522
	Attention: <i>Marcia H. Haberman</i>
To: <i>U.S. Army Corps of Engineers William S. Moorhead Federal Building 1000 Liberty Ave. Pittsburgh, 15222-4186</i>	RE: <i>Bailey CRDA No. 5 & 6 Response to Comments</i>

We are sending you *attached* the following items:

<input type="checkbox"/> Shop drawings	<input type="checkbox"/> Prints	<input type="checkbox"/> Plans	<input type="checkbox"/> Samples	<input type="checkbox"/> Specifications
<input type="checkbox"/> Copy of letter	<input type="checkbox"/> Change order	<input type="checkbox"/> _____		

Copies	Date	No.	Description
1	5/14/10		Response to USACE Comments
1	5/14/10		Response to PADEP Comments

<input checked="" type="checkbox"/> For approval	<input type="checkbox"/> Approved as submitted	<input type="checkbox"/> Resubmit _ copies for approval
<input type="checkbox"/> For your use	<input type="checkbox"/> Approved as noted	<input type="checkbox"/> Submit _ copies for distribution
<input type="checkbox"/> As requested	<input type="checkbox"/> Returned for corrections	<input type="checkbox"/> Return _ corrected prints
<input type="checkbox"/> For review and comment	<input type="checkbox"/> _	
<input type="checkbox"/> For bids due		<input type="checkbox"/> Prints returned after loan to us

Remarks: *Marcia,*
Enclosed please find the response to comments documents for the Bailey CRDA No. 5 & 6 project.
Thank you

Copy to	Signed:  Michael L Shema
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These federally regulated wetlands consist of 5.40 acres of emergent wetland (PEM), 0.014 acres of shrub/scrub wetland (PSS) and 0.266 acres of forested wetland (PFO). The proposed wetland mitigation plans proposes to construct 5.87 acres of wetland to equal a 1:1 replacement ratio in three areas within the Templeton Fork watershed. The replacement wetland plan includes shrub/wet meadow, shallow, intermediate, and deep marsh, and mound forest habitat components. In order to compensate for the temporal loss of habitat while the shrub and forest components develop, we request that you replace the PSS habitat at a ratio of 2:1 and the PFO at a 3:1 ratio. Therefore, the plan should be modified to include at a minimum 0.028 acres of PSS and 0.798 acres of PFO wetland for a total wetland acreage of 6.23 acres. Any planned non- vegetated open water habitat and upland buffer will be in addition to the 6.23 acres of replacement wetland.

The plan states that tree and shrub planting will not occur in the wetland mitigation area until the fall of year 2. We appreciate the need to ensure the correct hydrologic conditions of the grading prior to planting. Once completed, as built drawings, including planting schematics must be submitted to this office by December 31 of the year planted. The monitoring period will not begin until all required vegetation has been planted. Additionally, the monitoring period for the PFO wetland may be extended to 10 years in order to confirm the successful construction of forested wetland. This decision will be made after the 5th year of monitoring.

RESPONSE: The wetland mitigation acreage cited in this comment refers to the ratio that was proposed for the PADEP, which only requires a mitigation ratio of 1:1 (creation to impact) regardless of the Cowardin classification. CPCC acknowledges the required ratios for the USACE and has summarized this in the following table.

Cowardin Wetland Classification	CRDA No. 5 & 6 Wetland Impact Acreage	Mitigation Ratio	Required Mitigation Acreage
Palustrine Emergent	5.405	1:1	5.405
Palustrine Scrub/Shrub	0.007	2:1	0.014
Palustrine Forested	0.268	3:1	0.804
Total	5.680	N/A	6.22

Therefore, CPCC is proposing to create a minimum of 6.22 acres of shrub/wet meadow, shallow marsh, deep marsh, and mound forest habitat. The varied planting zones and hydroperiods, coupled with creation of three large wetland complexes adjacent to Templeton Fork are anticipated to provide functions and values at least equal to those currently provided by the impacted wetlands.



CPCC acknowledges that an as-built survey, including planting schematics, must be provided to your office by December 31st of the year planted. CPCC also acknowledges that the monitoring period will not begin until all vegetation is planted and may extend to 10 years for the forested wetland components.

USACE Comment 2. Compensatory stream mitigation: The plan proposes to restore 40,880 feet of stream channel, including 15,883 feet of Templeton Fork and 24,997 feet of 11 unnamed tributaries, to compensate for impacts to 25,835 feet of federally jurisdictional stream channel.

- a. *For each of the 17 adjacent watershed benthic study reference stations cited in your proposal, provide the location, including the latitude and longitude, on a topographic or aerial map, the field data sheets identifying the taxa collected, and the survey protocol used. Additionally, please describe the relationship between the reference reaches to the impact site and the proposed restoration sites.*

RESPONSE: Attachment 1 of this response includes the following requested information:

- Topographic map showing the Appendix A protocol benthic macroinvertebrate sample locations;
- Table listing the latitude and longitude of the benthic macroinvertebrate sample locations;
- Field data sheets for the benthic macroinvertebrate samples; and
- PADEP's (2005) Technical Guidance Document 563-200-655, Appendix A Stream Survey protocol used to collect the benthic macroinvertebrate samples.

The reference stream data were collected from 17 locations on six streams in adjacent watersheds as part of another study. The relevance of these data to the mitigation streams is that: (1) each stream has Appendix A benthic macroinvertebrate data collected from a reach degraded by current or past agricultural activity (e.g., grazing, cropping, removal of riparian vegetation, accelerated bank erosion and sedimentation, etc.) and Appendix A data collected from one or more stable forested stream reaches; and (2) the data for these two stream conditions were used to predict benthic macroinvertebrate densities and extrapolated numbers of organisms for available aquatic habitat for the pre- and post-restoration conditions in the mitigation streams. The agriculturally-impacted reference reaches are representative of the impaired reaches of Templeton Fork and its tributaries within the stream mitigation project area, whereas the forested reaches are used to represent the post-restoration condition. Thus, the difference in composition and abundance between the impaired and stable reaches was used to predict the potential lift



in benthic macroinvertebrate density and numbers that might be realized if the streams mitigation reaches were actually restored.

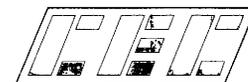
Furthermore, since benthic data were collected from the impact streams using the same Appendix A sampling protocol, benthic densities and extrapolated numbers of organisms for available aquatic habitat were also computed for the impacted streams in CRDA 5 and 6. These data were used to estimate the total number of benthic macroinvertebrates that would be lost from the impacted streams, compared with the potential increase (lift) in number of benthic macroinvertebrates predicted from the restoration of the mitigation streams.

CPCC proposes to increase the standing crop of benthic organisms in the restored streams by minimum of approximately 700,000 benthic organisms, as specified in Success Criterion 4 in Section 4.10 on page 4-29 of the *Revised Stream Restoration and Wetland Mitigation Plan*, dated February 3, 2010. This increase will offset the loss of an equal number of benthic organisms from the impacted streams, as measured using the PADEP's (2005) Technical Guidance Document 563-200-655, Appendix A Stream Survey sampling protocol. This improvement provides for a minimum 1:1 replacement of the organisms at the impact site.

- b. *In order to fully evaluate the proposed stream mitigation plan to determine its sufficiency to replace the impacted resources, please submit the results of the macroinvertebrate studies and habitat evaluation assessments done for each of the 12 streams proposed for restoration; Templeton Fork and the 11 unnamed tributaries, located within the 10 proposed restoration reaches, as identified on Table 4-1. If multiple surveys were done within one stream, i.e. Templeton Fork, at different locations, that data should be submitted. Each station should be identified on a map with the latitude and longitude provided. You may submit a summary table, but should also submit the field data sheets listing the taxa collected and the survey protocol used.*

RESPONSE: Since the time of the original submittal, CEC has conduct baseline surveys within the restoration reaches and has computed estimated densities per square meter for each of these streams. Attachment 2 of this response includes:

- Topographic map showing the benthic macroinvertebrate sample locations within the restoration area;
- Computation table listing the sampling location, coordinates, and estimated density of organisms per meter square within each stream; and



- Field data sheets for the benthic macroinvertebrate samples collected within the restoration area.

The PADEP's (2005) Technical Guidance Document 563-200-655, Appendix A Stream Survey protocol in Attachment 1 was used to collect the benthic macroinvertebrate data that was, in turn, used to compute the baseline density estimates for the streams within the restoration area.

In addition to the Appendix A density assessments, CEC has established a network of twelve biological monitoring stations throughout the restoration area. Five stations are located along the mainstem of Templeton Fork and seven stations are located on the larger tributaries to Templeton Fork. The location of the biological monitoring stations is depicted on the figure in Attachment 3. The intermittent flow regime of the smaller tributaries is not conducive for instream biological monitoring of benthic macroinvertebrates and fish. For this reason, CPCC has elected not to establish biological monitoring stations on these smaller streams.

Benthic macroinvertebrates at these twelve locations were sampled using the PADEP protocol, *Index of Biotic Integrity for Wadeable, Freestone Streams in Pennsylvania (2009)* to assess the biological condition of the streams. Additionally, single pass electrofishing surveys and USEPA stream habitat assessment forms were completed at each of the biological monitoring stations. The results of these studies are included as tables in Attachment 3. These data and subsequent baseline data collection will be used to establish the baseline condition for which to track post-restoration improvement in biological quality.

- c. *Riparian corridor fencing is required for any sites that will continue to be utilized for livestock grazing. For stream riparian areas that will not include fencing, describe the method that will be used to ensure the riparian zones are protected from disturbance including vegetation removal and mowing.*

RESPONSE: For stream and wetland mitigation sites currently used for livestock grazing, CPCC commits to either arranging for the removal of livestock from the site or installing livestock exclusion fencing to exclude grazing from restored streams, riparian corridors, and wetland mitigation areas. CPCC also commits to protect the restoration areas from vegetation removal and mowing.

- d. *Table 4-5, Stream Restoration Measure Summary, identifies 126 trees to be planted in parcel ID 27-21-4.05 East Finley Township Park. Riparian plantings should include*



trees in addition to shrubs, sedges, and other herbaceous material in all restoration segments proposed for riparian planting, currently proposed for 17,063 feet. Revise plan accordingly.

RESPONSE: CPCC acknowledges this comment and has revised the riparian planting scheme to include trees. Refer to Detail 11B on revised drawing MD-03 for a list of tree species and densities that were added to the riparian areas (Attachment 4).

- e. *Gravel bars vegetated with woody plants are viewed as special aquatic sites; therefore, we suggest eliminating their removal from the restoration plans. If you determine that this would compromise the integrity of the restoration plan for a given reach, please address each bar individually. If the gravel bars must be removed to contribute to the success of the restoration activities, they should be removed to leave 6 inches above the low water elevation.*

RESPONSE: CPCC acknowledges this comment and agrees not to remove gravel bars during the initial restoration activities. If bank erosion occurs on adjacent stream banks following restoration, then CPCC will coordinate with the USACE to discuss potential corrective measures.

- f. *Performance Goals and Standards: The compensatory mitigation plan must include measurable performance standards that can be monitored to ensure the goals of the mitigation plan were met and the site has provided adequate functional replacement for the impacted resource.*

- (1) *You have proposed a 1.99:1 ratio in the net gain of the standing crop of all benthics for a total of 1.4 million additional organisms in the existing streams after the restoration activities have taken place. This is acceptable as one performance measure provided that you compare the gain to the actual number of organisms in the restored streams compared to the pre- project stream condition. However, in addition to density, it is imperative that the quality of the benthic community improve also. Therefore, you must include a meaningful biological assessment tool that will measure and clearly document the improvement of a pollution intolerant benthic community. Based on your projections of the improvements that lead to the 1.5:1 mitigation ratio (40,880 feet:25,835 feet) the success criteria will be a 50% improvement rate for pollution intolerant taxa, ETPs and/or PADEP listed Pollution Tolerance Value 0-6 organisms. This criteria will be applied on the overall watershed level, but each of the individual*



stream reaches proposed for restoration and the individual reaches of Templeton Fork will be required to attain an improvement level of within 20% of this goal.

RESPONSE: CPCC proposes to increase the standing crop of benthic organisms in the restored streams by minimum of approximately 700,000 benthic organisms, as specified in Success Criterion 4 in Section 4.10 on page 4-29 of the *Revised Stream Restoration and Wetland Mitigation Plan*, dated February 3, 2010. This increase will offset the loss of an equal number of benthic organisms from the impacted streams, as measured using the PADEP's (2005) Technical Guidance Document 563-200-655, Appendix A Stream Survey sampling protocol (see Attachment 1). This improvement provides for a minimum 1:1 replacement of the organisms at the impact site. The 1.99:1 ratio was an estimate of the potential increase in density that could be achieved in the restoration streams, to provide assurance that the proposed performance criterion of a minimum 1:1 replacement could be met. The 1.99:1 ratio was not intended to be the restoration goal for this performance criterion.

CPCC acknowledges the USACE and other reviewing agencies' recommendation to include "a meaningful biological assessment tool that will measure and clearly document the improvement of a pollution intolerant benthic community." To this end, CPCC proposes to measure improvement in the benthic macroinvertebrate community using the PADEP *Index of Biotic Integrity for Wadeable Freestone Streams in Pennsylvania (PA IBI)* protocol (see Attachment 3). This protocol was selected to monitor improvements in the restored stream segments because: (1) it is a standard water quality assessment method that has been extensively tested and approved for use in Pennsylvania; and (2) it integrates six sensitive individual biological metrics into a single IBI score that can be used to evaluate mitigation success. The six metrics include:

- Percent Sensitive Individuals (only includes taxa with pollution tolerance values (PTV) of 0-3)
- Modified EPT Taxa Richness (only includes EPT taxa with PTV of 0-4)
- Modified Beck's Index (only includes taxa with PTV of 0-2)
- Total Taxa Richness
- Hilsenhoff Biotic Index
- Shannon Diversity Index



The PADEP has established an IBI benchmark score of 63.0 for aquatic life use (ALU) attainment for streams classified as WWF and TSF, which would apply to the Templeton Fork watershed. CPCC has just completed the first round of sampling the twelve stations established within the restoration streams (see figure and data in Attachment 3). The IBI scores for the twelve stations range from 25.1 to 58.1, all indicating non-attainment. CPCC proposes to perform two to four rounds of IBI sampling to establish baseline conditions at these biomonitoring stations.

As a biological quality performance criterion, CPCC proposes to increase the mean IBI scores at each station by 50% or so that they meet the ALU benchmark score of 63.0. In addition to using this method as a performance criterion to demonstrate biological quality and watershed improvement, demonstrating improved IBI scores could also provide support for removing Templeton Fork from the 303d list.

- (2) *We concur with the 6 performance measures proposed to document success of the bank stabilization with the goal to reduce sediment loading in Templeton Fork, a major tributary in the upper Enlow Fork watershed, by 1,923 tons per year, a 14:1 ratio. However, in addition to the physical measurements, we request that you add quarterly water quality monitoring of nitrite- nitrate nitrogen, total phosphorus, and total suspended solids. The performance criteria for the water quality will be an overall reduction of 25% of each respective element over current baseline conditions, attained when looked at as an annual average by year 2 of completion of all restoration activities and maintained throughout the monitoring period.*

RESPONSE: CPCC feels that it is premature to establish specific numeric reduction goals for nitrite+nitrate nitrogen, total phosphorus, and total suspended solids, since baseline data for these parameters are not available. CPCC is agreeable, however, to conducting quarterly baseline (pre-restoration) and post-restoration water quality monitoring for the parameters listed in this comment. As discussed with the USACE and USEPA during our April 28, 2010 field visit CPCC and CEC believe that these data should be used as an indicator of water quality trends, as recommended in USEPA Comment 1.b to “*support decreasing trends in these parameters for the mitigation reaches*”, rather than to establish numerical success criteria. To date, no water sample collection or analysis has occurred within the restoration areas, so the existing concentrations are not known.



Additionally, CPCC and CEC believe that success criteria should be based on factors that can reasonably be controlled or corrected through use of the proposed restoration techniques and that can be accurately and consistently measured in the field to provide a credible comparison of pre- and post-restoration conditions. The restoration plan is based on improving instream and riparian habitats, which will result in an improvement to the biological community. If these success criteria are not showing progress towards attainment, then CPCC will implement corrective actions as needed. Water chemistry results can be influenced by numerous factors (e.g., antecedent weather conditions, upstream changes in land use, disturbance on adjacent properties, failing septic systems, etc.), all of which are beyond the control of CPCC. Therefore, CPCC proposes that the water chemistry parameters be used as a secondary monitoring requirement and a reduction in the above listed parameters should be determined after baseline water quality for these parameters is established.

If this approach is not acceptable to the USACE, then CPCC proposes to develop a water quality sampling plan for the restoration area and to begin collecting baseline water quality data. The baseline water quality monitoring will continue until implementation of the first phase of the stream mitigation construction. When the baseline data collection is completed and the data are analyzed, CPCC will meet with the USACE to present the data and determine if achievable water quality improvement criteria can be developed and implemented for the restoration project using these water quality parameters.

- (3) *We appreciate the efforts Consol has taken to formulate a watershed wide restoration plan that is anticipated to lead to an improvement in the upper Enlow Fork watershed through these improvements to the main stem of Templeton Fork and 11 unnamed tributaries. We support the overall restoration ratio goals identified in the proposal and agree that these are the performance goals that will be used to measure the overall success of the entire project, with the addition of utilizing multimetric biological indices. However, in order to verify the success of each specific restoration reach, we request that monitoring stations be established within each stream restoration reach not only to measure the benthic community but also the success of the bank stabilization, the reduction in the sediment loading, and creation of vegetated riparian corridors.*

RESPONSE: CPCC acknowledges this comment and will establish locations throughout the stream restoration project to monitor the stream restoration areas for the factors listed in this comment. Section 4.12.2, page 4-33, of the *Revised*



Stream Restoration and Wetland Mitigation Plan, dated February 3, 2010 lists monitoring parameters for evaluating the success of the bank stabilization, the reduction in the sediment loading, and creation of vegetated riparian corridors

- (4) *You propose to construct the stream restoration over a period of time as the impacts occur. As built drawings of the restored segments should be submitted to this office annually by December 31 of the year constructed. The proposed 5 year monitoring period will begin with each segment as constructed. As with the forested wetland replacement, given that a goal of the plan is to establish a forested riparian corridor, the monitoring period may be extended beyond the original 5 years as specific site conditions may require.*

RESPONSE: CPCC acknowledges this comment and will provide as-built drawings of the restoration area to your office by December 31st of the year constructed. CPCC also agrees to reasonable extensions of the monitoring period beyond 5 years, as needed, to demonstrate mitigation success.

Comment 3. Site Protection: In accordance with 33 CFR 332.7 Management (a) Site protection: compensatory mitigation projects must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate. The compensatory mitigation plan submitted included a typical stream access agreement and memorandum of agreement for site access for stream restoration reaches located on 3rd party owner properties. The agreement provides for site access for a year, renewal annually for 4 years. This office has determined that this is not adequate site protection to protect the stream riparian restoration sites for the long term. Attached are sample conservation easement and deed restriction documents that have been approved by the Corps of Engineers Districts with authority in Pennsylvania for use in Pennsylvania. The protective covenant should be used for each of the three wetland mitigation areas and for the stream restoration sites. The stream restoration sites should include a riparian zone that is a minimum of 50 feet, with approximately 25 foot on each stream side. The mitigation areas should include a provision to prohibit vegetation removal and/or mowing, grading, filling and construction activities. In the event that Consol believes that upland stream riparian site protection with a perpetual conservation easement is not necessary for specific sites, each site should be addressed separately as to the specific reason long term site protection is not warranted.

RESPONSE: In addition to the previously signed and recorded stream access agreements and memorandum of agreements, an additional protective covenant document is currently being reviewed by the USACE and PADEP Attorneys for final approval. When final approval is received from both agencies the additional protective covenant document will



DEPARTMENT OF THE ARMY
PITTSBURGH DISTRICT, CORPS OF ENGINEERS
WILLIAM S. MOORHEAD FEDERAL BUILDING
1000 LIBERTY AVENUE
PITTSBURGH, PA 15222-4186

me

May 7, 2010

REPLY TO

Operations Division
Regulatory Branch
2007-463

Consol Pennsylvania Coal Company, LLC
P.O. Box J, 1525 Pleasant Grove Road
Claysville, PA 15323

Dear Ms. Goodballet:

I refer to your application for a Department of the Army permit to construct the Bailey Mine Coal Refuse Disposal Areas No. 5 and 6, located in Richhill Township, Greene County, Pennsylvania. As a result of our review and agency coordination of the proposed stream and wetland compensatory mitigation proposals received in this office on February 3, 2010, with revisions received March 10, and April 19, 2010, we submit the following comments. Copies of comments from the USEPA, USFWS, and PAFBC are attached. A response to each of these comments must be submitted to this office.

1. **Compensatory Mitigation Wetlands:** The project will impact 5.87 acres of wetlands, including 5.68 acres that are considered jurisdictional under the Clean Water Act. These federally regulated wetlands consist of 5.40 acres of emergent wetland (PEM), 0.014 acres of shrub/scrub wetland (PSS) and 0.266 acres of forested wetland (PFO). The proposed wetland mitigation plans proposes to construct 5.87 acres of wetland to equal a 1:1 replacement ratio in three areas within the Templeton Fork watershed. The replacement wetland plan includes shrub/wet meadow, shallow, intermediate, and deep marsh, and mound forest habitat components. In order to compensate for the temporal loss of habitat while the shrub and forest components develop, we request that you replace the PSS habitat at a ratio of 2:1 and the PFO at a 3:1 ratio. Therefore, the plan should be modified to include at a minimum 0.028 acres of PSS and 0.798 acres of PFO wetland for a total wetland acreage of 6.23 acres. Any planned non-vegetated open water habitat and upland buffer will be in addition to the 6.23 acres of replacement wetland.

The plan states that tree and shrub planting will not occur in the wetland mitigation area until the fall of year 2. We appreciate the need to ensure the correct hydrologic conditions of the grading prior to planting. Once completed, as built drawings, including planting schematics must be submitted to this office by December 31 of the year planted. The monitoring period will not begin until all required vegetation has been planted. Additionally, the monitoring period for the PFO wetland may be extended to 10 years in order to confirm the successful construction of forested wetland. This decision will be made after the 5th year of monitoring.

2. Compensatory stream mitigation: The plan proposes to restore 40,880 feet of stream channel, including 15,883 feet of Templeton Fork and 24,997 feet of 11 unnamed tributaries, to compensate for impacts to 25,835 feet of federally jurisdictional stream channel.

a. For each of the 17 adjacent watershed benthic study reference stations cited in your proposal, provide the location, including the latitude and longitude, on a topographic or aerial map, the field data sheets identifying the taxa collected, and the survey protocol used. Additionally, please describe the relationship between the reference reaches to the impact site and the proposed restoration sites.

b. In order to fully evaluate the proposed stream mitigation plan to determine its sufficiency to replace the impacted resources, please submit the results of the macroinvertebrate studies and habitat evaluation assessments done for each of the 12 streams proposed for restoration; Templeton Fork and the 11 unnamed tributaries, located within the 10 proposed restoration reaches, as identified on Table 4-1. If multiple surveys were done within one stream, i.e. Templeton Fork, at different locations, that data should be submitted. Each station should be identified on a map with the latitude and longitude provided. You may submit a summary table, but should also submit the field data sheets listing the taxa collected and the survey protocol used.

c. Riparian corridor fencing is required for any sites that will continue to be utilized for livestock grazing. For stream riparian areas that will not include fencing, describe the method that will be used to ensure the riparian zones are protected from disturbance including vegetation removal and mowing.

d. Table 4-5, Stream Restoration Measure Summary, identifies 126 trees to be planted in parcel ID 27-21-4.05 East Finley Township Park. Riparian plantings should include trees in addition to shrubs, sedges, and other herbeaceous material in all restoration segments proposed for riparian planting, currently proposed for 17,063 feet. Revise plan accordingly.

e. Gravel bars vegetated with woody plants are viewed as special aquatic sites; therefore, we suggest eliminating their removal from the restoration plans. If you determine that this would compromise the integrity of the restoration plan for a given reach, please address each bar individually. If the gravel bars must be removed to contribute to the success of the restoration activities, they should be removed to leave 6 inches above the low water elevation.

f. Performance Goals and Standards: The compensatory mitigation plan must include measurable performance standards that can be monitored to ensure the goals of the mitigation plan were met and the site has provided adequate functional replacement for the impacted resource.

1. You have proposed a 1.99:1 ratio in the net gain of the standing crop of all benthics for a total of 1.4 million additional organisms in the existing streams after the restoration activities have taken place. This is acceptable as one performance measure provided that you compare the gain to the actual number of organisms in the restored streams compared to the pre-project stream condition. However, in addition to density, it is imperative that the quality of the benthic community improve also. Therefore, you must include a meaningful biological assessment tool that will measure and clearly document the improvement of a pollution intolerant benthic community. Based on your projections of the improvements that lead to the 1.5:1

mitigation ratio (40,880 feet:25,835 feet) the success criteria will be a 50% improvement rate for pollution intolerant taxa, ETPs and/or PADEP listed Pollution Tolerance Value 0-6 organisms. This criteria will be applied on the overall watershed level, but each of the individual stream reaches proposed for restoration and the individual reaches of Templeton Fork will be required to attain an improvement level of within 20% of this goal.

2. We concur with the 6 performance measures proposed to document success of the bank stabilization with the goal to reduce sediment loading in Templeton Fork, a major tributary in the upper Enlow Fork watershed, by 1,923 tons per year, a 3.4:1 ratio. However, in addition to the physical measurements, we request that you add quarterly water quality monitoring of nitrite-nitrate nitrogen, total phosphorus, and total suspended solids. The performance criteria for the water quality will be an overall reduction of 25% of each respective element over current baseline conditions, attained when looked at as an annual average by year 2 of completion of all restoration activities and maintained throughout the monitoring period.

3. We appreciate the efforts Consol has taken to formulate a watershed wide restoration plan that is anticipated to lead to an improvement in the upper Enlow Fork watershed through these improvements to the main stem of Templeton Fork and 11 unnamed tributaries. We support the overall restoration ratio goals identified in the proposal and agree that these are the performance goals that will be used to measure the overall success of the entire project, with the addition of utilizing multimetric biological indices. However, in order to verify the success of each specific restoration reach, we request that monitoring stations be established within each stream restoration reach not only to measure the benthic community but also the success of the bank stabilization, the reduction in the sediment loading, and creation of vegetated riparian corridors.

4. You propose to construct the stream restoration over a period of time as the impacts occur. As built drawings of the restored segments should be submitted to this office annually by December 31 of the year constructed. The proposed 5 year monitoring period will begin with each segment as constructed. As with the forested wetland replacement, given that a goal of the plan is to establish a forested riparian corridor, the monitoring period may be extended beyond the original 5 years as specific site conditions may require.

3. Site Protection: In accordance with 33 CFR 332.7 Management (a) Site protection: compensatory mitigation projects must be provided long-term protection through real estate instruments or other available mechanisms, as appropriate. The compensatory mitigation plan submitted included a typical stream access agreement and memorandum of agreement for site access for stream restoration reaches located on 3rd party owner properties. The agreement provides for site access for a year, renewal annually for 4 years. This office has determined that this is not adequate site protection to protect the stream riparian restoration sites for the long term. Attached are sample conservation easement and deed restriction documents that have been approved by the Corps of Engineers Districts with authority in Pennsylvania for use in Pennsylvania. The protective covenant should be used for each of the three wetland mitigation areas and for the stream restoration sites. The stream restoration sites should include a riparian zone that is a minimum of 50 feet, with approximately 25 foot on each stream side. The mitigation areas should include a provision to prohibit vegetation removal and/or mowing,

grading, filling and construction activities. In the event that Consol believes that upland stream riparian site protection with a perpetual conservation easement is not necessary for specific sites, each site should be addressed separately as to the specific reason long term site protection is not warranted.

4. You propose to initiate construction of the wetland and stream compensatory mitigation prior to or concurrent with construction activities at the Bailey 5 & 6 impact site. Based on input from Consol, construction activities that will impact waters of the United States are expected to occur in the summer of 2010. The federal permit to authorize impacts will also authorize the restoration activities. Please be advised that you will also need a Pennsylvania DEP Chapter 105 permit to construct the wetland and stream mitigation areas within state jurisdictional waters.

5. National Historic Preservation Act: Provide a clearance letter from the Pennsylvania Historical and Museum Commission (PHMC) for the entire 709 acre Bailey 5 and 6 site. The letter submitted with your application is for phase 1 & 2 of the 4 phased project development. Additionally, in correspondence dated April 28, 2010, to Civil & Environmental Consultants, the PHMC stated that there are potentially significant archaeological sites located within the proposed mitigation areas and a Phase 1 archaeological survey is required. Please be advised that cultural resource clearance must be provided to this office for all construction and mitigation areas prior to disturbance.

In order to expedite our review and partner agency coordination, please send a copy of all requested information to each reviewing agency.

We will continue to work with you in your development plan. Upon receipt of the requested information, we will continue our review of the proposed project. If you have any questions, please contact me at (412)395-7361 or email marcia.h.haberman@usace.army.mil.

Sincerely,



Marcia H. Haberman
Chief, Southern Section
Regulatory Branch

Enclosures

Copy Furnished:
US EPA, Region 3
US FWS, State College Field Office
PA DEP, California Mining Office
PA FBC
Civil & Environmental Consultants



be distributed to private property owners for signatures and provided to the agencies when completed.

As discussed during our April 28, 2010 site visit, CPCC will provide a minimum 50-foot-wide riparian zone on all CPCC-owned property and will endeavor to negotiate with their private landowner partners in this project to provide riparian zones up to 50 feet wide on non-CPCC properties. CPCC also agrees to provide additional riparian zone area on CPCC properties to offset any private properties where the riparian zones are less than 50 feet wide, so that the overall average riparian zone width for the project is 50 feet wide.

Comment 4. You propose to initiate construction of the wetland and stream compensatory mitigation prior to or concurrent with construction activities at the Bailey 5 & 6 impact site. Based on input from Consol, construction activities that will impact waters of the United States are expected to occur in the summer of 2010. The federal permit to authorize impacts will also authorize the restoration activities. Please be advised that you will also need a Pennsylvania DEP Chapter 105 permit to construct the wetland and stream mitigation areas within state jurisdictional waters.

RESPONSE: CPCC acknowledges this comment and will obtain the necessary permits from the PADEP prior to commencing the wetland and stream mitigation activities.

Comment 5. National Historic Preservation Act: Provide a clearance letter from the Pennsylvania Historical and Museum Commission (PHMC) for the entire 709 acre Bailey 5 and 6 site. The letter submitted with your application is for phase 1 & 2 of the 4 phased project development. Additionally, in correspondence dated April 28, 2010, to Civil & Environmental Consultants, the PHMC stated that there are potentially significant archaeological sites located within the proposed mitigation areas and a Phase 1 archaeological survey is required. Please be advised that cultural resource clearance must be provided to this office for all construction and mitigation areas prior to disturbance.

RESPONSE: The PHMC clearance letters for all phases of the CRDA No. 5 & 6 project are included as Attachment 5 of this response. CPCC is currently working with the PHMC to obtain clearance for the wetland mitigation and stream restoration sites. Copies of the clearance letter will be provided to your office upon receipt.



2. USEPA Comments in Letter Dated April 30, 2010.

USEPA Comment 1. Stream Mitigation Success Criteria

- a. *EPA believes that measurements of bank stability, riparian vegetation, and rapid visual habitat assessment scores as proposed by the applicant are suitable endpoints for evaluating the physical improvements of the mitigation streams over time. However, one proposed success criterion is based upon the standing crop of benthic macroinvertebrates increasing by a minimum of 700,000 organisms. EPA does not believe that increased benthic macroinvertebrate productivity as measured by standing crop is an appropriate stand-alone indicator of improved stream health. In fact, it is known that some pollution tolerant organisms (e.g., tolerant of sediments or nutrients) can respond positively to increased stream degradation; therefore, the proposed indicator is inadequate. The success criteria should include more robust indicators of stream health and document improvements in additional metrics such as species richness; species diversity; and an increase in percentage of Ephemeroptera, Plecoptera, and Trichoptera (EPT) taxa. A more holistic indicator of benthic health, and thus a measure of mitigation success, would be to use a multimetric index. EPA recommends that the monitoring plan and mitigation success criteria include the multimetric indices routinely used by PA Department of Environmental Protection for freestone streams, or low-gradient streams, depending on stream classification within the project area. The applicant must be able to show significant increases in benthic community health as measured by the indices at all mitigation sites.*

RESPONSE: CPCC accepts this recommendation and agrees to include a success criterion based on the multimetric index in PADEP's *Index of Biotic Integrity for Wadeable, Freestone Streams in Pennsylvania (2009)*, to demonstrate significant increases in benthic community health for the restored streams. Please see CPCC's response to USACE Comments 2.b and 2.f.1 regarding the proposed biological success criterion for this project.

- b. *During the April 28, 2010 site visit, EPA noted that many of the Templeton Fork's tributaries as well as its main-stem demonstrated excess sediment deposition. According to the submitted mitigation plan, "one of the primary objectives of the stream restoration plan is to reduce sediment loading by improving bank stability and establishing riparian vegetation." Planted woody riparian vegetation is expected to "improve the sediment, nutrient, and toxicant retention capability of the streams." However, no water chemistry parameters are proposed to be monitored for the restoration reaches. EPA recommends that, at a minimum, nitrite-nitrate nitrogen*



(NO₂-NO₃-N), total phosphorus (P), and total suspended solids (TSS) are monitored to support decreasing trends in these parameters for the mitigation reaches. These parameters should be monitored quarterly in accordance with State field and laboratory protocols.

RESPONSE: CPCC agrees to perform quarterly monitoring for nitrite-nitrate nitrogen (NO₂-NO₃-N), total phosphorus (P), and total suspended solids (TSS) Please see CPCC's response to USACE Comment 2.f.2 regarding water quality monitoring.

USEPA Comment 2. Site Protection Mechanism

The 2008 Mitigation Rule states that "[t]he goal of the rule is to ensure permanent protection of all compensatory mitigation project sites" and "[t]he aquatic habitats, riparian areas, buffers, and uplands that comprise the overall compensatory mitigation project must be provided long-term protection through real estate instruments or other available mechanisms." Currently, conservation easements are proposed for those properties owned by the Applicant, only 38% (15,550 If of the stream mitigation segments. Approximately 32% (12,953 if) of the stream mitigation segments will be under a 20-year landowner memorandum of agreement (MOA) to protect the site and 30% (12,377 If) will be under a 10-year MOA. While EPA recognizes the Applicant's efforts to acquire permission from landowners to perform restorative work on their land; conservation easements are necessary on all properties to ensure that functions and values of the impacted aquatic resources are adequately replaced in the long-term.

RESPONSE: Please see CPCC's response to USACE Comment 3 regarding site protection.

3. USFWS Comments in Letter Dated April 30, 2010

USFWS Comment 1. *The applicant is now proposing to locate stream and wetland mitigation projects in the Enlow Fork watershed, instead of the out-of-watershed project proposed last year. We support this change.*

RESPONSE: CPCC appreciates this comment. The stream restoration projects have always been located within the upper Enlow Fork watershed. The original wetland mitigation project, however, was located in the adjacent Crabapple Creek watershed. The wetland mitigation projects are now located in the upper Enlow Fork watershed.



USFWS Comment 2. *We support the concept of determining stream mitigation ratios based on the projected increase in biological productivity that can be achieved by eliminating various sources of water quality impairment. However, success criteria should be based not just on numbers of aquatic organisms, but also the pollution tolerance of the benthic community. We recommend that the success criteria and mitigation ratios be based on a standard Pennsylvania Department of Environmental Protection or U.S. Environmental Protection Agency bioassessment metrics.*

RESPONSE: CPCC accepts this recommendation and agrees to include a success criterion based on the multimetric index in PADEP's *Index of Biotic Integrity for Wadeable, Freestone Streams in Pennsylvania (2009)*, which includes four metrics that measure the pollution tolerance of the benthic community (i.e., Percent Sensitive Individuals, Modified EPT Taxa Richness, Modified beck's Index, and Hilsenhoff Biotic Index) and are heavily weighted towards increasing the number of pollution sensitive individuals and taxa. Please see CPCC's response to USACE Comments 2.b and 2.f.1 regarding the biological success criteria for this project.

USFWS Comment 3. *Forested wetlands should be replaced at a 3:1 ratio, meaning that 0.8 acre of forested wetlands should be created. Tree species planted in the mitigation wetlands should be the same as native species present in the wetlands that will be destroyed by the project.*

RESPONSE: CPCC accepts this recommendation and agrees to replace forested wetlands at a 3:1 ratio and to provide 0.8 acre of forested wetlands as mitigation. Please see CPCC's response to USACE Comment 1 regarding the proposed replacement ratio for forested wetlands. Only native tree, shrub, and herbaceous species will be planted in the mitigation wetlands.

USFWS Comment 4. *The success criterion for planted woody vegetation in created wetlands should be a minimum of 80 percent survival.*

RESPONSE: CPCC agrees to increase the woody vegetation survival success criterion to 80 percent.

USFWS Comment 5. *Soil boring data for some of the mitigation sites (Table 15.5-1A) show a prevalence of silt loam, alluvium, sand loam, and gravelly loam. These soils are unlikely to maintain hydrology in a created wetland.*



RESPONSE: The soil boring data were used to estimate the depth to the apparent water table. The preliminary wetland grading plans were designed so that the proposed wetland elevations will be at or below the apparent water table, to provide a shallow groundwater source of saturated soil and inundated conditions within the mitigation areas. Over-bank flow from Templeton Fork and adjacent tributary streams will supplement the wetland hydrology. Furthermore, CPCC has installed a series of shallow groundwater observation wells at each wetland mitigation site and is currently monitoring these wells to collect more detailed data on the depth and duration of shallow groundwater that will be used to refine the wetland grading plans.

Finally, CPCC will perform topsoil replacement within the wetland mitigation areas using the native silt loam soils present on each site. These soils will both improve soil fertility for wetland vegetation and will decrease soil permeability, thereby extending the wetland hydroperiod during the dryer portions of the year. If, in the unlikely event, the planned groundwater and surface water hydrology are insufficient to maintain adequate hydroperiods for wetland development and/or substrate conditions within the wetland mitigation areas are not suitable for maintaining hydrology in the created wetlands, then CPCC will implement an adaptive management strategy to improve hydrologic conditions and/or further reduce the permeability underlying the wetland mitigation areas.

USFWS Comment 6. Consol proposed to arrange for permanent conservation easements only on land owned by Consol. The impacts to waters of the United States resulting from this project will be permanent; consequently, any mitigation projects must be protected permanently.

RESPONSE: Please see CPCC's response to USACE Comment 3 regarding site protection.

4. PAFBC Comments in E-mail dated April 30, 2010.

PAFBC Comment 1. Because of the large scale of stream impacts for the proposed coal refuse valley fill (>30,000 feet) the replacement plan needs to fully address the impacts. In reviewing the plan there does not appear to be adequate enhancements proposed which will address the physical impacts to the stream system.

RESPONSE: It is CEC's and CPCC's understanding that after viewing the stream and wetland mitigation sites in the field on May 13, 2010, and discussing the PAFBC's specific concerns regarding the project and mitigation, the PAFBC is satisfied with the

Ms. Marcia Haberman
CEC Project 071-522.0013
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May 14, 2010



overall scope of the mitigation project. CPCC, however, will consider specific suggestions provided by the PAFBC and will incorporate reasonable recommendations into the stream restoration drawings as appropriate. One recommendation made by the PAFBC during the field visit was to increase the width of the riparian buffer from 50 feet to 100 feet on CPCC properties. CPCC will evaluate the feasibility of providing additional buffers on CPCC properties.

PAFBC Comment 2. Although the applicant states that the benthic community will be enhanced the community structure to be targeted should be the intolerant taxa, to insure overall aquatic community enhancement rather than just density measurements.

RESPONSE: CPCC accepts this recommendation and agrees to include a success criterion based on the multimetric index in PADEP's *Index of Biotic Integrity for Wadeable, Freestone Streams in Pennsylvania (2009)*, which includes four metrics that measure the pollution tolerance of the benthic community (i.e., Percent Sensitive Individuals, Modified EPT Taxa Richness, Modified beck's Index, and Hilsenhoff Biotic Index) and are heavily weighted towards increasing the number of pollution sensitive individuals and taxa. Please see response to USACE Comments 2.b and 2.f.1 regarding biological success criteria for this project.

Please contact me with any other comments or questions.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read 'Michael L. Shema'.

Michael L. Shema
Project Manager, Ecological Services

A handwritten signature in black ink, appearing to read 'Mark R. Haibach'.

Mark R. Haibach, M.S., PWS
Vice President, Ecological Services

cc: Craig Burda and Joel Folman (PADEP)
Stephanie Chin (USEPA)
Jennifer Kagel (USFWS)
Steve Kepler (PAFBC)
Kerry Goodballet (CONSOL)
Ed Suter (CONSOL)

ATTACHMENT 1

**REFERENCE STREAM PADEP APPENDIX A BENTHIC
MACROINVERTEBRATE DENSITY DATA**



Reference:
 USGS 7.5 MIN TOPOGRAPHIC MAP,
 CLAYVILLE AND PROSPERITY, PA QUADRANGLES
 DATED: 1964, PHOTOREVISED: 1973, PHOTOINSPECTED: 1977.

DRAWN BY: CLC
 CHECKED BY: MLS
 APPROVED BY: MRH*
 SCALE: 1" = 2,000'
 DATE: 5/12/2010

0 2,000 4,000 Feet

Legend

○ Stream Sampling Point

*Hand signature on file.

ISSUED FOR: **CONSOL ENERGY**

ISSUED BY: **CIVIL & ENVIRONMENTAL CONSULTANTS, INC.**
 333 Baldwin Road
 Pittsburgh, PA 15205-9702
 1-800-365-2324

Columbus, OH * Cleveland, OH * Cincinnati, OH * Indianapolis, IN * Nashville, TN * Chicago, IL * St. Louis, MO *
 Export, PA * Detroit, MI * Phoenix, AZ

REFERENCE STREAM
 PADEP APPENDIX A MACROINVERTEBRATE
 DENSITY SAMPLING LOCATION MAP
 BAILEY CRDA NO. 5 AND 6
 CONSOL PENNSYLVANIA COAL COMPANY LLC
 GREENE COUNTY, PENNSYLVANIA

PROJECT NO.: 071-522.0013

Table 4-3
PADEP Appendix A Benthic Macroinvertebrate Productivity - Reference Streams
Bailey CRDA No. 5 & 6
Upper Enlow Fork Watershed - Stream Mitigation Project
Revised May 14, 2010

Stream Name (Relative Location To Pasture)	Sample Point Name	Latitude	Longitude	Perennial Reaches Upstream of Pastures					Perennial Reaches Within Pastures					Difference in Number of Benthic Organisms Between Non-Pastured and Pastured Reaches
				Ephemeroptera per m ²	Plecoptera per m ²	Trichoptera per m ²	Other Taxa per m ²	Grand Total Per m ²	Ephemeroptera per m ²	Plecoptera per m ²	Trichoptera per m ²	Other Taxa per m ²	Grand Total Per m ²	
Tributary 32982 (Upstream 1)	32982(3)	40°6' 7.33" N	80°22' 24.92" W	29	14	18	44	105	0	0	0	0	0	91
Tributary 32982 (Upstream 2)	32982(2)	40°5' 55.03" N	80°22' 47.20" W	2	7	7	92	108	0	0	0	0	0	94
Tributary 32982 (Within)	32982(1)	40°6' 7.33" N	80°22' 24.92" W	0	0	0	0	0	0	2	10	2	14	
Tributary 32986 (Upstream 1)	32986(3)	40° 6' 16.73" N	80°23' 32.50" W	16	76	42	73	207	0	0	0	0	0	187
Tributary 32986 (Upstream 2)	32986(2)	40° 6' 5.52" N	80°23' 26.17" W	27	32	21	20	100	0	0	0	0	0	80
Tributary 32986 (Within)	32986(1)	40°5' 54.62" N	80°23' 22.91" W	0	0	0	0	0	0	0	2	18	20	
Tributary 32991(Upstream 1)	32991(3)	40°5' 31.14" N	80°21' 7.72" W	16	13	45	29	103	0	0	0	0	0	10
Tributary 32991(Upstream 2)	32991(2)	40°4' 47.11" N	80°21' 21.07" W	4	4	76	36	120	0	0	0	0	0	27
Tributary 32991 (Within)	32991(1)	40°5' 46.48" N	80°21' 34.62" W	0	0	0	0	0	0	0	9	84	93	
Tributary 32998 (Upstream)	32998(2)	40° 5' 18.81" N	80°23' 1.68" W	82	2	45	35	164	0	0	0	0	0	134
Tributary 32998 (Within)	32998(1)	40°5' 8.10" N	80°22' 32.73" W	0	0	0	0	0	2	2	4	22	30	
Tributary 40942 (Upstream 1)	40942(3)	40°3' 39.56" N	80°20' 38.12" W	14	16	21	65	116	0	0	0	0	0	40
Tributary 40942 (Upstream 2)	40942(2)	40°3' 30.84" N	80°20' 40.19" W	18	25	9	18	70	0	0	0	0	0	-6
Tributary 40942 (Within)	40942(1)	40°3' 6.79" N	80°20' 43.08" W	0	0	0	0	0	6	20	22	28	76	
Tributary 40944 (Upstream 1)	40944(3)	40°3' 39.80" N	80°21' 24.41" W	11	7	11	26	55	0	0	0	0	0	31
Tributary 40944 (Upstream 2)	40944(2)	40°3' 33.79" N	80°21' 25.67" W	16	24	45	104	189	0	0	0	0	0	165
Tributary 40944 (Within)	40944(1)	40°3' 19.42" N	80°21' 16.34" W	0	0	0	0	0	0	2	4	18	24	
Average Density of Benthic Organisms Per m ² in Perennial Reaches Upstream of Pastures												122		
Average Density of Benthic Organisms Per m ² in Perennial Reaches Within Pastures												43		
Difference in Density of Benthic Organisms Per m ² in Perennial Reaches Upstream and Within Pastures												79		

SUMMARY				
	Density			Total Number of Organisms
	No./m ²	No./acre	Acreage	
CRDA No. 5 & 6 Intermittent Streams	30	122,216	1.39	169,880
CRDA No. 5 & 6 Perennial Streams	84	340,891	1.55	528,381
CRDA No. 5 & 6 All Streams				698,261
Stream Restoration Area (Perennial Streams Only) - Pre-Restoration	43	174,021	4.35	756,991
Stream Restoration Area (Perennial Streams Only) - Post-Restoration	122	493,734		2,147,743
Stream Restoration Area (Perennial Streams Only) - Net Gain	79	319,713		1,390,752
Improvement Ratio (Net Gain/CRDA All Streams)				2:1

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 32982	Project No.: 070-338.0001
Sampling Location: 32982(3)	Date/Time: 4/6/07 1:11pm
Coordinates: 289719.13N 1259901.80E	Investigator(s): NENPAK GPS Unit: 3 Camera: C

Stream Hydrology:

Estimated Flow =	50-60 gpm
Wetted Width =	7-10 ft
Water Depth =	1-7 in

Hydrology Source(s) (check all that apply):

Spring	<input checked="" type="checkbox"/>
Seep	<input checked="" type="checkbox"/>
Run-off	<input checked="" type="checkbox"/>
Pond	<input type="checkbox"/>

Channel Conditions:

Active Width (ft)	7-10
Bed & Banks	<input checked="" type="checkbox"/>
Abutted Channel	<input checked="" type="checkbox"/>
Eroded Channel	<input type="checkbox"/>
Debris-filled	<input type="checkbox"/>
Terrestrial Vegetation	<input type="checkbox"/>

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input checked="" type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Mollusca, B-Bivalvia, U-Unionida, S-Semivoltina):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelidae	U		<input checked="" type="checkbox"/>				Dytiscidae	B, U					
Basidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Peophanidae	U, S	<input checked="" type="checkbox"/>				
Ephemeroidea	U, S	<input checked="" type="checkbox"/>					Megaloptera (dobsonflies)						
Heptageniidae	B, U			<input checked="" type="checkbox"/>			Coryloidea	U, S					
Isopychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U		<input checked="" type="checkbox"/>			
Chloroporidae	U, S						Amphipoda (scuds)	M	<input checked="" type="checkbox"/>				
Loutridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S		<input checked="" type="checkbox"/>				Hirudinea (leeches)	U					
Plecoptera	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U	<input checked="" type="checkbox"/>				
Perlidae (2)	U	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Gastropoda (snails)	U, S	<input checked="" type="checkbox"/>				
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	<input checked="" type="checkbox"/>					Unionidae	U		<input checked="" type="checkbox"/>			
Limnephilidae	U, S	<input checked="" type="checkbox"/>					Phygadeuonidae			<input checked="" type="checkbox"/>			
Philopotamidae	B, U												
Physopterygidae	U, S		<input checked="" type="checkbox"/>										
Uenoidae	U, S		<input checked="" type="checkbox"/>				Vertebrates						
Diptera (true flies)							Blacknose dace						
Chironomidae	M, B, U			<input checked="" type="checkbox"/>			tadpole						
Simuliidae	M, U		<input checked="" type="checkbox"/>										
Tipulidae	B, U, S		<input checked="" type="checkbox"/>										
Tabanidae	U	<input checked="" type="checkbox"/>											

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach	32982 div end	47	48
Sampling PT	32982(3) div	45	46

Notes:
 Sampling method: 3 kicks in riffle/run and pool habitat ~ 1 yd²
 weather conditions: partly cloudy, cold
 End of reach @ end of permit boundary

Determination (circle one): Biologically Diverse Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: <u>32986</u>	Project No.: <u>070338.0001</u>
Sampling Location: <u>32986(3)</u>	Date/Time: <u>4/2/07</u>
Coordinates:	Investigator(s): <u>NEWJAI</u> GPS Unit: <u>5</u> Camera: <u>C</u>

Stream Hydrology:

Estimated Flow = 20-30 gpm
 Wetted Width = 2-5 ft
 Water Depth = 1-4 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-Diked
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Colopectera (aquatic beetles) ?		<input checked="" type="checkbox"/>				
Amelidae	U	<input checked="" type="checkbox"/>					Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psophenidae	U, S					
Ephemorillidae	U, S		<input checked="" type="checkbox"/>				Megaloptera (dobsonflies)						
Heptageniidae	B, U		<input checked="" type="checkbox"/>				Corydidae	U, S					
Isomyiidae	B						Stelidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Phlebotaraxa (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		<input checked="" type="checkbox"/>				Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Petropodidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae (2)	U	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	<input checked="" type="checkbox"/>					Unionidae	U					
Limnephilidae (2)	U, S		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
Phlebotamidae	B, U	<input checked="" type="checkbox"/>											
Rhyacophilidae	U, S	<input checked="" type="checkbox"/>											
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U												
Simuliidae	M, U	<input checked="" type="checkbox"/>											
Tipulidae (3)	B, U, S	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>										
Tabanidae	U	<input checked="" type="checkbox"/>											

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach	<u>32986 div end</u>	<u>17</u>	<u>18</u>
Sampling Pt	<u>32986(3) div</u>	<u>19</u>	<u>20</u>

Determination (circle one): Biologically Diverse Biologically Variable Upland

Notes:
 End of reach @ end of project boundary

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: <u>32986A</u>	Project No.: <u>070338-0001</u>
Sampling Location: <u>32986(2)</u>	Date/Time: <u>4/2/07</u>
Coordinates:	Investigator(s): <u>NENJAI</u> GPS Unit: <u>5</u> Camera: <u>C</u>

Stream Hydrology:

Estimated Flow = 20-30 cpm
 Wetted Width = 2-4 ft
 Water Depth = 1-3 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multiplying, B-Bioting, U-Uhbiting, S-Semiwilling):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amphipoda	U						Dytiscidae	B, U					
Beetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Hoptogenidae	B, U		✓				Corydidae	U, S		✓			
Isonychidae	B						Stalidae	U, S		✓			
Leptophlebiidae	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		✓				Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctidae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S				✓		Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S		✓			
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U		✓			
Perlodidae	U		✓				Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S		✓				Unionidae	U				✓	
Limnephilidae	U, S						<u>Ephemeraidae</u>						
Philopotamidae	B, U												
Rhyacophilidae	U, S		✓				<u>Vertebrates</u>						
Ulenidae	U, S		✓										
Diptera (true flies)													
Chironomidae	M, B, U		✓										
Simuliidae	M, U	✓											
Tipulidae	B, U, S	✓	✓										
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sampling PT	<u>32986(2) div</u>	<u>1</u>	<u>2</u>

Notes:

Stream conditions improve upstream from pond, more suitable substrate, increased number of taxa

Determination (circle one): Biologically Diverse Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: <u>32986</u>	Project No.: <u>070338.0001</u>
Sampling Location: <u>32986(1)</u>	Date/Time: <u>3/30/07</u>
Coordinates:	Investigator(s): <u>NENJWWT</u> GPS Unit: <u>3</u> Camera: <u>C</u>

Stream Hydrology:

Estimated Flow = 30-40 gpm
 Wetted Width = 1-3 ft
 Water Depth = 1-5 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 1-3
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Oxytelidae	B, U					
Baetidae	M, B, U						Ecnidae	U, S					
Caenidae	M, B, U						Psophonidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies, dobsonflies)						
Hoptogeniidae	B, U						Corydidae	U, S					
Isomychidae	B						Stelidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Polyperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S	✓											
Phlebotamidae	B, U												
Rhyacophilidae	U, S												
Uonidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		✓										
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												
							Vertebrates						

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	<u>32986 var</u>	<u>Start 151</u>	<u>152</u>
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sampling PT	<u>32986(1) var</u>	<u>153</u>	<u>154</u>

Notes:
 Sample retaken upstream, variable conditions below pond
 stream diverse upstream from pond

Determination (circle one): Biologically Diverse Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 32991	Project No.: 070-338.0001
Sampling Location: 32991 (3)	Date/Time: 3-29-07 3:35 PM
Coordinates:	Investigator(s): LCPS/JAI GPS Unit: GeoXT5 Camera: B

Stream Hydrology:

Estimated Flow = 25-30 gpm
 Wetted Width = 7-3 ft
 Water Depth = 3-8 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock
 Boulder
 Cobble
 Gravel
 Sand
 Silt
 Clay
 Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amphipoda	U		✓				Dytiscidae	B, U					
Beetle	M, B, U						Elmidae	U, S					
Caddisfly	M, B, U						Psaphonidae	U, S					
Ephemeroptera	U, S		✓				Megaloptera (dobsonflies)						
Holopterygidae	B, U						Corydalidae	U, S					
Trichoptera	B						Sialis	U, S	✓				
Leptophlebiidae	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U	✓				
Chloroperlidae	U, S	✓					Amphipoda (scuds)	M		✓			
Leuctridae	U, S	✓					Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Poloneuridae	S	✓					Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Trichopterygidae	U						Decapoda (crayfish)	U		✓			
Pedidae (3)	U		✓				Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Siphonidae	M, B, U					
Hydropsychidae	B, U, S				✓		Unionidae	U					
Limnephilidae (3)	U, S				✓								
Phlebotomidae	B, U												
Phlebotomidae	U, S		✓										
Uleidae	U, S	✓					Vertebrates						
Diptera (true flies)													
Chironomidae	M, B, U	✓											
Simuliidae	M, U												
Tipulidae (3)	B, U, S		✓										
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start/Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sampling Reach	32991 (3)	163	164

Notes:
 -channel deeply incised; much clay substrate present

Determination (circle one): Biologically Diverse Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 32991	Project No.: 070-338.0001
Sampling Location: 32991 (2)	Date/Time: 3-14-07 12:06 PM
Coordinates:	Investigator(s): LCPS, WWT GPS Unit: GcoXT4 Camera: B

Stream Hydrology:

Estimated Flow = 90-110 cpm
 Wetted Width = 3-4 ft
 Water Depth = 2-7 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bodrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amoebidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	<input checked="" type="checkbox"/>				
Caenidae	M, B, U						Psaphenidae	U, S		<input checked="" type="checkbox"/>			
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Hoptagonidae	B, U	<input checked="" type="checkbox"/>					Corydidae	U, S					
Isomychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Petropodidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U	<input checked="" type="checkbox"/>					Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S		<input checked="" type="checkbox"/>				Udonidae	U					
Limnephilidae	U, S						<i>Ephemeroidea</i>		<input checked="" type="checkbox"/>				
Philopotamidae	B, U												
Phyaophlebiidae	U, S				<input checked="" type="checkbox"/>								
Uenoidae	U, S		<input checked="" type="checkbox"/>										
Diptera (true flies)													
Chironomidae	M, B, U			<input checked="" type="checkbox"/>									
Simuliidae	M, U												
Tipulidae	B, U, S		<input checked="" type="checkbox"/>										
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sampling Reach	32991 (2)	29	30

Notes:

Determination (circle one): Biologically Diverse Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 32991	Project No.: 070-338.0001
Sampling Location: 32991 (1)	Date/Time: 3-14-07
Coordinates:	Investigator(s): LCPS, WWT GPS Unit: GeoXT4 Camera: B

Stream Hydrology:

Estimated Flow = 120-140 gpm
 Wetted Width = 6-8 ft
 Water Depth = 6-11 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 7-9
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Beetidae	M, B, U						Elmidae	U, S	<input checked="" type="checkbox"/>				
Caenidae	M, B, U						Psephenidae	U, S		<input checked="" type="checkbox"/>			
Ephemeralidae	U, S						Megoptera (dobsonflies)						
Heptageniidae	B, U						Corydellidae	U, S					
Isonychiidae	B						Stalidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Namouridae	U, S						Hirudinea (leeches)	U					
Poloporidae	S						Platyhelminthes (flatworms)	M, B, U, S	<input checked="" type="checkbox"/>				
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S		<input checked="" type="checkbox"/>			
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	<input checked="" type="checkbox"/>					Unionidae	U					
Limnephilidae	U, S												
Phlebotomidae	B, U												
Rhyacophilidae	U, S		<input checked="" type="checkbox"/>										
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U				<input checked="" type="checkbox"/>								
Simuliidae	M, U												
Tipulidae	B, U, S	<input checked="" type="checkbox"/>											
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	32991-Var start	1	2
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			

Notes:

Stream in cow pasture
 Sample reach 185' upstream from the start of the assessment reach

Determination (circle one): Biologically Diverse Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 32998	Project No.: 070338.0001
Sampling Location: 32998(2)	Date/Time: 3/28/07
Coordinates:	Investigator(s): NEN/WWJ GPS Unit: 3 Camera: C

Stream Hydrology:

Estimated Flow = 50-60 gpm
 Wetted Width = 3-6 ft
 Water Depth = 1-7 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-6
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Collembola (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Baetidae	M, B, U	<input checked="" type="checkbox"/>					Elmidae	U, S	<input checked="" type="checkbox"/>				
Caenidae	M, B, U						Psophenidae	U, S	<input checked="" type="checkbox"/>				
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Haplaxeridae	B, U			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Corydalidae	U, S					
Isonychidae	B			<input checked="" type="checkbox"/>			Sialidae	U, S					
Leptophlebiidae	U, S		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capnidae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinae (leeches)	U					
Pelloteriidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S	<input checked="" type="checkbox"/>				
Tricoptera (caddisflies)							Bivalvia (clams; mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S				<input checked="" type="checkbox"/>		Unionidae	U					
Limnephilidae	U, S	<input checked="" type="checkbox"/>											
Philopotamidae	B, U												
Rhyacophilidae	U, S		<input checked="" type="checkbox"/>										
Uenoidae	U, S				<input checked="" type="checkbox"/>								
Diptera (true flies)													
Chironomidae	M, B, U				<input checked="" type="checkbox"/>								
Simuliidae	M, U		<input checked="" type="checkbox"/>										
Tipulidae	B, U, S	<input checked="" type="checkbox"/>											
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	32998		
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sampling Pt	32998(2)div	77	78

Determination (circle one): Biologically Diverse Biologically Variable Upland

Notes:
 32998 no longer flows through cow pasture, habitat improves upstream

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 32998	Project No: 070338.0001
Sampling Location: 32998(1)	Date/Time: 3/28/07
Coordinates:	Investigator(s): MEN WJT GPS Unit: 3 Camera: C

Stream Hydrology:

Estimated Flow = **50-60** gpm
 Wetted Width = **3-4** ft
 Water Depth = **1-5** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **3-5**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Collembola (aquatic beetles)						
Ameletidae	U	✓					Dytiscidae	B, U					
Beetidae	M, B, U						Elmidae	(2) U, S	✓	✓			
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydellidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	✓					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Namuridae	U, S						Hirudinea (leeches)	U					
Petropodidae	S						Platyhelminthes (flatworms)	M, B, U, S	✓	✓			
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓	✓			
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Phlebotamidae	B, U	✓											
Phycophoridae	U, S	✓											
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U					✓							
Simuliidae	M, U												
Tipulidae	B, U, S	✓											
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	32998 var	Start 41*	42*
Diverse/Variable Break			
Upland Break			
End Assessment Reach			
Sampling PT	32998(1) var	45	44

Notes:
 * Pic taken 3/27, Stream flows through cow pasture

Determination (circle one): Biologically Diverse **Biologically Variable** Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 40942	Project No.: D70-338.0001
Sampling Location: 40942 (3)	Date/Time: 2-27-09 8:23 AM
Coordinates:	Investigator(s): LCPS, JIN GPS Unit: GLXT4 Camera: A

Stream Hydrology:

Estimated Flow = **90-120** cpm
 Wetted Width = **3-4** ft
 Water Depth = **3-7** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **3-5**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Colleoptera (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	✓				
Cenidae	M, B, U						Paophaenidae	U, S					
Ephemeroidea	U, S		✓				Megaloptera (dobsonflies, dobsonflies)						
Heptageniidae	B, U		✓				Corydalidae	U, S					
Isoperlellidae	B						Sialidae	U, S	✓				
Lepophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S		✓				Amphipoda (scuds)	M			✓		
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S	✓					Hirudinea (leeches)	U					
Pallanoptera	S						Platyhelminths (flatworms)	M, B, U, S		✓			
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Perlodidae	U		✓				Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S		✓				Unkiidae	U					
Limnephilidae	U, S		✓				Isonidae		✓				
Phlebotomidae	B, U												
Rhyacophilidae	U, S		✓				Vertebrates						
Uenoidae	U, S						Larval Salamanders			✓			
Diptera (true flies)													
Chironomidae	M, B, U			✓									
Simuliidae	M, U												
Tipulidae	B, U, S		✓										
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break	40942-dw/var	33	34
Variable/Upland Break			
End Assessment Reach			
Sampling Reach	40942 (3)	31	32

Notes:

- Sampling assessment just downstream of confluence with 40943
 - dw/var break made at confluence with 40943

Determination (circle one): **Biologically Diverse** Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 40442	Project No.: 070-338.0001
Sampling Location: 40442(2)	Date/Time: 2-22-07
Coordinates:	Investigator(s): LCP, WNT GPS Unit: GeoXT4 Camera: B

Stream Hydrology:

Estimated Flow = 70-90 gpm
 Wetted Width = 2.5-4.5 ft
 Water Depth = 2-5 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder SR
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelidae	U	<input checked="" type="checkbox"/>					Dytiscidae	B, U					
Beetidae	M, B, U						Elmidae	U, S					
Caddisidae	M, B, U						Psephenidae	U, S					
Ephemerebidae	U, S		<input checked="" type="checkbox"/>				Megaloptera (dobsonflies)						
Hoptageniidae	B, U		<input checked="" type="checkbox"/>				Corydalidae	U, S					
Isonychidae	B						Stalidae	U, S					
Leptophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Placoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		<input checked="" type="checkbox"/>				Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Kirudinea (leeches)	U					
Petropodidae	S						Platyhelminthes (flatworms)	M, B, U, S	<input checked="" type="checkbox"/>				
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U	<input checked="" type="checkbox"/>				
Perlodidae	U			<input checked="" type="checkbox"/>			Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	<input checked="" type="checkbox"/>					Uronidae	U					
Limnephilidae	U, S												
Phlebotomidae	B, U												
Phycophyllidae	U, S		<input checked="" type="checkbox"/>										
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		<input checked="" type="checkbox"/>										
Simuliidae	M, U												
Tipulidae	B, U, S		<input checked="" type="checkbox"/>										
Tabanidae	U												
							Vertebrates						

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sample Reach	40442(2)	13	14

Notes:
 stream in cow pasture
 ~ 2nd sample taken to be sure of diversity

Determination (circle one): Biologically Diverse Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 40942	Project No.: 070-338.0001
Sampling Location: 40942 (1)	Date/Time: 2-22-07
Coordinates:	Investigator(s): LCPS, WWT GPS Unit: GeoXT4 Camera: A

Stream Hydrology:

Estimated Flow = 80-100 gpm
 Wetted Width = 2-3 ft
 Water Depth = 5-12 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-3
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, P-Pivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelidae	U	<input checked="" type="checkbox"/>					Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	<input checked="" type="checkbox"/>				
Caenidae	M, B, U						Peaphanidae	U, S	<input checked="" type="checkbox"/>				
Ephemerellidae	U, S	<input checked="" type="checkbox"/>					Megoptera (dobsonflies, dobsonflies)						
Heptageniidae	B, U						Corysidae	U, S					
Isocnidae	B						Stalidae	U, S					
Lophophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroporidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pelloniidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taniplopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S	<input checked="" type="checkbox"/>				
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	<input checked="" type="checkbox"/>				
Hydropsychidae	B, U, S	<input checked="" type="checkbox"/>					Unionidae	U					
Limnephilidae	U, S												
Phlebotamidae	B, U												
Physophoridae	U, S	<input checked="" type="checkbox"/>											
Uenoidae	U, S												
Oiptera (true flies)							Vertebrates						
Chironomidae	M, B, U						Larval salamander		<input checked="" type="checkbox"/>				
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	40942-var	start	1
Diversion/Variable Break			Z
Variable/Upland Break			
End Assessment Reach			

Notes:
 - Stream in cow pasture
 - Sampling reach ~ 200' upstream from the start of the assessment reach

Determination (circle one): Biologically Diverse (Biologically Variable) Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 40944	Project No.: 070-338-0001
Sampling Location: 40944 (3)	Date/Time: 3-1-07 8:54 AM
Coordinates:	Investigator(s): LCPS/JAI GPS Unit: GeoXT4 Camera: A

Stream Hydrology:

Estimated Flow = **30-40** cpm
 Wetted Width = **2-3** ft
 Water Depth = **2-5** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **2-3**
 Bad & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coeloptera (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Basidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Peophenidae	U, S					
Ephemeroptera	U, S		✓				Megaloptera (dobsonflies, dobsonflies)						
Heptageniidae	B, U	✓					Corydalidae	U, S					
Isonychidae	B						Stalidae	U, S	✓				
Lepidoptera	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		✓				Anisoptera (dragonflies)	B, U	✓				
Chloroperlidae	U, S						Amphipoda (scuds)	M	✓				
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Petropodidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Perlidae	U	✓					Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae	B, U, S		✓				Unionidae	U					
Limnephilidae	U, S	✓											
Phlebotamidae	B, U												
Rhyacophilidae	U, S	✓											
Uonidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		✓										
Simuliidae	M, U												
Tipulidae	B, U, S		✓										
Tabanidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sampling Reach	40944(3)	79	80

Notes:
 - sample taken downstream of div/var break

Determination (circle one): **Biologically Diverse** Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 40944	Project No.: 070-338,0001
Sampling Location: 40944(2)	Date/Time: 2-28-07 2:21 PM
Coordinates:	Investigator(s): LCPS, JAI GPS Unit: GeoXT 4 Camera: A

Stream Hydrology:

Estimated Flow =	90-110	gpm
Wetted Width =	2-3	ft
Water Depth =	2-6	in

Hydrology Source(s) (check all that apply):

Spring	<input checked="" type="checkbox"/>
Seep	<input checked="" type="checkbox"/>
Run-off	<input checked="" type="checkbox"/>
Pond	<input checked="" type="checkbox"/>

Channel Conditions:

Active Width (ft)	2-3
Bed & Banks	<input checked="" type="checkbox"/>
Alluvial Channel	<input checked="" type="checkbox"/>
Eroded Channel	<input type="checkbox"/>
Debris-filled	<input type="checkbox"/>
Terrestrial Vegetation	<input type="checkbox"/>

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input checked="" type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input checked="" type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amoleidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	<input checked="" type="checkbox"/>				
Caenidae	M, B, U						Psephenidae	U, S		<input checked="" type="checkbox"/>			
Ephemeroellidae	U, S		<input checked="" type="checkbox"/>				Megoptera (dobsonflies)						
Heptageniidae	B, U		<input checked="" type="checkbox"/>				Corydalidae	U, S	<input checked="" type="checkbox"/>				
Isonychidae	B						Slidae	U, S					
Leptophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperiidae	U, S			<input checked="" type="checkbox"/>			Amphipoda (scuds)	M		<input checked="" type="checkbox"/>			
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S	<input checked="" type="checkbox"/>					Hirudinea (leeches)	U					
Polyperliidae	S	<input checked="" type="checkbox"/>					Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U	<input checked="" type="checkbox"/>					Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S			<input checked="" type="checkbox"/>			Ulonidae	U					
Limnephilidae	U, S	<input checked="" type="checkbox"/>											
Philopotamidae	B, U												
Rhyacophilidae	U, S		<input checked="" type="checkbox"/>										
Uanoidae	U, S			<input checked="" type="checkbox"/>									
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U					<input checked="" type="checkbox"/>							
Simuliidae	M, U	<input checked="" type="checkbox"/>											
Tipulidae	B, U, S			<input checked="" type="checkbox"/>									
Tabanidae	U	<input checked="" type="checkbox"/>											

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach			
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			
Sampling Reach	40944(2)	73	74

Notes:
 - Sampling reach just upstream of pasture in forested land

Determination (circle one): **Biologically Diverse** Biologically Variable Upland

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: 40944	Project No.: 070-338,000
Sampling Location: 40944 (1)	Date/Time: 2-27-07 3:02 PM
Coordinates:	Investigator(s): LCPSJAI GPS Unit: GeoXT4 Camera: A

Stream Hydrology:

Estimated Flow = **50-70** gpm
 Wetted Width = **1-2** ft
 Water Depth = **5-10** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **1-2**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coeloptera (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Beetidae	M, B, U						Etmidae	U, S					
Coenidae	M, B, U						Psophonidae	U, S					
Ephemeroidea	U, S						Megoptera (dobsonflies, dobsonflies)						
Hoptagonidae	B, U						Corydidae	U, S					
Isonychidae	B						Sludidae	U, S					
Lepidoptera	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	✓					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Laucidae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Trudinea (leeches)	U					
Polyperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S												
Phlebotomidae	B, U												
Umayidae	U, S	✓											
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U		✓				Ceratopogonidae	✓					
Simuliidae	M, U												
Tipulidae	B, U, S		✓										
Tanandidae	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	40944-var	45	46
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			

Notes:
 - sampling reach ~250' upstream from the start of the assessment reach (1 net from just US of road crossing and 2 nets just downstream of culverted road crossing)

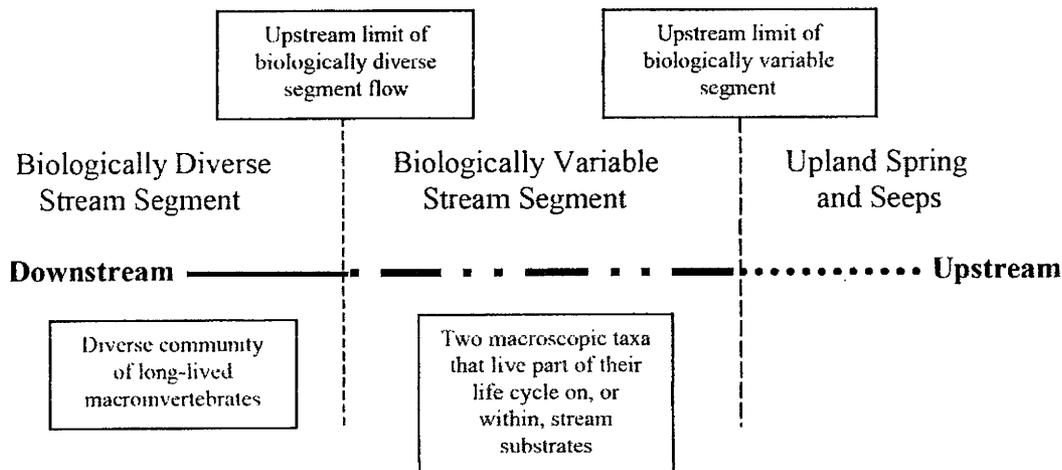
Determination (circle one): Biologically Diverse **Biologically Variable** Upland

Appendix A

Stream Survey Protocol for Delineating Protected Stream Segments

This survey protocol is designed to facilitate the delineation of intermittent and perennial stream segments that are subject to the provisions of this guidance.

The following diagram provides a simplified view of a stream distinguishing between segments that support diverse communities of long-lived benthic macroinvertebrates (biologically diverse stream segment) and segments that support less diverse benthic macroinvertebrate communities ranging down to a lower limit of two macroscopic taxa that live at least part of their life cycles within or upon substrates associated with flowing water (biologically variable stream segment). Segments that support diverse communities of long-lived benthic macroinvertebrate taxa may be assessed using the methodology in Appendix B to ascertain whether or not they are in attainment of existing and designated water uses. Segments that support less diverse benthic macroinvertebrate communities may be assessed to determine their ability to support at least two visually discernable macroinvertebrate taxa that are indicative of flowing waters.



The biologically diverse stream segment is the segment where, under the normal range of conditions, a diverse community of uni / semivoltine taxa and other macroinvertebrates, that are building blocks of aquatic ecologic systems, can exist. The macroinvertebrate community in these segments is suitable for water use attainment evaluations performed in accordance with Appendix B. The extent of this segment may be determined using a modified version of the qualitative kick screen method developed for use in the Department's Statewide Surface Water Assessment Program (SSWAP).

Upstream of the biologically diverse stream segment, the macroinvertebrate community is normally less diverse and more variable in composition. For purposes of the guidance, this segment is designated as the "biologically variable stream segment." The biologically variable stream segment supports at least two benthic taxonomic groups of organisms, which are visible to the unaided eye and live at least part of their life cycles within or upon available substrates in the stream. Its upstream limit is essentially equivalent to the "Point of First Stream Use" described by Bureau of Water Supply and Wastewater

Management's technical guidance document (TGD) 391-2000-014, titled *Implementation Guidance for Evaluating Wastewater Discharges to Drainage Ditches and Swales*. The delineation of the upstream limit of the biologically variable stream segment is compatible with TGD 391-2000-014 because it defines the point in the stream where Chapter 93 protection of existing and designated stream uses begins. Due to its natural variability and limited diversity, the macroinvertebrate community in a biologically variable stream segment cannot be evaluated using the procedures outlined in Appendix B.

The SSWAP kick screen method recommended in this Protocol was modified from EPA's *Rapid Bioassessment Protocols (RBP) for Use in Streams and Wadeable Rivers* (1989) and is similar to the kick screen method that is commonly used by the Department's field biologists.

SURVEY PROTOCOL

1. **Bioassessment Period.** Benthic macroinvertebrate sampling should be done in the period of October through May; optimal times would be November through early May in order to best characterize the biological communities during normal flow conditions.
2. **Survey Gear.** The sample device to be used in this protocol is a basic kick screen that is approximately a 1x1 meter square net with two large dowel handles (approx. 42" long). Other survey equipment would include forceps, sample vials, alcohol preservative, field forms, and note books. A field tray and 10X hand lens is also recommended.
3. **Bioassessment.** Based on field conditions and a review of map features, the beginning point of the stream survey will often be a significant distance upstream from the mouth. At each station, the best available habitat (preferably riffles) should be sampled. (Note: Where the aquatic community in a stream has been profoundly impacted by pre-existing pollution, the limits of the biologically diverse stream segment and the biologically variable stream segment may be delineated based on the stream's flow and substrate characteristics and on bioassessment survey data from healthy streams with similar drainage areas, geology, and geomorphological characteristics in the local area.)
 - a) **Preliminary Screening.** The delineation of the upstream limit of the biologically diverse stream segment begins with a quick preliminary evaluation of the benthic community. Once the survey starting point has been determined, the best riffle habitat is located and a qualitative kick sample is collected using the following method:
 - i) Facing upstream, one person¹² places the kick screen in the stream with the bottom edge of the screen held firmly against the streambed. An assistant then vigorously kicks the substrate within a 3x3-foot area immediately upstream of the screen to a depth of 3-4" (approximately 10cm). The functional depth sampled may vary due to ease of disturbance as influenced by types of substrate.
 - ii) Once the sample is collected, the biologist observes the net. (At stations within the biologically diverse stream segment, one kick should normally be adequate) If the benthos is well represented by benthic taxa listed in Table A.1, then the biologist moves to a point further upstream. This net inspection and decision

¹² While this method normally depends on two persons, it can be easily adapted for use by one biologist

process should only take several minutes at each station. Taxonomic identifications at this step need only be to the Family level in the field.

- iii) Working progressively upstream, this preliminary screening should result in the characterization of diverse benthic communities of uni-/semivoltine taxa and other aquatic life. This kick screen sampling continues upstream until the biologist notices a significant decrease or adverse change in the diverse benthic community structure observed downstream. Once this station is identified, the biologist should commence with the sample procedures described in the following Detailed Screening section.

4. Detailed Screening. At the point where a preliminary screening reveals a significant change in the benthic community, additional kicks and benthic sample collection will be necessary.

- a) At each site, collect a minimum of two to three kick screens in a “best available” single habitat of riffles or series of riffles with fast and slow velocity flows. Additional sampling in adjacent habitats to generate a more complete taxa list can be conducted at the discretion of the investigator. Initial analysis of the data must be limited to the riffle data for standardization.
 - i) Data observations shall be recorded on a standard field sheet created for each station sampled. Record the relative abundance of each recognizable Family in each individual collection in the field. Relative Abundance categories, with the observed “total” ranges indicated in parenthesis, include: rare (0-3), present (3-10), common (11-24), abundant (25-99), and (occasionally) very abundant (100+). The investigator, at his/her discretion, may elect to enumerate certain target taxa. Recording the results of each kick has several advantages that are lost if the data is composited for each station.
 - ii) Individuals of representative taxa for a station shall be composited in a single vial and preserved for later laboratory verification or identification down to most practical taxonomic level (preferably to Genus level) when the limit of the biologically diverse stream segment is anticipated.
 - iii) Once a station location has been determined, the following information should be recorded and provided in any resulting reports:
 - (A) Stream Name - as recorded in the Pennsylvania Gazetteer of Streams.
 - (B) Stream Code - a five-digit number assigned to every named and unnamed stream in the Commonwealth.
 - (C) Latitude/Longitude - For maps, visual aids, and report tables, lat/longs can be reported in degrees-minutes-seconds, based on USGS 7.5' quadrangle maps or GPS measurements.
 - (D) River Mile Index - the distance measured from the mouth upstream to the sampling point and reported in 0.1-mile increments. If sampling points are very close together, then the mileage may be reported in 0.01-mile

increments. Depending on the needed precision, map wheels or electronic measuring devices may be used.

- (E) Narrative Description - a brief narrative describing the station locations should be provided; preferably in tabular form. Local landmarks, special features, and road route numbers should be included when applicable. Include as many features as possible to aid in return visits by other investigators. For stream reporting narratives, discussion purposes, maps, and visual aids, it is desirable to use conventional station labels that are easily distinguishable to reviewers. GPS coordinates should also be provided.

- b) **Delineating the limit of a biologically diverse stream segment.** Distinct or relatively abrupt differences in habitat, particularly changes in instream cover, riffle frequency, epifaunal substrate, velocity/depth regimes, and/or channel flow status, may indicate locations the biologist would select to spot-check with a kick screen sample. Sampling should continue until kick screen results exhibit macroinvertebrate communities significantly different than the previous downstream location. Once the biologist determines that a location has exceeded the limit of the biologically diverse stream segment, the last benthic sample should be collected and preserved as in 4.a)(ii) above. By following this protocol, the biologist collects at least two benthic samples (for detailed identification) that clearly brackets and, thus defines the segment limit. The benthic sample collection used to determine segment limit should be retained for quality assurance purposes and verification if requested.

Supplemental Data. Additional data supporting delineation of a biologically diverse stream segment may include the collection of diverse communities of adult and intermediate juvenile fish, headwater occurrence of trout, sculpin, and several species of darters, and the presence of some rooted aquatic plants.

- c) Once the limit of the biologically diverse stream segment has been defined, the biologist continues upstream to define the upstream limit of the biologically variable stream segment.

5. **Delineating the limit of a biologically variable stream segment.** Continue preliminary spot-checking upstream until less than two recognizable taxonomic groups are found. This change in aquatic populations represents the point where the upstream limit of the biologically variable stream segment is located. Benthic communities commonly found in biologically variable stream segments are usually dominated by organisms typically with relatively short life cycles and may be represented by Baetis mayflies, chironomids, Simulium blackflies or other short life cycle (multivoltine) taxa. These benthic communities are often characterized by low diversity and abundance, absence of fall emergent taxa, and few dominating species.

In addition to the presence of aquatic populations as described above, the biologically variable stream segment will display common physical stream characteristics. These include a well defined stream channel with a defined bed and bank, substrates associated with flowing waters, and the absence of terrestrial plant growth in the channel bed. Regarding streams that do not support aquatic populations due to adverse impacts, these physical conditions may be used to define the upstream limit where aquatic life could be supported in the absence of such impacts.

Table A.1. Common univoltine and semivoltine organisms. (The list is not intended to be complete or exclusive)

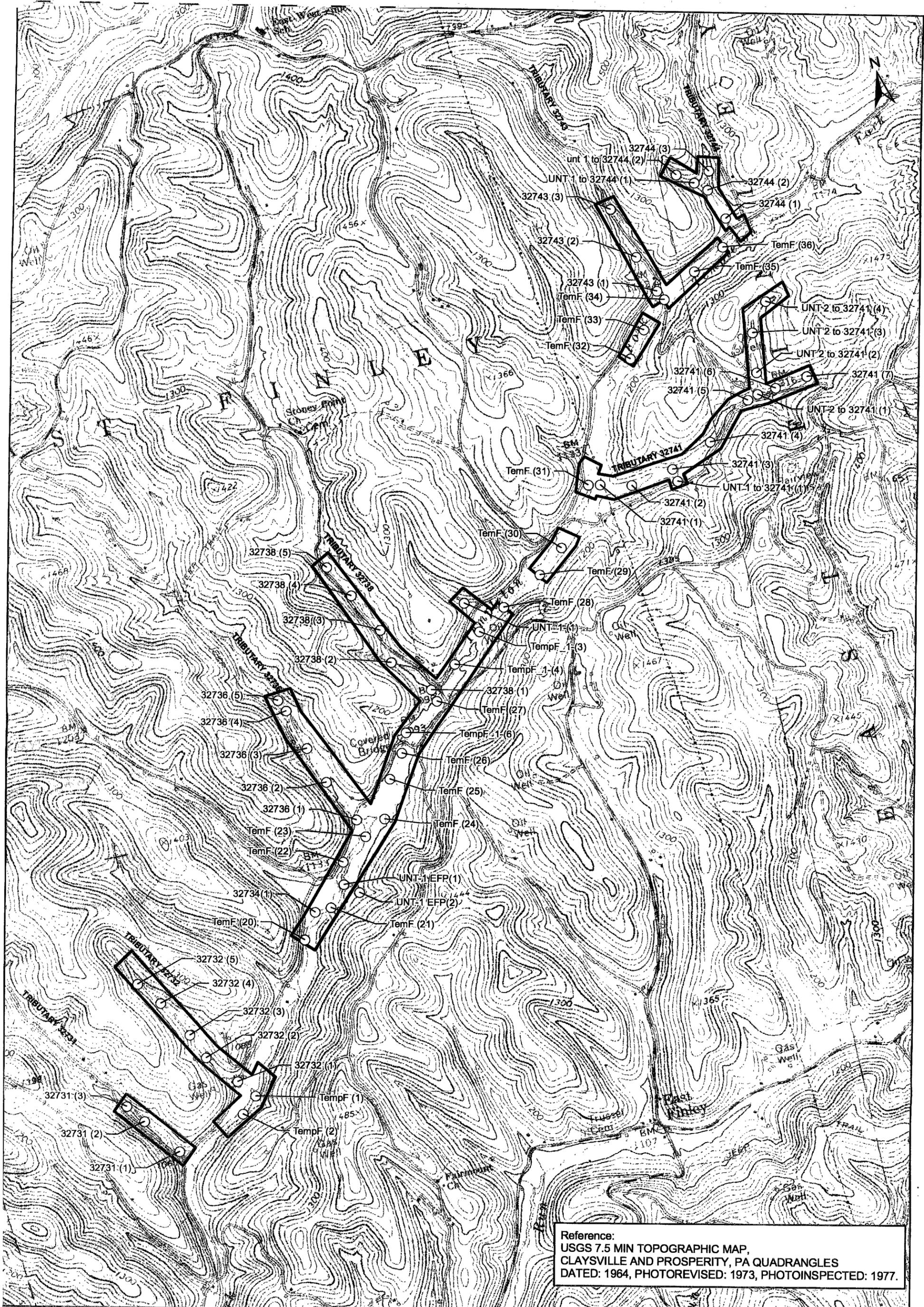
Megaloptera (hellgrammites; alder-, dobson-, & fishflies) <ul style="list-style-type: none"> ○ Corydalidae (2-5 years), ○ Sialidae (1-2 years)
Plecoptera (all stoneflies; variable life cycle lengths – see Table 14A; Merritt & Cummins, 1995) <ul style="list-style-type: none"> ○ Pteronarcyidae (1-3 years), Peltoperlidae (1-2 years) – common in small headwater streams ○ Perlidae (1-3 years) ○ Others (univoltine or 1-2 years)
Ephemeroptera (mayflies; normally univoltine, but can vary in some families. Highly dependent on temperature and seasonal conditions) <ul style="list-style-type: none"> ○ Ephemerellidae, <i>Epeorus</i>, <i>Paraleptophlebia</i> – commonly found in small, headwater streams ○ Other family taxa may be represented
Odonata (damself- & dragonflies; usually univoltine but some longer than 1 year)
Trichoptera (caddisflies)
Coleoptera Larvae (beetles) <ul style="list-style-type: none"> ○ Elmidae ○ Psephenidae
Native clams & mussels
Aquatic snails

REFERENCES CITED.

- Merritt, R.W. & K.W. Cummins, Eds. 1995. An Introduction to the Aquatic Insects of North America, 3rd Edition. Kendall/Hunt Publishing Company, Dubuque, Iowa. 722 pp.
- Stoner, J. D., Williams, D. R., Buckwalter, T. F., Felbinger, J. K., and Pattison, K. L., 1987. Water Resources and the Effects of Coal Mining, Greene County, Pennsylvania. Water Resource Report 63 – Pa. Bureau of Topographic and Geologic Survey.
- Williams, D. R., Felbinger, J. K., Squillace, P. J., 1993. Water Resources and the Hydrologic Effects of Coal Mining in Washington County, Pennsylvania. USGS Open-file Report 89-620, unpublished.

ATTACHMENT 2

**RESTORATION STREAM PADEP APPENDIX A BENTHIC
MACROINVERTEBRATE DENSITY DATA**



Reference:
 USGS 7.5 MIN TOPOGRAPHIC MAP,
 CLAYVILLE AND PROSPERITY, PA QUADRANGLES
 DATED: 1964, PHOTOREVISED: 1973, PHOTOINSPECTED: 1977.

DRAWN BY: CLC
 CHECKED BY: MLS
 APPROVED BY: MRH*
 SCALE: 1" = 1,500'
 DATE: 5/12/2010

0 1,500 3,000 Feet

Legend

- Stream Restoration Areas
- Stream Sampling Point

*Hand signature on file.

ISSUED FOR: **CONSOL ENERGY**

ISSUED BY: *CEC*

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
 333 Baldwin Road
 Pittsburgh, PA 15205-9702
 1-800-365-2324

Columbus, OH * Cleveland, OH * Cincinnati, OH * Indianapolis, IN * Nashville, TN * Chicago, IL * St. Louis, MO *
 Export, PA * Detroit, MI * Phoenix, AZ

**RESTORATION STREAM
 PADEP APPENDIX A MACROINVERTEBRATE
 DENSITY SAMPLING LOCATION MAP
 BAILEY CRDA NO. 5 AND 6
 CONSOL PENNSYLVANIA COAL COMPANY LLC
 GREENE COUNTY, PENNSYLVANIA**

PROJECT NO.: 071-522.0013

PADEP Appendix A Benthic Macroinvertebrate Productivity - Templeton Fork Restoration Streams
 Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
 Consol Pennsylvania Coal Company LLC

Stream Name	Sample Point Name	Latitude	Longitude	Ephemeroptera per m ²	Plecoptera per m ²	Trichoptera per m ²	Other taxa per m ²	Grand Total Per m ²
Templeton Fork	TempF(1)	40°1' 44.66" N	80°24' 41.67" W	4	4	11	213	232
Templeton Fork	TempF(2)	40°1' 42.08" N	80°24' 45.24" W	7	2	0	70	79
Templeton Fork	TempF 1-(3)	40°2' 53.84" N	80°23' 30.62" W	2	9	11	153	175
Templeton Fork	TempF 1-(4)	40°2' 49.33" N	80°23' 37.62" W	2	9	11	18	40
Templeton Fork	TempF 1-(6)	40°2' 39.60" N	80°23' 51.48" W	0	7	2	7	16
Templeton Fork	TempF (20)	40°2' 8.97" N	80°24' 23.36" W	2	7	4	137	150
Templeton Fork	TempF (21)	40°2' 13.37" N	80°24' 16.24" W	0	2	0	270	272
Templeton Fork	TempF (22)	40°2' 20.53" N	80°24' 11.29" W	2	7	2	29	40
Templeton Fork	TempF (23)	40°2' 23.94" N	80°24' 5.17" W	4	4	9	100	117
Templeton Fork	TempF (24)	40°2' 26.15" N	80°24' 0.29" W	0	2	27	234	263
Templeton Fork	TempF (25)	40°2' 32.58" N	80°23' 57.23" W	0	0	24	100	124
Templeton Fork	TempF (26)	40°2' 36.32" N	80°23' 53.37" W	2	2	8	33	45
Templeton Fork	TempF (27)	40°2' 43.77" N	80°23' 43.25" W	0	0	11	146	157
Templeton Fork	TempF (28)	40°2' 57.03" N	80°23' 24.25" W	2	0	6	49	57
Templeton Fork	TempF (29)	40°3' 1.12" N	80°23' 14.89" W	0	0	2	18	20
Templeton Fork	TempF (30)	40°3' 4.88" N	80°23' 8.82" W	0	0	11	11	22
Templeton Fork	TempF (31)	40°3' 14.30" N	80°23' 0.01" W	0	2	0	29	31
Templeton Fork	TempF (32)	40°3' 33.88" N	80°22' 44.81" W	0	0	0	20	20
Templeton Fork	TempF (33)	40°3' 38.18" N	80°22' 40.49" W	0	0	2	24	26
Templeton Fork	TempF (34)	40°3' 42.56" N	80°22' 34.59" W	2	0	0	18	20
Templeton Fork	TempF (35)	40°3' 46.05" N	80°22' 26.79" W	0	0	0	4	4
Templeton Fork	TempF (36)	40°3' 49.09" N	80°22' 19.43" W	2	0	18	20	40
Average Density				1	3	7	77	89
UNTI to Templeton Fork (East Finley Park)	UNT-1 EFP(1)	40°2' 16.78" N	80°24' 12.26" W	7	9	2	6	24
UNTI to Templeton Fork (East Finley Park)	UNT-1 EFP(2)	40°2' 14.84" N	80°24' 9.26" W	4	54	2	66	126
Average Density				6	32	2	36	75
UNTI to Templeton Fork (Restoration Area 1)	UNT 1-(1)	40°2' 59.20" N	80°23' 32.63" W	0	2	64	24	90
Average Density				0	2	64	24	90
Tributary 32731 to Templeton Fork	32731 (1)	40°1' 38.30" N	80°25' 0.67" W	7	0	2	86	95
Tributary 32731 to Templeton Fork	32731 (2)	40°1' 44.55" N	80°25' 6.76" W	0	0	2	29	31
Tributary 32731 to Templeton Fork	32731 (3)	40°1' 47.69" N	80°25' 9.81" W	4	0	2	113	119
Average Density				4	0	2	76	82
Tributary 32732 to Templeton Fork	32732 (1)	40°1' 47.76" N	80°24' 44.76" W	0	7	7	225	239
Tributary 32732 to Templeton Fork	32732 (2)	40°1' 52.98" N	80°24' 50.39" W	0	0	2	73	75
Tributary 32732 to Templeton Fork	32732 (3)	40°1' 57.39" N	80°24' 52.74" W	4	6	0	89	99
Tributary 32732 to Templeton Fork	32732 (4)	40°2' 3.79" N	80°24' 57.44" W	2	14	16	144	176
Tributary 32732 to Templeton Fork	32732 (5)	40°2' 7.90" N	80°25' 1.44" W	78	25	25	233	361
Average Density				17	10	10	153	190
Tributary 32734 to Templeton Fork	32734(1)	40°2' 13.17" N	80°24' 19.78" W	6	6	6	17	35
Average Density				6	6	6	17	35
Tributary 32736 to Templeton Fork	32736 (1)	40°2' 27.05" N	80°24' 6.39" W	0	0	0	7	7
Tributary 32736 to Templeton Fork	32736 (2)	40°2' 34.35" N	80°24' 11.04" W	2	0	4	89	95
Tributary 32736 to Templeton Fork	32736 (3)	40°2' 40.61" N	80°24' 13.60" W	0	0	4	224	228
Tributary 32736 to Templeton Fork	32736 (4)	40°2' 47.69" N	80°24' 16.19" W	2	64	18	284	368
Tributary 32736 to Templeton Fork	32736 (5)	40°2' 49.79" N	80°24' 17.38" W	6	71	9	406	492
Average Density				2	27	7	202	238
Tributary 32738 to Templeton Fork	32738 (1)	40°2' 45.89" N	80°23' 43.95" W	2	18	6	69	95
Tributary 32738 to Templeton Fork	32738 (2)	40°2' 51.91" N	80°23' 51.20" W	2	18	9	20	49
Tributary 32738 to Templeton Fork	32738 (3)	40°2' 57.73" N	80°23' 51.95" W	6	62	6	202	276
Tributary 32738 to Templeton Fork	32738 (4)	40°3' 4.51" N	80°23' 56.56" W	9	11	78	82	180
Tributary 32738 to Templeton Fork	32738 (5)	40°3' 10.15" N	80°24' 0.44" W	0	2	20	75	97
Average Density				4	22	24	90	139
Tributary 32741 to Templeton Fork	32741 (1)	40°3' 13.93" N	80°22' 57.44" W	0	2	2	28	32
Tributary 32741 to Templeton Fork	32741 (2)	40°3' 12.68" N	80°22' 50.56" W	0	2	4	24	30
Tributary 32741 to Templeton Fork	32741 (3)	40°3' 13.86" N	80°22' 40.98" W	0	0	0	2	2
Tributary 32741 to Templeton Fork	32741 (4)	40°3' 17.01" N	80°22' 31.52" W	0	2	0	24	26
Tributary 32741 to Templeton Fork	32741 (5)	40°3' 22.65" N	80°22' 21.36" W	0	0	0	27	27
Tributary 32741 to Templeton Fork	32741 (6)	40°3' 23.62" N	80°22' 14.86" W	7	0	4	275	286
Tributary 32741 to Templeton Fork	32741 (7)	40°3' 24.45" N	80°22' 7.57" W	0	4	2	126	132
Average Density				1	1	2	72	76
UNTI to Tributary 32741	UNT 1 to 32741 (1)	40°3' 11.67" N	80°22' 40.46" W	2	2	2	38	44
Average Density				2	2	2	38	44
UNT2 to Tributary 32741	UNT 2 to 32741 (1)	40°3' 23.27" N	80°22' 18.97" W	0	0	0	9	9
UNT2 to Tributary 32741	UNT 2 to 32741 (2)	40°3' 26.90" N	80°22' 18.14" W	0	0	7	404	411
UNT2 to Tributary 32741	UNT 2 to 32741 (3)	40°3' 33.72" N	80°22' 17.14" W	0	0	0	2	2
UNT2 to Tributary 32741	UNT 2 to 32741 (4)	40°3' 38.50" N	80°22' 12.84" W	0	9	0	18	27
Average Density				0	2	2	108	112
Tributary 32743 to Templeton Fork	32743 (1)	40°3' 44.18" N	80°22' 35.77" W	0	0	0	209	209
Tributary 32743 to Templeton Fork	32743 (2)	40°3' 50.62" N	80°22' 38.67" W	2	2	2	89	95
Tributary 32743 to Templeton Fork	32743 (3)	40°3' 59.62" N	80°22' 41.92" W	2	4	2	87	95
Average Density				1	2	1	128	133
Tributary 32744 to Templeton Fork	32744 (1)	40°3' 53.87" N	80°22' 17.41" W	2	9	4	97	112
Tributary 32744 to Templeton Fork	32744 (2)	40°3' 59.32" N	80°22' 19.90" W	6	25	13	55	99
Tributary 32744 to Templeton Fork	32744 (3)	40°4' 2.45" N	80°22' 18.74" W	4	2	4	28	38
Average Density				4	12	7	60	83
UNTI to Tributary 32744	UNT 1 to 32744 (1)	40°3' 11.67" N	80°22' 40.46" W	0	0	7	11	18
UNTI to Tributary 32744	UNT 1 to 32744 (1)	40°4' 1.02" N	80°22' 22.47" W	0	2	0	13	15
Average Density				0	1	4	12	17

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Templeton Fork - Area 2</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>@ Confluence of Trib. 32732 / Temp F(1)</u>	Date/Time: <u>3/9/2010 7415</u>
Coordinates:	Investigator(s): <u>SFB/SJP</u> GPS Unit: <u>X46</u> Camera: <u>J</u>
Current Weather Conditions: <u>Clear / Sunny / 50°F</u>	Weather Conditions Past 48 Hours: <u>25°F - 50°F</u>

Stream Hydrology:

Estimated Flow = > 800 gpm
 Wetted Width = 15 ft
 Water Depth = 12 - 20 in

Hydrology Source(s) (check all that apply):

Spring	<input checked="" type="checkbox"/>
Seep	<input checked="" type="checkbox"/>
Run-off	<input checked="" type="checkbox"/>
Pond	<input type="checkbox"/>

Channel Conditions:

Active Width (ft)	<u>18 - 22</u>
Bed & Banks	<input checked="" type="checkbox"/>
Alluvial Channel	<input checked="" type="checkbox"/>
Eroded Channel	<input type="checkbox"/>
Debris-filled	<input type="checkbox"/>
Terrestrial Vegetation	<input type="checkbox"/>

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U	<input checked="" type="checkbox"/>				
Caenidae	M, B, U					
Ephemerellidae	U, S	<input checked="" type="checkbox"/>				
Heptageniidae	B, U					
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U	<input checked="" type="checkbox"/>				
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S	<input checked="" type="checkbox"/>				
Peltoperlidae	S					
Pertidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Tricoptera (caddisflies)						
Glossomatidae	B, U					
Hydropsychidae	B, U, S		<input checked="" type="checkbox"/>			
Limnephilidae	U, S					
Philopotamidae	B, U					
Rhyacophilidae	U, S	<input checked="" type="checkbox"/>				
Uenoidae	U, S	<input checked="" type="checkbox"/>				
Diptera (true flies)						
Chironomidae	M, B, U					<input checked="" type="checkbox"/>
Simuliidae	M, U					
Tipulidae (z)	B, U, S		<input checked="" type="checkbox"/>			
Tabanidae	U	<input checked="" type="checkbox"/>				
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (alderflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S	<input checked="" type="checkbox"/>				
Hemiptera (Water Bugs)						
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)						
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)						
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Decapoda (crayfish)						
Gastropoda (snails)						
Bivalvia (clams, mussels)						
Sphaeriidae						
Unicidae						
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>Temp F (1)</u>	<u>Temp F(1)</u>	<u>17</u>	<u>18</u>

Notes (Include narrative description of sampling location):

- Sample - 3 1m² kicks
- SAMPLE COLLECTED JUST UPSTREAM OF TRIB 32732
- AREA 2

PADEP Classification: VAR
 USACE Classification: IM

STREAM DETERMINATION FIELD DATA FORM

Stream: TEMPLETON FORK - Area 2	Project No.: 071-522-0016
Sampling Location: TEMPF (2)	Date/Time: 3/9/10
Coordinates:	Investigator(s): MJP/SRB GPS Unit: XHS Camera: J
Current Weather Conditions: CLEAR/SUNNY/50°F	Weather Conditions Past 48 Hours: 25°F - 50°F

Stream Hydrology:

Estimated Flow = **7800** gpm
 Wetted Width = **25** ft
 Water Depth = **6-18** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **26-30**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S		<input checked="" type="checkbox"/>				Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Blivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	<input checked="" type="checkbox"/>				
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U						Vertebrates						
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U				<input checked="" type="checkbox"/>								
Simuliidae	M, U												
Tipulidae (2)	B, U, S	<input checked="" type="checkbox"/>											
Tabanidae	U	<input checked="" type="checkbox"/>											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
TEMPF (2)	TEMPF (2)	19	20

Notes (Include narrative description of sampling location):

(1) (2)
 • 3 1m² RAWS IN RIFLE/GLIDE HABITATS
 • AREA 2

PADEP Classification: **VAR**
 USACE Classification: **INT**

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>TEMPLETON FORK</u>	Project No.: <u>071-522-0016</u>
Sampling Location: <u>~ 200' DOWNSTREAM OF BORDER / TEMPE (3)</u>	Date/Time: <u>3/10/10 1355</u>
Coordinates:	Investigator(s): <u>MJP/SRB</u> GPS Unit: <u>XHB</u> Camera: <u>J</u>
Current Weather Conditions: <u>CLOUDY 50°F</u>	Weather Conditions Past 48 Hours: <u>30°-50°F</u>

Stream Hydrology:

Estimated Flow = > 300 gpm
 Wetted Width = 10-20 ft
 Water Depth = 6-18 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 20-30
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S	<input checked="" type="checkbox"/>				
Heptageniidae	B, U					
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U		<input checked="" type="checkbox"/>			
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S	<input checked="" type="checkbox"/>				
Pettoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Trichoptera (caddisflies)						
Glossosomatidae	B, U		<input checked="" type="checkbox"/>			
Hydropsychidae	B, U, S		<input checked="" type="checkbox"/>			
Limnephilidae	U, S					
Philoptamidae	B, U					
Rhyacophilidae	U, S	<input checked="" type="checkbox"/>				
Uenoidae	U, S	<input checked="" type="checkbox"/>				
Diptera (true flies)						
Chironomidae	M, B, U				<input checked="" type="checkbox"/>	
Simuliidae	M, U					
Tipulidae	B, U, S	<input checked="" type="checkbox"/>				
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S		<input checked="" type="checkbox"/>			
Psephenidae	U, S					
Megaloptera (dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S	<input checked="" type="checkbox"/>				
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M	<input checked="" type="checkbox"/>				
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S		<input checked="" type="checkbox"/>			
Oligochaeta (segmented worms)	B, U, S		<input checked="" type="checkbox"/>			
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S	<input checked="" type="checkbox"/>				
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					<input checked="" type="checkbox"/>
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
TEMPE (3) (AREA 1)	TEMPE-1 (3)	37	38

Notes (Include narrative description of sampling location):

- SAMPLED ON BOTH SIDES OF BRAIDED CHAN
- (3) 1M = KICK IN R1/RU
- VERY ERODED RDB
- LDB IS SLIGHTLY UNDERCUT
- VERY LITTLE COBBLE SUBSTRATE
- AREA 1

PADEP Classification: VAR
 USACE Classification: INT

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Temp E-1-(6)</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>~ 'up stream of Road / Temp E-2-(6)</u>	Date/Time: <u>3/10/2010 3:10</u>
Coordinates:	Investigator(s): <u>SRB/mvp</u> GPS Unit: <u>XH8</u> Camera: <u>✓</u>
Current Weather Conditions: <u>Cloudy / 50°F / Breezy</u>	Weather Conditions Past 48 Hours: <u>30° - 50°F</u>

Stream Hydrology:

Estimated Flow = 100-1000 gpm
 Wetted Width = 10-15 ft
 Water Depth = 8-18 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 20'
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ametetidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemereilidae	U, S					
Heptageniidae	B, U					
Isorychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U		X			
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Pertodidae	U					
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S	X				
Limnephilidae	U, S					
Philopotamidae	B, U					
Rhyacophilidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U		X			
Simuliidae	M, U					
Tipulidae	B, U, S					
Tabanidae	U					

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (dobsonflies, alderflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>Temp E-1-(6)</u>	<u>Temp E-1-(6)</u>	<u>41-</u>	<u>42</u>

Notes (include narrative description of sampling location):
 • Sampled 3 1m² kicks
 • Very Fast Flow
 • Water up 4-6 inches from markings

PADEP Classification: VAR
 USACE Classification: INT

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tem F. Uzlyk Property</u>	Project No.: <u>071522.0616</u>
Sampling Location: <u>Tem F (20)</u>	Date/Time: <u>3/18/10 10:20</u>
Coordinates:	Investigator(s): <u>LPS JAO</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>Sunny 50°F</u>	Weather Conditions Past 48 Hours: <u>Sunny 32°F-60°F</u>

Stream Hydrology:

Estimated Flow = 130-150 gpm
 Wetted Width = 6-20 ft
 Water Depth = 8-10 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 6-25
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		✓				Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S	✓				
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U				✓	
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S	✓					<u>Ephemeridae</u>		✓				
Philopotamidae	B, U												
Rhyacophilidae	U, S	✓											
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U				✓								
Simuliidae	M, U												
Tipulidae	B, U, S	✓											
Tabanidae	U		✓										

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Tem F (20)	Tem F (20)	7	8

Notes (include narrative description of sampling location):
 1 sample taken on Uzlyk Property
 3 kicks (1m)²
 ~100' upstream from property line

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: TemF East Finley Park	Project No.: 071-522.0016
Sampling Location: TemF (22)	Date/Time: 3/18/10 11:30
Coordinates:	Investigator(s): LCOS, JAD GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 50°F, sunny	Weather Conditions Past 48 Hours: 55°F, sunny

Stream Hydrology:

Estimated Flow = **130-150** gpm
 Wetted Width = **7-10** ft
 Water Depth = **5-30** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **7-10**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S	X					Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		X				Anisoptera (dragonflies)	B, U	X				
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	X	X			
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S	X					Vertebrates						
Uenoidae	U, S						Creek chub						
Diptera (true flies)													
Chironomidae	M, B, U			X									
Simuliidae	M, U	X											
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
TemF (22)	TemF(22)	11	12

Notes (include narrative description of sampling location):
 - sample taken ~ 700' upstream of sample (21)
 Using a D-Frame net for 1m² - sampling also taken in C-Pom and some cobble substrate downstream due to large amount of bedrock substrate

PADEP Classification: **VAR**
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tem F East Finley Park</u>	Project No.: <u>071522, 0016</u>
Sampling Location: <u>Tem F (23)</u>	Date/Time: <u>3/18/10 12:40</u>
Coordinates:	Investigator(s): <u>LCPs JAD</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>Sunny 55°F</u>	Weather Conditions Past 48 Hours: <u>Sunny 32°F-60°F</u>

Stream Hydrology:

Estimated Flow = 130-150 gpm
 Wetted Width = 6-15 ft
 Water Depth = 3-32 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 6-17
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemereilidae	U, S	✓				
Heptageniidae	B, U	✓				
Isorychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U	✓				
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S	✓				
Pettoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S	✓				
Limnephilidae	U, S					
Philopotamidae	B, U					
Rhyacophilidae	U, S		✓			
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U		✓			
Simuliidae	M, U					
Tipulidae	B, U, S					
Tabanidae	U	✓				
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S		✓			
Psephenidae	U, S		✓			
Megaloptera (dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S	✓				
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S	✓				
Oligochaeta (segmented worms)	B, U, S	✓				
Decapoda (crayfish)	U	✓				
Gastropoda (snails)	U, S		✓			
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					✓
Unionidae	U					
Vertebrates						
Rainbow Darter		X				
Johnny Darter		X				

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sample pt (23)	Tem F (23)	13	14

Notes (include narrative description of sampling location):
 • Sample taken ~ 630' from sample (22)
 • 3 (m)³ Sample w/ D-Frame
 CPOM, Gravel, Sand, Silt

PADEP Classification: Variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tem F Litman</u>	Project No.: <u>071522-0016</u>
Sampling Location: <u>Tem F (24)</u>	Date/Time: <u>3/18/10 13:00</u>
Coordinates:	Investigator(s): <u>LEPS JAD</u> GPS Unit: <u>GEORX9</u> Camera: <u>K</u>
Current Weather Conditions: <u>Sunny 55°F</u>	Weather Conditions Past 48 Hours:

Stream Hydrology:

Estimated Flow = 130-150 gpm
 Wetted Width = 5-15 ft
 Water Depth = 3-24 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 5-20
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

* Check leech

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelotidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isorychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	X					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S	X				
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		X			
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)				X		
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	X					Unionidae	U					
Limnephilidae	U, S		X										
Philopotamidae	B, U												
Rhyacophilidae	U, S			X									
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U					X							
Simuliidae	M, U												
Tipulidae	B, U, S		X										
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sample pt (24) Tem F (24)		15	16

Notes (include narrative description of sampling location):
 1 Sample taken ~700' upstream of sample (23)
 3 (m) Kirks in gravel, silt, sand

PADEP Classification: VAR
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>TemF Litman</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>TemF (25)</u>	Date/Time: <u>3-18-10 1:20PM</u>
Coordinates:	Investigator(s): <u>LCPS, JAD</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>60°F, sunny</u>	Weather Conditions Past 48 Hours: <u>sunny, 55°F</u>

Stream Hydrology:

Estimated Flow = 140-150 gpm
 Wetted Width = 7-10 ft
 Water Depth = 5-24 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 7-15
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S			✓		
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerefilidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychtiidae	B						Stalidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U				✓	
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S						<u>Helicopsychidae</u>			✓			
Philopotamidae	B, U	✓											
Rhyacophilidae	U, S				✓		Vertebrates						
Uenoidae	U, S	✓											
Diptera (true flies)													
Chironomidae	M, B, U				✓								
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U	✓											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>TemF (25)</u>	<u>TemF (25)</u>	<u>17</u>	<u>18</u>

Notes (include narrative description of sampling location):

- sample taken ~ 700' upstream of sample (24) using D-Frame net for 1mz

PADEP Classification: variable
 USACE Classification:

Stream: <u>Tem F</u>	Project No.: <u>071522-0016</u>
Sampling Location: <u>Tem F (26)</u>	Date/Time: <u>3/18/10 1350</u>
Coordinates:	Investigator(s): <u>LCPSJAD</u> GPS Unit: <u>GEOKH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>Sunny 60°F</u>	Weather Conditions Past 48 Hours: <u>Sunny 32°F-60°F</u>

Stream Hydrology:

Estimated Flow = 140-150 gpm
 Wetted Width = 8-14 ft
 Water Depth = 3-24 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 8-15
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S		X			
Caenidae	M, B, U						Psephenidae	U, S			X		
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U	X					Corydalidae	U, S					
Isonychidae	B						Stalidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	X					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S	X				
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S	X				
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	X					Unionidae	U					
Limnephilidae	U, S	X											
Philopotamidae	B, U	X											
Rhyacophilidae	U, S	X											
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S	X											
Tabanidae	U	X											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sample (26)	Tem F (26)	19	20

Notes (include narrative description of sampling location):

• Sample taken ~700' upstream from sample (25)
 3 kicks = (1 m)² in gravel; silt, sand

PADEP Classification: VAR
 USACE Classification:

Stream: <u>Tem F</u>	Project No.: <u>071522-0016</u>
Sampling Location: <u>Tem F (27)</u>	Date/Time: <u>3/18/10 14:20</u>
Coordinates:	Investigator(s): <u>LCPS JAO</u> GPS Unit: <u>GEOR49</u> Camera: <u>K</u>
Current Weather Conditions: <u>Sunny 60°F</u>	Weather Conditions Past 48 Hours: <u>Sunny 30°F-60°F</u>

Stream Hydrology:

Estimated Flow = 130-140 gpm
 Wetted Width = 5-8 ft
 Water Depth = 1-20 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 5-10
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S			✓		
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isorychiidae	B						Stalidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperiidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pettoperidae	S						Platyhelminthes (flatworms)	M, B, U, S	✓				
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Periodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U				✓	
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophillidae	U, S		✓										
Uenidae	U, S	✓											
Diptera (true flies)													
Chironomidae	M, B, U				✓		Vertebrates						
Simuliidae	M, U						Fantail Darters	✓					
Tipulidae	B, U, S	✓											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sample pt (27)	Tem F (27)	21	22

Notes (Include narrative description of sampling location):
 - Sample taken ~100' DS of where 231 crosses Tem F
 1.3 Kick = (1m)² in cobble, gravel, silt sand

PADEP Classification: Variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: TemF Thomas	Project No.: 071-522.0016
Sampling Location: TemF (28)	Date/Time: 3-8-10 3:08 PM
Coordinates:	Investigator(s): LCPS, JAD GPS Unit: GeoXIII9 Camera: K
Current Weather Conditions: 60°F, SUNNY	Weather Conditions Past 48 Hours: 55°F, SUNNY

Stream Hydrology:

Estimated Flow = **130-140** gpm
 Wetted Width = **19-23** ft
 Water Depth = **6-30** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **20-25**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S		✓			
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Petiopteridae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U			✓		
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S						Ephemeridae			✓			
Philopotamidae	B, U						Ceratopogonidae			✓			
Rhyacophilidae	U, S	✓											
Uenoidae	U, S	✓					Vertebrates						
Diptera (true flies)							Fantail Darter			✓			
Chironomidae	M, B, U			✓									
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U	✓											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
TemF (29)	TemF (28)	23	24

Notes (include narrative description of sampling location):
 - Sample taken ~ 100' downstream of DS start of F13 gate cut using D-Frame net for 1m²

PADEP Classification: **Variable**
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tem F</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>Tem F (29)</u>	Date/Time: <u>3/18/10 15:20</u>
Coordinates:	Investigator(s): <u>LCPS JAD</u> GPS Unit: <u>GEONX#9</u> Camera: <u>K</u>
Current Weather Conditions: <u>Sunny 60°F</u>	Weather Conditions Past 48 Hours: <u>Sunny 32°F -60°F</u>

Stream Hydrology:

Estimated Flow = 130-140 gpm
 Wetted Width = 7-13 ft
 Water Depth = 6-35 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 7-16
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Placoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperiidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pettoperidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	X				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U		X			
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophiliidae	U, S	X					Vertebrates						
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		X										
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U	X											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sample # (29)	Tem F (29)	25	26

Notes (Include narrative description of sampling location):

• Sample taken within Thomas property
 • 3 jabs = (1m)² in silt & gravel

PADEP Classification: VAR
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tem F Zuver</u>	Project No.: <u>071522.0016</u>
Sampling Location: <u>Tem F (30)</u>	Date/Time: <u>3/18/10 15:40</u>
Coordinates:	Investigator(s): <u>LCPS JAD</u> GPS Unit: <u>GE0xH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>Sunny 60°F</u>	Weather Conditions Past 48 Hours: <u>Sunny 32°F-60°F</u>

Stream Hydrology:

Estimated Flow = 125-135 gpm
 Wetted Width = 6-13 ft
 Water Depth = 3-28 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 6-15
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S		X				Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S	X											
Uenoidae	U, S	X											
Diptera (true flies)													
Chironomidae	M, B, U		X										
Simuliidae	M, U												
Tipulidae	B, U, S	X											
Tabanidae	U	X											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>Sample # (30)</u>	<u>Tem F (30)</u>	<u>27</u>	<u>28</u>

Notes (include narrative description of sampling location):
 • Sample taken ~ 700' US of Sample (29)
 • 3 jabs = (1m)² in silt, sand, gravel

PADEP Classification: VAR
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: TemF Phillips	Project No.: 071-522.0016
Sampling Location: TemF (31)	Date/Time: 3-18-10
Coordinates:	Investigator(s): LEPSJAD GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 65°F sunny	Weather Conditions Past 48 Hours: 55°F, sunny

Stream Hydrology:

Estimated Flow = **125-135** gpm
 Wetted Width = **6-8** ft
 Water Depth = **10-24** in.

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **6-8**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U					
Isorychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U	✓				
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S					
Philopotamidae	B, U					
Rhyacophilidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U			✓		
Simuliidae	M, U					
Tipulidae	B, U, S	✓				
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (aldersflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U	✓				
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Nirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U		✓			
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
TemF (31)	TemF (31)	29	30

Notes (include narrative description of sampling location):
 - sample taken near midpoint on Phillips property using a D-Frame for 1m²

PADEP Classification: **Variable**
 USACE Classification:

PADEP Stream Name/Code: TMF Bedillion	Project No.: 071-522.0016
Sampling Location: TMF (32)	Date/Time: 3-19-10 9:53AM
Coordinates:	Investigator(s): LCRS GPS Unit: GC0XT3 Camera: K
Current Weather Conditions: 50°F, SUNNY	Weather Conditions Past 48 Hours: 55°F, SUNNY

Stream Hydrology:

Estimated Flow = **100-120** gpm
 Wetted Width = **6-8** ft
 Water Depth = **6-24** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **7-9**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae*	U						Dytiscidae*	B, U					
Baetidae*	M, B, U						Elmidae*	U, S					
Caenidae*	M, B, U						Psephenidae*	U, S					
Ephemerellidae*	U, S						Megaloptera (dobsonflies)						
Heptageniidae*	B, U						Corydalidae*	U, S					
Isonychilidae*	B						Sialidae*	U, S					
Leptophlebiidae*	U, S						Hemiptera (Water Bugs)*	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)*	U					
Capniidae*	U						Anisoptera (dragonflies)*	U, S					
Chloroperlidae*	U, S						Amphipoda (scuds)	M					
Leuctridae*	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae*	U, S						Hirudinea (leeches)	U					
Peltoperlidae*	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae*	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae*	U						Decapoda (crayfish)*	U					
Perlodidae*	U						Gastropoda (snails)*	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae*	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae*	B, U, S						Unionidae*	U					
Limnephilidae*	U, S						Ceratopogonidae		✓				
Philopotamidae*	B, U												
Rhyacophilidae*	U, S						Vertebrates						
Uenoidae*	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		✓										
Simuliidae	M, U												
Tipulidae*	B, U, S	✓											
Tabanidae*	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	TMF (32)	31	32
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			

Notes:

- sample taken ~ 100' upstream from the DS of Bedillion property line using a D-Frame for 1m²
 - stream has heavy siltation and disturbance from cattle

Determination (circle one): Biologically Diverse **Biologically Variable** Upland

* Considered long-lived taxa.

PADEP Stream Name/Code: Temf Bedillion	Project No.: 071-522.0016
Sampling Location: Temf (33)	Date/Time: 3-19-10
Coordinates:	Investigator(s): LCPS GPS Unit: GeoXT3 Camera: K
Current Weather Conditions: 50°F sunny	Weather Conditions Past 48 Hours: 55°F, sunny

Stream Hydrology:	Hydrology Source(s) (check all that apply):	Channel Conditions:	Substrate Type(s) (check all that apply):
Estimated Flow = 100-120 gpm	Spring <input checked="" type="checkbox"/>	Active Width (ft) 5-8	Bedrock <input type="checkbox"/>
Wetted Width = 5-7 ft	Seep <input checked="" type="checkbox"/>	Bed & Banks <input checked="" type="checkbox"/>	Boulder <input type="checkbox"/>
Water Depth = 6-30 in	Run-off <input checked="" type="checkbox"/>	Aluvial Channel <input checked="" type="checkbox"/>	Cobble <input type="checkbox"/>
	Pond <input type="checkbox"/>	Eroded Channel <input type="checkbox"/>	Gravel <input checked="" type="checkbox"/>
		Debris-filled <input type="checkbox"/>	Sand <input checked="" type="checkbox"/>
		Terrestrial Vegetation <input type="checkbox"/>	Silt <input checked="" type="checkbox"/>
			Clay <input type="checkbox"/>
			Artificial <input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae*	U						Dytiscidae*	B, U					
Baetidae*	M, B, U						Elmidae*	U, S					
Caenidae*	M, B, U						Psephenidae*	U, S					
Ephemerellidae*	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae*	B, U						Corydalidae*	U, S					
Isonychiidae*	B						Sialidae*	U, S					
Leptophlebiidae*	U, S						Hemiptera (Water Bugs)*	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)*	U					
Capniidae*	U						Anisoptera (dragonflies)*	U, S					
Chloroperiidae*	U, S						Amphipoda (scuds)	M					
Leuctridae*	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae*	U, S						Hirudinea (leeches)	U					
Peltoperiidae*	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae*	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae*	U						Decapoda (crayfish)*	U					
Perlodidae*	U						Gastropoda (snails)*	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae*	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae*	B, U, S						Unionidae*	U					
Limnephilidae*	U, S												
Philopotamidae*	B, U	✓					Vertebrates						
Rhyacophilidae*	U, S												
Uenocidae*	U, S												
Diptera (true flies)													
Chironomidae	M, B, U			✓									
Simuliidae	M, U												
Tipulidae*	(2) B, U, S	✓											
Tabanidae*	U	✓											

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	Temf (33)	33	34
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			

Notes:
 - sampling reach located ~ 700' upstream of sample (32) using a D-Frame net for 1m²
 - heavy siltation and disturbance by cattle in stream

Determination (circle one): Biologically Diverse **Biologically Variable** Upland

* Considered long-lived taxa.

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: TemF	Project No.: 071-522.0016
Sampling Location: TemF (34)	Date/Time: 3-19-10 10:49 AM
Coordinates:	Investigator(s): LCPS GPS Unit: GeoXT3 Camera: K
Current Weather Conditions: 60°F, SUNNY	Weather Conditions Past 48 Hours: 55°F, SUNNY

Stream Hydrology:

Estimated Flow = **90-100** gpm
 Wetted Width = **5-7** ft
 Water Depth = **15-30** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **5-7**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae*	U						Dytiscidae*	B, U					
Belidae*	M, B, U						Elmidae*	U, S					
Caenidae*	M, B, U						Psephenidae*	U, S					
Ephemerellidae*	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae*	B, U						Corydalidae*	U, S					
Isorychiidae*	B						Sialidae*	U, S					
Leptophlebiidae*	U, S	✓					Hemiptera (Water Bugs)*	B, U	✓				
Plecoptera (stoneflies)							Zygoptera (damselflies)*	U		✓			
Capniidae*	U						Anisoptera (dragonflies)*	U, S					
Chloroperlidae*	U, S						Amphipoda (scuds)	M					
Leuctridae*	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae*	U, S						Hirudinea (leeches)	U					
Peltoperlidae*	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae*	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae*	U						Decapoda (crayfish)*	U					
Perlodidae*	U						Gastropoda (snails)*	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae*	B, U						Sphaeriidae	M, B, U					
Hydropsychidae*	B, U, S						Unionidae*	U					
Limnephilidae*	U, S												
Phlopotamidae*	B, U												
Rhyacophilidae*	U, S												
Uenoidae*	U, S						Vertebrates						
Diptera (true flies)													
Chironomidae	M, B, U		✓										
Simuliidae	M, U												
Tipulidae*	B, U, S												
Tabanidae*	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	TemF (34)	35	36
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			

Notes:

- sample taken ~ 700' upstream of sample (32)
 just upstream of culvert crossing @ road
 - pooled area with heavy siltation
 - sample taken closer to side of channel rather than center due to deep pooling

Determination (circle one): Biologically Diverse **Biologically Variable** Upland

* Considered long-lived taxa.

APPENDIX A - STREAM DETERMINATION FIELD DATA FORM

PADEP Stream Name/Code: TemF Bedillion	Project No.: 07-522.0016
Sampling Location: TemF (35)	Date/Time: 3-19-10 11:30PM
Coordinates:	Investigator(s): LCPS GPS Unit: GeoXT3 Camera: K
Current Weather Conditions: 60°F, SUNNY	Weather Conditions Past 48 Hours: 55°F, SUNNY

Stream Hydrology:

Estimated Flow = **90-100 gpm**
 Wetted Width = **4-6** ft
 Water Depth = **1-1.5** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **4-6**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae*	U						Dytiscidae*	B, U					
Baetidae*	M, B, U						Elmidae*	U, S					
Caenidae*	M, B, U						Psephenidae*	U, S					
Ephemerellidae*	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae*	B, U						Corydalidae*	U, S					
Isomyiidae*	B						Sialidae*	U, S					
Leptophlebiidae*	U, S						Hemiptera (Water Bugs)*	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)*	U					
Capniidae*	U						Anisoptera (dragonflies)*	U, S					
Chloroperlidae*	U, S						Amphipoda (scuds)	M					
Leuctridae*	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae*	U, S						Hirudinea (leeches)	U					
Pettoperlidae*	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae*	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae*	U						Decapoda (crayfish)*	U					
Perlodidae*	U						Gastropoda (snails)*	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae*	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae*	B, U, S						Unionidae*	U					
Limnephilidae*	U, S												
Philopotamidae*	B, U						Vertebrates						
Rhyacophilidae*	U, S												
Uenoidae*	U, S												
Diptera (true flies)													
Chironomidae	M, B, U	✓											
Simuliidae	M, U												
Tipulidae*	B, U, S												
Tabanidae*	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	TemF (35)	37	38
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			

Notes:

- Sample taken ~ 700' upstream of sample (34) using a D-Frame net for 1m²

Determination (circle one): Biologically Diverse **Biologically Variable** Upland

* Considered long-lived taxa.

PADEP Stream Name/Code: TomF Bedillion	Project No.: 071-522
Sampling Location: TomF(36)	Date/Time: 3-19-10
Coordinates:	Investigator(s): LCPS GPS Unit: GeoXT3 Camera: K
Current Weather Conditions: 60°F, SUNNY	Weather Conditions Past 48 Hours: 55°F, SUNNY

Stream Hydrology:

Estimated Flow = **90-100** gpm
 Wetted Width = **5-7** ft
 Water Depth = **5-9** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **5-7**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (1-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae*	U						Dytiscidae*	B, U					
Baetidae*	M, B, U						Elmidae*	U, S	<input checked="" type="checkbox"/>				
Caenidae*	M, B, U						Psephenidae*	U, S					
Ephemerellidae*	U, S	<input checked="" type="checkbox"/>					Megaloptera (alderflies, dobsonflies)						
Heptageniidae*	B, U						Corydalidae*	U, S					
Isomyiidae*	B						Stalidae*	U, S					
Leptophlebiidae*	U, S						Hemiptera (Water Bugs)*	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)*	U					
Capniidae*	U						Anisoptera (dragonflies)*	U, S					
Chloroperlidae*	U, S						Amphipoda (scuds)	M					
Leuctridae*	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae*	U, S						Hirudinea (leeches)	U					
Palloperlidae*	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae*	U, S						Offgochaeta (segmented worms)	B, U, S					
Taeniopterygidae*	U						Decapoda (crayfish)*	U					
Perlodidae*	U						Gastropoda (snails)*	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae*	B, U						Sphaeriidae	M, B, U					
Hydropsychidae*	B, U, S						Unionidae*	U					
Limnephilidae*	U, S												
Philopotamidae*	B, U						Vertebrates						
Rhyacophilidae*	U, S			<input checked="" type="checkbox"/>									
Uenoidae*	U, S												
Diptera (true flies)													
Chironomidae	M, B, U			<input checked="" type="checkbox"/>									
Simuliidae	M, U												
Tipulidae*	B, U, S												
Tabanidae*	U												

Location	GPS Point	Photographs	
		Downstream	Upstream
Start Assessment Reach	TomF(36)	39	40
Diverse/Variable Break			
Variable/Upland Break			
End Assessment Reach			

Notes:
 - sample taken ~ 700' upstream of sample (35) using a D-Frame net for 1mz
 * Considered long-lived taxa.

Determination (circle one): Biologically Diverse Biologically Variable Upland

STREAM DETERMINATION FIELD DATA FORM

Stream: UNT1 to Temp (East Finley Park)	Project No.: 071-522.0016
Sampling Location: UNT-1 EFP	Date/Time: 3-15-10
Coordinates:	Investigator(s): LCS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions:	Weather Conditions Past 48 Hours: heavy rain and snow melt

Stream Hydrology:

Estimated Flow = **15-20** gpm
 Wetted Width = **1-2** ft
 Water Depth = **1-3** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **1-2**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock
 Boulder
 Cobble
 Gravel
 Sand
 Silt
 Clay
 Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S		✓				Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isorychidae	B						Stalidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		✓				Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Perlodidae	U	✓					Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U	✓											
Simuliidae	M, U												
Tipulidae	B, U, S	✓											
Tabanidae	U												
							Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
UNTLEFP (1)	UNTEFP (1)	3	1

Notes (include narrative description of sampling location):
 sampled about 50' upstream of
 confluence with Templeton Park via a
 1.5' x 1.5' hole

PADEP Classification: **Variable**
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: UNT1 to TemF (East Finley Park)	Project No.: 071-522.0016
Sampling Location: UNT1 EFP (2)	Date/Time: 3-15-10
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoxHQ Camera: K
Current Weather Conditions:	Weather Conditions Past 48 Hours: heavy rain, snow melt

Stream Hydrology:	Hydrology Source(s) (check all that apply):	Channel Conditions:	Substrate Type(s) (check all that apply):
Estimated Flow = 15-20 gpm	Spring <input checked="" type="checkbox"/>	Active Width (ft) 3-6	Bedrock <input type="checkbox"/>
Wetted Width = 3-6 ft	Seep <input checked="" type="checkbox"/>	Bed & Banks <input checked="" type="checkbox"/>	Sand <input checked="" type="checkbox"/>
Water Depth = 2-5 in	Run-off <input checked="" type="checkbox"/>	Alluvial Channel <input checked="" type="checkbox"/>	Silt <input checked="" type="checkbox"/>
	Pond <input type="checkbox"/>	Eroded Channel <input type="checkbox"/>	Clay <input type="checkbox"/>
		Debris-filled <input type="checkbox"/>	Artificial <input type="checkbox"/>
		Terrestrial Vegetation <input type="checkbox"/>	

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S	<input checked="" type="checkbox"/>					Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U	<input checked="" type="checkbox"/>					Corydalidae	U, S	<input checked="" type="checkbox"/>				
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U			<input checked="" type="checkbox"/>			Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S			<input checked="" type="checkbox"/>			Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U			<input checked="" type="checkbox"/>			Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S	<input checked="" type="checkbox"/>											
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U												
Simuliidae	M, U				<input checked="" type="checkbox"/>								
Tipulidae	B, U, S	<input checked="" type="checkbox"/>											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
UNT1 EFP (2)		35	10

Notes (Include narrative description of sampling location):

sampled using D-frame x 1m²
 about 200' upstream from confluence
 in wooded area

PADEP Classification: variable
USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>UNT 1 To Tenaya Fork</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>UNT 1 (1)</u>	Date/Time: <u>3/10/2010 1210</u>
Coordinates:	Investigator(s): <u>SRB/mjp</u> GPS Unit: <u>XHG</u> Camera: <u>J</u>
Current Weather Conditions: <u>SS°F / Partly Cloudy</u>	Weather Conditions Past 48 Hours: <u>30°F - 50°F</u>

Stream Hydrology:

Estimated Flow = 10-20 gpm
 Wetted Width = 1-2.5 ft
 Water Depth = 1-4 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 4-5'
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerefilidae	U, S						Megatoptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Slalidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	✓					Anisoptera (dragonflies)	B, U					
Chloroperidae	U, S						Amphipoda (scuds)	M	✓				
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S	✓				
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S				✓								
Philopotamidae	B, U						Vertebrates						
Rhyacophilidae	U, S												
Uenidae	U, S	✓											
Diptera (true flies)													
Chironomidae	M, B, U			✓									
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>UNT 1 (1)</u>	<u>UNT 1 (1)</u>	<u>32</u>	<u>31</u>

Notes (Include narrative description of sampling location):

• Sampled 3 1m² kicks

• AREA 1

PADEP Classification: VAR
 USACE Classification: UNT

STREAM DETERMINATION FIELD DATA FORM

Stream: TRIBUTARY 32731 TO TEMPLETON FORK	Project No.: 071-522-0016
Sampling Location: ~ 50' upstream of Templeton Fork Rd. 32731 (1)	Date/Time: 3/9/2010 0850
Coordinates:	Investigator(s): SRB/MJP GPS Unit: XHB Camera: J
Current Weather Conditions: SUNNY/CLEAR/30°F	Weather Conditions Past 48 Hours: 25°F - 40°F

Stream Hydrology:

Estimated Flow = **50-100** gpm
 Wetted Width = **3'-4'** ft
 Water Depth = **3-12** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **3'-5'**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock
 Boulder
 Cobble
 Gravel
 Sand
 Silt
 Clay
 Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S		<input checked="" type="checkbox"/>			
Heptageniidae	B, U					
Isorychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U					
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Trichoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S	<input checked="" type="checkbox"/>				
Philopotamidae	B, U					
Rhyacophilidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U				<input checked="" type="checkbox"/>	
Simuliidae	M, U	<input checked="" type="checkbox"/>				
Tipulidae	B, U, S	<input checked="" type="checkbox"/>				
Tabanidae	U		<input checked="" type="checkbox"/>			
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae - <i>Observed only</i>	U, S	<input checked="" type="checkbox"/>				
Psephenidae	U, S					
Megaloptera (alderflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S	<input checked="" type="checkbox"/>				
Oligochaeta (segmented worms)	B, U, S		<input checked="" type="checkbox"/>			
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U	<input checked="" type="checkbox"/>				
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32731 (1)	32731 (1)	1	2

Notes (Include narrative description of sampling location):

- SAMPLED 2 1M² KICKS AND 1 JAB
- AREA 2

PADEP Classification: **VAR**
 USACE Classification: **INT**

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tributary 32731 To Templetan Fork</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>~750' upstream from sample C1</u> <u>32731 (2)</u>	Date/Time: <u>3/9/2010 1020</u>
Coordinates:	Investigator(s): <u>SRB/MJP</u> GPS Unit: <u>XHB</u> Camera: <u>J</u>
Current Weather Conditions: <u>Sunny/Clear 35°F</u>	Weather Conditions Past 48 Hours: <u>25°F-50°F</u>

Stream Hydrology:

Estimated Flow = 50-80 gpm
 Wetted Width = 1-2 ft
 Water Depth = 4-14 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft)
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelotidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S		✓			
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isorychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S		✓			
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S						Vertebrates						
Phlototamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U	✓											
Simuliidae	M, U												
Tipulidae (3)	B, U, S			✓									
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32731(2)	32731(2)	3	4

Notes (Include narrative description of sampling location):
 * Sampled 3 1m² kicks ABOVE CONF. w/ UNIT
 - AREA 2

PADEP Classification: VAR
 USACE Classification: INT

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>TRIE 32731 TO TEMPLETON FORK</u>	Project No.: <u>071-522 0016</u>
Sampling Location: <u>32731 (3)</u>	Date/Time: <u>3/9/2010 1057</u>
Coordinates:	Investigator(s): <u>MJP/SRB</u> GPS Unit: <u>XHB</u> Camera: <u>J</u>
Current Weather Conditions: <u>SUNNY/CLEAR/40°F</u>	Weather Conditions Past 48 Hours: <u>25-40°F</u>

Stream Hydrology:

Estimated Flow = 50-80 gpm
 Wetted Width = 4-5 ft
 Water Depth = 3-8 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 6-7
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input checked="" type="checkbox"/>	Clay	<input checked="" type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U	X				
Isonychilidae	B					
Leptophlebiidae	U, S	X				
Plecoptera (stoneflies)						
Capniidae	U					
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Pettoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S	X				
Philopotamidae	B, U					
Rhyacophilidae	U, S					
Uenocidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U				X	
Simuliidae	M, U			X		
Tipulidae (2)	B, U, S			X		
Tabanidae	U					
Coleoptera (aquatic beetles)		X				
Dytiscidae	B, U					
Elmidae	U, S	X				
Psephenidae	U, S	X				
Megaloptera (alderflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S		X			
Oligochaeta (segmented worms)	B, U, S	X				
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>32731 (3)</u>	<u>32731 (3)</u>	<u>5</u>	<u>6</u>

Notes (Include narrative description of sampling location):

• 3 1m² KICKS IN RIFLE

• AREA 2

PADEP Classification: VAR
 USACE Classification: INT

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tributary 32732 To Templeton Fork</u>	Project No.: <u>071-522,0016</u>
Sampling Location: <u>32732(1) 25' Downstream of Culvert</u>	Date/Time: <u>3/9/2010 1200</u>
Coordinates:	Investigator(s): <u>SAB/msp</u> GPS Unit: <u>XHB</u> Camera: <u>J</u>
Current Weather Conditions: <u>Clear/Sunny/40°F</u>	Weather Conditions Past 48 Hours: <u>25°-50°F</u>

Stream Hydrology:

Estimated Flow = 30-50 gpm
 Wetted Width = 1-2 ft
 Water Depth = 2-5 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft)
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemereitidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isorychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperfidae	U, S						Amphipoda (scuds)	M		X			
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S		X				Hirudinea (leeches)	U					
Peltoperfidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Pertidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S		X										
Phlotamidae	B, U												
Rhyacophilidae	U, S						Vertebrates						
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U					X							
Simuliidae	M, U			X									
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>32732(1)</u>	<u>32732(1)</u>	<u>7</u>	<u>8</u>

Notes (include narrative description of sampling location):

3 1m² kicks

PADEP Classification: VAR
 USACE Classification: INT

-ARCA 2

STREAM DETERMINATION FIELD DATA FORM

Stream: TRIB 32732 TO TEMPLETON FORK	Project No.: 071-522.0016
Sampling Location: 32732(2) / -680' UPSTREAM OF CULVERT	Date/Time: 3/9/2010 1230
Coordinates:	Investigator(s): SRB/MJP GPS Unit: XH8 Camera: J
Current Weather Conditions: CLEAR SUNNY 50°F	Weather Conditions Past 48 Hours: 25-50°F

Stream Hydrology:

Estimated Flow = **30-50** gpm
 Wetted Width = **1-4** ft
 Water Depth = **1-5** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **5-8**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation **SOME AREAS W/ CLUMPS OF GRASS**

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperiidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperiidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	X				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S	X					Vertebrates						
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U				X								
Simuliidae	M, U												
Tipulidae	B, U, S	X	X										
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32732(2)	32732(2)	9	10

Notes (Include narrative description of sampling location):

- 3 1M² KICKS IN A PIFLE
- HEAVY COW SLOUGHING THROUGHOUT REACH
- SAMPLED UPSTREAM OF HEAVIEST SLOUGHING
- AREA 2

PADEP Classification: **VAR**
 USACE Classification: **Tot**

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tributary 32732 To Tomahawk Fork</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>~490' upstream of (2) 32732 (3)</u>	Date/Time: <u>3/9/2010 1250</u>
Coordinates:	Investigator(s): <u>SRB/mSP</u> GPS Unit: <u>X46</u> Camera: <u>5</u>
Current Weather Conditions: <u>Clear / Sunny / 50°F</u>	Weather Conditions Past 48 Hours: <u>25°-50°F</u>

Stream Hydrology:

Estimated Flow = 15-20 gpm
 Wetted Width = 1-2.5 ft
 Water Depth = 1-4 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 5-7'
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U	X				
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S	X				
Heptageniidae	B, U					
Isorynchiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U	X				
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S	X				
Petoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U	X				
Trichoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S					
Philotamidae	B, U					
Rhyacophilidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U				X	
Simuliidae	M, U		X			
Tipulidae	B, U, S	X				
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (dobsonflies, alderflies)						
Corydalidae	U, S					
Stalidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M			X		
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>32732(3)</u>	<u>32732(5)</u>	<u>11</u>	<u>12</u>

Notes (Include narrative description of sampling location):

• Sample 3 1m² kicks

• AKA 2

PADEP Classification: VAR
 USACE Classification: INT.

STREAM DETERMINATION FIELD DATA FORM

Stream: TRIB. 32732 TO TERAETON FORD	Project No.: 071-522.0016
Sampling Location: ~750' UPSTREAM OF SAMPLE(S) / 32732(4)	Date/Time: 3/9/2010 1320
Coordinates:	Investigator(s): SPB/MJP GPS Unit: XHB Camera: J
Current Weather Conditions: CLEAR/SUNNY/50°F	Weather Conditions Past 48 Hours: 25°F - 50°F

Stream Hydrology:

Estimated Flow = **15-20** gpm
 Wetted Width = **1-2** ft
 Water Depth = **0.5-5** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **2-3**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S	✓					Megaloptera (dobsonflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		✓				Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M		✓			
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S		✓				Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Pertodidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U		✓			
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S		✓				LERADPOGONIDAE			✓			
Philopotamidae	B, U												
Rhyacophilidae	U, S						Vertebrates						
Uenoidae	U, S		✓										
Diptera (true flies)													
Chironomidae	M, B, U				✓								
Simuliidae	M, U				✓								
Tipulidae	B, U, S	✓											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32732(4)	32732(4)	13	14

Notes (Include narrative description of sampling location):

- 3 1m² KICKS SAMPLED
- WOODY DEBRIS IN CHANNEL
- NO COBBLE PRESENT IN THIS REACH
- ANKA 2

PADEP Classification: **D.V.**
 USACE Classification: **Per.**

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tributary 32732 To Templeton Fork</u>	Project No.: <u>071-S22-0016</u>
Sampling Location: <u>32732 (S)</u>	Date/Time: <u>3/9/2010 1426</u>
Coordinates:	Investigator(s): <u>SRB MSP</u> GPS Unit: <u>XHG</u> Camera: <u>)</u>
Current Weather Conditions: <u>Clear Sunny 50°F</u>	Weather Conditions Past 48 Hours: <u>25°-50°F</u>

Stream Hydrology:

Estimated Flow = 10-20 gpm
 Wetted Width = 1-2 ft
 Water Depth = 2-3 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft)
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U		X				Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S	X				
Ephemerelellidae	U, S				X		Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U		X				Corydalidae	U, S					
Isorynchidae	B						Sialidae	U, S	X				
Leptophlebiidae	U, S	X					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U			X			Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pettoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U		X				Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	X				
Hydropsychidae	B, U, S			X			Unionidae	U					
Limnephilidae	U, S						<u>Dixidae</u>		X				
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S		X										
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U			X									
Simuliidae	M, U					X							
Tipulidae (2)	B, U, S		X										
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>32732 (S)</u>	<u>32732 (S)</u>	<u>15</u>	<u>16</u>

Notes (Include narrative description of sampling location):

Sample: 3 1m² kicks
• Leaf litter in channel

• AREA 2

PADEP Classification: Div.
 USACE Classification: Per.

STREAM DETERMINATION FIELD DATA FORM

Stream: 32734(1)	Project No.: 071522.0016
Sampling Location: 100 ft. upstream of confl. w/TF	Date/Time: 3/15/10 9:30
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 40° and cloudy	Weather Conditions Past 48 Hours: Heavy rain + snow melt

Stream Hydrology:

Estimated Flow = 40-50 gpm
 Wetted Width = 3-5 ft
 Water Depth = 5-12 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	✓				
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U	✓					Corydalidae	U, S					
Isomyzidae	B						Sialidae	U, S					
Leptophlebiidae	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capnidae	U	✓					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S	✓					Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Perlodidae	U	✓					Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S	✓					Ceratopogonidae		✓				
Philopotamidae	B, U	✓					Ephemeriidae		✓				
Rhyacophiliidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U	✓					Larval Salamander		✓				
Simuliidae	M, U												
Tipulidae	B, U, S	✓											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32734(1)	32734(1) var	1	2

Notes (include narrative description of sampling location):
 Sample collected from a small stream (1 m²)

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32736	Project No.: 071522.0016
Sampling Location: 32736(1)	Date/Time: 3/15/10 11:30
Coordinates:	Investigator(s): LCP, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 40°F Cloudy	Weather Conditions Past 48 Hours: Heavy rain & snow melt

Stream Hydrology:

Estimated Flow = 30-40 gpm
 Wetted Width = 3-5 ft
 Water Depth = 5-12 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amphletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pelloteriidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Pertodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophiliidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U		X										
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32736(1)	32736(1) var	7	8

Notes (Include narrative description of sampling location):
 Sample taken with a D-frame (1m²)

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32736	Project No.: 071522.0016
Sampling Location: 32736 (2)	Date/Time: 3/15/10 11:50
Coordinates:	Investigator(s): LCP, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 40° F cloudy	Weather Conditions Past 48 Hours: Heavy rain + snowmelt

Stream Hydrology:

Estimated Flow = 30-40 gpm
 Wetted Width = 3-6 ft
 Water Depth = 4-12 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-6
 Bed & Banks
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S	✓				
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S	✓											
Philopotamidae	B, U												
Rhyacophilidae	U, S	✓											
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U				✓								
Simuliidae	M, U			✓									
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32736(2)	32736(2) var	9	10

Notes (include narrative description of sampling location):

Sample taken with a D-frame net (1m²).

PADEP Classification: variable

USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32736	Project No.: 071522.0016
Sampling Location: 32736(3)	Date/Time: 3/15/10 12:10
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXIT9 Camera: K
Current Weather Conditions: 40°F light rain	Weather Conditions Past 48 Hours: Heavy rain + snowmelt

Stream Hydrology:

Estimated Flow = 25-35 gpm
 Wetted Width = 3-6 ft
 Water Depth = 4-12 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-6
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerelellidae	U, S					
Heptageniidae	B, U					
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U					
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Peltoperlidae	S					
Pertidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S	✓				
Philopotamidae	B, U					
Rhyacophilidae	U, S	✓				
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U					✓
Simuliidae	M, U	✓				
Tipulidae	B, U, S					
Tabanidae	U	✓				
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (aldersflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S				✓	
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U	✓				
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32736(3)	32736(3) var	11	12

Notes (Include narrative description of sampling location):
 Sample collected using a D-frame net (1m²).

PADEP Classification: Variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32736	Project No.: 071-522, 0016
Sampling Location: 32736 (4)	Date/Time: 3-15-10
Coordinates:	Investigator(s): KLM, LCPs GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 40°F, light rain	Weather Conditions Past 48 Hours: heavy rain, snow melt

Stream Hydrology:

Estimated Flow = 25-45 gpm
 Wetted Width = 10-15 ft
 Water Depth = 3-10 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 10-15
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ametelidae	U	✓				
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U					
Isonychidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U				✓	
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Pettoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U	✓				
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S		✓			
Limnephilidae	U, S	✓				
Philopotamidae	B, U					
Rhyacophilidae	U, S	✓				
Uenoidae	U, S		✓			
Diptera (true flies)						
Chironomidae	M, B, U					✓
Simuliidae	M, U				✓	
Tipulidae (2)	B, U, S	✓				
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (aldersflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)						
Zygoptera (damselflies)	U, S					
Antsoptera (dragonflies)	B, U					
Amphipoda (scuds)						
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)						
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S			✓		
Decapoda (crayfish)						
Decapoda (crayfish)	U	✓				
Gastropoda (snails)						
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Bivalvia (clams, mussels)						
Sphaeriidae						
Sphaeriidae	M, B, U					
Unionidae						
Unionidae	U					
Vertebrates						
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32736	32736 (4)	13	14

Notes (Include narrative description of sampling location):
 - sampling reach ~ 150' into woodline using a D-Frame for 1m²

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32736	Project No.: 071-522.0010
Sampling Location: 32736 (5)	Date/Time: 3-15-10
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 40°F, light rain	Weather Conditions Past 48 Hours: heavy rain, snow melt

Stream Hydrology:

Estimated Flow = 25-35 gpm
 Wetted Width = 7-10 ft
 Water Depth = 5-10 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 7-10
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U	✓				
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U	✓				
Isonychiidae	B					
Leptophlebiidae	U, S	✓				
Plecoptera (stoneflies)						
Capniidae	U				✓	
Chloroperlidae	U, S					
Lauctridae	U, S					
Nemouridae	U, S	✓				
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U		✓			
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S		✓			
Limnephilidae	U, S					
Philopotamidae	B, U					
Rhyacophilidae	U, S	✓				
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U					✓
Simuliidae	M, U					✓
Tipulidae	B, U, S					
Tabanidae	U					

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S	✓				
Psephenidae	U, S					
Megaloptera (aldersflies, dobsonflies)						
Corydalidae	U, S	✓				
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M	✓				
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32736	32736(5)	15	16

Notes (Include narrative description of sampling location):

~ sampled ~ 200' upstream of Sump R (4)
 using D-Frame for 1m² in wooded habitat

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: TRIB 32738 TO TEMPLETON FORK	Project No.: 071-522.0016
Sampling Location: ~150' UPSTREAM OF CONFLUENCE / 32738 (1)	Date/Time: 3/16/11 0855
Coordinates:	Investigator(s): SRB/MJP GPS Unit: XHB Camera: J
Current Weather Conditions: PARTLY CLOUDY / 38° F	Weather Conditions Past 48 Hours: 30°-50° F

Stream Hydrology:

Estimated Flow = **15-125** gpm
 Wetted Width = **4-8** ft
 Water Depth = **6-15** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **8-15**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U	X					Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemereilidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Slafidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U			X			Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Periodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U		X			
Hydropsychidae	B, U, S	X					Unionidae	U					
Limnephilidae	U, S	X											
Philopotamidae	B, U												
Rhyacophidae	U, S	X											
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U				X								
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32738 (1)	32738 (1)	21	22

Notes (include narrative description of sampling location):

- 3 1m² RICKS IN R1/RU
- STREAM W/ IN PASTURE
- AREA 1

PADEP Classification: **VAR**
 USACE Classification: **INT**

STREAM DETERMINATION FIELD DATA FORM

Stream: <i>Tributary 32738 To Templeton Fork</i>	Project No.: <i>071-522.0016</i>
Sampling Location: <i>n 96 S' Straight Shot Up Stream of (2)</i> ³²⁷³⁸ ₍₂₎	Date/Time: <i>9/10/2010 9:40</i>
Coordinates:	Investigator(s): <i>SRB/msp</i> GPS Unit: <i>XHG</i> Camera: <i>3</i>
Current Weather Conditions: <i>Partly Cloudy / 38°F</i>	Weather Conditions Past 48 Hours: <i>30°F - 55°F</i>

Stream Hydrology:

Estimated Flow = gpm
 Wetted Width = *4'-5'* ft
 Water Depth = *3-4.5* in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) *6'-8'*
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
* Cobble	<input checked="" type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemereilidae	U, S						Megoptera (alderflies, dobsonflies)						
Heptageniidae	B, U	<input checked="" type="checkbox"/>					Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)						
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U			<input checked="" type="checkbox"/>			Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S		<input checked="" type="checkbox"/>				Unionidae	U					
Limnephilidae	U, S						Vertebrates						
Philopotamidae	B, U	<input checked="" type="checkbox"/>											
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U			<input checked="" type="checkbox"/>									
Simuliidae	M, U												
Tipulidae	B, U, S	<input checked="" type="checkbox"/>											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<i>32738(2)</i>	<i>32738(2)</i>	<i>23</i>	<i>24</i>

Notes (Include narrative description of sampling location):

- Very Imbedded*
- Sampled 3 1m² kicks*
- EDB - Heavily Eroded*
- * A little bit of Cobble*
- AREA 1*

PADEP Classification: *VAR*
 USACE Classification: *INT*

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>Tributary 32738 to Tompkins Fork</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>~300' straight up from Culvert/Road King</u> <small>Near where drainage swale enters 32738 (3)</small>	Date/Time: <u>3/10/2010 1010</u>
Coordinates:	Investigator(s): <u>SEB/mjp</u> GPS Unit: <u>XH8</u> Camera: <u>)</u>
Current Weather Conditions: <u>40°F / Partly Cloudy</u>	Weather Conditions Past 48 Hours: <u>30°F - 50°F</u>

Stream Hydrology:

Estimated Flow = 30-50 gpm
 Wetted Width = 4-8' ft
 Water Depth = 4-12 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 8'-10'
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U	X					Elmidae	U, S	X				
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U	X					Corydalidae	U, S					
Isomyzidae	B						Slalidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U				X		Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	X					Unionidae	U					
Limnephilidae	U, S						<u>Ephemera</u>		X				
Phlebotamidae	B, U	X					<u>Fantail</u>		X				
Rhyacophilidae	U, S	X											
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U					X							
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>32738 (3)</u>	<u>32738 (3)</u>	<u>25</u>	<u>26</u>

PADEP Classification: VAR
 USACE Classification: TMI

Notes (Include narrative description of sampling location):

- Large amount of Algae Present (Brown)
- Eroded LDB
- Sampled 31m² kicks

• AREA 1

STREAM DETERMINATION FIELD DATA FORM

Stream: T21B 32738 TO TEMPLETON FORK	Project No.: 071-522-0016
Sampling Location: 32738 (4) / ~100' straight downstream of horse pasture	Date/Time: 3/10/2010 1045
Coordinates:	Investigator(s): SRB/MJP GPS Unit: XHB Camera: J
Current Weather Conditions: 40°F / PARTLY CLOUDY	Weather Conditions Past 48 Hours: 30°F - 50°F

Stream Hydrology:

Estimated Flow = **30-50** gpm
 Wetted Width = **4-5** ft
 Water Depth = **2-8** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **7-10**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U	X					Elmidae	U, S		X			
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies, alderflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isorychiidae	B						Sialidae	U, S	X				
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U		X				Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S	X					Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U	X					Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U		X			
Hydropsychidae	B, U, S		X				Unionidae	U					
Limnephilidae	U, S		X				<i>Ephemera</i>			X			
Philopotamidae	B, U						<i>Stratiomyidae</i>		X				
Rhyacophilidae	U, S	X					Vertebrates						
Uenoidae	U, S				X								
Diptera (true flies)													
Chironomidae	M, B, U				X								
Simuliidae	M, U												
Tipulidae	B, U, S	X											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32738 (4)	32738 (4)	27	28

Notes (include narrative description of sampling location):

(3) 1M² KICKS IN RIFPLE/RUN SAMPLED
 - VERY ERODED RDB
 - Sampled @ TIP of second horseshoe bend in stream
 ~40' from Road.
 - AREA 1

PADEP Classification: **DIV**
 USACE Classification: **PRR**

STREAM DETERMINATION FIELD DATA FORM

Stream: TRIB 32738 TO THURTON FORK	Project No.: 071-522-0016
Sampling Location: 32738 (S) / <100' FROM BORDER	Date/Time: 3/10/10 1130
Coordinates:	Investigator(s): SRB/MJP GPS Unit: XHB Camera: J
Current Weather Conditions: PARTLY CLOUDY / 38F	Weather Conditions Past 48 Hours: 30° - 50° F

Stream Hydrology:

Estimated Flow = **30-50** gpm
 Wetted Width = **4-10** ft
 Water Depth = **5-10** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **10-15**
 Bed & Banks **/**
 Alluvial Channel **/**
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U					
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U	X				
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Petroleridae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Trichoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S		X			
Limnephilidae	U, S	X				
Philopotamidae	B, U	X				
Rhyacophilidae	U, S	X				
Uenoidae	U, S		X			
Diptera (true flies)						
Chironomidae	M, B, U				X	
Simuliidae	M, U		X			
Tipulidae	B, U, S	X				
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S	X				
Psephenidae	U, S					
Megaloptera (alderflies, dobsonflies)						
Corydalidae	U, S					
Stalidae	U, S					
Hemiptera (Water Bugs)						
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)						
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)						
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S	X				
Decapoda (crayfish)						
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32738 (S)	32738 (2)	29	30

Notes (Include narrative description of sampling location):

- VERY EMBEDDED
- (3) 1m² KICKS IN RIFPLE/RUN SAMPLED

PADEP Classification: **VAR**
 USACE Classification: **INI**

• AREA 1

STREAM DETERMINATION FIELD DATA FORM

Stream: 32741	Project No.: 071522.0016
Sampling Location: 32741 (1)	Date/Time: 3/15/10 2:30
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 45° F Cloudy	Weather Conditions Past 48 Hours: Rain + Snow melt

Stream Hydrology:

Estimated Flow = 25-35 gpm
 Wetted Width = 2-5 ft
 Water Depth = 4-12 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	<input checked="" type="checkbox"/>				
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies, alderflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pettoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U	<input checked="" type="checkbox"/>				
Perlodidae	U	<input checked="" type="checkbox"/>					Gastropoda (snails)	U, S	<input checked="" type="checkbox"/>				
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S	<input checked="" type="checkbox"/>											
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U			<input checked="" type="checkbox"/>									
Simuliidae	M, U												
Tipulidae	B, U, S	<input checked="" type="checkbox"/>											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32741 (1)	32741(1) var	17	18

Notes (Include narrative description of sampling location):

Sample taken w/ a D-frame net (1m²)

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32741	Project No.: 071522.0016
Sampling Location: 32741 (2)	Date/Time: 3/15/16 3:00
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 45°E Cloudy	Weather Conditions Past 48 Hours: Rain + Snowmelt

Stream Hydrology:

Estimated Flow = 30-40 gpm
 Wetted Width = 1.5-3 ft
 Water Depth = 4-10 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies, alderflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isorynchidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M	✓				
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Perlodidae	U	✓					Gastropoda (snails)	U, S	✓				
Trichoptera (caddisflies)							Blivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S	✓											
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U		✓										
Simuliidae	M, U	✓											
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32741 (2)	32741(2) var	19	20

Notes (include narrative description of sampling location):
 Sample taken w/ a d-frame net (1m²).

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32741	Project No.: 071-522.0016
Sampling Location: 32741 (3)	Date/Time: 3-15-10 3:46 PM
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 45°F, Cloudy	Weather Conditions Past 48 Hours: rain, snowmelt

Stream Hydrology:

Estimated Flow =	30-40 gpm
Wetted Width =	15-3 ft
Water Depth =	4-10 in

Hydrology Source(s) (check all that apply):

Spring	<input checked="" type="checkbox"/>
Seep	<input checked="" type="checkbox"/>
Run-off	<input checked="" type="checkbox"/>
Pond	<input type="checkbox"/>

Channel Conditions:

Active Width (ft)	2-4
Bed & Banks	<input checked="" type="checkbox"/>
Alluvial Channel	<input checked="" type="checkbox"/>
Eroded Channel	<input type="checkbox"/>
Debris-filled	<input type="checkbox"/>
Terrestrial Vegetation	<input type="checkbox"/>

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input type="checkbox"/>	Clay	<input type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemereilidae	U, S					
Heptageniidae	B, U					
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U					
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Trichoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S					
Philopotamidae	B, U					
Rhyacophilidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U	<input checked="" type="checkbox"/>				
Simuliidae	M, U					
Tipulidae	B, U, S					
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (dobsonflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)						
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)						
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)						
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)						
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32741 (3) var	32741 (3) var	21	22

Notes (include narrative description of sampling location):

- sampled ~700' upstream of sample (2)
 using D-Frame for 1m²
 * very poor substrate

PADEP Classification: variable
USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32741	Project No.: 071522.0016
Sampling Location: 32741(4)	Date/Time: 3/15/10 3:30
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 45° F Cloudy	Weather Conditions Past 48 Hours: Rainy + Snowmelt

Stream Hydrology:

Estimated Flow =	30-40	gpm
Wetted Width =	1-4	ft
Water Depth =	3-10	in

Hydrology Source(s) (check all that apply):

Spring	<input checked="" type="checkbox"/>
Seep	<input checked="" type="checkbox"/>
Run-off	<input checked="" type="checkbox"/>
Pond	<input type="checkbox"/>

Channel Conditions:

Active Width (ft)	1-4
Bed & Banks	<input checked="" type="checkbox"/>
Alluvial Channel	<input checked="" type="checkbox"/>
Eroded Channel	<input type="checkbox"/>
Debris-filled	<input type="checkbox"/>
Terrestrial Vegetation	<input type="checkbox"/>

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input checked="" type="checkbox"/>	Clay	<input checked="" type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ametelidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemereilidae	U, S						Megaloptera (aldertiles, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M			✓		
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U	✓					Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U	✓											
Simuliidae	M, U												
Tipulidae	B, U, S	✓											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32741(4)	32741(4)var	23	24

Notes (Include narrative description of sampling location):

Sample take ~700 ft. upstream of 32741(3) using a dframe net (1m²)

PADEP Classification: Variable
USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32741	Project No.: 071522.0016
Sampling Location: 32741(S)	Date/Time: 3/15/10 9:35
Coordinates:	Investigator(s): WPS KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 48° E Sunny	Weather Conditions Past 48 Hours: Light rain

Stream Hydrology:

Estimated Flow = 30-40 gpm
 Wetted Width = 3-6 ft
 Water Depth = 3-8 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-7
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemereilidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pettoperidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U		✓			
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophiliidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U			✓									
Simuliidae	M, U												
Tipulidae	B, U, S	✓											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32741(S)	32741(S) var	27	28

Notes (include narrative description of sampling location):

Sample taken ~ 700 ft. upstream of 32741 (+) w/ a dframe net for 1m².

PADEP Classification: Variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32741	Project No.: 090-216.0016
Sampling Location: 32741 (7)	Date/Time: 3-16-10 10:32 AM
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 48°, sunny	Weather Conditions Past 48 Hours: light rain, 40°

Stream Hydrology:	Hydrology Source(s) (check all that apply):	Channel Conditions:	Substrate Type(s) (check all that apply):
Estimated Flow = 25-35 gpm	Spring <input checked="" type="checkbox"/>	Active Width (ft) 2-3	Bedrock <input type="checkbox"/>
Wetted Width = 2-3 ft	Seep <input checked="" type="checkbox"/>	Bed & Banks <input checked="" type="checkbox"/>	Sand <input checked="" type="checkbox"/>
Water Depth = 2-6 in	Run-off <input checked="" type="checkbox"/>	Alluvial Channel <input checked="" type="checkbox"/>	Silt <input checked="" type="checkbox"/>
	Pond <input type="checkbox"/>	Eroded Channel <input type="checkbox"/>	Clay <input type="checkbox"/>
		Debris-filled <input type="checkbox"/>	Artificial <input type="checkbox"/>
		Terrestrial Vegetation <input type="checkbox"/>	

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Lauctriidae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S	<input checked="" type="checkbox"/>					Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Phlebotamidae	B, U												
Rhyacophiliidae	U, S	<input checked="" type="checkbox"/>					Vertebrates						
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U				<input checked="" type="checkbox"/>								
Simuliidae	M, U				<input checked="" type="checkbox"/>								
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32741 (7)	32741(7)NAC	33	34

Notes (Include narrative description of sampling location):
 - sampled ~ 700' upstream of sample (6)
 using D-Frame net for 1m² in cattle pasture

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>UNT 1 to 32741</u>	Project No.: <u>071522.0016</u>
Sampling Location: <u>UNT 1 to 32741 (1)</u>	Date/Time: <u>3/16/10 9:00</u>
Coordinates:	Investigator(s): <u>LCPS, KLM</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>45° F Sunny</u>	Weather Conditions Past 48 Hours: <u>Light rain & clouds</u>

Stream Hydrology:

Estimated Flow = 5-10 gpm
 Wetted Width = 3-6 ft
 Water Depth = 2-8 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-7
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemereitidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S	<input checked="" type="checkbox"/>				
Leptophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M			<input checked="" type="checkbox"/>		
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S	<input checked="" type="checkbox"/>					Hirudinea (leeches)	U					
Pettoperidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S	<input checked="" type="checkbox"/>											
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U			<input checked="" type="checkbox"/>									
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>UNT 1 to 32741</u>	<u>UNT 1 to 32741 (1) var</u>	<u>25</u>	<u>26</u>

Notes (Include narrative description of sampling location):

Sample taken ~150 ft from congl. w/ 32741 with a D-frame net for 1m².

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: UNT 2 to 32741	Project No.: 071-522.0016
Sampling Location: UNT 2 to 32741 (1)	Date/Time: 3/16/10 10:00
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 50°F Sunny	Weather Conditions Past 48 Hours: Light rain

Stream Hydrology:

Estimated Flow = **15-25** gpm
 Wetted Width = **1-3** ft
 Water Depth = **1-6** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **1-4**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Placoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		✓										
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
UNT 2 to 32741	UNT 2 to 32741 (1) var	29	30

Notes (Include narrative description of sampling location):

Sample taken ~ 50' upstream of conflu. w/ 32741 w/ a D-frame net for 1m².

PADEP Classification: **variable**
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>UNT 2 to 32741</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>UNT 2 to 32741 (2)</u>	Date/Time: <u>3-16-10 11:00 AM</u>
Coordinates:	Investigator(s): <u>LPS, KLM</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>50°F, Sunny</u>	Weather Conditions Past 48 Hours: <u>light rain</u>

Stream Hydrology:

Estimated Flow = 15-20 gpm
 Wetted Width = 1-2 ft
 Water Depth = 2-6 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 1-2
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U					
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U					
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S		<input checked="" type="checkbox"/>			
Philopotamidae	B, U					
Rhyacophiliidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U					<input checked="" type="checkbox"/>
Simuliidae	M, U					<input checked="" type="checkbox"/>
Tipulidae	B, U, S	<input checked="" type="checkbox"/>				
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (alderflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U	<input checked="" type="checkbox"/>				
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M					
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U					
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>UNT 2 to 32741</u>	<u>UNT 2 to 32741 (2)</u>	<u>35</u>	<u>36</u>

Notes (include narrative description of sampling location):

- sample taken ~ 200' upstream from culvert crossing @ road with D-Frame for 1m²
 - stream very trampled by cattle

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>UNT 2 to 32741</u>	Project No.: <u>071522.0016</u>
Sampling Location: <u>UNT 2 to 32741 (3)</u>	Date/Time: <u>3/16/10 11:30</u>
Coordinates:	Investigator(s): <u>LCPS, KLM</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>52° Sunny</u>	Weather Conditions Past 48 Hours: <u>light rain</u>

Stream Hydrology:

Estimated Flow = 10-15 gpm
 Wetted Width = 1-2 ft
 Water Depth = 1-4 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 1-3
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ametelidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S <input checked="" type="checkbox"/>					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Phlebotamidae	B, U												
Rhyacophilidae	U, S												
Uenidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>UNT 2 to 32741</u>	<u>UNT 2 to 32741 (3) var</u>	<u>37</u>	<u>38</u>

Notes (Include narrative description of sampling location): ^K Oligochaeta observed but not collected. Sample taken ~ 700' upstream from UNT 2 32741 (2) w/ D-frame net (1m²). Channel is heavily disturbed. Appears that material was removed from channel and placed along banks.

PADEP Classification: Variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>UNT 2 to 32741</u>	Project No.: <u>071-522.0016</u>
Sampling Location: <u>UNT 2 to 32741(4)</u>	Date/Time: <u>3-16-10 12:00</u>
Coordinates:	Investigator(s): <u>LCPs, KLM</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>52° Sunny</u>	Weather Conditions Past 48 Hours: <u>light rain</u>

Stream Hydrology:

Estimated Flow = ~ 5 gpm
 Wetted Width = 1-4 ft
 Water Depth = 1-4 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 1-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ametelidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (alderflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S		✓				Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U	✓					Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Blivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U												
Simuliidae	M, U				✓								
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>UNT 2 to 32741(4)</u>	<u>UNT 2 to 32741 (2) var</u>	<u>43</u>	<u>44</u>

Notes (Include narrative description of sampling location):
 Sample taken ~ 100' upstream of UNT 2 to 32741(3) w/ D-frame net (1m²).

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32743	Project No.: 071-522.0016
Sampling Location: 32743 (1)	Date/Time: 3-16-10 1:04 PM
Coordinates:	Investigator(s): LCPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 50°F SUNNY	Weather Conditions Past 48 Hours: light rain

Stream Hydrology:

Estimated Flow = 40-50 gpm
 Wetted Width = 3-4 ft
 Water Depth = 3-8 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megoptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Phitopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U					✓							
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32743 (1)	32743 (1) var	45	46

PADEP Classification: variable
 USACE Classification:

Notes (include narrative description of sampling location):
 - sampled ~100' upstream of confluence with Templeton Fork using D-Frame net for 1m²
 - stream very disturbed by cattle

STREAM DETERMINATION FIELD DATA FORM

Stream: 32743	Project No.: 01F-522-0016
Sampling Location: 32743 (2)	Date/Time: 3-16-10
Coordinates:	Investigator(s): LCPs, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 52°F, sunny	Weather Conditions Past 48 Hours: light rain

Stream Hydrology:

Estimated Flow = 40-50 gpm
 Wetted Width = 2-4 ft
 Water Depth = 3-10 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 3-4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S	✓					Hemiptera (Water Bugs)	B, U	✓				
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	✓					Anisoptera (dragonflies)	B, U					
Chloroperidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pettoperidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S		✓			
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S		✓			
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U		✓			
Hydropsychidae	U, S						Unionidae	U					
Limnephilidae	U, S						Phryganeidae		✓				
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U				✓		Creek chub		✓				
Simuliidae	M, U												
Tipulidae	B, U, S	✓											
Tabanidae	U	✓											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32743 (2)	32743(2) var	47	48

Notes (include narrative description of sampling location):
 ~ sample taken ~ 100' upstream of sample (1) using a D-Frame for 1m²

PADEP Classification: variable
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: 32743	Project No.: 071-522.0016
Sampling Location: 32743 (3)	Date/Time: 3-16-10 2:04 PM
Coordinates:	Investigator(s): LCPs, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 52°, sunny	Weather Conditions Past 48 Hours: light rain

Stream Hydrology:

Estimated Flow = 40-50 gpm
 Wetted Width = 2-3 ft
 Water Depth = 2-8 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock
 Boulder
 Cobble
 Gravel
 Sand
 Silt
 Clay
 Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ametetidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S		✓			
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capnidae	U	✓					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S				✓	
Taeniopterygidae	U						Decapoda (crayfish)	U	✓				
Periodidae	U	✓					Gastropoda (snails)	U, S	✓				
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	✓					Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U				✓								
Simuliidae	M, U												
Tipulidae	B, U, S		✓										
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32743 (3)	32743 (3) vks	49	50

PADEP Classification: variable
 USACE Classification:

Notes (include narrative description of sampling location):
 - sampled 100' upstream of where stream crosses under road (~950' upstream of sample (2)) using a D-Frame for 1m²
 - stream parallels road with mostly no riparian buffer

STREAM DETERMINATION FIELD DATA FORM

Stream: 32744	Project No.: 071522.0016
Sampling Location: 32744(1)	Date/Time: 3/16/10 3:00
Coordinates:	Investigator(s): WPS, KLM GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 55° Sunny	Weather Conditions Past 48 Hours: light rain

Stream Hydrology:

Estimated Flow =	30-40 gpm
Wetted Width =	2-4 ft
Water Depth =	2-8 in

Hydrology Source(s) (check all that apply):

Spring	<input checked="" type="checkbox"/>
Seep	<input checked="" type="checkbox"/>
Run-off	<input checked="" type="checkbox"/>
Pond	<input type="checkbox"/>

Channel Conditions:

Active Width (ft)	2-5
Bed & Banks	<input checked="" type="checkbox"/>
Alluvial Channel	<input checked="" type="checkbox"/>
Eroded Channel	<input type="checkbox"/>
Debris-filled	<input type="checkbox"/>
Terrestrial Vegetation	<input type="checkbox"/>

Substrate Type(s) (check all that apply):

Bedrock	<input type="checkbox"/>	Sand	<input checked="" type="checkbox"/>
Boulder	<input type="checkbox"/>	Silt	<input checked="" type="checkbox"/>
Cobble	<input type="checkbox"/>	Clay	<input checked="" type="checkbox"/>
Gravel	<input checked="" type="checkbox"/>	Artificial	<input type="checkbox"/>

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	<input checked="" type="checkbox"/>				
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S	<input checked="" type="checkbox"/>				
Leptophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	<input checked="" type="checkbox"/>				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U		<input checked="" type="checkbox"/>				Gastropoda (snails)	U, S		<input checked="" type="checkbox"/>			
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U			<input checked="" type="checkbox"/>		
Hydropsychidae	B, U, S	<input checked="" type="checkbox"/>					Unionidae	U					
Limnephilidae	U, S	<input checked="" type="checkbox"/>											
Phlebotamidae	B, U						Vertebrates						
Rhyacophiliidae	U, S						fantail darter		<input checked="" type="checkbox"/>				
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U				<input checked="" type="checkbox"/>								
Simuliidae	M, U												
Tipulidae (2)	B, U, S	<input checked="" type="checkbox"/>											
Tabanidae	U	<input checked="" type="checkbox"/>											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32744(1)	32744(1) var	51	52

Notes (Include narrative description of sampling location):
 Sample collected ~ 150' upstream of road using a d-frame net for 1m².

PADEP Classification: Variable
 USACE Classification:

Stream: 32744	Project No.: 071-522,0016
Sampling Location: 32744(2)	Date/Time: 3-16-10 3:25
Coordinates:	Investigator(s): UCPS, KLM GPS Unit: GeoXt9 Camera: K
Current Weather Conditions: 55° Sunny	Weather Conditions Past 48 Hours: light rain

Stream Hydrology:

Estimated Flow = 30-40 gpm
 Wetted Width = 2-3 ft
 Water Depth = 3-8 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S	✓				
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U	✓					Corydalidae	U, S					
Isonychiidae	B						Sialidae	U, S					
Leptophlebiidae	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U	✓				
Chloroperlidae	U, S						Amphipoda (scuds)	M	✓				
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S		✓				Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U			✓			Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Blivalvia (clams, mussels)			✓			
Glossosomatidae	B, U						Sphaeriidae	M, B, U		✓			
Hydropsychidae	B, U, S		✓				Unionidae	U					
Limnephilidae	U, S	✓					Pharyngaeidae		✓				
Philopotamidae	B, U	✓					Ephemeridae		✓				
Rhyacophilidae	U, S						Stratiomyidae		✓				
Uenoidae	U, S						Vertebrates						
Diptera (true flies)													
Chironomidae	M, B, U			✓									
Simuliidae	M, U			✓									
Tipulidae (2)	B, U, S	✓											
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32744(2)	32744(2) var	53	54

Notes (Include narrative description of sampling location):
 Sample collected ~ 700' upstream of 32744(1) w/ a D-frame net for 1m².

PADEP Classification: variable
 USACE Classification:

Stream: 32744	Project No.: 071-522.0016
Sampling Location: 32744 (3)	Date/Time: 3/18/10 9:15
Coordinates:	Investigator(s): LCPS JAD GPS Unit: GEOXH9 Camera: K
Current Weather Conditions: Sunny 35°F	Weather Conditions Past 48 Hours: Sunny 32°F-60°F

Stream Hydrology:

Estimated Flow = 30-35 gpm
 Wetted Width = 2.5' - 4' ft
 Water Depth = 2-7 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-5
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U	X				
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U					
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S					
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U	X				
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S	X				
Limnephilidae	U, S	X				
Philopotamidae	B, U					
Rhyacophilidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U	X				
Simuliidae	M, U					
Tipulidae	B, U, S	X				
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U					
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (aldersflies, dobsonflies)						
Corydalidae	U, S					
Stalidae	U, S	X				
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U	X				
Amphipoda (scuds)	M			X		
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S					
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U	X				
Unionidae	U					
Ephemeriidae		X				
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32744 (3)	32744(3)	5	6

Notes (Include narrative description of sampling location):
 ' Sample taken ~150' above CONF ✓/
 UNT-1 to 32744
 ' (1m)² Kicks in a R. ffr

PADEP Classification: VAR
 USACE Classification:

STREAM DETERMINATION FIELD DATA FORM

Stream: <u>UNT1 to 32744</u>	Project No.: <u>071522.0016</u>
Sampling Location: <u>UNT1 to 32744 (1)</u>	Date/Time: <u>3.16.10</u>
Coordinates:	Investigator(s): <u>CCPS, KLM</u> GPS Unit: <u>GeoXH9</u> Camera: <u>K</u>
Current Weather Conditions: <u>55° Sunny</u>	Weather Conditions Past 48 Hours: <u>light rain</u>

Stream Hydrology:

Estimated Flow = < 1 gpm
 Wetted Width = 1-3 ft
 Water Depth = 1.5-3 in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 1-4
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (aldersflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S		✓			
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S	✓				
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S		✓										
Philopotamidae	B, U						Vertebrates						
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
<u>UNT1 to 32744 (1)</u>	<u>UNT1 to 32744 (1) var</u>	<u>55</u>	<u>56</u>

Notes (Include narrative description of sampling location):
Sample collected ~ 150' from confl. w/ 32744 by visual inspection.

PADEP Classification: variable
 USACE Classification:

Stream: UNT 1 to 32744	Project No.: 071522.0014
Sampling Location: UNT 1 to 32744 (2)	Date/Time: 3-18-10
Coordinates:	Investigator(s): UOS, JAD GPS Unit: GeoXH9 Camera: K
Current Weather Conditions: 45° Sunny	Weather Conditions Past 48 Hours: Sunny, 55°F

Stream Hydrology:

Estimated Flow = **5-10** gpm
 Wetted Width = **0.5-1** ft
 Water Depth = **1-3** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **1-3**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)						
Ameletidae	U					
Baetidae	M, B, U					
Caenidae	M, B, U					
Ephemerellidae	U, S					
Heptageniidae	B, U					
Isonychiidae	B					
Leptophlebiidae	U, S					
Plecoptera (stoneflies)						
Capniidae	U					
Chloroperlidae	U, S					
Leuctridae	U, S					
Nemouridae	U, S	✓				
Peltoperlidae	S					
Perlidae	U, S					
Taeniopterygidae	U					
Perlodidae	U					
Tricoptera (caddisflies)						
Glossosomatidae	B, U					
Hydropsychidae	B, U, S					
Limnephilidae	U, S					
Philopotamidae	B, U					
Rhyacophiliidae	U, S					
Uenoidae	U, S					
Diptera (true flies)						
Chironomidae	M, B, U					
Simuliidae	M, U					
Tipulidae	B, U, S					
Tabanidae	U					
Coleoptera (aquatic beetles)						
Dytiscidae	B, U	✓				
Elmidae	U, S					
Psephenidae	U, S					
Megaloptera (alderflies, dobsonflies)						
Corydalidae	U, S					
Sialidae	U, S					
Hemiptera (Water Bugs)	B, U					
Zygoptera (damselflies)	U, S					
Anisoptera (dragonflies)	B, U					
Amphipoda (scuds)	M	✓				
Isopoda (aquatic sowbugs)	M					
Hirudinea (leeches)	U					
Platyhelminthes (flatworms)	M, B, U, S		✓			
Oligochaeta (segmented worms)	B, U, S					
Decapoda (crayfish)	U					
Gastropoda (snails)	U, S					
Bivalvia (clams, mussels)						
Sphaeriidae	M, B, U	✓				
Unionidae	U					
Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
UNT 1 to 32744	UNT 1 to 32744 (2)	1	2
UNT 1 to 32744	- loss of flow	3	4

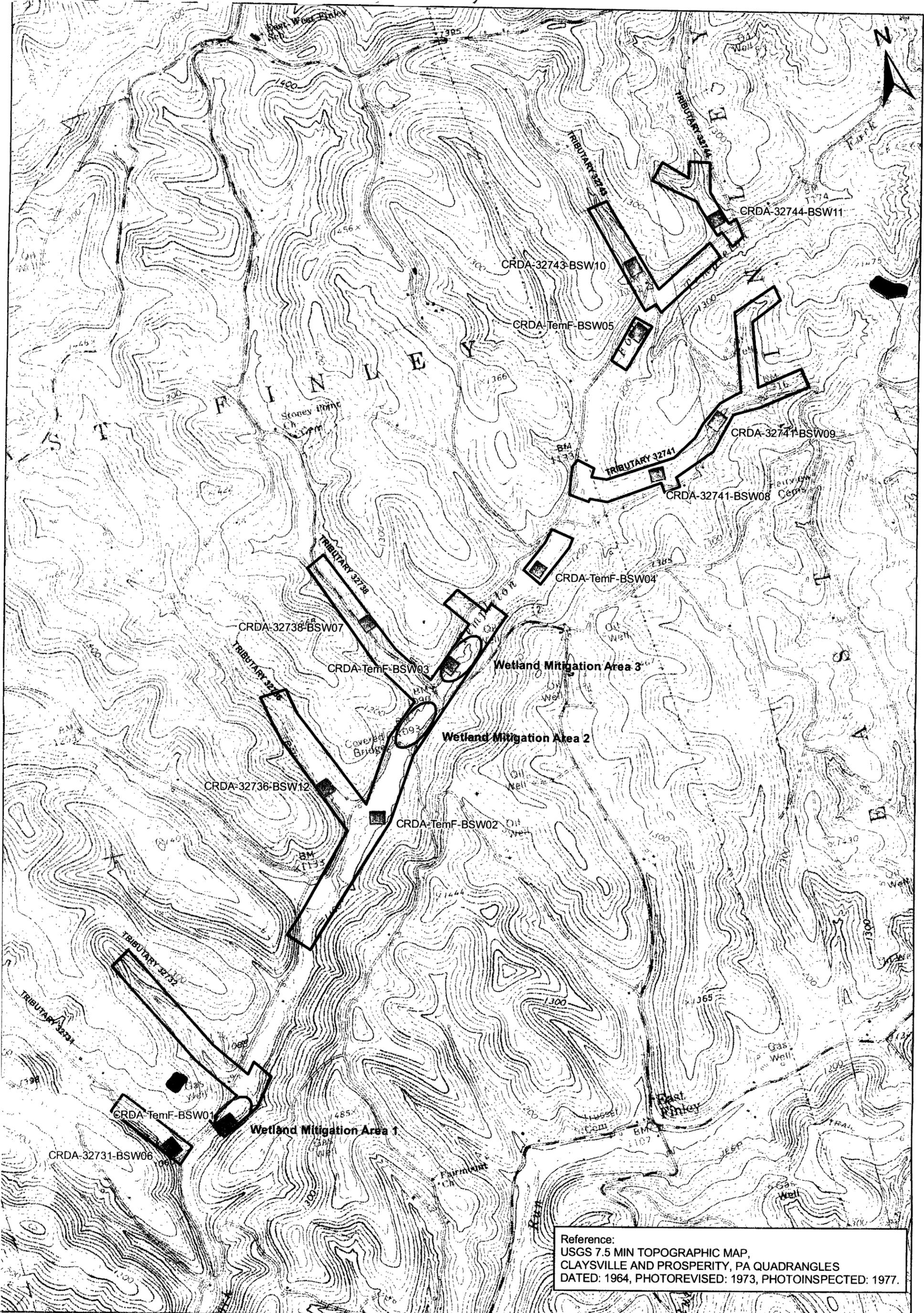
Notes (include narrative description of sampling location):

- sampled ~ 100' downstream of Bedillion/Dennison property/fence line by visual inspection of substrate
 - no flow from downstream end up to GPS point @ start of flow
 - lack of defined channel @ downstream end

PADEP Classification: **variable**
 USACE Classification:

ATTACHMENT 3

TEMPLETON FORK BASELINE BIOLOGICAL DATA



Reference:
 USGS 7.5 MIN TOPOGRAPHIC MAP,
 CLAYVILLE AND PROSPERITY, PA QUADRANGLES
 DATED: 1964, PHOTOREVISED: 1973, PHOTOINSPECTED: 1977.

DRAWN BY: CLC
 CHECKED BY: MLS
 APPROVED BY: MRH*
 SCALE: 1" = 1,500'
 DATE: 5/12/2010

0 1,500 3,000 Feet

Legend

- Stream Restoration Areas
- Wetland Mitigation Areas
- Biological Monitoring Station
- Soil Disposal Area

*Hand signature on file.

ISSUED FOR: **CONSOL ENERGY**

ISSUED BY:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
 333 Baldwin Road
 Pittsburgh, PA 15205-9702
 1-800-365-2324

Columbus, OH * Cleveland, OH * Cincinnati, OH * Indianapolis, IN * Nashville, TN * Chicago, IL * St. Louis, MO *
 Export, PA * Detroit, MI * Phoenix, AZ

**BIOLOGICAL MONITORING STATION
 SITE LOCATION MAP**
BAILEY CRDA NO. 5 AND 6
CONSOL PENNSYLVANIA COAL COMPANY LLC
GREENE COUNTY, PENNSYLVANIA

PROJECT NO.: 071-522.0013

Station CRDA-TemF-BSW01
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/13/2010	
	Riffle	Pool
Water Temperature (°C)	10.4	10.2
Dissolved Oxygen (mg/L)	8.8	5.4
pH (Standard Units)	7.75	7.75
Conductivity (uS/cm)	343	342
Stream Flow Rate (cubic feet per second)	4.51	
Habitat Reach Length (feet)	143	185
Stream Depth (inches)	3-36	
Stream Width (feet)	9-22	
USEPA Habitat Assessment Score	130	133
% Substrate Particle Size		
Silt (<0.062 mm)	6%	
Sand (0.125 - 2 mm)	16%	
Gravel (2 - 64 mm)	26%	
Cobble (64 - 256 mm)	40%	
Boulder (256 - 2,048 mm)	12%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	69	
Benthic IBI Metrics and Score		
Total Taxa Richness	23	
EPT Taxa Richness	11	
Beck's Index, Version 3	5	
Hilsenhoff Biotic Index	5.12	
Shannon Diversity Index	2.23	
Percent Sensitive Individuals	10.5%	
IBI Score	48.6	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	308	
Species Richness	12	
Dominant Species	Rainbow darter	
Percent Dominant Species	23%	
Shannon-Weaver Diversity Index	2.98	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	31.8	
Catch Per Foot (fish/foot)	0.94	
Catch Per Minute (fish/minute)	9.70	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW02
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/15/2010	
	Rifle	Pool
Water Temperature (°C)	8.8	8.7
Dissolved Oxygen (mg/L)	11.3	10.3
pH (Standard Units)	7.85	7.89
Conductivity (uS/cm)	313	309
Stream Flow Rate (cubic feet per second)	3.09	
Habitat Reach Length (feet)	122	206
Stream Depth (inches)	1-34	
Stream Width (feet)	3-16	
USEPA Habitat Assessment Score	111	111
% Substrate Particle Size		
Silt (<0.062 mm)	9%	
Sand (0.125 - 2 mm)	9%	
Gravel (2 - 64 mm)	52%	
Cobble (64 - 256 mm)	23%	
Boulder (256 - 2,048 mm)	7%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	35	
Benthic IBI Metrics and Score		
Total Taxa Richness	17	
EPT Taxa Richness	6	
Beck's Index, Version 3	1	
Hilsenhoff Biotic Index	4.94	
Shannon Diversity Index	2.04	
Percent Sensitive Individuals	17.1%	
IBI Score	39.9	
Fish Metrics		
	Total (Rifle and Pool)	
Number Fish Collected	309	
Species Richness	13	
Dominant Species	Bluntnose minnow	
Percent Dominant Species	24%	
Shannon-Weaver Diversity Index	2.92	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	28.2	
Catch Per Foot (fish/foot)	0.94	
Catch Per Minute (fish/minute)	10.99	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity quality
 NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW03
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/13/2010	
	Riffle	Pool
Water Temperature (°C)	12.3	12.3
Dissolved Oxygen (mg/L)	10.9	9.1
pH (Standard Units)	8.02	8.12
Conductivity (uS/cm)	330	330
Stream Flow Rate (cubic feet per second)	2.16	
Habitat Reach Length (feet)	162	166
Stream Depth (inches)	1-26	
Stream Width (feet)	3-20	
USEPA Habitat Assessment Score	98	104
% Substrate Particle Size		
Silt (<0.062 mm)	6%	
Sand (0.125 - 2 mm)	15%	
Gravel (2 - 64 mm)	43%	
Cobble (64 - 256 mm)	28%	
Boulder (256 - 2,048 mm)	8%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	28	
Benthic IBI Metrics and Score		
Total Taxa Richness	16	
EPT Taxa Richness	6	
Beck's Index, Version 3	2	
Hilsenhoff Biotic Index	5.49	
Shannon Diversity Index	1.65	
Percent Sensitive Individuals	5.5%	
IBI Score	34.2	
Fish Metrics		
		Total (Riffle and Pool)
Number Fish Collected	412	
Species Richness	14	
Dominant Species	Bluntnose minnow	
Percent Dominant Species	40%	
Shannon-Weaver Diversity Index	2.61	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	25.2	
Catch Per Foot (fish/foot)	1.26	
Catch Per Minute (fish/minute)	16.37	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW04
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/19/2010	
	Riffle	Pool
Water Temperature (°C)	7.2	7.3
Dissolved Oxygen (mg/L)	9.9	9.1
pH (Standard Units)	7.61	7.64
Conductivity (uS/cm)	246	298
Stream Flow Rate (cubic feet per second)	0.88	
Habitat Reach Length (feet)	25	303
Stream Depth (inches)	1-36	
Stream Width (feet)	5-15	
USEPA Habitat Assessment Score	85	103
% Substrate Particle Size		
Silt (<0.062 mm)	30%	
Sand (0.125 - 2 mm)	36%	
Gravel (2 - 64 mm)	27%	
Cobble (64 - 256 mm)	7%	
Boulder (256 - 2,048 mm)	0%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	1	
Benthic IBI Metrics and Score		
Total Taxa Richness	12	
EPT Taxa Richness	3	
Beck's Index, Version 3	1	
Hilsenhoff Biotic Index	6.75	
Shannon Diversity Index	1.48	
Percent Sensitive Individuals	3.10%	
IBI Score	25.1	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	240	
Species Richness	7	
Dominant Species	Bluntnose minnow	
Percent Dominant Species	51%	
Shannon-Weaver Diversity Index	2.00	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	18.8	
Catch Per Foot (fish/foot)	0.73	
Catch Per Minute (fish/minute)	12.78	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity quality
 NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW05
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/12/2010	
	Riffle	Pool
Water Temperature (°C)	8.5	8.5
Dissolved Oxygen (mg/L)	10.3	10.6
pH (Standard Units)	7.61	7.59
Conductivity (uS/cm)	218	225
Stream Flow Rate (cubic feet per second)	0.64	
Habitat Reach Length (feet)	300	28
Stream Depth (inches)	1-20	
Stream Width (feet)	2-14	
USEPA Habitat Assessment Score	89	80
% Substrate Particle Size		
Silt (<0.062 mm)	5%	
Sand (0.125 - 2 mm)	8%	
Gravel (2 - 64 mm)	22%	
Cobble (64 - 256 mm)	35%	
Boulder (256 - 2,048 mm)	12%	
Bedrock (> 2,048 mm)	18%	
Median Particle Size D ₅₀ (mm)	128	
Benthic IBI Metrics and Score		
Total Taxa Richness	18	
EPT Taxa Richness	5	
Beck's Index, Version 3	4	
Hilsenhoff Biotic Index	5.61	
Shannon Diversity Index	1.33	
Percent Sensitive Individuals	14.1%	
IBI Score	34.8	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	245	
Species Richness	9	
Dominant Species	Creek chub	
Percent Dominant Species	45%	
Shannon-Weaver Diversity Index	2.48	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	18.5	
Catch Per Foot (fish/foot)	0.75	
Catch Per Minute (fish/minute)	13.26	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32731-BSW06
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/13/2010	
	Riffle	Pool
Water Temperature (°C)	9.7	9.6
Dissolved Oxygen (mg/L)	11.0	10.5
pH (Standard Units)	7.83	7.81
Conductivity (uS/cm)	236	237
Stream Flow Rate (cubic feet per second)	0.27	
Habitat Reach Length (feet)	278	50
Stream Depth (inches)	1-16	
Stream Width (feet)	1-3.5	
USEPA Habitat Assessment Score	115	112
% Substrate Particle Size		
Silt (<0.062 mm)	21%	
Sand (0.125 - 2 mm)	9%	
Gravel (2 - 64 mm)	40%	
Cobble (64 - 256 mm)	23%	
Boulder (256 - 2,048 mm)	7%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	17	
Benthic IBI Metrics and Score		
Total Taxa Richness	24	
EPT Taxa Richness	6	
Beck's Index, Version 3	0	
Hilsenhoff Biotic Index	5.98	
Shannon Diversity Index	2.13	
Percent Sensitive Individuals	1.0%	
IBI Score	38.3	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	161	
Species Richness	5	
Dominant Species	Blacknose dace	
Percent Dominant Species	52%	
Shannon-Weaver Diversity Index	1.32	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	14.3	
Catch Per Foot (fish/foot)	0.49	
Catch Per Minute (fish/minute)	11.25	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality
 NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32738-BSW07
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/15/2010	
	Riffle	Pool
Water Temperature (°C)	16.4	16.6
Dissolved Oxygen (mg/L)	10.6	10.4
pH (Standard Units)	8.14	8.76
Conductivity (uS/cm)	364	365
Stream Flow Rate (cubic feet per second)	0.89	
Habitat Reach Length (feet)	185	143
Stream Depth (inches)	1-16	
Stream Width (feet)	2-10	
USEPA Habitat Assessment Score	121	112
% Substrate Particle Size		
Silt (<0.062 mm)	11%	
Sand (0.125 - 2 mm)	14%	
Gravel (2 - 64 mm)	45%	
Cobble (64 - 256 mm)	22%	
Boulder (256 - 2,048 mm)	5%	
Bedrock (> 2,048 mm)	3%	
Median Particle Size D ₅₀ (mm)	27	
Benthic IBI Metrics and Score		
Total Taxa Richness	23	
EPT Taxa Richness	9	
Beck's Index, Version 3	5	
Hilsenhoff Biotic Index	4.93	
Shannon Diversity Index	2.04	
Percent Sensitive Individuals	8.3%	
IBI Score	45.7	
Fish Metrics		
Number Fish Collected	156	
Species Richness	9	
Dominant Species	Creek chub	
Percent Dominant Species	33%	
Shannon-Weaver Diversity Index	2.62	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	19.0	
Catch Per Foot (fish/foot)	0.48	
Catch Per Minute (fish/minute)	8.23	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32741-BSW08
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/14/2010	
	Riffle	Pool
Water Temperature (°C)	15.2	15.2
Dissolved Oxygen (mg/L)	13.3	12.0
pH (Standard Units)	8.36	8.54
Conductivity (uS/cm)	326	331
Stream Flow Rate (cubic feet per second)	0.09	
Habitat Reach Length (feet)	278	50
Stream Depth (inches)	1-8	
Stream Width (feet)	1-4	
USEPA Habitat Assessment Score	124	118
% Substrate Particle Size		
Silt (<0.062 mm)	8%	
Sand (0.125 - 2 mm)	23%	
Gravel (2 - 64 mm)	47%	
Cobble (64 - 256 mm)	19%	
Boulder (256 - 2,048 mm)	3%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	9	
Benthic IBI Metrics and Score		
Total Taxa Richness	21	
EPT Taxa Richness	8	
Beck's Index, Version 3	8	
Hilsenhoff Biotic Index	3.56	
Shannon Diversity Index	1.93	
Percent Sensitive Individuals	63.2%	
IBI Score	58.1	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	36	
Species Richness	3	
Dominant Species	Creek chub	
Percent Dominant Species	56%	
Shannon-Weaver Diversity Index	1.23	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	9.5	
Catch Per Foot (fish/foot)	0.11	
Catch Per Minute (fish/minute)	3.81	

NS - Not sampled: stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32741-BSW09
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/14/2010	
	Riffle	Pool
Water Temperature (°C)	16.1	15.8
Dissolved Oxygen (mg/L)	10.5	7.2
pH (Standard Units)	7.88	7.98
Conductivity (uS/cm)	344	347
Stream Flow Rate (cubic feet per second)	0.03	
Habitat Reach Length (feet)	292	36
Stream Depth (inches)	0.5 - 14	
Stream Width (feet)	0.5 - 3.5	
USEPA Habitat Assessment Score	90	87
% Substrate Particle Size		
Silt (<0.062 mm)	14%	
Sand (0.125 - 2 mm)	26%	
Gravel (2 - 64 mm)	32%	
Cobble (64 - 256 mm)	16%	
Boulder (256 - 2,048 mm)	6%	
Bedrock (> 2,048 mm)	6%	
Median Particle Size D ₅₀ (mm)	11	
Benthic IBI Metrics and Score		
Total Taxa Richness	18	
EPT Taxa Richness	5	
Beck's Index, Version 3	2	
Hilsenhoff Biotic Index	5.25	
Shannon Diversity Index	1.12	
Percent Sensitive Individuals	17.9%	
IBI Score	34.2	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	21	
Species Richness	2	
Dominant Species	Creek chub	
Percent Dominant Species	86%	
Shannon-Weaver Diversity Index	0.59	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	7.6	
Catch Per Foot (fish/foot)	0.06	
Catch Per Minute (fish/minute)	2.78	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32743-BSW10
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/12/2010	
	Riffle	Pool
Water Temperature (°C)	15.8	15.4
Dissolved Oxygen (mg/L)	9.4	9.3
pH (Standard Units)	7.91	7.34
Conductivity (uS/cm)	301	368
Stream Flow Rate (cubic feet per second)	0.06	
Habitat Reach Length (feet)	218	110
Stream Depth (inches)	1-13	
Stream Width (feet)	1-4	
USEPA Habitat Assessment Score	67	73
% Substrate Particle Size		
Silt (<0.062 mm)	5%	
Sand (0.125 - 2 mm)	38%	
Gravel (2 - 64 mm)	52%	
Cobble (64 - 256 mm)	10%	
Boulder (256 - 2,048 mm)	0%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	8	
Benthic IBI Metrics and Score		
Total Taxa Richness	19	
EPT Taxa Richness	5	
Beck's Index, Version 3	3	
Hilsenhoff Biotic Index	5.21	
Shannon Diversity Index	1.59	
Percent Sensitive Individuals	24.5%	
IBI Score	39.2	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	35	
Species Richness	2	
Dominant Species	Creek chub	
Percent Dominant Species	89%	
Shannon-Weaver Diversity Index	0.51	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	11.2	
Catch Per Foot (fish/foot)	0.11	
Catch Per Minute (fish/minute)	3.13	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32744-BSW11
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/12/2010	
	Riffle	Pool
Water Temperature (°C)	17.3	16.8
Dissolved Oxygen (mg/L)	9.4	6.9
pH (Standard Units)	8.18	8.19
Conductivity (uS/cm)	260	260
Stream Flow Rate (cubic feet per second)	0.12	
Habitat Reach Length (feet)	293	35
Stream Depth (inches)	1-7	
Stream Width (feet)	1-4	
USEPA Habitat Assessment Score	96	89
% Substrate Particle Size		
Silt (<0.062 mm)	6%	
Sand (0.125 - 2 mm)	31%	
Gravel (2 - 64 mm)	39%	
Cobble (64 - 256 mm)	21%	
Boulder (256 - 2,048 mm)	3%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	12.65	
Benthic IBI Metrics and Score		
Total Taxa Richness	22	
EPT Taxa Richness	7	
Beck's Index, Version 3	6	
Hilsenhoff Biotic Index	4.43	
Shannon Diversity Index	1.86	
Percent Sensitive Individuals	48.00%	
IBI Score	51.6	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	57	
Species Richness	3	
Dominant Species	Creek chub	
Percent Dominant Species	89%	
Shannon-Weaver Diversity Index	0.55	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	9.7	
Catch Per Foot (fish/foot)	0.17	
Catch Per Minute (fish/minute)	5.86	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality
 NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32736-BSW12
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/19/2010	
	Riffle	Pool
Water Temperature (°C)	13.7	14.0
Dissolved Oxygen (mg/L)	9.1	8.5
pH (Standard Units)	7.59	7.62
Conductivity (uS/cm)	305	305
Stream Flow Rate (cubic feet per second)	0.11	
Habitat Reach Length (feet)	248	80
Stream Depth (inches)	1-22	
Stream Width (feet)	0.5-6	
USEPA Habitat Assessment Score	122	110
% Substrate Particle Size		
Silt (<0.062 mm)	12%	
Sand (0.125 - 2 mm)	16%	
Gravel (2 - 64 mm)	53%	
Cobble (64 - 256 mm)	18%	
Boulder (256 - 2,048 mm)	1%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	11	
Benthic IBI Metrics and Score		
Total Taxa Richness	15	
EPT Taxa Richness	8	
Beck's Index, Version 3	10	
Hilsenhoff Biotic Index	3.61	
Shannon Diversity Index	2.06	
Percent Sensitive Individuals	61.40%	
IBI Score	56.2	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	12	
Species Richness	2	
Dominant Species	Creek chub	
Percent Dominant Species	92%	
Shannon-Weaver Diversity Index	0.41	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	11.4	
Catch Per Foot (fish/foot)	0.04	
Catch Per Minute (fish/minute)	1.05	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

**An Index of Biotic Integrity for Wadeable
Freestone Riffle-Run Streams in Pennsylvania**
April 2009

Introduction

The Pennsylvania Department of Environmental Protection (DEP) developed an index of biotic integrity (IBI) for benthic macroinvertebrate communities in Pennsylvania's wadeable, freestone, riffle-run type streams as a scientifically credible biological assessment tool. This indicator assists in guiding and evaluating legislation, policy and management strategies as well as setting goals for aquatic resources by enabling direct quantification of important ecological attributes along a gradient of biological conditions and ecosystem stressors (Davis and Simon 1995; Davies and Jackson 2006; Hawkins 2006). This indicator serves as a measure of the extent to which anthropogenic stressors impair the capability of a stream to support a healthy aquatic community (Davis and Simon 1995).

Biological Sampling Methods

This IBI applies to benthic macroinvertebrate samples collected any time of the year from wadeable, freestone, riffle-run streams in Pennsylvania using a D-frame net with 500-micron mesh. Field sampling and laboratory methods are more fully described in DEP's Standardized Biological Field Collection and Laboratory Methods, Section V (Pennsylvania Department of Environmental Protection 2003). Sampling biologists composite six kicks from riffle areas distributed throughout a 100-meter stream reach, working progressively upstream, with each kick disturbing approximately one square meter immediately upstream of the net for approximately one minute to an approximate depth of 10 cm, as substrate allows. Composited samples are preserved with 95% ethanol in the field and transported back to the laboratory for processing. In the lab, each composited sample is placed into a 3.5" deep rectangular pan (measuring 14" long x 8" wide on the bottom of the pan) marked off into 28 four-square inch (2" x 2") grids. Four of the grids are randomly selected, their contents are extracted using a four-square inch circular "cookie cutter," and placed into another identical empty pan. All the organisms are picked from this second pan. If less than 160 identifiable organisms are picked from the second pan, additional grids are randomly selected and extracted from the first pan, transferred to the second pan and picked until the target number of organisms (200 ± 40 organisms) is obtained. If more than 240 identifiable organisms are picked from the original four grids then the second pan is cleared of debris, the picked organisms are floated in the cleared pan and randomly-selected grids are picked until the target number of organisms is obtained. Any grids selected during this entire process are picked in their entirety and the total numbers of grids selected for each part of the sub-sampling process are recorded.

Organisms in the sub-sample are identified and counted. Midges are identified to the family level of Chironomidae. Snails, clams and mussels are all also identified to family levels. Roundworms and proboscis worms are identified to the phylum levels of Nematoda and Nemertea, respectively. Moss animacules are identified to the phylum level of Bryozoa. Flatworms and leeches are identified to the class levels of Turbellaria and Hirudenia, respectively. Segmented worms, aquatic earthworms, and tubificids are identified to the class level of Oligochaeta. All water mites are identified as

Hydracarina, an artificial taxonomic grouping of several mite superfamilies. All other macroinvertebrates are identified to genus level.

Most of the samples used to develop the IBI were taken from relatively small, mostly first through third order riffle-run type streams draining less than 25 square miles, so this IBI should be applied with discretion to other stream types (e.g., limestone type streams) and larger stream/river systems. Currently, DEP does not apply any regionally-based classification to wadeable, freestone, riffle-run streams in the Commonwealth for purposes of applying this IBI.

The Metrics

A number of different metric combinations were evaluated during index development and the following six metrics were selected for inclusion as core metrics in the IBI based on various performance characteristics. These six metrics all exhibited a strong ability to distinguish between reference and stressed conditions. In addition, these six metrics measure different aspects of the biological communities represented by the sub-samples, and when used together in a multimetric index, they provide a solid foundation for assessing the biological condition of benthic macroinvertebrate assemblages in Pennsylvania's wadeable freestone riffle-run stream ecosystems.

Total Taxa Richness

This taxonomic richness metric is a count of the total number of taxa in a sub-sample. Generally, this metric is expected to decrease with increasing anthropogenic stress to a stream ecosystem, reflecting loss of taxa and increasing dominance of a few pollution-tolerant taxa. Other benefits of including this metric include its common use in many biological monitoring and assessment programs in other parts of the world as well as its ease of explanation and calculation.

Ephemeroptera + Plecoptera + Trichoptera Taxa Richness (Pollution Tolerance Values 0 – 4 only)

This taxonomic richness metric is a count of the number of taxa belonging to the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT) in a sub-sample – common names for these orders are mayflies, stoneflies, and caddisflies, respectively. The aquatic life stages of these three insect orders are generally considered sensitive to, or intolerant of, pollution (Lenat and Penrose 1996); in fact, this metric only counts EPT taxa with pollution tolerance values (PTVs) of 0 to 4, excluding a few of the most tolerant mayfly and caddisfly taxa. This metric is expected to decrease in value with increasing anthropogenic stress to a stream ecosystem, reflecting the loss of taxa from these largely pollution-sensitive orders. This metric has a history of use across the world and is relatively easy to use, explain and calculate (Lenat and Penrose 1996).

Beck's Index, version 3

This taxonomic richness and tolerance metric is a weighted count of taxa with PTVs of 0, 1, or 2. The name and conceptual basis of this metric are derived from the water quality work of William H. Beck in Florida (Beck 1955). This metric is expected to decrease in value with increasing anthropogenic stress to a stream ecosystem, reflecting the loss of pollution-sensitive taxa. It should be noted that the version of the Beck's Index metric used for this project, although similar in name and concept, differs slightly in its calculation from the Beck's Index used in DEP's multihabitat protocol for assessing biological condition of low gradient pool-glide type streams.

Shannon Diversity

This community composition metric measures taxonomic richness and evenness of individuals across taxa of a sub-sample. This metric is expected to decrease in values with increasing anthropogenic stress to a stream ecosystem, reflecting loss of pollution-sensitive taxa and increasing dominance of a few pollution-tolerant taxa. The name and conceptual basis for this metric are derived from the information theory work of Claude Elwood Shannon (Shannon 1968).

Hilsenhoff Biotic Index

This community composition and tolerance metric is calculated as an average of the number of individuals in a sub-sample, weighted by PTVs. Developed by William Hilsenhoff, the Hilsenhoff Biotic Index (Hilsenhoff 1977, 1987, 1988; Klemm et al. 1990) generally increases with increasing ecosystem stress, reflecting increasing dominance of pollution-tolerant organisms.

Percent Sensitive Individuals (PTV 0 – 3)

This community composition and tolerance metric is the percentage of individuals with PTVs of 0 to 3 in a sub-sample and is expected to decrease in value with increasing anthropogenic stress to a stream ecosystem, reflecting loss of pollution-sensitive organisms.

Example calculations for each metric are provided below for a sample from Lycoming Creek.

Benthic macroinvertebrate sample from Lycoming Creek in Lycoming County taken on November 19, 2001		
Taxa Name	Number of Individuals	Pollution Tolerance Value
Acentrella	1	4
Isonychia	4	3
Epeorus	6	0
Leucrocuta	1	1
Rhithrogena	9	0
Stenonema	8	3
Ephemerella	32	1
Serratella	1	2
Paraleptophlebia	4	1
Pteronarcys	1	0
Taeniopteryx	1	2
Leuctra	2	0
Agnetina	1	2
Paragnetina	1	1
Chimarra	1	4
Dolophilodes	1	0
Cheumatopsyche	25	6
Hydropsyche	22	5
Rhyacophila	16	1
Glossosoma	2	0
Brachycentrus	3	1
Micrasema	1	2
Apatania	2	3
Psilotreta	1	0
Psephenus	3	4
Optioservus	7	4
Atherix	1	2
Antocha	2	3
Hexatoma	5	2
Prosimulium	1	2
Chironomidae	49	6
Ancylidae	2	7
Oligochaeta	1	10

Total Taxa Richness

There are 33 taxa in this sub-sample, so

$$\text{Total Taxa Richness} = 33$$

EPT Taxa Richness (PTV 0 – 4 only)

There are 9 *Ephemeroptera* taxa (Acentrella, Isonychia, Epeorus, Leucrocuta, Rhithrogena, Stenonema, Ephemerella, Serratella, Paraleptophlebia), 5 *Plecoptera* taxa (Pteronarcys, Taeniopteryx, Leuctra, Agnetina, Paragnetina) and 8 *Trichoptera* taxa (Chimarra, Dolophilodes, Rhyacophila, Glossosoma, Brachycentrus, Micrasema, Apatania, Psilotreta) in this sub-sample, with PTVs ≤ 4 , so

$$\text{EPT Taxa Richness (PTV 0 – 4)} = 9 + 5 + 8$$

$$\text{EPT Taxa Richness (PTV 0 – 4)} = 22$$

Beck's Index, version 3

$$\begin{aligned} \text{Beck's Index, version 3} = & \\ & (3 \times (\text{number of taxa with PTV} = 0)) + \\ & (2 \times (\text{number of taxa with PTV} = 1)) + \\ & (1 \times (\text{number of taxa with PTV} = 2)) \end{aligned}$$

There are 7 taxa in this sub-sample with PTV = 0. There are 6 taxa in this sub-sample with PTV = 1. There are 7 taxa in this sub-sample with PTV = 2, so

$$\text{Beck's Index, version 3} = 3(7) + 2(6) + 1(7)$$

$$\text{Beck's Index, version 3} = 21 + 12 + 7$$

$$\text{Beck's Index, version 3} = 40$$

Hilsenhoff Biotic Index

$$\text{Hilsenhoff Biotic Index} = \sum_{i=0}^{10} [(i * n_{\text{indvPTVi}})] / N$$

where n_{indvPTVi} = the number of individuals in a sub-sample with PTV of i and N = the total number of individuals in a sub-sample

There are 22 individuals with PTV = 0	There are 22 individuals with PTV = 5
There are 57 individuals with PTV = 1	There are 74 individuals with PTV = 6
There are 11 individuals with PTV = 2	There are 2 individuals with PTV = 7
There are 16 individuals with PTV = 3	There are 0 individuals with PTV = 8 or 9
There are 12 individuals with PTV = 4	There is 1 individual with PTV = 10.

There are a total of 217 individuals in the sub-sample, so

$$\text{Hilsenhoff Biotic Index} = [(0 * 22) + (1 * 57) + (2 * 11) + (3 * 16) + (4 * 12) + (5 * 22) + (6 * 74) + (7 * 2) + (8 * 0) + (9 * 0) + (10 * 1)] / 217$$

Hilsenhoff Biotic Index = 3.47

Shannon Diversity Index

$$\text{Shannon Diversity Index} = \left[- \sum_{i=1}^{\text{Rich}} (n_i / N) \ln (n_i / N) \right]$$

where n_i = the number of individuals in each taxa (relative abundance); N = the total number of individuals in a sub-sample; and Rich = the total number of taxa in a sub-sample (total taxa richness)

There are 33 taxa in this sub-sample. The numbers of individuals in each taxa are shown in the table above. There are a total of 217 individuals in the sub-sample, so

$$\begin{aligned} \text{Shannon Diversity Index} = & - (1 / 217) \ln (1 / 217) + (4 / 217) \ln (4 / 217) + \\ & (6 / 217) \ln (6 / 217) + (1 / 217) \ln (1 / 217) + \\ & (9 / 217) \ln (9 / 217) + (8 / 217) \ln (8 / 217) + \\ & (32 / 217) \ln (32 / 217) + (1 / 217) \ln (1 / 217) + \\ & \dots \text{ (do this for all 33 taxa)} \\ & \dots (1 / 217) \ln (1 / 217) \end{aligned}$$

Shannon Diversity Index = 2.67

Percent Sensitive (PTV 0 – 3) Individuals

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = \left(\sum_{i=0}^3 n_{\text{indvPTVi}} \right) / N * 100$$

where n_{indvPTVi} = the number of individuals in a sub-sample with PTV of i and N = the total number of individuals in a sub-sample

There are 22 individuals with PTV = 0
There are 57 individuals with PTV = 1

There are 11 individuals with PTV = 2
There are 16 individuals with PTV = 3

There are a total of 217 individuals in the sub-sample, so

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = (22 + 57 + 11 + 16) / 217 * 100$$

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = 106 / 217 * 100$$

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = 48.8\%$$

The Index

An index is simply a means to integrate information from various measures of biological integrity, or various metrics (Barbour et al. 1999). In order to compare and combine sundry measures (e.g., percentage of individuals, counts of taxa, unitless numbers) of biological condition in a meaningful manner, it is necessary to standardize metrics with some mathematical transformation that results in a logical progression of values (Barbour et al. 1995).

The one selected core metric that increases in value with increasing anthropogenic stress (i.e., the Hilsenhoff Biotic Index) was standardized to the 5th percentile of metric scores for all samples in the IBI development dataset. Core metrics that decrease in value with increasing stress (i.e., total taxa richness, EPT taxa richness, % sensitive individuals, Shannon diversity, Beck's Index) were standardized to the 95th percentile of metrics scores for all samples in the IBI development dataset. The following table presents the standardization values used for each core metric.

Metric	Standardization value
Total Taxa Richness	33
EPT Taxa Richness (PTV 0 – 4)	19
Beck's Index, version 3	38
Hilsenhoff Biotic Index	1.89
Shannon Diversity	2.86
Percent Sensitive Individuals (PTV 0 – 3)	84.5

The values for standardized core metric values were set to a maximum value of 1.00, with values closer to zero corresponding to increasing deviation from the expected

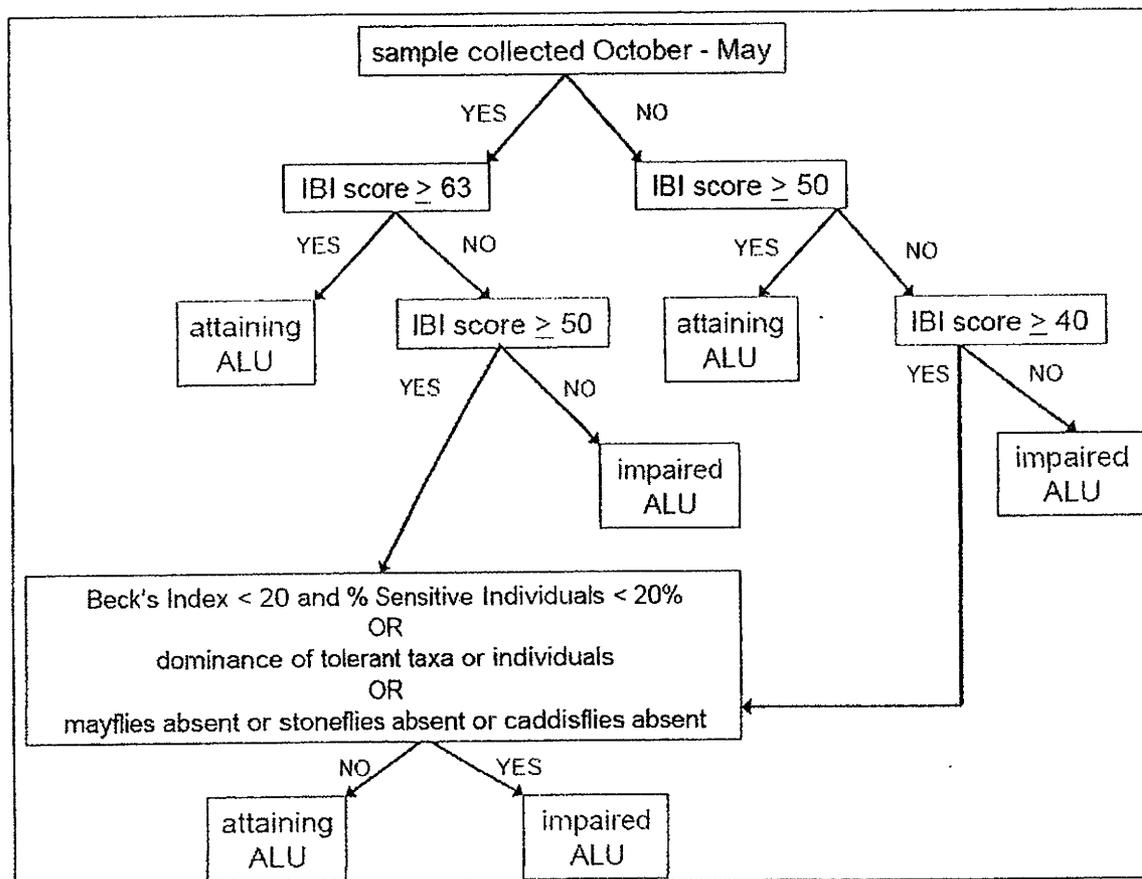
reference condition and progressively higher values corresponding more closely to the biological reference condition (Barbour et al. 1995). The adjusted standardized metric values for the six core metrics were averaged and multiplied by 100 to produce an index score ranging from 0 to 100. This number represents the multimetric index of biological integrity (IBI) score for a sample. The following table shows the standardized metric and index scoring calculations for the Lycoming Creek sample discussed above.

Metric	Standardization Equation	Observed Metric Value	Standardized Metric Score	Adjusted Standardized Metric Score Maximum = 1.000
Total Taxa Richness	observed value / 33	33	1.000	1.000
EPT Taxa Richness	observed value / 19	22	1.158	1.000
Modified Beck's Index	observed value / 38	40	1.053	1.000
Hilsenhoff Biotic Index	$(10 - \text{observed value}) / (10 - 1.89)$	3.47	0.805	0.805
Shannon Diversity	observed value / 2.86	2.67	0.934	0.934
Percent Sensitive Individuals	observed value / 84.5	48.8	0.578	0.578
Average of adjusted standardized core metric scores * 100 = IBI Score =				88.6

Aquatic Life Use Attainment Benchmarks

Based on the results of classification analyses (details available upon request), DEP decided not to establish separate reference conditions and thresholds for wadeable freestone, riffle-run type streams in separate regions of the Commonwealth. However, due to the influences of annual seasons and drainage area seen in the IBI development dataset, DEP recognizes different use attainment thresholds are appropriate for samples collected during different times of the year and from different size stream systems.

Based on the results of the analyses presented above, the results of workshops and feedback from DEP biologists and policy considerations, DEP implements a multi-tiered benchmark decision process for smaller wadeable freestone riffle-run streams in Pennsylvania that incorporates sampling season as a factor for determining aquatic life use (ALU) attainment and impairment for the cold water fishes (CWF), warm water fishes (WWF) and trout stocking (TSF) protected uses; this process is outlined in the diagram below.



The first step in the ALU assessment process for smaller wadeable freestone riffle-run streams in Pennsylvania considers sampling season (i.e. June through September versus October through May). These seasonal index periods are intended as general guidelines and may vary slightly year-to-year depending on climatological conditions; for example, a sample collected during the last week of May in a particularly hot, dry year may be more properly evaluated using procedures set forth for the summer months.

For samples collected from smaller streams between October and May, an IBI score ≥ 63 results in ALU attainment and an IBI score < 50 results in ALU impairment; an IBI score between 50 and 63 requires further evaluation to determine ALU impairment – three guidelines may be used: (1) if the Beck's Index score is < 20 and the % Sensitive Individuals in the sub-sample is $< 20\%$, the ALU should be impaired without compelling reason otherwise; (2) if the sample is dominated by tolerant taxa or individuals, the ALU should be impaired without compelling reason otherwise; or (3) if mayflies, stoneflies or caddisflies are absent from the sub-sample the ALU should be impaired without compelling reason otherwise.

For samples collected between June and September from smaller streams, an IBI score ≥ 50 results in ALU attainment and an IBI score < 40 results in ALU impairment; an IBI score between 40 and 50 requires further evaluation to determine ALU impairment,

guided by the same three guidelines outlined above for October to May samples scoring between 50 and 63 (although the absence of mayflies in samples collected immediately after spring hatches may be relaxed in some cases).

For larger wadeable freestone riffle-run type streams, DEP believes more samples are necessary to accurately establish ALU attainment and impairment benchmarks. Given the nature of flowing water bodies as gradually changing continuums, it is difficult to define a specific numeric cutoff to separate larger streams from smaller streams. However, the present dataset suggest that scores for some index metrics begin to decline for reference-quality streams drainage areas reach the 25 to 50 square mile range. Workshops conducted by DEP confirm that biological expectations or potential for most of the relatively pristine larger freestone streams in Pennsylvania are less than the biological expectations or potential for the relatively pristine smaller freestone streams.

The use assessment decision process and accompanying attainment/impairment benchmarks set forth above are intended as general guidelines, not as hard-and-fast rules. While the above guidelines will provide an accurate assessment of benthic macroinvertebrate community condition for the vast majority of samples collected from wadeable, freestone, riffle-run streams in Pennsylvania, there will be instances where a biologist's local knowledge of conditions may warrant a decision not arrived at using these guidelines. For instance, if a sample is heavily dominated by Simuliidae or Chironomidae larvae, often times this will make the metric and IBI scores difficult to interpret and the investigating biologist must rely on a more qualitative analysis of the metric scores and sample composition to arrive at an assessment decision. Similarly, samples from streams in areas receiving a substantial amount of flow from groundwater attributable to limestone geology are naturally expected to have less diversity than "true freestone" streams, so use attainment benchmarks may be justifiably relaxed for samples from these types of streams.

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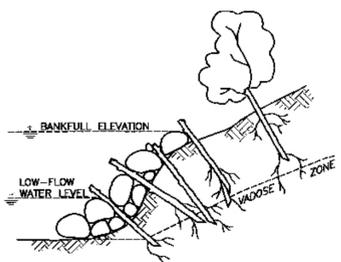
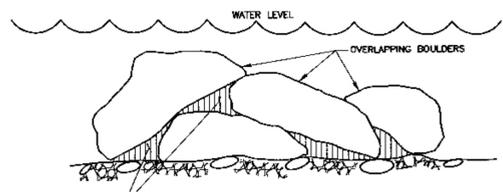
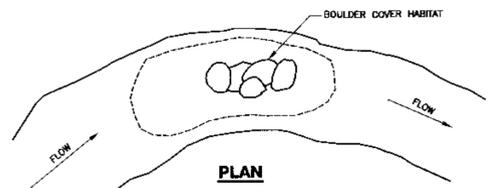
Lenat, D.R. and D.L. Penrose. 1996. History of the EPT taxa richness metric. *Bulletin of the North American Benthological Society* 13(2).

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ATTACHMENT 4

STREAM RESTORATION PLANTING DETAIL (MD01-3)



**DETAIL 10
BOULDER HABITAT IN POOLS**
N.T.S.

**DETAIL 11A
RIPARIAN VEGETATION**
N.T.S.

Planting Area	Stratum	Plant Species		Note	Size and Planting Density		
		Scientific Name	Common Name				
Stream Bank	Trees	<i>Acer rubrum</i>	red maple	1	1 gallon (250/acre) 5 gallon (150/acre) 10 gallon (100/acre)		
		<i>Platanus occidentalis</i>	eastern sycamore	1			
		<i>Quercus bicolor</i>	swamp white oak	1			
		<i>Quercus palustris</i>	pin oak	1			
		<i>Salix nigra</i>	black willow	1			
	Shrubs	<i>Alnus rugosa</i>	speckled alder	2	1 gallon (900/acre)		
		<i>Cephalanthus occidentalis</i>	buttonbush	2			
		<i>Cornus amomum</i>	silky dogwood	2			
		<i>Salix interior</i>	sandbar willow	2			
		<i>Salix sericea</i>	silky willow	2			
		<i>Viburnum lentago</i>	nannyberry	2			
		<i>Viburnum recognitum</i>	northern arrowwood	2			
		Herbs & Seed Mixes	<i>Carex stricta</i>	tussock sedge		3	plugs (5,000/acre)
			swamp forest seed mix (see Detail 11C for specifications)			4	seed (25bs/acre)
		Floodplain	Trees	<i>Acer rubrum</i>		red maple	1
<i>Acer saccharinum</i>	silver maple			1			
<i>Carpinus caroliniana</i>	ironwood			1			
<i>Carya ovata</i>	shagbark hickory			1			
<i>Hamamelis virginiana</i>	witch hazel			1			
<i>Liriodendron tulipifera</i>	tulip poplar			1			
<i>Quercus alba</i>	white oak			1			
<i>Quercus palustris</i>	pin oak			1			
<i>Quercus rubra</i>	red oak			1			
<i>Tilia americana</i>	basswood			1			
<i>Tsuga canadensis</i>	eastern hemlock		1				
Seed Mixes	shaded forest seed mix (see Table 11C for specifications)			4	seed (25bs/acre)		
	eastern habitat seed mix (see Table 11C for specifications)			5			
Fall/Winter Temporary Cover	<i>Secale cereale</i> (Aroostook)		Aroostook rye	6	seed (40bs/acre)		
Spring Temporary Cover	<i>Avena sativa</i>		Oats	6			

- Plant trees on 10ft centers.
- Plant shrubs on 6ft centers.
- Plant herbaceous plugs on 3ft centers.
- Use this seed mix in shady areas.
- Use this seed mix in sunny open areas.
- Plant cover seed along with appropriate seed mix for planting area.

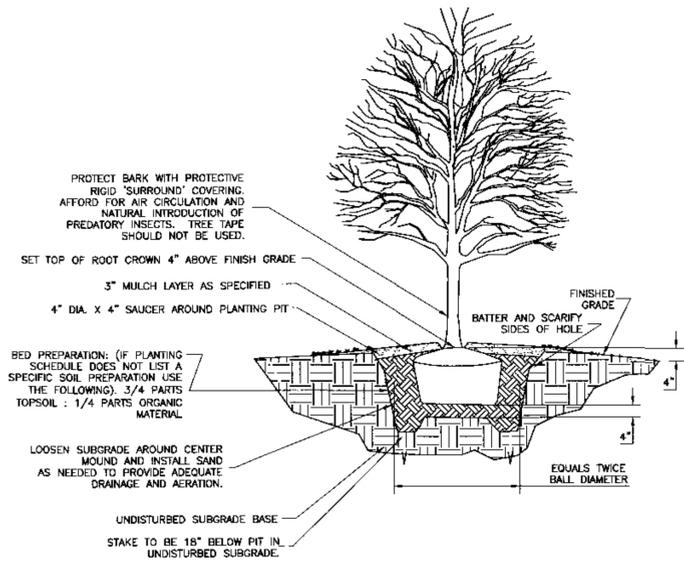
**DETAIL 11B
STREAM BANK PLANTING SPECIFICATIONS**

Plant Species		Seed Mix
Scientific Name	Common Name	Composition
SWAMP FOREST SEED MIX (ERNST CONSERVATION SEEDS-ERNMIX 131)		
<i>Carex vulpinoidea</i>	Fox Sedge	20%
<i>Spartanum eurycarpum</i>	Giant Bur Reed	10%
<i>Spartanum americanum</i>	Eastern Bur Reed	10%
<i>Scirpus atrovirens</i>	Green Bulrush	7%
<i>Scirpus polyphyllus</i>	Mary Leaved Bulrush	6%
<i>Bidens cernua</i>	Nodding Bur Marigold	6%
<i>Verbena hastata</i>	Blue Vervain	5.5%
<i>Juncus effusus</i>	Soft Rush	4%
<i>Carex lurida</i>	Lurid Sedge	3.5%
<i>Carex canosus</i>	Coarcted Sedge	3.5%
<i>Alisma subcordatum</i>	Mud Plantain	3%
<i>Rumex verticillatus</i>	Swamp Dock	3%
<i>Eupatorium maculatum</i>	Spotted Joe Pye Weed	3%
<i>Penthorum sedoides</i>	Ditch Stonecrop	2%
<i>Glyceria gracilis</i>	American Mannagrass	2%
<i>Scirpus acutus</i>	Hard Stemmed Bulrush	2%
<i>Minutus ringens</i>	Square Stemmed Monkey Flower	2%
<i>Scirpus cyperinus</i>	Wool Grass	2%
<i>Scirpus validus</i>	Soft Stem Bulrush	1.5%
<i>Carex lupulina</i>	Hop Sedge	1%
<i>Carex crinita</i>	Fringed Sedge	1%
<i>Dulichium arundinaceum</i>	Three Way Sedge	0.5%
<i>Chernisia virginiana</i>	Virgin's Bower	0.5%
<i>Solidago patula</i>	Rough Leaved Goldenrod	0.5%
<i>Caltha palustris</i>	Marsh Marigold	0.5%
WET MEADOW SEED MIX (ERNST CONSERVATION SEEDS-ERNMIX 122)		
<i>Elymus virginicus</i>	Virginia Wild Rye	20%
<i>Carex vulpinoidea</i>	Fox Sedge	19%
<i>Verbena hastata</i>	Blue Vervain	6%
<i>Helianthus helianthoides</i>	Ox-Eye Sunflower	5%
<i>Juncus effusus</i>	Soft Rush	5%
<i>Scirpus atrovirens</i>	Green Bulrush	5%
<i>Euthamia graminifolia</i>	Grass Leaved Goldenrod	5%
<i>Glyceria gracilis</i>	American Mannagrass	4%
<i>Carex lurida</i>	Lurid/Shallow Sedge	3%
<i>Eupatorium perfoliatum</i>	Boneset	3%
<i>Scirpus polyphyllus</i>	Mary Leaved Bulrush	3%
<i>Aster umbellatus</i>	Flat Topped White Aster	2%
<i>Carex canosus</i>	Coarcted (Bristly) Sedge	2%
<i>Carex lupulina</i>	Hop Sedge	2%
<i>Scirpus cyperinus</i>	Wool Grass	2%
<i>Vernonia gigantea</i>	Giant Ironweed	2%
<i>Eupatorium fistulosum</i>	Joe Pye Weed	1.5%
<i>Eupatorium maculatum</i>	Spotted Joe Pye Weed	2%
<i>Veratrum viride</i>	False Hellebore	2%
<i>Bromus helianthoides</i>	Wild Bromo Grass	1%
<i>Carex scoparia</i>	Blunt Broom Sedge	1%
<i>Carex lasiocarpa</i>	Rough Awns	1%
<i>Helianthus autumnalis</i>	Common Sunflower	1%
<i>Zizia aurea</i>	Golden Alexander	1%
<i>Carex acuticarpa</i>	Wood Reed Grass	1%
<i>Ludwigia stemmifolia</i>	Seedbox	1%
<i>Minutus ringens</i>	Square Stemmed Monkey Flower	0.5%
<i>Penthorum sedoides</i>	Ditch Stonecrop	0.5%
<i>Pyrocephalus rubineus</i>	Narrowleaf Mountain Mint	0.5%
<i>Juncus acuminatus</i>	Sharp Fruited Rush	0.3%
<i>Sanguisorba canadensis</i>	Canadian Burnet	0.3%
SHADED FOREST SEED MIX (ERNST CONSERVATION SEEDS-ERNMIX 140)		
<i>Elymus virginicus</i>	Virginia Wild Rye	35%
<i>Elymus hystrix</i>	Bottlebrush Grass	20%
<i>Chamaecrista fasciculata</i>	Partridge pea	8%
<i>Aster laevis</i>	Silky Smooth Aster	9%
<i>Helianthus helianthoides</i>	Ox Eye Sunflower	9%
<i>Parthenocissis vitacea</i>	Tail White beard Tongue	5%
<i>Munarda fistulosa</i>	Wild Bergamot	4%
<i>Aster novae-angliae</i>	New England Aster	3.50%
<i>Asclepias syriaca</i>	Common Milkweed	3%
<i>Rudbeckia triloba</i>	Brown Eyed Susan	3%
<i>Penstemon lanuginosus</i> , PA ecotype	Appalachian Beard Tongue, PA ecotype	2.50%
<i>Zizia aurea</i>	Golden Alexander	2%
<i>Solidago juncea</i>	Early Goldenrod	1.50%
<i>Anemone canadensis</i>	Canadian Anemone	1%
<i>Aster sagittifolius</i>	Arrow leaved Aster	1%
<i>Caulophyllum thalictroides</i>	Blue Cohosh	0.50%
EASTERN HABITAT MIX (ERNST CONSERVATION SEEDS-ERNMIX 173)		
<i>Andropogon gerardi</i> , Roundtree	Bacon Big Bluestem	25%
<i>Elymus canadensis</i>	Canada Wild Rye	25%
<i>Sorghastrum nutans</i> , PA Ecotype	Indian Grass, PA Ecotype	20%
<i>Chamaecrista fasciculata</i>	Partridge Pea	10%
<i>Helianthus helianthoides</i>	Ox Eye Sunflower	5%
<i>Panicum virgatum</i> , Shelter	Shelter Switch Grass	5%
<i>Desmodium canadense</i>	Showy Tick Trefol	6%
<i>Rudbeckia hirta</i>	Black Eyed Susan	4%

**DETAIL 11C
STREAM BANK SEED MIX**

- PLANT MATERIALS WILL BE FROM PLANT STOCK NATIVE OR ADAPTED TO THE EASTERN BROADLEAF FOREST ECOREGIONS, AS DEFINED BY THE USDA FOREST SERVICE, AND USDA PLANT HARDINESS ZONES 5 AND 6.
- WITHIN EACH PLANTING ZONE A TOTAL OF 350 WOODY PLANTS SHOULD BE ESTABLISHED PER ACRE OF DISTURBANCE. THE EXACT NUMBER OF EACH TREE SPECIES WILL VARY DEPENDING ON NURSERY STOCK AVAILABILITY.
- PLANT HANDING AND INSTALLATION SHOULD BE PERFORMED BY A CONTRACTOR WITH EXPERIENCE IN LANDSCAPING, PLANT PROPAGATION, PLANTING WETLAND MITIGATION SITES, REFORESTATION, AND/OR ECOLOGICAL RESTORATION WORK.
- CONDITION OF PLANT MATERIALS: PLANT MATERIALS WILL BE HEALTHY AND FREE OF DISEASE, PESTS, MECHANICAL INJURY AND STRESS. PLANTS WITH LEAVES AND SHOOTS WILL APPEAR HEALTHY, WITH NO LEAF SPOTS, LEAF DISCOLORATIONS, CHLOROSIS, LEAF WILTING OR CURLING, OR EVIDENCE OF INSECT INFESTATION. PLANTS WILL EXHIBIT NORMAL PHYSICAL AND GROWTH CHARACTERISTICS TYPICAL OF THE SPECIES. B. CONTAINER-GROWN PLANTS WILL BE FULLY ROOTED IN THE SOIL. POTTING MEDIUM WITHOUT SPIRALING PRIMARY WOODY ROOTS. C. UPON RECEIPT AND FOLLOWING INSPECTION, PLANT MATERIALS SHOULD BE IMMEDIATELY INSTALLED IN THE DISTURBED AREA. IF PLANT MATERIALS CANNOT BE INSTALLED IMMEDIATELY AFTER DELIVERY, THEY WILL BE STORED APPROPRIATELY FOR NOT LONGER THAN 3 DAYS. SEED SHOULD BE STORED IN A COOL, DRY, SHELTERED LOCATION. CONTAINER-GROWN PLANTS WILL BE STORED OUT OF DIRECT EXPOSURE TO WIND AND SUN AND WILL BE WATERED PERIODICALLY TO MAINTAIN SOIL MOISTURE.
- PROPER SEED MIX USE WILL DEPEND ON ENVIRONMENTAL CHARACTERISTICS AT THE INTENDED SITE. ALL SEED MIXES WILL BE SOWN IN CONJUNCTION WITH APPROPRIATE SEASONAL COVER CROP SEED. PRIOR TO SEEDING, SEED MIXES SHOULD BE MIXED WITH A MINIMUM OF AN EQUAL VOLUME OF APPROPRIATE INERT CARRIER (CLEAN SAND, SAWDUST, OAT GROATS, ETC.) TO PROVIDE MORE UNIFORM SEED DISTRIBUTION. WETLAND SEED MIXES WILL BE BROADCAST ON MOIST SOIL WITH HAND-HELD SEED SPREADERS UPLAND WARM SEASON GRASS SEED MIX WILL BE DRILLED INTO A FIRM SEED BED TO A DEPTH OF 1/2-INCH USING A NATIVE GRASS SEED DRILL. MULCH UPLAND BUFFERS WITH CLEAN STRAW (AT 140 POUNDS PER 1,000 SQUARE FEET) FOLLOWING TEMPORARY AND FINAL SEEDING.
- CONTAINER-GROWN WOODY AND HERBACEOUS WETLAND PLANTS WILL BE INSTALLED IN MOIST SOIL USING APPROPRIATE HAND TOOLS (SPADE, DIGGER, AUGER, ETC.). PLASTIC PLANT PROTECTORS WILL BE INSTALLED WITH ALL ROOTED WOODY PLANTS. INDIVIDUAL PLANTS WILL BE FERTILIZED ONCE, AT THE TIME OF PLANTING, BY MIXING THE FOLLOWING QUANTITIES OF 19-5-12 OSMOCOTE (14 TO 16-MONTH RELEASE) FERTILIZER IN EACH PLANTING HOLE.
 - A. 2.0 OUNCES FOR 1 GALLON WOODY PLANTS
 - B. 6.0 OUNCES FOR 5 GALLON WOODY PLANTS
 - C. 10.0 OUNCES FOR RELOCATED TREES/10 GALLON TREES/BALL & BURLAP TREES

**DETAIL 11D
STREAM BANK PLANTING NOTES**



- NOTES:
- PROVIDE POSITIVE DRAINAGE FOR ALL TREES PLANTED IN UPLAND BUFFER. DRAINAGE SHOULD BE FROM CENTER OF ROOT BALL TO PERIMETER OF ROOT BALL. DO NOT ALLOW PONDING OF WATER UNDER ROOTBALL.
 - IF PLANT IS IN A LARGE PLANT BED MULCH ENTIRE BED. IF PLANT IS A SINGLE PLANTING MULCH TO DRIP LINE OF TREE. MULCH DEPTH TO BE 3" THICK.
 - IF PLANT IS CONTAINER GROWN, REMOVE CONTAINER AND USING A SHARP KNIFE MAKE 3 VERTICAL CUTS 1/4" DEEP ON OPPOSITE SIDES OF THE ROOT MASS. IF PLANT IS IN A WIRE BASKET REMOVE PRIOR TO PLANTING.
 - IF ROOTS ARE WRAPPED IN BURLAP, 1ST. PLACE BURLAPPED ROOT BALL INTO THE HOLE. THEN REMOVE BURLAP CAREFUL NOT TO DISTURB OR BREAK THE ROOT BALL.
 - SEE PLANTING SCHEDULE AND SPECIFICATIONS FOR ADDITIONAL INFORMATION/REQUIREMENTS.

**DETAIL 12
TREE PLANTING**
N.T.S.

REVISION RECORD

C&E
Civil & Environmental Consultants, Inc.
333 Baldwin Road - Pittsburgh, PA 15205
412-429-2324 - 800-365-2324
www.candco.com

**BAILLEY CRDA NO. 5 AND 6
STREAM RESTORATION
EAST FINLEY TOWNSHIP
WASHINGTON COUNTY, PENNSYLVANIA**

STREAM RESTORATION DETAILS

DRAWING NO.: **MD01-3**

DATE: 1/23/10 DRAWN BY: M.J. M.S.
PROJECT NO.: 07-822.0014
PROJECT NAME: N.T.S. CHECKED BY: M.J. M.S.
APPROVED BY: M.J. M.S.

ATTACHMENT 5

CRDA NO. 5 & 6 PHMC CLEARANCE LETTERS



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

AREA #1-#2
Refuse Conveyor
Cleared

August 13, 2008

Randolph Manack
PA Department of Environmental Protection
California District Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423

TO EXPEDITE REVIEW USE
BHP REFERENCE NUMBER

Re: File No. ER 1985-0390-059-A70
COALD: Consol Pennsylvania
Coal Company LLC, CMAP
No. 30810703, Bailey Coal Refuse
Disposal Areas No. 1 & No. 2
Revision – Add 88 Acres for
Conveyor Corridor Extension, Rich
Hill Twp., Greene Co.

Dear Mr. Manack:

The Bureau for Historic Preservation has reviewed the above named project under the authority of the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 *et seq.* (1988), and in accordance with relevant Federal legislation. This legislation includes Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, the Surface Mining Control and Reclamation Act, and OSM's regulations. This review includes comments on the project's potential effect on both historic and archaeological resources.

Based on a recent field visit on June 18, 2008, by Mark McConaughy of our staff, it has been determined that the above referenced permit area has low archaeological potential. Consequently, this project should have no effect upon significant archaeological resources. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please contact the Bureau for Historic Preservation.

Page 2
August 13, 2008
Randolph Manack

If you need further information in this matter please consult Kira Presler at (717) 705-0700. If you need further information regarding archaeological survey please contact Mark McConaughy at (724) 527-5585 x103.

Sincerely,



Douglas C. McLearn, Chief
Division of Archaeology &
Protection

Cc: Mr. Edward Suter, Consol Pennsylvania Coal Company, LLC,
1525 Pleasant Grove Road, P.O. Box J, Claysville, PA 15323
David Hamilton, OSM Harrisburg Office
Mark A. McConaughy



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

June 20, 2008

Gregory A. Heilman, PE
Michael Baker Jr., Inc.
Airside Business Park
100 Airside Drive
Moon, PA 15108

Re: File No. ER 1985-0390-059-A64
COALD: Consol Pennsylvania
Coal Company LLC, Revision
to Coal Refuse Disposal Permit
No. 30810703, Bailey Coal Refuse
Disposal Areas No. 1 & No. 2
Conveyor Corridor Extension, Rich
Hill Twp., Greene Co.

Dear Mr. Heilman:

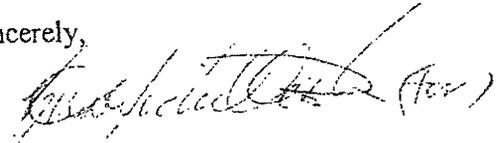
The Bureau for Historic Preservation has reviewed the above named project under the authority of the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988), and in accordance with relevant Federal legislation. This legislation includes Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, the Surface Mining Control and Reclamation Act, and OSM's regulations. This review includes comments on the project's potential effect on both historic and archaeological resources.

Based on a recent field visit on June 18, 2008, by Mark McConaughy of our staff, it has been determined that the above referenced permit area has low archaeological potential. Consequently, this project should have no effect upon significant archaeological resources. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please contact the Bureau for Historic Preservation.

Page 2
June 20, 2008
Gregory A. Heilman, PE

If you need further information in this matter please consult Kira Presler at (717) 705-0700. If you need further information regarding archaeological survey please contact Mark McConaughy at (724) 527-5585 x103.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas C. McLearn", with a circled "A" to the right of the signature.

Douglas C. McLearn, Chief
Division of Archaeology &
Protection

Cc: Mr. Edward Suter, Consol Pennsylvania Coal Company, LLC,
1525 Pleasant Grove Road, P.O. Box J, Claysville, PA 15323
DEP California District Mining Office
David Hamilton, OSM Harrisburg Office
Mark A. McConaughy



Commonwealth of Pennsylvania
 Pennsylvania Historical and Museum Commission
 Bureau for Historic Preservation
 Commonwealth Keystone Building, 2nd Floor
 400 North Street
 Harrisburg, PA 17120-0093
 www.phmc.state.pa.us

Area 5 Sed. Pond

June 15, 2009

Christine Davis
 Christine Davis Consultants
 Cider Mill of Pittsburgh
 560 Penn Street
 Verona, PA 15147

TO EXPEDITE REVIEW USE
 BHP REFERENCE NUMBER

Re: File No. ER 2002-1693-059-O
 COE: Bailey Coal Refuse Disposal
 Area No. 5-Sediment Pond
 Development, Richhill Twp., Greene
 Co.

Dear Ms. Davis:

The above named project has been reviewed by the Bureau for Historic Preservation (the State Historic Preservation Office) in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, and the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation. These requirements include consideration of the project's potential effect upon both historic and archaeological resources.

It is the opinion of the State Historic Preservation Officer that the following properties are not eligible for listing in the National Register of Historic Places:

Sollars Farmstead

Therefore, there are no National Register eligible or listed historic or archaeological properties in the area of this proposed project. Your responsibility for consultation for this project is complete. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please telephone the Bureau for Historic Preservation at (717) 783-8946.

Sincerely,

Andrea MacDonald, Chief
 Division of Preservation
 Services

AM/tmw



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

*Area 5 Slurry
Impoundment*

September 11, 2009

John D. Kernic
PA Department of Environmental Protection
California District Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423

TO EMPLOYER FOR REVIEW USE
BHP REFERENCE NUMBER

Re: File No. ER 1985-0390-059-B07
COALD: Consol Pennsylvania Coal
Company, LLC, CMAP No.
30080701 (In-Process Application)
Bailey Central Mine Complex-Coal
Refuse Disposal Area No. 5
Operation, Revision-Add 414.8
Acres for Slurry Impoundment Area
Richhill Twp., Greene Co.

Dear Mr. Kernic:

The Bureau for Historic Preservation has reviewed the above named project under the authority of the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988), and in accordance with relevant Federal legislation. This legislation includes Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, the Surface Mining Control and Reclamation Act, and OSM's regulations. This review includes comments on the project's potential effect on both historic and archaeological resources.

Based on a field visit on May 14, 2009, by Mark McConaughy of our staff, it has been determined that the above referenced permit area has low archaeological potential. Consequently, this project should have no effect upon significant archaeological resources. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please contact the Bureau for Historic Preservation.

Page 2
September 11, 2009
John D. Kernic

If you need further information in this matter please consult Kira Presler at (717) 705-0700. If you need further information regarding archaeological survey please contact Mark McConaughy at (724) 527-5585 x103.

Sincerely,

A handwritten signature in black ink, appearing to read "Douglas C. McLearn". The signature is written in a cursive style and is positioned above the typed name.

Douglas C. McLearn, Chief
Division of Archaeology &
Protection

Cc: Consol Pennsylvania Coal Company LLC, 1525 Pleasant Grove Road,
P.O. Box J, Claysville, PA 15243
David Hamilton, OSM Harrisburg Office
Mark A. McConaughy



Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

Area 6

May 19, 2009

Edward Suter
Consol Pennsylvania Coal Company, LLC
1525 Pleasant Grove Road
P.O. Box J
Claysville, PA 15323

Re: File No. ER 1985-0390-059-A91
COALC: Consol Pennsylvania Coal
Company, LLC, Coal Mining
Activity Permit Application, Bailey
Coal Refuse Disposal Area No. 6
Slurry Impoundment, Richhill Twp.,
Greene Co.

Dear Mr. Suter:

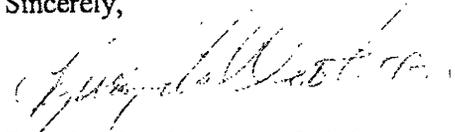
The Bureau for Historic Preservation has reviewed the above named project under the authority of the Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988), and in accordance with relevant Federal legislation. This legislation includes Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, the Surface Mining Control and Reclamation Act, and OSM's regulations. This review includes comments on the project's potential effect on both historic and archaeological resources.

Based on a recent field visit on May 14, 2009, by Mark McConaughy of our staff, it has been determined that the above referenced permit area has low archaeological potential. Consequently, this project should have no effect upon significant archaeological resources. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please contact the Bureau for Historic Preservation.

Page 2
May 19, 2009
Edward Suter

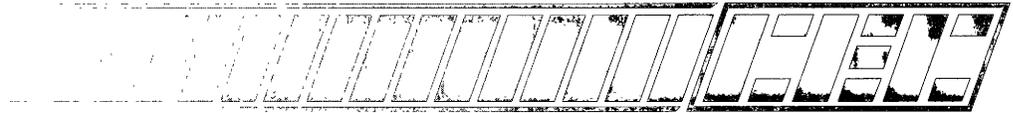
If you need further information in this matter please consult Kira Presler at (717) 705-0700. If you need further information regarding archaeological survey please contact Mark McConaughy at (724) 527-5585 x103.

Sincerely,



Douglas C. McLearn, Chief
Division of Archaeology &
Protection

Cc: Gregory A. Heilman, PE, Michael Baker Jr., Inc., Airside Business Park,
100 Airside Drive, Moon, PA 15108
DEP, California District Mining Office
David Hamilton, OSM Harrisburg Office
Mark A. McConaughy



May 14, 2010

Mr. Joel C. Folman
Water Pollution Biologist 2
District Mining Operations
Pennsylvania Department of Environmental Protection
California District Mining Office
25 Technology Drive
Coal Center, PA 15423

Dear Mr. Folman:

Subject: Application No: 30080701
Response to Comments
Bailey Mine Coal Refuse Disposal Areas No. 5 and 6
Richhill Township, Greene County, Pennsylvania
CEC Project 071-522.0013

Civil & Environmental Consultants, Inc. (CEC), on behalf of Consol Pennsylvania Coal Company LLC (CPCC), has prepared the following responses to the comments presented in your letter dated May 3, 2010, regarding the subject permit application. Below, we list the comments by number and provide the response following each comment. At this time we are only including attachments that are directly related to the responses; however, CPCC will provide the Department with a copy of the final comprehensive stream restoration and wetland mitigation plan within one week of the date of this letter. Copies of the final comprehensive plan will also be provided to the USACE, USEPA, USFWS, and the PAFBC.

Comment 1. A legal review of the proposed landowner agreement determined the agreement is not adequate to provide permanent protection for the completed stream mitigation. The agreement must ensure stream mitigation is protected from landowner intervention and live stock damage and provide Department staff access for construction and post construction monitoring. Provide a table which correlates agreements to drawings and parcel numbers.

RESPONSE: In addition to the previously signed and recorded stream access agreements and memorandum of agreements, an additional protective covenant document is currently being reviewed by the USACE and PADEP Attorneys for final approval. When final approval is received from both agencies the additional protective covenant document will be distributed to private property owners for signatures and provided to the agencies when completed. Parcel numbers will be included with the signed agreements.

Civil & Environmental Consultants, Inc.

Pittsburgh
333 Baldwin Road
Pittsburgh, Pennsylvania 15205
Phone 412/429-2324
Fax 412/429-2114
Toll Free 800/365-2324
E-mail info@cecinc.com

Chicago 877/963-6026
Cincinnati 800/759-5614
Cleveland 866/507-2324
Columbus 888/598-6808
Detroit 866/380-2324

Export 800/899-3610
Indianapolis 877/746-0749
Nashville 800/763-2326
Phoenix 877/231-2324
St. Louis 866/250-3679

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Comment 2. Please be advised a maintenance bond will be required upon successful completion of the stream mitigation work to ensure the long-term viability of the mitigation and to provide monitoring for the life of the permit.

RESPONSE: CPCC acknowledges this comment and will provide a maintenance bond for the stream restoration work and will monitor the restoration areas for the life of the Bailey Mine CRDA No. 5 & 6 permit.

Comment 3. Correct plan drawing scales, as some are listed at 1-inch = 150-feet.

RESPONSE: The scale on drawings CP09-1 through CP09-9 were revised to list a scale of 1 inch = 50 feet. A complete set of revised drawings is included with this response.

Comment 4. Depict footprints of proposed wetland mitigation areas for the No. 5/No. 6 coal refuse disposal areas on the site plan exhibits.

RESPONSE: The footprint of Wetland Mitigation Areas 1, 2, and 3 are shown on stream restoration drawings CP01-2, CP05-1, and CP05-2, respectively.

Comment 5. Specify the stream mitigation construction will be conducted and monitored by persons qualified in stream restoration work. Specify that restoration work upon completion will be certified by a qualified individual that the work has been completed in accordance with the approved permit.

RESPONSE: CPCC acknowledges this comment and will complete the stream restoration work using a qualified contractor. Construction oversight will be provided by a qualified consultant to ensure that the stream restoration activities are implemented as designed. Additionally, the as-built survey report will be certified by a qualified individual who has experience with stream restoration projects.

Templeton Fork Stream Restoration Plan:

Comment 6. Projects noted on Page 2 showing active channel restoration to offset stream impacts; have each of the projects reached their proposed success thresholds; if not why?

RESPONSE: An explanation of the success of the listed projects is provided in the following table.



Project	Stream Impact (l.f.)	Stream Restoration (l.f.)	Type of Restoration	Success of Projects
Crabapple Slope and Supply Yard	1,944	2,028	Active Channel Restoration	Project has been constructed and is still being monitored. Surveys to date indicate that the project will meet the established success criteria.
Crabapple Overland Belt	5,749	4,366	Active Channel Restoration	Pending Chapter 105 approval to construct this project.
Pittsburgh Mills Mall	6,733	11,000	Instream Habitat Improvement	Corrective measures are proposed for the instream habitat enhancement structures because of incorrect design and installation.
Little Blue Run	5,544	9,212	Stream Fencing and Riparian Planting	Project is still being monitored; however, the sites are progressing towards attainment of the success criteria.
Newbury	1,400	1,508	Active Channel Restoration	Permit was issued in the fall of 2009 and is currently waiting to be constructed.

Comment 7. The mitigation plan shall be based on the pre-treatment biological studies of macro-benthic organisms found within the Templeton Fork Watershed (within the area of influence) to offset the takings of biological organisms within the Owens Run Watershed associated with the proposed CRDA #5 permit area. Success shall be determined by the increasing the baseline of macro-benthic organisms using the Pa. DEP "Pollution Tolerance Values" between 0-6. Revise section 3.10 accordingly.



RESPONSE: Two biological success criteria are proposed for the Templeton Fork stream restoration plan.

1. Benthic macroinvertebrate standing crop in the stream mitigation areas will increase by a minimum of 700,000 organisms. Benthic macroinvertebrate sampling for density and standing crop estimates will be performed according to the stream classification protocol described in Module 15.2.c.
2. Pollution tolerance values cannot be determined from the family level identifications used for the standing crop estimates. Therefore, CPCC proposes to measure improvement in the benthic macroinvertebrate community structure at twelve (12) representative locations using the PADEP *Index of Biotic Integrity for Wadeable Freestone Streams in Pennsylvania (PA IBI)* protocol.

This protocol was selected to monitor improvements in the restored stream segments because: (1) it is a standard water quality assessment method that has been extensively tested and approved for use in Pennsylvania; and (2) it integrates six sensitive individual biological metrics into a single IBI score that can be used to evaluate mitigation success.

The six metrics include:

- Percent Sensitive Individuals (only includes taxa with pollution tolerance values (PTV) of 0-3)
- EPT taxa richness (only includes taxa with PTV of 0-4)
- Modified Beck's Index (only includes taxa with PTV of 0-2)
- Total Taxa Richness
- Hilsenhoff Biotic Index
- Shannon Diversity Index

The PADEP has established an IBI benchmark score of 63.0 for aquatic life use (ALU) attainment for streams classified as WWF and TSF, which applies to the Templeton Fork watershed. CPCC has just completed the first round of sampling on the twelve stations established within the restoration streams (see figure and data in Attachment 1). The IBI scores for the twelve stations range from 25.1 to 58.1, all indicating non-attainment. As a biological quality performance criterion, CPCC proposes to increase the baseline IBI scores by 50% or bring them up to the ALU benchmark score of 63.0.



Comment 8. Stream bank grading will require the removal of excess soils; provide information on where this material will be placed along with reclamation information. Other permits maybe required by other agencies; has the company reviewed this issue?

RESPONSE: Two soil disposal areas have been identified and are shown on the figure in Attachment 1. CPCC is currently seeking approval of the Erosion and Sedimentation (E&S) control plan and stormwater management plan through the Washington County Conservation District. The following reclamation information for the soil disposal areas was excerpted from the E&S control plan.

Soil disposal areas will be constructed in abandoned pastures along ridges. Fill material will be placed and stabilized in 10 vertical increments. Erosion control blankets will be installed on the face of the disturbed area will be seeded and mulched to promote establishment of vegetation. As the fill progresses, slope interrupter devices will be installed to collect and filter sediment laden water from the disposal area side slopes. Additionally, various sizes of Filtrex SiltSoxx™ (18", 24", etc.) will be used as perimeter control to filter sediment laden runoff from the construction site. Once final grades are established, the disposal pad will be seeded and mulched with grass seed mixtures mirroring existing vegetation.

Comment 9. Stream bank fencing was noted; provide a minimum width which will be used to protect both stream and riparian habitats?

RESPONSE: The stream bank fencing on the Bedillion property will provide a minimum 50-foot wide stream and riparian corridor; however, several sections will protect greater than a 100-foot wide corridor as shown on drawings CP09-1 through CP09-9.

Comment 10. Regrading and/or relocation of the stream channels were noted; how will the company reclaim the pre-existing channels?

RESPONSE: Existing channels that will be abandoned during the channel relocations will be backfilled with the excavated material from the newly created channel and will be planted with deep-rooted herbaceous and woody vegetation along the filled channel and newly-established stream banks. Backfilling is required to ensure that the stream will not scour into the abandoned channel during storm events, which could compromise the restoration activities.

Comment 11. Include the following to prevent unplanned wetland impacts from stream restoration construction activities: All wetlands within 50 feet of proposed stream restoration



activities shall be accurately delineated by a qualified individual prior to site development to ensure that unplanned impacts to wetlands do not occur. Individuals involved in the stream restoration work are to be instructed to avoid the wetland areas.

RESPONSE: CPCC acknowledges this comment and will have a qualified wetland scientist delineate and clearly mark the boundaries of the existing wetlands within 50 feet of the restoration areas. Construction contractors will be instructed to avoid the wetland areas during restoration.

Comment 12. Specify the general width of the riparian corridor to be planted for all planting areas.

RESPONSE: An average 50-foot-wide riparian corridor will be planted and protected within the restoration areas as indicated on the revised stream restoration drawings.

Comment 13. Areas previous mitigated from stream pooling should be excluded from the proposed stream length mitigation credit under this application.

RESPONSE: The proposed Templeton Fork restoration plan uses a watershed approach to improving the instream habitat and riparian corridors in the upper Templeton Fork watershed. Previous gate cuts were conducted to mitigate stream pooling only, but did not address the ecological component of restoring wooded riparian corridors along the stream channel. Since the historic gate cuts are deficient in this aspect, CPCC proposes to enhance the previous work with riparian plantings.

CPCC has accounted for the length of riparian planting that will be conducted in these reaches within the mitigation plan, but has not taken credit for previously completed bank grading and stabilization.

Comment 14. Show completed and proposed gate cut areas on the CP maps to show ties with the proposed project.

RESPONSE: The limits of completed and proposed gate cuts are depicted on the revised stream restoration drawings.

Templeton Fork Stream Restoration Plan: Maps

Comment 15. Depict the proposed enhancement structures within either the historic and proposed gate cut areas.

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RESPONSE: The location of the proposed enhancement structures within the historic and proposed gate cut areas are shown on the revised stream restoration drawings.

CP01-2:

Comment 16. Extend the bank cut on the right descending bank between Photo station 13 and 14.

RESPONSE: Stream restoration drawing CP01-2 has been revised to address this comment.

CP02-1:

Comment 17. At Photo station 1 through 2, why didn't the company propose stream relocation rather than the boulder placement to protect the township road from being undercut?

RESPONSE: A channel relocation was not proposed in the area identified by this comment, because it is adjacent to a property line. CPCC has revised stream restoration drawing CP02-1 to show grading on the inside meander and inclusion of rock vanes that will be constructed to deflect flow away from the township road embankment.

Comment 18. Provide a cut between Photo-station 14 to 15 along the left descending hank.

RESPONSE: Stream restoration drawing CP02-1 has been revised to address this comment.

Comment 19. Provide a cut on the left descending bank between Photo- stations 10 to 11.

RESPONSE: Stream restoration drawing CP02-1 has been revised to address this comment.

CP03-1

Comment 20. The company should remove the alluvial material depicted in Photo-station 10, the stream appears to be constricted in this area.

RESPONSE: CPCC acknowledges this comment and will remove the accumulated alluvial material in Templeton Fork at the confluence with Tributary 32736.

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CP04-1

Comment 21. Provide a cut on the right descending bank between Photo-stations 3 through 5.

RESPONSE: Stream restoration drawing CP04-1 has been revised to address this comment.

Comment 22. Provide a structure on the outside bend upstream of Photo-station 5.

RESPONSE: Stream restoration drawing CP04-1 has been revised to address this comment.

Comment 23. Provide a cut extension at Photo-station 5.

RESPONSE: Stream restoration drawing CP04-1 has been revised to address this comment.

CP05-1

Comment 24. Cattle were noted in this area, provide stream bank fencing in this area to prevent access to the restoration project.

RESPONSE: CPCC will exclude cattle from the proposed stream restoration area by either installing cattle exclusion fencing or removing livestock from the property.

CP05-1 and CP05-3

Comment 25. Provide a cut along the right descending bank from the corner downstream of Photo-station 22 to 23.

RESPONSE: CPCC believes this comment is in reference to the left descending bank. Stream restoration drawing CP05-1 has been revised to address this comment.

Comment 26. Provide a cut along the right descending bank between Photo-stations 24 to 25.

RESPONSE: Stream restoration drawings CP05-1 and CP05-3 have been revised to address this comment.



CP07-1

Comment 27. Provide a cut on the right descending bank at Photo- station 6.

RESPONSE: Stream restoration drawing CP07-1 has been revised to address this comment.

CP09-1 and CP09-4

Comment 28. Are instream structures proposed within the gate cut area F-17 and F-18?

RESPONSE: As noted in the response to Comment 15, the location of the proposed enhancement structures within the historic and proposed gate cut areas are shown on the revised stream restoration drawings.

CP09-8 and CP09-9

Comment 29. Provide photo-stations for both maps within the proposed work areas.

RESPONSE: Stream restoration drawings CP09-8 and CP09-9 have been revised to address this comment and the revised photo pages are included with Attachment 2.

CP01-1 and CP09-8: Wetland Takes

Comment 30. What type of wetlands are "G" and "W" and how many acres will be affected during stream restoration. Provide plans to mitigate any affected wetland areas?

RESPONSE: Wetlands "G" and "W" are both palustrine emergent wetlands, that will be incur minor impacts due to the proposed bank grading in these areas. The following table lists the wetland name, classification, existing acreage, and impact acreage.

Wetland Name	USFWS Classification	Existing Acreage	Impact Acreage	Drawing Number
Wetland G	PEM	0.08	0.04	CP01-1
Wetland W	PEM	0.12	0.01	CP09-8
Total	-----	0.20	0.05	-----

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The additional 0.05 acre of wetland impact will be mitigated within the proposed wetland mitigation areas; therefore, CPCC will provide a total of 5.92 acres of wetland mitigation for the Bailey CRDA No. 5 & 6 project. The design acreage of the three wetland mitigation areas along Templeton Fork totals 6.70 acres, thus providing adequate area to compensate for the additional impacts.

Appendix B Stream Restoration Area Site Photographs:

Comment 31. Correct: photographs depicting the East Finley Park property are mislabeled as Tributary 32731 they should read 32736. (Photographs 1-14)

RESPONSE: The restoration photographs for East Finley Park have been revised to read "Tributary 32736" and are included with this response as Attachment 3.

Comment 32. Photo 12 should be 32736 to Templeton Fork not 32731 (see CP03-1)

RESPONSE: The restoration photographs for East Finley Park have been revised to read "Tributary 32736" and are included with this response as Attachment 3.

Comment 33. Photo station 6 on CP04-2 should be labeled Photo station 15, correct to correspond to photograph.

RESPONSE: Stream restoration drawing CP04-2 has been revised to address this comment.

Comment 34. Provide a photograph for photo station 23 as depicted on CP04-2.

RESPONSE: The restoration photographs corresponding to CP04-2 have been revised to include photograph 23 (Attachment 4).

Comment 35. CP05-1: Cattle were noted in this area. Provide stream bank fencing to prevent access to all restoration projects in this area.

RESPONSE: CPCC will exclude cattle from the proposed stream restoration area by either installing cattle exclusion fencing or removing livestock from the property.

Comment 36. Provide Photo Stations on streams located on maps CP09-8 and CP09-9.

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RESPONSE: Stream restoration drawings CP09-8 and CP09-9 have been revised to address this comment and the revised photo pages are included as Attachment 2.

3.10 Stream Restoration Success Criteria

Comment 37. Change the statement: stream restoration project will be deemed successful when the "majority", to deemed successful when "all" of the following criteria have been met. Revise Module 19 criteria accordingly.

RESPONSE: Attachment 19.2c to Module 19 has been revised to include the word "all" and is provided as Attachment 5 of this document.

Comment 38. Breakout the success criteria between the in stream and stream bank restoration segments.

RESPONSE: Please see Attachment 19.2c. to Module 19, which is provided as Attachment 5 of this response document.

Comment 39. Paragraph 6: remove "excluding live stakes" from this paragraph.

RESPONSE: Please see Attachment 19.2c. to Module 19, which is provided as Attachment 5 of this response document.

Comment 40. Provide performance minimum of 70 percent survival rate for live stakes Herbaceous vegetation planted on the stream banks that will be cut to prevent erosion/sedimentation. Revise 19. c under Bond Reclamation Calculation to reflect this criterion.

RESPONSE: Please see Attachment 19.2c. to Module 19, which is provided as Attachment 5 of this response document.

Stream Protection:

Comment 41. Company to obtain from the landowner access agreement which permits agency personnel to enter properties for inspection purposes.

RESPONSE: In addition to the previously signed and recorded stream access agreements and memorandum of agreements, an additional protective covenant document is currently being reviewed by the USACE and PADEP Attorneys for final approval. When final approval is received from both agencies the additional protective covenant document will



be distributed to private property owners for signatures and provided to the agencies when completed.

Comment 42. The company must acknowledge responsibility for all construction, maintenance, monitoring, and funding of the final accepted stream mitigation project for the life of permit.

RESPONSE: CPCC acknowledges this comment and accepts responsibility for all construction, maintenance, monitoring, and funding of the final accepted stream restoration project for the life of the CRDA No. 5 & 6 permit.

3.12.1 Pre-restoration Baseline Stream Monitoring

Comment 43. Baseline Monitoring-(2) c) The company is proposing on using Pennsylvania Department of Environmental Protection Index of Biotic Integrity for Wadeable, Freestone Streams in Pennsylvania (IBI). However, the company is currently using for the stream evaluation for the CRDA #5 Sedimentation and Impoundment Applications the Surface Water Protection- Underground Bituminous Coal Mining Operations methodology (563-2000-655). Why is the company using two different sampling methodologies to determine benthic communities?

RESPONSE: CPCC was directed by Mr. Joel Folman, of the PADEP CDMO, to assess the instream biological community for the CRDA No. 5 Sediment Pond and Slurry Impoundment applications using the methodology outlined in TGD 563-2000-655. Justification for using the IBI protocol is included with the response to Comment 38. The IBI method used to collect the first round of baseline data and that is proposed to be used for subsequent pre- and post-restoration monitoring is only being used to measure restoration success by comparing pre- and post-restoration conditions within the mitigation streams. The associated success criterion does not involve comparison of the mitigation streams with the impacted streams.

Comment 44. Pre-restoration baseline monitoring shall be conducted at the same time periods as post restoration monitoring (October through May for benthic communities).

RESPONSE: CPCC acknowledges this comment and will conduct benthic macroinvertebrate sampling during the specified time period of October through May.

Comment 45. Establish two 100 meter monitoring locations within each restoration section. Depict the stations on the site plan maps.

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RESPONSE: A network of twelve biological monitoring stations has been established throughout the restoration area. Five stations are located along the mainstem of Templeton Fork and seven stations are located on the larger tributaries to Templeton Fork. The locations of the biological monitoring stations are shown on the figure in Attachment 1. The intermittent flow regime of the smaller tributaries is not conducive for instream biological monitoring of benthic macroinvertebrates and fish. For this reason, CPCC has elected not to establish biological monitoring stations on these smaller streams.

This concludes CPCC's responses to the Department's comment letter, dated May 3, 2010. Please contact me if you have any other comments or questions.

Very truly yours,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read 'Michael L. Shema', is written over the typed name.

Michael L. Shema
Project Manager, Ecological Services

A handwritten signature in black ink, appearing to read 'Mark R. Haibach', is written over the typed name.

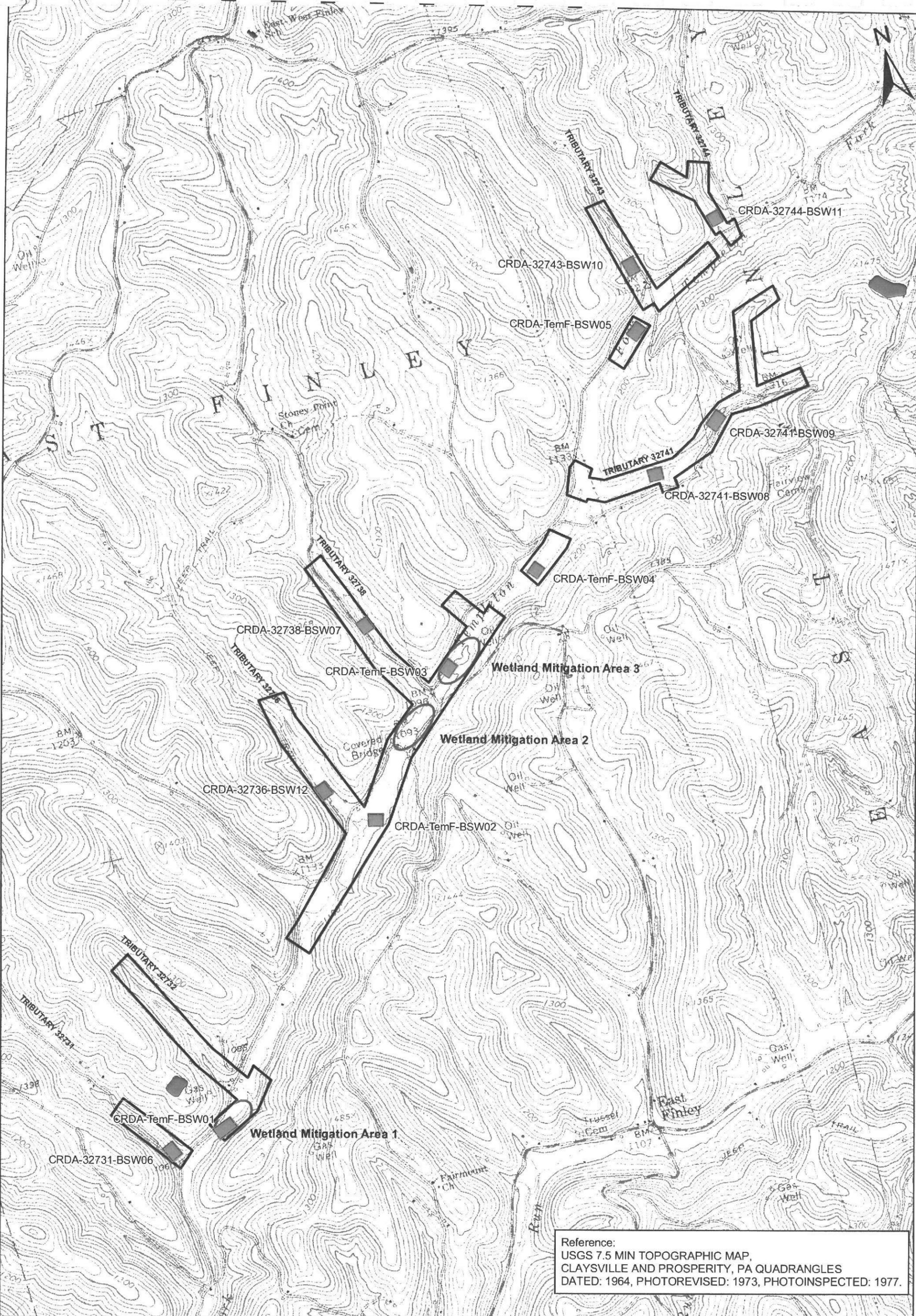
Mark R. Haibach, M.S., PWS
Vice President, Ecological Services

cc: Marcia Haberman (USACE – no figures)
Stephanie Chin (USEPA – no figures)
Jennifer Kagel (USFWS – no figures)
Steve Kepler (PAFBC – no figures)
Kerry Goodballet (CONSOL – no figures)
Ed Suter (CONSOL)

071-522.0013-RC-PADEP-5-14-10/W

ATTACHMENT 1

TEMPLETON FORK BASELINE BIOLOGICAL DATA



Reference:
 USGS 7.5 MIN TOPOGRAPHIC MAP,
 CLAYVILLE AND PROSPERITY, PA QUADRANGLES
 DATED: 1964, PHOTOREVISED: 1973, PHOTOINSPECTED: 1977.

DRAWN BY: CLC
 CHECKED BY: MLS
 APPROVED BY: MRH*
 SCALE: 1" = 1,500'
 DATE: 5/12/2010

0 1,500 3,000 Feet

Legend

- Stream Restoration Areas
- Wetland Mitigation Areas
- Biological Monitoring Station
- Soil Disposal Area

*Hand signature on file.

ISSUED FOR: **CONSOL ENERGY**

ISSUED BY: **C&E**

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
 333 Baldwin Road
 Pittsburgh, PA 15205-9702
 1-800-365-2324

Columbus, OH * Cleveland, OH * Cincinnati, OH * Indianapolis, IN * Nashville, TN * Chicago, IL * St. Louis, MO *
 Export, PA * Detroit, MI * Phoenix, AZ

BIOLOGICAL MONITORING STATION
 SITE LOCATION MAP
 BAILEY CRDA NO. 5 AND 6
 CONSOL PENNSYLVANIA COAL COMPANY LLC
 GREENE COUNTY, PENNSYLVANIA

PROJECT NO.: 071-522.0013

Station CRDA-TemF-BSW01
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/13/2010	
	Riffle	Pool
Water Temperature (°C)	10.4	10.2
Dissolved Oxygen (mg/L)	8.8	5.4
pH (Standard Units)	7.75	7.75
Conductivity (uS/cm)	343	342
Stream Flow Rate (cubic feet per second)	4.51	
Habitat Reach Length (feet)	143	185
Stream Depth (inches)	3-36	
Stream Width (feet)	9-22	
USEPA Habitat Assessment Score	130	133
% Substrate Particle Size		
Silt (<0.062 mm)	6%	
Sand (0.125 - 2 mm)	16%	
Gravel (2 - 64 mm)	26%	
Cobble (64 - 256 mm)	40%	
Boulder (256 - 2,048 mm)	12%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	69	
Benthic IBI Metrics and Score		
Total Taxa Richness	23	
EPT Taxa Richness	11	
Beck's Index, Version 3	5	
Hilsenhoff Biotic Index	5.12	
Shannon Diversity Index	2.23	
Percent Sensitive Individuals	10.5%	
IBI Score	48.6	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	308	
Species Richness	12	
Dominant Species	Rainbow darter	
Percent Dominant Species	23%	
Shannon-Weaver Diversity Index	2.98	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	31.8	
Catch Per Foot (fish/foot)	0.94	
Catch Per Minute (fish/minute)	9.70	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW02
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/15/2010	
	Riffle	Pool
Water Temperature (°C)	8.8	8.7
Dissolved Oxygen (mg/L)	11.3	10.3
pH (Standard Units)	7.85	7.89
Conductivity (uS/cm)	313	309
Stream Flow Rate (cubic feet per second)	3.09	
Habitat Reach Length (feet)	122	206
Stream Depth (inches)	1-34	
Stream Width (feet)	3-16	
USEPA Habitat Assessment Score	111	111
% Substrate Particle Size		
Silt (<0.062 mm)	9%	
Sand (0.125 - 2 mm)	9%	
Gravel (2 - 64 mm)	52%	
Cobble (64 - 256 mm)	23%	
Boulder (256 - 2,048 mm)	7%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	35	
Benthic IBI Metrics and Score		
Total Taxa Richness	17	
EPT Taxa Richness	6	
Beck's Index, Version 3	1	
Hilsenhoff Biotic Index	4.94	
Shannon Diversity Index	2.04	
Percent Sensitive Individuals	17.1%	
IBI Score	39.9	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	309	
Species Richness	13	
Dominant Species	Bluntnose minnow	
Percent Dominant Species	24%	
Shannon-Weaver Diversity Index	2.92	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	28.2	
Catch Per Foot (fish/foot)	0.94	
Catch Per Minute (fish/minute)	10.99	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal =106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW03
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/13/2010	
	Riffle	Pool
Water Temperature (°C)	12.3	12.3
Dissolved Oxygen (mg/L)	10.9	9.1
pH (Standard Units)	8.02	8.12
Conductivity (uS/cm)	330	330
Stream Flow Rate (cubic feet per second)	2.16	
Habitat Reach Length (feet)	162	166
Stream Depth (inches)	1-26	
Stream Width (feet)	3-20	
USEPA Habitat Assessment Score	98	104
% Substrate Particle Size		
Silt (<0.062 mm)	6%	
Sand (0.125 - 2 mm)	15%	
Gravel (2 - 64 mm)	43%	
Cobble (64 - 256 mm)	28%	
Boulder (256 - 2,048 mm)	8%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	28	
Benthic IBI Metrics and Score		
Total Taxa Richness	16	
EPT Taxa Richness	6	
Beck's Index, Version 3	2	
Hilsenhoff Biotic Index	5.49	
Shannon Diversity Index	1.65	
Percent Sensitive Individuals	5.5%	
IBI Score	34.2	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	412	
Species Richness	14	
Dominant Species	Bluntnose minnow	
Percent Dominant Species	40%	
Shannon-Weaver Diversity Index	2.61	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	25.2	
Catch Per Foot (fish/foot)	1.26	
Catch Per Minute (fish/minute)	16.37	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW04
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/19/2010	
	Riffle	Pool
Water Temperature (°C)	7.2	7.3
Dissolved Oxygen (mg/L)	9.9	9.1
pH (Standard Units)	7.61	7.64
Conductivity (uS/cm)	246	298
Stream Flow Rate (cubic feet per second)	0.88	
Habitat Reach Length (feet)	25	303
Stream Depth (inches)	1-36	
Stream Width (feet)	5-15	
USEPA Habitat Assessment Score	85	103
% Substrate Particle Size		
Silt (<0.062 mm)	30%	
Sand (0.125 - 2 mm)	36%	
Gravel (2 - 64 mm)	27%	
Cobble (64 - 256 mm)	7%	
Boulder (256 - 2,048 mm)	0%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	1	
Benthic IBI Metrics and Score		
Total Taxa Richness	12	
EPT Taxa Richness	3	
Beck's Index, Version 3	1	
Hilsenhoff Biotic Index	6.75	
Shannon Diversity Index	1.48	
Percent Sensitive Individuals	3.10%	
IBI Score	25.1	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	240	
Species Richness	7	
Dominant Species	Bluntnose minnow	
Percent Dominant Species	51%	
Shannon-Weaver Diversity Index	2.00	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	18.8	
Catch Per Foot (fish/foot)	0.73	
Catch Per Minute (fish/minute)	12.78	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal =106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-TemF-BSW05
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/12/2010	
	Riffle	Pool
Water Temperature (°C)	8.5	8.5
Dissolved Oxygen (mg/L)	10.3	10.6
pH (Standard Units)	7.61	7.59
Conductivity (uS/cm)	218	225
Stream Flow Rate (cubic feet per second)	0.64	
Habitat Reach Length (feet)	300	28
Stream Depth (inches)	1-20	
Stream Width (feet)	2-14	
USEPA Habitat Assessment Score	89	80
% Substrate Particle Size		
Silt (<0.062 mm)	5%	
Sand (0.125 - 2 mm)	8%	
Gravel (2 - 64 mm)	22%	
Cobble (64 - 256 mm)	35%	
Boulder (256 - 2,048 mm)	12%	
Bedrock (> 2,048 mm)	18%	
Median Particle Size D ₅₀ (mm)	128	
Benthic IBI Metrics and Score		
Total Taxa Richness	18	
EPT Taxa Richness	5	
Beck's Index, Version 3	4	
Hilsenhoff Biotic Index	5.61	
Shannon Diversity Index	1.33	
Percent Sensitive Individuals	14.1%	
IBI Score	34.8	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	245	
Species Richness	9	
Dominant Species	Creek chub	
Percent Dominant Species	45%	
Shannon-Weaver Diversity Index	2.48	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	18.5	
Catch Per Foot (fish/foot)	0.75	
Catch Per Minute (fish/minute)	13.26	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32731-BSW06
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/13/2010	
	Riffle	Pool
Water Temperature (°C)	9.7	9.6
Dissolved Oxygen (mg/L)	11.0	10.5
pH (Standard Units)	7.83	7.81
Conductivity (uS/cm)	236	237
Stream Flow Rate (cubic feet per second)	0.27	
Habitat Reach Length (feet)	278	50
Stream Depth (inches)	1-16	
Stream Width (feet)	1-3.5	
USEPA Habitat Assessment Score	115	112
% Substrate Particle Size		
Silt (<0.062 mm)	21%	
Sand (0.125 - 2 mm)	9%	
Gravel (2 - 64 mm)	40%	
Cobble (64 - 256 mm)	23%	
Boulder (256 - 2,048 mm)	7%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	17	
Benthic IBI Metrics and Score		
Total Taxa Richness	24	
EPT Taxa Richness	6	
Beck's Index, Version 3	0	
Hilsenhoff Biotic Index	5.98	
Shannon Diversity Index	2.13	
Percent Sensitive Individuals	1.0%	
IBI Score	38.3	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	161	
Species Richness	5	
Dominant Species	Blacknose dace	
Percent Dominant Species	52%	
Shannon-Weaver Diversity Index	1.32	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	14.3	
Catch Per Foot (fish/foot)	0.49	
Catch Per Minute (fish/minute)	11.25	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32738-BSW07
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/15/2010	
	Riffle	Pool
Water Temperature (°C)	16.4	16.6
Dissolved Oxygen (mg/L)	10.6	10.4
pH (Standard Units)	8.14	8.76
Conductivity (uS/cm)	364	365
Stream Flow Rate (cubic feet per second)	0.89	
Habitat Reach Length (feet)	185	143
Stream Depth (inches)	1-16	
Stream Width (feet)	2-10	
USEPA Habitat Assessment Score	121	112
% Substrate Particle Size		
Silt (<0.062 mm)	11%	
Sand (0.125 - 2 mm)	14%	
Gravel (2 - 64 mm)	45%	
Cobble (64 - 256 mm)	22%	
Boulder (256 - 2,048 mm)	5%	
Bedrock (> 2,048 mm)	3%	
Median Particle Size D ₅₀ (mm)	27	
Benthic IBI Metrics and Score		
Total Taxa Richness	23	
EPT Taxa Richness	9	
Beck's Index, Version 3	5	
Hilsenhoff Biotic Index	4.93	
Shannon Diversity Index	2.04	
Percent Sensitive Individuals	8.3%	
IBI Score	45.7	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	156	
Species Richness	9	
Dominant Species	Creek chub	
Percent Dominant Species	33%	
Shannon-Weaver Diversity Index	2.62	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	19.0	
Catch Per Foot (fish/foot)	0.48	
Catch Per Minute (fish/minute)	8.23	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32741-BSW08
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/14/2010	
	Riffle	Pool
Water Temperature (°C)	15.2	15.2
Dissolved Oxygen (mg/L)	13.3	12.0
pH (Standard Units)	8.36	8.54
Conductivity (uS/cm)	326	331
Stream Flow Rate (cubic feet per second)	0.09	
Habitat Reach Length (feet)	278	50
Stream Depth (inches)	1-8	
Stream Width (feet)	1-4	
USEPA Habitat Assessment Score	124	118
% Substrate Particle Size		
Silt (<0.062 mm)	8%	
Sand (0.125 - 2 mm)	23%	
Gravel (2 - 64 mm)	47%	
Cobble (64 - 256 mm)	19%	
Boulder (256 - 2,048 mm)	3%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	9	
Benthic IBI Metrics and Score		
Total Taxa Richness	21	
EPT Taxa Richness	8	
Beck's Index, Version 3	8	
Hilsenhoff Biotic Index	3.56	
Shannon Diversity Index	1.93	
Percent Sensitive Individuals	63.2%	
IBI Score	58.1	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	36	
Species Richness	3	
Dominant Species	Creek chub	
Percent Dominant Species	56%	
Shannon-Weaver Diversity Index	1.23	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	9.5	
Catch Per Foot (fish/foot)	0.11	
Catch Per Minute (fish/minute)	3.81	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32741-BSW09
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010 4/14/2010	
	Riffle	Pool
Water Temperature (°C)	16.1	15.8
Dissolved Oxygen (mg/L)	10.5	7.2
pH (Standard Units)	7.88	7.98
Conductivity (uS/cm)	344	347
Stream Flow Rate (cubic feet per second)	0.03	
Habitat Reach Length (feet)	292	36
Stream Depth (inches)	0.5 - 14	
Stream Width (feet)	0.5 - 3.5	
USEPA Habitat Assessment Score	90	87
% Substrate Particle Size		
Silt (<0.062 mm)	14%	
Sand (0.125 - 2 mm)	26%	
Gravel (2 - 64 mm)	32%	
Cobble (64 - 256 mm)	16%	
Boulder (256 - 2,048 mm)	6%	
Bedrock (> 2,048 mm)	6%	
Median Particle Size D ₅₀ (mm)	11	
Benthic IBI Metrics and Score		
Total Taxa Richness	18	
EPT Taxa Richness	5	
Beck's Index, Version 3	2	
Hilsenhoff Biotic Index	5.25	
Shannon Diversity Index	1.12	
Percent Sensitive Individuals	17.9%	
IBI Score	34.2	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	21	
Species Richness	2	
Dominant Species	Creek chub	
Percent Dominant Species	86%	
Shannon-Weaver Diversity Index	0.59	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	7.6	
Catch Per Foot (fish/foot)	0.06	
Catch Per Minute (fish/minute)	2.78	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32743-BSW10
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/12/2010	
	Riffle	Pool
Water Temperature (°C)	15.8	15.4
Dissolved Oxygen (mg/L)	9.4	9.3
pH (Standard Units)	7.91	7.34
Conductivity (uS/cm)	301	368
Stream Flow Rate (cubic feet per second)	0.06	
Habitat Reach Length (feet)	218	110
Stream Depth (inches)	1-13	
Stream Width (feet)	1-4	
USEPA Habitat Assessment Score	67	73
% Substrate Particle Size		
Silt (<0.062 mm)	5%	
Sand (0.125 - 2 mm)	38%	
Gravel (2 - 64 mm)	52%	
Cobble (64 - 256 mm)	10%	
Boulder (256 - 2,048 mm)	0%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	8	
Benthic IBI Metrics and Score		
Total Taxa Richness	19	
EPT Taxa Richness	5	
Beck's Index, Version 3	3	
Hilsenhoff Biotic Index	5.21	
Shannon Diversity Index	1.59	
Percent Sensitive Individuals	24.5%	
IBI Score	39.2	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	35	
Species Richness	2	
Dominant Species	Creek chub	
Percent Dominant Species	89%	
Shannon-Weaver Diversity Index	0.51	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	11.2	
Catch Per Foot (fish/foot)	0.11	
Catch Per Minute (fish/minute)	3.13	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal =106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32744-BSW11
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/12/2010	
	Riffle	Pool
Water Temperature (°C)	17.3	16.8
Dissolved Oxygen (mg/L)	9.4	6.9
pH (Standard Units)	8.18	8.19
Conductivity (uS/cm)	260	260
Stream Flow Rate (cubic feet per second)	0.12	
Habitat Reach Length (feet)	293	35
Stream Depth (inches)	1-7	
Stream Width (feet)	1-4	
USEPA Habitat Assessment Score	96	89
% Substrate Particle Size		
Silt (<0.062 mm)	6%	
Sand (0.125 - 2 mm)	31%	
Gravel (2 - 64 mm)	39%	
Cobble (64 - 256 mm)	21%	
Boulder (256 - 2,048 mm)	3%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	12.65	
Benthic IBI Metrics and Score		
Total Taxa Richness	22	
EPT Taxa Richness	7	
Beck's Index, Version 3	6	
Hilsenhoff Biotic Index	4.43	
Shannon Diversity Index	1.86	
Percent Sensitive Individuals	48.00%	
IBI Score	51.6	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	57	
Species Richness	3	
Dominant Species	Creek chub	
Percent Dominant Species	89%	
Shannon-Weaver Diversity Index	0.55	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	9.7	
Catch Per Foot (fish/foot)	0.17	
Catch Per Minute (fish/minute)	5.86	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

Station CRDA-32736-BSW12
Water Quality, Benthic Macroinvertebrate, and Fish Data
Bailey CRDA No. 5 and 6, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522

Water Quality Parameters	Spring 2010	
	4/19/2010	
	Riffle	Pool
Water Temperature (°C)	13.7	14.0
Dissolved Oxygen (mg/L)	9.1	8.5
pH (Standard Units)	7.59	7.62
Conductivity (uS/cm)	305	305
Stream Flow Rate (cubic feet per second)	0.11	
Habitat Reach Length (feet)	248	80
Stream Depth (inches)	1-22	
Stream Width (feet)	0.5-6	
USEPA Habitat Assessment Score	122	110
% Substrate Particle Size		
Silt (<0.062 mm)	12%	
Sand (0.125 - 2 mm)	16%	
Gravel (2 - 64 mm)	53%	
Cobble (64 - 256 mm)	18%	
Boulder (256 - 2,048 mm)	1%	
Bedrock (> 2,048 mm)	0%	
Median Particle Size D ₅₀ (mm)	11	
Benthic IBI Metrics and Score		
Total Taxa Richness	15	
EPT Taxa Richness	8	
Beck's Index, Version 3	10	
Hilsenhoff Biotic Index	3.61	
Shannon Diversity Index	2.06	
Percent Sensitive Individuals	61.40%	
IBI Score	56.2	
Fish Metrics		
	Total (Riffle and Pool)	
Number Fish Collected	12	
Species Richness	2	
Dominant Species	Creek chub	
Percent Dominant Species	92%	
Shannon-Weaver Diversity Index	0.41	
Reach Length Of Stream Sampled (feet)	328	
Time Sampled (minutes)	11.4	
Catch Per Foot (fish/foot)	0.04	
Catch Per Minute (fish/minute)	1.05	

NS - Not sampled; stream was dry or habitat either not present or only present in low quantity/quality.

NA- Not applicable

USEPA Habitat Assessment Scoring Ranges: Optimal = 156-200; Sub-optimal = 106-155; Marginal = 56-105; Poor = 0-55

Shannon-Weaver Diversity Index: <1 = very poor; 1.0-1.5 = poor; 1.5-2.0 = fairly poor; 2.0-2.5 = fair; 2.5-3.0 = good; 3.0-3.5 = very good; >3.5 = excellent

**An Index of Biotic Integrity for Wadeable
Freestone Riffle-Run Streams in Pennsylvania**
April 2009

Introduction

The Pennsylvania Department of Environmental Protection (DEP) developed an index of biotic integrity (IBI) for benthic macroinvertebrate communities in Pennsylvania's wadeable, freestone, riffle-run type streams as a scientifically credible biological assessment tool. This indicator assists in guiding and evaluating legislation, policy and management strategies as well as setting goals for aquatic resources by enabling direct quantification of important ecological attributes along a gradient of biological conditions and ecosystem stressors (Davis and Simon 1995; Davies and Jackson 2006; Hawkins 2006). This indicator serves as a measure of the extent to which anthropogenic stressors impair the capability of a stream to support a healthy aquatic community (Davis and Simon 1995).

Biological Sampling Methods

This IBI applies to benthic macroinvertebrate samples collected any time of the year from wadeable, freestone, riffle-run streams in Pennsylvania using a D-frame net with 500-micron mesh. Field sampling and laboratory methods are more fully described in DEP's Standardized Biological Field Collection and Laboratory Methods, Section V (Pennsylvania Department of Environmental Protection 2003). Sampling biologists composite six kicks from riffle areas distributed throughout a 100-meter stream reach, working progressively upstream, with each kick disturbing approximately one square meter immediately upstream of the net for approximately one minute to an approximate depth of 10 cm, as substrate allows. Compositing samples are preserved with 95% ethanol in the field and transported back to the laboratory for processing. In the lab, each composited sample is placed into a 3.5" deep rectangular pan (measuring 14" long x 8" wide on the bottom of the pan) marked off into 28 four-square inch (2" x 2") grids. Four of the grids are randomly selected, their contents are extracted using a four-square inch circular "cookie cutter," and placed into another identical empty pan. All the organisms are picked from this second pan. If less than 160 identifiable organisms are picked from the second pan, additional grids are randomly selected and extracted from the first pan, transferred to the second pan and picked until the target number of organisms (200 ± 40 organisms) is obtained. If more than 240 identifiable organisms are picked from the original four grids then the second pan is cleared of debris, the picked organisms are floated in the cleared pan and randomly-selected grids are picked until the target number of organisms is obtained. Any grids selected during this entire process are picked in their entirety and the total numbers of grids selected for each part of the sub-sampling process are recorded.

Organisms in the sub-sample are identified and counted. Midges are identified to the family level of Chironomidae. Snails, clams and mussels are all also identified to family levels. Roundworms and proboscis worms are identified to the phylum levels of Nematoda and Nemertea, respectively. Moss animacules are identified to the phylum level of Bryozoa. Flatworms and leeches are identified to the class levels of Turbellaria and Hirudenia, respectively. Segmented worms, aquatic earthworms, and tubificids are identified to the class level of Oligochaeta. All water mites are identified as

Hydracarina, an artificial taxonomic grouping of several mite superfamilies. All other macroinvertebrates are identified to genus level.

Most of the samples used to develop the IBI were taken from relatively small, mostly first through third order riffle-run type streams draining less than 25 square miles, so this IBI should be applied with discretion to other stream types (e.g., limestone type streams) and larger stream/river systems. Currently, DEP does not apply any regionally-based classification to wadeable, freestone, riffle-run streams in the Commonwealth for purposes of applying this IBI.

The Metrics

A number of different metric combinations were evaluated during index development and the following six metrics were selected for inclusion as core metrics in the IBI based on various performance characteristics. These six metrics all exhibited a strong ability to distinguish between reference and stressed conditions. In addition, these six metrics measure different aspects of the biological communities represented by the sub-samples, and when used together in a multimetric index, they provide a solid foundation for assessing the biological condition of benthic macroinvertebrate assemblages in Pennsylvania's wadeable freestone riffle-run stream ecosystems.

Total Taxa Richness

This taxonomic richness metric is a count of the total number of taxa in a sub-sample. Generally, this metric is expected to decrease with increasing anthropogenic stress to a stream ecosystem, reflecting loss of taxa and increasing dominance of a few pollution-tolerant taxa. Other benefits of including this metric include its common use in many biological monitoring and assessment programs in other parts of the world as well as its ease of explanation and calculation.

Ephemeroptera + Plecoptera + Trichoptera Taxa Richness (Pollution Tolerance Values 0 – 4 only)

This taxonomic richness metric is a count of the number of taxa belonging to the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT) in a sub-sample – common names for these orders are mayflies, stoneflies, and caddisflies, respectively. The aquatic life stages of these three insect orders are generally considered sensitive to, or intolerant of, pollution (Lenat and Penrose 1996); in fact, this metric only counts EPT taxa with pollution tolerance values (PTVs) of 0 to 4, excluding a few of the most tolerant mayfly and caddisfly taxa. This metric is expected to decrease in value with increasing anthropogenic stress to a stream ecosystem, reflecting the loss of taxa from these largely pollution-sensitive orders. This metric has a history of use across the world and is relatively easy to use, explain and calculate (Lenat and Penrose 1996).

Beck's Index, version 3

This taxonomic richness and tolerance metric is a weighted count of taxa with PTVs of 0, 1, or 2. The name and conceptual basis of this metric are derived from the water quality work of William H. Beck in Florida (Beck 1955). This metric is expected to decrease in value with increasing anthropogenic stress to a stream ecosystem, reflecting the loss of pollution-sensitive taxa. It should be noted that the version of the Beck's Index metric used for this project, although similar in name and concept, differs slightly in its calculation from the Beck's Index used in DEP's multihabitat protocol for assessing biological condition of low gradient pool-glide type streams.

Shannon Diversity

This community composition metric measures taxonomic richness and evenness of individuals across taxa of a sub-sample. This metric is expected to decrease in values with increasing anthropogenic stress to a stream ecosystem, reflecting loss of pollution-sensitive taxa and increasing dominance of a few pollution-tolerant taxa. The name and conceptual basis for this metric are derived from the information theory work of Claude Elwood Shannon (Shannon 1968).

Hilsenhoff Biotic Index

This community composition and tolerance metric is calculated as an average of the number of individuals in a sub-sample, weighted by PTVs. Developed by William Hilsenhoff, the Hilsenhoff Biotic Index (Hilsenhoff 1977, 1987, 1988; Klemm et al. 1990) generally increases with increasing ecosystem stress, reflecting increasing dominance of pollution-tolerant organisms.

Percent Sensitive Individuals (PTV 0 – 3)

This community composition and tolerance metric is the percentage of individuals with PTVs of 0 to 3 in a sub-sample and is expected to decrease in value with increasing anthropogenic stress to a stream ecosystem, reflecting loss of pollution-sensitive organisms.

Example calculations for each metric are provided below for a sample from Lycoming Creek.

Benthic macroinvertebrate sample from Lycoming Creek in Lycoming County taken on November 19, 2001		
Taxa Name	Number of Individuals	Pollution Tolerance Value
Acentrella	1	4
Isonychia	4	3
Epeorus	6	0
Leucrocuta	1	1
Rhithrogena	9	0
Stenonema	8	3
Ephemerella	32	1
Serratella	1	2
Paraleptophlebia	4	1
Pteronarcys	1	0
Taeniopteryx	1	2
Leuctra	2	0
Agnetina	1	2
Paragnetina	1	1
Chimarra	1	4
Dolophilodes	1	0
Cheumatopsyche	25	6
Hydropsyche	22	5
Rhyacophila	16	1
Glossosoma	2	0
Brachycentrus	3	1
Micrasema	1	2
Apatania	2	3
Psilotreta	1	0
Psephenus	3	4
Optioservus	7	4
Atherix	1	2
Antocha	2	3
Hexatoma	5	2
Prosimulium	1	2
Chironomidae	49	6
Ancylidae	2	7
Oligochaeta	1	10

Total Taxa Richness

There are **33 taxa** in this sub-sample, so

$$\text{Total Taxa Richness} = 33$$

EPT Taxa Richness (PTV 0 – 4 only)

There are **9 Ephemeroptera taxa** (Acentrella, Isonychia, Epeorus, Leucrocuta, Rhithrogena, Stenonema, Ephemerella, Serratella, Paraleptophlebia), **5 Plecoptera taxa** (Pteronarcys, Taeniopteryx, Leuctra, Agnetina, Paragnetina) and **8 Trichoptera taxa** (Chimarra, Dolophilodes, Rhyacophila, Glossosoma, Brachycentrus, Micrasema, Apatania, Psilotreta) in this sub-sample **with PTVs ≤ 4** , so

$$\text{EPT Taxa Richness (PTV 0 – 4)} = 9 + 5 + 8$$

$$\text{EPT Taxa Richness (PTV 0 – 4)} = 22$$

Beck's Index, version 3

Beck's Index, version 3 =
 $(3 \times (\text{number of taxa with PTV} = 0)) +$
 $(2 \times (\text{number of taxa with PTV} = 1)) +$
 $(1 \times (\text{number of taxa with PTV} = 2))$

There are **7 taxa in this sub-sample with PTV = 0**. There are **6 taxa in this sub-sample with PTV = 1**. There are **7 taxa in this sub-sample with PTV = 2**, so

$$\text{Beck's Index, version 3} = 3(7) + 2(6) + 1(7)$$

$$\text{Beck's Index, version 3} = 21 + 12 + 7$$

$$\text{Beck's Index, version 3} = 40$$

Hilsenhoff Biotic Index

$$\text{Hilsenhoff Biotic Index} = \frac{\sum_{i=0}^{10} [(i * n_{\text{indvPTVi}})]}{N}$$

where n_{indvPTVi} = the number of individuals in a sub-sample with PTV of i and N = the total number of individuals in a sub-sample

There are 22 individuals with PTV = 0	There are 22 individuals with PTV = 5
There are 57 individuals with PTV = 1	There are 74 individuals with PTV = 6
There are 11 individuals with PTV = 2	There are 2 individuals with PTV = 7
There are 16 individuals with PTV = 3	There are 0 individuals with PTV = 8 or 9
There are 12 individuals with PTV = 4	There is 1 individual with PTV = 10.

There are a total of 217 individuals in the sub-sample, so

$$\text{Hilsenhoff Biotic Index} = [(0 * 22) + (1 * 57) + (2 * 11) + (3 * 16) + (4 * 12) + (5 * 22) + (6 * 74) + (7 * 2) + (8 * 0) + (9 * 0) + (10 * 1)] / 217$$

$$\text{Hilsenhoff Biotic Index} = 3.47$$

Shannon Diversity Index

$$\text{Shannon Diversity Index} = \frac{\text{Rich}}{[- \sum_{i=1}^{\text{Rich}} (n_i / N) \ln (n_i / N)]}$$

where n_i = the number of individuals in each taxa (relative abundance); N = the total number of individuals in a sub-sample; and Rich = the total number of taxa in a sub-sample (total taxa richness)

There are 33 taxa in this sub-sample. The numbers of individuals in each taxa are shown in the table above. There are a total of 217 individuals in the sub-sample, so

$$\begin{aligned} \text{Shannon Diversity Index} = & - (1 / 217) \ln (1 / 217) + (4 / 217) \ln (4 / 217) + \\ & (6 / 217) \ln (6 / 217) + (1 / 217) \ln (1 / 217) + \\ & (9 / 217) \ln (9 / 217) + (8 / 217) \ln (8 / 217) + \\ & (32 / 217) \ln (32 / 217) + (1 / 217) \ln (1 / 217) + \\ & \dots \text{ (do this for all 33 taxa)} \\ & \dots (1 / 217) \ln (1 / 217) \end{aligned}$$

$$\text{Shannon Diversity Index} = 2.67$$

Percent Sensitive (PTV 0 – 3) Individuals

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = \left(\sum_{i=0}^3 n_{\text{indvPTVi}} \right) / N * 100$$

where n_{indvPTVi} = the number of individuals in a sub-sample with PTV of i and N = the total number of individuals in a sub-sample

There are 22 individuals with PTV = 0

There are 11 individuals with PTV = 2

There are 57 individuals with PTV = 1

There are 16 individuals with PTV = 3

There are a total of 217 individuals in the sub-sample, so

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = (22 + 57 + 11 + 16) / 217 * 100$$

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = 106 / 217 * 100$$

$$\text{Percent Sensitive (PTV 0 – 3) Individuals} = 48.8\%$$

The Index

An index is simply a means to integrate information from various measures of biological integrity, or various metrics (Barbour et al. 1999). In order to compare and combine sundry measures (e.g., percentage of individuals, counts of taxa, unitless numbers) of biological condition in a meaningful manner, it is necessary to standardize metrics with some mathematical transformation that results in a logical progression of values (Barbour et al. 1995).

The one selected core metric that increases in value with increasing anthropogenic stress (i.e., the Hilsenhoff Biotic Index) was standardized to the 5th percentile of metric scores for all samples in the IBI development dataset. Core metrics that decrease in value with increasing stress (i.e., total taxa richness, EPT taxa richness, % sensitive individuals, Shannon diversity, Beck's Index) were standardized to the 95th percentile of metrics scores for all samples in the IBI development dataset. The following table presents the standardization values used for each core metric.

Metric	Standardization value
Total Taxa Richness	33
EPT Taxa Richness (PTV 0 – 4)	19
Beck's Index, version 3	38
Hilsenhoff Biotic Index	1.89
Shannon Diversity	2.86
Percent Sensitive Individuals (PTV 0 – 3)	84.5

The values for standardized core metric values were set to a maximum value of 1.00, with values closer to zero corresponding to increasing deviation from the expected

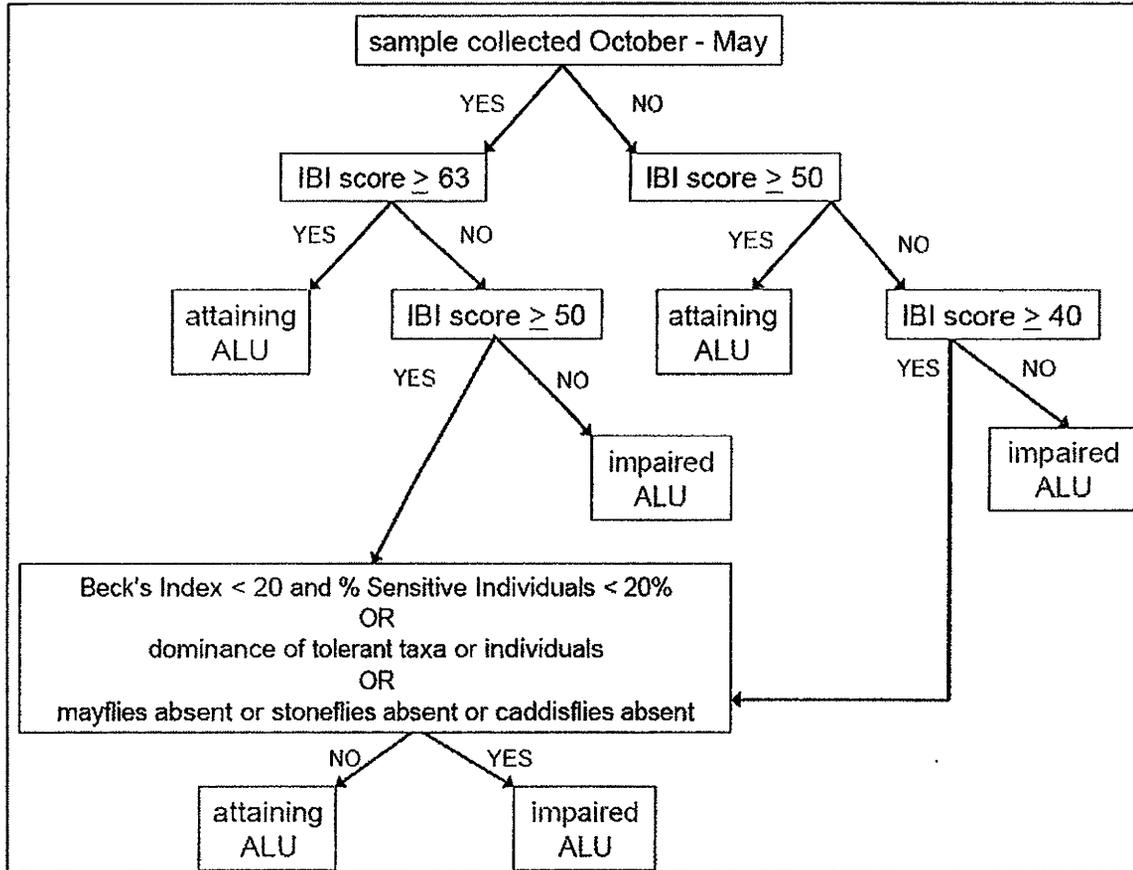
reference condition and progressively higher values corresponding more closely to the biological reference condition (Barbour et al. 1995). The adjusted standardized metric values for the six core metrics were averaged and multiplied by 100 to produce an index score ranging from 0 to 100. This number represents the multimetric index of biological integrity (IBI) score for a sample. The following table shows the standardized metric and index scoring calculations for the Lycoming Creek sample discussed above.

Metric	Standardization Equation	Observed Metric Value	Standardized Metric Score	Adjusted Standardized Metric Score Maximum = 1.000
Total Taxa Richness	observed value / 33	33	1.000	1.000
EPT Taxa Richness	observed value / 19	22	1.158	1.000
Modified Beck's Index	observed value / 38	40	1.053	1.000
Hilsenhoff Biotic Index	$(10 - \text{observed value}) / (10 - 1.89)$	3.47	0.805	0.805
Shannon Diversity	observed value / 2.86	2.67	0.934	0.934
Percent Sensitive Individuals	observed value / 84.5	48.8	0.578	0.578
Average of adjusted standardized core metric scores * 100 = IBI Score =				88.6

Aquatic Life Use Attainment Benchmarks

Based on the results of classification analyses (details available upon request), DEP decided not to establish separate reference conditions and thresholds for wadeable freestone, riffle-run type streams in separate regions of the Commonwealth. However, due to the influences of annual seasons and drainage area seen in the IBI development dataset, DEP recognizes different use attainment thresholds are appropriate for samples collected during different times of the year and from different size stream systems.

Based on the results of the analyses presented above, the results of workshops and feedback from DEP biologists and policy considerations, DEP implements a multi-tiered benchmark decision process for smaller wadeable freestone riffle-run streams in Pennsylvania that incorporates sampling season as a factor for determining aquatic life use (ALU) attainment and impairment for the cold water fishes (CWF), warm water fishes (WWF) and trout stocking (TSF) protected uses; this process is outlined in the diagram below.



The first step in the ALU assessment process for smaller wadeable freestone riffle-run streams in Pennsylvania considers sampling season (i.e. June through September versus October through May). These seasonal index periods are intended as general guidelines and may vary slightly year-to-year depending on climatological conditions; for example, a sample collected during the last week of May in a particularly hot, dry year may be more properly evaluated using procedures set forth for the summer months.

For samples collected from smaller streams between October and May, an IBI score ≥ 63 results in ALU attainment and an IBI score < 50 results in ALU impairment; an IBI score between 50 and 63 requires further evaluation to determine ALU impairment – three guidelines may be used: (1) if the Beck's Index score is < 20 and the % Sensitive Individuals in the sub-sample is $< 20\%$, the ALU should be impaired without compelling reason otherwise; (2) if the sample is dominated by tolerant taxa or individuals, the ALU should be impaired without compelling reason otherwise; or (3) if mayflies, stoneflies or caddisflies are absent from the sub-sample the ALU should be impaired without compelling reason otherwise.

For samples collected between June and September from smaller streams, an IBI score ≥ 50 results in ALU attainment and an IBI score < 40 results in ALU impairment; an IBI score between 40 and 50 requires further evaluation to determine ALU impairment,

guided by the same three guidelines outlined above for October to May samples scoring between 50 and 63 (although the absence of mayflies in samples collected immediately after spring hatches may be relaxed in some cases).

For larger wadeable freestone riffle-run type streams, DEP believes more samples are necessary to accurately establish ALU attainment and impairment benchmarks. Given the nature of flowing water bodies as gradually changing continuums, it is difficult to define a specific numeric cutoff to separate larger streams from smaller streams. However, the present dataset suggest that scores for some index metrics begin to decline for reference-quality streams drainage areas reach the 25 to 50 square mile range. Workshops conducted by DEP confirm that biological expectations or potential for most of the relatively pristine larger freestone streams in Pennsylvania are less than the biological expectations or potential for the relatively pristine smaller freestone streams.

The use assessment decision process and accompanying attainment/impairment benchmarks set forth above are intended as general guidelines, not as hard-and-fast rules. While the above guidelines will provide an accurate assessment of benthic macroinvertebrate community condition for the vast majority of samples collected from wadeable, freestone, riffle-run streams in Pennsylvania, there will be instances where a biologist's local knowledge of conditions may warrant a decision not arrived at using these guidelines. For instance, if a sample is heavily dominated by Simuliidae or Chironomidae larvae, often times this will make the metric and IBI scores difficult to interpret and the investigating biologist must rely on a more qualitative analysis of the metric scores and sample composition to arrive at an assessment decision. Similarly, samples from streams in areas receiving a substantial amount of flow from groundwater attributable to limestone geology are naturally expected to have less diversity than "true freestone" streams, so use attainment benchmarks may be justifiably relaxed for samples from these types of streams.

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ATTACHMENT 2

BEDILLION STREAM RESTORATION PHOTOGRAPHS

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARIES 32743, 32744, 32741, AND UNT TO 32741 TO TEMPLETON FORK
BEDILLION PROPERTY



Photograph 1: Bedillion Property
Templeton Fork



Photograph 2: Bedillion Property
Templeton Fork



Photograph 3: Bedillion Property
Templeton Fork



Photograph 4: Bedillion Property
Templeton Fork



Photograph 5: Bedillion Property
32743 to Templeton Fork



Photograph 6: Bedillion Property
32743 to Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARIES 32743, 32744, 32741, AND UNT TO 32741 TO TEMPLETON FORK
BEDILLION PROPERTY



Photograph 7: Bedillion Property
32743 to Templeton Fork



Photograph 8: Bedillion Property
32743 to Templeton Fork



Photograph 9: Bedillion Property
32743 to Templeton Fork



Photograph 10: Bedillion Property
32743 to Templeton Fork



Photograph 11: Bedillion Property
Templeton Fork



Photograph 12: Bedillion Property
Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARIES 32743, 32744, 32741, AND UNT TO 32741 TO TEMPLETON FORK
BEDILLION PROPERTY



Photograph 13: Bedillion Property
Templeton Fork



Photograph 14: Bedillion Property
Templeton Fork



Photograph 15: Bedillion Property
32744 to Templeton Fork



Photograph 16: Bedillion Property
32744 to Templeton Fork



Photograph 17: Bedillion Property
32744 to Templeton Fork



Photograph 18: Bedillion Property
32744 to Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARIES 32743, 32744, 32741, AND UNT TO 32741 TO TEMPLETON FORK
BEDILLION PROPERTY



Photograph 19: Bedillion Property
32741 to Templeton Fork



Photograph 20: Bedillion Property
32741 to Templeton Fork



Photograph 21: Bedillion Property
32741 to Templeton Fork



Photograph 22: Bedillion Property
32741 to Templeton Fork



Photograph 23: Bedillion Property
32741 to Templeton Fork



Photograph 24: Bedillion Property
32741 to Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARIES 32743, 32744, 32741, AND UNT TO 32741 TO TEMPLETON FORK
BEDILLION PROPERTY



Photograph 25: Bedillion Property
32741 to Templeton Fork



Photograph 26: Bedillion Property
32741 to Templeton Fork



Photograph 27: Bedillion Property
UNT to 32741 to Templeton Fork



Photograph 28: Bedillion Property
UNT to 32741 to Templeton Fork



Photograph 29: Bedillion Property
UNT to 32741 to Templeton Fork

ATTACHMENT 3

EAST FINLEY PARK STREAM RESTORATION PHOTOGRAPHS

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARY 32736, AND UNT TO TEMPLETON FORK
EAST FINLEY PARK PROPERTY



Photograph 1: East Finley Park Property
Templeton Fork



Photograph 2: East Finley Park Property
Templeton Fork



Photograph 3: East Finley Park Property
Templeton Fork



Photograph 4: East Finley Park Property
Templeton Fork



Photograph 5: East Finley Park Property
Templeton Fork



Photograph 6: East Finley Park Property
Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARY 32736, AND UNT TO TEMPLETON FORK
EAST FINLEY PARK PROPERTY



Photograph 7: East Finley Park Property
Templeton Fork



Photograph 8: East Finley Park Property
Templeton Fork



Photograph 9: East Finley Park Property
Templeton Fork



Photograph 10: East Finley Park Property
Templeton Fork



Photograph 11: East Finley Park Property
Templeton Fork



Photograph 12: East Finley Park Property
32736 to Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK, TRIBUTARY 32736, AND UNT TO TEMPLETON FORK
EAST FINLEY PARK PROPERTY



Photograph 13: East Finley Park Property
32736 to Templeton Fork



Photograph 14: East Finley Park Property
UNT to Templeton Fork

ATTACHMENT 4

LITMAN STREAM RESTORATION PHOTOGRAPHS

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK AND TRIBUTARY 32736 TO TEMPLETON FORK
LITMAN PROPERTY



Photograph 1: Litman Property
Templeton Fork



Photograph 2: Litman Property
Templeton Fork



Photograph 3: Litman Property
Templeton Fork



Photograph 4: Litman Property
Templeton Fork



Photograph 5: Litman Property
Templeton Fork



Photograph 6: Litman Property
Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK AND TRIBUTARY 32736 TO TEMPLETON FORK
LITMAN PROPERTY



Photograph 7: Litman Property
Templeton Fork



Photograph 8: Litman Property
Templeton Fork



Photograph 9: Litman Property
Templeton Fork



Photograph 10: Litman Property
Templeton Fork



Photograph 11: Litman Property
Templeton Fork



Photograph 12: Litman Property
Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK AND TRIBUTARY 32736 TO TEMPLETON FORK
LITMAN PROPERTY



Photograph 13: Litman Property
Templeton Fork



Photograph 14: Litman Property
Templeton Fork



Photograph 15: Litman Property
32736 to Templeton Fork



Photograph 16: Litman Property
32736 to Templeton Fork



Photograph 17: Litman Property
32736 to Templeton Fork



Photograph 18: Litman Property
32736 to Templeton Fork

STREAM RESTORATION PHOTOGRAPHS
TEMPLETON FORK AND TRIBUTARY 32736 TO TEMPLETON FORK
LITMAN PROPERTY



Photograph 19: Litman Property
32736 to Templeton Fork



Photograph 20: Litman Property
32736 to Templeton Fork



Photograph 21: Litman Property
32736 to Templeton Fork



Photograph 21: Litman Property
32736 to Templeton Fork



Photograph 22: Litman Property
32736 to Templeton Fork



Photograph 23: Litman Property
32736 to Templeton Fork

ATTACHMENT 5

REVISED MODULE 19 (BONDING)

Attachment 19.2 C
Stream Mitigation Area Construction Cost Estimate
Bailey Central Mine Complex
Templeton Fork Streams

Activity	Cost Per Foot (\$\$)
Pre-Construction Planning and Design	0 (Complete)
Site Acquisition	0 (Complete)
*Construction Costs	53.70
*Post Construction Costs	9.52
TOTAL	\$63.22/foot
TOTAL Stream Length	40,880 feet
TOTAL Construction & Post Construction Costs	\$2,584,433

*In-Kind Project Costs by Project Size Table 2
Average of Small (<3001 ft), Medium (3001 – 10,000 ft) and Large (>10,000 ft) Costs

Attached Reference: A Cost Analysis of Stream Compensatory Mitigation Projects in Southern Appalachian Region by J. Bonham and K. Stephenson; research Associate and Associate professor, respectively, Department of Agriculture and Applied economics. Virginia Tech, Blacksburg, VA

The proposed Templeton Fork watershed stream restoration project will be deemed successful and bond release will be requested when all of the following criteria have been met:

- (1) Benthic macroinvertebrate standing crop in the stream mitigation areas will increase by a minimum of 700,000 organisms within intolerant range 0 – 6. Benthic macroinvertebrate sampling for density and standing crop estimates will be performed according to the stream classification protocol described in Module 15.2.c.
- (2) USEPA instream habitat and riparian buffer metrics will be increased to attain, at a minimum, scores within the suboptimal range.
- (3) Restored stream banks are stable.

- (4) Planted rooted woody vegetation and live stakes in the riparian buffer enhancement areas will have a minimum 70% survival rate and will show a positive increase in height at the end of each year of monitoring during the five-year monitoring and maintenance period. Height will be measured on a minimum of 10% of the planted woody vegetation during the latter half of the growing season. Herbaceous vegetation will have a minimum of 70 % cover.
- (5) Stream enhancement and stabilization structures are constructed in accordance with the approved plans.



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION
CALIFORNIA DISTRICT MINING OFFICE

2010 MAY 17 PM 1:35

May 12, 2010

Edward Suter, Project Consultant
Consol Pennsylvania Coal Company, LLC
1525 Pleasant Grove Road
Claysville, PA 15323

Re: Applicant's Name: Consol Pennsylvania Coal Company, LLC
Application Number: 30080701
Name of Mining Operation: Coal Refuse Disposal Area No. 5
Richhill Township, Greene County

Dear Mr. Suter:

We have completed our technical review of your application for the Coal Refuse Disposal Area No. 5, sediment pond development. Before a permit can be issued you must provide the following:

Mining and Reclamation Bond in the amount of \$4,210,970.

I have enclosed the following materials to help you complete the process: an instruction sheet, bond forms, a bond submittal form, and any other forms that apply.

The completed bond submittal form and the completed bond forms are to be submitted to the Bonding Section by July 11, 2010. Failure to submit them by that due date will result in permit denial.

You should submit your bond to Harrisburg at the following address:

Department of Environmental Protection
Bureau of Office Services
Bonding Section
PO Box 8766
Harrisburg, PA 17105-8766

Also, before a permit can be issued, the following needs addressed:

Module 8

1. Area #6 should be shown as probable future coarse coal refuse disposal area or not shown at all on the Exhibit 6.3 and 8.2 maps. Revise accordingly.
2. Where is and what designation is the internal Station Kerr Rd. Valley monitoring station? Please show this point on a map. Revise Attachment 8.14c accordingly.
3. Attachment 8.14c states that the range of flows for this stream at these two stations (SW-P and Station Kerr Rd. Valley) is from 9.0 to 1189.2 gpm. Are the flows the combined flow of both monitoring points? Please clarify and revise accordingly.
4. Continue collecting surface and groundwater data at all surface and groundwater monitoring points. Please include chlorides, and TDS for surface water points.

5. Enclosed are the effluent limits for outfalls 501 and 502 recently received from Water Quality.

Wetland Designs

6. The berm overflow spillway is not designed to withstand the potential shear stresses on the selected rock unit. In addition, the detail references on Figure 15.5-8 are incorrect.

Site Plan Drawings

7. Drawing No. 211. The hill top area located from the end of access road 1 to the 938 bin was revised to provide grading and promote drainage to the east; however, a portion of the area will be conveyed to diversion channel DD-16. The area must be conveyed to the MSP or other suitable erosion and sedimentation controls. Disturbed areas may not exit the permit without the benefit of treatment. Facilities must be provided to convey disturbed areas to the MSP. Revise drawings No. 212 and No. 213 to reflect the grading plans.

Module 15

8. Provide all biological habitat, and pebble count data forms for each of the monitoring stations (BSW01, BSW03, and BSW04) on Owens Run that corresponds to data provided on Table 1. Provide the biological information showing types of organisms collected for each location on a separate table.

If you have any questions, please contact me at 724.769.1100.

Sincerely,



John D. Kernic
Hydrogeologist
District Mining Operations

Enclosures



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING AND RECLAMATION

BOND SUBMITTAL FORM

A APPLICANT: Consol Pennsylvania Coal Company, LLC
PHONE: 724-663-3034 **LICENSE NO:** _____
TOTAL ACRES: 91.5
ORIGINAL ISSUANCE DATE: NA
PERMIT NUMBER: 30080701
FACILITY NAME: Coal Refuse Disposal Area No. 5
TWP.: Richhill **COUNTY:** Greene

B PURPOSE
 SURFACE COAL MINE
 NON COAL SURFACE MINE
 UNDERGROUND COAL MINE
 COAL REFUSE DISPOSAL
 COAL PREPARATION PLANT
 NON COAL UNDERGROUND MINE
 WATER LOSS
 APPEAL/CIVIL PENALTY

C BOND CALCULATION

UNDG. MINE CLOSURE	\$ _____	WATER LOSS	\$ _____
DEMOLITION	\$ _____	APPEAL C.P.	\$ _____
POST TRMT COST	\$ _____	SUBSIDENCE	\$ _____
RECLAMATION COST	\$ <u>4,210,970</u>		

RATES BREAKDOWN

<u>91.5</u> ACRES AT \$ _____	PER ACRE = \$ _____
_____ ACRES AT \$ _____	PER ACRE = \$ _____
_____ ACRES AT \$ _____	PER ACRE = \$ _____
_____ ACRES AT \$ _____	PER ACRE = \$ _____
_____ AT \$ _____	PER = \$ _____
_____ AT \$ _____	PER = \$ _____
_____ AT \$ _____	PER = \$ _____
_____ AT \$ _____	PER = \$ _____
_____ AT \$ _____	PER = \$ _____
<u>91.5</u> ACRES	SUBTOTAL \$ <u>4,210,970</u>

D TYPE
 ORIGINAL
 ADDITIONAL
 REPLACEMENT
 TRANSFER
 REVISION
 ROLLOVER
 CHANGE IN PERMIT ACREAGE
 PRE-EXISTING LIABILITY
 CONVERSION ASSISTANCE
 LAND RECLAMATION MAINTENANCE
 FINANCIAL GUARANTEE

California _____ DISTRICT
 John D. Kernic _____ REVIEWER
 May 12, 2010 _____ DATE

E BOND REQUIRED: \$ 4,210,970 **ON DEPOSIT:** \$ -0- **AMOUNT DUE:** \$ 4,210,970

F ENCLOSED IS/ARE THE FOLLOWING BONDS (S) FOR THE APPLICANT OF THE PERMIT IDENTIFIED ABOVE:

a) SURETY BOND NO.	SURETY COMPANY	BOND DATE	AMOUNT (\$)
b) COLLATERAL DESCRIPTION	NAME OF BANK/GOVT ISSUER	COLLATERAL DATE	AMOUNT (\$)
c) Other (Includes Financial Guarantee/Conversion Assistance/Land Reclamation Maintenance) Description			AMOUNT (\$)

Total: \$ _____

LICENSING AND BONDING	(DATE) _____	(INITIAL) _____	SENT TO LEGAL	(DATE) _____	(INITIAL) _____
SENT TO APPLICANT	_____	_____			
COMMENT:					

RECEIVED FROM APPLICANT	_____	_____	APPROVED BY LEGAL	_____	_____
			C.O. NOTIFIED BOND ACCEPTED	_____	_____

BOND ACCEPTED _____
 NAME _____ DATE _____

JDK/be: f a WSP JK CB JCF

bc: Greensburg District Office File
Bonding Section
MCI Tim Hamilton
Consultant: Michael Baker Jr., Inc.
PA fish & Boat Commission
PA Game Commission
U.S. Fish & Wildlife Service
Army Corps of Engineers
US EPA Region III
PA DEP – Division of Dam Safety
MSHA District 2



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

CALIFORNIA DISTRICT MINING OFFICE

May 3, 2010

Certified Mail #7006 2150 0002 5177 3563

Edward Suter, Project Consultant
Consol Pennsylvania Coal Company
1525 Pleasant Grove Road
Claysville, PA 15323

Re: Applicant's Name: Consol Pennsylvania Coal Company
Application No: 30080701
Richhill Township, Greene County

Dear Mr. Suter:

A review of the stream information for the Coal Refuse Disposal Area No. 5 received on March 26, 2010, for the Templeton Fork Restoration Project from Civil and Environmental Consultants, Inc. has been completed. Please address the following items:

1. A legal review of the proposed landowner agreement determined the agreement is not adequate to provide permanent protection for the completed stream mitigation. The agreement must ensure stream mitigation is protected from landowner intervention and live stock damage and provide Department staff access for construction and post construction monitoring. Provide a table which correlates agreements to drawings and parcel numbers.
2. Please be advised a maintenance bond will be required upon successful completion of the stream mitigation work to ensure the long-term viability of the mitigation and to provide monitoring for the life of the permit.
3. Correct plan drawing scales, as some are listed at 1-inch = 150 -feet.
4. Depict footprints of proposed wetland mitigation areas for the No. 5/No. 6 coal refuse disposal areas on the site plan exhibits.
5. Specify the stream mitigation construction will be conducted and monitored by persons qualified in stream restoration work. Specify that restoration work upon completion will be certified by a qualified individual that the work has been completed in accordance with the approved permit.

Templeton Fork Stream Restoration Plan:

6. Projects noted on Page 2 showing active channel restoration to offset stream impacts; have each of the projects reached their proposed success thresholds; if not why?

7. The mitigation plan shall be based on the pre-treatment biological studies of macro-benthic organisms found within the Templeton Fork Watershed (within the area of influence) to offset the takings of biological organisms within the Owens Run Watershed associated with the proposed CRDA #5 permit area. Success shall be determined by the increasing the baseline of macro-benthic organisms using the Pa. DEP "Pollution Tolerance Values" between 0-6. Revise section 3.10 accordingly.
8. Stream bank grading will require the removal of excess soils; provide information on where this material will be placed along with reclamation information. Other permits maybe required by other agencies; has the company reviewed this issue?
9. Stream bank fencing was noted; provide a minimum width which will be used to protect both stream and riparian habitats?
10. Regrading and/or relocation of the stream channels were noted; how will the company reclaim the pre-existing channels?
11. Include the following to prevent unplanned wetland impacts from stream restoration construction activities: *All wetlands within 50-feet of proposed stream restoration activities shall be accurately delineated by a qualified individual prior to site development to ensure that unplanned impacts to wetlands do not occur. Individuals involved in the stream restoration work are to be instructed to avoid the wetland areas.*
12. Specify the general width of the riparian corridor to be planted for all planting areas.
13. Areas previous mitigated from stream pooling should be excluded from the proposed stream length mitigation credit under this application.
14. Show completed and proposed gate cut areas on the CP maps to show ties with the proposed project.

Templeton Fork Stream Restoration Plan: Maps

15. Depict the proposed enhancement structures within either the historic and proposed gate cut areas.

CP01-2:

16. Extend the bank cut on the right descending bank between Photo station 13 and 14.

CP02-1:

17. At Photo station 1 through 2, why didn't the company propose stream relocation rather than the boulder placement to protect the township road from being under cut?
18. Provide a cut between Photo-station 14 to 15 along the left descending bank.
19. Provide a cut on the left descending bank between Photo- stations 10 to 11.

CP03-1

20. The company should remove the alluvial material depicted in Photo- station 10, the stream appears to be constricted in this area.

CP04-1

21. Provide a cut on the right descending bank between Photo-stations 3 through 5.
22. Provide a structure on the outside bend upstream of Photo-station 5.
23. Provide a cut extension at Photo-station 5.

CP05-1

24. Cattle were noted in this area, provide stream bank fencing in this area to prevent access to the restoration project.

CP05-1 and CP05-3

25. Provide a cut along the right descending bank from the corner downstream of Photo- station 22 to 23.
26. Provide a cut along the right descending bank between Photo-stations 24 to 25.

CP07-1

27. Provide a cut on the right descending bank at Photo- station 6.

CP09-1 and CP09-4

28. Are instream structures proposed within the gate cut area F-17 and F-18?

CP09-8 and CP09-9

29. Provide photo-stations for both maps within the proposed work areas.

CP01-1 and CP09-8: Wetland Takes

30. What type of wetlands are “G” and “W” and how many acres will be affected during stream restoration. Provide plans to mitigate any affected wetland areas?

Appendix B Stream Restoration Area Site Photographs:

31. Correct: photographs depicting the East Finley Park property are mislabeled as Tributary 32731 they should read 32736. (Photographs 1-14)

32. Photo 12 should be 32736 to Templeton Fork not 32731 (see CP03-1)

33. Photo station 6 on CP04-2 should be labeled Photo station 15, correct to correspond to photograph.

34. Provide a photograph for photo station 23 as depicted on CP04-2.

35. CP05-1: Cattle were noted in this area. Provide stream bank fencing to prevent access to all restoration projects in this area.

36. Provide Photo Stations on streams located on maps CP09-8 and CP09-9.

3.10 Stream Restoration Success Criteria

37. Change the statement: stream restoration project will be deemed successful when the “majority”, to deemed successful when “all” of the following criteria have been met. Revise Module 19 criteria accordingly.

38. Breakout the success criteria between the in stream and stream bank restoration segments.

39. Paragraph 6: remove “excluding live stakes” from this paragraph.

40. Provide performance minimum of 70 percent survival rate for live stakes Herbaceous vegetation planted on the stream banks that will be cut to prevent erosion/sedimentation. Revise 19.2 c under Bond Reclamation Calculation to reflect this criterion.

Stream Protection:

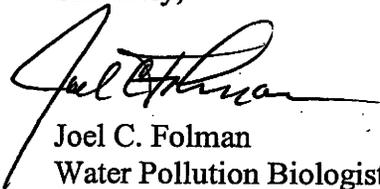
41. Company to obtain from the landowner access agreement which permits agency personnel to enter properties for inspection purposes.
42. The company must acknowledge responsibility for all construction, maintenance, monitoring, and funding of the final accepted stream mitigation project for the life of permit.

3.12.1 Pre-restoration Baseline Stream Monitoring

43. Baseline Monitoring-(2) c) The company is proposing on using Pennsylvania Department of Environmental Protection *Index of Biotic Integrity for Wadeable, Freestone Streams in Pennsylvania (IBI)*. However, the company is currently using for the stream evaluation for the CRDA #5 Sedimentation and Impoundment Applications the Surface Water Protection-Underground Bituminous Coal Mining Operations methodology (563-2000-655). Why is the company using two different sampling methodologies to determine benthic communities?
44. Pre-restoration baseline monitoring shall be conducted at the same time periods as post restoration monitoring (October through May for benthic communities).
45. Establish two 100 meter monitoring locations within each restoration section. Depict the stations on the site plan maps.

If you have any questions, please contact me at 724.769.1090.

Sincerely,



Joel C. Folman
Water Pollution Biologist 2
District Mining Operations

JCF/be: f a JK CB WSP

bc: Greensburg District Office File
MCI Tim Hamilton
Mine Safety
Consultant: Civil and Environmental Consultants, Inc.
PA Fish and Boat Commission
PA Game Commission
U.S. Fish and Wildlife Service
Army Corp. of Engineers
U.S. EPA Region III
PA DEP, Division of Dam Safety
MSHA District 2



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION
CALIFORNIA DISTRICT OFFICE

2010-04-06 11:13:42

April 6, 2010

Certified Mail #7006 2150 0002 5177 3655

Edward Suter, Project Consultant
Consol Pennsylvania Coal Company
1525 Pleasant Grove Road
Claysville, PA 15323

Re: Applicant's Name: Consol Pennsylvania Coal Company
Application No.: 30080701
Richhill Township, Greene County

Dear Mr. Suter:

A review of the information for the Coal Refuse Disposal Area No. 5 accepted on February 18, 2009, for sedimentation pond development and received November 10, 2008, from Michael Baker Jr., Inc. has shown that several of the items in our correction letter of January 21, 2010, have not been satisfactorily addressed. Therefore, we will be holding an informal pre-denial conference at the California District Office to discuss the deficiencies. We recommend that you make arrangements to have your consultant present at this meeting.

Please contact me before June 4, 2010, to arrange a mutually convenient date for this meeting.

Specifically, the items, which were not adequately addressed or are still outstanding, include the following:

Module 7

1. Based upon the structure contours of the Pittsburgh coal seam on the Exhibit 8.2 Map, it appears that the Washington Anticlinal Crest plunges towards the northeast contrary to Module 7.3 submitted. Please explain and revise if necessary.
2. Submit a copy of the fracture trace analysis performed by MSHA and show any and all fracture traces identified on the Exhibit 6.2 and 8.2 maps.

Module 8

3. Submit all surface and background monitoring data to date and begin sampling for chlorides at all monitoring points.

4. No Table 8.13A was submitted to determine the average and maximum concentrations for sulfate, chloride and TDS on UNT 32705 to Owens Run (Module 8.15b). Submit all the data used to calculate the averages. Show this data collection point on a map.
5. Submit all groundwater data collected from when monitoring wells or piezometers MW-2, MW-5, MW-11, MW-18, MW-22, MW-23, MW-26, MW-27 and MW-107 were constructed to date.
6. No numerical range was provided from groundwater level fluctuations for hilltops. Revise Module 8.1 accordingly.
7. What are the high, low, and average flow of Owens Run at monitoring point 32700-D1 and determine what minimum flow would be required to maintain its use.
8. Determine the percent of watershed upstream of point 32700-D1 on Owens Run will be impacted by the proposed CRDA No. 5 and No. 6 CRDA facilities. Then determine the amount of flow that UNT-OR (D1) and Stream 32705 (SWP) contribute to the total flow of Owens Run at 32700-D1. Use this information along with the facility design details, surface and groundwater monitoring plan and data to determine the probable hydrologic consequences at this point, both quantitatively and qualitatively for surface and groundwater systems under all seasonal conditions. Revise Module 8.14 (c) accordingly.

Miscellaneous

9. Provide application revisions resulting from PADEP Dam Safety revisions TR#1. Provide future revisions from PADEP and MSHA in triplicate upon submission to the agencies.

Module 15

10. Provide nine (9) copies of newly proposed stream mitigation plans, which were presented conceptually to this office on March 9, 2010.
11. Provide Biological Data for Owens Run to establish a baseline at monitoring points BSW01, BSW02, BSW03, and BSW04 to determine the cumulative effects of the proposed CRDA No. 5 and possible future disposal locations. Biological data shall include macrobenthic information based on the surface water protection protocol.
12. Provide a 15.2c map showing the locations of the proposed biological monitoring points.

Wetlands

13. How will the wetland mitigation locations coincide with the proposed stream mitigation locations?
14. Reevaluate the wetland No. 1 for pre-existing wetlands between the tributary 32732 and the proposed eastern lobe of the proposed wetland. This area appears from aerial photographs to show potential wet areas within this area.
15. Wetland No. 2: How will the company provide protection of this wetland from cattle noted on this location?
16. Wetland No. 3: The site location map (15.5-6) and topographical map provided did not provide for a good reference for the site location of this proposed wetland. Supply an upgraded reference map for this site.
17. Wetland No. 3: How will the company provide protection from cattle noted in the area of this wetland?
18. The conceptual wetland mitigation plan is acceptable. Please provide detailed designs subsequent to installation of ground water observation standpipes and groundwater analysis of each wetland mitigation area.
19. Provide engineering certification on the exhibits and design plans.
20. Tributary 32732 is flowing out of the defined stream channel to the north east of wetland No.1 and will enter the constructed wetland over the proposed cutslope. The upslope drainage area associated with the stream is approximately 100-acres, which could cause significant erosion of the cutslope and overwhelm the constructed wetland and discharge structures.
21. Exhibit 15.5-8.
 - a. Detail 1. Provide an earthen plug or other suitable measure to prevent flow through the rock armor prior to reaching the design water surface elevation (top of wetland pool) of the constructed wetland. The rock inlet must be provided with a similar configuration to prevent a discharge through the rock prior to reaching the design invert elevation of the inlet.
 - b. Provide a table that lists the elevations for each inlet channel, outlet channel, and weir. Stream flow-through conditions between wetland cells should be avoided and hydrology in each wetland should be regulated independently. Please contact Craig Burda to discuss.

22. Berms.
 - a. Provide a note on the site plan maps that cuts and fills will not exceed a slope of 2:1.
 - b. Planting on wetland berms should exclude woody species to minimize the potential for future seepage through the berms.
 - c. Provide berm construction details.
23. Inlet/outlet channels.
 - a. Provide inlet and outlet channel design calculations.
 - b. Provide energy dissipaters at the outlets of channels and pipes.
 - c. Provide profiles through each of the inlet and outlet structures.

Module 17

24. 17.3.a) and attachment 17.1. Revise attachment 17.1 to depict prime farmland soil unit DoB. Revise the exhibit 9.1 map to depict all prime farmland soil units within and 1000-feet beyond the permit boundary.

Module 18

25. Revise 18.4.a to address reclamation requirements, if the slurry impoundment revision is not issued. The revised module refers to the entire project area and not disturbances associated with initial site and treatment pond development.

Technical Specifications

26. Pages 3E-5, 3E-6, 3E-7, 30-7, 30-8, and etc. are not consistent with pages submitted Division of Dam Safety on 2/26/10, although the pages are dated v: February 2010. Please reconcile the technical specifications submitted the California Office and the Division of Dam Safety.
27. Sulfate resistant cement is to be utilized for drainage facilities constructed with concrete in contact with water containing sulfates (3-I; E. and F).

Site plan drawings

28. Drawing No.201. Update the revisions record block to be consistent with PADEP Division of Dam Safety drawing.
29. Drawing No.202.
 - a. Drawing No. 233 is revision No.3.
 - b. Drawing No. 208 is revision No.4. Revise drawing 208 accordingly.

30. Drawing No. 211. The hill top area located from the end of access road 1 to the 938 bin was revised to provide grading and promote drainage to the east; however, a portion of the area will be conveyed to diversion channel DD-16. The area must be conveyed to the MSP or other suitable erosion and sedimentation controls. Disturbed areas may not exit the permit without the benefit of treatment. A temporary berm or collection channel should be constructed between the diversion channel and the disturbed areas which are designed to convey surface runoff to the MSP. Revise drawings no.212 and no.213 to reflect the grading plans.

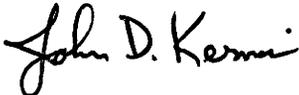
Module 19

31. Please note that additional information or revisions may be forthcoming if the proposed wetland and stream mitigation plans change.

All outstanding deficiencies must be addressed to the satisfaction of the Department within thirty (30) days of the date of this letter. Failure to comply with this schedule by June 4, 2010, will result in the denial or return of this application.

If you have any questions, please contact me at 724.769.1100.

Sincerely,



John D. Kernic
Hydrogeologist
District Mining Operations

JDK/be: f a JK WSP JCF

bc: Greensburg District Office File
MCI Tim Hamilton
Mine Safety
Consultant: Michael Baker, Jr., Inc.
PA Fish & Boat Commission
PA Game Commission
U. S. fish & Wildlife Service
Army Corp of Engineers
U. S. EPA Region III
PA DEP, Division of Dam Safety
MSHA District 2



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION
CALIFORNIA DISTRICT OFFICE

ARMY CORPS OF ENGINEERS
PITTSBURGH DISTRICT
2010 MAR 09 14:01

March 8, 2010

Mr. Edward Suter
Consol Pennsylvania Coal Company, LLC
1525 Pleasant Grove Road, PO Box J
Claysville, PA 15323

Re: Applicant's Name: Consol Pennsylvania Coal Company, LLC
Application Number: 30080701
Richhill Township, Greene County

Dear Mr. Suter:

In order to continue processing your coal refuse disposal application for Area No. 5 Slurry Impoundment accepted on August 4, 2009, the following additions or corrections must be made:

Module 1

1. Page 1-2, extent of mining says that 506.3 acres are proposed under this application while page 101 (application type) states that this application adds 414.8 acres to the previously submitted 91.5 acres sediment pond development area site. Revise accordingly.

Module 2

2. Submit the proof of publication once the required publishing time frame has expired.

Module 4

3. Enclosed is more recent correspondence from the Fish and Wildlife Service for your review.
4. Provide USFWS approval and requirements regarding the Indiana bat.

Module 7

5. Based on the structure contours on the Exhibit 8.2 map, it appears that the Washington Anticlinal crest plunges towards the northeast, contrary to Module 7.3. Please explain and revise accordingly.
6. Submit the fracture trace and analysis and include any and all fracture traces identified from the analysis on the Exhibit 8.2 map. Revise accordingly.

Module 8

7. Demonstrate /submit the evaluation of the hydrologic water monitoring program for CRDA area 3 and 4 showing no trends of adverse impacts to the ground and surface water resources. Revise Module 8.14c(2) accordingly.
8. Please add private water supplies 2209-111-W1 and W2 and 2210-122-S1 and S2 to the water monitoring plan.
9. Tributary 40702 to Owens Run and surface water monitoring point SW-R were not shown on either Exhibit 6.2 or 8.2 maps. Revise accordingly.
10. As per Chapter 90.35© of the regulations, provide a determination of the probable hydrologic consequences of the proposed coal refuse disposal activities on the proposed and adjacent areas with respect to the hydrologic regime and the quantity and quality of water in surface and groundwater systems under all seasonal conditions, including total dissolved solids, total suspended solids, total iron, pH, total manganese, acidity, alkalinity, sulfates and chlorides.

Module 10

11. Submit copies of the certificates of borehole sealing for ventilation boreholes 3A-2, 6A-3, and 7A-3.
12. 10.1.a.iii.
 - a. Revise (1), paragraph 2 to state stream rock drains will pass beneath the treatment facilities and outlet down stream. Revise the narrative to state that a liner will be constructed over the rock drains to prevent infiltration (not reduce) to the drains from the refuse disposal area.
 - b. Revise (1), paragraph 2 to address chemical treatment requirements.
 - c. Revise (2) to address recent plans for slurry disposal into the Bailey Mine and proposed revision to increase the slurry disposal volume in the no.3 slurry impoundment.
13. 10.5.
 - a. Revise to state a mine closure report for ventilation boreholes 4A-3 and 5A-3 will be submitted to the California District Office prior to conducting refuse disposal activities within 100-feet of the boreholes and the boreholes will be sealed in accordance with the approved sealing plans.
 - b. Provide mine closure reports for boreholes 3A-2, 6A-3, and 7A-3.

14. 10.7.
 - a. Provide an agreement for 6-inch Columbia gas line #6985 prior to permit issuance.
 - b. Address Columbia 8-inch gas line in accordance with TGD 562-2112-503.
Notification is required to excavate or blast within 100-feet or 200-feet of a gas line respectively. Mining activities cannot occur within the right-of-way without an agreement. Depict the line right-of-way, if an agreement is not provided.
 15. 10.10.c. and 10.11.b Revise plans to provide a capping system that will prevent precipitation from coming in contact with the refuse.
 16. Describe in module 10.11.b. the measures which will be taken to during the development and active phases of operation to achieve enhancement of the resources where practical or explain why enhancement is not practical.
-

Module 11

17. The response to 11.1.d.vii states that culvert outlet velocities are *expected* (emphasis added) to be less than allowable velocities of downstream channel linings. Outlet velocities must be evaluated to verify receiving channel linings are adequate to withstand the calculated culvert outlet velocities.
18. Form 11.1.A.
 - a. Channel profiles were not provided, as indicated in note no.1.
 - b. The length to flow depth ratio for CD-17 (.003 ft/ft) should be less than 12:1, as recommended by the Chapter 102 manual.
 - c. The calculated velocity for CD-17 exceeds 4 feet per second and is not acceptable for a grass lined channel.
 - d. Provide a maintenance plan for CD-17 due to the shallow slope of the channel, which will accumulate sediment until all contributory areas are adequately vegetated. The Chapter 102 manual recommends that channel slope be avoided at slopes less than 1% and the shallowest slope of channel CD-17 is 0.3%.
 - e. Channels GDL3 and GDR3 shall be designed for a 100-year design storm.
 - f. Channels receiving refuse leachate or surface runoff from disposal areas must be lined to prevent infiltration of contaminated water.
 - g. Channels SP3-BG, SP3-GD, RG938-0, and RG1 could not be located on the site plans.

Module 13

19. 13.4.a. Describe the quality of water that will be contained in the impoundment.

20. Revise 13.5.b. to state the normal pool will be maintained at an elevation to prevent a discharge from the slurry impoundment prior to exceeding a 24-hour, 10-year design storm. Revise the staging drawings and decant schedule to include the required normal pool elevations and a plans to provide a marker to clearly identify the maximum normal pool that will be maintained for each active decant inlet.

Module 14

21. Clay liners are not acceptable to *prevent* adverse impacts to groundwater and surface water. In addition, a final “capping” system must be provided that will *prevent* precipitation from coming in contact with the coal refuse. We believe at this time that flexible membrane liners and caps are the only material capable of preventing uncontrolled and perpetual discharges from the coal refuse slurry impoundment. Refer to letter from Craig Burda of DEP to Mark Stanley of Consol Energy, Inc. dated October 20, 2009 regarding liners for this site and a meeting held with DEP on October 14, 2009. Revise the application to reflect liner and cap design changes, where applicable.
22. Revise the liner soil protective cover to vegetate the protective cover.
23. Channels receiving or conveying refuse area runoff or leachate shall be designed in a manner to prevent infiltration of contaminated waters from the channels.

Module 15

24. 15.2 Surface Activities Involving Stream Encroachments and Water Obstructions: Provide a mitigation plan for the forty one streams to be taken during the construction of this facility.
25. 15.2.a. No chapter 105 waivers will be granted for the proposed stream impacts.
26. Revise 15.2.q to reflect plan to outlet stream drains down gradient of the treatment facilities.

Module 16

27. Revise 16.3 to address mobile equipment.

Module 17

28. Provide NRCS prime farmlands soil certification upon receipt.

29. 17.3.a). Reconcile module 17 and site alternatives analysis information with recently provided NRCS letter dated 10/6/08 (initial site development soils certification).
30. 17.3.b). Provide referenced letter upon receipt.
31. 17.4.a). Indicate *all* topsoil will be removed for final reclamation and if topsoil is less than 12-inches that topsoil and unconsolidated materials will be removed in accordance with §87.97.c).

Module 18

32. Exhibit 18.1.
 - a. Several areas identified as unmanaged natural habitat exist as land occasionally cut for hay. Revise 18.3.c).
 - b. Forested areas may only be established outside of the refuse disposal area foot-print to prevent damage to the refuse area cap.
 - c. Identify cross-section lines and provide references to design drawings for section locations.
 - d. Depict barrier areas for gas wells, as shown on exhibit 9.1
33. 18.3. Enhancement measures are proposed for enhancement of terrestrial and aquatic habitats at final reclamation in the form of permanent vegetative cover that will provide mixtures desirable for terrestrial species and retention of the treatment facilities to develop aquatic and terrestrial habitat. Please provide terrestrial enhancements during operation of the site.
34. 18.4.d). Postmining access roadways.
 - a. Landowner agreements must be provided to retain the access roads permanently.
 - b. A haulroad maintenance plan is required to retain the access roads. The maintenance plan should be identified as a "Postmining Road Maintenance Plan" and should be written as your recommendations to the landowner for maintaining the road in good condition. The maintenance plan should suggest measures for preventing or controlling erosion and siltation, flooding and damage to public or private property, air and water pollution and or minimizing damage to fish, wildlife and their habitat. It should include a recommended schedule for inspecting the road (at least annually) and correcting problems. It should also state that road crowns and surfacing are to be maintained, and road ditches, sediment traps and culverts kept clean.
 - c. Haul roads and roads approved as part of the postmining land use must be certified by a qualified registered professional engineer or qualified registered land surveyor that the roads have been constructed or reconstructed as designed in accordance with the approved plan.

35. 18.5.
- a. The proposed permanent seed mixture will not provide prompt stabilization of steep slope areas. An increase in application rates for prompt stabilization species is suggested.
 - b. 18.4.a. Areas located outside of the refuse area footprint are to be restored to their premining land uses, except in areas where postmining roads will remain for access and maintenance of the site.
 - c. 18.5.d. The response is not consistent with plans to restore areas located within the footprint of the disposal area to unmanaged natural habitat.
 - d. Provide woody species that are indigenous to the area and promote the development of terrestrial habitat.

Module 19

36. Recalculate the reclamation costs using the most recent Bond Rate Guidelines and RS Means numbers.

Module 20

37. Provide the requested information in module 20.3

Module 21

38. Label drawings 326 and 327, as exhibits 21.1A and 21.1B.
39. 21.2.a.iv.(1). Revise to provide a reverse slope of 5%, in accordance with §90.122.(m).(2). Revise terrace channel designs to account for reduction in bench depth, as necessary.
40. Provide specific locations for required information in modules 21.3c. and d.
41. 21.6.i. Revise to include additional critical stages identified in §90.124.(a).
42. 21.6.ii. Haul roads must be certified by a registered professional engineer.
43. 21.6.ii. and iii. Underdrains must be certified in accordance with 90.124.(d), including but not limited to photographic documentation.
44. Provide specific section references for required information in 21.7.g and identify the drawings as exhibit 21.7.

Technical Specifications

- 45. Provide a conspicuous note that all work shall be accomplished in accordance with approved state and federal permits. In the event of a discrepancy between technical specifications, contract drawings and permit documents, the permit requirements shall govern. Changes shall only be implemented with approvals from state and federal agencies, where applicable.
- 46. The specifications on page 2F-2 are not consistent with topsoil removal requirements.

Drawings 301 through 364

- 47. Reference specifications on the site plan development and design details to extend the underdrains up gradient in a manner that will prevent sediment contamination of the drains and untreated discharges from exiting the site without the benefit of treatment.
- 48. Site plan staging drawings
 - a. Provide site plan drawings 304 to 319 in a scale of 1-inch equal 200-feet.
 - b. Revise to be consistent with initial site development application.
 - c. Depict barrier areas (variance areas need not be shown), gob ventilation boreholes, gas wells, one south air shafts, cemetery, and utilities.
 - d. Provide reference to module 9.1 for additional details.
 - e. Depict all main principal spillway inlet points.
 - f. Provide reference to construction notes on drawing 303B.
 - g. Provide a piezometer table that lists the surface, tip, and maximum water surface elevation for each stage of development.
 - h. Please revise the line type for the permit boundaries to one less obtrusive.
- 49. Drawing 303A. Revise general note no.9 to state that no surface runoff from disturbed areas may enter the underdrains and must be conveyed to the sediment/treatment ponds.
- 50. Drawing 307
 - a. Depict the limits of sediment treatment basin liner and tie in point of slurry pond embankment liner.
 - b. Extend the main underdrain beneath the sediment/treatment pond, as shown in the initial site development plans.
 - c. Provide detailed plans for the collection/conveyance of discharges from the CRDA no.1 south saddle dam drains. Seepage from the saddle dam may not be conveyed to the underdrain system of CRDA no.5.
 - d. Label CD12 and reference plans to protect the spring collectors and liner from erosive water velocities and abrasion in areas of concentrated flow.

- e. A significant slip exists just to the south of the 1 south air shafts. How will this area be stabilized to facilitate liner and embankment development? Shaft cuttings runoff/seepage may not enter the refuse area underdrain system.
 - f. Label the limits of the FCR underdrain. How and when will the underdrain be constructed to maintain channel CD14 and provide protection of the liner and liner underdrains. In addition, what will keep the FCR underdrain from being eroded/damaged until it is inundated?
 - g. An embankment fill of unsuitable materials is shown just upstream of the northern stage 1 cutoff trench and west of channel CD14. The area is located in an area of future slurry pond embankment construction. The fill may compromise liner and slurry pond embankment stability.
 - h. Plans for stockpile SST3 were not provided in the initial site development application, including but not limited to collection channels. The stream drain must be shown in accordance with initial site development plans.
 - i. Delineate/label haulroad collection channels and provide designs, keyed to module 11.
 - j. Identify the main valley diversion dike spillway inlet and provide a drawing reference for details.
 - k. Extend the outlet of channels from SST3 to the treatment pond in a nonerosive manner. The extension must be designed to accommodate future planned discharges from channel CD19 in stage 7.
51. Drawing 303B – DWG 307
- a. Describe plans to develop liner in fill areas located within the slurry impoundment and embankment (e.g. haulroad 3 and 4, soil placement area, diversion dikes, etc.).
 - b. The reference to the main (east) principal spillway in Note no.5 is incorrect.
 - c. Correct the minimum east principal spillway elevation in note no.7. In addition, clarify installation of a downstream FCR underdrain, as the site plans or details do not include a FCR underdrain.
 - d. Label the “west” and “main” diversion dikes and “west” and “main” valley cutoff trenches on the site plan maps.
52. Drawing 308
- a. Delineate previously constructed liner footprints (initial site and stage 1 slurry embankment development) in the downstream slurry embankment area to clearly show tie-ins to previously constructed liner.
 - b. Label downstream terrace channel designs keyed to form 11.1A.
53. Drawing 309
- a. Provide outlet protection for channel GDR5 to protect the liner from the initial west impoundment slurry discharge to the main slurry impoundment.

- b. The delineation of internal drain ID-5 should be off-set from the embankment section line or the limits of the drain should be labeled to clarify the drain configuration.
 - c. Topsoil stockpile TSS5 is located in an area that is inaccessible from coal refuse disposal area no.5.
 - d. Groin channels and channel outlets are not shown. The channels must be conveyed from the toe of the soil embankment to the treatment pond in a non-erosive manner.
 - e. Depict the el. 1167.5 inlet and label as decommissioned.
 - f. Provide plans to transition and maintain groin drainage from channels GDL3 and GDR3 to GDL4 and GDR4 while down stream embankment construction is occurring, as described in construction note no.9.
54. Drawing 303B – DWG 309. Topsoil may not be stored in stockpile SST3 as proposed in step no.10 and is to be stored separately from other soil types.
55. Drawing 310. Depict entire liner footprint of the slurry embankment/impoundment footprint in stages 3 through 6 to ensure protection of the liner and coal refuse is not placed on unlined areas.
56. Drawing 303B – DWG 310. Revise note no.6 to include “cap” and vegetate the completed portion of the embankment. Revise subsequent stages accordingly.
57. Drawing 311
- a. A collection channel at the downstream toe of the western embankment and adjacent to the 937 corridor must be provided and designed for a 24-hour, 100-year design storm.
 - b. Extend the outlet from ID-6 to the downslope collection channel in a nonerosive manner.
58. Drawing 312. The haulroad gutter located at the downstream toe of the stage 5 north embankment and adjacent to the 936 corridor must be designed for a 24-hour, 100-year design storm. Depict and label the channel, keyed to module 11.1A. The refuse area out slopes must be collected and conveyed to the treatment pond in a nonerosive manner and may not discharge to refuse disposal area no.1 or the freshwater impoundment.
59. Drawing 314.
- a. Extend C24-C26 to the bottom of the treatment pond in a nonerosive manner to protect the pond liner and provide reference to detail on drawing no.320.
 - b. The capacity of CRDA no.1 box culverts may be impacted by channel CD-17 due to the resulting increased tail water depth. The culverts must be evaluated to demonstrate the required culvert capacity is provided for discharges from the CRDA no.1 coal refuse slurry impoundment.

60. Drawing 303B – DWG 314
 - a. Address development of channels CD18 and CD19 and grading activities occurring downstream of the main embankment, as the activities area identified to occur in phase 1 reclamation.
 - b. Extend CD19 to the bottom of the treatment pond in a nonerosive manner and provide reference to detail on drawing no.20 for channel CD19 outlet.
61. Drawing 315. Provide a berm on the downstream eastern embankment crest for this and subsequent phases to ensure top surface runoff from the embankment will not pass over the completed embankment.
62. Drawing 320
 - a. Extend upstream chamber discharge and culverts C24 through C26 to the main sediment/treatment pond bottom in a nonerosive manner.
 - b. Label SST3 underdrain and extend to the treatment pond underdrain, as proposed in the initial site development application.
63. Drawing 321. The transition of the bench gutter to CD17 shown in detail 5 exceeds the maximum design slope of the channel and may undercut CD17 at the bench gutter entrance point to CD17.
64. Drawing 326. Delineate section line on an exhibit map and provide reference to the exhibit for this and subsequent sections.
65. Drawings 327, 330, etc. The entire length of channel CD17 must be constructed in original ground {90.122(1)}.
66. Drawing 328. Channel GD-4 must be constructed in original ground.
67. Drawing 331. The 936 haulroad gutter must be installed in the conveyor bench fill.
68. Drawing 332
 - a. Revise note no.1 in the preparation of abutment slope notes be consistent with topsoil removal requirements.
 - b. Please explain how the cutoff trench will be formed and the soil backfill adjacent to the flowable fill will be compacted.
69. Drawing 335. Channel CD-14 will be eliminated with the construction of the FCR underdrain, which could cause damage to the liner and the FCR underdrain from surface runoff. Please explain how the liner and FCR drain will be protected from damage until the drain and channel is inundated.

70. Drawing 337. Provide additional seepage collection details reference to drawing no.342.
71. Drawing 342. Seepage collectors shall not discharge to the spring drains.
72. Drawing 348
 - a. All refuse embankment groin channels must be constructed in original ground. Add a note to the channel schedule specifying the requirement and identify channels in the table to be constructed in original ground.
 - b. The channel schedule does not include channels RG938-0 and RG1.
73. Drawing 349. List the minimum headwater elevation for each culvert needed to achieve the required design capacity.
74. Drawing 350. The 2/348 and 4/363 drawing references are incorrect.
75. Drawing 357. The hilltop area to the south of conveyor bin 357 must be graded or collected in a manner to direct surface runoff to the treatment facilities.

Miscellaneous

76. Revise the application to reflect changes resulting from revisions to the initial site development application.
77. Provide a drawing index sheet(s) that includes all drawings, including exhibits 6.1, 6.2, 9.1, 18.1 and all other drawings submitted with the initial site development.

Site plan exhibits

78. Revise exhibits to reflect the recently approved permit boundary for Bailey no.1/no.2 coal refuse disposal area permit, as approved in the coarse refuse conveyor extension permit, revision no.19.
79. Depict the cemetery and a 100-foot cemetery barrier in the area located with the eastern limits of coal refuse disposal area no.5. Refer to exhibit 9.1 of the approved Bailey no.3/no.4 coal refuse disposal area permit for cemetery location.
80. Depict gob degasification boreholes and label status (plugged, to be plugged, etc.).
81. Provide all information and mapping detail, as shown in the initial site development application site plan exhibits, including 6.2, 9.1, and 18.1. The revised exhibits are to be completed in a manner to supersede the initial site development permit application.

exhibits. Revisions to site plan exhibits are to be tracked for all permit revision applications to the Bailey no.5/no.6 coal refuse disposal permit.

Exhibit 9.1

82. Depict Zollar cemetery barrier area.
83. Reconcile prime farmland soils delineation with the delineation shown on the initial site development application. Revise module 18, as necessary.
84. The entire length of channel CD-17 must be constructed in original ground.
85. Depict the slurry pond decant inlets and the corresponding inlet elevations. Provide a table on the exhibit that lists the minimum dam embankment elevation for each inlet and the normal pool elevation for each inlet that must be maintained to prevent a discharge from the decant pipe prior to exceeding a 10-year, 24-hour design storm. Include the table or portions of the table on the stage development drawings.
86. Surface runoff from the northern limits of the coarse refuse fill may not be conveyed to sediment pond #1 or coal refuse disposal area #1 and sediment/treatment pond #10.
87. Depict coarse refuse conveyor details, consistent with Bailey no.1/no.2 coal refuse disposal area permit revision no. 19 and provide drawing reference to Bailey no.1/no.2 coal refuse disposal area permit revision no. 19. Note: Sediment traps and other coarse refuse conveyor facilities eliminated by refuse disposal area no.5 need not be shown. Provide revised designs for drainage controls receiving additional surface drainage from coarse refuse disposal area no.5. Revise the approved Bailey no.1/no.2 coal refuse disposal permit in a separate permit application to reflect impacts from Bailey no.5 disposal activities.
88. Label one south intake and return airshafts and water borehole as, to be sealed. Provide shaft sealing plan details, which will prevent settling and liner damage.
89. Indicate the source and accuracy of topographic information.
90. Depict road barrier and variance areas.
91. Label slurry pond dam no.1, slurry pond 1 saddle dam, and slurry pond 3 saddle dam A.
92. Label internal drain outlet points and provide unique identification for each point (e.g. ID-3a and ID-3b). Depict and label the piezometers. Revise other exhibits accordingly.

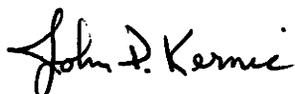
93. Provide a map key or label topsoil stockpiles associated with refuse area no.5. Include a drawing note on the drawing that topsoil stockpiles collected from area no.5 may not be utilized for other sites unless approved by the Department.
94. Depict water treatment facilities proposed in addition to treatment ponds.
95. Provide reference(s) to drawings required in 9.1.f for additional site plan details.
96. Label R (right) or L (left) of center for stations on refuse embankment section line.
97. The outlet from the conveyor bench channel located between the 936 and 937 bins is to discharge to CD-18 near bin 937 to facilitate the reclamation of the access roads at final reclamation.

The revisions and additions you submit must satisfy the provisions of Title 25, PA Code Section 86.37 by providing an affirmative demonstration of compliance with all existing laws and rules and regulations of the Department. All revised plan drawings must bear the date of revision and the seal or signature of the engineer or person who prepared the revision. All revised pages of the mining permit application, including the narrative, must indicate page number and date of revision. If revisions extend beyond the original page, each additional sheet should bear the original page number and a sequential letter of the alphabet. Also, please be sure to reference the acceptance date as indicated above on any correspondence for this application.

Please submit three (3) copies of all information within thirty (30) days. You must also revise the copy of the application available for public review. If this information is not received in this office by April 8, 2010, your application will be returned as incomplete.

If you have any questions regarding this matter, please contact our office at 724.769.1100.

Sincerely,



John D. Kernic
Hydrogeologist
District Mining Operations

Enclosure

JDK/be: f a JFL WSP JK CB JCF

bc: Greensburg District Office File
MCI Tim Hamilton
Mine Safety
PA Fish & Boat Commission
PA Game Commission
U. S. Fish & Wildlife Service
Army Corps of Engineers
EPA, Region III
Division of Dam Safety



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION
CALIFORNIA DISTRICT OFFICE

2010 JAN 23 PM 1:26

January 21, 2010

Certified Mail #7007 2560 0000 7189 9032

Edward Suter, Project Consultant
Consol Pennsylvania Coal Company, LLC
1525 Pleasant Grove Road, PO Box J
Claysville, PA 15323

Re: Applicant's Name: Consol Pennsylvania Coal Company, LLC
Application No.: 30080701
Richhill Township, Greene County

*2nd steep site
development*

Dear Mr. Suter:

A review of the information for the Coal Refuse Disposal Area No. 5 application accepted on February 18, 2009, for sedimentation pond development and received November 10, 2008, from Michael Baker Jr., Inc., has shown that several of the items in our correction letter of November 10, 2009, have not been satisfactorily addressed. Therefore, we will be holding an informal pre-denial conference at the California District Office to discuss the deficiencies. We recommend that you make arrangements to have your consultant present at this meeting.

Please contact me before February 20, 2010, to arrange a mutually convenient date for this meeting.

Specifically, the items, which were not adequately addressed or are still outstanding, include the following:

Module 4

1. A road variance has been approved by letter dated December 21, 2009; therefore, revise Module 4.4 accordingly.

Module 7

2. Submit the drill logs for the boreholes and monitoring wells used to construct the geologic cross sections.

Module 8

3. Show the location of SW-O and 40702-U1 on the Exhibit 6.2 or 8.3 Map.

4. Submit all data collected to date for all surface and groundwater monitoring and background sampling points, including MW-2, MW-5, MW-18, MW-22, MW-23, MW-26, MW-27, and 107.
5. Based upon the groundwater monitoring data, what is the range of groundwater fluctuation on the hilltops? Revise Module 8.1 accordingly.
6. Submit the design details for monitoring well MW-5.
7. Why was water sampling point SW-O eliminated as a surface water monitoring point from the original proposed water monitoring plan? Revise where, if applicable.
8. Submit all flow data used to determine the high, low and average flows of Owens Run.
9. Determine how much of the total Owens Run Watershed will be encompassed by Coal Refuse Disposal Area No. 5 and No. 6, upstream of the confluence of Owens Run and UNT-OR.
10. Address Module 8.14c in detail because this application is a portion of the total proposed coal refuse disposal and slurry pond for CRDA No. 5 and No. 6.
11. Establish a surface water monitoring point for the chimney drain outlet to ensure unanticipated embankment seepage is monitored for stability and water quality. This requirement is supported also by the PA Division of Dam Safety. Revise Module 8.15 and exhibits accordingly.

Module 9.1

12. Restore the stream barrier area designations.

Plan details

13. Include filter bag construction detail #26 and use requirements on the plan drawings. Filter bags may not discharge directly to temporary inlet boxes or streams.
14. Drawing no. 207
 - a. Provide filter fence between the upper 300-feet of channel DD-16 and access road #1 and other hilltop disturbed areas.
 - b. Channel CD-26 development is to be delayed until after sediment pond no.2 is completed to minimize concentrated flows from disturbed areas associated with pond access corridor and TAC-3 development. Runoff from the access road is to be

- controlled with filter fence until the pond no.2 is completed and channel CD-26 is constructed.
- c. Revise culvert TC-1 design to provide a permanent culvert and extend the culvert discharge to ditch DD6 in a nonerosive manner.
15. Drawing no. 211. The hill top area located from the end of access road 1 to the 938 bin must be conveyed to the MSP or other suitable erosion and sedimentation controls. Disturbed areas may not exit the permit without the benefit of treatment.
16. Drawing no. 212. The proposed erosion and sedimentation control plans for earth disturbances associated with MSP auxiliary spillway development are not adequate to control runoff from disturbed areas. Sediment trap ST-8 is not designed to accept runoff from areas associated with spillway development. There is significant potential for accelerated erosion and off-site sedimentation due to steep slopes and proximity to the stream.
17. Drawing no. 230. Depict the pond dewatered (normal pool) and sediment storage elevations in section A-A. Revise drawing no. 231 to include the pond dewatered and sediment storage elevations.
18. Drawing no. 245, note no. 2 and drawing details. Revise plans to provide rock or other suitable protective cover on the pond interior to prevent damage to the liner from cleaning equipment. A rock liner protection design is consistent with the other application responses.
19. Drawing no. 247. The drawing detail references are incorrect.

Module 10

20. Provide a gas line owner agreement for impacts within the right-of-way for Columbia gas line #6292.

Module 12

21. Revise Module 12.2.a) to reflect future plans to discharge mine water to the area no.5 impoundment, as stated in the previous comment response no.44. Please be advised that the normal pool of the no.5 coal refuse slurry impoundment must be maintained at an elevation to contain a 10-year, 24-hour design storm, as the provided discharge rate information did not indicate a mine water discharge (dry weather) would occur from the no. 5 slurry impoundment decant pipe.

22. 12.3. Remove dilution as a measure to meet effluent discharge limits. Revise 13.4.a) accordingly.
23. Provide requested information to Modules 12.4 and 12.5.

Module 13

24. Form 13.2A – MSP. Revise the dewatering perforation schedule to include the row located at 1136 feet.
25. Form 13.2A – SP2. Revise drainage area to be consistent with contributory area and pond designs.
26. Form 13.2A – SP3
 - a. The embankment crest elevation is 1142-feet (see design calculations).
 - b. The emergency spillway depth and capacity information is inconsistent with design calculations.

Module 15

27. Please be advised that a 401 water quality certification review by the Department will not commence until the complete 404 permit application is received by the Department in its final version.
28. 15.5.
 - a. Revisions to the current application (section J) are not adequate to address chapter 105 requirements for the wetland mitigation area. This office is currently seeking internal guidance to advise you where to submit a chapter 105 application is for the proposed wetland mitigation activities.
 - b. A revised exhibit 15.5-1 was not provided. The previous comment is included in italics for your reference. *Exhibit 15.5-1 does not show roadways or other surface features necessary to locate the wetland mitigation site.*
 - c. Justification was not provided for locating the wetland mitigation site outside of the Enlow Fork watershed, which is the first watershed located downstream of Owens Run. Sufficient area likely exists in the Enlow Fork Watershed to conduct wetland mitigation. Refer to TGD363-0300-001, section III.B for siting replacement wetlands. The previous comment is included in italics for your reference. *Wetland mitigation should first occur in the Owens Run watershed and second in the Enlow Fork watershed before going outside of the watershed. Provide justification for selecting the wetland mitigation site in the Crabapple watershed.*

- d. Provide plans for the establishment of suitable substrate conditions to support wetland plant communities.
 - e. A detailed erosion and sedimentation control plan (section M) must be provided for the project.
 - f. Exhibit 15.5-4, detail 1. Provide an earthen plug or other suitable measure to prevent flow through the rock armor prior to reaching the design water surface elevation (top of wetland pool) of the constructed wetland. The top of wetland pool shown on the section is not consistent with the control weir crest.
-
29. CPCC and the California District Office have interacted extensively on a proposed stream mitigation plan (Presto-Sygan) for the stream impacts associated the proposed coal refuse disposal areas no.5 and no.6. The proposed plans or information provided to date are incomplete or not acceptable for mitigation plan acceptance. The following items must be addressed in order to proceed with the application processing:
- a. Revise stream mitigation plan in 15.5.a.iv to state CPCC will be responsible for the construction, operation, and perpetual funding of the final accepted stream mitigation project(s). Revise response to previous comment no.60.a accordingly, which indicates CPCC is evaluating the “possibility” of providing funding to construct and provide long-term O&M for the AMD treatment system.
 - b. The comment response to 60.a describes how the Presto-Sygan discharge was selected for stream mitigation; however, the explanation excluded a requested analysis of areas located closer to the Enlow Fork watershed. Previous comment 60.a. is included again in italics for your reference. *Describe how the Presto-Sygan project was selected and an evaluation of other similar projects that may exist in the impacted watershed or in closer proximity to the impacted watershed (emphasis added), as agreed by Jonathan Pachter in a meeting held on 8/17/09.*
 - c. Part of the mitigation plan success shall be based on pre-treatment biological studies of macro-benthic organisms found within the Chartiers Watershed (within the area of influence) as compared to the takings of biological organisms within the Owens Run Watershed. Success shall be determined by the increasing the baseline of macro-benthic organisms using the Pa. DEP “Pollution Tolerance Values” between 0-6. The increase of 2 times the number of organisms taken shall be the minimum replacement value. Secondary success shall be determined by increasing the Warm Water fishery populations within the Chartiers Watershed (within the area of influence) to mirror populations present in areas within the watershed that are not polluted by mine discharges.
 - d. The success of the Preston-Sygan project is significantly dependent on the success of Wigfield Pine (Chartiers Creek) and Gladden (Millers Run) AMD projects, which are located upstream of the Presto-Sygan discharge. CPCC must demonstrate that treatment of the Preso-Sygan project will result in improvement to Chartiers Creek by ensuring that the Gladden and Wigfield Pine AMD projects are completed and funding is secured for

the perpetual treatment of all three discharges. The provided water quality data indicates and CPCC's own admission on page no.22 in exhibit "A" states that the current observed water quality impact to Chartiers Creek from Presto-Sygan is limited.

- e. A conventional treatment system is required for the Presto-Sygan discharge. A conventional treatment system will ensure that required treated water effluent limits are consistently attained.
 - f. Consol must obtain all necessary permits and approvals in a timely manner to ensure stream restoration occurs in advance or concurrently with stream impacts.
 - g. ~~Revise exhibit "A" to provide an updated and complete mitigation plan, which includes the final accepted mitigation plan, design details, monitoring plans, performance standards, and incorporates relevant information from application review comment responses.~~
 - h. A consent order and agreement must be developed for the stream mitigation project and a NPDES permit is required for the treatment effluent. Effluent limit requirements under §89.52 for passive treatment systems are not applicable, as asserted in previous submittals by CPCC.
30. Provide Biological Data for Owens run to establish a baseline (4 points) to determine the cumulative effects of the proposed CRDA No. 5 and possible future disposal locations. Site selections should be located upstream of proposed CRDA No. 5 and No. 6, downstream of CRDA No. 6 and No. 7.

NOTE: Failure to adequately address these items will result in rejection of the currently proposed stream mitigation plans and may result in denial of the permit application.

Module 15: Exhibit a Presto-Sygan AMD Restoration Mitigation Report

31. Provide pre-treatment information for all biological communities on Chartiers Creek upstream and downstream to the mitigated discharges. In addition, describe how the biological benefits to the mitigated reaches of Chartiers Creek offset the adverse effects to Owens Run.

Provide a proposed distance in stream length and percent increased to the various biological communities within Chartiers Creek with respect to the adverse stream impacts of the sediment pond. Demonstrate how improvements to Chartiers Creek's Watershed will result in a significant environmental improvement to compensate for the lost uses to the unnamed tributaries to Owens Run associated with the sediment pond development.

The benefits to Chartiers Creek may be expressed in terms of improved stream length and increased percentage of biological communities.

October 14, 2009 Letter: Presto-Sygan AMD Remediation Justification

32. Comments Executive Summary – question 7: Provide preconstruction background biological information for Chartiers Creek upstream and downstream of discharges to be collected and treated (i.e. fish and macrobenthic).

Module 17

33. 17.3.a). Reconcile Module 17 and site alternatives analysis information with recently provided NRCS letter dated October 6, 2008.

Module 18

34. Revise the response to Module 18.1.e.14 to provide a reclamation schedule of the initial site development facilities, if the slurry impoundment is not issued. The schedule shall include, but not be limited to, dates for submission of a detailed reclamation plan, and commencement and completion of reclamation activities. Revise 18.4.a to include reclamation requirements, if the slurry impoundment is not issued.

Technical Specifications

35. Provide a conspicuous note that all work shall be accomplished in accordance with approved state and federal permits. In the event of a discrepancy between technical specifications, contract drawings and permit documents, the permit requirements shall govern. Changes shall only be implemented with approvals from state and federal agencies, where applicable.
36. The specifications on page 3F-2.A.1) and 3F-8.2) are not consistent with topsoil removal requirements.

Calculation Brief – Volume 2

37. Reconcile sediment trap calculation designations with site plan designations.
38. The maximum potential contributory drainage area for sediment trap ST-8 exceeds the maximum allowable drainage area for a sediment trap. The elimination of DD-8 during MSP embankment and auxiliary spillway development will increase the contributory drainage area to ST-8 in excess of current designs.

All outstanding deficiencies must be addressed to the satisfaction of the Department within thirty (30) days of the date of this letter. Failure to comply with this schedule by February 20, 2010, will result in the denial or return of this application.

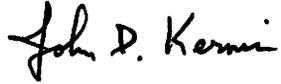
Edward Suter

-8-

January 21, 2010

If you have any questions, please contact me at 724.769.1100.

Sincerely,

A handwritten signature in black ink that reads "John D. Kernic". The signature is written in a cursive style with a large initial "J" and "K".

John D. Kernic
Hydrogeologist
District Mining Operations

JDK/be: f a JK JFL WSP CB JCF

bc: Greensburg District Office File
MCI Tim Hamilton
Consultant: Michael Baker Jr., Inc.
PA Game Commission
US Fish & Wildlife Service
Army Corps of Engineers
EPA Region III
Division of Dam Safety
~~MSHA district 2~~
PA Fish Commission



Pennsylvania Department of Environmental Protection

25 Technology Drive
California Technology Park
Coal Center, PA 15423
December 29, 2009

California District Office

724-769-1100

US Army Corps of Engineers
Pittsburgh District
William S. Moorehead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Re: CMAP# 30810703
Company: Consol PA Coal Company, LLC
Operation Name: Bailey Coal Refuse Disposal Areas No. 1 and No. 2
Purpose: Revision – Add 129.2 Support Acres to Install Slurry Pipeline,
Boreholes, and Fine Coal Slurry Injection into Bailey Mine
Acceptance Date: 12/23/09
Township: Richhill
County: Greene

Ladies and Gentlemen:

Enclosed is information concerning the referenced coal mining activity within your jurisdiction. We have begun our review of this application and would appreciate your comments, including any supporting data, to assist us in our review.

We would like your comments within thirty (30) days because our review time frame is very tight. Please include the above referenced CMAP#, Company & Operation Name, Purpose, and Acceptance Date in your comments.

This notification is sent to you pursuant to the Clean Streams Law and the Department's coal mining rules and regulations.

slurry into mine

Sincerely,

Jay A. Winter

Jay A. Winter
Hydrogeologist
District Mining Operations

Enclosure



SECTION C. SITE INFORMATION

Location of Operation – for underground mines provide main portal location

County(ies) Greene Municipality(ies) Richhill County Code 30

U.S.G.S. Map Name(s): Wind Ridge, PA

Map Coordinates (center of proposed permit area) (center of main portal for underground mines)

Latitude 39° 56' 44" Longitude 80° 25' 28"

Name(s) of receiving stream(s)/Chapter 93 Classification

Talley Run WWF Owens Run (32700) WWF

Trib. 32705 to Owens Run WWF

MSHA Mine I.D. No. (include date of issuance) 36-07230 (10/01/1981)

Site Contact

Bogden (Last Name) Brian (First Name) (MI)

Environmental Engineer (Title)

Mailing Address

P.O. Box J, 1525 Pleasant Grove Road (Street # and Name or P.O. Box)

Claysville (City) PA (State) 15323 (Zip Code + Four)

brianbogden@consolenergy.com (E-mail) (724) 663-3065 (Telephone #) Ext. 724-663-3067 (FAX #)

Extent of Mining	Permitted	Proposed under this application.	Total
Coal Preparation Activity Area	_____ acres	_____ acres	_____ acres
Coal Refuse Disposal Area	<u>402.0</u> acres	<u>0</u> acres	<u>402.0</u> acres
Coal Refuse Reprocessing Area	_____ acres	_____ acres	_____ acres
Support Area – Disposal/Reprocessing	<u>205.0</u> acres	<u>129.2</u> acres	<u>334.2</u> acres
Total Refuse Area, plus Support Area	<u>607.0</u> acres	<u>129.2</u> acres	<u>736.2</u> acres
Underground Mines:	_____ acres	_____ acres	_____ acres
Underground Permit Area	_____ acres	_____ acres	_____ acres
Subsidence Control Plan Area	_____ acres	_____ acres	_____ acres
Surface Activity Sites (List Individually with Site Area Acreage)	_____ acres	_____ acres	_____ acres
Total Surface Activity Site Acres	_____ acres	_____ acres	_____ acres

RECEIVED

DEC 16 2009

Dept. of Environmental Protection
California District Office

SECTION C. SITE INFORMATION (continued)

Comments:

SECTION D. PERMIT COORDINATION

Will underground tanks for storage of fuel or chemicals be located within the proposed permit area? Yes No
 (if Yes, please complete Module 10.8)

SECTION E. APPLICATION FEE

Application Fee (make check payable to "Commonwealth of Pennsylvania")

Quantity	_____	_____	_____
<input type="checkbox"/>	2	\$ 250	NPDES (\$250)
<input type="checkbox"/>	_____	\$ _____	General Permit BAQ-GPA/GP 12 (\$1,000)
<input type="checkbox"/>	_____	\$ _____	Mining activity (underground and/or coal preparation) (\$250)
<input type="checkbox"/>	129.2 acres	\$ 1292	Refuse Disposal (\$500 + \$10 acre for every acre over 50)
<input type="checkbox"/>	_____	\$ _____	Stream Enclosure (\$350/enclosure)*
<input type="checkbox"/>	_____	\$ _____	Stream Channel Change or Stream Restoration Area (\$300/each)*
<input type="checkbox"/>	_____	\$ _____	Bridge, water obstruction or encroachment in a stream or floodway with a drainage area larger than 100 acres (\$200 each)*
<input type="checkbox"/>	_____	\$ _____	Small project as defined in 25 Pa Code Section 105.1 (\$100 each)*
		\$ 1542	Total Application Fee

(* if less than 100 acres, no fee is required.)

SECTION F. CONSULTANT

(if more than one consultant prepared this application provide information on separate sheets)

See Attachment F

(Last Name)

(First Name)

(MI)

(Title)

(Name of Consulting Firm)

Mailing Address

(Street # and Name or P.O. Box)

(City)

(State)

(Zip Code + Four)

(E-mail)

() _____
(Telephone #)

Ext. _____

RECEIVED

(FAX #)

DEC 16 2009

Dept. of Environmental Protection
California District Office

SECTION G. LAND USE INFORMATION

Have you submitted local municipal and county approval letters for this mining project with this permit application? Yes No

List the municipality(ies) and county(ies) that received the approval letters:

If "no," respond to the following additional questions:

1. Is there a municipal comprehensive plan? Yes No
2. Is there a county comprehensive plan? Yes No
3. Is there a multi-municipal or multi-county comprehensive plan? Yes No
4. Is the proposed project consistent with these plans? Yes No
(If no plans exist, answer "yes.")
5. Is there a municipal zoning ordinance? Yes No
6. Is there a joint municipal zoning ordinance? Yes No
7. Will the proposed project require a zoning approval? (e.g., special exception, conditional approval, rezoning, variance). (If zoning approval has already been received, attach documentation.) Yes No
8. Are any zoning ordinances that are applicable to this project currently subject to any type of legal proceeding? Yes No
9. Will the project be located on a site that is being remediated under DEP's Land Recycling Program? Yes No
10. Will the project result in reclamation of abandoned mine lands through re-mining or as part of DEP's RECLAIM PA Program? Yes No
11. Will the project be located in an agricultural security area or an area protected under an agricultural conservation easement? Yes No
12. Will the project be located in a Keystone Opportunity Zone or Enterprise Development Area? Yes No
13. Will the project be located in a Designated Growth Area as defined by the Municipalities Planning Code? Yes No

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

SECTION H. ADDITIONAL RELATED INFORMATION

Name and Address of Public Review Office where a copy of this application is on file for public review. (reference Appendix B if appropriate)

**PA Department of Environmental Protection
California District Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423**

**Greene County Conservation District
19 South Washington Street, Suite 150
Waynesburg, PA 15370**

Have you paid all reclamation fees to the Federal Office of Surface Mining Reclamation and Enforcement as required by the Federal Surface Mining Control and Reclamation Act of 1977 (30 USC 1232)? Yes No

Provide the following as applicable to the proposed operation:

Pre-Application No. Not applicable

Small Operator Assistance Program (SOAP) Project No. Not applicable

Notice of Intent to Explore No. Not applicable

PNDI – Search results Yes No (if yes, complete Module 4.7)

Environmental Justice Areas Yes No

(if yes, provide plan for enhanced public participation) N/A – Borehole Application Only

Application Date October 2009

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SECTION I. AFFIDAVIT

Commonwealth of Pennsylvania, County of *Washington*

I, *Jonathan M. Pachter* being duly sworn, according to law, depose and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Sworn and Subscribed to Before Me This

_____ day of _____ 2009
(month) (year)

Signature of Applicant or Responsible Official

Notary Public
General Manager - Environmental Services
Title and Seal

Jonathan M. Pachter
Name (Typed)
1000 CONSOL Energy Drive, Canonsburg, PA 15317
Address

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Dept. of Environmental Protection
California District Office

ATTACHMENT F – Consultant Listing

SECTION F. CONSULTANT			
<u>Stewart</u> (Last Name)	<u>Michele</u> (First Name)		(MI)
<u>Project Manager</u> (Title)	<u>Michael Baker Jr., Inc.</u> (Name of Consulting Firm)		
Mailing Address			
<u>4301 Dutch Ridge Road</u> (Street # and Name or P.O. Box)			
<u>Beaver</u> (City)	<u>PA</u> (State)	<u>15009</u> (Zip Code + Four)	
<u>mstewart@mbakercorp.com</u> (E-mail)	<u>(724) 495-4104</u> (Telephone #)	<u>Ext.</u>	<u>(724) 495-4017</u> (FAX #)

SECTION F. CONSULTANT			
<u>Trexler</u> (Last Name)	<u>Heather</u> (First Name)		(MI)
<u>Geologist</u> (Title)	<u>Moody and Associates, Inc.</u> (Name of Consulting Firm)		
Mailing Address			
<u>199 Johnson Rd, Bldg 2, Suite 101</u> (Street # and Name or P.O. Box)			
<u>Houston</u> (City)	<u>PA</u> (State)	<u>15342</u> (Zip Code + Four)	
<u>htrexler@moody-s.com</u> (E-mail)	<u>(724) 746-5200</u> (Telephone #)	<u>Ext.</u>	<u>(724) 746-5603</u> (FAX #)

SECTION F. CONSULTANT			
<u>Shema</u> (Last Name)	<u>Mike</u> (First Name)		L (MI)
<u>Project Manager</u> (Title)	<u>Civil & Environmental Consultants, Inc.</u> (Name of Consulting Firm)		
Mailing Address			
<u>333 Baldwin Road</u> (Street # and Name or P.O. Box)			
<u>Pittsburgh</u> (City)	<u>PA</u> (State)	<u>15205-9702</u> (Zip Code + Four)	
<u>mshema@cecinc.com</u> (E-mail)	<u>(412) 429-2324</u> (Telephone #)	<u>(412) 429-2114</u> (FAX #)	

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Module 2: General Information

Check those modules included in this application (submit only those which apply). See Appendix D of the instructions for modules and documents required for permit transfer, name changes, and ownership changes.

Yes	No		Module	Date of Last Revision
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1: Application	1	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2: General Information	2	10/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3: Ownership/Compliance Information	3	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4: Areas Where Mining is Prohibited or Restricted	4	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5: Property Interests/Right of Entry	5	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6: Environmental Resource Maps	6	9/2008
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	7: Geologic Information	7	10/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8: Hydrology/Baseline Biology	8	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9: Operations Maps - Surface Activity Sites	9	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10: Operation Plan	10	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11: Erosion and Sedimentation Controls	11	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12: Treatment Systems	12	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13: Impoundments	13	10/2008
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	14: Liners and Caps	14	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15: Streams/Wetlands	15	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	16: Air Quality and Noise Control	16	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17: Soils/Prime Farmland	17	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18: Land Use/Reclamation	18	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	19: Reclamation Schedule and Cost Information	19	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	20: Coal Refuse/Coal Ash - Sources and Properties	20	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	21: Coal Refuse Construction Plans	21	9/2008
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	22: Subsidence Control and Underground Mine Maps	22	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	23: Mine Openings	23	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	24: Special Protection Waters	24	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	25: Coal Ash Beneficial Use	25	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	26: Remining of Areas with Preexisting Pollutational Discharges	26	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	27: Biosolids/Coal Ash Beneficial Use	27	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	28: Blasting Plan	28	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	29: Disposal of Excess Spoil	29	9/2008
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	30: Underground Disposal/Backstowing	30	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	31: In Situ Processing	31	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	32: Surface Site Stability	32	10/2008

Has a check, payable to the Commonwealth of Pennsylvania for the proper amount, been included? Yes No
 Has the application been properly executed and if a corporation, the corporate seal affixed? Yes No
 Is a copy of the public notice attached to this module? Yes No

(The notice must indicate whether the application is for a new permit, permit revision, permit renewal or permit transfer, and specifically reference areas to be affected by both surface and underground operations, stream variances, stream crossings, stream channel changes, streambed deformation and dewatered stream restoration, road variances, blasting, fly ash deposition and land use changes.)

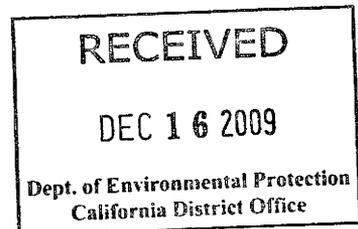
(Example Public Notices are included in the instructions as Appendix F (deep mines and prep plants) and Appendix G (coal refuse)).

Have arrangements been made to publish public notice of this application? (Proof of publication must be submitted to the Department upon completion of the publication requirements.) See Appendix E of the instructions for information regarding permit type vs. public notice and proof of publication requirements. Yes No

Has documentation been provided indicating that the advertisement requirement of §86.31(a) is in the process of being satisfied? (Intent to publish requirement, 86.70) Yes No

I do hereby certify that this application includes: all of the modules checked above; payment of application fee(s), and all other information as noted above.

Jonathan M. Richter
 Signature of Applicant or Responsible Official



PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

The application, plans, reports and specifications shall be certified by a licensed professional engineer, licensed professional geologist or licensed land surveyor, as appropriate. Certain items, such as; haul road design (87.160, 89.26, 90.134), stream channel diversions (87.104, 90.105), dams and impoundments (87.73, 87.112, 90.39, 80.112, 89.101), disposal of excess spoil (87.131), variance to contouring (87.175), subsidence control plan maps (89.154), and maps, plans, and cross sections (90.21, 90.46) require preparation and certification by specific professionals. Please review the appropriate sections of Chapters 86-90 to ensure compliance with these certification requirements.

Registered Professional Engineer

I, Michele Stewart, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 6 (Exhibit 6.2), 9 (9.1 & Appendix Design Drawings pertaining to borehole construction), 10, 11, 12, 13, 16, 18, 19, and 23, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Michele Stewart

Address

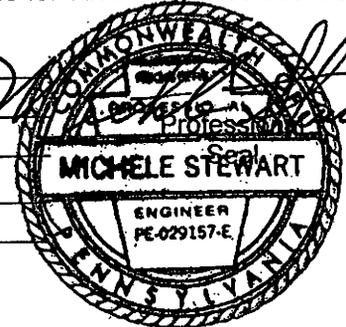
Michael Baker Jr., Inc.
4301 Dutch Ridge Road
Beaver, PA 15009

Telephone No.

724-495-4104

Date

10-8-09



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Professional Seal

Telephone No.

Date

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Professional Seal

Telephone No.

Date

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PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

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Registered Professional Engineer

I, Gregory Hynes, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 9 (Appendix Design Drawings pertaining to slurry line construction) and 30, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____

Address _____

Michael Baker Jr., Inc.

4301 Dutch Ridge Road

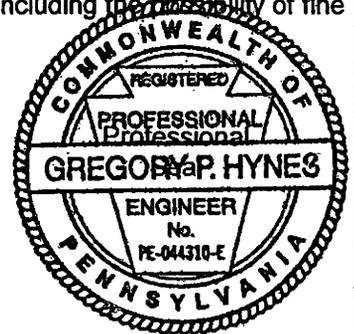
Beaver, PA 15009

Telephone No. _____

724-495-4104

Date _____

9/18/09



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____

Address _____

Professional Seal

Telephone No. _____

Date _____

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____

Address _____

Professional Seal

Telephone No. _____

Date _____

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PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

The application, plans, reports and specifications shall be certified by a licensed professional engineer, licensed professional geologist or licensed land surveyor, as appropriate. Certain items, such as; haul road design (87.160, 89.26, 90.134), stream channel diversions (87.104, 90.105), dams and impoundments (87.73, 87.112, 90.39, 80.112, 89.101), disposal of excess spoil (87.131), variance to contouring (87.175), subsidence control plan maps (89.154), and maps, plans, and cross sections (90.21, 90.46) require preparation and certification by specific professionals. Please review the appropriate sections of Chapters 86-90 to ensure compliance with these certification requirements.

Registered Professional Engineer

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Module _____, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____

Address _____

Telephone No. _____

Date _____

Professional Seal

Registered Professional Geologist

I, Heather Freeman do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 8.1, 8.3 - 8.7, 8.9a, e, f, 8.13 - 8.16, 23, and 30, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____

Address _____

Telephone No. _____

Date 9-14-09

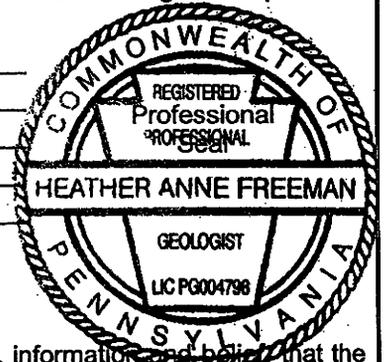
Heather A Freeman

Moody and Associates

199 Johnson Road

Houston, PA 15342

724-746-5200



Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

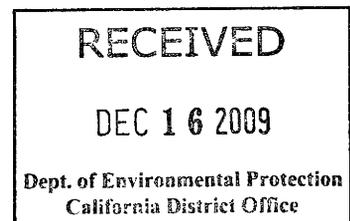
Signature _____

Address _____

Telephone No. _____

Date _____

Professional Seal



PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

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Registered Professional Engineer

I, Kenneth R. Miller, P.E., do hereby certify to the best of my knowledge, information and belief, that the information contained in Module 15, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

[Handwritten Signature]

Address

Civil & Environmental Consultants, Inc.

333 Baldwin Road

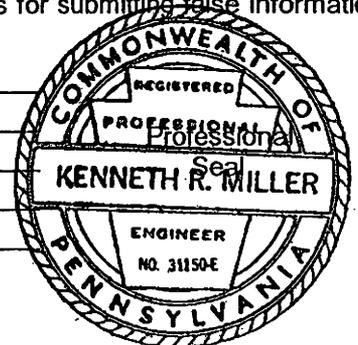
Pittsburgh, PA 15205

Telephone No.

412-429-2324

Date

8/28/09



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Professional Seal

Telephone No.

Date

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Professional Seal

Telephone No.

Date

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PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

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Registered Professional Engineer

I, Kerry Goodballet, P.E., do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 6 (Exhibit 6.1), and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Kerry Lynn Goodballet

Address

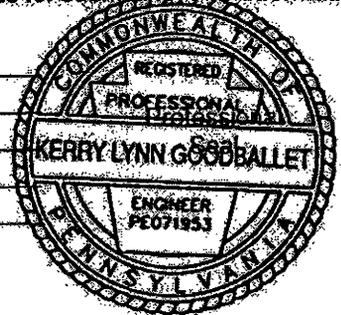
Consol Pennsylvania Coal Company
1000 CONSOL Energy Drive
Canonsburg, PA 15317

Telephone No.

724-485-4267

Date

10-12-09



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____ and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Professional Seal

Telephone No.

Date

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____ and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Professional Seal

Telephone No.

Date

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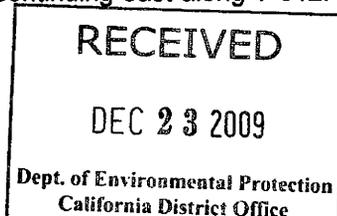
Dept. of Environmental Protection
California District Office

PUBLIC NOTICE

Pursuant to the Pennsylvania Clean Streams Law, the Pennsylvania Department of Environmental Protection Rules and Regulations, the Surface Mining Conservation and Reclamation Act, and the Bituminous Mine Subsidence and Land Conservation Act as amended, notice is hereby given that Consol Pennsylvania Coal Company LLC, doing business at P.O. Box J, 1525 Pleasant Grove Road, Claysville, PA 15323, has made application to the Pennsylvania Department of Environmental Protection to revise existing Permit No. 30810703 and related NPDES permit for the Bailey Coal Refuse Disposal Areas No. 1 and No. 2 Facility.

The proposed revision adds approximately 129.2 acres of surface permit area for construction of underground slurry injection facilities. It also will impact approximately 21 acres within the existing Disposal Area No. 1 permit. The proposed revision includes: installation of 19 injection boreholes; installation of 19 vent boreholes; extension of an existing slurry pipeline approximately 18,700 feet to the injection borehole areas; construction of a new dewatering borehole and control borehole; and associated support facilities. The slurry injection facility will be located in Richhill Township, Greene County; south of the existing Bailey Central Mine Complex. Nine (9) injection boreholes and an adjoining vent borehole for each injection borehole will be located within proposed permit area that encompasses the hillside bordering the north side of S.R. 4007 (Ackley Creek Road) west of the S.R. 4007/Kerr Road intersection. Ten (10) additional injection boreholes and an adjoining vent borehole for each injection borehole will be located within the permit area along the north side of Oak Ridge Road (T-610), in the vicinity of Teagarden Lane (T-612). The two borehole areas will be connected by additional permit area for slurry line construction, which will be constructed east of Teagarden Lane (T-612). The entire proposed permit area is located on the Wind Ridge, PA U.S. Geological Survey 7.5 minute topographic map. The proposed permit revision includes two new sedimentation ponds as well as other erosion and sedimentation control facilities.

The application includes a request for variance to encroach within 100 feet of the right of way of S.R. 4007, T-610, and T-612 at the following locations: three sections of S.R. 4007 having lengths of approximately 390 feet, 690 feet, and 180 feet, with each beginning approximately 180 feet, 1,440 feet, and 2,240 feet west of Kerr Road, respectively and continuing west; approximately 230 feet of T-610 beginning at its intersection with T-612 and continuing west; three sections of T-610 having lengths of approximately 200 feet, 200 feet, and 800 feet, with each section beginning approximately 670 feet, 900 feet, and 1,300 feet southeast of the intersection with T-612, respectively and continuing southeast; and approximately 1,160 feet of T-612 beginning at its intersection with T-610 and continuing east along T-612. The road variances are required for site



Revised December 2009

grading and construction of a pipeline crossing access roads, and erosion and sedimentation controls.

The proposed permit revision includes the discharge of treated surface water runoff requiring two new NPDES discharge points; 101 from a sedimentation pond into Tributary 32705 to Owens Run and point 102 from a sedimentation pond to UNT 8 to Owens Run. The proposed new NPDES discharge points are located approximately 200 feet north of the intersection of S.R. 4007/Kerr Road on Tributary 32705 to Owens Run and approximately 370 feet southwest (upstream) from the mouth of UNT 8 to Owens Run, respectively.

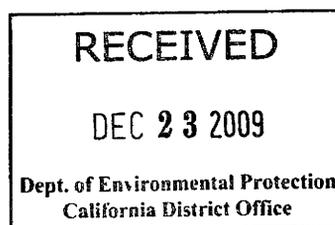
Stream variances have been requested for activities within 100 feet of Owens Run and seven (7) Unnamed Tributaries to Owens Run totaling approximately 2,219 feet of stream. This total includes 735 feet of variance for Owens Run at the following four locations: approximately 155 feet beginning at approximately 207 feet northwest of the S.R. 4007/T-611 intersection (along S.R. 4007) and extending upstream; approximately 280 feet beginning at approximately 1,444 feet northwest of the S.R. 4007/T-611 intersection (along S.R. 4007) and extending upstream; approximately 157 feet beginning approximately 1,870 feet northwest of the S.R. 4007/T-611 intersection (along S.R. 4007) and extending upstream; and approximately 30 feet beginning approximately 2,225 feet northwest of the S.R. 4007/T-611 intersection (along S.R. 4007) and extending upstream. Stream variance are requested for seven (7) other unnamed tributaries Owens Run through the project site including: 732 feet of variance for tributary UNT-OR to Owens Run beginning at approximately 1,396 feet northwest of the S.R. 4007/T-611 intersection (along S.R. 4007) and 177 feet due north and extending upstream; 44 feet of variance for tributary UNT-OR A to Owens Run beginning at approximately 1,364 feet northwest of the S.R. 4007/T-611 intersection (along S.R. 4007) and 224 feet due north and extending upstream; 135 feet of variance for tributary 32705 to Owens Run beginning at approximately 151 feet northwest of the S.R. 4007/T-611 intersection (along S.R. 4007) and 59 feet due west and extending upstream; 307 feet of variance for tributary UNT 8 to Owens Run, beginning approximately 841 feet southeast of the T-612/T-610 intersection (along T-610) and 870 feet due east and extending upstream; 85 feet of variance for UNT 9 to UNT 8, beginning at approximately 873 feet southeast of the T-612/T-610 intersection (along T-610) and 597 feet due east and extending upstream; 163 feet of variance for UNT 11 to Owens Run beginning at approximately 813 feet southeast of the T-610/T-612 intersection (along T-610) and 545 feet due east and extending upstream and 18 feet of variance for UNT 12 to UNT 11 beginning at approximately 834 feet southeast of the T-610/T-612 intersection (along T-610) and 450 feet due east and extending upstream. The stream variances are required for the borehole pads, access road grading, installation of two sedimentation ponds, and installation of drainage channels and other erosion and sedimentation control facilities.

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DEC 23 2009
Dept. of Environmental Protection
California District Office

Revised December 2009

Copies of the application are available for public inspection, and copying for a fee, by appointment at the Pennsylvania Department of Environmental Protection, California District Mining Office, 25 Technology Drive, California Technology Park, Coal Center, PA 15423 (telephone number: 724-769-1100) and at the Greene County Conservation District, 19 South Washington Street Suite 150, Waynesburg, PA 15370 (telephone number: 724-852-5278).

Written comments, objections, or a request for an informal conference may be submitted to the Department of Environmental Protection, District Mining Operations, at the above address, no later than thirty (30) days following the final publication date of this notice.



Revised December 2009

Module 10: Operation Plan

This Module is designed so that it can be used for new permit applications and permit revision applications. When using it to complete a revision application, the responses may reference the original approved application or be worded to apply specifically to the new activity or site being proposed. Information submitted under this Module must be certified by a licensed professional engineer.

10.1 Description of Operations

- a. Provide a description of operations that will take place under this permit.

This application adds approximately 129.2 acres of surface support area to existing Coal Refuse Disposal Area No. 1 and No. 2 Permit No. 30810703 for construction of a fine coal refuse slurry injection facility in Richhill Township, Greene County.

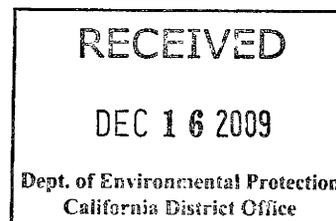
The injection facility will be used to dispose fine coal refuse within abandoned workings of the Bailey Mine. Basically, the facility will consist of 19 injection boreholes located in two general areas and will include approximately 20,800 linear feet of new 14-inch diameter pipeline (trunk line) that will extend from an existing section of slurry pipeline located on the north side of Coal Refuse Disposal Area No. 1 to each borehole area. Service to each borehole will be accomplished with additional smaller diameter piping and valves as indicated on the Module 9 appendix drawings. Nine (9) boreholes with an adjoining vent borehole for each slurry injection borehole will be located along the north side of Ackley Creek Road (S.R. 4007), within an area that begins just west of the Ackley Creek Road/Kerr Road (T-611) intersection and extends approximately 2,300 feet west. Ten (10) additional boreholes with an adjoining vent borehole for each slurry injection borehole will be installed on property along the northeast side of Oak Ridge Road (T-610), in the vicinity of its intersection with Teagarden Lane (T-612); five near the road intersection and five (5) in an area that begins approximately 1,000 feet south of the Oak Ridge Road/Teagarden Lane intersection and continues south/east approximately 2,000 feet.

Construction and operation of a new dewatering borehole and adjacent control borehole located just west of Coal Refuse Disposal Area No. 3 Saddle Dam A on existing CRDA No. 1 and No. 2 permit area is included with this permit revision application. Mine water withdrawn from the dewatering borehole will be discharged to Coal Refuse Disposal Area No. 3 as is currently being done by the Bailey and Enlow Fork Mining.

This proposed permit revision also includes earthmoving activities to construct borehole pads and access roads, and installation of required erosion and sedimentation controls.

- i. If the operation involves underground mining, describe the method of mining (longwall, room and pillar, etc.); the estimated life of the mine; the type of haulage and underground machinery; the maximum number of working faces; the anticipated annual production in tons; the anticipated underground acreage that will be affected each year; surface activity sites and the activities which will take place at each (coal storage, ventilation, rock dust transport, etc.); the means by which coal will be transported from the operation; and the system that will be used to convey mine drainage to treatment. If mining will re-affect existing workings, identify the company that developed those workings and the time frame during which that mining took place.

Not applicable.



- ii. If the operation involves coal preparation, describe the estimated life of the operation; the types of processing equipment used; media used in separation processes; chemical treatment of coal or refuse; source and quality of make-up water; the means by which coal will be transported to and from site; and whether the facilities are designed to recirculate or discharge water from the coal preparation circuit.

Not applicable.

- iii. If the operation involves coal refuse disposal:

- (1) Describe the type of operation (head of hollow fill, cross valley embankment, side hill embankment, ridge embankment, heaped embankment, surface mine backfill, disposal into underground mine workings, etc.); the estimated life of the operation; the type of equipment which will be used to handle and compact refuse; the systems that will be used to monitor, collect, manage and treat runoff and leachate; and any chemical treatment to which refuse will be subjected (surfactants, bactericides, alkalizing agents, etc.)

The operation will involve disposal of fine coal refuse into the underground workings of Bailey Mine. Fine coal refuse slurry will be hydraulically conveyed through the injection borehole(s) and into the mine workings. Refer to the design drawings appended to Module 9 and the information submitted under Module 30.

- (2) If the operation does not involve disposal in abandoned, inactive or active underground mine or in abandoned or unreclaimed surface mines, outline the technical, economic and safety considerations prohibiting such disposal.

Not applicable.

- b. If the operation will involve the discharge of coal processing wastes, underground mine development wastes, coal ash, mine drainage treatment sludge, flue gas desulfurization sludge, or inert stabilizing materials to underground workings:

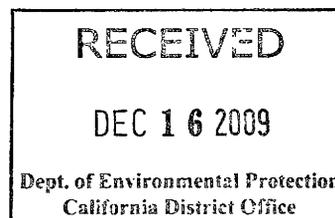
Refer to the narrative provided under Section 10.1(a).

- c. Describe the nature of the material to be discharged, the system which will be used to convey the material to the point of discharge, and the means of controlling the material within the underground workings.

Refer to Module 30.

- d. If the operation will include the use of fly ash or bio-solids, describe the purpose for which the material will be used and the site(s) on which it will be used.

Not applicable.



FORM 12.1A NPDES Information

Identify each point of discharge, the receiving stream and the corresponding latitude and longitude.
If none, enter NONE in Column 1.

Discharge Point (001,002, etc.)	Surface Elev.	Source of Discharge (i.e., mine drainage, ring water, surface runoff*, etc.)	Drainage Acreage	Describe Treatment or Other Control Technology Provided	C, PFM, N/A**	Is Discharge Existing or Proposed?	Description of Discharge		Name of Receiving Stream	Latitude	Longitude
							Average Rate (mgd)	Frequency			
024	1337	Surface Runoff from an active coarse refuse disposal area and slurry impoundment.	181	None	N/A	Existing	Unknown (Rare, only during large storm events)		Unnamed Tributary to Owens Run	39°57'30"	80°24'00"
101	1094	Surface Runoff Sediment Pond AC1	8.7	Sedimentation Control	N/A	Proposed	17.4 cfs (max discharge)		Trib. 32705 to Owens Run	39°56'52"	80°25'10"
102	1273	Surface Runoff Sediment Pond OR1	7.13	Sedimentation Control	N/A	Proposed	14.3 cfs (max discharge)		UNT 8 to Owens Run	39°56'21"	80°25'29"

*For discharges of surface runoff indicate site drainage area in acres, and whether the runoff will come in contact with coal or other pollution forming materials.

** (C = Coal, PFM = Pollution Forming Materials, N/A = Not Applicable)

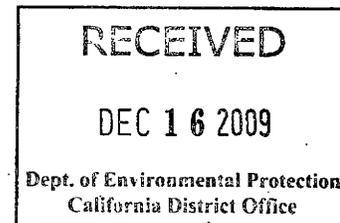
The information on the NPDES form must be certified correct by one of the following, as applicable.

- a) In the case of corporations, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
- b) In the case of a partnership, by a general partner.
- c) In the case of a sole proprietorship, by the proprietor.
- d) In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

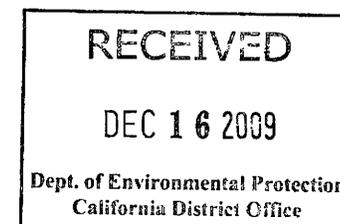
I certify that I am familiar with the information contained in the above table, and that to the best of my knowledge and belief such information is true, complete, and accurate.

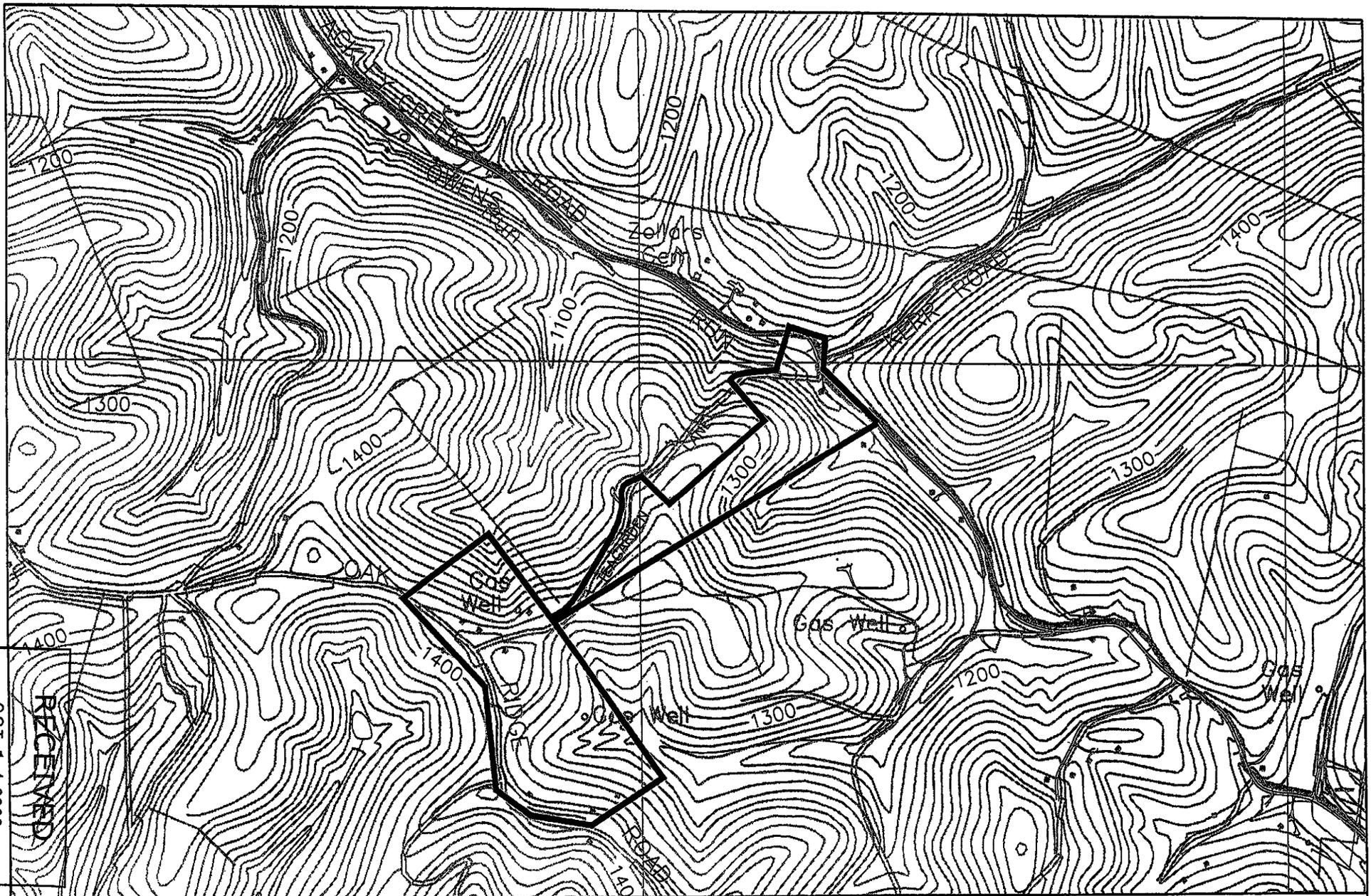
Jonathan Pachter
Printed Name of Person Signing
12/03/09
Date

General Manager - Environmental Services
Title
Jonathan M. Pachter
Signature



18 U.S. C. Section 1001 provides that: whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes or uses any false, fictitious, or fraudulent statements or representations; or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both.





Dept. of Environmental Protection

OCT 14 2009

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LOCATION MAP - PNDI #20090629199559 - WIND RIDGE QUAD

CONSOL ENERGY INC.
 BAILEY CRDA SLURRY INJECTION BOREHOLES
 CLAYSVILLE, PA

SCALE: 1"=1000' S.O. NO. 117480
 DATE: JULY 2009 FILE: _____

Baker MICHAEL BAKER JR., INC.
 CONSULTING ENGINEERS
 BEAVER, PENNSYLVANIA

SHEET
 1
 OF 1



EXHIBIT 6.1 - LOCATION MAP
CONSOL PENNSYLVANIA COAL COMPANY LLC
BAILEY MINE
PITTSBURGH No. 8 COAL SEAM

GREENE & WASHINGTON COUNTIES, PA.
 ALEPPO, GRAY, MORRIS & RICHHILL TOWNSHIPS, GREENE COUNTY
 WEST FINLEY TOWNSHIP, WASHINGTON COUNTY
 MINING ACTIVITY PERMIT No. 30841316
 AND COAL REFUSE DISPOSAL AREA PERMIT No's. 30810703 & 30020701

● BOREHOLES SEALED - REMOVED FROM PERMIT AREA
 ○ BOREHOLES NOT INSTALLED - REMOVED FROM PERMIT AREA
 ● ⊕ BOREHOLES (DRILLED, SEALED, PROPOSED)

_____ MINE PERMIT AREA BOUNDARY
 _____ ENLOW FORK MINE CMPAP

□ AIRSHAFT
 ▲ NON COMMUNITY PUBLIC WATER SUPPLY

⊞ APPROXIMATE PERMIT AREA
 ⊞ MAIN SURFACE ACTIVITY SITES
 ⊞ PROPOSED REVISION

11/09 ES/08

SCALE 1" = 2000'
 FEET
 BASE MAP CENTER INTERVALS - 50 FT.

I, the undersigned, hereby certify that the foregoing is a true and correct copy of the original as shown to me, and that the same are accurate and show all of the facts and circumstances as they exist.

Kerry Lynn Goodballet
 Registered Professional Engineer

RECEIVED
 16203
 12901



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION
CALIFORNIA DISTRICT OFFICE

December 16, 2009

Marcia Haberman
US Army Corps of Engineers
Pittsburgh District
William S. Moorehead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

RE: **ACOE Application No. 2007-463**
CMAP No. 30080701
Company: Consol Pennsylvania Coal Company
Operation Name: Bailey Central Mine Complex –
Coal Refuse Disposal Area No. 5
Purpose: New Coal Refuse Permit – Sediment Pond Development
Acceptance Date: February 18, 2009
Township: Richhill
County: Greene

Dear Ms. Haberman:

Enclosed is information concerning the referenced coal mining activity within your jurisdiction, including a comment response letter from Baker Engineering, Inc. for Consol PA Coal Company dated December 9, 2009, and revised Module 15 narrative information regarding streams and wetlands. We have begun our review of this application and would appreciate your comments, including any supporting data, to assist us in our review.

We would like your comments within thirty (30) days because our review time frame is very tight. Please include the above referenced CMAP#, Company & Operation Name, Purpose, and Acceptance Date in your comments.

Sincerely,

Craig Burda
Underground Mine Permit Section
District Mining Operations

2007-463 -MARCIA-PM

Baker

Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation

Airside Business Park
100 Airside Drive
Moon Township, PA 15108

412-269-6300
FAX 412-375-3986

December 9, 2009

Mr. John D. Kernic
Pennsylvania Department of Environmental Protection
California District Mining Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423

RECEIVED

DEC 10 2009

Dept. of Environmental Protection
California District Office

Re: Consol Pennsylvania Coal Company LLC
Bailey Central Mine Complex
Coal Refuse Disposal Area No.5 - Sediment Pond Development
Application No. 30080701; Accepted February 18, 2009
Response to November 10, 2009 Letter

Dear John:

This is in response to your letter dated November 10, 2009 for the above referenced permit application. Responses to the comments included in your letter are being provided below on behalf of Consol Pennsylvania Coal Company LLC (CPCC). For convenience, each comment is repeated and followed by the response. Three copies of all revised information, except the design documents, are enclosed as requested and the public review copy has been updated. Three copies of the revised design drawings, technical specifications, and calculations are being submitted under separate cover.

Miscellaneous

1. *Comment: Consol must request a 401 water quality certification from the Department, which is required for the 404 authorization.*

Response: CPCC hereby requests a 401 water quality certification from the Department. Upon completion of the 404 permit application, a copy will be forwarded to the Department for review.

2. *Comment: The application addresses only initial site and sediment/treatment basin development for coal refuse disposal area no. 5. A subsequent application adds the coal refuse disposal area. Provide justification for the submission of two separate permit applications for coal refuse disposal area no. 5.*

Response: A stormwater management pond would be needed in the valley of Tributary 32705 to Owen's Run to attenuate peak discharges even without construction of the slurry impoundment. The existing drainage area of Tributary 32705 at the confluence with Tributary 32706 is approximately 295 acres. The existing drainage area at the downstream end of Tributary 32705 to Owen's Run is approximately 480 acres. The approved closure plans for both CRDA No. 1 - Permit 30810703 and CRDA No. 3 - Permit 30020701 include

the provision for draining the top of the impoundments into Tributary 32705. This adds approximately 295 acres of contributing drainage area into tributary 32705 (190 acres from CRDA No. 1 and 105 acres from CRDA No. 3). This represents an increase in drainage area of approximately 100 % at the confluence with Tributary 32706 and approximately 60% at the downstream end of Tributary 32705. This increase in drainage area would result in a large increase in peak discharges without the proposed CRDA No. 5 Sediment Pond.

Timing is certainly a concern as well. In order to maintain the coal refuse disposal process the slurry impoundment proposed in the second application has to be in service by July 2012. In order to accomplish this, the Area No. 5 Sediment Pond has to be in service by August 2010. Due to the complex permitting process involved for coal refuse disposal operations it was necessary to submit the applications in phases in order to expedite approval and construction of the initial phase being the Area No. 5 Sediment Pond.

3. Comment: *Identify any changes made to the application resulting from MSHA and PADEP Dam Safety review comments.*

Response: CPCC received formal comments from MSHA on July 30, 2009 and informal (E-mail message) comments related to facility hydrologic & hydraulic (H&H) design from PADEP Dam Safety on November 13, 2009. The MSHA comments were resolved by CPCC's October 8, 2009 submission, which was copied to PADEP Dam Safety and District Mining. Revisions have been made in response to the minor comments from PADEP Dam Safety, although a formal comment response document has not been submitted to PADEP Dam Safety. Attached is a copy of the PADEP Dam Safety correspondence indicating their requested design revisions related to H&H aspects.

Module 2

4. Comment: *Submit proof of publication once the required publishing time frame has expired.*

Response: The proof of publication is attached.

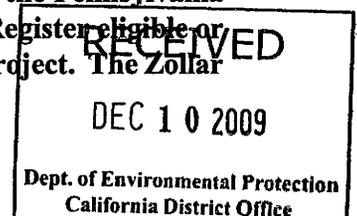
Module 4

5. Comment: *Please address the enclosed comments received from PennDOT.*

Response: Requests for both a Highway Occupancy Permit (HOP) and variance approval have been submitted to PennDOT. CPCC will forward copies of the HOP and variance approval documents issued by PennDOT when they are received.

6. Comment: *Please address the enclosed response from the Pennsylvania Historical and Museum Commission.*

Response: Attached for inclusion with Attachment 4.2 is a letter from the Pennsylvania Historical and Museum Commission indicating there are no National Register eligible or listed historic or archaeological properties in the area of the proposed project. The Zollar



cemetery is shown on Exhibits 6.2 and 9.1 and, as indicated on those drawings, will not be disturbed by proposed activities.

7. Comment: *Submit the variance approval for SR 4007.*

Response: The variance approval has been requested from PennDOT as indicated in the revised module. CPCC will forward a copy of the approval to the Department when it is received.

8. Comment: *Provide the public notice proof of publication for initial site development and the public notice proof of publication for the refuse disposal area. The refuse disposal area proof of publication is required, as the publication includes previously unidentified stream variance impacts in the initial site development application.*

Response: Both proofs of publication are attached.

Module 6.2

9. Comment: *Depict the Pittsburgh coal seam structure contours.*

Response: Exhibit 6.2 has been revised as requested.

10. Comment: *Label the One South "intake and return" as intake and return airshafts.*

Response: Exhibit 6.2 has been revised as requested.

11. Comment: *Provide requested geologic information as required.*

Response: Geologic information is presented on the Exhibit 8.2 Map which is enclosed for inclusion with the permit application. Module 6.2.f has been revised to reference geologic information presented on the Exhibit 8.2 Map.

Module 7

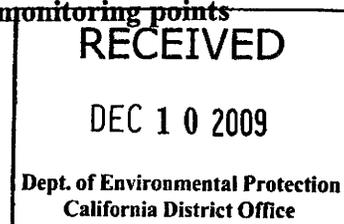
12. Comment: *Submit a completed Module 7.*

Response: Module 7 is attached as requested. Also attached is a revised Module 2 certification for Moody and Associates that includes certification of Module 7.

Module 8

13. Comment: *A minimum of six months sampling must be conducted for all proposed surface and groundwater monitoring points. Continue to collect and submit the data for all points as necessary, i.e. MW-2 and MW-101.*

Response: Form 8.13A has been revised and submitted for proposed monitoring points with six months of sampling.



- 14. *Comment: Determine what the minimum base flow rate from the facility (total of the underdrain and treatment basin) should be to maintain the receiving stream uses. Provide the justification, calculations, etc. used to determine the minimum base flow rate.*

Response: Flow data and water quality has been monitored for the receiving stream UNT 32705 to Owens Run since 2001 (refer to attached Table 8.13A). The current Chapter 93 designated use is warm water fishery.

Two monitoring stations are located at the mouth of UNT 32705 to Owens Run near the confluence of Owens Run. Station SW-P is a monitoring point for Bailey CRDA Area 3 & 4 and data is submitted on a HMR quarterly to the PA DEP. Station Kerr Rd Valley is monitored for internal CPCC records. The range in flows for this stream at these two stations is from 8.98 gpm (September 22, 2009) to 1189.2 gpm (March 10, 2005). The average flow is 255 gpm. During the typical low flow months (August through October), the average flow is only 118 gpm. This average flow of 118 gpm is representative of current base flow conditions as the average is based on flows recorded in the typically drier months of August through October.

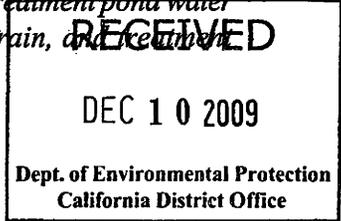
With the reduced recharge due to the anticipated construction of the slurry impoundment, the spring collectors and stream bypass is expected to have minimal flow throughout the year that is more consistent with the observed low flows. Based on the data collected, while flows as low as 8.98 have been recorded, maintaining a base flow of at least 118 gpm would be sufficient to sustain the designated use of UNT 32705 to Owens Run.

The expected maximum inflow to the treatment pond is approximately 562 gpm, without storm events (refer to Module 12). While discharge from this pond will vary, this flow will supplement flow from the stream bypass and underdrain system in order to ensure that there is sufficient flow of at least 118 gpm from the facility to maintain the designated use of UNT 32705 to Owens Run. *no 255?*

- 15. *Comment (8.15):*
 - a. *Provide separate surface water monitoring points for the stream bypass pipe, treatment pond underdrain, and treatment pond chimney drain outlets. Revise module 8.15 and exhibits accordingly.*

Response: Surface water monitoring points have been added for the stream bypass pipe (Station ID SPO1) and the treatment pond underdrain (Station ID TPU). The treatment pond chimney drain is not added as a monitoring point because it will be designed as an open rock channel, making obtaining a clean sample difficult. Additionally, very little water is expected to be flowing in the drain. Module 8.15 has been revised and the locations have been added to Exhibits 8.2, 9.1, and 18.1.

- b. *Provide plans to report any evidence of refuse disposal or sediment/treatment pond water quality impacts to the stream bypass pipe, treatment pond underdrain, and treatment pond chimney drain outlets.*



Response: Monitoring at the stream bypass pipe and treatment pond underdrain pipe will occur on a quarterly basis for the parameters listed on Form 8.15A including sulfates, chlorides and total dissolved solids (TDS). The laboratory results will be reviewed and compared with background data to determine changes in the water quality. As submitted in Table 8.13A, the water quality for stream UNT 32705 to Owens Run has been monitored since 2001. The average concentration for sulfate is 105 mg/L, chloride 163 mg/L and TDS 592 mg/L. Concentrations for these parameters have varied with values as high as 353 mg/L for sulfate, 700 mg/L for chloride and 1910 mg/L for TDS.

Based on the data collected and the occasionally high concentrations of sulfate, chloride and TDS already recorded for stream UNT 32705 to Owens Run, trigger concentrations will be set for chloride and sulfate at 250 mg/L and TDS at 1000 mg/L. If during routine quarterly monitoring, chlorides or sulfates are determined to have a concentration greater than 250 mg/L or TDS greater than 1000 mg/L at these stations, the sampling frequency will increase to bi-weekly to determine if there is a trend of degradation and to rule out poorly collected samples. The PADEP will be notified within 90 days, not to exceed 3 months, after the initial exceedence.

- c. *All water sample analysis are to include chlorides, sodium, and total dissolved solids. Revise accordingly.*

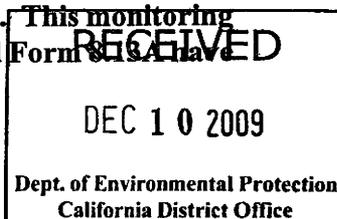
Response: Refer to response above and Module 8.15. Chlorides and total dissolved solids will be analyzed for the stream bypass pipe and treatment pond underdrain pipe. Sodium is not a regulated parameter and has many other sources other than refuse and brine that could cause increased concentrations..

16. *Comment: Propose and install multilevel piezometers southwest of MW-11 along the same ridgeline between the site and Fletcher Run.*

Response: A piezometer cluster is proposed southwest of MW-11. Proposed piezometer MW-5 has been added to Module 8.15 and Exhibits 6.2, 8.2, 9.1, and 18.1. A shallow piezometer is proposed to be drilled to a depth of 30-60 feet below ground surface. An intermediate piezometer is proposed to be drilled to a depth of 150-180 feet below ground surface. A deep piezometer is proposed to be drilled to a depth of 240-270 feet below ground surface. The drilling is expected to occur during December 2009 and six months of data will be collected.

17. *Comment: Establish a surface water monitoring point on UNT3-OR-A near the confluence of Fletcher Run and begin collecting data. Revise all applicable maps, modules, etc.*

Response: UNT3-OR-A is an ephemeral tributary to UNT3-OR. A surface water monitoring point is located at the mouth of UNT3-OR near Owens Run. This monitoring point has been added to Exhibits 6.2, 8.2, 9.1, and 18.1. Form 8.15A and Form 8.15A have been revised to include six months of sampling.



Module 9.1

18. Comment: Diversion Channels.

- a. *Extend channel DD-5 to a natural drainageway in a nonerosive manner. The current channel outlet location may impact the cemetery and disturbed areas located downslope.*

Response: The DD-5 configuration has been revised so that the ditch discharges into a temporary culvert (TC1) which conveys the runoff into DD-6. Supplemental calculations for TC1, as well as revised calculations for DD-6 and C-11, are provided in revised Calculation Brief Sections D2 and D3.

- b. *Extend channel DD-6 to culvert C11 in a nonerosive manner and eliminate the earthen level spreader. Extend SR4007 road channel to culvert C11 in a nonerosive manner.*

Response: The earthen level spreader at the outlet of DD-6 has been removed, as requested. Also, a note has been added to Drawing No. 208 to direct the adjacent road gutter into C11. Per the details presented on Drawing No. 242, C-11 will be constructed with a grouted riprap apron at its inlet. This apron permits conveyance of the road gutter discharge into the culvert in a nonerosive manner.

- c. *Remove channels DD-10 and DD-11, as they are not permanent.*

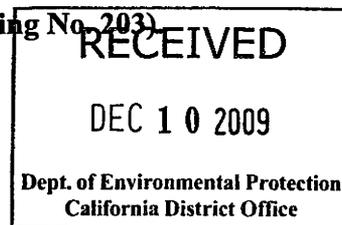
Response: Channels DD-10 and DD-11 have been removed from Exhibit 9.1 as requested. Also, a note has been added to Drawing No. 212 stating that DD-10 and DD-11 will be removed as part of the final sedimentation pond development.

19. Comment: Topsoil Stockpiles.

- a. *Topsoil storage areas must be established separate from soil storage areas. In addition, there does not appear to be sufficient areas designated for topsoil storage. Sufficient storage must be provided to remove all topsoil. Refer to topsoil removal requirements in module 17 comments.*

Response: In addition to Topsoil Stockpile #2 (TSS2), topsoil and other soils stripped during the site development will be segregated and stored at designated areas within the existing CRDA No. 1, which areas afford more than adequate storage. The location of the existing soil stockpile area at CRDA No. 1 is shown on Drawing No. 206.

As agreed at the comment review meeting with the DEP-DMO, recognizing that it is not feasible to restrict all stockpiles to the CRDA No. 5 site, permanent signage will be installed at the CRDA No. 1 stockpile area(s) to clearly identify the stockpiles of topsoil and soil materials from the CRDA No. 5 development that must be reserved for future CRDA #5 site reclamation (refer to Note 7 on Drawing No. 203).



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- b. *Topsoil stockpile TSS2 should be located a minimum of 200-feet from the top of cutslope for channel DD5; otherwise provide a sediment trap for the storage area. Include a minimum distance requirement note on the exhibit.*

Response: TSS2 has been revised so that the limits of the stockpile are 200 feet from the top of the DD-5 cutslope (refer to Drawing No. 207).

- c. *Topsoil storage areas of sufficient volume must be established within the permit area of coal refuse disposal area no.5 initial site development. Only excess topsoil may be taken outside of the permit area (drawing no.208, construction sequence no. 2). This is to ensure sufficient topsoil is stored for the reclamation of disposal area no. 5 initial site development.*

Response: As discussed at the comment review meeting with the DEP-DMO, topsoil and other soils will be stored at designated areas within the CRDA No. 5 and CRDA No. 1 permit boundaries. Referring to the response to Comment 19.a, signage will be installed at the proposed CRDA No. 1 stockpile area(s) to clearly identify those topsoil and soil stockpiles that are reserved for use in CRDA No. 5 site reclamation.

20. *Comment: Provide a reference to the design detail drawings.*

Response: Exhibit 9.1 has been revised to include a note referencing the design detail drawings.

Plan Details

21. *Comment: Drawing no. 202 (Index of Drawings). Provide reference to exhibit 9.1 for additional details.*

Response: A note referencing Exhibit 9.1 has been added to Drawing No. 202.

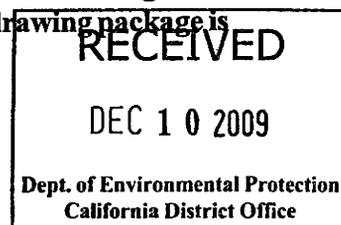
22. *Comment: Drawings no.202 through no. 247.*

- a. *Depict utilities, gas wells, barrier areas, and wetlands.*

Response: The utilities, gas wells, stream barriers, and wetlands are depicted on the revised permit drawings as requested. This information has been replicated on selected plan drawings for the purposes of construction control and permit compliance.

- b. *Provide an application module reference on the drawings. Application module responses are to reference the respective drawings.*

Response: Drawing No. 202, Index of Drawings and the individual drawing titles include Module exhibit references where applicable. The design drawing package is an integral part of the permit application submission.



- c. *The stream/spring drain constructed in tributary 32705C must outlet to the main stream bypass system.*

Response: As shown on the revised permit drawings (Drawings Nos. 210 and 243) and discussed at the comment review meeting with the DEP-DMO, the spring drain adjacent to Tributary 32705C has been extended to connect to the Main Sediment Pond liner underdrain system. Also, the spring drain will be covered with low permeability soil in order to preclude sediment-laden runoff from entering the drain during site development.

23. *Comment: Drawing no 208.*

- a. *Provide silt fence below sediment trap ST9 in step no. 1.*

Response: As shown on the revised Drawing No. 207, 30-inch Filter Fabric Fence (FF30) has been added below ST9 as requested.

- b. *Rock construction entrance and haulroad runoff must be isolated from the inlet to culvert C11. It is not clear that haulroad runoff will be conveyed to culvert C10.*

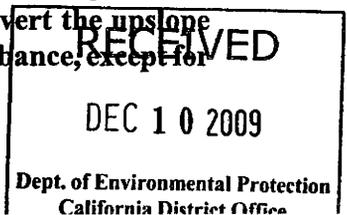
Response: A note has been added to Drawing No. 207 stating that access road runoff shall be directed into C10. Access Road No. 1 (AR1) is not a permanent haul road and will not be subject to regular earthwork construction activities (i.e. equipment such as dump trucks will be hauling the majority of the earthen material to TSS2 or the Bailey Mine CRDA No. 1, which will be accessed by traveling to the north, or away from AR1.). Following development, AR1 will be used for contractor mobilization and the delivery of construction materials, which activities are addressed by the rock construction entrance.

- c. *Provide a break in the haulroad berm just upslope of ST9 to ensure that water accumulated against the berm will not exit the permit without the benefit of treatment.*

Response: Refer to the response to Comment 23.b. above. Runoff from the access road will be directed into C10 by providing a cross-slope to the road surface. Excavating a break in the road berm may cause a safety concern for vehicular traffic on the road and may cause isolated soil erosion at this location. No revision is warranted.

- d. *Diversion channels DD-7 and DD-8 may not be constructed adjacent to temporary road TC1 to ensure that haulroad runoff will not enter the channel and earth disturbances a re-minimized. Revise subsequent phases accordingly.*

Response: The drawings have been revised so that Temporary Access Corridor #1 (TAC1) has been eliminated. Primary site access will be facilitated through TAC3. DD-7 and DD-8 will be installed along Kerr Road in order to divert the upslope watershed. It is not anticipated that a significant amount of disturbance, except for



the disturbance associated with the channel installation, will exist adjacent to the diversion ditches in this configuration.

- e. *Provide temporary road TCI stabilization plans adequate to prevent the tracking of materials from the site. Revise subsequent phases accordingly.*

Response: As previously discussed in response to Comment 23.d, TAC1 has been removed from the design drawings.

- f. *Provide erosion and sedimentation controls for temporary road TCI. Rock check dams located in a channel (step no.3) is not acceptable for primary erosion and sedimentation control. Revise subsequent phases accordingly.*

Response: As previously discussed in response to Comment 23.d, TAC1 has been removed from the design drawings..

- g. *Provide stream water handling, erosion and sedimentation control, and stream channel stabilization plans for steps no. 5 and no. 6.*

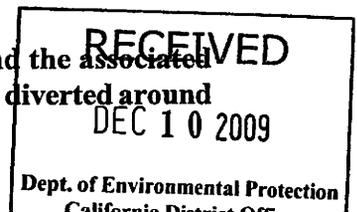
Response: The construction sequence on Drawing No. 207 (formerly Drawing No. 208) and the associated E&S control features, have been revised. The configuration and installation of SP2 have been revised in accordance with post-meeting discussions with the DEP-DMO, so that much of the upstream watershed is bypassed around the SP2. Also, a stream bypass pumping detail has been added to Drawing No. 239 in order to provide more clarification for diverting the stream during "in-channel" work (i.e., C15 or short-term bypass pipe installation).

- h. *The proposed staging in step no.5 does not provide adequate erosion and sedimentation control plans. Plans must minimize disturbances until sediment pond no. 2 is fully functional, provide adequate erosion and sedimentation controls for each step of pond development, and provide a temporary stream diversion for 32705C (33-acres drain to filter fence FF-18). Refer to drawing no. 210 comment, c), as this comment may be irrelevant.*

Response: The Sedimentation Pond No. 2 (SP2) configuration has been revised as shown in revised Calculation Brief Section E2. Also, Tributary 32705C has been diverted around SP2, as shown on the revised permit drawings.

- i. *The proposed stockpile area located north of sediment pond no. 2 is not shown. Depict the pile, underdrains, and erosion and sedimentation controls. The pile must be constructed in a manner to prevent pooling and accelerated erosion. Provide terrace benches every 50-feet and direct runoff from the fill to groin channels for conveyance to the treatment facilities.*

Response: The Sedimentation Pond No. 2 (SP2) configuration and the associated E&S controls have been revised. Also, Tributary 32705C has been diverted around



SP2, as requested. Therefore, as depicted on the revised permit drawings, no stockpile area is proposed in the valley to the north of SP2. Soil material associated with the Main Sediment Pond development will be stored in TSS2 or stockpile areas at CRDA #1.

24. Comment: Drawing no. 209.

- a. *Construct diversion dike emergency spillway in original ground and extend the outlet to the stream in a nonerosive manner.*

Response: The Diversion Dike emergency spillway location has not been changed. In order to facilitate the construction of a diversion ditch on the right abutment of the valley (DD19), the Diversion Dike emergency spillway will be located within the dike embankment. Locating the emergency spillway in original ground would result in locating DD19 further upslope, resulting in less total diverted watershed within the Main Sediment Pond development area, and disturbing more area adjacent to the dike. Since the dike is a temporary structure, locating the emergency spillway within the dike embankment is warranted. Also, a riprap revetment will be constructed with the emergency spillway to reduce the erosion potential of the embankment during storm events.

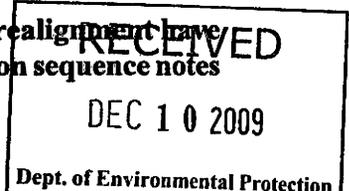
- b. *The stream tributary located on the northern side of the diversion dike must be diverted in a nonerosive manner to the southern tributary prim to disturbance associate with dike construction. The temporary bypass pipe is to be completed prior to initiating diversion dike construction.*

Response: A temporary stream realignment has been added to Drawing No. 208 (formerly Drawing No. 209) to direct the north stream tributary into the temporary bypass pipe inlet. Additionally, a pumped stream diversion will be implemented upstream of the Diversion Dike to bypass the stream around the dike during initial construction.

The current staging of the bypass pipe installation seems to result in the least amount of initial stream impacts and, therefore, will not be changed. An additional Phase drawing (Phase 2A [Drawing No. 209]) has been included to better define the installation of the Temporary Bypass Pipe. Installation of the Temporary Bypass Pipe from STA 9+87 to STA 14+07 will be completed after the Main Sediment Pond Starter Dike (Phase 2A) has been constructed. This will allow the sediment associated with the excavation of this section of pipe to be contained in the Main Sediment Pond. (Note that if the entire temporary bypass were constructed in one phase, the stream would be disturbed at multiple locations prior to establishing sedimentation controls.)

- c. *Provide stream water handling and erosion and sedimentation controls for step no. 3.*

Response: A pumped stream diversion and a temporary stream realignment have been added upstream of the Diversion Dike. Additional construction sequence notes



have been added to Drawings Nos. 208 and 209 further describing the Diversion Dike and Temporary Bypass Pipe installation.

- d. *Specify in step no. 4 that initial pond excavation will commence and develop from west to east.*

Response: Drawing No. 208 has been revised, as requested.

- e. *The rock filter will not provide adequate treatment for surface runoff associated with initial pond excavation. The rock filter appears to be 1 foot higher or less and will receive surface runoff from approximately 2-acres.*

Response: The rock filter in question has been enlarged and designed in accordance with the sediment trap requirements provided in the PADEP Erosion and Sediment Pollution Control Program Manual. Refer to calculations for "ST11" provided in revised Calculation Brief Section D4.

- f. *Culvert C17 may not discharge to the upstream side of the diversion dike.*

Response: Refer to the revised Drawing No. 208. Considering the revised site configuration, C17 no longer collects runoff from an adjacent access road. No revision is necessary.

- g. *Specify the stream and temporary bypass pipes will be capped until put into service to prevent disturbed area runoff from entering the pipes. Include the requirement on drawing no. 210.*

Response: Drawing No. 208 has been revised to require that the downstream portion of the temporary bypass pipe be capped, as appropriate, during the site development.

- h. *A portion of the main dam cutoff trench is not shown, as referenced in step no. 7.*

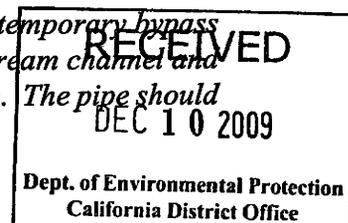
Response: The design drawings have been revised to show the portion of the cutoff trench to be constructed during this phase of development.

- i. *Address installation of temporary inlet box.*

Response: The construction sequence notes on the revised Drawing No. 208 have been revised to clarify that the temporary inlet box will be installed as part of the Main Sediment Pond principal spillway.

25. Comment: Drawing no. 210.

- a. *Provide erosion and sedimentation controls for the extension of the temporary bypass pipe. A stream relocation is needed in some areas to maintain the stream channel and adequate erosion and sedimentation controls during pipe installation.*



be installed during dry weather as indicated but must be completed prior to additional earth disturbances beyond the main pond phase 2 configuration.

Response: Additional construction sequence notes regarding the extension of the temporary bypass pipe and a stream bypass pumping detail have been added to the revised Drawing No. 209. The upstream stream flow will be diverted around the work area by installing a temporary dike within the stream and pumping the stream flow to a downstream stabilized area. Additionally, the revised permit drawings depict diversion ditches installed on the valley abutments, on either side of the temporary bypass pipe installation work area, which will decrease the amount of runoff that could be conveyed toward the temporary bypass pipe work area.

- b. *Provide details of stream diversion around the bypass pipe by pumping or other approved methods. The methods are to be included in the permit application for review and approval.*

Response: Temporary stream realignment and stream bypass pumping details are provided on the revised Drawings Nos. 239 and 240.

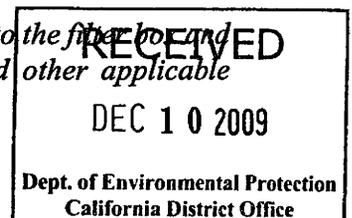
- c. *The elimination of sediment pond no. 2 during main pond construction will cause a substantial area of drainage to enter the main pond construction area. The current plans to establish sediment pond no. 2 and an upslope soil stockpile area in the contributory drainage area to the main pond are not acceptable. Disturbed areas located upslope of the main sediment pond (other than those required to develop the main pond) may not be conveyed to the main pond until it is complete. Upslope and undisturbed drainage areas are to be conveyed around the main pond to the greatest extent practical until it is complete. Please schedule a meeting with Craig Burda to discuss main pond development staging plans.*

Response: The Sedimentation Pond No. 2 (SP2) configuration has been revised as shown in Section E2 of the revised Calculation Brief. Also, Tributary 32705C has been diverted around SP2, as requested. Refer to the revised permit drawings.

- d. *Provide design calculations and for the temporary inlet box and temporary pond configuration. The temporary pond configuration must be designed in accordance with applicable regulations and demonstrate runoff will be controlled during construction of the main pond.*

Response: Supplemental calculations have been provided in revised Calculation Brief Section E1A, which demonstrate that the temporary inlet box and starter dike are designed in accordance with the PADEP Erosion and Sediment Pollution Control Program Manual.

- e. *The main pond may not be dewatered by priming surface runoff into the filter box and other applicable regulations.*



Response: The temporary inlet box has been designed in accordance with Chapter 102 regulations to collect and treat sediment-laden runoff associated with the Main Sediment Pond development. It is anticipated that Sediment Pond #2 (SP2), and the main chamber of the Main Sediment Pond, will have to be dewatered in order to facilitate the Main Sediment Pond underdrain and liner installation. The accumulated runoff within the pond areas will be pumped through a filtered sump or filter bag, and into the temporary inlet box. The proposed filtered sump is in accordance with Standard Construction Detail #10 of the PADEP Erosion and Sediment Pollution Control Program Manual. Provisions for pumped water filter bags, which are in accordance with the recommendations for pumped water filter bags provided in the PADEP Erosion and Sediment Pollution Control Program Manual, have been added to Section 3D of the Technical Specifications.

- f. *Sediment pond no. 3 and haulroad no. 1 construction must be completed prior to diversion channel DD9.*

Response: The construction sequence has been revised. DD9 will be constructed prior to SP3 and Haul Road No. 1 (HR1). However, DD9 discharges upstream of the Diversion Dike and not into SP3. Therefore, DD9 will be constructed to divert surface runoff around the SP3/HR1 construction.

- g. *Provide erosion and sedimentation controls for rock construction entrance RCE3.*

Response: A note has been added to the design drawings requiring that the vehicular access road be stabilized with road surfacing (coarse aggregate) immediately as the road surface is developed. Additionally, filter fabric fence will be installed at the southern limits of the associated RCE3 disturbance area.

- h. *Provide a temporary energy dissipater at the treatment pond outlet.*

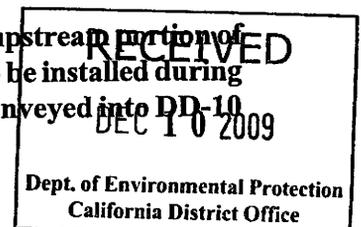
Response: A riprap apron will be provided at the treatment pond outlet as shown on Drawings Nos. 208 and 239. Calculations concerning the design of the apron are provided in Section G2 of the revised Calculation Brief.

- i. *Extend the auxiliary spillway outlet (Texas crossing) to the toe of the embankment fill in a nonerosive manner.*

Response: A riprap revetment will be extended over the embankment fill in order to reduce the erosion potential of the embankment during extreme storm events.

- j. *Extend channel DD-11 to channel DD-10 in a nonerosive manner.*

Response: Drawing No. 210 has been revised to require that an upstream portion of the Main Sediment Pond embankment right groin ditch (GDR-1) be installed during this phase of development. The discharge from DD-11 will be conveyed into DD-10



through GDR-1. As tabulated in the design calculations for GDR-1, its design peak discharge is 6.3 cfs. The peak discharge for DD-11 (i.e. the peak discharge conveyed to GDR-1 during the phase shown on Drawing No. 210) is 4.2 cfs. Therefore, GDR-1 is adequately designed to convey the design discharge.

26. Comment: Drawing no. 211.

- a. *Provide a berm or channel at the toe of the downstream main pond embankment fill to ensure runoff from disturbed areas and future channels GDR1 and GDL1 will not bypass sediment trap ST8.*

Response: Drawing No. 210 has been revised to require that an upstream portion of the Main Sediment Pond embankment right groin ditch (GDR-1) be installed during this phase of development. The discharge from DD-11 will be conveyed into DD-10 through GDR-1. As tabulated in the design calculations for GDR-1, its design peak discharge is 6.3 cfs. The peak discharge for DD-11 (i.e. the peak discharge conveyed to GDR-1 during the phase shown on Drawing No. 210) is 4.2 cfs. Therefore, GDR-1 is adequately designed to convey the design discharge.

- b. *Revise narrative to include plans for liner development and include details of water handling plans for removal of the temporary stream by-pass pipe. Sediment accumulated in SP3 and runoff from other disturbed areas may not enter the temporary stream by-pass pipe inlet and discharge from the site without the benefit of treatment.*

Response: According to the construction sequence shown on the revised Drawing No. 211, the temporary inlet box located upstream of the Main Sediment Pond riser will be decommissioned (sealed) prior to the temporary bypass pipe removal (i.e. the temporary bypass pipe is blocked off at the Main Sediment Pond inlet box before the temporary bypass pipe is removed). The downstream end of the temporary bypass will discharge into the Main Sediment Pond subsequent to the inlet box decommissioning. Therefore, sediment-laden runoff generated by the removal of the temporary bypass pipe and SP3 will be collected and treated by the Main Sediment Pond.

A brief description of water handling procedures for the Main Sediment Pond liner installation is presented on Drawing No. 210. In order to facilitate the Main Sediment Pond liner installation, the pond interior will be maintained in a relatively dry condition by pumping accumulated runoff, through a filtered sump or pumped water filter bag, into the temporary inlet box. At this time of interest, the amount of tributary area to the Main Sediment Pond will be reduced to the extent practical by utilization of the diversion dike, temporary bypass pipe, diversion ditches, and SP3. The Main Sediment Pond liner will be installed incrementally in accordance with the details provided in the design drawings and the technical specifications.

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- c. *The spring drain shown on the southeastern side of the permit area may not extend beyond the surface permit area at this time.*

Response: The limit of the spring drain has been reduced to be within the permit boundary, as requested.

- d. *Construct and label collection channel CD-10 upon completion of liner installation.*

Response: The construction sequence of the Main Sediment Pond construction has been revised such that CD-10 will be constructed concurrently with liner installation.

- e. *The liner subgrade shown upstream of the main pond located within the northern and southern liner limits does not appear to support liner construction.*

Response: The proposed Main Sediment Pond liner will be installed on a prepared subgrade that is sloped at a 3 horizontal to 1 vertical (3H:1V) slope or flatter. As shown on Drawing No. 211, a portion of the liner will be constructed beneath the Haul Road #1 (HR1) fill (up to EL 1140) at the northern limits of the liner. By installing the liner prior to the haul road development, the required subgrade conditions are achieved.

27. Comment: Drawing no 212.

- a. *Label culverts C20 and C21.*

Response: C21 is located at the intersection of HR1 and HR1A. A label for C21 is located at the northern limits of Drawing No. 211. A more expanded view of C21 and the surrounding area is presented on Drawing No. 217.

A label for C20 (located along the upstream, left groin of the Main Sediment Pond embankment) has been added to Drawing No. 212, as requested.

- b. *Provide erosion and sedimentation control plans for earth disturbances associated with all phase of emergency spillway construction. The rock filter sump located at the outlet of the emergency spillway will not be developed until the spillway is complete.*

Response: According to Step No. 2 of the construction sequence presented on Drawing No. 212, the earthen berm rock filter outlet will be installed prior to the emergency spillway excavation. This area can be accessed through the site access provided at RCE3. Also, a note/label has been added to Drawing No. 212 requiring that a soil berm be constructed at the limits of the spillway excavation disturbance area to direct the surface runoff into the rock filter outlet. Based upon this configuration, runoff from the spillway excavation should be collected and treated appropriately.

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- c. *Provide plans to stabilize the fill slopes associate with downstream main darn embankment and auxiliary (emergency) spillway construction, as fills and cut slopes are completed. This is to minimize erosion and expedite vegetative growth.*

Response: A note has been added to Drawing 212 requiring the incremental revegetation of the Main Sediment Pond embankment and areas adjacent to the emergency spillway.

28. Comment: Drawing no. 213.

- a. *The detail references are incorrect.*

Response: The detail references have been corrected, as appropriate.

- b. *Please include a note that sediment trap ST8 and any other erosion and sedimentation controls may not be removed until approved by the mine conservation inspector.*

Response: The requested note has been added to Drawing No. 212 and 213.

- c. *Label channel SPO1.*

Response: SPO-1 has been labeled on Drawing No. 213, as requested.

- d. *Runoff from the refuse bin area, haulroads, and other earth disturbances located in proximity to the refuse bin must be directed to the main pond.*

Response: The construction sequence notes on Drawing No. 212 have been revised to require that areas adjacent to the 938 bin be directed to drain into the HR1 gutter. Additionally, the grading around this area has been revised to more accurately depict this configuration.

29. Comment: Drawing no. 216. The section references are incorrect.

Response: The section references have been corrected, as appropriate.

30. Comment: Drawing no. 221. The label for DD-8 is DD-12.

Response: The note has been corrected, as requested.

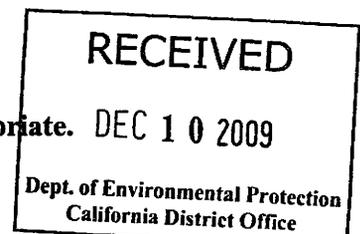
31. Comment: Drawing no. 222. The section references are incorrect.

Response: The section references have been corrected, as appropriate.

32. Comment: Drawing no. 223.

- a. *The section references are incorrect.*

Response: The section references have been corrected, as appropriate.



- b. *Provide a minimum top width of 8-feet at the required downstream crest elevation for SP3 (upstream haulroad berm).*

Response: As presented in the revised SP3 design calculations (Section E3 of the revised Calculation Brief), the peak water surface elevation in the pond during the 100-yr design storm is at El 1140.0. The minimum embankment width of the upstream haul road berm at elevation 1140 is approximately 9.6 feet, or greater than the required 8 feet. An upstream berm and downstream berm are provided up to El. 1142.0 on the embankment to provide the required pond freeboard.

- c. *Provide pond embankment cutoff trenches and anti-seep protection.*

Response: Drawing No. 223 and Drawing No. 224 have been revised to require that cutoff trenches within the pond embankment foundations, and anti-seep collars around the spillway outlet pipes, be installed for SP3 and the Diversion Dike.

- 33. Comment: Drawing no. 230.

- a. *Depict the pond dewatered (normal pool) and the auxiliary (emergency) spillway elevation in section A-A. Revise drawing no. 231 to include the pond dewatered and auxiliary spillway elevation.*

Response: Drawing No. 230 has been revised to depict the auxiliary spillway invert profile through the embankment. The normal pool of the Main Sediment Pond is depicted on Drawing No. 230 and is labeled "Max Sediment El 1118.0". The note has been revised to more clearly describe this item.

Drawing No. 231 has been revised to depict the normal pool, or maximum sediment elevation. Note that the auxiliary spillway does not appear within the view limits of this drawing.

- b. *The cross-section references are incorrect.*

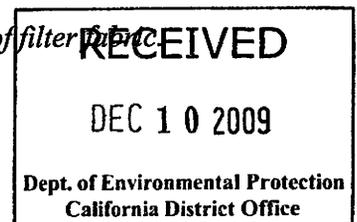
Response: The section references have been corrected, as appropriate.

- 34. Comment: Drawing no. 232. A skimmer is required for the dewatering perforation inlets to prevent coal fines and other float materials from exiting the pond.

Response: A baffle/passive skimming system has been added to the Main Sediment Pond principal spillway riser to prevent floating materials from entering the principal spillway. Refer to the revised Drawings Nos. 231 and 232 for applicable details.

- 35. Comment: Drawing no. 237.

- a. *Revise to identify sediment storage elevation, consistent with top of filter pipe.*



Response: Sections C-C and E-E of Drawing No. 237 have been revised to identify that the sediment cleanout elevation coincides with the top of the geotextile filter.

- b. *Sediment trap ST-1 is identified as ST-8.*

Response: ST-8 is the correct name for the referenced sediment trap. The Design Drawings and Calculation Brief have been revised to be consistent with this designation.

36. *Comment: Drawing no. 238. Provide R-3 riprap in lieu of AASHTO #1 coarse aggregate in accordance with the Chapter 102 manual.*

Response: The coarse aggregate to be installed in the rock filter has been revised to R-3 riprap, as shown on Drawing No. 238. However, the coarse aggregate for the Rock Construction Entrance will remain AASHTO No. 1 coarse aggregate in accordance with the PADEP Chapter 102 manual.

37. *Comment: Drawing no. 241.*

- a. *The subgrade types for the main pond groin channels are incorrect. Rock may not be placed in contact with the liner.*

Response: The channel schedule on Drawing No. 241 has been revised to indicate that channels will be constructed over soil subgrade or protective soil cover. A minimum amount of protective cover will be maintained over the liner system in accordance with the applicable drawing details and the Technical Specifications. The "subgrade type" column in the channel schedule was intended to alert the installer that a liner system will be installed beneath the channel. It is not intended to indicate that channel linings will be placed directly on the liner system.

- b. *Provide a typical for channels constructed over liner.*

Response: See the response to Comment 37.a. No additional details are necessary.

38. *Comment: Drawing no. 242.*

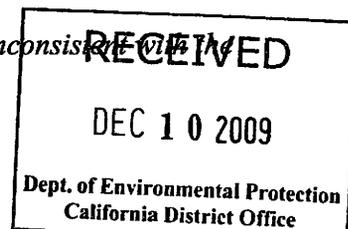
- a. *Revise culvert installation table to include minimum required culvert inlet headwater depths.*

Response: Drawing No. 242 has been revised as requested.

- b. *List the culvert types.*

Response: Drawing No. 242 has been revised as requested.

- c. *Provide plan details for culvert 19. The listed culvert diameter is inconsistent with design calculations.*



Response: Plan and section details for C19 have been added to the revised Drawing No. 242. Additionally, Section D3 of the Calculation Brief has been revised to include design calculations for C19 that are consistent with the proposed culvert configuration.

39. *Comment: Drawing nos. 243 and 244. Rock drain materials must comply with §90.122(i)(1)(ii). Revise pg. 20-21 of the technical specifications to conform to chapter 90 requirements.*

Response: Note that for consistency with other phases of the Bailey Mine CRDA No. 5 development, the CRDA No. 5 Main Sediment Pond Technical Specifications have been re-organized and re-formatted. Specifications concerning the underdrain system are now provided in Section 3H, rather than Section 2O. The complete package of Technical Specifications is included with this revision submission.

The material requirements for the underdrain system drainage aggregates have been revised to be consistent with the Chapter §90.122(i)(1)(ii) requirements.

Module 11

40. *Comment: Module 11.2 is applicable.*

Response: Module 11.2 has been revised as requested.

41. *Comment: Form 11.1A.*
a. *Channel bed slopes are to be listed as a percentage.*

Response: The Form 11.1A data sheets have been revised accordingly.

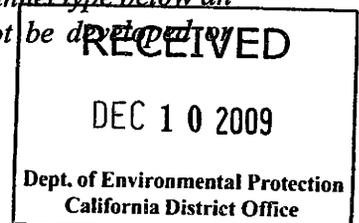
- b. *CD-10 is to be designed for a 100-year storm event, as the channel is permanent and is critical in protecting the liner system. The selected curve number does not reflect the maximum disturbed area.*

Response: CD-10 has been revised to convey the peak discharge due to the 100-year design storm. Refer to Section D2 of the revised Calculation Brief and the revised Form 11.1A.

- c. *Channel CD11 designs must be extended to the main pond bottom.*

Response: The Main Sediment Pond interior will be lined with rock fill underlain by geotextile. The rock lining at the outlet of CD11 will be grouted, as shown on the revised Drawing No. 210. This lining will provide erosion protection at the channel outlet. Note that CD11 is a temporary channel.

- d. *GDR2 and GCL2 are to be constructed of rock or other suitable channel type below an elevation of 1137-feet, as a submerged vegetated channel cannot be developed or maintained.*



Response: Drawing No. 241 has been revised to require that the downstream sections of GDR2 and GDL2 be lined with grouted riprap. Additionally, Module 11 and the associated design calculations for GDR2 and GDL2 have been revised accordingly.

- e. *Rock sizes for rock lined channels are to be designed for the maximum allowable flow velocities. The use of grouted channels with undersized rock is not acceptable.*

Response: Supplemental calculations are provided in Section G3 of the revised Calculation Brief and compare the allowable flow velocity of the ungrouted riprap to the estimated channel flow velocity. Based upon these calculations, R-3 or R-4 riprap, as required, will be utilized within the grouted riprap channel linings. The suggested approach to first select the riprap size based on flow velocity, and then grout and anchor the riprap lining as required to satisfy tractive force/shear stress requirements can lead to unnecessarily large riprap and problematic conditions considering the lining thickness with much larger riprap. As discussed and in cooperation with the DEP-DMO, we adopted the suggested philosophy for added conservatism for permanent channels up to a R-4 riprap size, but applied the more conventional design approach in other cases.

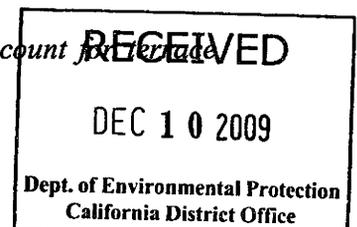
- f. *Shear stress must be evaluated for all rock lined channels that exceed a channel bed slope of 10 percent. All rock-lined channels that exceed the maximum allowable shear stress must utilize the required rock unit for velocity and be slush grouted or an alternative channel lining may be proposed. If slush grout is proposed, please describe the propose coverage and depth of grout penetration.*

Response: All proposed channels, including those channels lined with grouted riprap, have been designed so that the estimated shear stress acting on the channel lining is less than the allowable shear stress. For permanent grouted riprap channel linings, the riprap size has been revised so that the estimated channel velocity is less than the allowable velocity for the proposed riprap size (up to R-4 size riprap). Refer to the preceding response also.

- g. *Slush-grout designs should provide a minimum of 6" of filter stone. Specify grout will not be placed when temperatures are below 35° and will be protected from freezing for 7 days.*

Response: The details on Drawing No. 241 have been revised to require that 6 inches of filterstone be placed below grouted riprap channel linings. Section 3I of the Technical Specifications has been revised to include provisions for allowable weather conditions, and slush grout protection/curing, during slush grouting operations.

- h. *The main pond groin channels are not adequately segment to account for thermal segments.*



Response: The groin channel design calculations have been revised to account for minimum bed slopes (i.e. 0.02 ft/ft) at the terrace locations and the anticipated maximum bed slopes along the groin (refer to Section D2 of the revised Calculation Brief). The largest channel depth (based upon the minimum bed slope) and the largest shear stress within the channel (based upon the maximum bed slope) are considered for the proposed channel configuration. Therefore, the proposed groin channel configurations are applicable for a range of bed slopes including the transition from the terrace segments to the steeper groin area.

- i. *The channel bed slopes listed for several of the main pond groin channels are incorrect. Provide details of the transition from bench to groin channels.*

Response: See the response to Comment 41.h. above.

- j. *Provide haulroad collection channels and key to the site plans.*

Response: Design calculations for each haul road gutter (i.e. RG1, RG2, RG3, RG4, and RG5) are provided in the Calculation Brief. Based upon these calculations, the haul road gutters have similar configurations. For simplicity, one haul road gutter detail is provided on Drawing No. 220. This channel configuration meets or exceeds the design channel dimensions and lining requirements for RG1 through RG5. It is not necessary to designate separate haul road gutters.

- k. *Designs for channel CD-21 were not provided.*

Response: A proposed collection ditch #21 (CD-21) does not appear in the design drawings. Please provide additional information as appropriate.

- l. *Label channels RG1 through RG5, BGRI, BGL1, and BG2 on the site plan drawings.*

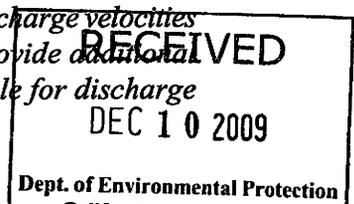
Response: Channels BGR1, BGL1, and BG2 are labeled on Drawing No. 212.

Design calculations for each haul road gutter (i.e. RG1, RG2, RG3, RG4, and RG5) are provided in the Calculation Brief. Based upon these calculations, the haul road gutters have similar configurations. For simplicity, one haul road gutter detail is provided on Drawing No. 220. This channel configuration meets or exceeds the design channel dimensions for RG1 through RG5. It is not necessary to designate separate haul road gutters.

- m. *List the rock size for channels RG1 and RG2.*

Response: The Form 11.1A for RG1 and RG2 has been revised as requested.

- n. *The selected rock lining unit for channel SPO1 will not withstand the discharge velocities from the collection channels and main sediment basin outlet pipe. Provide additional details for channel SPO1 that demonstrates the channel will be suitable for discharge*



entrance velocities and the outlet from channel SPO1 will enter the receiving stream in a nonerosive manner.

Response: A riprap apron will be constructed at the outlet of the Main Sediment Pond downstream groin ditches (GDR1 and GDL1) and the Main Sediment Pond principal spillway pipe. Refer to Section G2 of the revised Calculation Brief for supplemental calculations concerning the design of the SPO-1 erosion protection. Also, refer to the revised Drawings Nos. 210, 212, and 239.

42. *Comment:* Provide filter fence designs, keyed to the site plan drawings.

Response: Filter fence designs are provided in Section G4 of the revised Calculation Brief.

Module 12

43. *Comment:* Revise the module to provide requested information for future planned discharges from the coal refuse disposal facility and required water treatment. The following email excerpt to Greg Heilman of Baker Engineering on 1/6/09 is included in italics for your reference:

Sediment storage volume cannot be considered for treatment of continuous type discharges, which in this case are estimated to be approximately 720 gallons per minute. Designs for the new treatment facility must provide sufficient volume below the dewatered elevation of the pond to provide adequate detention times for continuous water treatment and sediment storage. In addition, water treatment plans must address the removal of contaminants, as detention time alone may not be sufficient to meet effluent limits.

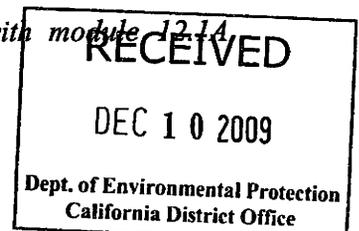
Response: Module 12 has been revised as requested to reflect future planned discharges from the disposal facility and required water treatment. Module 13 has also been revised to include additional information on dry weather discharge rates and detention time.

44. *Comment:* Revise form 12.1A regarding outfall 501 (during refuse disposal operation) to reflect the redesign of the facilities that provides a stream bypass pipe. Include the maximum discharge rate associated with mine water discharge and leachate rates associated with the saddle dam for CRDA no. 1 and saddle dam A for CRDA no. 3. Note: The maximum listed discharge rate may not be exceeded or a formal revision to the permit will be required.

Response: Form 12.1A has been revised as requested. The discharge rate presented for Outfall 501 "during refuse disposal operation" (34.2 cfs) is the highest rate estimated for the various stages of facility operation; evaluation of which considered the presence of the Area No. 1 and Area No. 3 discharges. Area No. 1 and Area No. 3 seepage, as well as any mine water, will be conveyed to the Area No. 5 impoundment; therefore, the reported maximum discharge accounts for flows from these sources.

Module 13 - MSP

45. *Comment:* Revise 13.1 to reflect water treatment plans consistent with ~~module 12.14~~ information.



Response: Module 13 has been revised to reference Module 12 and Form 12.1A for water treatment information. Also, refer to the response to Comment 43 above.

46. Comment: 13.2A.

- a. *Revise 13.2A to list dewatering times for both drainage area conditions. The performance standards must be met for both cases.*

Response: As shown in the design calculations and Module 13, the Main Sediment Pond has a dewatering time of 4.3 days. This is within the recommended dewatering time of 2 to 7 days presented in the PADEP Erosion and Sediment Pollution Control Program Manual. The approximate Main Sediment Pond dewatering time was calculated assuming that the pond was allowed to “free-drain” down to the sediment cleanout elevation, with the beginning water surface at the principal spillway riser crest elevation. This analysis is independent of the drainage area conditions and, therefore, the tabulated dewatering time is representative of both drainage area conditions.

- b. *Provide pond designs and form 13.2A for the temporary pond (temporary riser). Provide designs in volume 2, section E. Drainage area limits must be clearly defined.*

Response: Supplemental calculations have been provided for the Main Sediment Pond Starter Dike configuration in Section E1A of the revised Calculation Brief. Form 13.2A for the Starter Dike configuration is provided in the revised Module 13.

47. Comment: 13.4.

- a. *The prediction of water quality is not consistent with existing conditions at the no.3/no.4 coal refuse treatment facilities. Elevated levels of aluminum and manganese have caused water treatment difficulties,*

Response: Module 13.4 has been revised to provide more detailed information regarding a prediction of water quality.

- b. *Revise 13.4.b) to be consistent with current plans.*

Response: Module 13 has been revised to incorporate the proposed flexible membrane liner (FML) that will be implemented within the Main Sediment Pond.

48. Comment: 13.5. *The sediment cleanout elevation cannot be determined with a visual indicator, as indicated. A normal pool must be maintained above the sediment cleanout elevation to provide adequate water treatment from anticipated continuous discharges.*

Response: Physical markers within the pond (i.e., “windows” in the baffle around the principal spillway riser, and/or marker stake(s) projecting to a set elevation above normal pool) will provide reference points for identifying (via measurement or soundings) when the pond is approaching sediment capacity and requires cleaning. Module 13.5 has been revised accordingly. Also, refer to response to Comment 76.

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Module 13 – SP3

49. Comment: 13.2A.

a. *Provide an additional embankment height of 5% for settlement.*

Response: The minimum embankment height of SP3 is at elevation (El) 1142.0 and the pond bottom is at approximately El. 1129. Therefore, the total embankment is approximately 13 feet and 5% additional embankment height would be 0.65 feet. Since the embankment is a haul road corridor, the top surface of the embankment will be continually maintained (i.e., material will be regarded and the surface restored to grade), such that the minimum dimensions of the embankment will remain relatively unchanged.

The emergency spillway coincides with the embankment centerline (i.e. the low point of the embankment is located at the emergency spillway). Settlement within the embankment may lower the invert of the emergency spillway. Assuming that the embankment settled 5%, or 0.65 feet, the resulting emergency spillway invert elevation would be El. 1138.35. The top of the principal spillway riser is at El 1138.0. Therefore, an embankment settlement of 5% would not affect the sediment storage or settling volume of the pond. Also, a lower emergency spillway invert elevation would result in an increase of the hydraulic capacity of the spillway as it relates to the stage-discharge curve for the pond.

b. *Provide 2-foot freeboard at the design flow depth of the emergency spillway. The spillway capacity is to be calculated and listed at the design flow depth.*

Response: The calculations for SP3 have been revised. Based upon Section E3 of the revised Calculation Brief, SP3 can safely convey the peak discharge due to a 100-yr design storm while maintaining a minimum 2 feet of freeboard.

Module 14

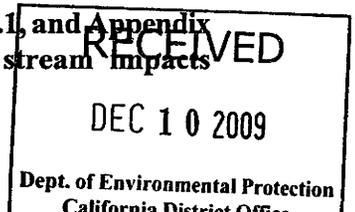
50. Comment: *Revise the application responses and all exhibits to reflect plans to utilize a flexible membrane liner. Refer also to our letter to Mark Stanley dated 10/20/09 regarding liner requirements.*

Response: The permit drawings, technical specifications, modules, and calculation brief have been revised to reflect the utilization of a flexible membrane liner (FML) within the Main Sediment Pond.

Module 15

51. Comment: *Update the initial site development application to address additional stream impacts identified in the first revision to this permit application (add 414.8 acres).*

Response: The Module 15 narrative, Tables 15.1.a and 15.2.m, Exhibit 15.1, and Appendix 15.2-A have been revised to address all intermittent and perennial stream impacts associated with development of the sediment pond.



52. Comment: 15.1c.

- a. *Revise to be consistent with plans to construct a stream bypass drain and pipe. Revise 15.2.q.*

Response: Modules 15.1.c and 15.2.q have been revised to be consistent with plans to construct a stream bypass drain and pipe.

- b. *Revise to address the minimum treatment pond and stream bypass discharge rates that will be provided to maintain downstream uses of tributary 32705 and Owens Run. Be advised the permit special conditions will include the following: Water may not be withdrawn from the sediment/treatment pond when the total discharge rate from the basin and stream bypass pipe is less than (rate to be determined) gallons per minute.*

Response: The analysis of flow data and determination of the minimum discharge rate to be maintained from the sediment basin and stream bypass are presented in the response to Comment 14; and are, therefore, not reiterated here. An evaluation of the proposed minimum discharge rate with regard to maintaining downstream uses in tributary 32705 and Owens Run is presented in Modules 15.1.c and 15.2.q.

- c. *Address future anticipated continuous discharge water treatment due to slurry impoundment construction.*

Response: Module 12 has been revised to reflect treatment of anticipated continuous discharges.

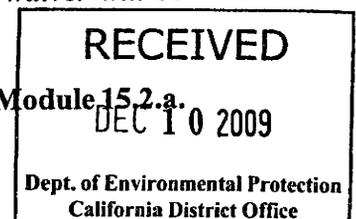
- d. *Explain and quantify the likely moderate impact on secondary production within the local watershed.*

Response: CPCC assumes that this question is in reference to Module 15.2.c. rather than 15.1.c. Secondary producers include benthic macroinvertebrates that feed on algae, leaf litter/detritus, and single celled organisms (i.e., primary producers). These secondary producers include filterer-collectors, scrapers, and shredders that are represented by a wide range of organisms including many mayflies (Ephemeroptera), stoneflies (Plecoptera), caddisflies (Trichoptera), and true flies (Diptera). The potential moderate impact on this group of organisms is based on the potential reduction of upstream food source from enclosing portions of Tributary 32705 and its tributaries. Seasonal variation in stream discharge, primary production, and benthic macroinvertebrate populations in Owens Run makes this impact difficult to quantify.

53. Comment: 15.2.

- a. *Revise 15.2.a to delete permit waiver language, as no chapter 105 waiver will be approved for this project.*

Response: The request for a permit waiver has been deleted from Module 15.2.a.



- b. *Revise 'Hydrologic Consequences of Activities on Water Quality, Quantity, and Aquatic Life' to address only perennial and intermittent stream identifications. In addition, revise response to reflect stream bypass plans.*

Response: Methods for delineating and classifying streams are described in Module 15.2.c. Streams throughout the remainder of Module 15 and on Exhibit 15.1 are classified as either biologically diverse perennial, biologically variable perennial, or intermittent. These distinctions allow the ecologist to present an accurate functional assessment of the onsite resources as discussed with and agreed to by the Department during our meeting on November 16, 2009.

Module 15.2.c has also been revised to reflect the stream bypass plans.

54. *Comment: 15.2c. Revise Stream sections are to be shown as either Perennial or Intermittent (Chapter 90). The TGD 563-2000-655 does not pertain to Surface Mining Applications and as such, the stream sections are not to be designated as Diverse, Variable, or First Use.*

Response: Refer to response for Comment 53.b.

55. *Comment: 15.5.*

- a. *Detailed wetland mitigation plans must be provided in accordance with TGD 363-0300.001. Mitigation plan details are to include but not be limited to a hydrologic assessment, detailed mapping, cross-sections, lining in areas where groundwater is not encountered, planting selections, etc. The cross-sections must include piezometers and design water surface elevations. In summary, the wetland mitigation plan is not adequate to conduct a detailed assessment at this time. Additional comments will likely follow the submission of a detailed plan.*

Response: Refer to Module 15.5 and Exhibits 15.5-1 through 15.5-5 for detailed wetland mitigation plans showing groundwater elevations, proposed grading plan and cross sections, and proposed planting specifications.

- b. *Provide a schedule for completion of the wetland mitigation plans. Note: The mitigation must be completed prior to or concurrent with wetland impacts associated with initial site development.*

Response: Refer to Section K in Module 15.5 for a proposed implementation schedule.

- c. *Exhibit 15.5-1 does not show roadways or other surface features necessary to locate the wetland mitigation site.*

Response: Exhibit 15.5-1 has been revised to show roadways and other landmarks.

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- d. *Be advised a chapter 105 permit will be required for the wetland mitigation site due to its proximity to Crabapple Creek and several proposed rock inlet structures.*

Response: CPCC requests Chapter 105 approval for construction of the wetland mitigation area as part of the Module 15 revisions. Specific activities requiring chapter 105 approval are listed in Section J of Module 15.5.

- e. *The reference to section F in 15.5.a.iv is incorrect.*

Response: The reference has been corrected.

- f. *Provide wetland assessment of the mitigation site to document response to section F of the conceptual mitigation plan.*

Response: Section F has been expanded to provide additional information related to the wetland assessment that was conducted at the proposed mitigation site.

- g. *Revise wetland mitigation success criteria to be consistent with wetland monitoring criteria in TGD 363-0300-001.*

Response: The wetland mitigation success criteria have been revised to be consistent with the success criteria listed in TGD 363-0300-001.

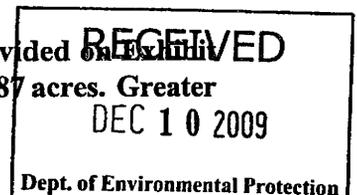
- h. *Wetland mitigation should first occur in the Owens Run watershed and second in the Enlow Fork watershed before going outside of the watershed. Provide justification for selecting the wetland mitigation site in the Crabapple watershed.*

Response: Owens Run was examined for potential wetland mitigation opportunities; however, the land use is dominated by residential lots that are separated by blocks of forested riparian habitat. Due to land use restrictions and limited opportunity to conduct large scale aquatic resource restoration in the Owens Run watershed, it was eliminated from further consideration.

The wetland mitigation area is located along Crabapple Creek, which is within the larger Wheeling Creek watershed, as is Owens Run and CRDA 5 & 6. The site was selected based on its suitability for wetland development, watershed benefits, potential to construct one large contiguous wetland mitigation area, its location within a permanent conservation easement, and its location on property that is owned by CPCC.

- i. *The total wetland mitigation acreage listed on exhibit 15.5-2 is incorrect. Identify wetland mitigation areas on exhibit 15.5-2. Open water and upland areas may not be included in mitigation acreage.*

Response: Wetland mitigation acreages by habitat type are provided on Exhibit 15.5-2. The total wetland impacts from CRDA No. 5 & 6 will be 5.87 acres.



than six acres of shrub wet meadow, shallow marsh, intermediate marsh, deep marsh, and mound forest habitat are provided by the proposed plan. CPCC has agreed to establish a wooded upland buffer around the wetland mitigation area to improve the functionality of the site even though credit is not being assigned for the additional effort and expense. Open water is not proposed as part of the mitigation plan.

- j. *Revise stream mitigation plan to state CPCC will be responsible for the construction and maintenance of the proposed AMD project. In addition, the response must be revised upon acceptance of the final stream mitigation plan,*

Response: Refer to response to Comment No. 60.c.

56. **Comment:** 15.5 Conceptual Wetland Mitigation Plan: Wetland Success Criteria

- a. *The company will provide a Conservation Easement for any wetlands built under this permit application.*

Response: One of the aspects that made the preferred wetland mitigation site attractive was that it will be within a permanent conservation easement. Consequently, the wetlands will be protected in perpetuity by a deed restriction, protective covenants, a conservation easement, or other legal instrument.

- b. *Provide nesting boxes for wetland species: state the number of boxes to be installed along with the species to be targeted.*

Response: Four wood duck boxes and six bluebird boxes will be installed in the mitigation area as identified on Exhibit 15.5-2.

- c. *Provide a list of the plant species to be used within the proposed wetland segments,*

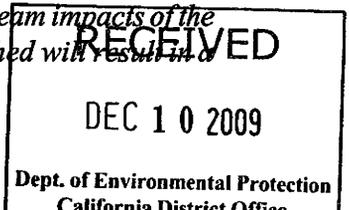
Response: Refer to Details 4A and 4B on Exhibit 15.5-5 for the species and quantities of plants that are proposed within the different wetland and upland habitat zones of the mitigation area.

Module 15 – Exhibit a Presto-Sygan AMD Restoration Mitigation Report

- 57. **Comment:** *Provide pre-treatment information for all biological communities on Chartiers Creek upstream and downstream of the discharges to be mitigated. In addition, show the benefits of taking the unnamed tributaries to Owens Run as it relates to improvements of the biological communities to the extent of the proposed reaches to be mitigated within Chartiers Creek,*

Response: Refer to the response presented in the Attachment to this letter.

- 58. **Comment:** *Provide a proposed distance in stream length and percent increases to the various biological communities within Chartiers Creek with respects to the adverse stream impacts of the sediment pond. Demonstrate how improvements to Chartiers Creek's watershed will result in a*



significant environmental improvement to compensate for the lost uses to the unnamed tributaries to Owens Run associated with the sediment pond development.

Response: These issues are discussed in the response to Comment 57.

59. **Comment:** *Stream mitigation - miscellaneous*

a. *Address mitigation proposed for predicted impacts within the local watershed, as reported on page 15-4 of the application.*

Response: Potential impacts within the local watershed will be mitigated by the Presto Sygan project. As discussed in the response to comment 57, the Presto Sygan project is anticipated to provide a many-fold increase in aquatic productivity compared with the streams directly affected by the CRDA 5 and 6 project. Any additional potential reduction in aquatic productivity in the downstream reach of Owens Run would be offset by the anticipated increase in productivity in Chartiers Creek and UNT 1 from the proposed AMD remediation.

b. *Provide an explanation of the mitigation plans relative to stream impacts associated with phases of project development. This is to make clear that the proposed mitigation exceeds that required for impacts associated with initial site and treatment pond development.*

Response: Refer to Table 15.1.a for a list of stream impacts associated with the sediment pond development application. Refer to the stream length table provided in the response to Comment 57 for the total stream impacts that will result from development of CRDA No. 5 & 6. As discussed in the response to Comment 57, the proposed Presto-Sygan remediation project represents stream mitigation for development of CRDA No. 5 & 6.

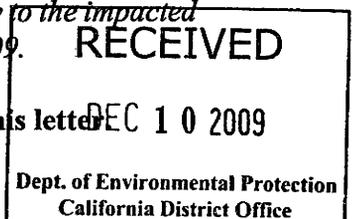
c. *Provide a schedule for completion of the stream mitigation project. Note: The mitigation project must be completed prior to or concurrent with stream impacts associated with initial site development.*

Response: The mitigation project is to be completed concurrent with stream impacts associated with initial development of the coal refuse disposal site. The Gantt charts included in the attachment to this letter identify major milestones, with target completion dates, for implementation of the treatment system at the Presto-Sygan discharge.

60. **Comment:** *Stream mitigation plan - Presto Sygan (Original plan received 2/12/09 and additional information received 10/14/09).*

a. *Describe how the Presto-Sygan project was selected and an evaluation of other similar projects that may exist in the impacted watershed or in closer proximity to the impacted watershed, as agreed by Jonathan Pachter in a meeting held on 8/17/09.*

Response: Refer to the response presented in the Attachment to this letter.



- b. *A trust fund evaluation will not been conducted at this time and will be deferred until a detailed stream mitigation plan is accepted by the California District Mining Office.*

Response: CPCC acknowledges this comment and will work with the California District Mining Office to address this comment once the stream mitigation plan is accepted.

- c. *Consol will be responsible for the successful implementation and operation of the treatment facilities, as agreed by Mark Stanley in a meeting held on 5/13/09. A consent order and agreement or other acceptable mechanism will be required for the project to be acceptable.*

Response: CPCC will be responsible for the successful implementation and operation of the treatment facilities, as agreed by Mark Stanley in a meeting held on 5/13/09. A consent order and agreement or other acceptable mechanism will be required for the project to be acceptable.

Upon approval by the PADEP California District Mining Office of the proposed treatment facilities, CPCC will assume, through an acceptable mechanism, responsibility for the successful implementation and operation of the system.

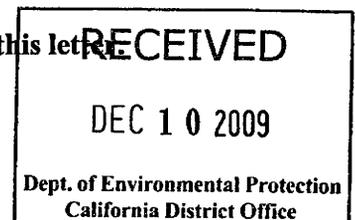
- d. *Consol will be responsible to obtain a NPDES permit for the treated discharge water.*

Response: As previously noted in the response to Item 60.c, upon acceptance of the proposed treatment system by the PADEP California District Mining Office, CPCC will assume, through an acceptable mechanism, responsibility for the successful operation of the system. Successful operation of the treatment system in this context is to comply with DEP-approved final effluent limits on a long-term basis.

Historically, NPDES permits have not been required on systems installed to treat abandoned mine drainage like the Presto-Sygan discharge. An acceptable mechanism to consider, therefore, is a "Memorandum of Understanding" that includes clearly defined water quality success criteria; i.e., PA Title 25 §89.52(f) relating to effluent limits for postmining polluttional discharges, and funding for long-term operational and maintenance costs. CPCC would monitor the treated effluent to document acceptable treatment of the Presto-Sygan discharge and implement, if needed, an "Adaptive Management Plan" to insure consistent treatment.

- e. *A conventional treatment system is required for the water treatment to ensure consistent compliance with NPDES permit limits, as discussed with Jonathan Pachter on 5/13/09.*

Response: Refer to the response presented in the Attachment to this letter.



- f. *The plan was presented initially as a "shovel ready" plan to ensure mitigation plans could be implemented timely to off-set stream impacts. The plans are not shovel ready and may take months or years to successfully complete. Detailed plans must be developed and additional permits and other approvals must be secured.*

Response: Upon DEP-approval of the proposed Presto-Sygan treatment facility, detailed plans, permit applications, and necessary notifications will be completed promptly. Gantt charts have been attached to Item 59.c. The Gantt chart entitled, "Expected Project Timeline - Design and Permitting Phase", shows completion of the design and permitting phase within 6 months (includes acquisition of permits and approvals listed in Item 5 of the October 14, 2009 response to the California District Office 5/14/09 comments). The Gantt chart entitled, "Expected Project Timeline - Construction Phase", shows completion within 6 months following receipt of the permits and approvals of a passive treatment system by a design-build team (Quality Aggregates Inc. and BioMost, Inc.) that has installed ~30 passive treatment systems. [In addition, BioMost, Inc. has designed passive treatment systems for the US Army Corps of Engineers and is currently under passive/active treatment design contracts with both the PADEP Bureau of Mining and Reclamation (BMR) and the Bureau of Abandoned Mine Reclamation (BAMR). Quality Aggregates Inc. has constructed passive treatment systems for BMR, BAMR, watershed groups, and private industry.]

- g. *Sludge disposal plans must be revisited upon acceptance of a conceptual stream mitigation plan.*

Response: As noted in Item 4 of the October 14, 2009 response to the California District Mining Office 5/14/09 comments, sludge stabilization and haulage to an approved disposal facility (Imperial Landfill, 11 Boggs Road, Imperial, PA 15126) was reviewed as a viable option.

In addition, under current consideration is to haul the sludge generated at the Presto-Sygan treatment facility to the nearby Hahn Treatment Plant/Montour 4 (Consolidation Coal Company, Permit #63901701, NPDES Permit #PA0001147, Cecil Twp., Washington Co.) for disposal.

- h. *Function and value comparisons were not provided. Mark Stanley in a meeting held on 5/13/09 committed to a demonstration that improvements resulting from treatment of the Presto-Sygan discharge will go beyond pollution reduction. Further, the response to item no. 10 received 10/14/09 regarding a question about how representative sampling was conducted to assess water quality impacts from the Presto-Sygan discharge to Chartiers Creek states to provide a more detailed and representative monitoring of the impact to Chartiers Creek, a more in-depth and representative monitoring program would be necessary, which was outside the scope of the previous effort. The report and additional information fails to predict or demonstrate that the proposed Presto-Sygan project will provide adequate mitigation for stream impacts associated with construction*

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of the no. 5 coal refuse disposal area. Failure to provide an acceptable stream mitigation plan will result in a return or denial of the permit application.

Response: Refer to response to Comment 57 for a functional assessment of the existing condition of Chartiers Creek and UNT-1, and the proposed approach for assessing the biological improvement that will result from the Presto-Sygan remediation project..

Module 16

61. *Comment: Provide dust control plans for stockpiles.*

Response: Module 16.2.e has been revised to present dust control plans for stockpiles as requested.

Module 17

62. *Comment: 17.3.a). Please provide a certification by the NRCS indicating that the findings of prime farmland investigations are correct .*

Response: The NRCS certification is attached.

63. *Comment: 17.4.a). Indicate all topsoil will be removed for final reclamation and if topsoil is less than 12 inches that topsoil and unconsolidated materials will be removed in accordance with §87.97.c). Revise the technical specifications definition for topsoil stripping on page 20-1 to be consistent with topsoil removal requirements.*

Response: Module 17.4.a and the technical specification for topsoil stripping have been revised as requested.

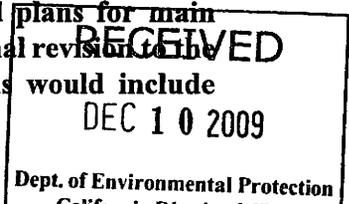
Module 18

64. *Comment: Exhibit 18.1. Several areas identified as unmanaged natural habitat exist as land occasionally cut for hay. Revise 18.3.c).*

Response: After discussion with Craig Burda, two areas of land use shown as “unmanaged natural habitat” on Exhibit 18.1 have been changed to a land use of “pastureland or land occasionally cut for hay”. Neither of these areas are within the proposed permit boundary, therefore, Module 18.3.c) remains not applicable. Module 18.3.c) has been revised to clarify the land use reference pertains to land within the permit area.

65. *Comment: Provide detailed and staged reclamation plans for initial site development, including the main sediment/treatment basin. Include stream restoration plans for all impacted stream reaches.*

Response: CPCC does not plan to reclaim the main sediment pond as part of disposal site reclamation. Module 18.1.e.14 has been revised to note that detailed plans for main sediment pond reclamation will be provided to the Department as a formal revision to the permit if the slurry impoundment permit is not issued. Those plans would include



associated stream restoration. The bond amount presented in Module 19 has been increased to provide for main sediment pond reclamation and associated stream restoration.

66. *Comment: 18.4.c). Measures must be employed to prevent impact to downstream watercourses. Address stream restoration plans and enhancement measures to develop aquatic habitat.*

Response: Module 18.4.c) has been revised to indicate plans for stream restoration and the erosion and sedimentation controls that will be used to control impacts to downstream watercourses.

67. *Comment: 18.4.d). Address all requested information to retain the main sediment/treatment basin.*

Response: Module 18.4.d) has been expanded as requested.

68. *Comment: 18.4.d). Postmining access roadways.*

- a. *Landowner agreements must be provided to retain the access roads permanently.*

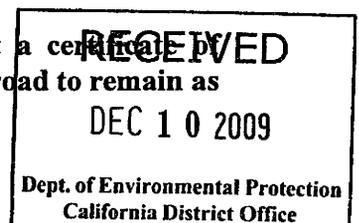
Response: Attached for inclusion in the permit application as Attachment 18.4.d is the letter from the landowner agreeing to CPCC's proposed plan for retaining the access road permanently. Module 18.4.d) has been revised to address this agreement.

- b. *A haulroad maintenance plan is required to retain the access roads. The maintenance plan should be identified as a "Postmining Road Maintenance Plan" and should be written as your recommendations to the landowner for maintaining the road in good condition. The maintenance plan should suggest measures for preventing or controlling erosion and siltation, flooding and damage to public or private property, air and water pollution and or minimizing damage to fish, wildlife and their habitat. It should include a recommended schedule for inspecting the road (at least annually) and correcting problems. It should also state that the road crowns and surfacing are to be maintained, and road ditches, sediment traps and culverts kept clean.*

Response: Attached for inclusion with Attachment 18.4.d is the requested Postmining Road Maintenance Plan. Module 18.4.d) has been revised to address this plan.

- c. *Haul roads and roads approved as part of the postmining land use must be certified by a qualified registered professional engineer or qualified registered land surveyor that the roads have been constructed or reconstructed as designed in accordance with the approved plan.*

Response: Module 18.4.d) has been revised to indicate that a certificate of construction will be provided at the time of reclamation for the road to remain as part of the postmining land use.



69. Comment: 18.5.

- a. *The proposed permanent seed mixture will not provide prompt stabilization of steep slope areas. An increase in application rates for prompt stabilization species is suggested.*

Response: The perennial ryegrass seed application rate has been increased to promote prompt stabilization.

- b. *Reconcile fertilizer and seeding plans with drawing no. 203.*

Response: Drawing No. 203 has been revised to conform to fertilizer and seeding plans presented in Module 18.

- c. *Provide woody species that are indigenous to the area and promote the development of terrestrial habitat.*

Response: Woody species listed under Module 18.5.d) have been revised as requested.

70. Comment: 18.6.e). *Enhancement measures are proposed in 18.4.c) and 18.6.d).*

Response: Because enhancement measures have been proposed, Module 18.6.e) is not applicable and has been revised accordingly.

Module 19

71. Comment: *Submit reclamation bond calculations to include full cost bonding of stream/wetland mitigation projects and for reclamation of the entire initial development area.*

Response: Module 19 bonding calculations have been revised to include bonding for reclamation of the entire initial development area as well as bonding for proposed wetland mitigation. Bonding for proposed stream mitigation will be added when proposed stream mitigation plans are further defined.

Technical Specifications

72. Comment: *Revise page 20-7.C to be consistent with pond liner plans.*

Response: The Technical Specifications have been revised to reflect the current proposed FML system. Note that the specifications have been re-organized and re-formatted to be consistent with the structure of specifications for other CRDA #5/#6 phases. Refer to Specification Section 3H and Section 3R for liner underdrain system and FML requirements, respectively.

73. Comment: *Revise page 20-27.B.2) to be consistent with liner and refuse underdrain plans.*

Response: Refer to response to Comment 72.

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74. Comment: *Revise page 20-35.D and 20-45.E to be consistent with liner plans and topsoil removal requirements.*

Response: Refer to response to Comment 72.

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75. Comment: *Section D4. Provide a drainage area map for each sediment trap that depicts the maximum contributory drainage areas.*

Response: Drainage maps depicting the watershed boundaries for Sediment Trap #8 (ST8), ST9, and ST11 are provided in the revised Calculation Brief.

76. Comment: *Section E1.*

- a. *The MSP is not designed to provide water treatment for continuous discharges from the slurry pond embankment. A normal pool (dewatered elevation) must be maintained above the sediment storage elevation to provide adequate detention time for degraded water. Refer to module 12 comment regarding water treatment requirements. The upstream chamber volume may not be considered for continuous degraded water treatment.*

Response: Refer to response to Comment 43.

- b. *The drainage area maps are not to scale. Provide a drainage area map that clearly defines the maximum disturbed area for each site condition. Revise the module 13.2A form to list the maximum allowable disturbed area. Please be advised the staging plans for the slurry impoundment area development must list the same disturbed area limitations.*

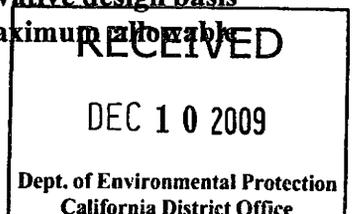
Response: Scalable, hard copies of the referenced drainage maps are provided with the revised Calculation Brief. Module 13.2A has been revised accordingly. Also, refer to response to Comment 76.a.

Note that the maximum allowable disturbed area for the Main Sediment Pond Starter Dike conditions is 30.8 acres.

77. Comment: *Section E3.*

- a. *Revise the module 13.2A form to list the maximum allowable disturbed area and include the maximum allowable disturbed area requirement on the phase plan drawings.*

Response: A note has been added to the SP3 Form 13.2A, as requested. Additionally, a note has been added to the design drawings stating that the maximum allowable disturbed area to SP3 is 16.2 acres (conservative design basis [11.3 disturbed acres actually anticipated]). Note that the maximum allowable disturbed area for Sediment Pond #2 (SP2) is 4.9 acres.



Baker

Mr. John Kernic
December 9, 2009
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- b. *Pg. 1-10. The auxiliary spillway must pass the 50-year design storm per Pond no. 378, as the drainage area exceeds 20-acres.*

Response: The calculations have been revised to show that SP3 can safely convey the peak discharge due to a 100-yr design storm while maintaining 2 feet of freeboard.

- c. *Revise the drainage area map to be consistent with site plan changes. Conveyor bench discharges must be considered, dependent on the final design.*

Response: A revised drainage map is presented in the supplemental calculations. Based upon this map, the total watershed area tributary to SP3 is 20.7 acres (including 4.0 acres which will be collected by Sediment Trap 4 and discharged through its flow-through rock spillway prior to entering the SP3 watershed). The anticipated disturbed watershed area tributary to SP3, under the revised/current site development presented on the revised drainage map, is 11.3 acres. SP3 was originally designed for a maximum total tributary area of 23.0 acres, with 16.2 acres assumed to be disturbed. Therefore, the previous hydrologic analysis (23.0 acre total watershed with 16.2 acres disturbed) for SP3 is conservative and will be utilized for the current SP3 design.

Please feel free to call me at 412-269-6096 or Ron Lehman with CPCC at 724-663-3032 if you have any questions or require additional information.

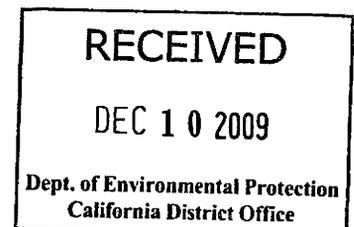
Sincerely,

MICHAEL BAKER JR., INC.



Gregory A. Heilman, P.E.
Project Manager

cc: Ron Lehman - CPCC (w/ 1 copy)
Kerry Goodballet - CPCC (w/ 1 copy)
Chris Lewis - D'Appolonia (w/ 1 copy)
Public Review Copy - Greene County Conservation District Office (w/ 1 copy)
Mike Shema - CEC (letter only)
Heather Trexler - Moody (letter only)
Roger Adams - PADEP Division of Dam Safety (letter and three copies of Module 15 revisions)



Module 15: Streams / Wetlands

Note: Engineering designs, engineering calculations, and stream profiles submitted under this Module must be certified by a qualified registered professional engineer.

15.1 Surface Activities within 100 Feet of a Stream

If surface mining activities, including haul road crossings, are proposed within 100 feet of any intermittent or perennial stream provide the following information:

- a. The name and location of the stream; and location, length, and acreage disturbed by the proposed activities (Identify the location of the proposed activities on the Operation Map, Exhibit 9.1 and the Land Use and Reclamation Maps, Exhibit 18.1.)

Refer to Exhibit 15.1 for the name and location of the onsite streams. Refer to Table 15.1.a for the stream name, stream length within 100 feet of surface mining activities, disturbed stream length, and disturbed stream acreage. Proposed activities are shown on Exhibits 9.1 and 18.1.

- b. A narrative giving a description and the purpose and justification of the proposed activities.

This permit application is for construction of a sediment pond and ancillary facilities for a new coal refuse disposal area (CRDA) at the Bailey Central Mine Complex. The new disposal facility is referred to as Coal Refuse Disposal Area No. 5. The proposed sediment pond development permit application encompasses 91.5 acres and includes installation of a sediment pond, a 1,800 foot long access road from S.R. 4007 (Ackley Creek Road), approximately 2,800 feet of haul roads, temporary access corridors, and various erosion and sedimentation control facilities. A future permit application will address the development of a slurry impoundment and coal refuse disposal operations for CRDA No. 5.

There are currently four existing CRDAs at the Bailey Central Mine Complex, consisting of two slurry impoundments (CRDA Nos. 1 and 3) and two areas comprised entirely of coarse coal refuse (CRDA Nos. 2 and 4). At projected production rates, fine coal refuse disposal capacity in the existing CRDAs will be exhausted during the 2nd Quarter of 2013. Therefore, site preparation for a new slurry impoundment must begin in 2010 provide for continued fine coal refuse disposal capacity. Coarse coal refuse disposal capacity in the existing CRDAs will also be exhausted in 2013 without a new refuse disposal area. Development of a new CRDA is essential for the continuing operation of the Bailey and Enlow Fork Mines.

- c. Provide a narrative that demonstrates that no adverse hydrologic impacts, water quality impacts, or other environmental resources impacts will occur as the result of the variance.

To control the effects of erosion on the project area and downstream watercourses, an approved E&S control plan has been developed for each project stage in accordance with 25 Pa Code Chapter 89 and Chapter 102 requirements. Best Management Practices (BMPs) will be utilized during construction and throughout the life of the facility to control erosion and sedimentation and minimize impacts to the aquatic environment. The sediment pond will be constructed to retain sediment-laden runoff for a sufficient duration to allow settling of suspended solids before releasing the water to a natural watercourse. Sediment pond discharge will be sampled and tested in accordance with National Pollutant Discharge Elimination System (NPDES) criteria. The approved E&S control plan also will include timely construction and maintenance of BMP facilities combined with concurrent reclamation and revegetation of disturbed areas.

Stream base flow will be conveyed to the toe of the disposal area via rock and spring drains constructed along the same approximate alignment as the stream channels. By-pass piping will be used to convey stream base flow from the toe of the disposal area around the sediment pond. This piping will discharge into the existing stream channel downstream of the sediment pond in order to maintain baseflow to downstream waters. Hydrologic analysis of stream flow data performed by Moody Associates indicates that a base flow of 118 gpm could be expected to be supplied via the

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rock drains to maintain the downstream uses in Tributary 32705 and Owens Run. Based on benthic macroinvertebrate and fish sampling in similar headwater and second order streams in southwest Pennsylvania, a base flow of 118 gpm would maintain viable fish and benthic populations in the downstream portion of Tributary 32705 and would help maintain flow and contribute to the maintenance of aquatic life in Owens Run. Although the sediment pond will intercept and temporarily detain a range of storm events that would normally be conveyed downstream, larger storm events will discharge to the downstream waterways through the pond control structure.

15.2 *Surface Activities Involving Stream Encroachments and Water Obstructions*

Where a stream relocation, channel change, or any other Chapter 105 activity is proposed for surface mining activities, provide the following information:

- a. The name and location of stream and location and length of the proposed activity. (Identify the location of the proposed activities on the Operation Map, Exhibit 9.1 and the Land Use and Reclamation Maps, Exhibit 18.1.)

Refer to Exhibit 15.1 for a plan view of onsite streams and proposed stream impacts. Proposed activities and streams are shown on Exhibits 9.1 and 18.1. A summary of Chapter 105 disturbance activities is presented in Table 15.1.a. Eleven streams, totaling 6,052 feet, will be impacted by the proposed activities. In addition, there will be surface activities within 50 feet of a 425-foot long section of Owens Run. The surface activities include a stormwater culvert, an access road, a sediment trap, and other erosion and sedimentation control facilities. However, there will not be any disturbance to the stream channel and the culvert will only convey runoff from non-disturbed areas that is collected in a diversion ditch

- b. A narrative describing the proposed activity, its purpose, and the reason it is necessary.

Refer to Module 15.1.b

- c. A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities. Provide the name(s), address(es), and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data.

Principal Investigators and Methods

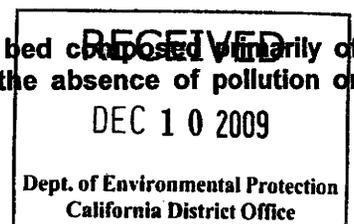
The principal investigators responsible for the collection and analysis of aquatic ecological data for this project are:

Michael L. Shema, Ecologist/ Project Manager
 Mark R. Halbach, Ecologist/Principal
 Civil & Environmental Consultants, Inc.
 333 Baldwin Road
 Pittsburgh, Pennsylvania 15205-9702
 Telephone (412) 429-2324

The resident aquatic communities in the onsite tributaries were sampled and assessed in order to: 1) classify stream reaches as either perennial or intermittent, in accordance with Section 89.5 of Title 25 of the Pennsylvania Code; and 2) further classify perennial reaches as biologically diverse or biologically variable, in accordance with Appendix A of the TGD, as requested by the PADEP California District Mining Office.

Section 89.5 of Title 25 of the Pennsylvania Code defines perennial and intermittent streams, as follows:

- Perennial Stream – A body of water flowing in a channel or bed composed primarily of substrates associated with flowing water and is capable, in the absence of pollution or



other manmade stream disturbances, of supporting a benthic macroinvertebrate community which is composed of two or more recognizable taxonomic groups of organisms which are large enough to be seen by the unaided eye and can be retained by a United States Standard No. 30 sieve (28 meshes per inch, 0.595 millimeter openings) and live at least part of their life cycles within or upon available substrates in a body of water or water transport system.

- **Intermittent Stream** – A body of water flowing in a channel or bed composed primarily of substrates associated with flowing water which, during periods of the year, is below the local water table and obtains its flow from both surface runoff and groundwater discharges.

Thus, stream segments were identified as perennial streams if they had flowing water, a defined channel, substrates associated with flowing water, and at least two benthic macroinvertebrate taxa. Stream segments lacking surface flow, but having a defined channel and substrates associated with flowing water were delineated as intermittent streams. The perennial streams were further classified according to the TGD Appendix A classifications of “biologically diverse” and “biologically variable”. These perennial stream sub-classifications are defined by PADEP (2005) as follows:

- **Biologically Diverse** – A stream segment where, under the normal range of conditions, a diverse community of uni/semivoltine taxa and other macroinvertebrates, that are building blocks of aquatic ecologic systems, can exist.
- **Biologically Variable** – A stream segment that supports at least two benthic taxonomic groups of organisms, which are visible to the unaided eye and live at least part of their life cycles within or upon available substrates in the stream.

Classifications for the streams were based on field observations using biological, physical, and hydrological indicators. The stream classification data forms and photographs are included in Appendix 15.2-A.

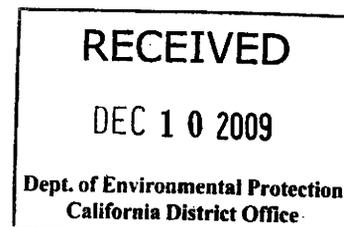
“Appendix B – PA DEP Low Gradient Stream Assessment Protocol” of the TGD (PADEP 2005) was used to evaluate the benthic macroinvertebrate community at two 100-meter long sampling stations (BSW01 and BSW02) established within the biologically diverse perennial section of Tributary 32705 (see Exhibit 15.1). The stream sampling also included field water quality measurements, evaluation of physical habitat conditions, USEPA habitat assessments, modified Wolman pebble counts, and electrofishing surveys. The field sampling was conducted on February 8, 2008. The TGD Appendix B stream biological field data forms and photographs are included in Appendix 15.2-B.

Description of Aquatic Community

The main stem of Tributaries 32705 and 32705A to Owens Run were both classified as “biologically diverse perennial” and supported 13 benthic macroinvertebrate taxa, the majority of which are considered long-lived (i.e. univoltine or semivoltine). Included in these taxa were several families of Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies).

The remaining perennial stream segments were classified as biologically variable and typically produced between 3 and 10 benthic taxa with the majority of taxa being assessed as Rare or Present.

The five intermittent stream reaches were dry at the time of sampling and did not support an aquatic community.



Twenty-two taxa were identified from the 200±20% organism subsample for BSW01, which included eight EPT taxa of the insect orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), which are generally considered most sensitive to environmental stress and water quality degradation. The dominant taxon in this sample was the midge larvae (Chironomidae).

Table 15.2.c-1 shows the calculations for the five Appendix B metrics, which were used to compute a Total Biological Score for the Station BSW01 benthic macroinvertebrate community. The metrics computed for Station BSW01 showed that the benthic community had 22 total taxa, 4 Trichoptera (caddisfly) taxa, 9 intolerant taxa, and 9 filterer-collector plus predator taxa. EPT taxa comprised 36% of the total number of taxa. The Total Biological Score (TBS) computed from the five Appendix B metrics at BSW01 was 58.3.

Twenty taxa were identified from the 200±20% organism subsample for BSW02, which included eight EPT taxa of the insect orders Ephemeroptera, Plecoptera, and Trichoptera. The dominant taxon in this sample was the caddisfly genera (Neophylax).

Table 15.2.c-2 shows the calculations for the five Appendix B metrics and Total Biological Score for Station BSW02. Station BSW02 had 20 total taxa, 4 Trichoptera taxa, 9 intolerant taxa, and 8 filterer-collector plus predator taxa. EPT taxa comprised 40% of the total number of taxa. The Total Biological Score computed from the five Appendix B metrics at BSW02 was 56.8.

Field water quality measurements, physical habitat conditions, USEPA habitat scores, and pebble count data are presented in Table 15.2.c-3.

Only six fish, representing two species, creek chub (*Semotilus atromaculatus*) and blacknose dace (*Rhinichthys atratulus*), were collected at Station BSW01 during the electrofishing surveys. These species are listed as “pioneering” and “headwater” species respectively, which means that they are typically the first to inhabit a stream and are adapted to the conditions of small, shallow headwater streams. No fish were collected at BSW02.

Biological data was not collected on the main stem of Owens Run because it is located outside of the permit boundary and is not likely to be affected by the proposed encroachment activities.

Description of Riparian Vegetation

Riparian vegetation along Tributary 32705 was dominated by herbaceous species including wingstem (*Verbesina alternifolia*), reed canary grass (*Phalaris arundinacea*), sedge species (*Carex* spp.) and bluegrass (*Poa* sp.); however, black walnut (*Juglans nigra*) trees were also present along both banks.

Upland forests, located along steep side slopes adjacent to the streams, were typically dominated by the following tree species: sugar maple (*Acer saccharum*), green ash (*Fraxinus pennsylvanica*), American hornbeam (*Carpinus caroliniana*), American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*) and northern red oak (*Quercus rubra*).

Portions of Tributary 32705 were also bordered by emergent wetlands that commonly supported the following herbaceous species: sweetflag (*Acorus calamus*), rice-cut grass (*Leersia oryzoides*), arrow-leaf tearthumb (*Polygonum sagittatum*), boneset (*Eupatorium perfoliatum*), jewelweed (*Impatiens capensis*), and sedge species (*Carex* spp.).

Floodplain vegetation along Owens Run, within the proposed encroachment area, is dominated by a mixed deciduous forest similar in composition to that of the upland forest described above.

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Hydrologic Consequences of Activities on Water Quality, Quantity, and Aquatic Community

The entire watershed of Tributary 32705 represents approximately 20 percent of the local watershed (Owens Run) and 1 percent of the regional watershed (Enlow Fork). Construction of the sediment pond development area will impact approximately 3,193 linear feet of biologically diverse perennial streams, 1,917 linear feet of biologically variable perennial streams, and 942 linear feet of intermittent streams. The probable hydrologic consequences of these activities on water quantity and water quality is expected to be low in the Owens Run watershed, but will likely have a moderate impact on the aquatic community as discussed in the following paragraphs.

Best Management Practices (BMP) that will be incorporated to control erosion and sedimentation for the life of the facility to prevent water quality impacts to Owens Run are outlined in Module 11 and on the Design Drawings included with this permit application. Stream base flow will be conveyed to the toe of the disposal area via rock and spring drains constructed along the same approximate alignment as the stream channels. Piping will be used to convey stream base flow from the toe of the disposal area around the sediment pond. The by-pass piping will discharge into the existing stream channel downstream of the sediment pond in order to maintain baseflow in downstream waters.

Hydrologic analysis of stream flow data performed by Moody Associates indicates that a base flow of 118 gpm could be expected to be supplied via the rock drains to maintain the downstream uses in Tributary 32705 and Owens Run. Based on benthic macroinvertebrate and fish sampling in similar headwater and second order streams, a base flow of 118 gpm would maintain viable fish and benthic populations in the downstream portion of Tributary 32705 and would help maintain flow and contribute to the maintenance of aquatic life in Owens Run. Although the sediment pond will intercept and temporarily detain a range of storm events that would normally be conveyed downstream, larger storm events will discharge to the downstream waterways through the pond control structure.

Routing of onsite streams through the rock drains and the detention of stormwater runoff by the sediment pond will alter the natural flow rates and movement of the stream flow within the floodplain and change the drainage patterns in the affected stream reaches. Proposed site development should not impact base flows, but it will decrease flood flows. The quantity of surface water discharged from the Site is not expected to be significantly altered and impacts to natural drainage patterns from the project are not expected to be significant in the Enlow Fork watershed.

The proposed stream impacts are not expected to have a significant impact on fisheries due to the low relative abundance of fish within the impacted reach of Tributary 32705. However, the impacts will likely have a moderate impact on secondary production within the local watershed.

The instream habitat, vegetation, substrates, and associated small, immobile or sedentary organisms will be lost within the impact areas, but there is no evidence that the vegetation or organisms within these habitats are critical or unique food resources to organisms outside the impact areas. The biota observed in the streams were common species and the loss of these organisms will not result in a regional decrease in biodiversity within the Enlow Fork watershed.

The project is likely to have a moderate impact on the aquatic community and certain aquatic functions (e.g., food chain export); however, it is not anticipated that these alterations will negatively impact the aquatic community in a regional context.

The encroachment activities along the mainstem of Owens Run are minimal and are not likely to affect the water quality, quantity, or aquatic community in the stream.

- d. A hydrologic and hydraulic analysis which includes:

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- i. Data on size, shape and characteristics of the watershed;

Hydrologic and hydraulic analyses developed for the sediment pond design include details of watershed size, shape and characteristics. This analysis is presented in the Calculation Brief included with this permit application.

- ii. The size and frequency of the design storm;

The design storm for the proposed sediment pond is discussed in the Calculation Brief.

- iii. The hydraulic capacity of the proposed replacement channel;

Not Applicable.

- iv. The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.

Not Applicable.

- e. A stream profile for the existing and proposed channel for a reasonable distance upstream, downstream and within the proposed change, showing bed slopes, pool-riffle ratios, normal and flood water surfaces, and existing obstructions.

Profiles of Tributaries 32705 and 32706 to Owens Run are provided on Exhibit 15.2.e.

- f. A detailed plan and cross sections of the existing and proposed channel upstream, downstream and within the proposed channel change showing the limits and configuration of the proposed activities, dimensions, channel linings and normal and flood water surfaces.

Refer to Exhibits 6.2 and 15.1 for a detailed plan of the existing streams. Locations of the proposed activities are shown on Exhibit 9.1 and the Design Drawings. Refer to the Design Drawings for cross sections of the project area.

- g. A description of the construction methods and sequence including: water handling during construction, erosion and sedimentation controls, and measures to be taken to prevent adverse impacts to water quality and quantity, water users and the aquatic communities, and measures for environmental enhancement if practicable.

A construction sequence is provided on Design Drawings 208 through 213 included with this permit application.

- h. A characterization of the existing water quality and quantity of the stream, including downstream water uses and 25 PA Code Chapter 93 Protection Water Use Classification.

Water quality and quantity parameters were measured by CEC on February 8, 2008 for Stations BSW01 and BSW02. Field measurements for each specified parameter are summarized in the table below.

Parameter	BSW01	BSW02
	February 8, 2008	February 8, 2008
Water Temperature (°C)	4.8	5.1
Conductivity (µS/cm)	232	287
pH (s.u.)	7.47	7.37
Dissolved Oxygen (mg/l)	10.91	11.51
Flow (cfs)	2.71	1.39

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Water quality parameters were measured in Owens Run at a location approximately 450 feet downstream from the confluence of Owens Run and UNT-OR during four separate site visits. Field measurements for each specified parameter are summarized in the table below.

Parameter	Owens Run			
	10/11/07	1/29/08	4/11/08	7/17/08
Water Temperature (°C)	11.7	1.7	13.3	18.8
Conductivity (µS/cm)	484	186	334	460
pH (s.u.)	7.89	7.65	8.51	8.33
Dissolved Oxygen (mg/l)	5.9	14.0	11.4	8.5

Tributary 32705 drains directly into Owens Run where typical water uses are limited to aquatic life and wildlife support functions. Owens Run and its unnamed tributaries have a protected aquatic life use designation of Warm Water Fishes (WWF), as per 25 PA Code Chapter 93 Protection Water Use Classification. The WWF protected use is defined as “maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat”.

- i. Stormwater Analysis: If a stormwater management plan has been prepared or adopted under the Stormwater Management Act, an analysis of the project's impact on the Stormwater Management Plan and a letter from the county or municipality commenting on the analysis.

Not applicable. No stormwater management plans have been prepared or adopted under the Stormwater Management Act in the project area.

- j. Floodplain Management Analysis: If the proposed restoration project is located within a floodway delineated on a Federal Emergency Management Agency (FEMA) map, include an analysis of the project's impact on the floodway delineation and water surface profiles and a letter from the municipality commenting on the analysis.

Not applicable. There are no FEMA designated floodways in the project area.

- k. Risk Assessment: If the stormwater or the floodplain management analysis conducted in 15.2(i) or 15.2(j) indicates increases in peak rates of runoff or flood elevations, include a description of property or land uses that may be affected and an analysis of the degree of increased risk to life, property and the environment.

Not applicable. Stormwater and floodplain management analyses were not required under 15.2.i. or 15.2.j.

- l. Provide verification that landowner's consent and permission have been obtained to conduct activities on private property.

Refer to Module 5.1.

- m. A Resource Characterization. For each stream or stream segment identified in module 15.2(a) or 15.3(a), provide the following pre-mining water resource information:

- i. Is the water resource stocked by the Pa. Fish and Boat Commission? Yes No
- ii. Is the water resource designated as a Natural Wild or Scenic River or as part of the Commonwealth's Scenic Rivers System? Yes No
- iii. Habitat Assessment: Provide a written narrative discussing the following ecological functions: food chain production, general habitat (nesting, spawning, rearing, resting, migration, feeding, escape cover), threatened and endangered species habitat (include PNDI search results), environmental study areas (sanctuaries, refuges).

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Tributaries 32705 and 32706 and their unnamed tributaries are warm water streams located within the Waynesburg Hills physiographic province of the Western Allegheny Plateau Ecoregion, located within the Ohio River catchment area. Each stream reach within the proposed site was assigned a rating of low, moderate, or high based on the stream's ability to provide each of the listed ecological functions. The ratings for the stream reaches are discussed in the following paragraphs and are summarized in Table 15.2.m.

Food Chain Production

The main stem of Tributary 32705 supported up to 22 benthic macroinvertebrate taxa and two fish species; consequently, this stream was rated high for food chain production. The 13 benthic macroinvertebrate taxa collected from Tributary 32705A indicate that it is relatively productive; however, its narrow width (2-3 feet) and short length (165 linear feet) limit its ability to function at a high level. The biologically variable perennial tributaries typically supported between 3 and 10 benthic taxa with the majority of taxa being assessed as Rare (0 to 3 organisms) or Present (4-10 organisms); consequently, these streams were rated low for food chain production. The remaining onsite tributaries were classified as intermittent streams that lacked flow and benthic macroinvertebrate communities, for this reason intermittent streams were rated low for food chain production.

Food chain production capabilities of Owens Run were not rated because biological data was not collected for this reach.

Nesting, Spawning, and Rearing

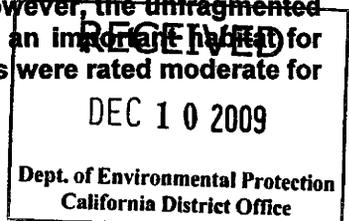
With the exception of UNT 2 – OR, the onsite perennial streams and Owens Run were rated high for nesting due to the presence of mature riparian forest along most of the banks. Stream reaches with trees, shrubs, and dense herbaceous vegetation in the riparian zones are more likely to provide nesting functions for migratory birds and other stream and riparian dependent wildlife. UNT 2 – OR is located in a mowed field and has several reaches which are culverted under roads, thus it was rated low for nesting. Intermittent streams are not likely to influence the nesting behavior of wildlife; consequently, they were rated low for this function.

The instream habitat along Tributary 32705 is dominated by gravel and sand substrates that are suitable for fish spawning; however, the low relative abundance and species richness indicate that the stream is not used as a primary spawning area. Moreover, several bedrock ledges (12-20 inches high) serve as barriers to fish passage. For these reasons Tributary 32705 was rated moderate for spawning. The remaining tributaries in the 32705 watershed are located upstream of the previously described bedrock ledges and are small tributaries that are not likely to serve as spawning areas – a low rating was assigned to these streams. UNT 2 – OR is separated from Owens Run by a culvert and was also rated low for spawning. Spawning functions of Owens Run were not rated because fish community data was not collected on this reach.

Tributary 32705 and Owens Run were rated moderate for rearing habitat due to the presence of suitable instream cover; however, the remaining tributaries were rated low because of their lack of opportunity to support a fish community.

Migration

Migratory fish are not endemic to the Owens Run watershed and the onsite streams are unlikely to attract large aggregations of migrating waterfowl. However, the unfragmented forests in the Tributary 32705 and Owens Run watersheds are an important habitat for migratory neotropical songbirds; therefore, the perennial streams were rated moderate for



this function. UNT 2 – OR was rated low because of its lack of woody riparian vegetation. The lack of flow and limited influence on migration behaviors is the basis for assigning a low rating to intermittent tributaries.

Feeding, Resting, and Escape Cover

The high level of food chain production in Tributary 32705 provides opportunity to support the feeding behavior of aquatic and semi-aquatic organisms, but because of the low number of predators (e.g. fish and salamanders) in the stream it was rated moderate for feeding. The moderate level of food chain production in Tributary 32705A is the basis for assigning it a moderate rating for feeding. The remaining perennial tributaries provide low levels of food chain production and were rated low for feeding. No benthic macroinvertebrates were observed in the intermittent streams; consequently, they were rated low for food chain production. The feeding functions provided by Owens Run were not rated because biological data was not collected from this reach.

Instream cover, such as woody debris, undercut banks and rootwads were not prevalent in the streams, but the streams do provide some foraging and feeding habitat and watering sources for small mammals. Additionally, the presence of unfragmented forest in the vicinity of most of the streams is likely to provide resting and escape cover for terrestrial and avian species. Owens Run and all perennial streams in the Tributary 32705 watershed were rated moderate for resting and escape cover. UNT 2 – OR and intermittent streams are not likely to provide unique habitats that would attract wildlife seeking resting and escape cover. Consequently, these streams were rated low for these functions.

Habitat for Endangered and Threatened Plant and Animal Species

A PNDI Review for the project area, attached as Exhibit 18.6, did not result in a “hit” for any state or federal threatened or endangered species. Mist net studies completed during the summer of 2007 found one Indiana bat foraging in the area. As determined by DEP, Indiana bats are not “contained in” the permit area, as defined in 25 Pa. Code §90.202(e)(3).

Environmental Study Areas (Sanctuaries and Refuges)

The proposed project site is not located within or adjacent to any known environmental sanctuaries or study areas. Consequently, all of the affected reaches were rated as low for these functions.

- iv. Water Quantity and Streamflow. Provide a written narrative discussing the following: natural drainage patterns, flushing characteristics, current patterns, groundwater discharge for baseflow, natural recharge areas for groundwater and surface water, storm and floodwater storage and control.

Natural Drainage Patterns

Historic pasturing of the Tributary 32705 watershed has resulted in some areas of bank erosion and channel scour within the project area. It does not appear that there were significant alterations to the course of the onsite streams; therefore, they were rated moderate for natural drainage patterns. The continued mowing along UNT 2 – OR and the installation of culverts and an impoundment have significantly altered the drainage patterns in this stream; consequently, it was rated low for this function. Within the encroachment area of Owens Run, the stream is flowing through wooded riparian habitat and has natural drainage patterns.

Flushing Characteristics and Current Patterns

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Flushing flows may occur seasonally in association with heavy precipitation, as evident from some moderate bank erosion and minor channel scouring along reaches of Owens Run and Tributaries 32705 and 32706. Silt deposition in these streams was primarily limited to small pools and glides that have decreased water velocity. Therefore, the main stem of Owens Run, 32705, and 32706 were assigned a moderate rating for flushing characteristics and current patterns.

The remaining tributaries have small drainage areas (i.e., less than 100 acres) and have limited flushing flows in association with heavy precipitation. Therefore, all of these streams were assigned a low rating for flushing characteristics and current patterns.

Groundwater Discharge and Recharge

Groundwater discharge and recharge functions in the onsite streams could not be adequately evaluated with existing data. Hydrologic studies on other similar streams in the vicinity of the project area have demonstrated the presence of alternating losing and gaining stream reaches within the same stream, indicating both functions may occur in the same regional setting. Adjacent upland areas appear to be the primary groundwater recharge areas for these streams and hillside springs and seeps serve as the primary discharge areas.

The size and drainage areas of Owens Run and Tributaries 32705 and 32706 suggest these functions may be occurring at a moderate level for these streams. Conversely, the relatively low flows, or lack of flows, and small drainage areas of the remaining streams suggest that they are functioning at a low level. The exception is Tributary 32705A, which originates at a spring and likely flows year round, thus allowing it to function at a moderate level for groundwater discharge.

Storm and Flood Water Storage and Control

Numerous depressional wetlands were present along Tributary 32705 within the permit boundaries. The density, size, and hydrologic connectivity of these wetlands provide floodwater attenuation and storage within or adjacent to the channels. Therefore, Tributary 32705 was rated high for the function of storm and flood water storage and control. A wetland delineation was not performed along Owens Run; however, field observations suggest that large floodplain wetlands are not present along Owens Run. Furthermore, the majority of the floodplain has been altered by agricultural and residential development; therefore, the stream provides moderate levels of storm and flood water control.

The relatively incised nature of Tributary 32706 and the high-gradient landscape surrounding the remaining tributaries limits their ability to retain flood water. These streams were rated low for storm and flood water storage and control.

- v. **Water Quality:** Provide a written narrative discussing the following: preventing pollution, sedimentation control, and natural water filtration.

Preventing Pollution and Natural Water Filtration

Pollution prevention and natural water filtration are broad categories of aquatic functions that include a variety of specific pollutant removal mechanisms, such as trapping sediments, removal and burial of metals and other toxic compounds, and biological transformation and degradation of nutrients and organic pollutants. The extent to which the stream assessment reaches provide these functions depends on the presence of extensive floodplains and riparian wetlands (with well-developed ~~vegetation~~ and

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depressional storage) and the degree to which these areas are connected to the stream channel.

Tributaries 32705 and 32705A were rated as high for preventing pollution due to the presence of moderate size wetlands along their banks. Additionally, these streams provide a moderate level of water filtration via contact with alluvial substrates and streamside wetland vegetation. It is noted that there are not obvious sources of pollution within or upstream of the project area, so the opportunity for the streams to provide these functions is limited. Thus, the streams were rated moderate for these functions.

The remaining tributaries lacked numerous streamside wetlands; therefore, they were rated low for the functions of pollution prevention and natural water filtration.

Sedimentation Control

Sediment control functions consist of streambank anchoring and stabilization, dissipation of erosion forces, and trapping of sediments. In general, the presence of woody vegetation, root mats, boulders, and bedrock protect stream banks from scour and erosion and minimize sediment loading to the stream. Vegetative cover (e.g., herbaceous and scrub/shrub vegetation) within riparian wetlands or uplands along the stream can stabilize soils and trap sediments during overbank flooding. The ability of an area to provide sediment retention functions depends on the frequency and duration of flooding and storage capacity.

The majority of the perennial streams have either riparian wetlands or forest cover along their banks, thus they were assigned a moderate rating for sedimentation control. UNT 2 - OR lacks woody riparian vegetation and does not have many riparian wetlands. Therefore, the stream was rated low for sedimentation control.

Intermittent tributaries only flow during periods of precipitation, when the scour/erosion potential is highest. Additionally, the steep gradient of these streams allows them to erode faster than the other onsite streams; therefore, intermittent streams were rated low for sediment control.

- vi. Recreation: Provide a written narrative discussing the following: game species, non-game species, fishing, hiking, observation (plant/wildlife), or other recreational attributes.

Recreational functions and values include hunting, fishing, hiking, and nature observation. The game species, non-game species, fishing and hiking functions were rated low for all of the affected reaches because of the limited public access to the site.

- vii. Describe upstream and downstream property uses.

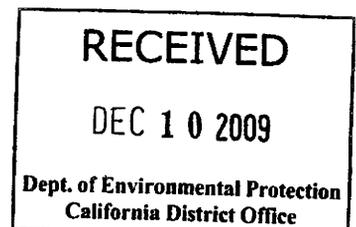
Properties upstream of the site are owned by CPCC and consist of abandoned pasture, old field, and mature forest. Downstream of the site there are a few residential lots that contain single family dwelling and land use is limited to mowed lawns or undeveloped woodlots.

- viii. Other environmental factors determined by site investigation.

No other environmental factors were identified during CEC's site visits that would warrant special consideration in the evaluation of this permit application.

- n. Provide a discussion of the proposed activity's impacts on: national, state or local parks, forests or recreation areas, natural or wilderness areas, national, state, or local historic sites, national natural landmarks, national wildlife refuges, cultural or archaeological landmarks, state game lands, federal, state, local or private plant or wildlife sanctuaries, and prime farmland.

The proposed development will not impact any of the items listed.



- o. Environmental Impacts: Provide the following information regarding environmental impacts:
- i. A discussion of the proposed activity's impacts to water resource characteristics listed previously in Modules 15.2(m)iii) through 15.2(m)viii).

Construction of the sediment pond development area will impact approximately 3,193 linear feet of biologically diverse perennial streams, 1,917 linear feet of biologically variable perennial streams, and 942 linear feet of intermittent streams. The anticipated impact to the previously discussed water resource characteristics are discussed below.

Food Chain Production

The instream habitat, vegetation, substrates, and associated small, immobile or sedentary organisms within Tributaries 32705 and 32705A will be lost within the impact areas, but there is no evidence that the vegetation or organisms within these habitats are critical or unique food resources to organisms outside the impact areas. Though the biota observed in the streams were common species, the loss of these organisms will reduce local food chain production and export to the aquatic community immediately downstream of the site; however, the loss is not anticipated to be significant in a regional context. Encroachment on Owens Run will be limited to installation of a stormwater culvert, which is anticipated to have a negligible effect on the food chain production functions of Owens Run.

The larger and more mobile vertebrates in Tributary 32705 and 32705A should be able to migrate to adjacent areas of suitable habitat that are capable of providing acceptable food resources and cover. Overall, the project does not significantly reduce habitat for aquatic, terrestrial, or avian species in a regional context.

The remaining onsite tributaries were rated low for food chain production; therefore, the impact to this function was rated as low.

Nesting, Spawning and Rearing

Loss of mature forested riparian habitat along the banks Tributary 32705 and its tributaries is likely to have an impact on the nesting behaviors of avian species at the point of impact. However, large blocks of unfragmented forest will remain undisturbed in the vicinity of the project, so there is likely to be a low impact to nesting behaviors within the Enlow Fork watershed. UNT 2 – OR was rated low for nesting habitat and therefore the impact to this function will be low.

Tributaries 32705 was rated moderate for spawning and rearing and therefore it is likely to see a moderate impact to these functions in the locality of the construction activities. The remaining tributaries make minimal if any contribution to spawning and rearing; therefore, the impact to these functions will be low.

The encroachment activities along Owens Run are minor; therefore, the impact to nesting, spawning, and rearing functions is anticipated to be low.

Migration

The lack of migratory fish species in the Owens Run watershed and low potential for use by migratory waterfowl suggests that there will be a low impact to these animals. Despite, the clearing of forested habitat in the locality of the project, there will be large tracts of contiguous forest that remain; therefore, no significant impact to the migratory behavior of neotropical songbirds is anticipated.

Feeding, Resting, and Escape Cover

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Tributaries 32705 and 32705A are likely to experience a moderate impact to the feeding, resting, and escape cover functions in the immediate vicinity of the project, but these are not anticipated to have measurable effect in a regional context. The remaining tributaries provide these three functions on a limited level and consequently loss of these resources is likely to have a low impact.

The encroachment activities along Owens Run are minor; therefore, the impact to feeding, resting, and escape cover functions is anticipated to be low.

Habitat for Endangered and Threatened Plant and Animal Species

Rare, threatened, or endangered plants were not identified within the project area; therefore, no impact to these types of plants is anticipated. Refer to "Habitat for Endangered and Threatened Plant and Animal Species" in Module 15.2.m.

Environmental Study Areas (Sanctuaries and Refuges)

The proposed project site is not located within or adjacent to any known environmental study areas and the proposed project is not expected to impact environmental study areas.

Natural Drainage Patterns

The impacts to onsite streams will restrict the natural movement of the stream within the floodplain and change the drainage patterns in the impacted sections. This is likely to have a high impact on the streams at the point of impact. However, the quantity of surface water discharged from the site is not expected to be significantly altered and impacts to natural drainage patterns from the project are not expected to have a significant effect on the Enlow Fork watershed.

The encroachment activities along Owens Run are minor; therefore, the impact to natural drainage patterns is anticipated to be low.

Flushing Characteristics and Current Patterns

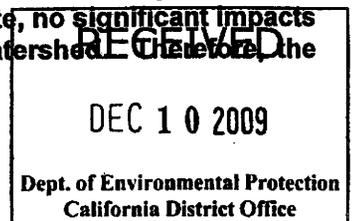
Flushing flows may occur in onsite streams in association with heavy precipitation. Tributaries 32705 and 32706 were assigned a moderate rating for this function based on their drainage areas. Installation of rock drains and by-pass piping and development of the sediment pond will affect flushing characteristics and current patterns at the point of impact. However, installation of a perforated riser will help to maintain the flushing characteristics in Owens Run that are generated by stormwater runoff during lesser storm events and should only have a moderate effect on this stream. The remaining tributaries were rated low for flushing characteristics due to their relatively small drainage areas and consequently will have a low impact on the receiving streams.

The construction of rock drains and piping around the sediment pond will control current patterns immediately upstream and downstream of the installations. No other impacts are expected and the project is not likely to have a significant effect on current patterns outside of the impact area; therefore, these impacts were rated low.

The encroachment activities along Owens Run will not alter the flushing characteristics or current patterns in this stream.

Groundwater Discharge and Recharge

Groundwater recharge will be reduced by altering the surface drainage at the proposed site; however, stormwater runoff from these areas will be returned to Tributary 32705 after it passes through the sediment pond. Based on the size of the site, no significant impacts to groundwater discharge and recharge are expected in the watershed. Therefore, the



impacts are rated as low for these functions. Proposed encroachment activities along Owens Run are not likely to affect the groundwater discharge and recharge functions of this stream.

Storm and Flood Water Storage and Control

Tributary 32705 was assigned a high rating for these functions due to the presence of numerous moderate size wetlands within the floodplain of this stream. The wetland impacts will affect the flood water storage function; however, the proposed sediment pond will provide floodwater attenuation and storage and will minimize impacts on adjacent properties. The sediment pond will remain in place after reclamation and serve as a permanent stormwater detention pond servicing CRDA No. 5, and portions of reclaimed CRDA No. 1 and No. 3.

The remaining onsite tributaries lacked large stream side wetlands and were rated low for this function; therefore, the impacts to these streams was also rated as low. Owens Run is not likely to experience a change in its storm and floodwater storage and control functions as a result of the proposed encroachment activities.

Preventing Pollution and Natural Water Filtration

Tributaries 32705 and 32705A were assigned a moderate to high ratings for these functions based on the numerous wetlands within the floodplains of onsite streams. Removal of wetland vegetation and soils will likely have a localized effect on the water quality improvement functions provided by these streams; however, the impact will be partially offset by the use of best management practices and the execution of the E&S pollution control plan that will minimize temporary impacts to water quality during construction.

The remaining onsite tributaries lacked numerous stream side wetlands and were rated low for these functions. Therefore, the impact to these stream functions was also rated as low. The encroachment activities along Owens Run are not likely to affect the pollution prevention and natural water filtration capabilities of Owens Run.

Sedimentation Control

Perennial streams in the Tributary 32705 watershed were rated as moderate for sedimentation control because of the presence of wetlands or forested riparian zones. Loss of these habitats will have a moderate impact on sedimentation control; however, this loss will be offset by construction of the sediment pond which is specifically designed to control the release of sediment laden runoff.

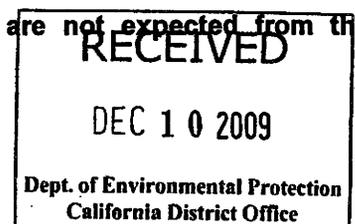
UNT 2 – OR and intermittent streams are currently functioning at a low level for sedimentation control; consequently, impacts to these streams will have a low impact on this function. Significant tree clearing will not be required to install the stormwater culvert along Owens Run; therefore, the anticipated impact is low.

Recreation

The site is not publicly accessible for recreational activities; therefore, development of this area will not affect its recreational value.

Upstream and Downstream Property

Adverse impacts to upstream or downstream properties are not expected from the proposed project.



Other Environmental Factors

Other significant environmental features were not identified during this study.

- ii. Identify all environmental impacts on other adjacent land and water resources associated with the planned encroachment activities.

The potential environmental impacts to adjacent lands and downstream resources were discussed in Module 15.2.o.i. No other environmental impacts are anticipated from the proposed encroachment activities.

- iii. Identify and evaluate the potential cumulative environmental impacts of the proposed activity and other potential or existing similar activities, and the impacts that may result through numerous piecemeal changes to the impacted water resource.

Construction of the sediment pond development area is being initiated in preparation for development of the coal refuse disposal area, located immediately upstream of the sediment pond. This additional area will require impacts to the remaining portions of Tributaries 32705 and 32706 and their unnamed tributaries. Wetlands in the proposed refuse area will also be impacted. The conceptual wetland mitigation plan, presented in Module 15.5 (Wetland Mitigation/Replacement), discusses cumulative impacts associated with development of the Bailey Mine CRDA No. 5 & 6. The proposed mitigation measures are anticipated to offset the loss of functions and values provided by the impacted aquatic resources.

- p. **Alternatives Analysis: Provide a discussion of any alternatives to implementing the encroachment or restoration plan(s).**

Refer to the report entitled, *Bailey Central Mine Complex, Greene County, Pennsylvania, Alternative Analysis & Site Selection Study for New Coal Refuse Disposal Area No. 5*, that was submitted to the PADEP California District Mining Office and was approved on April 21, 2008. This report demonstrates the need for the project and contains information on other potential sites that were evaluated for their use as coal refuse disposal areas.

- q. Where a bridge or culvert is proposed provide the following information:

No bridges or culverts across streams are proposed. Stream base flow will be conveyed to the toe of the disposal area via rock and spring drains constructed along the same approximate alignment as the stream channels. Piping will be used to convey stream base flow from the toe of the disposal area around the sediment pond. This piping will discharge into the existing stream channel downstream of the sediment pond. Refer to the Design Drawings for plans and details of the drains and piping carrying stream base flow, cross sections, and the proposed construction sequence. Refer to the Calculation Brief for calculations demonstrating the capacity of the pipe, rock drain, and spring drains.

- i. Plans and details showing the location, type, size, and height of the structure.
- ii. Calculations showing the hydraulic capacity of the structure.
- iii. A profile of the stream bed for a reasonable distance above and below the proposed location showing normal and flood water surface elevations and backwater effects of the structure.
- iv. Cross sections upstream, downstream, and at the proposed location of the structure showing normal and flood water surface elevations and other topographic features, elevations, etc., necessary for an appraisal of the hazard potential of the structure.
- v. A narrative description of the construction methods and sequence including water handling during construction, and erosion and sedimentation controls.
- vi. Indicate if the structure will be temporary or permanent, (include plans for removal of temporary structures.)

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15.3 Surface Activities Affecting Wetlands

(Note: Provide the name, address, and phone number of person(s) conducting the wetland delineation.)

The wetland delineation was performed by:

**Michael L. Shema, Ecologist/Project Manager
 Laura C. P. Shema, Ecologist/Project Manager
 Civil & Environmental Consultants, Inc.
 333 Baldwin Road
 Pittsburgh, Pennsylvania 15205-9702
 Telephone (412) 429-2324**

- a. Complete Form 15.3A "Wetland Inventory Summary" to provide inventory and classification information on all wetlands which occur on or within the permit area of surface mining activity sites or within stream restoration sites. In completing the form, answer "yes" or "no" to the following questions as they pertain to each wetland.

Twenty four wetlands totaling 1.85 acres were delineated within the permit boundary. Construction of the sedimentation pond development area will directly impact 1.49 acres of these wetlands as illustrated on Exhibit 9.1 and summarized in Table 15.3.a-1. Wetland determination data forms and photographs are provided in Appendix 15.3.

Exceptional Value Wetland Characteristics

- i. Does the wetlands serve as habitat for flora and fauna listed as "threatened" or "endangered" under the Endangered Species Act of 1973, or Wild Resource Conservation Act, Fish and Boat Code, or Game and Wildlife Code? Yes X No

Refer to "Habitat for Endangered and Threatened Plant and Animal Species" in Module 15.2.m.

- ii. Is the wetland hydrologically connected to or located within ½ mile of another wetland that serves as habitat of "threatened" or "endangered" species, and does it serve to maintain the habitat in that wetland? Yes X No

Refer to "Habitat for Endangered and Threatened Plant and Animal Species" in Module 15.2.m.

- iii. Is the wetland located in or along the floodplain of a wild trout stream (as designated by the Pennsylvania Fish and Boat Commission), or the floodplain of a tributary to a wild trout stream? Yes X No

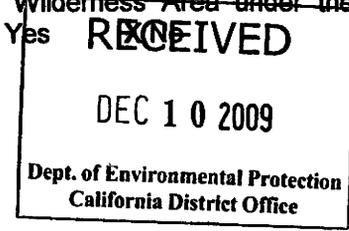
- iv. Is the wetland located in or along the floodplain of a stream listed as exceptional value (under Chapter 93) or the floodplain of a tributary to an exceptional value stream? Yes X No

- v. Is the wetland within the corridor of a waterway, which has been designated as a wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or the PA Scenic Rivers Act? Yes X No

- vi. Is the wetland part of, or located along, an existing public or private drinking water supply and does it maintain the quality or quantity of the drinking water supply? Yes X No

- vii. Is the wetland located in an area designated by the Department as "natural" or "wild" area within state forest, game, or park lands? Yes X No

- viii. Is the wetland located in an area designated as a Federal Wilderness Area under the Wilderness Act or the Federal Eastern Wilderness Act of 1975? Yes



- ix. Is the wetland located in an area designated as a National Natural Landmark by the Secretary of the Interior under the Historic Sites Act of 1935? Yes No

Note: If a "yes" response is indicated for any question in (i) through (ix) above, the wetlands would be "exceptional value" (as defined in 25 PA Code Section 105.17) and a demonstration must be made that the requirements of subsection (a) of 25 PA Code Section 105.18(a) have been met.

Wetland Functions

A qualitative evaluation of the aquatic functions listed in Module 15.3.x through 15.3.xvii was performed for the wetlands within the proposed permit area. This evaluation was based on the physical, hydrological, and biological characteristics of the wetlands and the professional judgment of CEC's lead ecologist for this project. CEC assigned probability ratings of low, moderate, or high to indicate a wetland's ability to perform the specified aquatic functions. These ratings are qualitative and do not attempt to quantify the physical, chemical, or biological attributes of the individual wetlands.

On Form 15.3A, the answer to the following questions was given as "No" for wetlands in functional classes that were rated as "Low" in Table 15.3.a-2. Conversely, the questions on Form 15.3A were answered as "Yes" for wetlands in functional classes rated as "Moderate" or "High" in Table 15.3.a-2.

- x. Does the wetland serve natural biological functions, including food chain production; general habitat; and nesting, spawning, rearing, or resting sites for aquatic or land species?

Yes No

Palustrine Emergent (PEM) and Palustrine Forested (PFO) wetlands greater than 0.1 acre in size function at a moderate to high level for most of the specified functions. These wetlands typically exhibited the following characteristics: supported plants with edible seeds or roots, were surrounded by forest or shrub habitat on greater than 50% of the wetland, and/or were covered by greater than 90% native vegetation. The exception was that suitable spawning habitat (i.e. standing water) was limited to the largest PEM wetland and therefore it was rated as moderate while the other wetlands were rated as low. The smaller (<0.1 acre) riparian wetlands were rated as low for all functions because of their small size and limited ability to serve natural biological functions.

- xi. Does the wetland provide areas for study of the environment, or as sanctuaries or refuges?

Yes No

The wetlands are located on private property with restricted access; therefore, the value of all wetlands for environmental study, sanctuaries, and refuges was rated as low.

- xii. Does the wetland aid in, or maintain natural drainage characteristics, natural water filtration processes, current (flow) patterns, or other environmental characteristics? Yes No

Palustrine Emergent (PEM) and Palustrine Forested (PFO) wetlands greater than 0.1 acre in size function at a moderate to high level for all of the specified functions. The lack of continued disturbance, depressional topography, and moderate size allow these wetlands to slow surface water runoff, stabilize stream banks, store stormwater, and filter significant amounts of water.

In contrast, the small floodplain wetlands were rated low for these functions due to their small size.

- xiii. Does the wetland serve as a storage area for flood and storm waters, or does it shield other areas from erosion or storm damage? Yes No

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Depressional riparian wetlands in the size range between 0.1 and 0.5 acre have the opportunity and ability to retain flood and storm waters and therefore were rated as moderate for this function. The added storage capacity and location, adjacent a second order stream, of the largest riparian wetland was the basis for rating it high for this function. The relatively small size of the remaining riparian wetlands limits their ability to significantly affect the flooding potential of the receiving stream and therefore these wetlands were rated low for flood and storm water control.

- xiv. Does the wetland provide recharge to local streams that maintains minimum baseflow?
 Yes No

CEC has interpreted this function to include wetlands that serve as groundwater recharge points, which may indirectly help to maintain stream baseflow. Generally, wetlands having depressional topography, a restricted outflow, and a greater input than output are considered to be recharge sites. The ability of a wetland to perform these functions is largely dictated by its size and storage capacity. For this reason, small (<0.1 acre) wetlands were rated as low, medium size (0.1-0.5 acre) wetlands were rated as moderate, and large (>0.5 acre) wetlands were rated as high for this function.

- xv. Does the wetland serve as a prime natural discharge area where surface water and groundwater are directly connected? Yes No

CEC has interpreted this function to include wetlands containing groundwater discharge points that release water directly into onsite streams. Generally, floodplain wetlands and some fringe wetlands can be considered sites where surface water and groundwater are connected. Wetlands greater than 0.1 acre were classified as having a moderate ability to perform this function because of the volume of water they release. Wetlands smaller than 0.1 acre were considered to function at a low level for groundwater discharge.

- xvi. Does the wetland aid in the prevention of pollution? Yes No

Vegetative cover and class, residence time, topography, and wetland size all influence a wetland's ability to retain and transform pollutants. Though the larger onsite wetlands have the ability to function at moderate to high levels, they are limited by opportunity due to the lack of chemical and organic pollution sources within the Tributary 32705 watershed. For these reasons a moderate rating was assigned to the larger wetlands and a low rating was assigned to the smaller wetlands.

- xvii. Is the wetland used for, or does it provide the opportunity to be used for recreation?
 Yes No

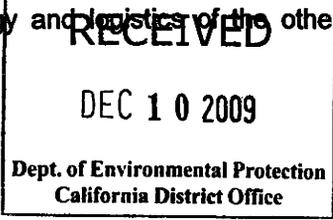
The wetlands are located on private property with restricted access; therefore, the value of all wetlands for recreational opportunities was rated as low.

15.4 Wetland Impact Analysis/Assessment

- a. Describe the alternatives to the proposed surface mining activities or stream restoration activities that have been considered to avoid or minimize impacts on wetlands. An alternative analysis should include alternatives to the proposed surface mining activities, including alternative locations, routings or designs to avoid adverse impacts on the wetlands (i.e. relocating spoil/topsoil storage areas, rerouting haul roads).

Refer to Module 15.2.p.

- b. Discuss whether any of the alternatives considered in 15.4(a) are practical to achieve the basic purposes of the project taking into account availability, cost, technology and logistics of the other possible project sites that would not affect wetlands?



Refer to Module 15.2.p.

c. If any wetlands will be directly affected, provide the following:

i. Identify the wetland and the areal extent of the impact.

Refer to Table 15.3.a-1 for a summary of the areal extent of the impacts.

ii. Submit a cross-sectional view showing the wetland and the proposed disturbed area.

Refer to the Design Drawings provided with this permit application for cross sections.

iii. Explain how the proposed activities will directly affect the hydrology, functions, and values of the wetlands.

(1) If the proposed surface mining activities will affect less than one (1.0) acre of wetland and the wetland is not an exceptional value wetland (in accordance with 25 PA Code Section 105.17), provide a description and probable degree of impact to the wetland functions and values which will be impacted by the proposed mining activities. NOTE: If a "yes" response is indicated for any question in 15.3(a)i) through 15.3(a)ix), the wetlands would be exceptional value (as defined in Section 105.17).

Not applicable.

(2) If the proposed surface mining activities will affect one (1.0) or more acres of wetlands or may affect an exceptional value wetland, provide a detailed assessment of the wetland functions and values identified in 15.3(a)x) through 15.3(a)xvii). Provide extent or degree of impact to each function and value.

Natural Biological Functions

The majority of the larger low gradient riparian wetlands are functioning at moderate to high levels for the natural biological functions listed in 15.3.a.x. Construction of the sediment pond development area will eliminate most of these wetlands and their associated functions, thus it is anticipated that this will have a moderate impact on the local ecosystem. However, the functions provided by these wetlands are not unique resources in a regional context and are unlikely to have a significant impact on plants and animals of the region.

Small riparian wetlands currently function at a low level for the specified natural biological functions; consequently, the impact is anticipated to be low in both a local and region context.

Environmental Study Areas

Sanctuaries or refuges are not located with or adjacent to the proposed site; therefore, impacts to these types of resources will be low.

Hydrology

Creation of the sediment pond development area will eliminate most of the wetlands within the project area and their associated hydrology functions; consequently, the impact is anticipated to be moderate to high for the larger riparian wetlands, but will be relatively low for small riparian wetlands.

Specific functions, such as flood water storage, that are provided by the wetlands will be offset by use of best management practices that are designed to control these conditions. Additionally, water will be collected in the sediment pond and released at a rate that will maintain the flow requirements of downstream receptors.

Water Quality

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Section 15.1-c identifies the BMPs that will be incorporated to control erosion and sedimentation to minimize water quality impacts to Owens Run. Loss of the natural water filtration and pollution prevention functions provided by wetland vegetation and soils may have a moderate impact on water quality in a local context, but is not anticipated to have a significant impact in a regional context.

Recreation

Due to private ownership, the wetlands currently have a low value and opportunity for use in recreational activities, thus the impact to recreational functions will be low.

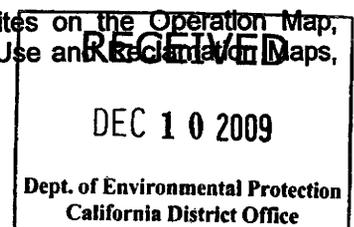
- d. If any wetlands will be indirectly affected by surface mining activities (e.g. altering the wetland hydrology):
- i. Identify the wetland and provide an estimate of the total wetland acreage affected. Describe the functions or values to be impacted and the degree of impact.
Not applicable.
 - ii. Provide a description of how the proposed surface mining activities will indirectly affect the wetland's functions and values.
Not applicable.
- e. Indicate whether the cumulative impact of the proposed and anticipated surface mining activities result in a major impairment of the wetland resource in the general area, provide an explanation of the determination and identify any contacts with state or federal agencies involved in making the determination.

Construction of the sediment pond development area is being initiated in preparation for development of the coal refuse disposal area, located immediately upstream of the sediment pond. This additional area will require impacts to the remaining portions of Tributaries 32705 and 32706, their unnamed tributaries, and associated wetlands. The proposed stream and wetland mitigation plan will replace the wetland acreage directly and is designed to provide wetlands that function at levels equal to or greater than the impacted wetlands.

15.5 Wetland Mitigation/Replacement.

(Sites where less than 0.5 acres of wetland are affected may qualify for mitigation options provided under the Pennsylvania Wetland Replacement Project. Contact the DEP permitting office for details.)

- a. If wetland mitigation measures or wetland replacements are proposed, address the following items:
- i. Identify the wetlands where mitigation measures will be employed, wetlands that will be replaced, and sites where replacement wetlands will be constructed along with the respective area of each.
Exhibit 15.1 shows the location and Table 15.3.a-1 provides acreages of the wetlands that will be replaced. Exhibit 15.5-1 identifies the location of the proposed wetland mitigation area.
 - ii. Provide a plan for mitigation/replacement following the guidelines in the DEP's Technical Guidance Document, "363-0300-001", "Design Criteria for Wetlands Replacement." (This Guidance is available from DEP's Bureau of Water Quality Protection, Post Office Box 8465, Harrisburg, Pennsylvania 17105-8775, (717) 787-6827 or through the Department's web site under Technical Guidance.)
Refer To "Conceptual Wetland Mitigation Plan" provided below.
 - iii. Show all affected wetlands, mitigation areas, and replacement sites on the Operation Map, Exhibit 9.1; and, in addition, show replacement sites on the Land Use and Reclamation Maps, Exhibit 18.1.



The affected wetlands are shown on the Operation Map and the replacement site is shown on Exhibit 15.5-1.

- iv. Provide a comparison of the wetlands functions and values of the current vs. replacement wetland acreage. In the case of mitigation, a comparison of the known wetlands functions and values and degree of impact to each must be compared to the functions and values of the proposed mitigation site when completed. This comparison of "currently existing" to "probable replacement" allows for a basis of the 1:1 replacement ratio.

Section H in the Conceptual Wetland Mitigation Plan provides a comparison of the functions and values of the current vs. replacement wetlands.

Notes: At a minimum, wetland replacement must be at a 1:1 ratio (replacement acres: affected acres), although the Department may require the ratio to exceed 1:1 based on the functions and values of the wetlands to be affected.

Wetland replacement sites will generally not be approved unless the site is located within the same general area as the existing wetland to be replaced.

As discussed with the Department on January 29, 2009, CPCC will fund an Abandoned Mine Discharge (AMD) remediation project located in South Fayette Township, Allegheny County, Pennsylvania. The project is anticipated to address the compensatory mitigation requirements for all stream impacts associated with development of the four phases of the Bailey Mine Coal Refuse Disposal Areas No. 5 & 6. For details on the remediation project, refer to the report entitled, "Presto-Sygan AMD Remediation Project", which is presented in this module as Exhibit A.

CONCEPTUAL WETLAND MITIGATION PLAN

A. PURPOSE

The following sections of this conceptual mitigation plan are intended to address the cumulative wetland impacts associated with development of all four phases of the Bailey Mine Coal Refuse Disposal Areas No. 5 & 6. As such, the acreage of wetland mitigation is more than that which is required for the impacts within the sediment pond development area.

CPCC proposes to offset the loss of wetland functions and values by creating one contiguous wetland complex in the floodplain of Crabapple Creek (Exhibit 15.5-2).

B. SUMMARY OF WETLAND IMPACTS

Construction of the Bailey CRDA No. 5 & 6 will impact ninety-five wetlands, totaling 5.87 acres. Included in this acreage is 5.60 acres of palustrine emergent wetland, 0.01 acre of palustrine emergent/scrub-shrub wetland, and 0.26 acre of palustrine forested wetland. As discussed in Module 15.3, the larger (>0.10 acre) riparian wetlands are functioning at moderate to high levels for most habitat and water quality improvement functions, while the smaller (<0.10 acre) wetlands are functioning at low levels for these same functions. None of the impacted wetlands provide opportunities for recreation or environmental study.

C. PROPOSED MITIGATION RATIOS

CPCC proposes to mitigate for wetland impacts at a ratio of 1:1 (creation acreage to impact acreage). Therefore, a minimum of 5.87 acres of shrub/wet meadow, shallow marsh, intermediate marsh, deep marsh, and mound forest habitat will be created in the wetland mitigation area. The varied planting zones and hydroperiods, coupled with creation of a contiguous wetland complex adjacent a third order stream are anticipated to provide functions and values at least equal to those currently provided by the impacted wetlands.

D. MITIGATION GOALS

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The goal of the wetland mitigation project is to offset the loss of approximately 5.87 acres of wetlands, and their associated ecological functions, by creating a minimum of 5.87 acres of shrub wet meadow, shallow marsh, intermediate marsh, deep marsh, and mound forest habitat.

E. MITIGATION SITE SELECTION PROCESS

The wetland mitigation area was selected because, 1) there was adequate acreage to create one contiguous wetland, 2) hydrologic investigations indicate that the site has sufficient hydrology to support a wetland of this size (see Section G.1), 3) the property is owned by CPCC, 4) the property will be protected by a permanent conservation easement, 5) the site is located within the Wheeling Creek watershed as are the impacts from CRDA No. 5 & 6., and 6) the wetland will provide beneficial functions within the Crabapple Creek and greater Wheeling Creek watersheds

F. EXISTING CONDITIONS AT PROPOSED MITIGATION SITE

The proposed wetland mitigation area is an upland hay field located in the low-gradient floodplain of Crabapple Creek. The site was visited by ecologists Michael L. Shema, Laura C. P. Shema, and Professional Wetland Scientist/ecologist Mark R. Haibach on multiple occasions between 2005 and 2009. Over this five-year period, the wetland mitigation site has been used and maintained as a hayfield that supports a vegetative community dominated by upland species including red fescue (*Festuca rubra*, FACU), orchard grass (*Dactylis glomerata*, FACU), and timothy (*Phleum pratense*, FACU).

Additionally, on March 4, 2009 fourteen (14) soil borings were established throughout the mitigation area in order to set groundwater observation standpipes (location shown on Exhibit 15.5-2). The soil profile at each location was recorded and none of the test sites had hydric soils indicators within 10 inches of ground surface or showed evidence of wetland hydrology. Based on the lack of hydrophytic vegetation, hydric soils, and wetland hydrology no portion of the proposed mitigation area satisfies the criteria of a wetland. Photographs of the proposed wetland mitigation area are located in Appendix 15.5-1.

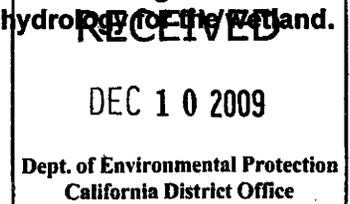
G. WETLAND MITIGATION PLAN

1. Hydrologic Assessment

On March 4, 2009 fourteen (14) groundwater observation standpipes were installed within the limits of the proposed mitigation area to monitor groundwater elevation. The standpipes were positioned in a grid pattern, so that the groundwater surface could be modeled in planes parallel and perpendicular to Crabapple Creek. Locations of the standpipes are shown on Exhibit 15.5-2,

The groundwater elevations in the standpipes were monitored automatically using water level pressure sensors that have an accuracy of 0.5 cm. One pressure sensor was installed in each standpipe and logged the water level hourly. The pressure sensors yielded accurate data at more frequent intervals than could be accomplished by monitoring the groundwater manually. The data collection period extended from March 2009 through September 2009.

The groundwater data was analyzed for the period from May 15, 2009 through September 12, 2009 since this represents the majority of the growing season. This data was used to generate groundwater contour maps of the maximum, minimum, and average groundwater surfaces. The profiles and cross-sections provided on Exhibit 15.5-2 and 15.5-3 show the different groundwater surfaces in relation to the proposed finished grades of the wetlands. The base elevations in each wetland cell were determined using the minimum groundwater elevations, which are anticipated to provide a continuous source of hydrology for the wetland.



Supplemental sources of wetland hydrology will be provided by designing wetland inlet structures along Crabapple Creek and Tributary 32522 to Crabapple Creek that will allow stream water to enter the wetland when the stream reaches bankfull elevations. Retention of precipitation and overland sheetflow will also augment hydrology during wet periods of the year.

Water surface elevations will be controlled at a single point within each wetland cell using inline water level control structures (See Appendix 15.5-1). The structures will provide operational flexibility during start up of the wetland plant community. Specifically water levels will be staged up incrementally to allow seed mixes and rooted aquatic vegetation to get established before water levels reach their final elevation. Once the wetland topography, hydrology, and plant communities are functioning as designed, the structures will be removed and a permanent berm will be constructed at the appropriate elevation.

Water surface elevations within the wetlands will also be monitored throughout the year by installing water level pressure sensors within each of the four wetland cells. This will provide critical information on the wetland hydrology during periods when no one is on site.

2. Site Grading and Wetland Topography

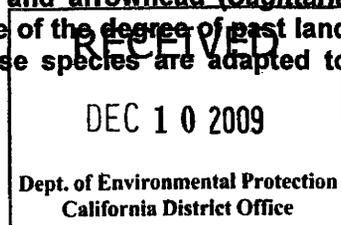
The goal of the mitigation plan is to offset the loss of 5.87 acres of wetlands by creating a minimum of 5.87 acres of replacement wetlands. The wetland mitigation area will be designed to create diverse wetland habitats including shrub/wet meadow, shallow marsh, intermediate marsh, deep marsh, and mound forests (Exhibit 15.5-2). The wetland topography will be created by excavating the cells to the base elevations then grading mounds and depressions within each cell. CPCC is offering to establish a wooded upland buffer around the wetland mitigation area to improve the functionality of the site even though wetland credit is not being assigned for the additional effort and expense. The following table provides a comparison of the anticipated hydrologic range and acreage of each habitat type:

Habitat Type	Anticipated Grade Above Base Elevation (feet)	Anticipated Acreage
Shrub/Wet Meadow	+0.5 to 0	0.60
Shallow Marsh	0 to -1.0	3.70
Intermediate Marsh	-1.0 to -2.0	1.50
Deep Marsh	-2.0 to -2.5	0.50
Mound Forest	+0.5 to +1.5	0.30
Total		6.60

The wetland grading along the north embankment adjacent to Braddock Run Road has been designed with a 3:1 slope to minimize potential slippage from the wetland excavation. The grading plan may need to be further refined following a geotechnical evaluation of the stability of the graded slope. Excess cut material will be permanently disposed in non-wetland, non-floodplain sites on adjacent property owned by CPCC.

3. Wetland Vegetation

The wetland planting plan is designed to increase local and regional biodiversity by including plant species native to, but relatively uncommon in many wetlands in southwestern Pennsylvania. For example, the intermediate marsh community will include pickerelweed (*Pontederia cordata*) and arrowhead (*Sagittaria latifolia*), both of which are uncommon plants in local wetlands, possibly because of the degree of past land disturbance to natural communities from historic agricultural land uses. These species are adapted to



permanent hydroperiods and wet-season water levels ranging from 1-2 feet as described by Thunhorst in *Wetland Planting Guide for the Northeastern United States* (1993).

Diverse shallow marsh and wet meadow seed mixes will be used to establish herbaceous vegetation in these wetland plant communities. A variety of wetland shrubs will be planted to establish woody vegetation. Proposed shrub plantings include buttonbush (*Cepalanthus occidentalis*), silky dogwood (*Cornus amomum*), winterberry (*Ilex verticellata*), and willows (*Salix interior*, *S. sericea*). Refer to Detail 4A and 4B on Exhibit 15.5-5 for a list of plant species, densities, and quantities proposed within each habitat type.

The wetland mitigation area will be designed to meet or exceed the wetland functions and values provided by the existing wetlands in the Bailey CRDA No. 5 & 6. The depressional topography and vegetative interspersion will provide a more diverse habitat for flora and fauna and will provide equal or greater water quality and floodwater attenuation functions compared with the wetlands proposed for impacts.

H. FUNCTIONS AND VALUES OF IMPACTED WETLANDS COMPARED TO THE PROPOSED MITIGATION AREA

Wetlands that are proposed for impacts are currently functioning at a wide range of levels for hydrology and water quality functions, including natural drainage patterns, groundwater discharge, floodwater storage and control, pollution prevention, sediment control, and natural water filtration. Impacts to existing wetlands resulting from construction of the Bailey CRDA No. 5 & 6 will total 5.87 acres. A minimum of 5.87 acres of wetland and upland buffer will be created or restored to offset these impacts. The wetland mitigation area is located adjacent to Crabapple Creek and is designed, at a minimum, to replace the functions and values lost as a result of this project, as described below.

As a contiguous wetland complex located adjacent to a third order stream, the replacement wetlands will provide moderate to high quality habitat for numerous wildlife species. The woody wetland vegetation will provide nesting and resting habitat for birds and other aquatic and terrestrial wildlife species. The replacement wetlands are designed as a series of depressional basins of varying depths, which will also serve as vernal pools with hydroperiods ranging from seasonal to semi-permanent. The range of hydroperiods will provide a hydrologic buffer for breeding amphibians and aquatic insect reproduction during extremely wet and dry years and seasons. The deep marsh habitat will be planted with rooted aquatic vegetation that will provide cover for reptile and amphibian species that are likely to use the marsh for spawning and rearing. The target plant species for the mitigation wetlands were also selected for their food value for wildlife species, including seed and fruit bearing plants.

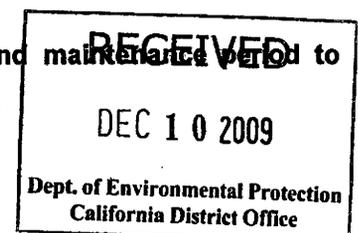
The depressional topography of the created wetlands will help to maintain natural drainage characteristics, current flow patterns, and will provide storage for floodwaters by intercepting and storing stormwater run-off and overbank flows, thereby desynchronizing peak flows and reducing erosive flows in Crabapple Creek.

The grading of the proposed wetland mitigation area will be such that it is anticipated that the groundwater will be expressed in the wetlands and gradually discharged to Crabapple Creek thereby providing a direct connection between groundwater and surface water and helping to maintain minimum baseflow in Crabapple Creek.

Constructed wetlands will provide high levels of pollution prevention by means of trapping sediment and transforming pollutants as they come in contact with the vegetation, wetland soils, and exposed root mats. The depressional topography of the wetland basins will serve to increase the residence time that runoff and floodwater remains in contact with the wetland soils, microbial community, and vegetation, thereby increasing reaction times for physical, chemical, and biological pollution removal mechanisms. Overall, the benefits of having a large, well vegetated wetland complex located in the floodplain of a third order stream will provide higher levels of functions compared with those provided by numerous small wetlands.

I. WETLAND MITIGATION SUCCESS CRITERIA

The following parameters will be evaluated during the five-year monitoring and maintenance period to determine the success of the wetland mitigation area:



- The proposed mitigation will provide a minimum of 5.87 acres of habitat replacement, which will include shrub/wet meadow, shallow marsh, intermediate marsh, deep marsh, and mound forest habitats.
- The wetland mitigation areas will be planted with appropriate plant species (see tables on Exhibit 15.5-5), so that greater than 50% of the dominant plant species in the wetland mitigation area will be classified as obligate, facultative wetland, or facultative, according to Reed (1988), and will comprise greater than 85% areal vegetative cover.
- Planted woody vegetation in the wetland habitats will have a minimum 70% survival rate and will show a positive increase in height at the end of each year of monitoring during the five-year monitoring and maintenance period. Height will be measured on a minimum of 20% of the planted woody vegetation.

J. ACTIVITIES REQUIRING CHAPTER 105 AUTHORIZATION

The following table summarizes the Chapter 105 encroachment activities that are associated with construction of the wetland mitigation area. None of the activities will result in direct impact to Crabapple Creek or Tributary 32522 to Crabapple Creek; however, they are within 50-feet of the stream banks.

Activity	Stream Affected	Length of Encroachment (linear feet)
Wetland Grading	Crabapple Creek	1,167
Wetland Inlet	Crabapple Creek	22
Wetland Outlet	Crabapple Creek	35
Wetland Grading	Tributary 32522 to Crabapple Creek	156
Wetland Inlet	Tributary 32522 to Crabapple Creek	35

CPCC request that the Department authorize these activities as part of the Coal Mining Activities Permit, in order to facilitate the timely construction of the wetland mitigation area.

K. IMPLEMENTATION SCHEDULE FOR MITIGATION ACTIVITIES

CPCC proposes to begin the wetland mitigation activities concurrent with development of the CRDA No. 5 Sediment Pond and the associated wetland impacts. CPCC also proposes to construct the entire mitigation area at the same time; therefore, mitigation activities for future phases of the project will occur in advance of the impacts. Specific timeframes are dependent on receipt of permits and agency approvals from the PADEP and U.S. Army Corps of Engineers; however, the following construction and monitoring schedule is envisioned for the project, once that all necessary permits are issued:

- Year 1: Install erosion controls, perform mass grading of site, construct internal berms, install water level control structures, and seed.
- Fall of Year 2: Evaluate hydrologic conditions, fine tune grading to match hydrologic conditions (if necessary), plant shrubs and bare root material in wetland mitigation area, and conduct as-built survey.
- Spring of Year 3: Verify success criteria and conduct first monitoring inspection.

Trees and shrubs should be planted in the fall (September 15 to November 15) or spring (April 15 to May 15). Seed mixtures should be sown in the fall (October through November) or early spring (April). Within 24 hours following seeding, weed-free straw mulch will be placed in those areas not inundated with water.

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A temporary seed mixture will be used to stabilize the mitigation site if the construction sequence is delayed more than 30 days between grading and seeding. Temporary seed specifications for both spring and fall seasons are identified in Detail 4A on Exhibit 15.5-5.

L. WETLAND MITIGATION PERFORMANCE MONITORING

The wetland mitigation area will be monitored twice yearly for the first three years in order to determine the success of both early and late season vegetation. Two additional years of annual monitoring will be conducted toward the end of the growing season. All monitoring will be performed by a qualified wetland scientist. Monitoring reports will be submitted annually along with a plan for any corrective action or remedial measures that may be required to meet the wetland mitigation goals and success criteria.

Prior to initiating the monitoring program, permanent photo stations will be established within each wetland cell in the mitigation area. Specifically, each report will include the following information:

1. Photographs taken from the permanently established locations - (180 degree panoramas).
2. Water depths and estimates of hydroperiod based on data collected from water level pressure sensors installed in each wetland cell.
3. Plant taxa and their relative abundance within herbaceous and woody categories in all wetland plant communities.
4. Approximate percent aerial coverage by the dominant plant taxa within each wetland plant community.
5. An assessment of the growth of 20 percent of randomly selected permanently marked woody plants within the wetland mitigation area (upland buffer plantings will not be monitored).
6. The presence and relative abundance of invasive or exotic vegetation, and recommendations for any corrective action.
7. Discussion of wetland functions being provided.
8. Observations of wildlife usage.

M. EROSION AND SEDIMENTATION CONTROL

CPCC will employ erosion and sedimentation control best management practices during construction of the wetland mitigation area.

15.6 *Underground Mining Stream Impact Evaluation / Restoration*

Under certain conditions, surface restoration activities may be necessary to avoid impacts to water uses and rectify subsidence-related effects of underground mining beneath streams. These plans typically include Chapter 105 in-stream encroachment activities. Where impact predictions under Module 8.9 and 8.10 indicate the need to perform surface restoration activities, provide the following information. Provide a separate Module 15.6 for each named stream. Unnamed tributaries to named streams may be included in the same Module 15.6 as the named stream.

Not applicable, since project is a surface facility.

Note: Where information is required to be shown on Exhibit 6.3, a separate Exhibit 15.6, "Plan Map" of appropriate scale and equivalent information may be substituted.

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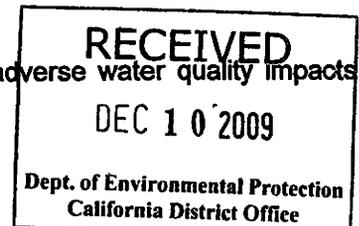
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a. Types of Impacts.

Provide the name and location of each impacted stream and describe predicted or anticipated impacts to the streams due to undermining. Describe potential restoration measures and the general areas in which they may be used, including pooled stream restoration, stream dewatering restoration, and minor stream restoration.

b. Pooled Stream Flow Evaluation / Restoration.

- i. Provide pre-mining stream profiles showing the extents of all riffles, pools, glides and runs. Profiles must be developed from survey information accurate within ± 1.0 foot. Submit profiles scaled at a minimum: horizontal 1" = 50' and vertical 1" = 10'. Key the stream stationing to the Environmental Resource Map, Exhibit 6.3. Identify the profiles as "Exhibit 15.6(b)ii – Stream Profiles".
- ii. Provide subsidence prediction information, including all documentation and calculations from subsidence prediction models. Show the post-mining stream profiles on Exhibit 15.6(b)ii).
- iii. Provide an analysis and description of the extent of post-mining pooled areas based on a comparison of pre-mining and post-mining profiles. Show the post-mining pooled areas on the Environmental Resource Map, Exhibit 6.3, and Exhibit 15.6(b)ii).
- iv. Provide a general description of restoration measures if the analysis in Module 15.6(b)iv) indicates pool depths will increase by less than 1.0 foot.
- v. Provide a plan for mitigating the effects of mining induced pooling if the analysis in Module 15.6(b)iv) indicates pool depths will increase by 1.0 foot or more. The plan should be designed to address mining induced changes before they rise to the level of adverse effects and, where practical, should include measures to enhance aquatic and terrestrial habitat. The plan must include the following:
 - (1) A post-mining evaluation plan, in accordance with Technical Guidance Document "563-2000-655".
 - (2) A description of the proposed restoration activities and the time frame in which the activities will occur. Describe the effect of the restoration activities on public health and safety.
 - (3) The location of proposed restoration areas. Show the extents of restoration areas on the Environmental Resource Map, Exhibit 6.3.
 - (4) Photographs of pre-mining stream conditions along the restoration area. Reference the photograph locations on the Environmental Resource Map, Exhibit 6.3.
 - (5) Post-restoration stream profiles; include on Exhibit 15.6(b)ii).
 - (6) Stream cross-section(s) at minimum 100-foot intervals along the restoration area. The cross-section(s) must be at a scale of 1" = 10' or larger. Key the cross-section(s) to the stationing on the Environmental Resource Map, Exhibit 6.3.
 - (7) An erosion and sedimentation control plan for the restoration activities that includes: a description of the activities, structures, best management practices, water handling plans, construction typicals, and implementation methods that will be utilized throughout all phases of the restoration.
 - (8) A reclamation plan for areas disturbed by restoration activities, including: regrading, revegetation, and environmental enhancement. Include plans for riparian area plantings.
 - (9) Depict wetland boundaries on the Environmental Resource Map, Exhibit 6.3 within the limits of the restoration project in accordance with Technical Guidance Document "563-2000-655". Provide a schedule and procedure for the submission of Module Items 15.3, 15.4, and 15.5 before restoration work commences.
 - (10) A description of the measures that will be used to prevent adverse water quality impacts during restoration activities.



- (11) A plan for evaluating the success of the restoration. At a minimum, the plan should provide for biological sampling to document that the macroinvertebrate community has recovered to its pre-mining condition, and substrate evaluations (e.g., Wolman Pebble Counts) to document that the substrate is not being blanketed by fine sediment.

c. Stream Dewatering Restoration.

- i. Where mining plans have the potential to cause mining induced flow loss, but do not pose a high probability of causing flow loss, provide a mitigation plan describing all aspects of restoration work needed to restore stream flow to the normal range of conditions. (NOTE: Should mining induced flow loss occur, site-specific plans, including required information in 15.6(c)ii) and 15.6(d), must be submitted and approved before restoration work commences.)
- ii. Where mining plans are predicted to result in mining induced flow loss in specific areas and Chapter 105 activities are proposed to restore flow, provide the following:
- (1) A description of the proposed restoration activities and the time frame in which the activities will occur.
 - (2) A description of the effect of restoration activities on public health and safety.
 - (3) A description of the location of specific areas predicted for stream dewatering. Show the extents of predicted dewatering areas on the Environmental Resource Map, Exhibit 6.3.
 - (4) All necessary supporting data (calculations, manufacturer's specifications, typical drawings, etc.) for the proposed restoration measures.
 - (5) Pre and post-mining, and post-restoration stream profiles (if not submitted in Section 15.6(b)(ii)). Profiles must be developed from survey information accurate within ± 1.0 foot. Submit profiles scaled at a minimum: horizontal 1" = 50' and vertical 1" = 10'. Key stream stationing to the Environmental Resource Map, Exhibit 6.3. Identify the profiles as "Exhibit 15.6(c)(ii)(6) – Stream Profiles."
 - (6) Photographs of pre-mining stream conditions along the restoration area. Reference the locations of the photographs on the Environmental Resource Map, Exhibit 6.3.
 - (7) Stream cross-sections at minimum 100-foot intervals along the restoration area. Indicate the limits of stream channel disturbance. Cross-section scale must be at a scale of 1" = 10' or larger. Key the cross-sections to stream stationing on the Environmental Resource Map, Exhibit 6.3.
 - (8) An erosion and sedimentation control plan for the restoration site that includes: a description of the activities, structures, best management practices, water handling plans, construction typicals and implementation methods that will be utilized throughout all phases of the restoration.
 - (9) A reclamation plan for areas disturbed by restoration activities, including: regrading, revegetation, and environmental enhancement. Include plans for riparian area plantings.
 - (10) Depict wetland boundaries on the Environmental Resource Map, Exhibit 6.3 within the limits of the restoration project in accordance with Technical Guidance Document 563-2000-655. Provide a schedule and procedure for the submission of Modules Items 15.3, 15.4, and 15.5 before restoration work commences.
 - (11) A description of the measures that will be used to prevent adverse water quality impacts *during* restoration activities.

d. Chapter 105 Requirements for Pooled Stream Flow Restoration and Stream Dewatering Restoration should include the following information:

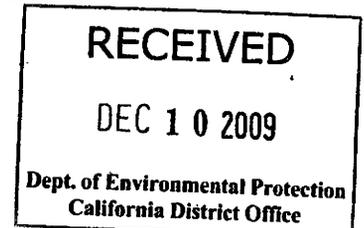
- i. Verification that the public notification required in Module 2 was completed.

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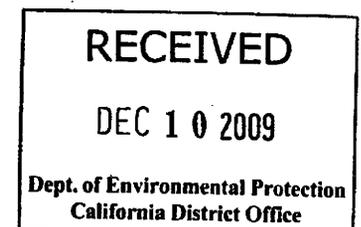
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- ii. A characterization of the resident aquatic community, a description of the riparian vegetation and an assessment of the probable hydrologic consequences of the proposed activities on the water quality and quantity, and the resident aquatic communities.
- iii. The name(s), address(es), and telephone number(s) of the individual(s) responsible for the collection and analysis of this data and provide a description of the methodologies used to collect and analyze the data.
- iv. A hydrologic and hydraulic analysis which includes:
 - (1) Data on size, shape and characteristics of the watershed;
 - (2) The size and frequency of the design storm;
 - (3) The hydraulic capacity of the proposed replacement channel;
 - (4) The hydraulic capacity of the stream channel upstream and downstream of the proposed relocation or channel change.
- v. **Stormwater Analysis:** If a stormwater management plan has been prepared or adopted under the Stormwater Management Act, an analysis of the project's impact on the Stormwater Management Plan and a letter from the county or municipality commenting on the analysis.
- vi. **Floodplain Management Analysis:** If the proposed restoration project is located within a floodway delineated on a FEMA map, include an analysis of the project's impact on the floodway delineation and water surface profiles and a letter from the municipality commenting on the analysis.
- vii. **Risk Assessment:** If the stormwater or the floodplain management analysis conducted in 15.6(d) or 15.6(d)4 indicates increases in peak rates of runoff or flood elevations, include a description of property or land uses that may be affected and an analysis of the degree of increased risk to life, property and the environment.
- viii. Provide verification that landowner's consent and permission have been obtained to conduct activities on private property.
- ix. **Resource Characterization:** For each stream or stream segment identified in module 15.6(a), provide the following pre-mining water resource information:
 - (1) Is the water resource stocked by the Pa. Fish and Boat Commission? Yes No
 - (2) Is the water resource designated as a Natural Wild or Scenic River or as part of the Commonwealth's Scenic Rivers System? Yes No
 - (3) **Habitat Assessment:** Provide a written narrative discussing the following ecological functions; food chain production, general habitat (nesting, spawning, rearing, resting, migration, feeding, escape cover), threatened and endangered species habitat (include PNDI search results), environmental study areas (sanctuaries, refuges).
 - (4) **Water Quantity and Streamflow:** Provide a written narrative discussing the following: natural drainage patterns, flushing characteristics, current patterns, groundwater discharge for baseflow, natural recharge areas for groundwater and surface water, storm and floodwater storage and control.
 - (5) **Water Quality:** Provide a written narrative discussing the following: preventing pollution, sedimentation control, and natural water filtration.
 - (6) **Recreation:** Provide a written narrative discussing the following: game species, non-game species, fishing, hiking, observation (plant/wildlife), or other recreational attributes.
 - (7) Describe upstream and downstream property uses.
 - (8) Other environmental factors determined by site investigation.



- x. Provide a discussion of the proposed activity's impacts on: national, state or local parks, forests or recreation areas, natural or wilderness areas, national, state, or local historic sites, national natural landmarks, national wildlife refuges, cultural or archaeological landmarks, state game lands, federal, state, local or private plant or wildlife sanctuaries, and prime farmland.
 - xi. Environmental Impacts: Provide the following information regarding environmental impacts:
 - (1) Include a discussion of the proposed activity's impacts to water resource characteristics listed in paragraph ix, above.
 - (2) Identify all environmental impacts on other adjacent land and water resources associated with the planned encroachment activities.
 - (3) Identify and evaluate the potential cumulative environmental impacts of the proposed activity and other potential or existing similar activities, and the impacts that may result through numerous piecemeal changes to the impacted water resource.
 - xii. Alternatives Analysis: Provide a discussion of any alternatives to implementing the encroachment or restoration plan(s).
- e. Minor stream restoration activities should include the following information:
- (Note: Minor stream restoration activities could include: streambed deformation restoration, streambed sealing, streambed grouting, stream channel enhancement structures, etc.)
- i. A post-mining evaluation procedure for the proposed restoration activities.
 - ii. A description of the location of the streambed restoration area(s) (if known). Show the restoration areas on the Environmental Resource Map, Exhibit 6.3.
 - iii. Restoration plans that should include the following information:
 - (1) A general description of the proposed restoration activities and the time frame in which the activities will occur. Describe the effect of the restoration activities on public health and safety.
 - (2) A general cross-section of the restoration area.
 - (3) An erosion and sedimentation control plan for the restoration activities that includes: a description of the activities, structures, best management practices, water handling plans, construction typicals and implementation methods that will be utilized throughout all phases of the restoration.
 - (4) A reclamation plan for areas disturbed by restoration activities, including: regrading, revegetation, and environmental enhancement. Include plans for riparian area plantings.
 - (5) A description of the measures that will be used to prevent adverse water quality impacts *during* restoration activities.
 - (6) A post-mitigation Stream Delineation and Bioassessment Summary (Form 8.8B), a Quantitative Multi-Habitat Bioassessment of Diverse Community (Form 8.8C), and a Biometric and Total Biological Score Summary (Form 8.8D), must be submitted to evaluate all areas requiring minor stream restoration.



FORM 15.3A - WETLAND INVENTORY SUMMARY

Operator: Consol Pennsylvania Coal Company LLC

Permit No.: TBD

Operation Name: Coal Refuse Disposal Area No. 5 Sediment Pond Development

Date: Sept 5, 2008

Surface Site I.D.	Wetland I.D.	Acreage	Provide a positive (Y) or negative response (N) to each question under 15.3 (a) as it applies to each wetland. (Column numbers correspond to question numbers).																		
			i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv	xvi	xvii		
	Wetland 1	0.132	N	N	N	N	N	N	N	N	N	N	Y	N	Y	Y	Y	Y	Y	N	
	Wetland 2	0.109	N	N	N	N	N	N	N	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	N
	Wetland 3	0.041	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 3A	0.033	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 3B	0.009	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 4	0.028	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 5	0.013	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 5A	0.011	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 5B	0.039	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 5C	0.034	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 6	0.099	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 6A	0.069	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 7	0.033	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 7A	0.006	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 7B	0.015	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 7C	0.009	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Wetland 8	0.288	N	N	N	N	N	N	N	N	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y

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TABLE 15.1.a
Streams Within 100 Feet of Surface Activities
Bailey CRDA No. 5 Sediment Pond Development Area
Richhill Township, Greene County, Pennsylvania
Consol Pennsylvania Coal Company LLC
CEC Project 071-522
Revised 12-9-09

Streams	Watershed Area (Acres)	Stream Classification			Total Stream Length within 100 feet of Surface Activities (linear feet)	Total Disturbed Stream Length (linear feet)	Disturbed Stream Acreage
		Biologically Diverse Perennial Stream Length (linear feet)	Biologically Variable Perennial Stream Length (linear feet)	Intermittent Stream Length (linear feet)			
Tributary 32705	481	3,303	0	0	3,303	3,028	0.910
Tributary 32705A	3	165	0	0	165	165	0.009
Tributary 32705B	1	0	43	0	43	43	0.002
Tributary 32705C	31	0	1,222	0	1,222	1,222	0.070
Tributary 32705C-1	2	0	0	240	240	240	0.014
Tributary 32705C-2	3	0	0	132	132	132	0.004
Tributary 32705C-3	2	0	0	283	283	283	0.008
Tributary 32705C-4	2	0	0	105	105	105	0.004
Tributary 32705C-5	5	0	0	182	182	182	0.008
Tributary 32705E	3	0	66	0	66	0	0.000
Tributary 32706	110	0	492	0	492	364	0.068
UNT 2 -OR	6	0	288	0	288	288	0.013
Owens Run	1,014	1,091	0	0	1,091	0	0.000
Total		4,559	2,111	942	7,612	6,052	1.11

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TABLE 15.2.m
Stream Ecological Function Assessment
Bailey CRDA No. 5 Sediment Pond Development Area
Richhill Township, Greene County, Pennsylvania
Consol Pennsylvania Coal Company, LLC
CEC Project 071-522
Revised 12-9-09

CHARACTERISTICS AND FUNCTIONS	Streams within Permit Boundary				
	Tributary 32705	Tributary 32705A	Tributaries 32705B, 32705C, 32705E, and 32706*	UNT 2 - OR	Tributaries 32705C-1, 32705C-2, 32705C-3, 32705C-4, and 32705C-5
CHAPTER 89.5 STREAM CLASSIFICATION	Perennial	Perennial	Perennial	Perennial	Intermittent
BIOLOGICAL CLASSIFICATION	Diverse	Diverse	Variable	Variable	N/A
WATERSHED ACREAGE	481	3	1-110	6	2-5
SURROUNDING LAND USE	Forest	Forest	Forest	Residential	Forest
HABITAT FUNCTIONS					
Food Chain Production	H	M	L	L	L
Nesting	H	H	H	L	L
Spawning	M	L	L	L	L
Rearing	M	L	L	L	L
Migration	M	M	M	L	L
Feeding	M	M	L	L	L
Resting	M	M	M	L	L
Escape Cover	M	M	M	L	L
Habitat for Threatened and Endangered Species	M	M	L	L	L
Environmental Study Areas (Sanctuaries and Refuges)	L	L	L	L	L
WATER QUANTITY AND STREAMFLOW FUNCTIONS					
Natural Drainage Patterns	M	M	M	L	M
Flushing Characteristics	M	L	L/M*	L	L
Current Patterns	M	L	L/M*	L	L
Groundwater Discharge for Baseflow	M	M	L/M*	L	L
Natural Recharge Area for Ground and Surface Waters	M	L	L/M*	L	L
Storm and Floodwater Storage and Control	H	L	L	L	L
WATER QUALITY FUNCTIONS					
Preventing Pollution	M	M	L	L	L
Natural Water Filtration	M	M	L	L	L
Sedimentation Control and Patterns	M	M	M	L	L
RECREATION FUNCTIONS					
Game Species	L	L	L	L	L
Non Game Species	L	L	L	L	L
Fishing	L	L	L	L	L
Hiking	L	L	L	L	L
Observation (plant/wildlife)	L	L	L	L	L

L = Low: Indicates that resource is ranked as having a low ability to provide the specified ecological function.
M = Moderate: Indicates that resource is ranked as having a moderate ability to provide the specified ecological function.
H = High: Indicates that resource is ranked as having a high or optimal ability to provide the specified ecological function.

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Insert into:

APPENDIX 15.2 - A

STREAM CLASSIFICATION DATA FORMS AND PHOTOGRAPHS

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STREAM DETERMINATION FIELD DATA FORM

Stream: 32705	Project No.: 071-522.0001
Sampling Location: 32705 (1)	Date/Time: 1-9-08
Coordinates:	Investigator(s): MLS, LCS GPS Unit: GeoXH9 Camera: D
Current Weather Conditions: cloudy, 50°, no precip.	Weather Conditions Past 48 Hours: some rain, 70°

Stream Hydrology:	Hydrology Source(s) (check all that apply):	Channel Conditions:	Substrate Type(s) (check all that apply):
Estimated Flow = 300 gpm	Spring <input checked="" type="checkbox"/>	Active Width (ft) 12-15	Bedrock <input checked="" type="checkbox"/>
Wetted Width = 10-12 ft	Seep <input checked="" type="checkbox"/>	Bed & Banks <input checked="" type="checkbox"/>	Sand <input checked="" type="checkbox"/>
Water Depth = 4-12 in	Run-off <input checked="" type="checkbox"/>	Alluvial Channel <input checked="" type="checkbox"/>	Silt <input checked="" type="checkbox"/>
	Pond <input type="checkbox"/>	Eroded Channel <input type="checkbox"/>	Clay <input type="checkbox"/>
		Debris-filled <input type="checkbox"/>	Artificial <input type="checkbox"/>
		Terrestrial Vegetation <input type="checkbox"/>	

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Subvoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameloidae	U		✓				Dytiscidae	B, U					
Baetidae	M, B, U						Euridae	U, S					
Caenidae	M, B, U						Psocoptera	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Haplagenidae	B, U		✓				Corydalidae	U, S	✓				
Isonychidae	B						Stelidae	U, S	✓				
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Psephenidae (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U			✓			Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Ampipoda (scuds)	M					
Leuctidae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudina (leeches)	U					
Petropodidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlidae (2 genera)	U			✓			Gastropoda (snails)	U, S	✓				
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U	✓				
Hydropsychidae	B, U, S			✓			Unionidae	U					
Limnephilidae	U, S												
Phlebotamidae	B, U												
Phyaophtidae	U, S			✓									
Venidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		✓										
Simuliidae	M, U												
Tipulidae (2 genera)	B, U, S		✓										
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sampling Pt. 32705 (1)	32705 (1)	3	4
USACE Classification:	Perennial	Intermittent	Ephemeral
RIPARIAN Classification:	Biologically Diverse	Biologically Variable	Upland

Notes (include narrative description of sampling location):
 Sampling reach ~ 200' US from start of assessment (just ~ 40' ds of small bedrock waterfall)

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STREAM DETERMINATION FIELD DATA FORM

Stream: 32705A	Project No.: 071-522.0001
Sampling Location: 32705 ALI	Date/Time: 1-9-08 9:50 AM
Coordinates:	Investigator(s): MLS, LCPs GPS Unit: Geo X119 Camera: D
Current Weather Conditions: cloudy, 50°	Weather Conditions Past 48 Hours: rain (some), 70°

Stream Hydrology:

Estimated Flow = **15-20** gpm
 Wetted Width = **1-2** ft
 Water Depth = **2-3** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **2-3**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Mollusca, B-Bivalvia, U-Unionida, S-Semioptera):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Beetidae	M, B, U		✓				Elmidae	U, S					
Chironomidae	M, B, U						Psocoptera	U, S					
Ephemeroptera	U, S						Megaloptera (dobsonflies, dobsonflies)						
Trichoptera	B, U						Corydidae	U, S	✓				
Isopoda	B						Sialidae	U, S					
Lepidoptera	U, S	✓					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroporidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S	✓					Isopoda (aquatic sowbugs)	M					
Hemiptera	U, S		✓				Strudinea (leeches)	U					
Pelliponidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Portidae	U, S						Oligochaeta (segmented worms)	B, U, S	✓				
Taeniopterygidae	U						Decapoda (crayfish)	U					
Parotidae	U		✓				Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Gigascorinidae	B, U						Siphonura	M, B, U					
Hydropsychidae	B, U, S		✓				Urolophidae	U					
Limnephilidae	U, S												
Phlebotomidae	B, U												
Phygadeuonidae	U, S			✓									
Urolophidae	U, S												
Diptera (true flies)							Vertebrates						
Chironomidae	M, B, U			✓			Larval salamander	✓					
Simuliidae	M, U			✓									
Tipulidae	B, U, S		✓										
Tubificidae	U	✓											

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sampling Reach	32705A/DIV	7	8

RCAE Classification: Perennial Intermittent Ephemeral

RDFP Classification: Biologically Dynamic Biologically Stable Upland

Notes (include narrative description of sampling location):
 - sampling location 100' us from start of assessment
 - end of assessment at loss of flow and channel @ spring house
 - start assessment @ confluence w/ 32705

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STREAM DETERMINATION FIELD DATA FORM

Stream: 32705B	Project No.: 071-522.0001
Sampling Location: 32705B(1)	Date/Time: 1-9-08
Coordinates:	Investigator(s): MLS, LRS GPS Unit: GeoXH9 Camera: D
Current Weather Conditions: cloudy, 55°	Weather Conditions Past 48 Hours: Some rain 70°

Stream Hydrology:

Estimated Flow = 1 gpm
 Wetted Width = 1-2 ft
 Water Depth = 0-1 in

Hydrology Sources (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-3
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Types (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (A-Aquatic, B-Benthic, U-Unevaluated, S-Sensitive)

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-20)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-20)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Cenocidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megaloptera (dobsonflies)						
Haplodentidae	B, U						Corydalidae	U, S					
Isonychidae	B						Salidae	U, S					
Leptophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Limnephilidae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Tardigrada (tardigrades)	U					
Perlidae	S	<input checked="" type="checkbox"/>					Platyhelminthes (flatworms)	M, B, U, S	<input checked="" type="checkbox"/>				
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Limnoria	U					
Limnephilidae	U, S												
Phlebotomidae	B, U												
Phlebotomidae	U, S		<input checked="" type="checkbox"/>										
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												
							Vertebrates						

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sampling Reach 32705B Sta 11		11	12

USACE Classification: Perennial Intermittent Ephemeral

PADEP Classification: Biologically Diverse Biologically Variable Upland

Notes (include narrative description of sampling location):
 *sampled by visual inspection of substrate throughout reach
 -start assessment @ wetland boundary
 -end assessment @ loss of fir on defined channel

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STREAM DETERMINATION FIELD DATA FORM

Stream: 32705C	Project No.: 071-522.0001
Sampling Location: 32705C (1)	Date/Time: 1-9-08
Coordinates:	Investigator(s): MJS, KPS GPS Unit: GEOXH9 Camera: D
Current Weather Conditions: cloudy 55°	Weather Conditions Past 48 Hours: some rain 70°

Stream Hydrology:

Estimated Flow = 20-30 gpm
 Wetted Width = 2-3 ft
 Water Depth = 2-3 in

Hydrology Special (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-3
 Bed & Banks
 Altered Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Types (check all that apply):

Bedrock
 Boulder
 Cobble
 Gravel
 Sand
 Silt
 Clay
 Artificial

Benthic Macroinvertebrates (U=Unidentified, B=Bivalvia, I=Insecta, S=Semivertebrae)

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amelidae	U						Dytiscidae	B, U					
Beetidae	M, B, U						Elmidae	U, S					
Cenidae	M, B, U						Psophonidae	U, S					
Ephemeralidae	U, S						Megaloptera (dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Leuctridae	B						Stalidae	U, S					
Leptophlebiidae	U, S	<input checked="" type="checkbox"/>					Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Copridae	U	<input checked="" type="checkbox"/>					Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S		<input checked="" type="checkbox"/>				Amphipoda (scuds)	M					
Leuctridae	U, S	<input checked="" type="checkbox"/>					Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Pallanopteridae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U	<input checked="" type="checkbox"/>					Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossopsocidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Udonidae	U					
Limnephilidae	U, S	<input checked="" type="checkbox"/>											
Platypolamidae	B, U												
Rhyacophidae	U, S												
Gonidae	U, S												
Diptera (true flies)													
Climaciidae	M, B, U		<input checked="" type="checkbox"/>										
Simuliidae	M, U	<input checked="" type="checkbox"/>											
Tipulidae (3)	B, U, S			<input checked="" type="checkbox"/>									
Tobaniidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
Sampling Pt.	32705C-st1	17	18

USDA Classification: Perennial Informant Ephemeral

RADEP Classification: Biologically Diverse Biologically Variable Upland

Notes (include narrative description of sampling location):

- sampling reach ~ 100' into the treeline
- start @ start of flow and defined channel
- no channel between start and 32705, but ~100' of surface flow connection
- end assessment @ loss of flow and channel

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STREAM DETERMINATION FIELD DATA FORM

Stream: 32705C-1	Project No.: 071-522.0001
Sampling Location: 32705C-1	Date/Time: 1-9-08
Coordinates:	Investigator(s): MLS, LCPs GPS Unit: GeoXH9 Camera: D
Current Weather Conditions: cloudy, 55°	Weather Conditions Past 48 Hours: some rain, 70°

Stream Hydrology:

Estimated Flow = N/A gpm
 Wetted Width = N/A ft
 Water Depth = N/A in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-3
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Megoptera (dobsonflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isonychiidae	B						Slatidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uenoidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

NO BENTHOS

Vertebrates

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32705C-1	start	19	20

USACE Classification: Perennial Intermittent Ephemeral

PADEP Classification: Biologically Diverse Biologically Variable Upland

Notes (include narrative description of sampling location):
 no flow, so no benthos collected
 - start @ confl. w/ 32705
 - end @ loss of defined channel

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STREAM DETERMINATION FIELD DATA FORM

Stream: 32705C-4	Project No.: 071-522.0001
Sampling Location: 32705C-4	Date/Time: 1-9-07
Coordinates:	Investigator(s): KPS GPS Unit: GeoXH9 Camera: D
Current Weather Conditions: cloudy, 55°	Weather Conditions Past 48 Hours: Some rain, 70°

Stream Hydrology:

Estimated Flow = **N/A** gpm
 Wetted Width = **N/A** ft
 Water Depth = **N/A** in

Hydrology Source(s) (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **1-2**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (M-Multivoltine, B-Bivoltine, U-Univoltine, S-Semivoltine):

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Caenidae	M, B, U						Psephenidae	U, S					
Ephemereflidae	U, S						Megaloptera (dobsonflies)						
Haplaxoniidae	B, U						Corydidae	U, S					
Isonychidae	B						Sialidae	U, S					
Leptophlebiidae	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Louciidae	U, S						Isopoda (aquatic sowbugs)	M					
Nomouridae	U, S						Hirudinea (leeches)	U					
Peltoperlidae	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Decapoda (crayfish)	U					
Perlodidae	U						Gastropoda (snails)	U, S					
Tricoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Philopotamidae	B, U												
Rhyacophilidae	U, S												
Uonidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

NO BENTHOS

Vertebrates

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32705C-4	start	25	26

USACE Classification: Perennial Intermittent Ephemeral

PADEP Classification: Biologically Diverse Biologically Variable Upland

Notes (include narrative description of sampling location):
 - no flow; no sample collected
 - start @ confl. w/ 32705C
 - end @ loss of flow and defined channel
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STREAM DETERMINATION FIELD DATA FORM

Stream: 3270SE	Project No.: 071-522.0001
Sampling Location: 3270SE (1)	Date/Time: 1-11-08
Coordinates:	Investigator(s): ICPS GPS Unit: GeoXTRM1 Camera: D
Current Weather Conditions: Cloudy, light rain, 50°	Weather Conditions Past 48 Hours: some rain, 50°

Stream Hydrology:

Estimated Flow = 5-7 gpm
 Wetted Width = 2 ft
 Water Depth = 0.1 in

Hydrology Sources (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) 2-3
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris filled
 Terrestrial Vegetation

Substrate Types (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Benthic Macroinvertebrates (A-Aquatic, B-Benthic, U-Unefficient, S-Sensitive)

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amphipoda	U						Odyptidae	B, U					
Beetles	M, S, U						Elmidae	U, S					
Coleoptera	M, S, U						Psephenidae	U, S					
Ephemeroptera	U, S						Megaloptera (dobsonflies, dobsonflies)						
Heptageniidae	B, U						Corydalidae	U, S					
Isopoda	B						Stalidae	U, S					
Lepidoptera	U, S						Hemiptera (Water Bugs)	B, U					
Plecoptera (stoneflies)							Zygoptera (damselflies)	U, S					
Copidae	U						Anisoptera (dragonflies)	B, U					
Chironomidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S		✓				Hirudinea (leeches)	U					
Psephenidae	S						Platyhelminthes (flatworms)	M, B, U, S		✓			
Pedidae	U, S						Orghocheta (segmented worms)	B, U, S					
Tanopterygidae	U						Decapoda (crayfish)	U					
Petrolidae	U						Gastropoda (snails)	U, S					
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S						Unionidae	U					
Limnephilidae	U, S												
Ptilopotamidae	B, U												
Rhyacophilidae	U, S												
Hydroptilidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location:	GPS Point	Photographs	
		Downstream	Upstream
3270SE	start	29	30

USACE Classification: Perennial Intermittent Ephemeral
 PADEF Classification: Biologically Diverse Biologically Variable Upland

Notes (include narrative description of sampling location):
 - Sampled throughout assessment reach by visual inspection of substrate
 - start @ confluence w/ 3270SE
 - end @ loss of flow/channel @ road

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STREAM DETERMINATION FIELD DATA FORM

Stream: 32706	Project No.: 071-522.0001
Sampling Location: 32706 (1)	Date/Time: 1-9-08 2:50 pm
Coordinates:	Investigator(s): HIS, LCPS GPS Unit: Rental 1 Camera: H
Current Weather Conditions: 50°F Partly Cloudy	Weather Conditions Past 48 Hours: 50-70°F Clear Dry

Stream Hydrology:

Estimated Flow = **30-40 gpm**
 Wetted Width = **3-4**
 Water Depth = **1-3**

Hydrology Sources (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **5-7**
 Bed & Banks
 Aluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Type(s) (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Terrestrial Macroinvertebrates (M=Mobile, U=Unmobile, S=Semi-mobile)

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Amphibia	U						Dytiscidae	B, U					
Baetidae	M, B, U						Elmidae	U, S					
Chironomidae	M, B, U						Psephenidae	U, S					
Ephemerellidae	U, S						Hemiptera (water bugs)						
Hopterygidae	B, U						Zygoptera (damselflies)						
Isopodidae	B						Corydalidae	U, S					
Leptophlebiidae	U, S						Stelidae	U, S					
Plecoptera (stoneflies)							Hemiptera (water bugs)	B, U					
Capniidae	U						Zygoptera (damselflies)	U, S					
Chloroperlidae	U, S				✓		Anisoptera (dragonflies)	B, U					
Claustidae	U, S						Amphipoda (scuds)	M					
Nemouridae	U, S						Isopoda (aquatic sowbugs)	M					
Pelloniidae	S						Hirudinea (leeches)	U					
Plekiidae	U, S						Platyhelminthes (flatworms)	M, B, U, S					
Taeniopterygidae	U						Oligochaeta (segmented worms)	B, U, S		✓			
Perlidae (Zygema)	U	✓	✓				Decapoda (crayfish)	U	✓				
Trichoptera (caddisflies)							Gastropoda (snails)	U, S					
Glossosomatidae	B, U						Bivalvia (clams, mussels)						
Hydropsychidae	B, U, S		✓				Sphaeriidae	M, B, U					
Limnephilidae	U, S						Urosidae	U					
Phlebotomidae	B, U												
Phryganeidae	U, S												
Urolidae	U, S												
Diptera (true flies)													
Chironomidae	M, B, U		✓				Vertebrates						
Simuliidae	M, U						larval Salamander						
Tipulidae (Zygema)	B, U, S		✓										
Tanipidae	U		✓										

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
32706(1)	32706(1)	16	17

USACE Classification: Perennial Intermittent Ephemeral

PADEP Classification: Biologically Diverse Biologically Variable Upland

Notes (include narrative description of sampling location):

• Sample collected ~375' from confluence w/ 32705
 • Stream was observed to be dry during Summer 2007

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STREAM DETERMINATION FIELD DATA FORM

Stream: WNTZ-OR	Project No.: 071-522.0001
Sampling Location: WNTZ-OR (1)	Date/Time: 1-15-08
Coordinates:	Investigator(s): MUS, LPS GPS Unit: GeoXTraII Camera: D
Current Weather Conditions: snow, cloudy, 34°	Weather Conditions Past 48 Hours: snow, 34°

Stream Hydrology:

Estimated Flow = **5-10** gpm
 Wetted Width = **1** ft
 Water Depth = **1-2** ft

Hydrology Sources (check all that apply):

Spring
 Seep
 Run-off
 Pond

Channel Conditions:

Active Width (ft) **2**
 Bed & Banks
 Alluvial Channel
 Eroded Channel
 Debris-filled
 Terrestrial Vegetation

Substrate Types (check all that apply):

Bedrock Sand
 Boulder Silt
 Cobble Clay
 Gravel Artificial

Terrestrial Macroinvertebrates (M), Aquatic Insects (A), Benthos (B), U (Unidentified), P (Pesticide/Herbicide)

Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)	Taxon	Life History	Rare (0-3)	Present (4-10)	Common (11-24)	Abundant (25-99)	Very Abundant (100+)
Ephemeroptera (mayflies)							Coleoptera (aquatic beetles)						
Ameletidae	U						Dytiscidae	B, U					
Baetidae	M, B, U						Eurycoridae	U, S					
Capniidae	M, B, U						Hydrophilidae	U, S					
Ephemerellidae	U, S						Megoptera (dobsonflies, dobsonflies)						
Heptageniidae	B, U						Coryphidae	U, S					
Isoperlae	B						Stenonema	U, S					
Lepidopterygidae	U, S						Hemiptera (Water Bugs)	B, U					
Trichoptera (caddisflies)							Zygoptera (damselflies)	U, S					
Capniidae	U						Anisoptera (dragonflies)	B, U					
Chloroperlidae	U, S						Amphipoda (scuds)	M					
Leuctridae	U, S						Isopoda (aquatic sowbugs)	M					
Nemouridae	U, S						Krillidae (beetles)	U					
Plecoptera	S						Platyhelminthes (flatworms)	M, B, U, S					
Perlidae	U, S						Oligochaeta (segmented worms)	B, U, S					
Taeniopterygidae	U						Isopoda (crayfish)	U					
Perlidae	U						Gastropoda (snails)	U, S		✓			
Trichoptera (caddisflies)							Bivalvia (clams, mussels)						
Glossosomatidae	B, U						Sphaeriidae	M, B, U					
Hydropsychidae	B, U, S	✓					Unioidea	U					
Gnaphalidae	U, S												
Philopotamidae	B, U						Vertebrates						
Hydropsychidae	U, S												
Trichoptera	U, S												
Diptera (true flies)													
Chironomidae	M, B, U												
Simuliidae	M, U												
Tipulidae	B, U, S												
Tabanidae	U												

Sampling Location	GPS Point	Photographs	
		Downstream	Upstream
WNTZ-OR	start	125	126

USACE Classification: Perennial Intermittent Ephemeral

RAPR Classification: Biologically Diverse Ecologically Variable Upland

Notes (include narrative description of sampling location):
 start @ project boundary
 end @ wetland boundary pond
 sampled reach throughout by visual inspection of substrate.

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Appendix 15.2-A
Stream Photographs
Bailey CRDA No. 5 Sediment Pond Development Area
Revised 12-9-09



Photograph 1: Tributary 32705
(Biologically Diverse Perennial)



Photograph 2: Tributary 32705A
(Biologically Diverse Perennial)



Photograph 3: Tributary 32705B
(Biologically Variable Perennial)



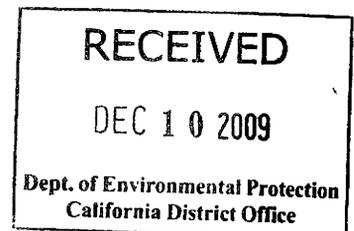
Photograph 4: Tributary 32705C
(Biologically Variable Perennial)



Photograph 5: Tributary 32705C-1 (Intermittent)



Photograph 6: Tributary 32705C-2 (Intermittent)



Appendix 15.2-A
Stream Photographs
Bailey CRDA No. 5 Sediment Pond Development Area
Revised 12-9-09



Photograph 7: Tributary 32705C-3 (Intermittent)



Photograph 8: Tributary 32705C-4 (Intermittent)



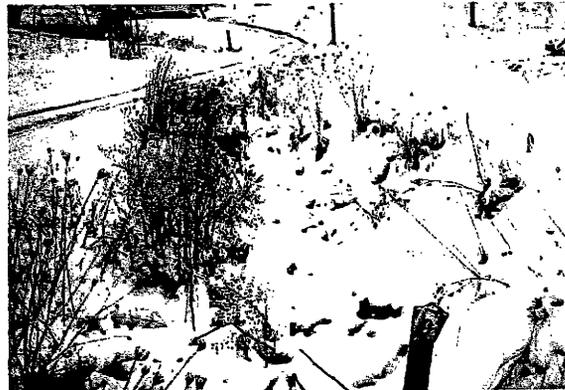
Photograph 9: Tributary 32705C-5 (Intermittent)



Photograph 10: Tributary 32705E
(Biologically Variable Perennial)



Photograph 11: Tributary 32706
(Biologically Variable Perennial)



Photograph 12: Tributary UNT2-OR
(Biologically Variable Perennial)

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APPENDIX 15.5-1
INLINE WATER LEVEL CONTROL STRUCTURE

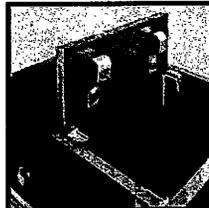
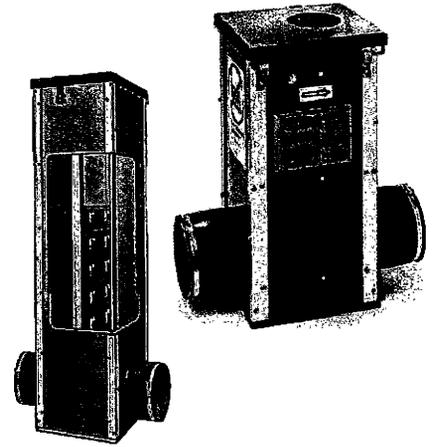
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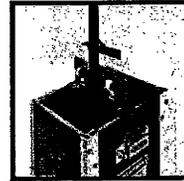
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Inline Water Level Control Structure™

- Rugged 1/2" PVC structure.
- Heavy Steel lockable top.
- Stainless steel screws and custom anodized aluminum corner extrusions are used for strength and durability.
- 5" & 7" stoplogs for adjustability.
- Flexible couplers allow PVC, plastic pipe, or other materials to be easily attached. (Please specify type of pipe when ordering)
- 5-Year Warranty on all parts
- Please allow up to 2 weeks for shipment.



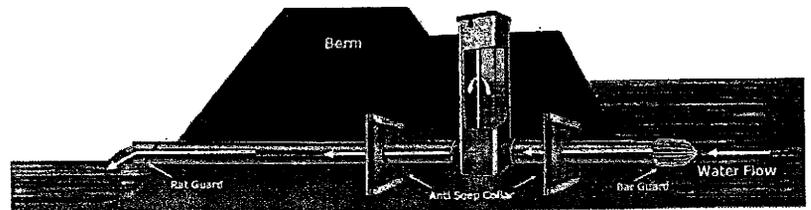
Durable stainless steel lifting hooks.



Comes with a handle to install and remove stoplogs.

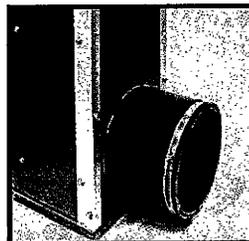
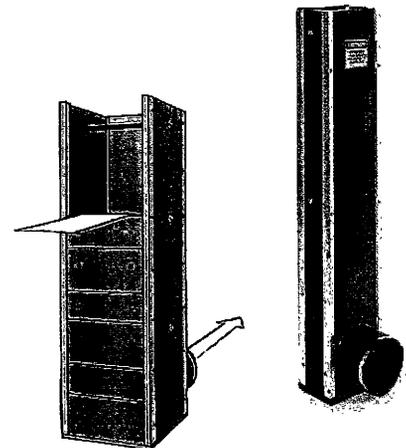
Inline Water Level Control Structure			
Pipe Size	Available Heights	Width	Depth
4"	2' - 12'	8"	10"
6"	2' - 12'	8"	10"
8"	2' - 12'	12"	12"
10"	2' - 12'	14"	16"
12"	2' - 12'	16"	20"
15"	2' - 12'	20"	24"
18"	2' - 12'	24"	28"
24"	3' - 10'	31"	39"

TYPICAL INSTALLATION
Inline Water Level Control Structure



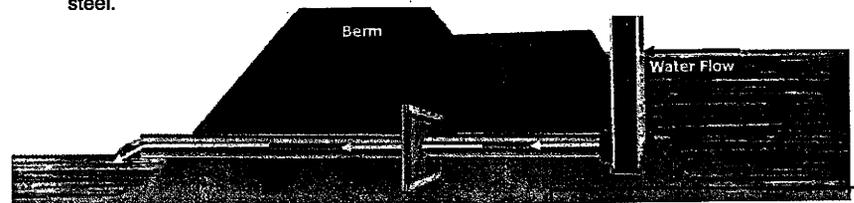
Inlet Water Level Control Structure™

- Rugged 1/2" PVC structure.
- Stainless steel screws and custom anodized aluminum corner extrusions are used for strength and durability.
- 5" & 7" stoplogs for adjustability.
- Flexible couplers allow PVC, plastic pipe, or other materials to be easily attached. (Please specify type of pipe when ordering)
- 5-Year Warranty on all parts
- Please allow up to 2 weeks for shipment.



Aluminum extruded corners with stainless steel.

TYPICAL INSTALLATION
Inlet Water Level Control Structure



Inlet Water Level Control Structure			
Pipe Size	Available Heights	Width	Depth
4"	2' - 6'	8"	5"
6"	2' - 6'	8"	5"
8"	2' - 6'	12"	6"
10"	2' - 6'	14"	8"
12"	2' - 6'	16"	10"
15"	2' - 6'	20"	12"
18"	2' - 6'	24"	14"
24"	2' - 6'	31"	18"

Manufactured by:

Agri Drain
CORPORATION

P.O. Box 458 • 1462 340th Street • Adair, Iowa 50002
Phone: 1-800-232-4742 • Fax: 1-800-232-3353
www.agridrain.com • email: info@agridrain.com

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Water Level Control Structures

The **Water Level Control Structures** manufactured by *Agri Drain Corp.* are constructed of 1/2" thick extruded PVC sheets, connected at the corners by means of specially extruded anodized aluminum profiles sealed with waterproof caulking and secured with stainless steel screws. The bottom of the structure is sealed with 1/2" thick PVC sheet and also utilizes waterproof caulking for sealant and stainless steel screws to hold it in place.

The stoplogs are also constructed of 1/2" thick PVC sheet and utilizes 3/16" diameter closed cell foam neoprene o-ring, glued into a groove to mate against the downstream surface of the extruded aluminum track and the top of the stoplog that it rests upon. The stoplogs are equipped with two stainless steel hooks to facilitate their removal by means of a special handle/hook assembly.

In order to obtain inch-by-inch water level adjustment capabilities, the stoplogs are built in equal quantity of two heights, 5" and 7" tall. This allows for various combinations and nearly infinite adjustability. Examples: 7+7=14", 5+5+5=15", 5+5+7=17", 5+7+7=19", 5+5+5+5=20", etc.

The means of connecting to the downstream and upstream pipe is a flexible rubber sewer coupler. It will accommodate corrugated plastic tubing, PVC pipe, corrugated metal pipe or virtually any other conduit material.

The units are available in two different types. The first type (Inlet) is designed to be installed on the upstream end of the conduit so the water must enter the structure before it enters the pipe. The second type (Inline) is designed to be installed in the pipe line, so the water enters the pipe, then flows into the box, over the stoplogs, then out the downstream side of the structure. The structure is equipped with a metal lid and brackets for attachment. Both structures come with a handle to remove, install or adjust the stoplogs.

The structures are manufactured in various sizes based on diameter of the conduit and engineered to provide a minimum of 30% greater capacity than the conduit it is connected to. It is available in heights to suit the specific installation.

INLINE WATER LEVEL CONTROL STRUCTURE SHIPPING WEIGHTS								
Pipe Size	HEIGHT							
	2'	3'	4'	5'	6'	8'	10'	12'
4"	50U	64U	82U	90U	100U	190T	214T	278T
6"	52U	70U	90U	103U	160T	200T	240T	320T
8"	64U	87U	110U	175T	200T	240T	300T	
10"	78U	110U	176T	195T	224T	300T	345T	436T
12"	94U	172T	210T	250T	314T	396T	450T	
15"		222T	278T	316T	387T	492T	560T	626T
18"		236T	376T	422T	480T	586T	710T	816T
24"		369T	500T	607T	680T	830T	950T	1180T

UPS=U
TRUCK LINE=T

Inlet Boards - 1/8" off width
Inline Boards - 1 1/4" off width

Larger CMP structures also available. Call for details on custom sizes and pricing.

INLET WATER LEVEL CONTROL STRUCTURE SHIPPING WEIGHTS					
Pipe Size	HEIGHT				
	2'	3'	4'	5'	6'
4"	26U	38U	51U	64U	83U
6"	35U	41U	52U	67U	75T
8"	37U	51U	67U	82T	134T
10"	49U	62U	85U	122T	136T
12"	55U	72T	96U	145T	172T
15"	82U	95T	139T	185T	210T
18"	128T	178T	190T	232T	250T
24"	178T		268T	288T	352T

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**ATTACHMENT
ADDITIONAL MODULE 15 RESPONSES**

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California District Office**

COMMENT NO. 57 RESPONSE

CPCC proposes to sample the fish and benthic macroinvertebrate communities at five locations in Chartiers Creek, three locations on Millers Run, and one location on UNT-1 to Chartiers Creek in order to establish baseline conditions for each of these streams. Samples will be collected and processed during the winter 2009-2010. Degree of impairment and probable improvement in biological communities will be determined after the samples are collected and processed. Consequently, the biological communities in the affected streams and Chartiers Creek cannot be compared at this time. Following the completion of the biological sampling, a complete evaluation and comparison of the functions and benefits of the affected and mitigation streams will be prepared and submitted to the DEP. A preliminary comparison of the ecological functions for the affected streams and mitigation streams and the benefits of the proposed AMD remediation in Chartiers Creek and UNT-1 to Chartiers Creek are presented in the attached table for Comment 57 and discussed below.

During the biological sampling, an instream habitat evaluation will be performed to help assess the degree of improvement that will be recognized as a result of remediating the Presto-Sygan discharge. It is noted that there are multiple mine discharges affecting the Chartiers Creek watershed and the overall improvement to the health of the stream will result from completion of multiple AMD remediation projects.

CPCC will collaborate with the Department's California DMO biologist to confirm that the proposed sampling methodologies and locations will meet the Department's interests in documenting existing biological communities and physical conditions in Chartiers Creek. A detailed discussion of the functions provided by the impacted streams, within the footprint of the CRDA No. 5 Sediment Pond, is presented in Module 15. The following sections provide a parallel preliminary assessment for Chartiers Creek and UNT-1 to Chartiers Creek (UNT-1). The Comment 57 table attached to this response summarizes the functions of the impacted streams, UNT-1, and Chartiers Creek.

Food Chain Production

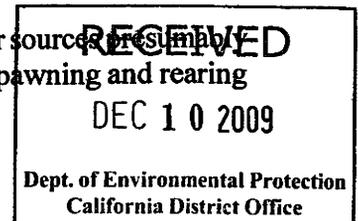
Food chain production capabilities of Chartiers Creek and UNT-1 will be evaluated using the benthic macroinvertebrate and fish community data that will be collected during the winter of 2009-2010. Improvement in the post-treatment biological communities for the AMD-affected reaches of these streams will be predicted from evaluation of data collected from upstream and reference sampling locations.

Nesting, Spawning, and Rearing

Chartiers Creek is a major stream/riparian corridor but flows through suburban and highly urbanized areas that lack woody riparian vegetation in some areas and have minimal wooded riparian zones along other reaches. Thus, reaches lacking riparian forest are assessed as functioning at a low level for nesting. Portions of Chartiers Creek that are bordered by riparian forests may function at moderate levels for nesting, but are prevented from functioning at a high level due to habitat fragmentation. UNT-1 was rated low for supporting the nesting functions of avian species because the AMD impacted reach is bordered by a road and open fields that provide limited opportunity for nesting birds. Improvements to water quality would likely attract additional bird species to the river corridor, although nesting habitat availability may ultimately limit the extent to which this function is supported by the mitigation streams.

The impaired water quality in the mitigation reaches from AMD discharges and other sources ^{and} ~~and~~ adversely affect spawning and sensitive juvenile stages of aquatic organisms. The spawning and rearing

much of stream is culverted



functions of Chartiers Creek and UNT-1 will be further evaluated based on the results of the biological sampling.

Migration

No migratory fish species are endemic to the Chartiers Creek watershed. The forested riparian zones along portions of Chartiers Creek may provide opportunity for use by migratory neotropical songbirds; therefore, Chartiers Creek was rated as low to moderate for this function. UNT-1 is unlikely to be a significant migratory corridor for avian species; therefore, it was rated low for this function. Improvements to water quality from the AMD remediation would likely attract additional bird species to the Chartiers Creek corridor, resulting in a net improvement to this function.

Feeding, Resting, and Escape Cover

Instream feeding habitat will be determined based on the results of the biological sampling. The instream resting and escape cover for Chartiers Creek will be assessed during the biological sampling. Instream cover in UNT-1 is limited and the substrate is buried beneath iron floc; therefore, it is providing low levels of resting and escape cover for aquatic species.

Habitat for Endangered and Threatened Plant and Animal Species

The high degree of habitat alteration throughout the lower Chartiers Creek watershed makes it unlikely for supporting threatened and endangered plant and animal species. However, there may be isolated populations of terrestrial species remaining in intact forest habitat, but these streams are not likely to influence the existence of those species.

Improvements in water quality would likely support a richer aquatic fauna, including listed fish species currently found in the Ohio River and its tributaries. Migration of rare fish species into Chartiers Creek from the Ohio River under improved water quality conditions is a distinct possibility.

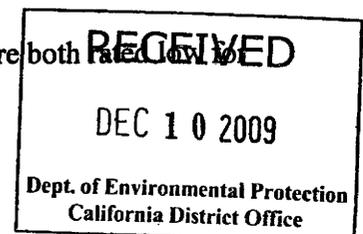
Environmental Study Areas, Sanctuaries and Refuges

Although wildlife sanctuaries or refuges are not located within the lower Chartiers Creek watershed, the Chartiers Nature Conservancy has established an environmental center on its Idlewood tract, located along Chartiers Creek in Scott Township. Consequently, Chartiers Creek was rated low to moderate and UNT-1 was rated low for this function.

Constructing a passive wetland treatment system on UNT-1 would provide educational opportunities for the local community and school groups. Landmark Properties is the landowner and developer of the property on which the passive system would be located and a willing partner in this project, and has offered to donate the necessary property for the Presto Sygan passive treatment system. They have repeatedly expressed their support for the project, for both its water quality and public education benefits. Construction of the passive treatment system would thus provide an opportunity for establishing an environmental study area along UNT-1.

Natural Drainage Patterns

Portions of Chartiers Creek and UNT-1 have been channelized; therefore, they were both rated low to moderate for natural drainage patterns.



promote environmental study and education within the watershed. Thus, recreational values of fishing hiking, and environmental study and education are evaluated as moderate for the mitigation reach along Chartiers Creek. Improvement of water quality by the AMD treatment project would further enhance environmental education and study and passive uses of the stream. The planned biological sampling will provide additional information on the presence/probable absence of game species within Chartiers Creek.

The game species, non-game species, fishing and hiking functions were rated low for UNT-1 because of the limited public access to the site. As discussed above for Environmental Study Areas, construction of the Presto Sygan passive treatment system would afford excellent opportunities for environmental study and education.

Anticipated Improvement to Biological Functions in Relation to CRDA Streams

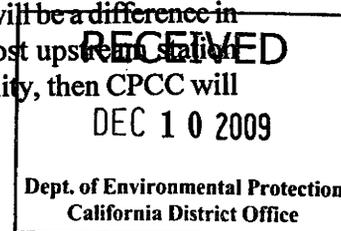
The following table presents, 1) the cumulative impact area of each stream type within CRDA No. 5 & 6, 2) the approximate area of improvement in UNT-1, and 3) the minimum length of improvement needed in Chartiers Creek in order to meet a 1:1 (restoration to impact) ratio.

Streams within CRDA No. 5 & 6		
Classification	Length (feet)	Area (acres)
Biologically Diverse Perennial	8,625	1.55
Biologically Variable Perennial	17,332	1.47
Intermittent	6,294	0.24
Total	32,251	3.26
Presto-Sygan Improvement		
UNT-1 to Chartiers Creek	1,400	0.19 ⁽¹⁾
Chartiers Creek	1,337 ⁽²⁾	3.07 ⁽³⁾
Total	2,737	3.26

- (1) Assumes 6-foot average width.
- (2) Minimum length of improvement needed to meet 1:1 acreage replacement ratio. This does not represent total anticipated improvement to Chartiers Creek.
- (3) Assumes 100-foot average width.

As documented in the October 14, 2009 responses to the Department's comments, the three largest AMD sources of impairment in the lower Chartiers Creek watershed were the Wingfield Pines discharge, Gladden discharge, and Presto-Sygan discharge. A passive treatment system has already been constructed at the Wingfield Pines site and the Bureau of Abandoned Mine Reclamation (BAMR) is currently evaluating methods for remediating the Gladden discharge. This will leave Presto-Sygan as the last major discharge to be remediated along Chartiers Creek between the confluence with UNT-1 and the next major source of impairment (Robinson Run), which is approximately 6 miles downstream of the confluence with UNT-1. Restoring water quality to six miles of Chartiers Creek will provide nearly a 1:1 restoration ratio based on length and greater than a 22:1 ratio based on surface area.

CPCC is planning to study the biological community in Chartiers Creek below the Presto-Sygan discharge, between the Presto-Sygan discharge and the confluence with Miller Run (input from Gladden discharge), and above the confluence with Miller Run. CPCC anticipates that there will be a difference in the benthic macroinvertebrate and/or fish communities between stations. If the most upstream station (above confluence with Miller Run) supports the highest quality biological community, then CPCC will



use those values as the biological remediation goal and success criteria for improvement to Chartiers Creek. Additionally, CPCC anticipates the Presto-Sygan project will improve the benthic macroinvertebrate productivity of UNT-1 and Chartiers Creek to the point that it offsets the loss of standing crop in CRDA No. 5 & 6 and any potential impacts to secondary production within the Owens Run watershed.

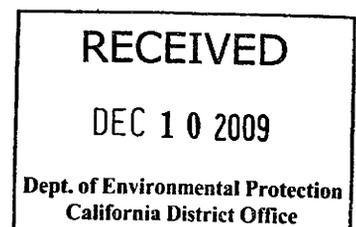
Standing crop represents the total number of individuals existing in a given area at a given time. The standing crop of benthic macroinvertebrates supported by all streams in CRDA No. 5 & 6, in January 2008, was estimated using the physical (i.e., channel width and length) and biological (i.e., benthic taxa and relative abundances) data collected during the stream classification. The following table summarizes estimated standing crop of streams in CRDA No. 5 & 6.

Standing Crop of Benthic Macroinvertebrates Supported by Streams in CRDA No. 5 & 6					
Stream Classification	Ephemeroptera	Plecoptera	Trichoptera	Other	Total
Biologically Diverse Perennial	29,553	155,825	135,227	207,776	528,381
Biologically Variable Perennial	3,140	62,135	19,169	85,436	169,880
Intermittent	0	0	0	0	0
Total	32,693	217,960	154,396	293,212	698,261

It is anticipated that through remediation of the Presto-Sygan discharge, the biological community in UNT-1 and Chartiers Creek will be improved such that collectively the streams will support 700,000 more benthic macroinvertebrate individuals than baseline. This will provide a 1:1 replacement ratio for food chain production. The Presto-Sygan remediation is also anticipated to enhance the spawning and rearing functions in UNT-1 and Chartiers Creek. The improved water quality may also improve game fish populations in Chartiers Creek, which is a function that is not currently provided by the impacted streams in CRDA No. 5 & 6. Moreover, the social significance (i.e., recreation and education) aspects of the Presto-Sygan project will add value to the project beyond what is provided by the streams in CRDA No. 5 & 6.

The physical, chemical, and biological improvements that will result from the Presto-Sygan remediation project are anticipated to greatly offset the loss of functions provided by the impacted streams in CRDA No. 5 & 6. As such, CPCC requests that the Department accept this project as compensatory mitigation for the impacts associated with development of CRDA No. 5 & 6.

In addition to the Presto-Sygan project, CPCC continues to develop an active stream channel restoration plan to address instream and riparian habitat deficiencies along degraded reaches of Templeton Fork and Rocky Run in order to satisfy the compensatory mitigation requirements of the United States Army Corps of Engineers, United States Environmental Protection Agency, and the United States Fish & Wildlife Service.



Response to Comment 57 in DEP Revision Letter Dated November 10, 2009
Preliminary Stream Ecological Function Assessment and Comparison
Bailey Mine Coal Refuse Disposal Areas No. 5 and 6

CHARACTERISTICS AND FUNCTIONS	Streams within CRDA No. 5 and 6 Permit Area					Mitigation Streams			
	Diverse Reaches of Tributary 32705 and UNT-OR*	Tributary 32705A	Variable Tributaries in Forested Watersheds and Tributary 32706*	Variable Tributaries in Old Field Habitat and UNT 2-OR*	Intermittent Tributaries	Pre-treatment		Post-treatment (Anticipated)	
						Chartiers Creek (Downstream of Presto-Sygan Discharge)	UNT-1 to Chartiers Creek	Chartiers Creek (Downstream of Presto-Sygan Discharge)	UNT-1 to Chartiers Creek
CHAPTER 89.5 STREAM CLASSIFICATION	Perennial	Perennial	Perennial	Perennial	Intermittent	Perennial	Perennial	Perennial	Perennial
BIOLOGICAL CLASSIFICATION	Diverse	Diverse	Variable	Variable	N/A	TBD	TBD	Diverse	Diverse
WATERSHED ACREAGE	102-481	3	1-110	2-5	176,789	38	176,789	38	38
LENGTH (ft)	8,625	17,332	6,294	32,000	1,400	32,000	1,400	32,000	1,400
AVERAGE WIDTH at OHW (ft)	7.8	3.7	1.7	100	6	100	6	100	6
AREA OF AQUATIC HABITAT (acres)	1.55	1.47	0.24	73.5	0.2	73.5	0.2	73.5	0.2
SURROUNDING LAND USE	Forest	Forest	Forest	Old Field/ Residential Lawn*	Forest/Old Field	Urban, Forest, Residential	Road, Field, Wetlands	Urban, Forest, Residential	Road, Field, Passive Treatment
HABITAT FUNCTIONS									
Food Chain Production	H	M	L	L	L	TBD	TBD	TBD	TBD
Nesting	H	H	H	L	L	L/M	L	M	L
Spawning	M	L	L	L	L	TBD	TBD	TBD	TBD
Rearing	M	L	L	L	L	TBD	TBD	TBD	TBD
Migration	M	M	M	L	L	L/M	L	M	L
Feeding	M	M	L	L	L	TBD	TBD	TBD	TBD
Resting	M	M	M	L	L	TBD	L	TBD	L
Escape Cover	M	M	M	L	L	TBD	L	TBD	L
Habitat for Threatened and Endangered Species	M	M	L	L	L	L/M	L	M	L
Environmental Study Areas, Sanctuaries, and Refuges	L	L	L	L	L	L/M	L	L/M	L/M
WATER QUANTITY AND STREAMFLOW FUNCTIONS									
Natural Drainage Patterns	M/H*	M	M	M/L*	M/L*	L	L	L	L
Flushing Characteristics	M	L	L/M*	L	L	H	L	H	L
Current Patterns	M	L	L/M*	L	L	H	L	H	L
Groundwater Discharge for Baseflow	M	M	L/M*	L	L	M/H	H	M/H	H
Natural Recharge Area for Ground and Surface Waters	M	L	L/M*	L	L	M/H	L	M/H	L
Storm and Floodwater Storage and Control	H/M*	L	L	L	L	M	M	M	M
WATER QUALITY FUNCTIONS									
Preventing Pollution	M	M	L	L	L	L	L	M	M
Natural Water Filtration	M	M	L	L	L	L	L	M	M
Sedimentation Control and Patterns	M	M	M	M/L*	L	M	M	M	M
RECREATION FUNCTIONS									
Game Species	L	L	L	L	L	TBD	L	TBD	L
Non Game Species	L	L	L	L	L	TBD	L	TBD	L
Fishing	L	L	L	L	L	M	L	M	L
Hiking	L	L	L	L	L	M	L	M	L
Environmental Study and Education	L	L	L	L	L	M	L	H	H
Nature Observation (plant/wildlife)	L	L	L	L	L	L	L	M	L

L = Low: Indicates that resource is ranked as having a low ability to provide the specified ecological function.
M = Moderate: Indicates that resource is ranked as having a moderate ability to provide the specified ecological function.
H = High: Indicates that resource is ranked as having a high or optimal ability to provide the specified ecological function.
TBD = To Be Determined: Functions will be assessed following baseline biological sampling during the winter 2009/2010.

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COMMENT NO. 59c GANTT CHARTS

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Presto-Sygan AMD Remediation
 South Fayette Twp., Allegheny Co., PA
 Chartiers Creek Watershed

EXPECTED PROJECT TIMELINE CONSTRUCTION PHASE

December 2009 DRAFT
 1511130
 CONSOL Mitigation Project

TASK DESCRIPTION	Days	Start	Finish	14-Jun-10	21-Jun-10	28-Jun-10	05-Jul-10	12-Jul-10	19-Jul-10	26-Jul-10	02-Aug-10	09-Aug-10	16-Aug-10	23-Aug-10	30-Aug-10	06-Sep-10	13-Sep-10	20-Sep-10	27-Sep-10	04-Oct-10	11-Oct-10	18-Oct-10	25-Oct-10	01-Nov-10	08-Nov-10	15-Nov-10	22-Nov-10	29-Nov-10	06-Dec-10		
Project Initiation & Mobilization																															
Project Initiation & Planning	5	06/18/10	06/24/10	■	■	■	■	■																							
PA One Call	4	06/21/10	06/24/10	■	■	■	■																								
Mobilization	5	06/22/10	06/28/10	■	■	■	■	■	■																						
Site Preparation																															
E&S Control Installation	10	06/29/10	07/13/10			■	■	■	■	■	■	■	■	■																	
Access Road Installation	5	07/09/10	07/15/10			■	■	■	■	■																					
Clearing and Grubbing																															
Clearing & Grubbing	10	07/13/10	07/26/10			■	■	■	■	■	■	■	■	■																	
Vegetation Removal/Disposal	10	07/20/10	08/02/10			■	■	■	■	■	■	■	■	■	■																
Vertical Flow Pond Construction																															
Install Flow Control & Bypass Device/Dewatering	10	08/03/10	08/16/10								■	■	■	■	■	■	■	■	■	■											
Excavation/Embankment Construction AFVFP1A	15	08/06/10	08/26/10								■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Excavation/Embankment Construction AFVFP1B	15	08/23/10	09/13/10																												
Underdrain and Siphon Installation AFVFP1A	4	09/10/10	09/15/10																												
Underdrain and Siphon Installation AFVFP1B	4	09/15/10	09/20/10																												
Treatment media placement (both AFVFPs)	10	09/09/10	09/22/10																												
Settling Pond & Visual Buffer Construction																															
Excavation/Embankment Construction SP1	10	09/16/10	09/29/10																												
Construction/Grading of Visual Buffer	10	09/23/10	10/06/10																												
Culvert Installation																															
Install culvert under Presto-Sygan Road	5	10/05/10	10/11/10																												
Treatment Wetland Construction																															
Reconfigure Wetland Area 1	15	10/08/10	10/28/10																												
Install culverts/reconfigure old access road	5	10/26/10	11/01/10																												
Reconfigure Wetland Area 2	15	10/26/10	11/15/10																												
Site Finalization, Revegetation & Demobilization																															
Final grading/Site Cleanup	5	11/15/10	11/19/10																												
Revegetation	5	11/19/10	11/26/10																												
Demobilization	5	11/26/10	12/02/10																												

Total Calendar Days: 167

Notes:
 Purpose of timeline is to show RELATIVE expected project timeframe for construction of proposed passive treatment system and is not intended to be a fixed-date schedule.
 Initial start date is assumed and will vary based on other project related factors (i.e. CRDA permitting, etc.).
 All durations are very approximate and will vary based on actual initiation date, weather conditions and other factors.
 Assumes Design-Build project by experienced construction team.

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EXPECTED PROJECT TIMELINE DESIGN AND PERMITTING PHASE

5 MONTHS

TASK DESCRIPTION	Days	Start	Finish	04-Jan-10	11-Jan-10	18-Jan-10	25-Jan-10	01-Feb-10	08-Feb-10	15-Feb-10	22-Feb-10	01-Mar-10	08-Mar-10	15-Mar-10	22-Mar-10	29-Mar-10	05-Apr-10	12-Apr-10	19-Apr-10	26-Apr-10	03-May-10	10-May-10	17-May-10	24-May-10	31-May-10	07-Jun-10	14-Jun-10
Final Design																											
Test Drilling (including PA-One Call for Drilling)	10	01/04/10	01/15/10	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Final Design Preparation	18	01/08/10	02/02/10	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Final Drawings, Details, and Sections	5	02/01/10	02/05/10																								
Joint Permit - USACE/DEP																											
Prepare Joint Permit	20	01/18/10	02/12/10																								
Field Review with USACE/DEP	1	02/01/10	02/01/10																								
USACE/DEP Review Submission	30	02/15/10	03/26/10																								
Receive and Respond to Review Comments	10	03/25/10	04/07/10																								
USACE/DEP Review Submission	25	04/08/10	05/12/10																								
Receive and Respond to Review Comments	5	05/13/10	05/19/10																								
USACE/DEP Review Submission	20	05/20/10	06/17/10																								
Joint Permit Issuance	1	06/18/10	06/18/10																								
PNDI Project Environmental Review																											
Prepare and Submit PHMC	5	01/15/10	01/21/10	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
PAG-2 (E&S Control Plan Approval)																											
Prepare & Submit E&S Control Plan	10	02/05/10	02/18/10																								
ACCD Review Submission	20	02/19/10	03/18/10																								
Receive and Respond to Review Comments	5	03/19/10	03/25/10																								
ACCD Review Submission	20	03/26/10	04/22/10																								
Acknowledgement Issuance	1	04/23/10	04/23/10																								
ACT 67, 68, and 127 Municipal Notification																											
Send Notification to South Fayette & Allegheny Co.	1	01/23/10	01/23/10	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Highway Occupancy Permit																											
Prepare and Submit PA DOT HOP(s)	8	02/06/10	02/16/10																								
Road Bonds																											
Obtain road bonds (if needed)	5	02/14/10	02/18/10																								
Underground Utility Notification																											
Submit PA One-Call	1	01/04/10	01/04/10	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Receive and Respond to Utilities	15	01/05/10	01/25/10	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█
Grading Permit																											
Prepare & Submit Grading Permit Application	3	02/02/10	02/04/10																								
South Fayette Twp. Review Submission	20	02/04/10	03/03/10																								
Receive and Respond to Review Comments	5	03/03/10	03/09/10																								
South Fayette Twp. Review Submission	15	03/09/10	03/29/10																								
Grading Permit Issuance	1	03/30/10	03/30/10																								

Total Calendar Days: 165

Notes:
Purpose of timeline is to show RELATIVE expected project timeframe and is not intended to be a fixed-date schedule.
Initial start date is assumed and will vary based on other project related factors (i.e. CRDA permitting, etc.).
All durations are very approximate and will vary based on agency response times, actual permitting requirements and other factors.
Assumes Design-Build project by experienced construction team.

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COMMENT NO. 60a RESPONSE

Prior to submitting the Treatment Pond application, CPCC conducted a comprehensive search for stream restoration projects within the upper Enlow Fork watershed. This watershed encompasses over 40 square miles and includes a significant portion of Enlow Fork and all of Owens Run, Rocky Run, and Templeton Fork. During this search, the major sources of stream impairment within the watershed were identified as sedimentation from bank erosion, nutrient enrichment from livestock pastures, and riparian clearing from historic land use practices. Water quality impacts from abandoned mine drainage, refuse piles, and unreclaimed surface mining were not observed within the Upper Enlow Fork watershed during this assessment.

The PADEP and United States Army Corps of Engineers (USACE) mitigation guidance stipulates that unavoidable stream and wetland impacts should be mitigated as close to the impact site as possible. Since there was no opportunity to remediate water quality impacts from abandoned mine drainage, refuse piles, and un-reclaimed surface mining impacts in the Upper Enlow Fork watershed, CPCC prepared a stream restoration plan to improve the stability, water quality, and aquatic habitat of streams within the watershed caused by other historic impairments. The active stream channel restoration plan submitted with the Sediment Pond application addressed the combined stream impact of the sediment pond and CRDA No. 5 & 6 at a ratio of 1:1 (impact to restoration).

Following submission of the Treatment Pond application, the PA DEP issued administrative comments identifying their interest in having CPCC pursue Abandoned Mine Drainage (AMD) reclamation projects in lieu of active stream channel restoration. The PA DEP's justification for this form of mitigation was that development of CRDA No. 5 & 6 will result in the permanent loss of streams and replacing the lost functions of these streams is best mitigated by permanently mitigating water quality issues on impaired streams within the Commonwealth.

After collaboration with the PA DEP, historic mining-related land use and water quality impacts from abandoned mine drainage (AMD) would have to meet the following criteria in order to be considered as a feasible mitigation project:

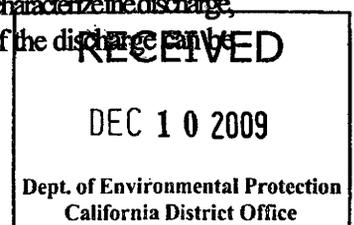
1. Located within southwestern Pennsylvania, preferably in the same river basin;
2. Recognized by state and federal agencies as a significant contributor to impairment of a receiving stream;
3. Studied in sufficient detail to adequately define the scope of the problem;
4. Could be treated with existing technologies; and,
5. Developed plans and estimated costs to correct the problem.

Using these criteria, CPCC identified potential opportunities for AMD remediation. As noted previously, AMD projects meeting these criteria were not identified within the Upper Enlow Fork watershed. Consequently, the search area was expanded until projects were identified that satisfied all five parameters.

Two options recommended by CPCC include the Presto-Sygan Discharge Remediation Project and the Gladden Discharge Stream Sealing Project. Both projects are located in the Chartiers Creek watershed. Like Enlow Fork and Wheeling Creek, Chartiers Creek is a tributary of the Ohio River and the proposed mitigation measures would cumulatively benefit the Ohio River basin. Each of the AMD projects is briefly described below.

The Presto-Sygan Discharge Remediation Project is located in South Fayette Township, Allegheny County, Pennsylvania. The discharge releases an average of 425 gpm of acidic, high iron and aluminum mine water to an unnamed tributary to Chartiers Creek and is a major source of impairment to the unnamed tributary and Chartiers Creek. Stream Restoration, Inc. (SRI) received a Growing Greener Grant from Bureau of Abandoned Mine Reclamation (BAMR), to characterize the discharge, evaluate treatment options, and design a treatment system for the discharge. The water quality of the discharge can be characterized as follows:

#60a-1



Parameter	Average Value
pH (S.U.)	4.9
Alkalinity (mg/L)	23
Acidity (mg/L)	134
Total Iron (mg/L)	>70
Dissolved Iron (mg/L)	>70
Total Aluminum (mg/L)	20
Dissolved Aluminum (mg/L)	6

SRI designed treatment system consisting of a vertical flow pond, settling pond and treatment wetlands and established the following potential pollutant reduction goals and/or water quality benefits for the discharge:

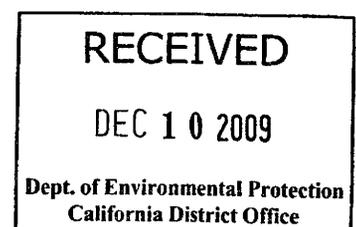
- Acidity: 700 lbs/day (≈128 tons/year)
- Iron: 400 lbs/day (≈73 tons/year)
- Aluminum: 100 lbs/day (≈18 tons/year)

The potential stream mitigation benefits for the project include restoration of approximately 1,400 linear feet of the unnamed tributary to Chartiers Creek and permanently improving water quality in the nine-mile reach of Chartiers Creek downstream of the discharge. The project has the support of the landowner, who has reserved land to construct the treatment system, and the BAMR who funded the Growing Greener Grant. The project would also be consistent with the state-adopted Chartiers Creek Watershed TMDL, which was developed to address use impairments caused by aluminum, iron, manganese and pH from AMD and resource extraction. CPCC is evaluating the possibility of providing funding to construct and provide long term O&M for the AMD treatment system as a stream mitigation project.

The Gladden Discharge Stream Sealing Project is also located in South Fayette Township, Allegheny County. The Gladden Discharge flows into Millers Run, which drains into Chartiers Creek. The PADEP BAMR has studied the Gladden AMD and believes that several tributaries - Fishing Creek and an unnamed tributary referred to as the Senex Tributary – are losing stream flow into the underlying mine and contributing substantially to the rate of the Gladden discharge. If these streams can be sealed, thereby eliminating the stream from flowing into the mine, which provides a surface flow component contribution to the AMD, the PADEP believes that eventually the discharge rate can be reduced sufficiently to effectively treat the AMD in the limited land area available to construct a treatment system.

The PADEP estimates that approximately 8,400 linear feet of stream channel will need to be sealed. The stream restoration/mitigation benefits of this project would be minimal, but could possibly include restoring stream flow and aquatic life to the 8,400 feet of sealed stream channel and the potential restoring of Millers Run and water quality improvements to Chartiers Creek, downstream of the discharge. CPCC is evaluating the possibility of providing funding to construct the stream sealing as a stream mitigation project.

CPCC continues to develop an active stream channel restoration plan to address instream and riparian habitat deficiencies along degraded reaches of Templeton Fork and Rocky Run in order to satisfy the compensatory mitigation requirements of the USACE, United States Environmental Protection Agency, and the United States Fish & Wildlife Service.



COMMENT NO. 60e RESPONSE

As provided in Item 1 of the October 14, 2009 response to the California District Office 5/14/09 comments, the available monitoring for the last 40 years was compiled to characterize the Presto-Sygan AMD as part of the preliminary alternatives analysis, which evaluated both active and passive treatment systems (PTS).

Presto-Sygan AMD Characteristics
All Samples (1968 through 2008)
 Average; minimum/median/maximum

Flow (gpm)	pH		Alkalinity (mg/L)		Acidity (mg/L)	Fe (mg/L)		Al (mg/L)		SO ₄ ⁻² (mg/L)
	Field	Lab	Field	Lab		Total	Diss.	Total	Diss.	
425 150/411/940 (n=38)	5.3 4.6/5.5/5.8 (n=21)	5.1 3.3/5.3/6.5 (n=44)	57 23/57/89 (n=17)	33 0/24/86 (n=23)	146 12/153/296 (n=43)	50 26/45/107 (n=43)	70 37/71/102 (n=11)	16 8/15/28 (n=22)	6 1/3/15 (n=12)	916 419/824/1700 (n=43)

Metal concentrations - total values; Mn avg. 1.4 mg/L (n=44); 6/16/1968 5 mg/L Fe & 3/15/06 3 mg/L Al considered spurious.

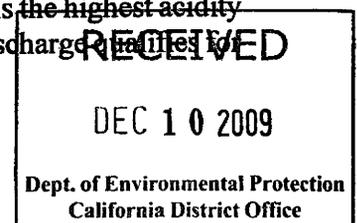
The preliminary alternatives analysis of selected treatment options and the individual sample analyses were provided in the following report:

BioMost, Inc. and Stream Restoration Inc., 6/2008, Presto-Sygan AMD Restoration
 Technical Report: *submitted to* Ronald Horansky, PA DEP, Project# GD040325, Doc#
 4100028956, 126pp with Water Quality Database. (BMI, 6/2008)

Critical to the alternatives analysis is consideration of the setting of the proposed treatment facility. If a treatment facility is to be constructed for the Presto-Sygan AMD, not only installation but also future operation, monitoring, and maintenance are to be conducted so as not to interfere with the major commercial/industrial/residential land development project (partially funded by the Commonwealth of Pennsylvania) currently under construction. The land development project which includes a shopping mall and a residential area is on the same property and in close proximity to the area suitable for installation of the treatment facility. As the footprint of the land development project has been revised within the last few months, a re-evaluation to determine the feasibility of implementing an active/conventional treatment system is currently being conducted.

An overview as to the selection of a passive system and the individual components was provided in Item 3 of the October 14, 2009 response to the California District Office 5/14/09 comments. Although this is an abandoned mine discharge, PA Code Title 25, §89.52, "Water quality standards, effluent limitations and best management practices" was reviewed to demonstrate applicability of passive technology for treatment of the Presto-Sygan discharge as well as to identify acceptable final effluent limits.

Passive treatment technology was found to be suitable under the regulations. According to Title 25, §89.52 (f)(2), "...Discharges which can be adequately treated using a passive treatment system include, but are not limited to: ... (iii) Discharges with a net acidity always less than 300 milligrams per liter which is calculated by subtracting the alkalinity of the discharge from its acidity." As the highest acidity measured for the discharge is 296 mg/L (n=43; 1968 thru 2008) the Presto-Sygan discharge qualifies for passive treatment.



In accordance with Title 25, §89.52(f)(3), a passive treatment system authorized under Title 25, §89.52 (f)(2) “shall comply with the following effluent requirements:

- (i) The system shall reduce the iron concentration by at least 90% or by that percentage necessary to achieve the Group A effluent requirements in subsection (c), whichever percentage is less.
- (ii) The system shall produce an effluent alkalinity which exceeds effluent acidity.”

Note: Title 25, §89.52(c) Group A effluent limitations:

- Applicable at all times: 6.0<pH<9.0; alkalinity>acidity
- 30-day average/daily maximum/instantaneous maximum (mg/L): total iron 3.0/6.0/7.0; total manganese 2.0/4.0/5.0; suspended solids 35/70/90

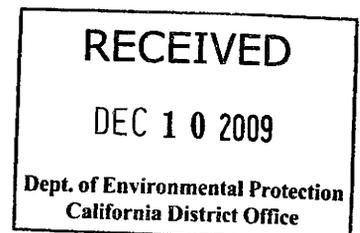
An example of a passive system built and operated to treat an abandoned mine discharge in the Chartiers Creek Watershed with a much higher flow rate and somewhat higher iron loading than the Presto-Sygan AMD is the recently-constructed Wingfield Pines Passive Treatment System. As discussed in Item 8 of the response to the California District Office 5/14/09 comments, the Wingfield Pines PTS (funded by a PA DEP Growing Greener Grant) was designed by Hedin Environmental, Inc. with system construction, wetland planting, and site revegetation by Quality Aggregates Inc. and BioMost, Inc. Recent selected monitoring data are shown in the following table: (Data from current and future monitoring events are to be available online at www.datashed.org.)

Wingfield Pines Passive Treatment System (monitoring date: 9/8/09)

Point	Flow (gpm)	pH (field)	Alk. (field) (mg/L)	Acid (mg/L)	TFe (mg/L)	TMn (mg/L)	TAI (mg/L)
Influent	1433	6.66	401	-386	12.3	0.3	<0.04
Effluent		7.54	361	-388	0.2	<0.1	<0.04

Total iron (TFe); total manganese (TMn); total aluminum (TAI)

Even though the proposed passive system is a viable option, further review of conventional treatment technology is being completed in order to propose the most suitable system based upon consistently meeting the long-term treatment goals, characteristics of the available construction area, compatibility of monitoring, operation, and maintenance requirements with land use, and economic feasibility.





**Module 1: Application For Bituminous Underground Mine,
Coal Preparation Plant and/or Coal Refuse Disposal Area**

Before completing this form, read the step-by-step instructions provided with this Permit Application Package.

SECTION A. PROJECT INFORMATION			
Operation Name: <u>Bailey Central Mine Complex</u> <u>Coal Refuse Disposal Area No. 5.</u>		Permit No. (existing site): <u>30080701</u> <i>(Application No)</i>	
SECTION B. APPLICANT INFORMATION			
Applicant Name <u>Consol Pennsylvania Coal Company LLC (CPCC)</u>		Applicant Type <input type="checkbox"/> Individual <input type="checkbox"/> PA Corporation <input type="checkbox"/> Non-PA Corporation <input type="checkbox"/> General Partnership <input type="checkbox"/> Limited Partnership <input type="checkbox"/> Municipality <input checked="" type="checkbox"/> Other	
Mailing Address <u>1525 Pleasant Grove Road, P.O. Box J</u> <small>(Street # and Name or P.O. Box)</small>			
<u>Claysville</u> <small>(City)</small>	<u>PA</u> <small>(State)</small>	<u>15243</u> <small>(Zip Code + Four)</small>	Pending
<u>724-663-3034</u> <small>(Telephone #)</small>	<u>724-663-3067</u> <small>(FAX #)</small>	- VOLUNTARY - <small>(Social Security Number) (if individual)</small>	<u>20-8732852</u> <small>(Federal Tax ID #)</small>
			<u>20059</u> <small>(Mining Operators License #)</small>
Application Contact <u>Suter</u> <u>Ed</u> <small>(Last Name) (First Name) (MI) (Social Security #)</small>		Type of Mining Activity <input type="checkbox"/> Underground Mine <input type="checkbox"/> Coal Preparation <input checked="" type="checkbox"/> Refuse Disposal <input type="checkbox"/> Refuse Reprocessing Blasting Anticipated <input checked="" type="checkbox"/> <input type="checkbox"/>	
<u>Project Consultant</u> <small>(Title)</small>			
Mailing Address <u>1525 Pleasant Grove Road, PO Box J</u> <small>(Street # and Name or P.O. Box)</small>			
<u>Claysville</u> <small>(City)</small>	<u>PA</u> <small>(State)</small>	<u>15323</u> <small>(Zip Code + Four)</small>	
Application Type <input type="checkbox"/> New Permit <input checked="" type="checkbox"/> Permit Revision <input type="checkbox"/> Permit Transfer <input type="checkbox"/> Renewal			
Permit Revision Description: <u>The proposed Coal Refuse Disposal Area No. 5 Impoundment Area adds 414.8 acres to the previously submitted 91.5 acres Sediment Pond Development Area site.</u>			

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see from PA DEP, mining 1-1

SECTION C. SITE INFORMATION

Location of Operation – for underground mines provide main portal location

County(ies) Greene Municipality(ies) Richhill Township County Code 30

U.S.G.S. Map Name(s) Wind Ridge, PA

Map Coordinates (center of proposed permit area) (center of main portal for underground mines)

Latitude 39° 57' 15" Longitude 80° 24' 36"

Name(s) of receiving stream(s)/Chapter 93 Classification

Unnamed Tributary to Owens Run (WWF)

MSHA Mine I.D. No. (include date of issuance) 36-07230 (10/01/81)

Site Contact

Bogden (Last Name) Brian (First Name) (MI)

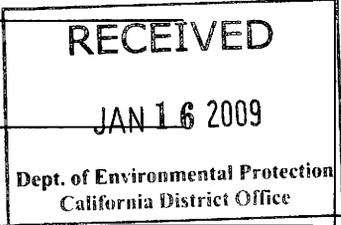
Environmental Engineer (Title)

Mailing Address

1525 Pleasant Grove Road (Street # and Name or P.O. Box)

Claysville (City) PA (State) 15323 (Zip Code + Four)

brianbogden@consolenergy.com (E-mail) (724) 663-3065 (Telephone #) Ext. 724-663-3067 (FAX #)



Extent of Mining	Permitted	Proposed under this application.	Total
Coal Preparation Activity Area	_____ acres	_____ acres	_____ acres
Coal Refuse Disposal Area	_____ acres	<u>375.0</u> acres	<u>375.0</u> acres
Coal Refuse Reprocessing Area	_____ acres	_____ acres	_____ acres
Support Area – Disposal/Reprocessing	<u>** 91.5</u> acres	<u>39.8</u> acres	<u>131.3</u> acres
Total Refuse Area, plus Support Area	<u>** 91.5</u> acres	<u>414.8</u> acres	<u>506.3</u> acres
Underground Mines:	_____ acres	_____ acres	_____ acres
Underground Permit Area	_____ acres	_____ acres	_____ acres
Subsidence Control Plan Area	_____ acres	_____ acres	_____ acres
Surface Activity Sites (List Individually with Site Area Acreage)	_____ acres	_____ acres	_____ acres
** Includes Pending Sediment Pond Development Application No. 30080701	_____ acres	_____ acres	_____ acres
Total Surface Activity Site Acres	<u>** 91.5</u> acres	<u>506.3</u> acres	<u>506.3</u> acres

SECTION C. SITE INFORMATION (continued)

Comments:

SECTION D. PERMIT COORDINATION

Will underground tanks for storage of fuel or chemicals be located within the proposed permit area? Yes No
 (if Yes, please complete Module 10.8)

SECTION E. APPLICATION FEE

Application Fee (make check payable to "Commonwealth of Pennsylvania")

	Quantity		
<input type="checkbox"/>	_____	\$ _____	NPDES (\$250)
<input type="checkbox"/>	_____	\$ _____	General Permit BAQ-GPA/GP 12 (\$1,000)
<input type="checkbox"/>	_____	\$ _____	Mining activity (underground and/or coal preparation) (\$250)
<input checked="" type="checkbox"/>	<u>414.8</u>	<u>\$ 4,148</u>	Refuse Disposal (\$500 + \$10 acre for every acre over 50)
<input checked="" type="checkbox"/>	<u>2</u>	<u>\$ 700</u>	Stream Enclosure (\$350/enclosure)*
<input type="checkbox"/>	_____	\$ _____	Stream Channel Change or Stream Restoration Area (\$300/each)*
<input type="checkbox"/>	_____	\$ _____	Bridge, water obstruction or encroachment in a stream or floodway with a drainage area larger than 100 acres (\$200 each)*
<input type="checkbox"/>	_____	\$ _____	Small project as defined in 25 Pa Code Section 105.1 (\$100 each)*
		<u>\$ 4,848</u>	Total Application Fee

(* if less than 100 acres, no fee is required.)

SECTION F. CONSULTANT

(if more than one consultant prepared this application provide information on separate sheets)

See attached sheets 1-6 & 1-7

(Last Name)

(First Name)

(Title)

(Name of Consulting Firm)

Mailing Address

(Street # and Name or P.O. Box)

(City)

(State)

(Zip Code + Four)

()

Ext.

(E-mail)

(Telephone #)

(FAX #)

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California District Office

SECTION G. LAND USE INFORMATION

Have you submitted local municipal and county approval letters for this mining project with this permit application? Yes No

List the municipality(ies) and county(ies) that received the approval letters:

If "no," respond to the following additional questions:

- 1. Is there a municipal comprehensive plan? Yes No
- 2. Is there a county comprehensive plan? Yes No
- 3. Is there a multi-municipal or multi-county comprehensive plan? Yes No
- 4. Is the proposed project consistent with these plans? Yes No
(If no plans exist, answer "yes.")
- 5. Is there a municipal zoning ordinance? Yes No
- 6. Is there a joint municipal zoning ordinance? Yes No
- 7. Will the proposed project require a zoning approval? (e.g., special exception, conditional approval, rezoning, variance). (If zoning approval has already been received, attach documentation.) Yes No
- 8. Are any zoning ordinances that are applicable to this project currently subject to any type of legal proceeding? Yes No
- 9. Will the project be located on a site that is being remediated under DEP's Land Recycling Program? Yes No
- 10. Will the project result in reclamation of abandoned mine lands through remining or as part of DEP's RECLAIM PA Program? Yes No
- 11. Will the project be located in an agricultural security area or an area protected under an agricultural conservation easement? Yes No
- 12. Will the project be located in a Keystone Opportunity Zone or Enterprise Development Area? Yes No
- 13. Will the project be located in a Designated Growth Area as defined by the Municipalities Planning Code? Yes No

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

SECTION H. ADDITIONAL RELATED INFORMATION

Name and Address of Public Review Office where a copy of this application is on file for public review. (reference Appendix B if appropriate)

**Pennsylvania Department of Environmental Protection
California District Office
25 Technology Drive
California Technology Park
Coal Center, Pennsylvania 15423**

**Greene County Conservation District
Fort Jackson Building, Mezzanine
19 South Washington Street
Waynesburg, PA 15370**

Have you paid all reclamation fees to the Federal Office of Surface Mining Reclamation and Enforcement as required by the Federal Surface Mining Control and Reclamation Act of 1977 (30 USC 1232)? Yes No

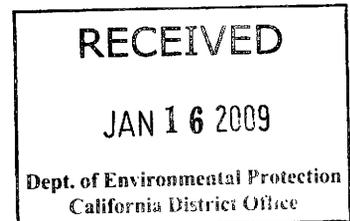
Provide the following as applicable to the proposed operation:

Pre-Application No. _____
Small Operator Assistance Program (SOAP) Project No. _____
Notice of Intent to Explore No. _____

PNDI – Search results Yes No (if yes, complete Module 4.7)

Environmental Justice Areas Yes No

(if yes, provide plan for enhanced public participation) **Will provide plan upon request.**



Application Date January 16, 2009

SECTION I. AFFIDAVIT

Commonwealth of Pennsylvania, County of ~~Allegheny~~ Washington

I, Jonathan M. Pachter being duly sworn, according to law, depose and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Sworn and Subscribed to Before Me This

9th day of January 2009
(month) (year)

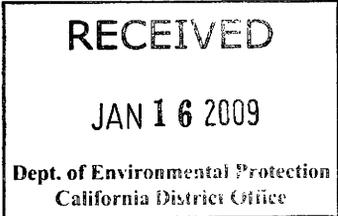
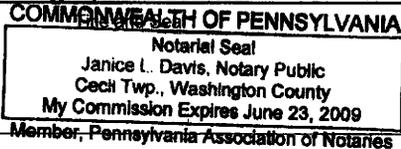
Jonathan M. Pachter
Signature of Applicant or Responsible Official

Janice L. Davis
Notary Public

Jonathan M. Pachter
Name (Typed)

CNX Center, 1000 CONSOL Energy Drive
Canonsburg, PA 15317
Address

General Manager, Environmental Services

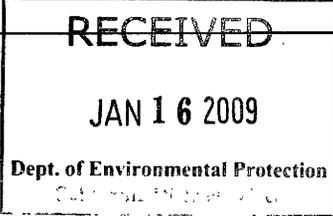


Section F – Consultant Listing

SECTION F. CONSULTANT		
<u>Heilman</u> (Last Name)	<u>Gregory</u> (First Name)	<u>A.</u> (MI)
<u>Technical Consultant</u> (Title)	<u>Michael Baker Jr., Inc.</u> (Name of Consulting Firm)	
Mailing Address		
<u>Airside Business Park, 100 Airside Drive</u> (Street # and Name or P.O. Box)		
<u>Moon Township</u> (City)	<u>PA</u> (State)	<u>15108</u> (Zip Code + Four)
<u>gheilman@mbakercorp.com</u> (E-mail)	<u>(412) 269-6096</u> (Telephone #)	<u>(412) 375-3986</u> (FAX #)

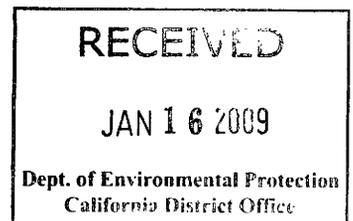
SECTION F. CONSULTANT		
<u>Lewis</u> (Last Name)	<u>Christopher</u> (First Name)	<u>J</u> (MI)
<u>Principal Engineer</u> (Title)	<u>D'Appolonia Engineering</u> (Name of Consulting Firm)	
Mailing Address		
<u>275 Center Road</u> (Street # and Name or P.O. Box)		
<u>Monroeville</u> (City)	<u>PA</u> (State)	<u>15146-1451</u> (Zip Code + Four)
<u>cilewis@dappolinia.com</u> (E-mail)	<u>412 856-9440</u> (Telephone #)	<u>412-856-9535</u> (FAX #)

SECTION F. CONSULTANT		
<u>Shema</u> (Last Name)	<u>Mike</u> (First Name)	<u>L</u> (MI)
<u>Project Manager</u> (Title)	<u>Civil & Environmental Consultants, Inc.</u> (Name of Consulting Firm)	
Mailing Address		
<u>333 Baldwin Road</u> (Street # and Name or P.O. Box)		
<u>Pittsburgh</u> (City)	<u>PA</u> (State)	<u>15205-9702</u> (Zip Code + Four)
<u>mshema@cecinc.com</u> (E-mail)	<u>(412) 429-2324</u> (Telephone #)	<u>(412) 429-2114</u> (FAX #)



Section F – Consultant Listing (Cont.)

SECTION F. CONSULTANT		
<u>Freeman</u> (Last Name)	<u>Heather</u> (First Name) <u> </u> (MI)	
<u>Geologist</u> (Title)	<u>Moody and Associates, Inc</u> (Name of Consulting Firm)	
Mailing Address		
<u>199 Johnson Rd, Bldg 2, Suite 101</u>		
(Street # and Name or P.O. Box)		
<u>Houston</u>	<u>PA</u>	<u>15342</u>
(City)	(State)	(Zip Code + Four)
<u>hfreeman@moody-s.com</u>	<u>724 746-5200</u>	<u>724-746-5603</u>
(E-mail)	(Telephone #)	(FAX #)



Module 2: General Information

Check those modules included in this application (submit only those which apply). See Appendix D of the instructions for modules and documents required for permit transfer, name changes, and ownership changes.

				Date of Last	
Yes	No			Module	Revision
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1:	Application	1	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2:	General Information	2	10/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3:	Ownership/Compliance Information	3	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4:	Areas Where Mining is Prohibited or Restricted	4	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5:	Property Interests/Right of Entry	5	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6:	Environmental Resource Maps	6	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	7:	Geologic Information	7	10/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8:	Hydrology/Baseline Biology	8	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9:	Operations Maps - Surface Activity Sites	9	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10:	Operation Plan	10	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11:	Erosion and Sedimentation Controls	11	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	12:	Treatment Systems	12	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13:	Impoundments	13	10/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14:	Liners and Caps	14	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15:	Streams/Wetlands	15	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	16:	Air Quality and Noise Control	16	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17:	Soils/Prime Farmland	17	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18:	Land Use/Reclamation	18	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	19:	Reclamation Schedule and Cost Information	19	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	20:	Coal Refuse/Coal Ash - Sources and Properties	20	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	21:	Coal Refuse Construction Plans	21	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	22:	Subsidence Control and Underground Mine Maps	22	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	23:	Mine Openings	23	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	24:	Special Protection Waters	24	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	25:	Coal Ash Beneficial Use	25	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	26:	Remining of Areas with Preexisting Pollutational Discharges	26	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	27:	Biosolids/Coal Ash Beneficial Use	27	9/2008
<input checked="" type="checkbox"/>	<input type="checkbox"/>	28:	Blasting Plan	28	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	29:	Disposal of Excess Spoil	29	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	30:	Underground Disposal/Backstowing	30	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	31:	In Situ Processing	31	9/2008
<input type="checkbox"/>	<input checked="" type="checkbox"/>	32:	Surface Site Stability	32	10/2008

- Has a check, payable to the Commonwealth of Pennsylvania for the proper amount, been included? Yes No
- Has the application been properly executed and if a corporation, the corporate seal affixed? Yes No
- Is a copy of the public notice attached to this module? Yes No

(The notice must indicate whether the application is for a new permit, permit revision, permit renewal or permit transfer, and specifically reference areas to be affected by both surface and underground operations, stream variances, stream crossings, stream channel changes, streambed deformation and dewatered stream restoration, road variances, blasting, fly ash deposition and land use changes.)

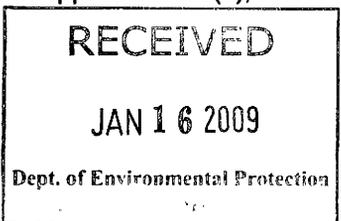
(Example Public Notices are included in the Instructions as Appendix F (deep mines and prep plants) and Appendix G (coal refuse)).

Have arrangements been made to publish public notice of this application? (Proof of publication must be submitted to the Department upon completion of the publication requirements.) See Appendix E of the Instructions for information regarding permit type vs. public notice and proof of publication requirements. Yes No

Has documentation been provided indicating that the advertisement requirement of §86.31(a) is in the process of being satisfied? (Intent to publish requirement, 86.70) Yes No

I do hereby certify that this application includes: all of the modules checked above; payment of application fee(s), and all other information as noted above.

Jonathan M. Pachter
Signature of Applicant or Responsible Official



PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

The application, plans, reports and specifications shall be certified by a licensed professional engineer, licensed professional geologist or licensed land surveyor, as appropriate. Certain items, such as; haul road design (87.160, 89.26, 90.134), stream channel diversions (87.104, 90.105), dams and impoundments (87.73, 87.112, 90.39, 80.112, 89.101), disposal of excess spoil (87.131), variance to contouring (87.175), subsidence control plan maps (89.154), and maps, plans, and cross sections (90.21, 90.46) require preparation and certification by specific professionals. Please review the appropriate sections of Chapters 86-90 to ensure compliance with these certification requirements.

Registered Professional Engineer

I, Gregory A. Heilman, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 6, 7.7-7.9, 9, 10, 15.1(b)-(c), 15.2(d)-(g), 15.2(i)-(l), 15.2(q), 16, 18, 19, and 28, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

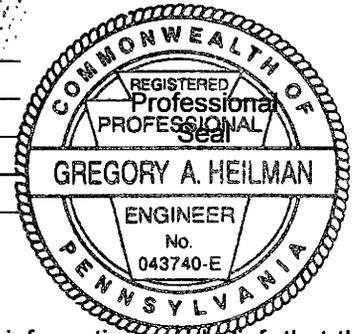
Michael Baker Jr., Inc.
Airside Business Park, 100 Airside Drive
Moon Township, PA 15108

Telephone No.

412-269-6096

Date

1/14/09



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Telephone No.

Date

Professional Seal

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Telephone No.

Date

Professional Seal

RECEIVED

JAN 16 2009

Dept. of Environmental Protection
California District Office

PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

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Registered Professional Engineer

I, Christopher J. Lewis, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 11, 13, 14, 20, 21, the Engineering Report, Calculation Brief, and Design Drawings, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Christopher J. Lewis

Address

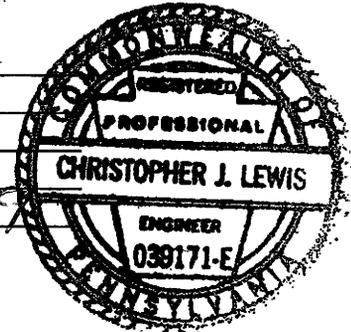
D'Appolonia Engineering
275 Center Road
Monroeville, PA 15146-1451

Telephone No.

412-856-9440

Date

JAN 7, 2009



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Telephone No.

Date

Professional Seal

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Telephone No.

Date

Professional Seal

RECEIVED

JAN 16 2009

Dept. of Environmental Protection

PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

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Registered Professional Engineer

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

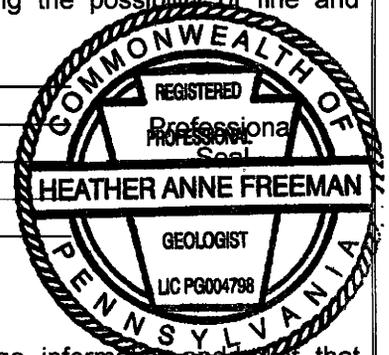
Signature _____
 Address _____
 Telephone No. _____ Date _____

Professional Seal

Registered Professional Geologist

I, Heather A. Freeman do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 7.1 - 7.6, 8.1-8.8, 8.9(a),(e),(f), and 8.13-8.16, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature Heather A. Freeman
 Address Moody and Associates
199 Johnson Road
Houston, PA 15342
 Telephone No. 724-746-5200 Date 1-9-09

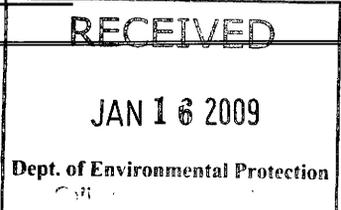


Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____
 Telephone No. _____ Date _____

Professional Seal



PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

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Registered Professional Engineer

I, Kenneth R. Miller, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Module 15 - exclusive of 15.1(b)-(c), 15.2(d)-(g), 15.2(i)-(l), and 15.2(g), and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature



Address

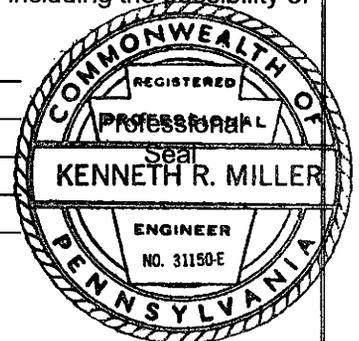
Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205

Telephone No.

412-429-2324

Date

1/12/09



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature

Address

Professional Seal

Telephone No.

Date

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

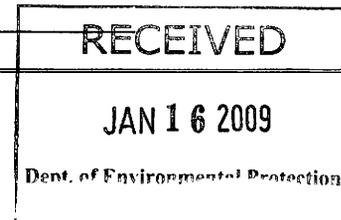
Signature

Address

Professional Seal

Telephone No.

Date



PUBLIC NOTICE

RECEIVED
JAN 16 2009
Dept. of Environmental Protection
Office of Environmental Policy

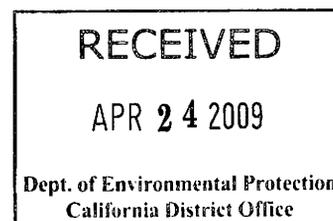
PUBLIC NOTICE

Pursuant to the Pennsylvania Clean Stream Law, the Pennsylvania Department of Environmental Protection rules and regulations, the Surface Mining Conservation and Reclamation Act and the Coal Refuse Disposal Control Act as amended, notice is hereby given that Consol Pennsylvania Coal Company LLC, doing business at 1525 Pleasant Grove Road, PO Box J, Claysville, PA, 15243, has made application to the Pennsylvania Department of Environmental Protection to permit a new coal refuse slurry impoundment at the Bailey Central Mine Complex Coal Refuse Disposal Area No. 5.

The proposed project will add approximately 414.8 acres of permit area to the previously submitted application for sediment pond development (Application Number 30080701). The facility will be located in Richhill Township, Greene County; northeast of S.R. 4007 (Ackley Creek Road), south of the existing Bailey Central Mine Complex, and at least 1,500 feet northwest of Fletcher Run Road (T-370). The proposed additional area extends approximately 7,600 feet to the northeast from a point approximately 1,700 feet northwest of the S.R. 4007/Day Lane intersection; then approximately 1,500 feet northwest; then approximately 6,000 feet west; then approximately 2,100 feet south, then approximately 1,900 feet southeast, then approximately 2,200 feet southwest, then approximately 1,000 feet southeast to the starting point. The proposed permit area is located on the Wind Ridge, PA U.S. Geological Survey 7.5 minute topographic map.

Stream variance requests are proposed for 5,408 feet of Unnamed Tributary 32705 to Owens Run beginning approximately 2,500 feet upstream of its confluence with Owens Run (located 0.58 miles northwest of the S.R. 4007/Day Lane intersection) and extending northeast through the proposed site; and 7,751 feet of 24 other Unnamed Tributaries to Owens Run that flow into Unnamed Tributary 32705 to Owens Run along this reach. Stream variance requests are also proposed for 3,287 feet of Unnamed Tributary 32706 to Owens Run beginning at its confluence with Unnamed Tributary 32705 to Owens Run and extending north through the proposed site; and 3,669 feet of 15 other Unnamed Tributaries to Owens Run that flow into Unnamed Tributary 32706 along this reach. The stream variances are required for grading activities and construction of the slurry impoundment.

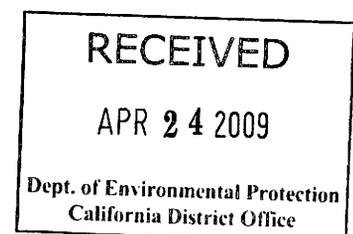
Blasting may be conducted during site grading activities. Blasting will not occur until a plan has been approved by the PADEP. When a blasting schedule is finalized, residents, owners of dwellings or other structures, local governments and public utilities located within ½ mile of the



area where blasting will occur will be notified. All residents, owners of dwellings or other structures located within ½ mile of the area where blasting will occur will be informed of their right to a pre-blast survey and how they may request such a survey.

Copies of the application are available for public inspection, and copying for a fee, by appointment at the Pennsylvania Department of Environmental Protection, California District Mining Office, 25 Technology Drive, California Technology Park, Coal Center, PA 15423 (telephone number: 724-769-1100) and at the Greene County Conservation District, Fort Jackson Building, Mezzanine, 19 South Washington Street, Waynesburg, PA 15370 (telephone number: 724-852-5278).

Written comments, objections, or a request for an informal conference may be submitted to the Department of Environmental Protection, District Mining Operations, at the above address, no later than thirty (30) days following the final publication date of this notice.



Module 6: Environmental Resource Maps

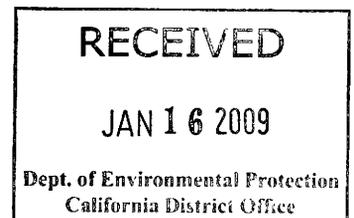
Instructions: Information submitted under this Module must be certified by a licensed professional engineer, licensed professional land surveyor, or a licensed professional geologist.

6.1 Location Map

Provide a 7.5 Minute USGS map covering the area within one (1) mile of the site boundaries (underground permit area boundaries in the case of an underground mine). Show the following information, highlighting any features which are newly proposed under a permit revision. Identify the map as Exhibit 6.1.

Refer to Exhibit 6.1.

- a. Boundaries of surface mining activity site(s).
- b. Boundaries of underground permit area.
- c. Roads covered under permit.
- d. Mine openings and boreholes.
- e. Springs, water wells, and surface water intakes which are sources to public water supply systems.
- f. Outlines of areas designated unsuitable for mining or under petition for such designation.
- g. State and public parks.
- h. Point source discharges associated with the proposed mining operation.
- i. Existing and proposed stream restoration boundary limits.



Module 10: Operation Plan

This Module is designed so that it can be used for new permit applications and permit revision applications. When using it to complete a revision application, the responses may reference the original approved application or be worded to apply specifically to the new activity or site being proposed. Information submitted under this Module must be certified by a licensed professional engineer.

10.1 Description of Operations

- a. Provide a description of operations that will take place under this permit.

This application is for construction and operation of a slurry impoundment at the Bailey Central Mine Complex. The permit application will add 414.8 acres to the previously submitted Coal Refuse Disposal Area (CRDA) No. 5 sediment pond development permit application (Application No. 30080701). The proposed slurry impoundment includes a dam comprised of coarse coal refuse. Fine coal refuse slurry will be disposed within the reservoir contained by the dam. Ancillary facilities; including erosion and sediment control structures, haul roads, and soil stockpiles will also be developed and operated within the proposed permit area.

A part of the existing No. 1 Airshaft permit boundary overlaps the proposed impoundment area permit. CPCC is proposing to 'double count' this area in both permits until such time as the No. 1 Airshaft has been eliminated and the permit area has been removed from Permit No. 30841316. In addition, some of the work proposed with this application will extend onto the adjacent CRDA No. 1 permit area (Permit no. 30810703). These permit areas are shown on Exhibits 6.2, 9.1 and 18.1 as well as on the Design Drawings.

- i. If the operation involves underground mining, describe the method of mining (longwall, room and pillar, etc.); the estimated life of the mine; the type of haulage and underground machinery; the maximum number of working faces; the anticipated annual production in tons; the anticipated underground acreage that will be affected each year; surface activity sites and the activities which will take place at each (coal storage, ventilation, rock dust transport, etc.); the means by which coal will be transported from the operation; and the system that will be used to convey mine drainage to treatment. If mining will re-affect existing workings, identify the company that developed those workings and the time frame during which that mining took place.

Not applicable.

- ii. If the operation involves coal preparation, describe the estimated life of the operation; the types of processing equipment used; media used in separation processes; chemical treatment of coal or refuse; source and quality of make-up water; the means by which coal will be transported to and from site; and whether the facilities are designed to recirculate or discharge water from the coal preparation circuit.

Not applicable.

- iii. If the operation involves coal refuse disposal:

- (1) Describe the type of operation (head of hollow fill, cross valley embankment, side hill embankment, ridge embankment, heaped embankment, surface mine backfill, disposal into underground mine workings, etc.); the estimated life of the operation; the type of equipment which will be used to handle and compact refuse; the systems that will be used to monitor, collect, manage and treat runoff and leachate; and any chemical treatment to which refuse will be subjected (surfactants, bactericides, alkalizing agents, etc.)

Description of Operation: Coal Refuse Disposal Area No. 5 will be a valley fill. It has been designed to provide permanent disposal of coarse coal refuse (CCR) and fine coal refuse (slurry) generated by the Bailey Central Mine Complex preparation plant. Coarse coal refuse will be placed in embankments constructed across the valley to form an impoundment. Fine coal refuse will be pumped into the impoundment area by water slurry techniques. Slurry will be discharged along the



upstream face of the dam. A pump will be installed in the main impoundment area to recirculate water to the preparation plant and to maintain the normal pool level below the active principal spillway riser. Passive control of the impoundment pool level is provided by a permanent principal spillway system that will discharge into the main sediment pond.

Surface water management will be controlled by a system of drains and ditches, and the main sediment pond (submitted with a previous permit application). Rock drains will be constructed in the existing stream channels to carry stream base flow under the disposal facility. The rock drains will discharge into the main sediment pond. Springs intercepted at the subgrade of the impounding structures and the liner subgrade will be drained to the rock drains. A liner will be constructed over the rock/spring drainage system to reduce infiltration to the drains from above.

Life of the Operation: The proposed slurry impoundment will provide for approximately 52,700,00 cubic yards of CCR disposal and 38,000,000 cubic yards of fine coal refuse disposal over 13 and 7.5 years, respectively.

Coarse Coal Refuse Handling and Compaction Equipment: CCR will be delivered to the refuse disposal area by a network of conveyor beltlines and off-road scrapers and/or off-road haul trucks. CCR will be spread in horizontal to nearly horizontal lifts with haulage equipment (scrapers) and/or bulldozers.

Runoff/Leachate Management & Treatment: Runoff from the impoundment will be collected in ditches and conveyed to the main sediment pond. All runoff will pass through the main sediment pond and then will discharge into UT 32705 to Owens Run.

The dams will be provided with an internal drainage system to control seepage. Seepage collected by the internal drainage systems will be conveyed to the main sediment pond. Sediment Pond discharges will be sampled and tested in accordance with NPDES criteria. The hydrologic monitoring plan outlined under Module 8 also will be implemented to monitor facility performance.

- (2) If the operation does not involve disposal in abandoned, inactive or active underground mine or in abandoned or unreclaimed surface mines, outline the technical, economic and safety considerations prohibiting such disposal.

Refer to the report entitled, *Bailey Central Mine Complex, Greene County, Pennsylvania, Alternative Analysis & Site Selection Study for New Coal Refuse Disposal Area No. 5*, that was submitted to the PADEP California District Mining Office and was approved on April 21, 2008. This report demonstrates that there are no preferred sites (i.e., abandoned or unreclaimed surface mines) in the area and that due to operational, technology, safety, and economic concerns, use of underground mines for refuse disposal is not feasible.

- b. If the operation will involve the discharge of coal processing wastes, underground mine development wastes, coal ash, mine drainage treatment sludge, flue gas desulfurization sludge, or inert stabilizing materials to underground workings:
- c. Describe the nature of the material to be discharged, the system which will be used to convey the material to the point of discharge, and the means of controlling the material within the underground workings.

Not applicable.

- d. If the operation will include the use of fly ash or bio-solids, describe the purpose for which the material will be used and the site(s) on which it will be used.

Not applicable.

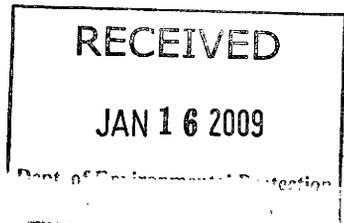




EXHIBIT 6.1 - LOCATION MAP
CONSOL PENNSYLVANIA COAL COMPANY LLC
BAILEY MINE
PITTSBURGH No. 8 COAL SEAM

GREENE & WASHINGTON COUNTIES, PA.
 ALEPPD, GRAY, MORRIS & RICHHILL TOWNSHIPS, GREENE COUNTY
 WEST FINLEY TOWNSHIP, WASHINGTON COUNTY
 MINING ACTIVITY PERMIT No. 30841316
 AND COAL REFUSE DISPOSAL AREA PERMIT No's. 30810703 & 30020701

● BOREHOLES SEALED - REMOVED FROM PERMIT AREA	▲ AIRSHAFT
○ BOREHOLES NOT INSTALLED - REMOVED FROM PERMIT AREA	▼ NPDES OUTLET
⊗ BOREHOLES (DRILLED, SEALED, PROPOSED)	▲ NON COMMUNITY PUBLIC WATER SUPPLY
— MINE PERMIT AREA BOUNDARY	
- - - ENLOW FORK MINE CMAP	

APPROXIMATE PERMIT AREA
 MAIN SURFACE ACTIVITY SITES
 PENDING UNDERGROUND PERMIT & SCPA (DEVELOPMENT ONLY)
 PROPOSED REVISION

SCALE 1" = 2000'
 BASE MAP CONTOUR INTERVALS = 20 FT.

12/08 ES/08

I, the undersigned, hereby certify to the best of my knowledge and belief, the data shown on this map are accurate and show all of the following:

12/16/08
 Date

Greg Heilman
 Registered Professional Engineer
 No. 043740-E
 State of Pennsylvania

RECEIVED
 DEPT. OF ENVIRONMENTAL PROTECTION
 12/16/08



RECEIVED
APR 24 2009
Dept. of Environmental Protection
Caldwell Tower Office

EXHIBIT 6.1 - LOCATION MAP
CONSOL PENNSYLVANIA COAL COMPANY LLC
BAILEY MINE
PITTSBURGH No. 8 COAL SEAM

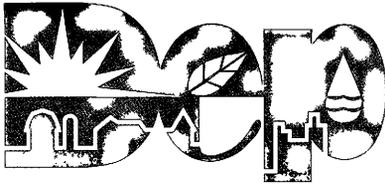
GREENE & WASHINGTON COUNTIES, PA.
 ALEPPD, GRAY, MORRIS & RICH HILL TOWNSHIPS, GREENE COUNTY
 WEST FINLEY TOWNSHIP, WASHINGTON COUNTY
 MINING ACTIVITY PERMIT No. 30841316
 AND COAL REFUSE DISPOSAL AREA PERMIT No's. 30810703 & 30020701

●	BOREHOLES SEALED - REMOVED FROM PERMIT AREA	▲	AIRSHAFT
○	BOREHOLES NOT INSTALLED - REMOVED FROM PERMIT AREA	▲	NON COMMUNITY PUBLIC WATER SUPPLY
⊙	BOREHOLES (DRILLED, SEALED, PROPOSED)		
—	MINE PERMIT AREA BOUNDARY		
—	ENLOW FORK MINE CMAP		
▨	APPROXIMATE PERMIT AREA MAIN SURFACE ACTIVITY SITES		
▨	PROPOSED REVISION		
▨	PENDING REVISION 10.G.1		

4/09 ES/08

I, the undersigned, hereby certify that the information shown on this map is the best of my knowledge and belief, the additional information required by the Department of Environmental Protection are accurate and show all of the information required.

Registered Professional Engineer
 No. 4172-09
 Date



Pennsylvania Department of Environmental Protection

25 Technology Drive
California Technology Park
Coal Center, PA 15423
February 23, 2009

California District Office

724-769-1100

Marcia Haberman
U. S. Army Corps of Engineers
Pittsburgh District
William S. Moorehead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

Re: CMAP No. 30080701
Company: Consol Pennsylvania Coal Company LLC
Operation: Bailey Central Mine Complex-Coal Refuse Disposal Area No. 5
Purpose: New Coal Refuse Permit-Sediment Pond Development
Township: Richhill
County: Greene
Acceptance Date: February 18, 2009

Dear Ms. Haberman:

Enclosed is information concerning the referenced coal mining activity within your jurisdiction. We have begun our review of this application and would appreciate your comments, including any supporting data, to assist us in our review.

We would like your comments within thirty (30) days because our review time frame is very tight. Please include the above referenced CMAP#, Company & Operation name, Purpose, and Acceptance Date in your comments.

This notification is sent to you pursuant to the Clean Streams Law and the Department's coal mining rules and regulations.

JKERNIC STATE, PA. US

Sincerely,

John D. Kernic SA

John D. Kernic
Hydrogeologist
District Mining Operations

Enclosure

2009 FEB 23 11:19 AM

2007-00463

MARCIA

www.dep.state.pa.us

Printed on Recycled Paper





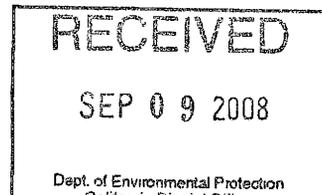
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF MINING AND RECLAMATION

DEP USE ONLY	
Date Received	9-9-2008
Permit Number	30080701

**MODULE 1: APPLICATION FOR BITUMINOUS UNDERGROUND MINE,
COAL PREPARATION PLANT AND/OR COAL REFUSE DISPOSAL AREA**

Before completing this form, read the step-by-step instructions provided with this Permit Application Package.

SECTION A. PROJECT INFORMATION			
Operation Name: <i>Bailey Central Mine Complex</i>		Permit No. (existing site):	
<i>Coal Refuse Disposal Area No. 5.</i>			
SECTION B. APPLICANT INFORMATION			
Applicant Name <i>Consol Pennsylvania Coal Company LLC (CPCC)</i>		Applicant Type <input type="checkbox"/> Individual <input type="checkbox"/> PA Corporation <input type="checkbox"/> Non-PA Corporation <input type="checkbox"/> General Partnership <input type="checkbox"/> Limited Partnership <input type="checkbox"/> Municipality <input checked="" type="checkbox"/> Other (LLC) <input type="checkbox"/> Pending	
Mailing Address <i>1525 Pleasant Grove Road, P.O. Box J</i> <small>(Street # and Name or P.O. Box)</small>			
<i>Claysville</i> <small>(City)</small>	<i>PA</i> <small>(State)</small>	<i>15243</i> <small>(Zip Code + Four)</small>	
<i>724-663-3034</i> <small>(Telephone #)</small>	<i>724-663-3067</i> <small>(FAX #)</small>	<i>- VOLUNTARY -</i> <small>(Social Security Number if individual)</small>	<i>20-8732852</i> <small>(Federal Tax ID #)</small>
Application Contact <i>Suter</i> (Last Name) <i>Ed</i> (First Name) (MI) (Social Security #) <i>Project Consultant</i> (Title)		Type of Mining Activity <input type="checkbox"/> Underground Mine <input type="checkbox"/> Coal Preparation <input checked="" type="checkbox"/> Refuse Disposal <input type="checkbox"/> Refuse Reprocessing Blasting Anticipated <input checked="" type="checkbox"/> <input type="checkbox"/>	
Mailing Address <i>1525 Pleasant Grove Road, PO Box J</i> <small>(Street # and Name or P.O. Box)</small>		Mining Operators License # <i>20059</i>	
<i>Claysville</i> <small>(City)</small>	<i>PA</i> <small>(State)</small>	<i>15323</i> <small>(Zip Code + Four)</small>	
Application Type <input checked="" type="checkbox"/> New Permit <input type="checkbox"/> Permit Revision <input type="checkbox"/> Permit Transfer <input type="checkbox"/> Renewal			
SECTION C. SITE INFORMATION			
Location of Operation – for underground mines provide main portal location			
<i>Greene</i> <small>County(ies)</small>	<i>Richhill Township</i> <small>Municipality(ies)</small>	<i>30</i> <small>County Code</small>	



SECTION C. (continued)

U.S.G.S. Map Name(s) Wind Ridge, PA

Map Coordinates (center of proposed permit area) (center of main portal for underground mines)

Latitude 39° 57' 15" Longitude 80° 24' 36"

Name(s) of receiving stream(s)/Chapter 93 Classification

Unnamed Tributary to Owens Run (WWF)

MSHA Mine I.D. No. (include date of issuance)

36-07230 10/01/81

Site Contact

Bogden

(Last Name)

Brian

(First Name)

(MI)

Environmental Engineer

(Title)

Mailing Address

1525 Pleasant Grove Road, PO Box J

(Street # and Name or P.O. Box)

Claysville

(City)

PA

(State)

15323

(Zip Code + Four)

brianbogden@consolenergy.com

(E-mail)

(724) 663-3065

(Telephone #)

Ext.

724-663-3067

(FAX #)

Extent of Mining

Coal Preparation Activity Area _____ acres

Coal Refuse Disposal Area _____ acres

Support Area – Disposal/Reprocessing 91.5 acres

Coal Refuse Reprocessing Area _____ acres

91.5 Total acres

Underground Mines:

Underground Permit Area _____ Acres

Subsidence Control Plan Area _____ acres

Surface Activity Sites (List Individually with Site Area Acreage)

_____ acres

_____ acres

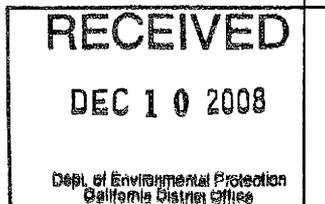
_____ acres

_____ acres

_____ acres

_____ acres

Total acres _____



SECTION D. PERMIT COORDINATION

1. If coal processing activities are proposed, will the total amount of coal processed be equal to or greater than 200 tons/day? **Not applicable. No coal processing activities are proposed with this application.** Yes No

2. Will underground tanks for storage of fuel or chemicals be located within the proposed permit area? Yes No

SECTION E. APPLICATION FEE

Application Fee (make check payable to "Commonwealth of Pennsylvania")

- \$ 250** NPDES (\$250)
- \$ Mining activity (underground and/or coal preparation) (\$250)
- \$ 915** Refuse Disposal (\$500 + \$10 acre for every acre over 50)
- \$ 700** Stream Enclosure (\$350/enclosure)
- \$ Stream Channel Change (\$300/change)
- \$ 200** Bridge, water obstruction or encroachment in a stream or floodway with a drainage area larger than 100 acres (\$200 each)
- \$ Small project as defined in 25 Pa Code Section 105.1 (\$100 each)
- \$ Dam with contributing drainage area of 100 acres or more, maximum water depth of 15 feet or more at maximum storage elevation or maximum impounding capacity of 50 acre-feet or more (\$1,500/dam)
- \$ 2,065** Total Application Fee

SECTION F. CONSULTANT (if more than one consultant prepared this application provide information on separate sheets)

See attached sheet 1-5

 (Last Name) (First Name) (MI)

 (Title) (Name of Consulting Firm)

Mailing Address

 (Street # and Name or P.O. Box)

 (City) (State) (Zip Code + Four)

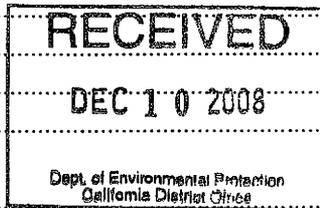
 (E-mail) (Telephone #) Ext. (FAX #)

SECTION G. LAND USE INFORMATION

Have you submitted local municipal and county approval letters for this mining project with this permit application? Yes No

If "no," respond to the following additional questions.

- 1. Is there a municipal comprehensive plan? Yes No
- 2. Is there a county comprehensive plan? Yes No
- 3. Is there a multi-municipal or multi-county comprehensive plan? Yes No
- 4. Is the proposed project consistent with these plans? Yes No
 If no plans exist, answer "yes."
- 5. Is there a municipal zoning ordinance? Yes No
- 6. Is there a joint municipal zoning ordinance? Yes No
- 7. Will the proposed project require a zoning approval (e.g., special exception, conditional approval, rezoning, variance?) If zoning approval has already been received, attach documentation? Yes No
- 8. Are any zoning ordinances that are applicable to this project currently subject to any type of legal proceeding?? Yes No
- 9. Will the project be located on a site that is being remediated under DEP's Land Recycling Program? Yes No



SECTION G. LAND USE INFORMATION (Continued)

- 10. Will the project result in reclamation of abandoned mine lands through re-mining or as part of DEP's RECLAIM PA Program? Yes No
- 11. Will the project be located in an agricultural security area or an area protected under an agricultural conservation easement? Yes No
- 12. Will the project be located in a Keystone Opportunity Zone or Enterprise Development Area?..... Yes No
- 13. Will the project be located in a Designated Growth Area as defined by the Municipalities Planning Code? Yes No

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

SECTION H. ADDITIONAL RELATED INFORMATION

Name and Address of Public Review Office where a copy of this application is on file for public review. (reference Appendix B if appropriate)

**Pennsylvania Department of Environmental Protection
California District Office
25 Technology Drive
California Technology Park
Coal Center, Pennsylvania 15423**

**Greene County Conservation District
Fort Jackson Building, Mezzanine
19 South Washington Street
Waynesburg, PA 15370**

Have you paid all reclamation fees to the Federal Office of Surface Mining Reclamation and Enforcement as required by the Federal Surface Mining Control and Reclamation Act of 1977 (30 USC 1232)? Yes No

Provide the following (if applicable to this proposed operation):

Pre-Application No. _____
Small Operator Assistance Program (SOAP) Project No. _____
Notice of Intent to Explore No. _____

Application Date September 5, 2008

SECTION I. AFFIDAVIT

Commonwealth of Pennsylvania, County of Allegheny

I, Jonathan M. Pachter being duly sworn, according to law, depose and say that I (am the applicant) (am an officer or official of the applicant) (have the authority to make this application) and that the plans, reports and documents submitted as part of the application are true and correct to the best of my knowledge and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Sworn and Subscribed to Before Me This

28th. Day of August 2008
(month) (year)

Jonathan M. Pachter
Signature of Applicant or Responsible Official

Janice L. Davis
Notary Public

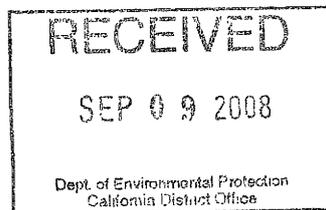
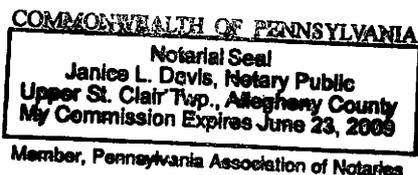
Jonathan M. Pachter
Name (Typed)

General Manager, Environmental Services

**CNX Center, 1000 CONSOL Energy Drive
Canonsburg, PA 15317**

Title and Seal

Address



Section F – Consultant Listing

SECTION F. CONSULTANT

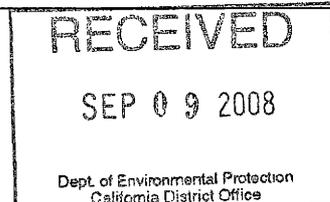
<u>Heilman</u> (Last Name)	<u>Gregory</u> (First Name)	<u>A.</u> (MI)
<u>Technical Consultant</u> (Title)	<u>Michael Baker Jr., Inc.</u> (Name of Consulting Firm)	
Mailing Address <u>Airside Business Park, 100 Airside Drive</u> (Street # and Name or P.O. Box)		
<u>Moon Township</u> (City)	<u>PA</u> (State)	<u>15108</u> (Zip Code + Four)
<u>gheilman@mbakercorp.com</u> (E-mail)	<u>(412) 269-6096</u> (Telephone #)	<u>(412) 375-3986</u> (FAX #)

SECTION F. CONSULTANT

<u>Lewis</u> (Last Name)	<u>Christopher</u> (First Name)	<u>J</u> (MI)
<u>Principal Engineer</u> (Title)	<u>D'Appolonia Engineering</u> (Name of Consulting Firm)	
Mailing Address <u>275 Center Road</u> (Street # and Name or P.O. Box)		
<u>Monroeville</u> (City)	<u>PA</u> (State)	<u>15146-1451</u> (Zip Code + Four)
<u>cilewis@dappolinia.com</u> (E-mail)	<u>412 856-9440</u> (Telephone #)	<u>412-856-9535</u> (FAX #)

SECTION F. CONSULTANT

<u>Shema</u> (Last Name)	<u>Mike</u> (First Name)	<u>L</u> (MI)
<u>Project Manager</u> (Title)	<u>Civil & Environmental Consultants, Inc.</u> (Name of Consulting Firm)	
Mailing Address <u>333 Baldwin Road</u> (Street # and Name or P.O. Box)		
<u>Pittsburgh</u> (City)	<u>PA</u> (State)	<u>15205-9702</u> (Zip Code + Four)
<u>mshema@cecinc.com</u> (E-mail)	<u>(412) 429-2324</u> (Telephone #)	<u>(412) 429-2114</u> (FAX #)



Section F – Consultant Listing (Cont.)

SECTION F. CONSULTANT

Freeman

(Last Name)

Heather

(First Name)

(MI)

Geologist

(Title)

Moody and Associates, Inc

(Name of Consulting Firm)

Mailing Address

199 Johnson Rd, Bldg 2, Suite 101

(Street # and Name or P.O. Box)

Houston

(City)

PA

(State)

15342

(Zip Code + Four)

hfreeman@moody-s.com

(E-mail)

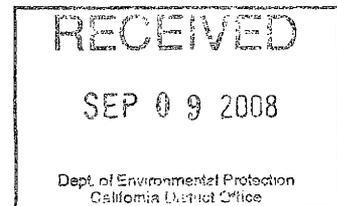
724

746-5200

(Telephone #)

724-746-5603

(FAX #)



Module 2: General Information

Check those modules included in this application (Submit only those which apply). See Appendix D for modules and documents required for permit transfer, name changes and ownership changes.

Yes	No		Module	Date of Last Revision
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1: Application	1	3/2003
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2: General Information	2	1/2006
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3: Ownership/Compliance Information	3	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4: Areas Where Mining is Prohibited or Restricted	4	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5: Property Interests/Right of Entry	5	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6: Environmental Resource Maps	6	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	7: Geologic Information	7	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8: Hydrology	8	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9: Operations Maps - Surface Activity Sites	9	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10: Operation Plan	10	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11: Erosion and Sedimentation Controls	11	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	12: Treatment Systems	12	3/2004
<input checked="" type="checkbox"/>	<input type="checkbox"/>	13: Impoundments	13	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	14: Liners	14	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	15: Streams/Wetlands	15	1/2006
<input checked="" type="checkbox"/>	<input type="checkbox"/>	16: Air Pollution and Noise Control	16	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	17: Soils/Prime Farmland	17	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	18: Land Use/Reclamation/Fish and Wildlife	18	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	19: Reclamation Schedule and Cost Information	19	4/2004
<input type="checkbox"/>	<input checked="" type="checkbox"/>	20: Coal Refuse/Coal Ash - Sources and Properties	20	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	21: Coal Refuse Construction Plans	21	1/2006
<input type="checkbox"/>	<input checked="" type="checkbox"/>	22: Subsidence Control and Underground Mine Maps	22	2/2004
<input type="checkbox"/>	<input checked="" type="checkbox"/>	23: Mine Openings	23	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	24: Special Protection Waters	24	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	25: Coal Ash Beneficial Use	25	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	26: Remining of Areas With Preexisting Pollutational Discharges	26	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	27: Sewage Sludge/Coal Ash Beneficial Use	27	4/2001
<input checked="" type="checkbox"/>	<input type="checkbox"/>	28: Blasting Plan	28	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	29: Disposal of Excess Spoil	29	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	30: Underground Disposal/Backstowing	30	4/2001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	31: In Situ Processing	31	4/2001

Has a check, payable to the Commonwealth of Pennsylvania for the proper amount, been included? yes no

Has the application been properly executed and if a corporation, the corporate seal affixed? yes no

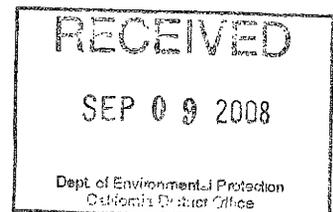
Is a copy of the public notice attached to this module? (The notice must indicate whether the application is for a new permit, permit revision, permit renewal or permit transfer, and specifically reference areas to be affected by both surface and underground operations, stream variances, stream crossings, stream channel changes, road variances, blasting, fly ash deposition and land use changes). Example Public Notices are included in the Instructions as Appendix F (deep mines and prep plants) and Appendix G (coal refuse). yes no

Have arrangements been made to publish public notice of this application? (Proof of publication must be submitted to the Department upon completion of the publication requirements). See Appendix E of the Instructions for information regarding permit type vs. public notice and proof of publication requirements. yes no

Has documentation been provided indicating that the advertisement requirement of §86.31(a) is in the process of being satisfied? (Intent to publish requirement, 86.70) yes no

I do hereby certify that this application includes: all of the modules checked above; payment of application fee(s); and all other information as noted above.

Jonathan M. Packter
Signature of Applicant or Responsible Official



PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

The application, plans, reports and specifications shall be prepared by a professional engineer, professional geologist or registered land surveyor, as appropriate. Certain items, such as; haul road design (87.160, 89.26, 90.134), stream channel diversions (87.104, 90.105), dams and impoundments (87.73, 87.112, 90.39, 80.112, 89.101), disposal of excess spoil (87.131), variance to contouring (87.175), subsidence control plan maps (89.154), and maps, plans, and cross sections (90.21, 90.46) require preparation and certification by specific professionals. Please review the appropriate sections of Chapters 86-90 to ensure compliance with these certification requirements.

Registered Professional Engineer

I, Gregory A. Heilman, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 6, 9, 10, 12, 15.2(d)-(g), 15.2(i)-(l), 15.2(q), 16, 18, 19, and 28, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature 
 Address Michael Baker Jr., Inc.
Airside Business Park, 100 Airside Drive
Moon Township, PA 15108
 Telephone No. 412-269-6096



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Module _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____

 Telephone No. _____

Professional Seal

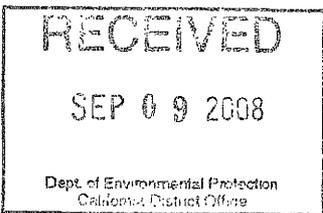
Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____

 Telephone No. _____

Professional Seal



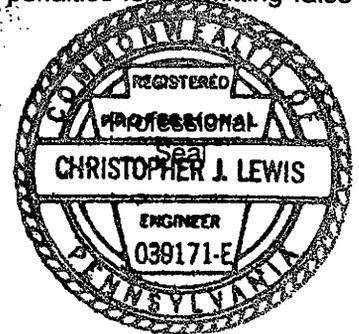
PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

The application, plans, reports and specifications shall be prepared by a professional engineer, professional geologist or registered land surveyor, as appropriate. Certain items, such as; haul road design (87.160, 89.26, 90.134), stream channel diversions (87.104, 90.105), dams and impoundments (87.73, 87.112, 90.39, 80.112, 89.101), disposal of excess spoil (87.131), variance to contouring (87.175), subsidence control plan maps (89.154), and maps, plans, and cross sections (90.21, 90.46) require preparation and certification by specific professionals. Please review the appropriate sections of Chapters 86-90 to ensure compliance with these certification requirements.

Registered Professional Engineer

I, Christopher J. Lewis, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 11, 13, 14; and the following attachments: Design Drawings, Engineering Report, Calculation Brief, and Geotechnical Data Report, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature Christopher J. Lewis 8/26/2008
 Address D'Appolonia Engineering
275 Center Road
Monroeville, PA 15146-1451
 Telephone No. 412-856-9440



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Module _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____
 Telephone No. _____

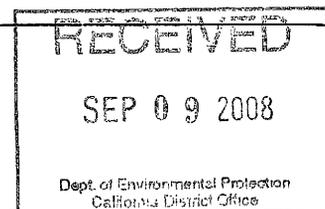
Professional Seal

Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____
 Telephone No. _____

Professional Seal



PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

Application, plans, reports and specifications shall be prepared by a professional engineer, professional geologist or registered land surveyor, as appropriate. Certain items, such as; haul road design (87.160, 89.26, 90.134), stream channel diversions (87.104, 90.105), dams and impoundments (87.73, 87.112, 90.39, 80.112, 89.101), disposal of excess spoil (87.131), variance to contouring (87.175), subsidence control plan maps (89.154), and maps, plans, and cross sections (90.21, 90.46) require preparation and certification by specific professionals. Please review the appropriate sections of Chapters 86-90 to ensure compliance with these certification requirements.

Registered Professional Engineer

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Module _____, and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____

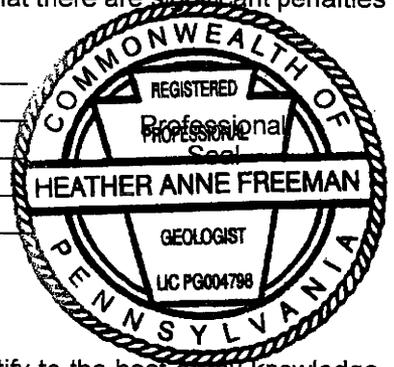
 Telephone No. _____

Professional Seal

Registered Professional Geologist

I, Heather A. Freeman do hereby certify to the best of my knowledge, information and belief, that the information contained in Modules 8.1 - 8.8, 8.9(a), (e), (f), 8.13 - 8.16, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature Heather A. Freeman 8/26/08
 Address Moody and Associates
199 Johnson Road
Houston, PA 15342
 Telephone No. 724-746-5200



Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____

 Telephone No. _____

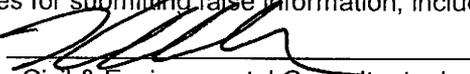
Professional Seal

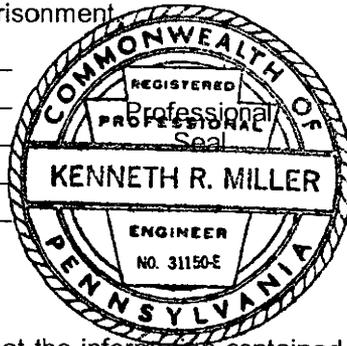
PERSON(S) AUTHORIZED BY APPLICANT TO PREPARE THIS APPLICATION

The application, plans, reports and specifications shall be prepared by a professional engineer, professional geologist or registered land surveyor, as appropriate. Certain items, such as; haul road design (87.160, 89.26, 90.134), stream channel diversions (87.104, 90.105), dams and impoundments (87.73, 87.112, 90.39, 80.112, 89.101), disposal of excess spoil (87.131), variance to contouring (87.175), subsidence control plan maps (89.154), and maps, plans, and cross sections (90.21, 90.46) require preparation and certification by specific professionals. Please review the appropriate sections of Chapters 86-90 to ensure compliance with these certification requirements.

Registered Professional Engineer

I, Kenneth R. Miller, P.E. do hereby certify to the best of my knowledge, information and belief, that the information contained in Module 15 exclusive of 15.2(d)-(g), 15.2(i)-(l), and 15.2(q) and the accompanying application, plans, specifications and reports have been prepared in accordance with accepted practice of engineering, are true and correct, and are in accordance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature  9/5/08
 Address Civil & Environmental Consultants, Inc.
333 Baldwin Road
Pittsburgh, PA 15205
 Telephone No. 412-429-2324



Registered Professional Geologist

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in Module _____, and the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of geology and hydrology, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____

 Telephone No. _____

Professional Seal

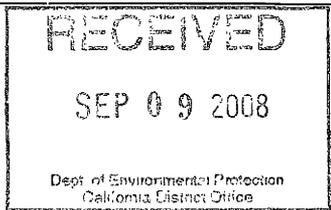
Registered Professional Land Surveyor

I, _____ do hereby certify to the best of my knowledge, information and belief, that the information contained in the accompanying application, plans, specifications and reports has been prepared in accordance with accepted practice of land surveying and engineering land surveys, are true and correct and are in conformance with the Rules and Regulations of the Department of Environmental Protection. I further certify that it is within my professional expertise to verify the correctness of the information. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature _____
 Address _____

 Telephone No. _____

Professional Seal



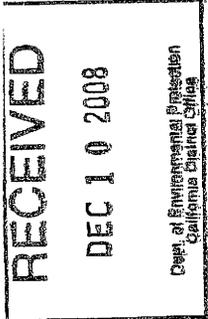
PUBLIC NOTICE

Pursuant to the Pennsylvania Clean Streams Law, the Pennsylvania Department of Environmental Protection Rules and Regulations, the Surface Mining Conservation and Reclamation Act, and the Bituminous Mine Subsidence and Land Conservation Act as amended, notice is hereby given that Consol Pennsylvania Coal Company LLC, doing business at P.O. Box J, 1525 Pleasant Grove Road, Claysville, PA 15323, has made application to the Pennsylvania Department of Environmental Protection to permit sediment pond development and a NPDES outfall for a new Coal Refuse Disposal Area at the Bailey Central Mine Complex.

The proposed Coal Refuse Disposal Area No. 5 Sediment Pond Development permit area encompasses 91.5 acres and includes installation of a sediment pond, a 1,800 foot long access road from S.R. 4007 (Ackley Creek Road), approximately 2,800 feet of haul roads, temporary access corridors, and various erosion and sedimentation control facilities. The facility will be located in Richhill Township, Greene County; south of the existing Bailey Central Mine Complex and north of S.R. 4007 (Ackley Creek Road), approximately 4,100 feet northwest of the S.R. 4007/S.R. 4005 intersection. The proposed permit area is located on the Wind Ridge, PA U.S. Geological Survey 7.5 minute topographic map.

The application includes a request for variance to encroach within 100 feet of the right of way of three sections of S.R. 4007 beginning at a location approximately 3,700 feet northwest of its intersection with S.R. 4005 (Sawmill Road) and continuing northwest for approximately 1,500 feet. The road variance is required for construction of the access road, contractor access to the site, and installation of erosion and sedimentation controls.

Stream variances are requested for activities within 100 feet of Owens Run for a distance of 1,091 feet of stream. The variance request for Owens Run begins 0.54 miles northwest of the S.R. 4007/T-683 (Day Lane) intersection and progresses northwest approximately 0.07 miles (345 feet), then resumes approximately 0.64 miles northwest of the intersection and progresses an additional 0.14 miles (746 feet) northwest. Variance requests are also proposed for 3,303 feet of Unnamed Tributary 32705 to Owens Run beginning at it's confluence with Owens Run (located 0.58 miles northwest of the S.R. 4007/Day Lane intersection) and extending northeast through the proposed site; and 1,988 feet of five other Unnamed Tributaries to Owens Run that flow into Unnamed Tributary 32705 to Owens Run along this reach. A variance request is also requested for 288 feet of Unnamed Tributary 2-OR to Owens Run beginning at it's confluence with Owens Run (located 0.73 miles northwest of the S.R. 4007/Day Lane intersection) and extending north through the proposed site. The stream variances are required for construction of the sediment



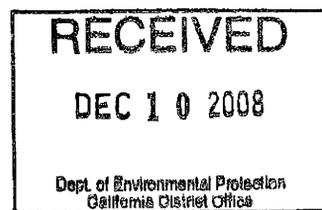
pond, grading activities, construction of access and haul roads, and installation of various erosion and sedimentation control facilities.

The proposed permit application includes two new NPDES discharge point from sediment ponds into Unnamed Tributary 32705 to Owens Run. The proposed NPDES discharge point #501 discharges flow from the Main Sediment Pond and Temporary Sediment Pond SP #3 and is located approximately 400 feet upstream (northeast) from the mouth of Unnamed Tributary 32705 to Owens Run (located approximately 0.58 miles northwest of the S.R. 4007/Day Lane intersection). The proposed NPDES discharge point #502 discharges flow from Temporary Sediment Pond SP #2 and is located approximately 900 feet upstream (northeast) from the mouth of Unnamed Tributary 32705 to Owens Run.

Blasting may be conducted during site grading activities. Blasting will not occur until a plan has been approved by the PADEP. When a blasting schedule is finalized, residents, owners of dwellings or other structures, local governments and public utilities located within ½ mile of the area where blasting will occur will be notified. All residents, owners of dwellings or other structures located within ½ mile of the area where blasting will occur will be informed of their right to a pre-blast survey and how they may request such a survey.

Copies of the application are available for public inspection, and copying for a fee, by appointment at the Pennsylvania Department of Environmental Protection, California District Mining Office, 25 Technology Drive, California Technology Park, Coal Center, PA 15423 (telephone number: 724-769-1100) and at the Greene County Conservation District, Fort Jackson Building, Mezzanine, 19 South Washington Street, Waynesburg, PA 15370 (telephone number: 724-852-5278).

Written comments, objections, or a request for an informal conference may be submitted to the Department of Environmental Protection, District Mining Operations, at the above address, no later than thirty (30) days following the final publication date of this notice.



Module 10: Operation Plan

This Module is designed so that it can be used for new permit applications and permit revision applications. When using it to complete a revision application, the responses may reference the original approved application or be worded to apply specifically to the new activity or site being proposed.

10.1 Description of Operations

- a) Provide a description of operations which will take place under this permit.

This permit application is for construction of a sediment pond for a new coal refuse disposal area at the Bailey Central Mine Complex. The new disposal facility is referred to as Coal Refuse Disposal Area No. 5. This permit application encompasses 91.5 acres and includes installation of a sediment pond, a 1,800 foot long access road from S.R. 4007 (Ackley Creek Road), approximately 2,800 feet of haul roads, temporary access corridors, and various erosion and sedimentation control facilities. A future permit application will address the development of a slurry impoundment and coal refuse disposal operations for Coal Refuse Disposal Area No. 5. The permit application also includes a new NPDES outfall from the proposed sediment pond into Unnamed Tributary 32705 to Owens Run.

- 1) If the operation involves underground mining, describe the method of mining (longwall, room and pillar, etc.); the estimated life of the mine; the type of haulage and underground machinery; the maximum number of working faces; the anticipated annual production in tons; the anticipated underground acreage that will be affected each year; surface activity sites and the activities which will take place at each (coal storage, ventilation, rock dust transport, etc.); the means by which coal will be transported from the operation; and the system that will be used to convey mine drainage to treatment. If mining will re-affect existing workings, identify the company that developed those workings and the time frame during which that mining took place.

Not applicable.

- 2) If the operation involves coal preparation, describe the estimated life of the operation; the types of processing equipment used; media used in separation processes; chemical treatment of coal or refuse; source and quality of make-up water; the means by which coal will be transported to and from site; and whether the facilities are designed to recirculate or discharge water from the coal preparation circuit.

Not applicable.

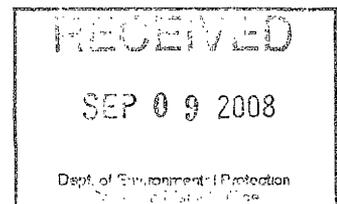
- 3) If the operation involves coal refuse disposal:

Not applicable. This application does not include coal refuse disposal.

- i) Describe the type of operation (head of hollow fill, cross valley embankment, side hill embankment, ridge embankment, heaped embankment, surface mine backfill, disposal into underground mine workings, etc.); the estimated life of the operation; the type of equipment which will be used to handle and compact refuse; the systems that will be used to monitor, collect, manage and treat runoff and leachate; and any chemical treatment to which refuse will be subjected (surfactants, bactericides, alkalizing agents, etc.)
- ii) If the operation does not involve disposal in abandoned, inactive or active underground mine or in abandoned or unreclaimed surface mines, outline the technical, economic and safety considerations prohibiting such disposal.
- 4) If the operation will involve the discharge of coal processing wastes, underground mine development wastes, coal ash, mine drainage treatment sludge, flue gas desulfurization sludge, or inert stabilizing materials to underground workings:

Describe the nature of the material to be discharged, the system which will be used to convey the material to the point of discharge, and the means of controlling the material within the underground workings.

Not applicable.



FORM 12.1A NPDES Information

Identify each point of discharge, the receiving stream and the corresponding latitude and longitude.
If none, enter NONE in Column 1.

Discharge Point (001,002, etc.)	Surface Elev.	Source of Discharge (i.e., mine drainage, ring water, surface runoff*, etc.)	Describe Treatment Or Other Control Technology Provided	Is Discharge Existing or Proposed?	Description of Discharge		Name of Receiving Stream	Latitude	Longitude
					Average Rate (mgd)	Frequency			
501 (temporary - during site preparation)	1102	Main Sed Pond Outlet - Surface runoff from site preparation, SP #3, bypass pipe & completed Area 1 Cap (650 acres)	Sedimentation	Proposed	123.8 cfs	(discharge for 10-yr storm event)	UT 32705 to Owens Run	39° 56' 52.3"	80° 25' 10.0"
501 (during refuse disposal operations)	1102	Main Sed Pond Outlet - Surface runoff from active refuse area & slurry impoundment, completed Area 1 & 3 Caps (783 acres) mine water, seepage	Sedimentation	Proposed	34.2 cfs	(discharge for 10-yr storm event)	UT 32705 to Owens Run	39° 56' 52.3"	80° 25' 10.0"
502 (temporary - during site preparation)	1110	SP#2 Outlet - Surface runoff (33 acres)	Sedimentation	Proposed	720.8 gpm (ave) [Range = 61-977 gpm]	[dam seepage rate (470 gpm)+ ave UT 32705 flow (250.8 gpm)]	UT 32705 to Owens Run	39° 56' 56.7"	80° 25' 6.1"

*If discharge is storm induced runoff indicate site drainage area in acres.

The information on the NPDES form must be certified correct by one of the following, as applicable.

- In the case of corporations, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the NPDES form originates.
- In the case of a partnership, by a general partner. *N/A*
- In the case of a sole proprietorship, by the proprietor. *N/A*
- In the case of a municipal, state, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee. *N/A*

I certify that I am familiar with the information contained in the above table, and that to the best of my knowledge and belief such information is true, complete, and accurate.

Jonathan Pachter

Printed Name of Person Signing

January 28, 2009

Date

General Manager - Environmental Services

Title

Jonathan M. Pachter
Signature

RECEIVED

JAN 30 2009

Dept. of Environmental Protection
California District Office

18 U.S. C. Section 1001 provides that:
Whoever, in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact, or makes or uses any false, fictitious, or fraudulent statements or representations; or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than \$10,000 or imprisoned not more than 5 years, or both.

1.0 Slurry Pond (CRDA 5) and Coarse Refuse Disposal (CRDA 6)

USFWS Project #2008-0021

1.1 Introduction

The Bailey Enlow Fork Mine Complex directly employs approximately one-thousand people and is a vital part of the tri-state economy. An integral segment of this mining operation entails the disposal of refuse. For that reason, the timely expansion of refuse disposal facilities at this site is vital to the continued operation of this important energy supply.

The remaining fine coal refuse disposal capacity at the Consol Energy Bailey Mine Complex will be exhausted in 2013. It is necessary to have a new refuse disposal facility in operation to keep the Bailey and the Enlow Fork Mines and the Bailey Central Coal Preparation Plant operating beyond 2013. Transition to a new fine coal refuse facility (Slurry Pond) must be made in 2012. To meet that timeframe it is crucial to pursue a very aggressive construction schedule. The Refuse Conveyor and Sediment Pond, which are Phases I and II of the IV-phase Project, must be operational in mid 2011 in order to have the Slurry Pond and Refuse Disposal Area 5 (Phase III) constructed by 2012. To meet this deadline, construction of the Refuse Conveyor and Sediment Pond must begin in the summer of 2009.

Delays in construction of the Slurry Pond (CRDA 5) and the Coarse Coal Refuse Disposal Area (CRDA 6) will jeopardize the employment of the Bailey Enlow Fork Mine Complex work force as well as the many workers that are employed by companies that support the mining industry. A delay would also risk the loss of a significant portion of the country's energy supply.

1.2 Project Description

The Slurry Pond (CRDA 5) and CRDA 6 are 724 acres, of which approximately 467 acres are forested. Eventually, most of the area will be cleared for expanding coal refuse disposal needs; however, it is necessary for construction of Phases I and II (Coal Refuse Conveyor and Sedimentation Pond) to begin in summer 2009. Construction of the remaining phases (Phases III and IV – Slurry Pond and Coarse Refuse Disposal) will begin in summer 2010 and 2012, respectively.

1.2.1 Coal Refuse Conveyor and Sedimentation Pond (Phases I and II)

The Coal Refuse Conveyor and Sedimentation Pond are in the CRDA 5 and 6 permit boundary (Figure 1). Permitting for the Coal Refuse Conveyor was covered under previous permits for existing CPCC Bailey Mine facilities (CRDA 1 and 2), and does not require USACE permits. The Coal Refuse Conveyor and the Sedimentation

Pond Permit Areas encompass 88 and 91.5 acres, respectively, for a total of 179.5 acres.

Between 16 and 19 February 2008, ESI conducted a potential roost tree survey on the Coal Refuse Conveyor Permit Boundary and the portion of the Sedimentation Pond Permit Boundary not cleared by the previous landowner. The report concluded that given the low to moderate overall habitat quality and the relatively low number of high potential roosts, effects from winter clearing in the Coal Refuse Conveyor Permit Boundary and the portion of the Sedimentation Pond Permit Boundary not cleared by the previous landowner should not rise to the level of a take of Indiana bats.

A letter from David Densmore of USFWS to Craig Burda of PA DEP, dated 20 March 2009, determined take would occur from the harm and harassment of habitat removal, even when removed in the winter season. However, pursuant to the 1996 Biological Opinion between USFWS and OSM, implementation of 10 species-specific protection measures on the Project Area will ensure incidental take associated with the Project is incidental and not considered prohibited. The authorized habitat removal was completed before 1 April 2009.

1.2.2 Slurry Pond (CRDA 5) and Coarse Refuse Disposal (CRDA 6)

The Slurry Pond will add 414.8 acres to the previously submitted Sediment Pond permit. The remaining 724-acre Permit Area will provide permanent disposal of coarse coal refuse.

A letter from David Densmore of USFWS to Craig Burda of PA DEP, dated 30 April 2009, determined take would occur from the harm and harassment of habitat removal, even when removed in the winter season. The letter also states the Project is inconsistent with the Coal Refuse Disposal Control Act Section 4.1(b), and request a complete Environmental Impact Statement under the National Environmental Policy Act. Further, the letter requests additional consultation with the Service under the 1996 Biological Opinion should the Corps and DEP determine the Project is lawful under the two preceding laws (CRDCA and NEPA).

1.3 Consultation History

- 1) An alternatives analysis conducted in Feb 2007 (Baker 2007)
 - Alternatives analysis report approval by PADEP should preclude the need to complete additional alternative analyses or select another site
 - No "Preferred Sites" were available in the search area
 - Initial presence/absence survey (CEC 2005) found no Indiana bats in the Project Area
 - Alternatives analysis required under CRDCA only, not ESA

- 2) Indiana Bat discovered July 2007 (CEC 2007)
 - A single Indiana bat was captured and spent part of its time foraging in the Project Area on 1 of 5 days of tracking
 - USFWS rescind determination of Not Likely to Adversely Affect

- In 2008 (ESI 2009), another single Indiana bat was captured and spent part of its time foraging in the Project Area on 6 of 7 days of tracking
 - The same bat roosted in the Project Area following transmitter attachment, however, this was not considered normal roosting behavior (ESI 2009)
 - Section 1.8 provides additional species occurrence information
- 3) Phase I and II (Refuse Conveyor and Sediment Pond)
- No Corps Permit needed for Refuse Conveyor
 - Sediment Pond application package accepted, technical review Pending
 - Consulted on with USFWS in March 2009
 - Trees cut in March 2009
- 4) Phase III and IV (Slurry Pond and CRDA 5)
- Slurry Pond (Phase III) application in acceptance review at PA DEP
 - CRDA 5 (Phase IV) will be submitted in June 2009
- 5) Phase II, III and IV submitted as one application to Corps in December 2008

1.4 Coal Refuse Disposal Control Act

A letter from David Densmore of USFWS to Craig Burda of PA DEP, dated 30 April 2009, cites the PADEP Coal Refuse Disposal – Site Selection guidance:

PADEP's Section 4.1 (b) of CRDCA prohibits coal refuse disposal on nonpreferred sites that contain federally listed threatened or endangered species. With respect to preferred sites, the Department will not approve (via the site selection process) or permit (via the permitting process) a site that is known or likely to contain Federally listed threatened or endangered species, unless the Department concludes and the U.S. Fish and Wildlife Service concurs that the proposed activity is not likely to adversely affect Federally listed threatened or endangered species or result in the "take" of federally listed threatened or endangered species in violation of Section 9 of the Endangered Species Act.

The guidance is not adjudication or a regulation. Rather, it establishes the framework, within which PADEP will exercise its administrative discretion. Specifically, the guidance states:

The Department reserves the discretion to deviate from this policy statement if circumstances warrant.

Additionally, although the term "contain" is not defined in the CRDCA, the proposed project clearly does not contain Indiana bats. Two Indiana bats were captured and foraged in the Project boundary. One of the two Indiana bats roosted in the Project area as a result of a temporary behavior change following capture and transmitter attachment (White and Garrott 1990). There is no reason to believe, with certainty, that the bats will return to the Project area or that other Indiana bats will use the

Project area. Indiana bats are highly mobile and forage and roost over a wide range of habitat types across the landscape. An abundance of habitat is available in the region for the bats, and they therefore are not required to use the Project area, nor are they contained within it. During clearing and grubbing for the Coal Refuse Conveyor and Sediment Pond (Phases I and II) in March 2009, approximately 113.5 acres of forest were removed. Currently the Project Area is 49 percent forested with 353.5 acres of forest in the Project Area. This habitat removal was authorized by USFWS under the 1996 BO. Areas outside the current Project Area are likely more suitable for Indiana bats. For the Project area to contain the Indiana bat, it would need to encompass a significant hibernaculum, critical habitat, or at the very least, a significant maternity tree.

The definition of contain was previously addressed after capture of the first Indiana bat on the Project Area in 2007. In a letter from Michael Baker Jr., Inc. to PADEP dated November 27, 2007, Mr. Gregory Heilman, P.E., addresses comments from Craig Burda on the Alternatives Analysis Report. The letter summarizes a consultation between legal council for CONSOL and PADEP, in which it was determined the Project Area is not known to contain an endangered species so as to preclude approval of the proposed site as the preferred site in the site selection review. Additionally, permit approval is dependant upon compliance with 25 Pa. Code §86.37 (a)(15), which addresses jeopardy and critical habitat:

The proposed activities would not affect the continued existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973 (16 U.S.C.A. §§ 1531—1544)

In regard to jeopardy and critical habitat, the Project only affects summer habitat and USFWS determined summer habitat is not limiting for the species in 72 Federal Register 9917.

1.4.1 Questions and answers

Q: Is the approved Alternatives Analysis still valid due to the fact that it was conducted before the Indiana bats were discovered?

A: Yes because CONSOL addressed the Indiana Bats with PADEP prior to receiving approval of the Alternatives Analysis application.

Q: Is PADEP able to exercise discretion on the definition of “contain” when mitigation measures as well as avoidance and minimization measures will reduce impacts to “not likely to adversely affect” the Indiana bats onsite? Moreover, are they willing to accept scientific evidence showing the Project does not contain Indiana bats or will they rely on the suggestions of USFWS?

A: PADEP did exercise this discretion for the Alternatives Analysis without mitigation measures being applied. This is currently going through review before CONSOL legal council and PADEP legal council.

If so, the issue of compliance is an ESA-only issue. The USFWS request for additional NEPA compliance (beyond OSM standards), is optional, however, may be covered as a response to a Habitat Conservation Plan (HCP). The HCP will include provisions for compliance under the 1996 BO.

1.5 Consultation Process

A letter from David Densmore of USFWS to Craig Burda of PA DEP, dated 30 April 2009, provided a recommended consultation framework:

If you believe there is not sufficient information to support permit denial, we recommend the further action on this permit application not be taken until an Environmental Impact Statement has been prepared that will address the full environmental, economic, and social effects of this project for its projected 25 years of operation, as well as its permanent effects beyond the life of the project.

In addition, should the Corps and Department of Environmental Protection determine it is lawful and appropriate to proceed with permitting CRDA 5 and 6, further consultation with the Service will be necessary prior to permit issuance due to anticipated adverse effects on Indiana bats. This consultation would be conducted with the State regulatory authority pursuant to the terms of the 1996 biological opinion on the approval and implementation of surface coal mining and reclamation operations under State and Federal regulatory programs adopted pursuant to the Surface Mining Control and Reclamation Act of 1977(SMCRA).

The following paragraphs on Indiana bat ecology show abundant habitat is available for the maternity colony in the region. Other effects from habitat loss are shown to be insignificant and discountable, and therefore do not rise to the level of take. It is for these reasons, in addition to the fact that the Project does not actually “contain” Indiana bats, CONSOL’s permit applications may be approved by the Corps and PADEP.

In respect to the request to prepare an Environmental Impact Statement, it is our opinion that an Environmental Assessment prepared in response to a Habitat Conservation Plan is more appropriate based on the level of impacts from Project development (or more likely a Categorical Exclusion, and determine Why/If/When the higher level EA or EIS is used). Regardless, the NEPA and ESA processes should proceed concurrently to accommodate project timelines.

The Biological Opinion included an Incidental Take Statement that authorized the taking of a limited, but unquantifiable, number of listed individuals when the taking is incidental to, and not the intended purpose of, the surface coal mining and reclamation operations.

Additional options for consultation may include an individual Section 7 Consultation, with or without a take.

1.6 Available Habitat

Available habitat, as shown in Figure 2 and Table 1, is all habitat available for bats within a 2.5 and 5 mile radius of the Project Area. These areas were defined to accommodate the ecology of a mobile species in an area where nursery colonies likely exist. Nursery colonies use one to several maternity tree roosts and travel across the landscape among roost sites and areas used for foraging (Kurta et al. 2002).

Studies of the bat suggest 3 miles is a conservative upper limit of typical movements by members of a maternity colony to meet life requisites for roosting and foraging (Butchkoski and Hassinger 2002, Murray and Kurta 2004, Sparks et al. 2005), and there is precedence for use of a less conservative 2.5-mile buffer in major Biological Assessments, for example, U.S. 33 in Ohio (ESI 2004), and Millennium in New York (GAI and ESI 2006). The area within 2.5 miles of, and outside the Project Area, represents the habitat remaining after Project development to provide life requisites within a distance typically traveled by members of a maternity colony.

However, recent guidance provided by OSM, USFWS, and state regulatory agencies representing the Interstate Mining Compact Commission in the Draft Range-wide Indiana Bat Protection and Enhancement Plan Guidelines dated 4 December, 2008, suggest 5 miles as a more appropriate range for a maternity colony. Therefore, all available habitat inside 5 miles of the Project Area is also examined.

1.6.1 Habitat Delineation

Habitat delineation was completed using GIS to determine abundance and suitability of habitat available for the Indiana bat during the summer reproductive season. Habitat types were obtained by overlaying PAMAP Landcover for Pennsylvania (PSU 2005) on the Project Area. Habitat types were based on the Anderson et al. (1976) Land Use/Cover Classification System.

Four forested habitat types and nine non-forested habitat types were delineated in the available habitat, which included the Project Area.

Table 1. Acreages and percentages of current habitat types in the Project Area and buffer zones.

Habitat Type	Project Area (acres)	2.5-Mile Buffer (acres)	5-Mile Buffer (acres)	Combined Project area and 5-Mile Buffer (acres)	Percent loss in 5-Mile Buffer
Forested					
Deciduous Forest	396	14558	48296	48692	0.8
Mixed Forest	6	191	473	479	1.3
Evergreen Forest	36	597	1848	1884	1.9
Forested Wetland		3	9	9	0
Non-forested					
Commercial Land		30	177	177	0

Residential Land		74	210	210	0
Mine Land	11	1088	1088	1099	1
Row Crops	37	1817	6111	6148	0.6
Pasture/Grass	73	1549	6233	6306	1.2
Emergent Wetland		17	38	38	0
Barren Land	167	34	130	297	56
Roads		204	569	569	0
Water		54	317	317	0
Total	726	20216	65499	66225	1
Forested	438	15349	50626	51064	0.9
Non-forested	288	4867	14873	15161	1.9

1.6.2 Summary of Habitat Delineation

The available habitat outside the Project Area is 76 percent forested within 2.5 miles of the Project Area and 77 percent forested within 5 miles of the Project Area (Table 1). The Project Area is currently 60 percent forested. Deciduous forest dominates the landscape, including 55 percent of the Project Area, 72 percent within 2.5 miles of the Project Area, and 74 percent within 5 miles of the Project Area. The nearby Crabapple Overland Belt is included as existing as pre-construction conditions in the delineation because it has already been consulted on with USFWS and impacts were completely mitigated.

The use of PAMAP landcover data is for comparative purposes. Detailed habitat delineations performed by CPCC Bailey Mine for permitting and subsequent studies indicate the Project Area was 724 acres, of which approximately 467 acres were forested. During clearing and grubbing for the Coal Refuse Conveyor and Sediment Pond (Phases I and II) in March 2009, approximately 113.5 acres of forest were removed. Currently the Project Area is 49 percent forested with 353.5 acres of forest in the Project Area. This habitat removal was authorized by USFWS under the 1996 BO. Areas outside the current Project Area are likely more suitable for Indiana bats.

1.6.3 Affected Habitat

Project development assumes there will be a complete loss of forested habitat in the Project Area. Table 1 shows this loss as being 438 acres or 0.9 percent of the forested habitat available within 5 miles of the Project area. Overall, 726 acres will be converted to refuse disposal needs. This may result in the loss of 1 percent of the land available to bats within 5 miles of the Project Area. Other areas within 5 miles of the Project Area that may not be suitable for use by Indiana bats include commercial, mine, and barren lands. Collectively, these areas account for approximately 2.1 percent of the area within 5 miles of the Project Area. Other non-forested areas including residential, crop/pasture, wetlands, roads, and water are potentially suitable for use by Indiana bats (Sparks et al. 2005).

1.7 Habitat Associations

There are several major landscape features that provide permanent protection of habitat within 5 miles of the Project Area that will maintain the quality of habitat in the area and thus avoid and minimize the potential for a take of Indiana bats.

1. CPCC Bailey Mine donated approximately 1084 acres of land to PGC for formation of State Game Lands #302 along the Washington/Greene County line. The vast majority of these lands are wooded and provide suitable roosting and foraging habitat that will be maintained in perpetuity by PGC.
2. CPCC Bailey Mine is currently in the process of protecting approximately 1100 acres of land under permanent conservation easement with the Western Pennsylvania Conservancy associated with removal of approximately 260 acres of habitat in the 324.5 acre Crabapple Overland Belt Project Permit Area. This area includes parcels containing key maternity trees for the resident colony.
3. CPCC Bailey Mine has agreed to protect 260 acres of forested lands under permanent conservation easement in association with removal of 113.5 acres of forested and 66 acres of non-forested lands for the construction of Coal Refuse Conveyor and Sediment Pond (Phases I and II).
4. CPCC Bailey Mine has agreed to protect approximately 800 acres of forest in association with removal of the remaining 353.5 acres of forest for the construction of the Slurry Pond (CRDA 5) and CRDA 6 (Phases III and IV).
5. Approximately 1100 acres of the 1164-acre Ryerson Station State Park are within 5 miles of the Project Area.

Much of the land protected under conservation easements will be actively managed for Indiana bats. In addition to the conservation easements, CONSOL must adhere to strict PADEP reclamation requirements following the life of the Project.

1.8 Species Occurrence

Mist net surveys were conducted on CRDA 5 and 6 by Civil and Environmental Consultants, Inc. (CEC) during summer 2007. Of six Indiana bats captured, one was captured in the CRDA 5 and 6 Permit Area. The same bat, an adult female, foraged in CRDA 5 and 6 during one of five nights of tracking. Two other bats were radio-tracked, however, neither foraged in CRDA 5 and 6. Figure 3 shows Indiana bat activity on the CRDA 5 and 6 Permit Area.

Additional mist net surveys, as required by CPCC Bailey Mine's state permit (PADEP) for the Crabapple Overland Belt, were conducted in summer 2008. Of 13 Indiana bats captured, one was captured on the CRDA 5 and 6 Permit Area. The same bat, an adult female, foraged in CRDA 5 and 6 during six of seven nights of radio-telemetry. This area was one of two distinct areas for the bat. Figure 3 shows Indiana bat activity on the CRDA 5 and 6 Permit Area.

One roost tree was found in the project area during the two years of studies. In summer 2008, an adult female Indiana bat roosted in an 8.6-inch dbh dead elm on

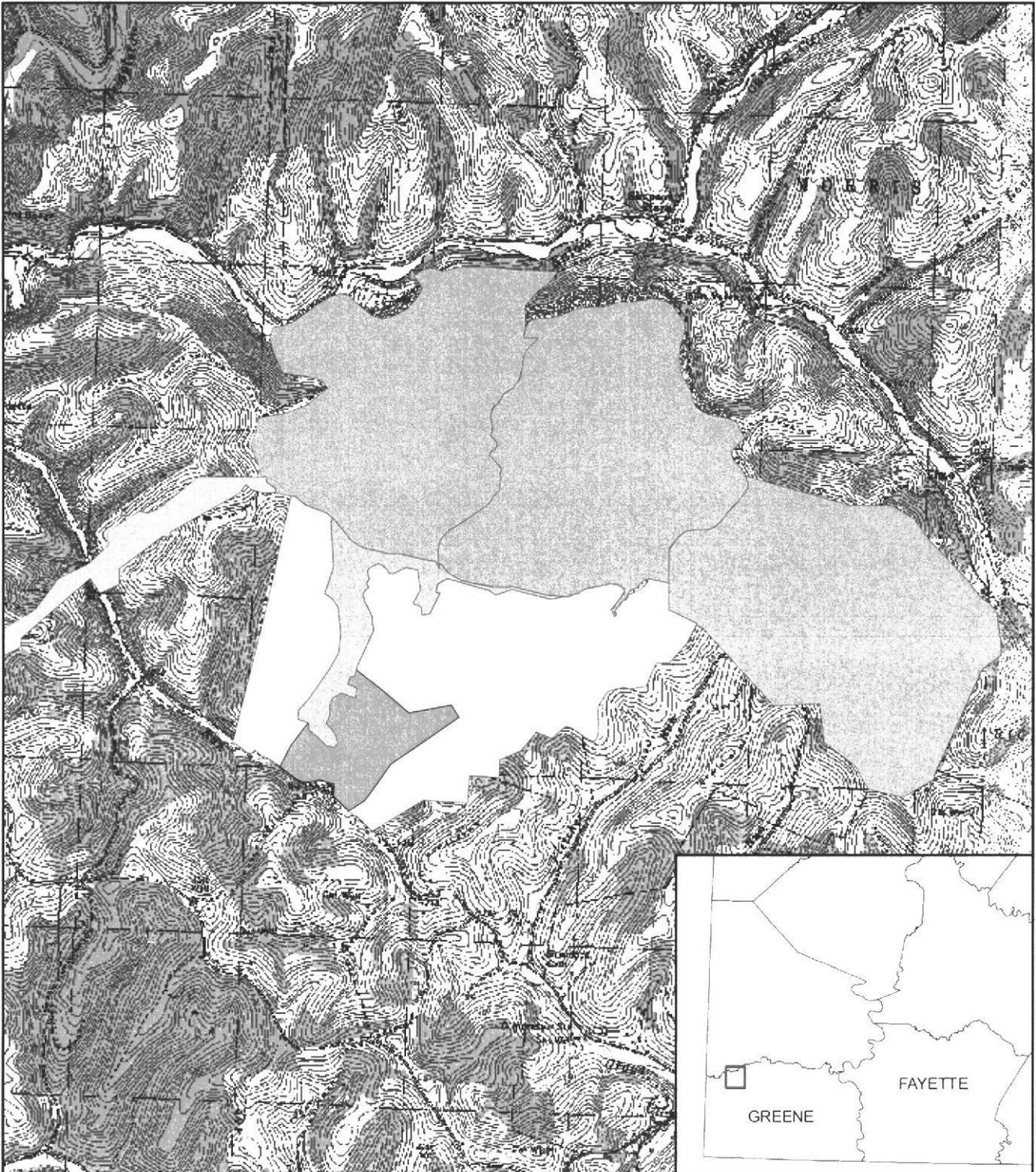
the edge of the Coal Refuse Conveyor Permit Boundary. The bat roosted in the tree only one night, immediately after capture and transmitter attachment. During three nights of emergence counts, no other bats were found using the tree. It is assumed use of the tree resulted from a temporary behavior change following capture and transmitter attachment (White and Garrott 1990). Additional use of the tree by Indiana bats is likely rare, if it is used at all. Similarly, long-term observations on the Indianapolis Airport have shown that given enough time, many or nearly all potentially suitable roost trees are used at least once by one bat, though few are used repeatedly or consistently, and the importance of any such individual tree is nearly inconsequential for a colony (Dale Sparks pers. comm.). Figure 3 shows Indiana bat activity on the CRDA 5 and 6 Permit Area.

Detailed descriptions of Indiana bat use of the surrounding areas can be found in CEC (2007) and ESI (2009).

2.0 Literature Cited

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- | | | | | | |
|---|----------------------------|---|--------------------------------|---|--------------|
|  | Existing CONSOL Facilities |  | CRDA 5 Refuse Conveyor |  | CRDA 5 and 6 |
|  | CRDA 5 Sedimentation Pond |  | Crabapple Overland Belt Permit | | |

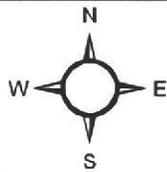


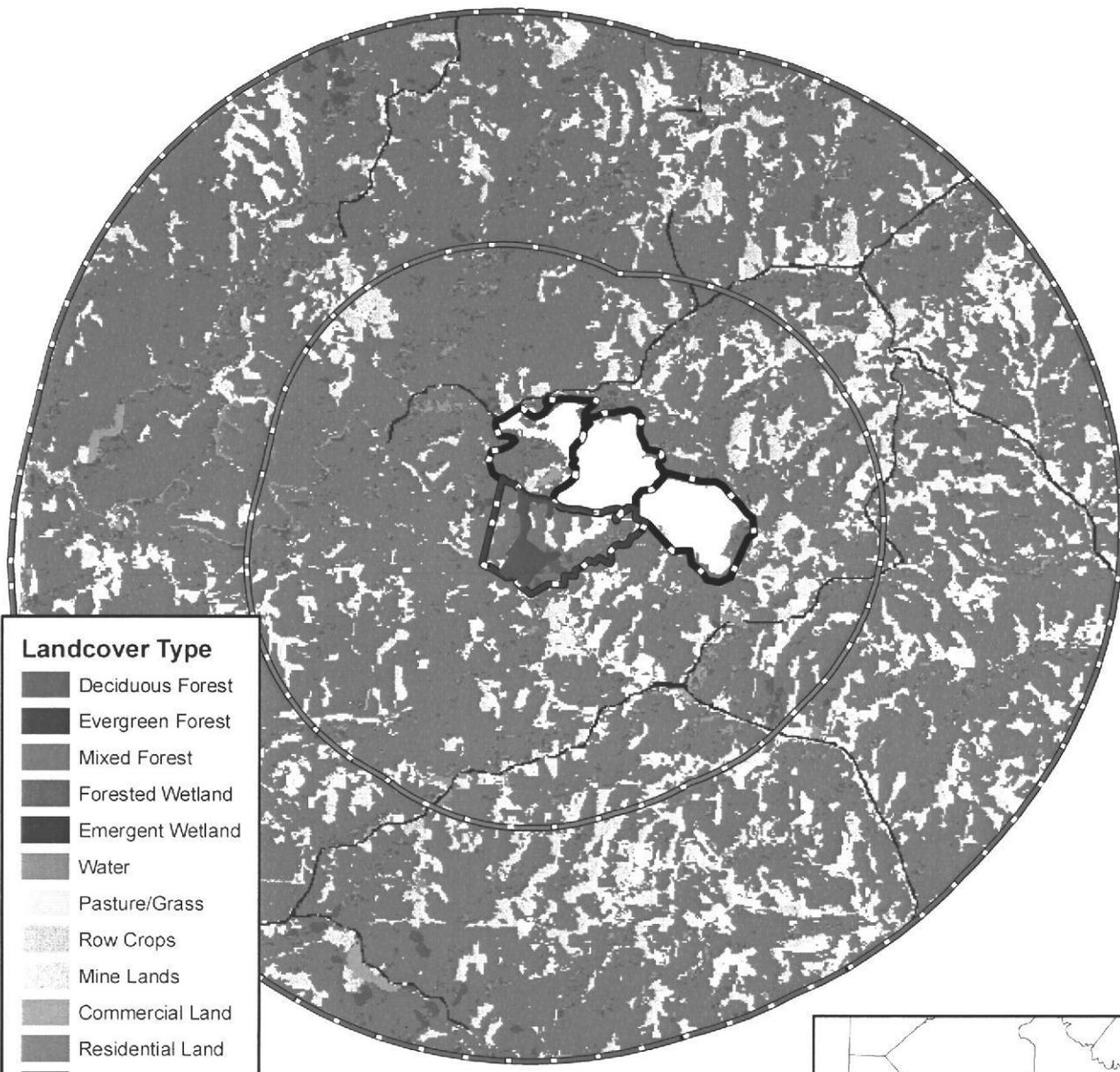
Figure 1. CRDA 5 and 6, Greene County, Pennsylvania.

0 0.9 1.8 Kilometers

Project No. 213, Task 17 May 2009



ENVIRONMENTAL SOLUTIONS
& INNOVATIONS, INC.



- Landcover Type**
- Deciduous Forest
 - Evergreen Forest
 - Mixed Forest
 - Forested Wetland
 - Emergent Wetland
 - Water
 - Pasture/Grass
 - Row Crops
 - Mine Lands
 - Commercial Land
 - Residential Land
 - Barren Land
 - Roads

- Existing CONSOL Facility
- CRDA 5 and 6
- 5 Mile Buffer
- 2.5 Mile Buffer

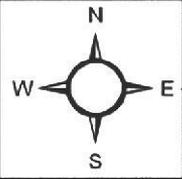
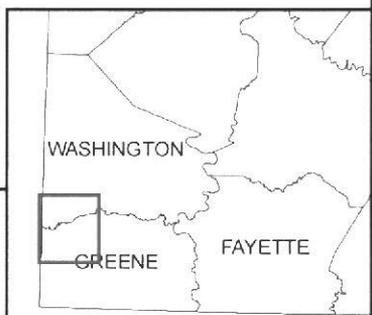
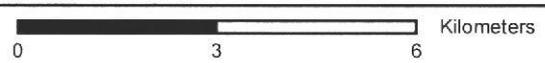


Figure 2. Available Habitat, Greene County, Pennsylvania.



Project No. 213, Task 17 May 2009



ENVIRONMENTAL SOLUTIONS & INNOVATIONS, INC.

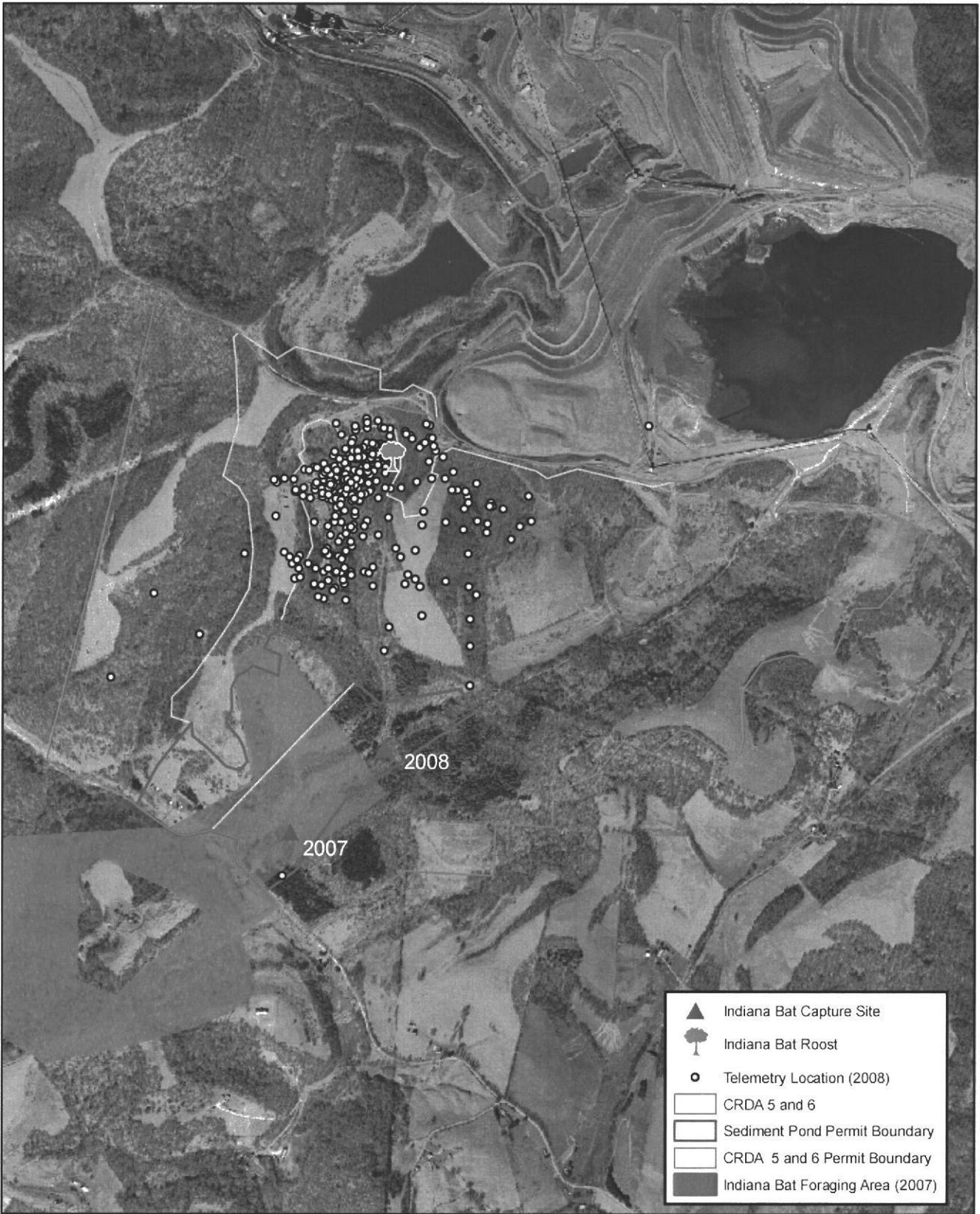
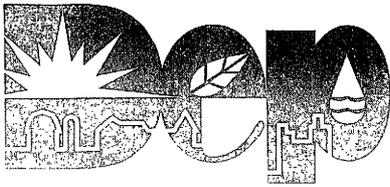


Figure 3. Species occurrence.

Project No. 213.17
May 2009



ENVIRONMENTAL SOLUTIONS
& INNOVATIONS, INC.



Pennsylvania Department of Environmental Protection

25 Technology Drive
California Technology Park
Coal Center, PA 15423
December 23, 2008

California District Office

Gregory A. Heilman, P.E.
Michael Baker Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

Re: Applicant's Name: Consol Pennsylvania Coal Company LLC
Application Number: 30080701
Richhill Township, Greene County

Dear Mr. Heilman:

This is a follow-up to our December 23, 2008 telephone conversation regarding the proposal by Consol Pennsylvania Coal Company LLC for a new refuse disposal and related NPDES permit for the Bailey Central Mine Complex, Coal Refuse Disposal Area No. 5. The following information is needed to make this application administratively complete:

Module 12

1. Form 12.1A
 - a) Please provide a date on the form.
 - b) The listed surface acreage to Outfall 501 does not include surface area runoff from the complete surfaces of Coal Refuse Disposal Areas No. 1 and No. 3. The form must include all drainage areas to the impoundment.

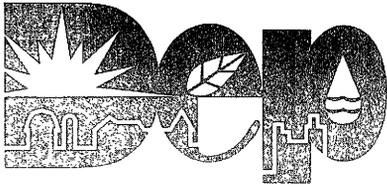
Module 15

2. A cursory review of the proposed stream mitigation plan was completed. Mitigation is required to address the permanent loss of 25,957-feet of streams (currently proposed and future impacts) resulting from the construction of the No. 5 and No. 6 Coal Refuse Disposal Areas. The current stream mitigation proposal to perform 25,957-feet of stream enhancement in the Templeton Fork and Rocky Run watersheds to mitigate the impacted streams is not acceptable, as discussed in our 12/8/08 meeting. Therefore, the application cannot be currently accepted for review. The application may be withdrawn or retained in this office until an acceptable stream mitigation plan is provided. Please advise us of your intentions.

ARNEY &
PITTSBURGH
2008 DEC 24
724-769-1100

ARNEY &
PITTSBURGH
2008 DEC 24 AM 11:26

RECEIVED
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Pennsylvania Department of Environmental Protection

25 Technology Drive
California Technology Park
Coal Center, PA 15423
April 21, 2008

2008 APR 24 PM 12:30

ARMY CORPS OF ENGINEERS
PITTSBURGH DISTRICT

724-769-1100

California District Office

Mr. Ron Lehman, P.E.
CONSOL Energy, Inc.
Pennsylvania Coal Operations
1525 Pleasant Grove Road
P.O. Box J
Claysville, PA 15323

Re: Bailey Mine Central Complex
Site Selection - Bailey no.5 Coal Refuse Disposal Area
Richhill Township, Greene County

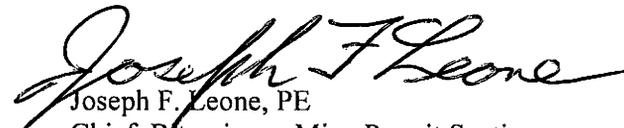
Dear Mr. Lehman:

A review of the above referenced Coal Refuse Disposal Site Selection report, accepted on April 18, 2007 and additional information received November 29, 2007 has been completed. The selected Refuse Disposal Area Sites No.5, No.6, No.7, and No.14 are acceptable. Site No.8 is not acceptable, as the "existing" use of the stream located in the site is classified as exceptional value. Refuse disposal shall not occur in exceptional value watersheds. You may begin preparing a Coal Refuse Disposal Permit Application to be submitted to our office for the acceptable sites. Please be advised that available fine and coarse coal refuse disposal capacity must be utilized in a timely manner to the greatest extent practical to avoid premature and potentially unnecessary impacts to streams, wetlands, and other resources. Future coal refuse disposal applications for individual sites must justify the need for additional disposal areas. Further, Consol must comply with §86.37(a)(15) prior to permit issuance regarding the Indian bat.

Please be advised it is a violation of the law to perform any work in conjunction with a coal mining activity without first obtaining a written permit from the Department.

If you have any questions, please contact this office at the above listed number.

Sincerely,


Joseph F. Leone, PE
Chief, Bituminous Mine Permit Section
District Mining Operations

JFL/CB/dlr: f a JF JK JFL

cc: Greensburg District Office
MCI Tim Hamilton
Michael Baker Jr, Inc. – Gregory Heilman, P.E.
U.S. Army Corps of Engineers – Marsha Haberman
U.S. Department of the Interior, USFWS – Cindy Tibbott
PA Game Commission – Jeff Kost, P.G.
PA Fish Commission – Steve Kepler
PA Division of Dam Safety, c/o Jack Kraeuter

Baker

Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation

Airside Business Park
100 Airside Drive
Moon Township, PA 15108

412-269-6300
FAX 412-375-3986

November 27, 2007

Mr. Craig Burda
Pennsylvania Department of Environmental Protection
California District Mining Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423

Re: Consol Pennsylvania Coal Company
Bailey Central Mine Complex
Alternatives Analysis & Site Selection Study for
New Coal Refuse Disposal Area No. 5

Dear Craig:

In response to your letter of October 12, 2007 for the above referenced Report, four copies of revised pages and exhibits are enclosed. Responses to the comments included in your letter are provided below. For convenience, the comment is followed by the response.

1. *Comment: Provide copy of certified mail receipts for resource agency notification, if available.*

Response: The Alternatives Analysis Reports were not sent to the resource agencies via certified mail; therefore, certified mail receipts are not available. However notifications from Baker's shipping service indicating that the shipments were delivered are attached.

2. *Comment: Please be advised that the future coal refuse disposal permit application must demonstrate no adverse hydrologic or water quality impacts will result from coal refuse disposal activities being conducted within 100 feet of streams. Failure to provide adequate demonstration will result in the permit application being denied. Refer to page 8 of the Department's technical guidance document titled Coal Refuse Disposal- Site Selection for permit application requirements.*

Response: CPCC will address potential hydrologic and water quality impacts during the permit submission/review process.

2007-463
Manna
~~2002-371~~

Christina
Received
11/28/07
EBA

Mr. Craig Burda
November 27, 2007
Page 2

3. *Comment: The executive summary states that coal refuse disposal capacity will be exhausted by 2013 and fine coal refuse is expected to be exhausted by 2012. Please provide approximate available capacity estimates and closure dates for each of the existing facilities. The introduction indicates that coal refuse disposal area no.3 slurry impoundment pool will remain open to provide water for the Bailey Mine Central Complex. Strong justification must be provided for disposal area no.3 to remain open once slurry capacity is exhausted, as substantial coarse coal refuse disposal capacity exists in the final coarse refuse fill/cover of the slurry impoundment. Available fine and coarse coal refuse disposal capacity must be utilized in a timely manner to the greatest extent practical to avoid premature and potentially unnecessary impacts to streams, wetlands and other resources. Permit applications will not be approved unless demonstration is provided that existing disposal capacity will be exhausted prior to affecting new sites.*

Response: Table 1-1 has been added to the Report that summarizes the available capacities and estimated closure dates for the existing coal refuse disposal areas. Section 1 has been revised to state that closure of the Area No. 3 pool will begin once sufficient water is available in the new slurry impoundment to support Bailey Central Mine Complex operations.

4. *Comment: The evaluation for the federally listed, endangered Indiana bat must be completed and approved by the resource agencies (PA Game Commission and USFWS) prior to site alternatives analysis approval. Please provide agency correspondence for our records.*

Response: Regarding site selection, section 4.1 of the Coal Refuse Disposal Control Act, 52 P.S. §30.54a, and 25 Pa. Code § 90.202(e)(3), both provide that except if it is a preferred site, coal refuse disposal shall not occur ... in sites known to contain federal threatened or endangered plants or animals or state threatened or endangered animals.... A PNDI review did not result in a "hit" for any state or federal threatened or endangered animals. However, in the summer of 2007, a survey was conducted to determine the presence/probable absence of Indiana bats in an area that included the site proposed by Consol as the preferred site. In the course of the survey, on July 5, one adult female Indiana bat was captured while foraging in the southeast corner of the proposed permit area. That bat (Bat 1) was fitted with a transmitter and was tracked to a maternity roost tree that is over two miles west of the proposed permit area.

A second adult female Indiana bat (Bat 5) was captured in the vicinity of the maternity roost (approximately two miles from the proposed permit area) on July 28. On August 15, Consol's consultant assisted representatives of the Pennsylvania Game Commission in capturing another adult female Indiana bat (Bat 6) in the vicinity of the maternity roost tree.

Each of the bats (Bat 1, Bat 5 and Bat 6) was fitted with a transmitter and was tracked for several days. Neither Bat 5 nor Bat 6 traveled to the proposed permit area during the time that it was tracked. Bat 1's presence in the proposed permit area during the time that it

was tracked was limited to some foraging in the southeast corner of the proposed permit area on one night.

The proposed permit area does not contain "critical habitat" for Indiana bats as that term is defined in the federal regulations. "Critical habitat" is defined at 50 CFR 402.02, as "an area designated as critical habitat listed in 50 CFR parts 17 or 226." The critical habitats listed for Indiana bats in 50 CFR part 17.95 are a number of specific caves and mines, none of which are located in Pennsylvania. Additionally, no resource agency has indicated that the proposed permit area contains critical habitat.

Given the capture of one Indiana bat in the proposed permit area, Consol asked DEP Regulatory Counsel, Richard Morrison, for a legal interpretation of whether the proposed permit area is "known to contain" an endangered species. Consol submitted a complete copy of the Indiana Bat Survey Report to Mr. Morrison and asked him to consider it in the context of (i) the rule of statutory construction that undefined words in a statute shall be construed according to their common usage, and (ii) the common meaning of "contain" (to hold within fixed limits; to hold within an area). After due deliberation and discussion of the issue with Harold Miller and other Department personnel, Mr. Morrison advised Consol's counsel that under the facts of this matter, the proposed permit area is not "known to contain" an endangered species so as to preclude approval of the proposed site as the preferred site in the site selection review. However, we were also advised that in the review of a permit application for the proposed permit area, the criterion for permit approval of 25 Pa. Code § 86.37(a)(15) would be applicable and the Department will rely on the Pennsylvania Game Commission and the U.S. Fish and Wildlife Service (USFWS) evaluations in its consideration of this criterion.

Regarding the consideration by the USFWS, a copy of a letter from David Dinsmore of the USFWS to Colonel Michael P. Crall of the U.S. Army Corps of Engineers, dated October 12, 2007, in which the USFWS requests formal consultation under the Federal Endangered Species Act, is attached.

5. *Comment: Please provide a copy of the map submitted to the PHMC for our records.*

Response: A copy of the map that was submitted to PHMC along with Baker's February 28, 2007 letter is attached.

6. *Comment: Please provide copy of a map for our reference and records that depicts the properties identified in the letter from Dave Hudson regarding prime farmland soil units.*

Response: A figure showing the properties identified in the March 6, 2007 David Hudson letter is attached. Please note that an additional letter from David Hudson dated November 14, 2007 that addresses two properties not included in the March 6, 2007 letter is also provided for inclusion into Appendix B of the Report; these parcels are also shown on the attached figure.

Mr. Craig Burda
November 27, 2007
Page 4

7. *Comment: Please be advised that the selected alternative exists in an Environmental Justice Area, which must be addressed in the future permit application.*

Response: CPCC will address potential Environmental Justice Area impacts during the permit submission/review process.

8. *Comment: PHMC is requiring a Phase 1 archaeological survey to locate potentially significant archaeological resources, which must be addressed prior to permit issuance.*

Response: CPCC is already planning to have a Phase 1 archaeological survey performed as part of the coal refuse disposal permitting process. CPCC will obtain PHMC approval prior to permit issuance.

9. *Comment: No stream and wetland mitigation proposal has been submitted to our office for consideration to date. We are requesting stream mitigation proposals be presented in the future coal refuse disposal application that will result in the restoration of a stream(s) adversely impacted by untreated mine discharges or other conditions, such as the construction of a mine water treatment facility and the development of a trust fund to adequately fund water treatment in perpetuity.*

Response: CPCC understands that approval of the site alternatives analysis will not constitute approval of mitigation plans. CPCC's formal mitigation proposal to PADEP will be submitted and finalized during the coal refuse disposal permit application review process.

10. *Comment: A small area of prime farmland soil is located just south west of the freshwater impoundment that is not shown on Exhibit 1.*

Response: The prime farmland soil unit area located southwest of the freshwater impoundment has been added to Exhibit 1.

11. *Comment: 5.1. Please provide a map that shows the relationship between the proposed coal refuse disposal sites and underground mining.*

Response: A Figure showing the locations of the Bailey and Enlow Fork underground mines in the search area has been added to the Report as Exhibit 5; and Section 5.1 has been revised to reference Exhibit 5.

12. *Comment: 5.1. Please address the possibility of fine coal refuse slurry injection into currently abandoned (if any) or future abandoned portions of Bailey and Enlow Fork Mines.*

Response: Section 5.1 has been revised to include a discussion on the potential for slurry injection into the Bailey and/or Enlow Fork Mines.

13. *Comment:* 5.4. Coal refuse disposal activities are prohibited within 100-feet of a cemetery and would constitute a fatal flaw. Please revise the narrative accordingly.

Response: Section 5.4 has been revised to indicate that coal refuse disposal within 100 feet of a cemetery is considered to be a fatal flaw.

14. 6.2.1

- a. *Comment:* Table 6-2 shows that water samples collected at sites 5, 6, and 11 are exhibiting signs of high conductivity relative to surrounding streams. Please explain.

Response: The conductivities for samples collected for Sites 5, 6 and 11 are somewhat higher than the other sites monitored in this one time sampling event for all of the sites in the Alternatives Analysis Study. Based on past experience, these conductivity levels in surrounding streams are not out of the ordinary for samples collected and analyzed over time. With the submittal of the permit application additional samples will be collected and analyzed in order to obtain a complete seasonal picture of streams in the intended permit area.

- b. *Comment:* Please explain why site 6 is exhibiting high sulfate readings in addition to high conductivity relative to surrounding streams.

Response: The sulfate analysis for the sample collected for Site 6 is somewhat higher than the other sites monitored in this one time sampling event for all of the sites in the Alternatives Analysis Study. Based on past experience, this sulfate level in surrounding streams is not unusual for samples collected and analyzed over time. With the submittal of the permit application additional samples will be collected and analyzed in order to obtain a complete seasonal picture of streams in the intended permit area.

- c. *Comment:* Please address how the construction of refuse areas that have been longwall mined will affect the water quality of surrounding watersheds.

Response: A discussion on the potential impacts from refuse disposal over longwall mined areas has been added to Section 6.12.

15. *Comment:* 6.6. Alternate 2 indicates five dwellings are located within the 300-foot barrier area, although only one is shown on exhibit 1. In addition, an occupied dwelling appears to be located across the state route located on the southern side of site #5

Response: Exhibit 1 has been revised to show the additional dwelling across State Route 4007, on the southern side of Site 5. The five dwellings listed within 300 feet of Alternate 2 include four dwellings on the other side of State Route 4004, across from Sites 5, 7, and 8 that are located slightly further than 300 feet from the disposal limits shown. These dwellings were included for Alternate 2 since associated disposal facilities (i.e., access roads, drainage structures) would extend beyond the refuse disposal limits shown.

Mr. Craig Burda
November 27, 2007
Page 6

16. *Comment: The narrative lists engineering design measures that may be employed to reduce the impact to the adjacent high quality watershed. Please be advised the future refuse disposal area plans must be designed in a manner to prevent impacts to the high quality watershed.*

Response: CPCC understands that future disposal areas must be designed to prevent impacts to high quality watersheds. Section 6.12 has been revised to state that impacts to the adjacent high quality watershed will be prevented.

Please feel free to call me at 412-269-6096 or Ron Lehman of CPCC at 724-663-3032 if you have any questions or require additional information.

Sincerely,

MICHAEL BAKER JR., INC.



Gregory A. Heilman, P.E.
Technical Consultant

cc: Ron Lehman – CPCC (w/ 2 copies)
~~Scott Hans – U.S. Army Corps of Engineers, Pittsburgh District (w/ 1 copy)~~
Cindy Tibbott – U.S. Fish and Wildlife Service (w/ 1 copy)
Jeff Kost – PA Game Commission (w/ 1 copy)
Steven Kepler – PA Fish and Boat Commission (w/ 1 copy)
Neil Bossart – Civil and Environmental Consultants (w/ 1 copy)



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TO Scott - 013

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Delivery date	Apr 18, 2007 1:09 PM		
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Delivery date	Apr 18, 2007 2:01 PM		
Status	Delivered		
Signature image available	Yes		

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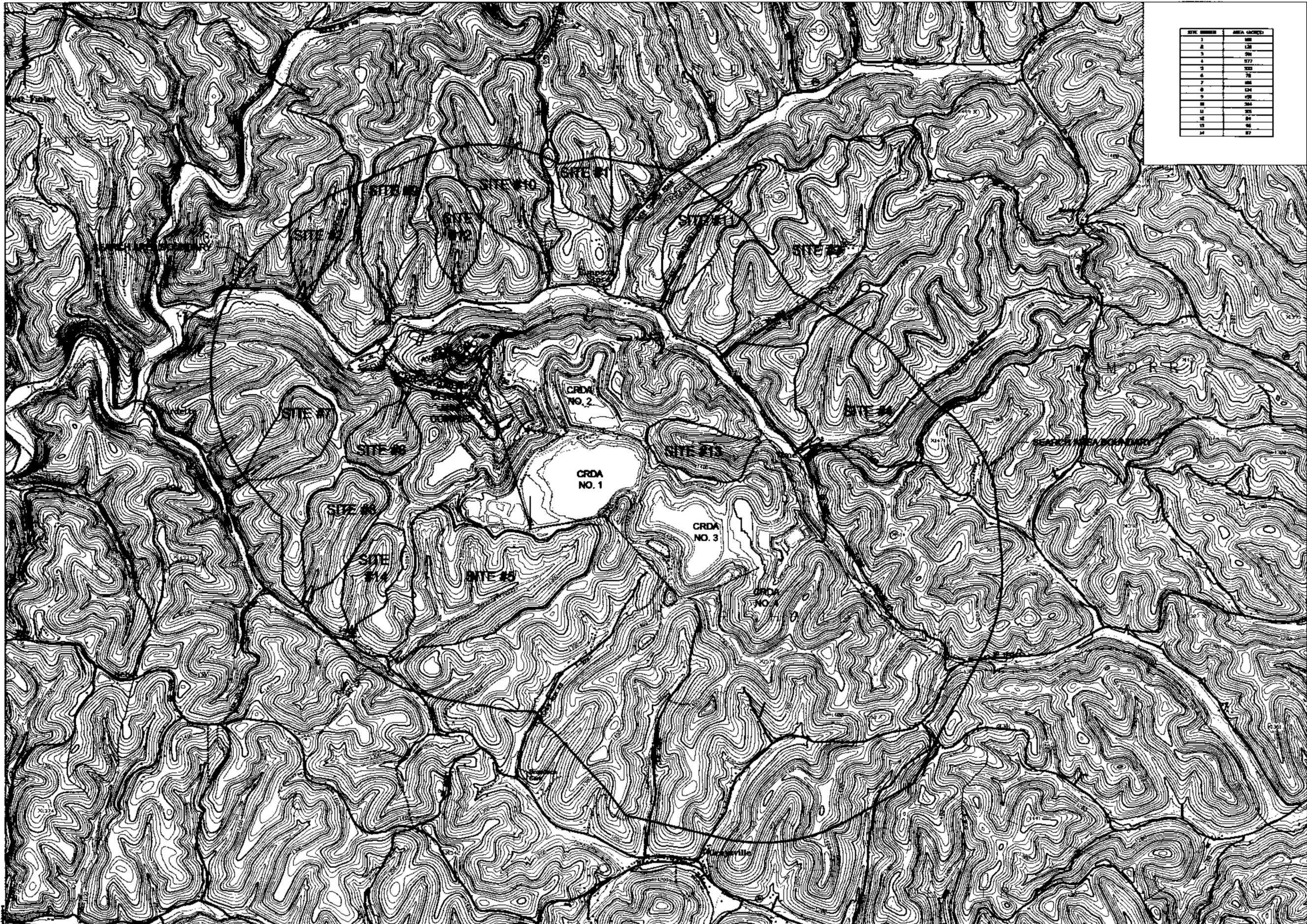
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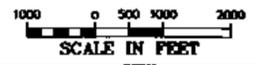
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SITE NUMBER	AREA (ACRES)
1	100
2	120
3	200
4	377
5	330
6	70
7	80
8	100
9	120
10	150
11	180
12	200
13	250
14	270

Baker
 CONSULTING ENGINEERS, INC.
 1000 W. 12th Street, Suite 200
 Oklahoma City, Oklahoma 73102



DATE	BY	CHKD BY	DATE

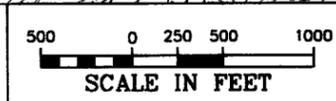
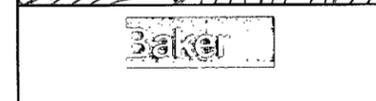
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BAILEY GENERAL MINE COMPLEX
 SITE SELECTION STUDY - ALTERNATIVE ANALYSIS
 COAL REFUSE DISPOSAL AREA
 INITIAL SITE ASSESSMENT MAP

SCALE	PROJECT NO.
1" = 1000'	109957
DRAWN BY	DATE



REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE

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 DESIGNED BY: G.Hellman
 CHECKED BY: G.Hellman
 APPROVED BY: M.Stewart

DATE: 10/07
 DATE: 10/07
 DATE: 11/07
 DATE: 11/07

BAILEY CENTRAL MINE COMPLEX
 ALTERNATIVE ANALYSIS & SITE SELECTION STUDY
 NEW COAL REFUSE DISPOSAL AREA NO. 5
 CONSOL TRACKS REFERENCED IN DAVID HUDSON
 MARCH 6, 2007 & NOVEMBER 14, 2007 LETTERS

SCALE: 1" = 1000'
 PROJECT NO.: 109957
 DRAWING NO.:
 EXHIBIT:
 Prime Farmland Prop. Et.



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

October 12, 2007

Colonel Michael P. Crall, District Engineer
(ATTN: Christina L. Schroeder)
U.S. Army Corps of Engineers
Pittsburgh District
William S. Moorhead Federal Building
1000 Liberty Avenue
Pittsburgh, PA 15222-4186

RE: USFWS Project #2008-0021

Dear Colonel Crall:

The Fish and Wildlife Service has reviewed Public Notice Number 07-37 (Application No. 2005-2160), dated August 22, 2007. Consol Pennsylvania Coal Company proposes to construct an overland conveyor beltline (Crabapple Belt Line) that will transport extracted coal from the Crabapple Slope Yard to the Bailey Preparation Plant. The proposed conveyor belt, located in Richhill Township, Greene County, Pennsylvania, would result in impacts to about 5,715 feet of 24 headwater streams (about 287 feet perennial, 2,429 feet intermittent and 2,999 feet ephemeral) and 0.47 acre of wetlands. In addition, the project will temporarily affect 456 feet of intermittent streams (for crossings) and permanently affect 0.92 acre of wetlands (for restoration of Crabapple Creek). As compensatory mitigation for the loss of streams, the applicant proposes restoration of 1,308 feet of Crabapple Creek (a third-order stream) and 2,908 feet of an unnamed headwater tributary to Crabapple Creek. As compensatory mitigation to offset wetland losses, the applicant proposes creation and restoration of 1.60 acres of wetlands. We have previously commented on this project by letter dated March 13, 2006.

Federally Listed and Proposed Species

The project area is within the range of the federally listed, endangered Indiana bat (*Myotis sodalis*). Indiana bats hibernate in caves and abandoned mines during the winter months (November through March), and use a variety of upland, wetland and riparian habitats during the spring, summer and fall. Indiana bats usually roost in dead or living trees with exfoliating bark, crevices or cavities, especially those with sun exposure to the trunk. Female Indiana bats form nursery colonies under the exfoliating bark of dead or living trees, such as shagbark hickory, black birch, red oak, white oak, and sugar maple, in upland or riparian areas. Land-clearing, especially of forested areas, may adversely affect Indiana bats by killing, injuring or harassing roosting bats, and by removing or reducing the quality of foraging and roosting habitat.

In our letter of February 6, 2006, we determined that the project was not likely to adversely affect Indiana bats, based on negative survey results obtained in June of 2005. However, following the discovery of an Indiana bat maternity colony in the project area in July of 2007, we are rescinding our earlier determination.

Pursuant to section 7 of the Endangered Species Act, further consultation on this project will be necessary to address potential effects on the Indiana bat, since adverse effects on this species may occur due to forest removal, and impacts on streams and wetlands. We are currently consulting with Consol and the Pennsylvania Department of Environmental Protection regarding the Bailey Coal Refuse Disposal Area #5, located a short distance to the east of the proposed Crabapple Belt Line. Timber removal from these two projects combined total about 678 acres. Because these projects are interrelated, and both may affect Indiana bats, they should be reviewed as one single and complete project to ensure all direct and indirect effects on Indiana bats are considered.

Alternatives Analysis

We appreciate the applicant's effort to minimize impacts on perennial streams and wetlands. However, since our last review, project impacts to intermittent and ephemeral streams have increased, rather than decreased (original impacts would affect 1,265 feet of headwater streams; about 81 feet perennial, 347 feet intermittent and 722 feet ephemeral). Consol should evaluate ways to further reduce impacts by reducing grading impacts through either reconfigured site plans or installed headwalls; minimizing the lengths of stream enclosures; restricting the forest corridor clearing to the minimum necessary for constructing the beltline, especially minimizing clearing widths at all stream crossings; letting unneeded cleared areas within the beltline corridor revert back to native vegetation when construction is completed; and elevating the beltline to cross streams (instead of filling in at grade).

For any stream crossings that are unavoidable, open-bottom arches should be used instead of culverts to enable free movement of wildlife (aquatic and terrestrial) along the stream corridor. If the use of conventional culverts cannot be avoided, the applicant should countersink the culvert invert six inches to allow for formation of a natural stream bottom.

Secondary Impacts

There are likely secondary or indirect adverse environmental effects beyond those associated with direct project impacts, such as interruption of hydrology in streams and wetlands, stormwater runoff into streams, impacts due to pesticides (beltway clearing and maintenance), introduction of petroleum products, heavy metals and coal fines into the environment (beltline maintenance and operation), and limited regrowth of vegetation under and near the beltline (due to shading and herbicide treatment), post construction erosion and sedimentation and others. All effects should be identified, quantified, and included in the permit package. We support the use of a rain cover, enclosed transfer points, and belt drip pans over streams to protect coal products from the elements, and to minimize stream habitat loss and degradation due to incidental fallout of coal fines from the beltline.

Single and Complete Project

The proposed Crabapple Slope Yard Development and the Bailey Coal Refuse Disposal Area (Nos. 5 and 6) projects are interrelated projects that are currently being constructed and developed in conjunction with the beltline construction. By the applicant's own words, "the overland belt is a critical project in maintaining the productivity and economic viability of the Bailey Mine." The proposed beltline, Slope Yard, and Refuse Disposal developments are interdependent and interrelated projects, it is still not clear why they are being reviewed and permitted separately. A full evaluation of potential effects (direct and secondary) requires that all such projects be considered.

Compensatory Mitigation

Stream mitigation:

1. The applicant's proposed stream mitigation amounts to a replacement ratio of about 0.74:1. Stream replacement should be a minimum of 1:1; with higher ratios if the proposed work involves riparian enhancements only. We request that the stream mitigation plan reflect this need.
2. To incorporate a natural stream channel design approach, an appropriate reference reach must be chosen, which represents stable conditions for a stream of this type and in this setting. The reference reach will provide information crucial for design, including the appropriate cross-section dimensions, pattern, and stream profile. We note that this information was not included in the information provided.
3. Based on the materials provided, there is no operation and maintenance plan in place for the completed stream restoration project (other than a plan to monitor the completed stream restoration project). The plan should specify the party responsible for completing maintenance remediation should the project fail.
4. We have concerns about laying back the streambanks at a 2:1 (H:V) slope beginning at the bankfull elevation and extending back to the existing grade. We are concerned that this practice would remove crucial woody riparian vegetation that presently functions to hold the stream banks in place and keep them from eroding. Furthermore, no data have been provided to demonstrate that a 2:1 slope is the stable geomorphic form for this particular stream.
5. The applicant has proposed the use of rock and log J-hooks, with root wads incorporated as habitat cover for aquatic organisms on the downstream side. While the project designers have provided "typicals" of these proposed structures, they have not indicated placement of each structure on the design plans, as is usually included in stream restoration plans of this kind. Project designers should review the placement of each in-stream structure with respect to the flow lines of the stream and how they affect the banks

(especially during high water events) Consequently, we cannot fully review the adequacy of the stream restoration plan without this missing information.

6. We are concerned that the applicant has included plans to install coir logs at the outside of stream meanders to "help alleviate erosive forces" on the banks of restoration area #3. Installing coir rolls for stabilization purposes is not appropriate. In our experience, these devices wash out with the first high flow event. They are meant for streambank enhancements only, not for stabilization. Streambank stabilization may be best served by instream structures.
7. The applicant has not provided detailed plans for the existing channel meander once those stream reaches are abandoned. If left intact, the abandoned stream channel would act as an alternative flow path during flood conditions, especially if stream channel changes within the relocated reach trigger accumulation of materials in the newly-constructed channel. We request that the applicant detail their plans for the abandoned stream channel. We recommend that those plans include backfilling, or installing multiple channel blocks within, the abandoned stream channel.
8. With reference to the riparian planting scheme, the proposed native tree and shrub plantings should be scattered in groups of two or three throughout the riparian corridor of the mitigation area, instead of being concentrated in evenly-spaced groupings. This information was not included in the Planting Notes. Furthermore, we recommend that the applicant place some sort of demarcation (physical barrier) to protect newly revegetated areas from indiscriminant mowing or maintenance until plants have established and matured. This was also not indicated in the materials provided.
9. We commend the applicant's efforts to use plants that are native to Pennsylvania in the proposed planting scheme for the stream and wetland mitigation sites. However, we note that one introduced species, *Coreopsis tinctoria* (Plains coreopsis), has been included in the upland buffer seed mix. We recommend that this species be replaced with one that is native to Pennsylvania.
10. To enable us to conduct a thorough review of this mitigation plan, we request that the applicant provide more detailed information on each J-hook's reference to the points of tangency and curvature along the stream meander.
11. We are concerned about disturbance of existing wetlands for stream relocation. The applicant has not adequately described stream conditions at this location, nor have they provided detailed plans for the relocated stream channel. We request that the applicant provide more specifics on the proposed stream relocations.

Wetland mitigation: It appears that to relocate the stream, the wetland that currently exists on the site (0.92 acre) must be disturbed. However, it is now clear that while these impacts to the existing wetland were not included as part of the total impacts, the applicant intends to compensate for these impacts in their mitigation plan (a total of 1.39 acres). The mitigation plan speaks only to the creation and restoration of palustrine emergent (PEM) and scrub-shrub (SS) wetlands at a 1:1 replacement ratio. We normally recommend a palustrine forested wetland replacement ratio of 2:1, SS wetland replacement at 1.5:1, and PEM replacement at 1:1. We request that the applicant clarify the amounts of each habitat type and, if appropriate, provide additional mitigation to fulfill these recommended ratios

Mitigation Monitoring Plan

Although the applicant has proposed post-construction monitoring of the stream restorations and constructed wetland, they have not included the important components of a stream restoration monitoring plan. We have previously recommended the inclusion of structure and bank stability evaluations, using cross-sectional as-built measurements of each structure, benchmarks, and means/methods/plans for structure repair in the event that a structure would be altered or destroyed by large storm events or ice, in addition to the proposed photo documentation. We recommend that at a minimum, these components are included in any monitoring plan for the proposed stream restoration. Additionally, the applicant makes no mention of including biological monitoring in the stream mitigation monitoring plan. With stream restoration as the goal of the mitigation plan, the stream biota should indicate the success of the stream restoration project from a biological standpoint.

Summary

A project of this scale has the potential to severely alter the biota, habitats, and aquatic resources over a large area, and cause substantial direct, indirect, and cumulative losses of aquatic and terrestrial habitats. The effects of the beltline proposal and all interrelated actions (including Disposal Areas #5) should be fully evaluated and considered in project impact assessment, design, and permitting. For these and the reasons described above, we recommend that the project not be authorized as proposed. In addition, due to the presence of Indiana bats in the project area, further consultation pursuant to section 7 of the Endangered Species Act will be necessary prior to any Corps authorization of this project.

Thank you for the opportunity to comment on this project. Please contact Jennifer Kagei of my staff at 814-234-4090 if you have any questions or require further assistance regarding this matter.

Sincerely,



David Deasmore
Supervisor

cc:

PADEP - Southwest
PADEP - California District mining office
PFBC - Kepler
PGC - Capouillez
EPA - Walsh
Readers File
ES File - Active
Project File - Kagel
ES: PAFO:JKagel/jak:
Filename: Y:\FROFFICE\Finals\FINALS 2007\Crabapple beltline IP.doc

**CONSOL PENNSYLVANIA COAL COMPANY
BAILEY CENTRAL MINE COMPLEX**

**ALTERNATIVES ANALYSIS & SITE SELECTION STUDY
NEW COAL REFUSE DISPOSAL AREA NO. 5**

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3	Structural Geology
4	CRDA Nos. 3 and 4 Stream Length Comparison
5	Underground Mining Locations

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B	Agency Correspondence
C	PNDI Searches

barriers created by the valley (sidewalls and head of hollow), and minimizing the number of hydrologic systems that are contacted.

This study summarizes the site selection process conducted by CPCC to identify a new disposal site for coal refuse generated by BCMC. Sites currently receiving coal refuse from the BCMC preparation plant are nearing capacity and available disposal capacity is expected to be depleted by 2013.

Selection of the site identified by CPCC as most suitable for disposal of coal refuse was derived through a site screening and selection process. This process followed requirements of Pennsylvania Department of Environmental Protection (PADEP) as contained in the PADEP's Technical Guidance Document (TGD) entitled "Coal Refuse Disposal-Site Selection", No. 563-2113-660, dated February 8, 1999. Additional recommendations obtained through discussions with representatives of PADEP California District Mining Office also were followed. The process included initial consideration of all sites within a 1 mile radius centered around the BCMC and the existing coal refuse disposal areas.

Evaluation of coal refuse disposal options included a search for suitable preferred sites as defined in the above-referenced PADEP TGD. Such sites generally include areas previously disturbed or degraded such as abandoned mine lands. No preferred sites were identified within the search area. Coal refuse disposal in underground mine workings as an alternative to surface disposal was considered; however, it was determined that this method was not technologically or economically feasible in this case. Thus surface disposal options in non-preferred sites were considered.

The search area was initially screened to identify areas where disposal would be prohibited such as areas where mining activities are prohibited and high quality watershed areas. Sites within these areas were eliminated from further consideration. The remainder of the search area then was screened to identify sites or combinations of adjoining sites having sufficient disposal capacity. Three potential disposal alternatives, each consisting of two or more individual sites

1.0 INTRODUCTION

Consol Pennsylvania Coal Company (CPCC) operates the Bailey Central Mine Complex (BCMC) in Greene County, Pennsylvania. The BCMC supports the Bailey and Enlow Fork underground coal mines and includes a preparation plant facility, freshwater impoundment, and four existing coal refuse disposal areas (CRDA Nos. 1, 2, 3, and 4). The BCMC is located approximately 2.5 miles southeast of West Finley, Pennsylvania, with the coal preparation facility located on a hill overlooking Enlow Fork to the north (See Exhibit 1). BCMC produces coal that is sold primarily to electric utility companies for generation of electrical power.

Raw coal removed from the mines must be cleaned in the preparation plant to remove impurities such as rock, clay, and various other minerals before it is suitable for market. Cleaning also reduces mineral impurities thereby reducing byproducts of coal combustion. The resultant coarse and fine waste to be disposed of is referred to as coal refuse. Coal refuse has no market value and therefore must be disposed in an environmentally safe manner. Coal refuse generated by the BCMC currently is disposed in accordance with industry standards; fine coal refuse slurry is pumped into a valley upstream of an impounding structure constructed of coarse coal refuse.

The four existing coal refuse disposal areas at the BCMC consist of two slurry impoundments, CRDA Nos. 1 and 3, and two areas comprised entirely of coarse coal refuse, CRDA Nos. 2 and 4. A summary of currently available capacities and estimated disposal capacity completion dates for the existing CRDAs is provided on Table 1-1. At projected production rates, fine coal refuse disposal capacity in Area No. 3 will be exhausted during the 2nd Quarter of 2013. Therefore, site preparation for a new slurry impoundment must begin in 2010 to provide for continued fine coal refuse disposal capacity. Coarse coal refuse disposal capacity in the existing CRDAs will be exhausted in 2013 without a new refuse disposal area, except for the storage volume available in the CRDA No. 3 cap. CPCC plans to keep the CRDA No. 3 pool open to provide water for the BCMC operations until sufficient water is available in the new slurry impoundment (estimated in the 3rd Quarter 2013), at which point coarse coal refuse disposal will begin in the CRDA No. 3 Cap.

**TABLE 1-1
SUMMARY OF EXISTING DISPOSAL AREA CAPACITIES**

	Current Available CCR Capacity (CY)	Capacity Exhausted	Current Available FCR Capacity (CY)	Capacity Exhausted
Area 1	6,290,000	3 rd Quarter 2010	0	1 st Quarter 2007
Area 2	750,000	3 rd Quarter 2008	N/A	N/A
Area 3	3,000,000	2 nd Quarter 2009	24,500,000	2 nd Quarter 2013
Area 3 Cap	14,000,000	4 th Quarter 2016	N/A	N/A
Area 4	26,250,000	2 nd Quarter 2014	N/A	N/A

Notes:

Assumes CCR disposal in Area No. 5 begins in 4th Quarter 2011 for construction of new impoundment.

Assumes FCR disposal in Area No. 5 begins in 3rd Quarter 2012.

Assumes CCR placement in Area No. 3 Cap begins in 3rd Quarter 2013 (after sufficient water available in Area No. 5 for Bailey Central Mine Complex operations).

5.0 INITIAL SITE SELECTION AND SCREENING

The search area was screened and evaluated to identify possible disposal sites. Underground as well as surface disposal options were evaluated; however, underground disposal was determined to be not feasible. The search area also was screened for possible disposal sites meeting PADEP requirements for “preferred sites”. No preferred sites were identified in the search area. Results of the initial site screening process identified three non-preferred disposal alternatives as candidates for the new BCMC coal refuse disposal area.

5.1 Underground Disposal Options

The potential for underground disposal of coal refuse within the search area was considered and determined not to be feasible.

There are no known inactive, abandoned, or unreclaimed mines within the project search area. As previously stated, there are two active longwall mines located within the search area around the BCMC (refer to Exhibit 5). The Bailey Mine lies below the southern portion of the search area, whereas the Enlow Fork Mine lies beneath the northern portion of the search area, with the Enlow Fork stream valley being the approximate division between the two. These mines extract raw coal using longwall mining methods. Upon completion of a longwall mining section, the section experiences complete subsidence, filling the void space created by coal removal.

Mining techniques used at the Bailey and Enlow Fork Mines are representative of the industry standard for longwall mining. Mine subsidence at the time of mining eliminates the large void spaces in longwall mining sections, while void spaces within the active main headings offer very little disposal capacity. Significant portions of these main headings are needed for ventilation and transport/conveyance of mine personnel, mined coal, supplies, etc., and must be kept open. Utilization of areas for coal refuse disposal in near proximity to areas utilized for ventilation and conveyance of mine personnel pose serious health and safety hazards in addition to operational problems.

pool of the slurry impoundment settling occurs allowing the clarified water to be recycled back to the preparation plant thus minimizing the amount of fresh water imported into the cleaning plant circuit. Fresh water to supplement the coal cleaning process and mining operations is drawn from Enlow Fork stream. During summer months there are extended periods when low flow conditions prohibit pumping water from Enlow Fork. During these times it would be impossible to operate without recycling clarified slurry water. Similar settling and recycling of water for re-use would be extremely difficult, if not impossible, in the current underground mine configurations for the Bailey and Enlow Fork Mines.

In addition to the problems associated with disposing FCR underground described above, there is very limited underground volume available for FCR disposal. While there are plans to abandon a substantial portion of the Bailey Mine in the future, plans for abandoning portions of the Enlow Fork Mine are still in the early planning stages. Experience has shown that only areas that are open, such as mains that are not flooded, can serve as FCR disposal areas. The only such area in the portion of the Bailey Mine that is to be abandoned is the South Mains. Experience also shows that the entire void area cannot be completely filled. Restraints in the flow of the FCR caused by such things as isolated roof falls and ventilation structures can significantly limit the percentage of void that can be filled. The volume of the void space in the South Mains is approximately 2.26 million cubic yards. Assuming that fifty percent of the void space could be effectively filled with FCR, the amount of FCR that could be disposed of would be 1.13 million cubic yards. At the projected FCR generation rate, the South Mains would only provide 3.8 months of disposal life.

Dr. Christopher Bise, currently Chairman of the West Virginia University Department of Mining Engineering, has concluded that underground stowing technology cannot keep pace with the production potential of U.S. longwall systems, and such practices decrease coal production while significantly increasing costs (Bise, et al. 1993). Due to the operational, technology, safety, and economic concerns, use of the Bailey or Enlow Fork Mines for coal refuse disposal was determined not to be feasible.

5.2 Preferred Sites

The search area has no preferred sites available for development of the new coal refuse disposal areas.

Inquiries to the PADEP Bureau of Mining and Reclamation and the PADEP California District Mining Office revealed no inactive, abandoned, or unreclaimed mine sites within the search area. A search of the Pennsylvania Brownfields Directory revealed no brownfields within the search area. Similarly, an inquiry to the CERCLIS listings available from the United States EPA revealed no hazardous waste sites within the search area. Results and correspondence from the preferred site searches are provided in Appendix A.

To further investigate the existence, if any, of a preferred site, water quality and benthic macroinvertebrate samples^{*} were collected for analysis from the primary stream within sites

- At a location which would adversely affect a publicly-owned park or place included on the National Register of Historic Places.
- Within the Commonwealth park system.
- Within a Commonwealth forest picnic area.
- Within the game land system of the Commonwealth.
- Within the boundaries of the Pennsylvania Scenic River Systems.
- Within 300 feet of a public building, school, church, community building, or public park.
- Within 100 feet of a cemetery.

The following other areas listed per 025 Pa. Code §86.102 were not considered to be fatal flaws since it was assumed that the final design of the refuse area could be revised to avoid the item, or that the appropriate variances/waivers could be obtained if necessary:

- Within 100 feet of the outside right-of-way of a public road
- Within 300 feet of an occupied dwelling
- Within 100 feet of a perennial or intermittent stream.

Based on information gathered for this study, none of the three alternative disposal sites appear to have fatal flaws and were therefore carried forward to undergo a second assessment as discussed in Section 6.0.

Results of the PNDI Search indicated the potential for state listed endangered plants for Alternative 1 (Sites 2 and 9) and Alternative 2 (Sites 6, 7, and 8). However, the presence of state listed endangered plants is not a fatal flow. Refer to Section 6.11 for a more detailed discussion on threatened and endangered species.

As shown on Exhibit 1, prime farmland soil units are present within the boundaries of all three alternatives. However, the presence of prime farmland soil units was not considered a fatal flaw for any of the three alternatives. The prime farmland soil unit areas within Alternative 1 are either wooded, which indicates that the areas have not been historically used as cropland, or are

installation of underdrains, as well as a low permeability cap component and liner, for control of exfiltration to adjacent watersheds, thereby preventing impacts to the adjacent high quality watershed on the Alternative settings.

As shown on Exhibit 5, long wall mining has occurred under portions of all three alternatives. Construction of refuse areas over areas that have been longwall mined should have no affect on the water quality of surrounding watersheds. Longwall mining results in planned overburden subsidence which occurs relatively quickly after mining. Subsidence is full and complete in a period of weeks or months. Since mining occurred before 1990, subsidence associated with the multi-panel longwall mining underlying the search area would have been completed a long time ago. In the event of a pillar collapse, induced subsidence will be much less than original panel subsidence and given the depth of overburden (approximately 655 feet), this residual subsidence should have no surface effects. Therefore, longwall mining related subsidence should have no affect on the refuse area stability which may result in leaking or piping of degraded water to adjacent watersheds.

Longwall mine subsidence does fracture the overlying strata, changing the local hydrologic system and creating new flow patterns. However, given the time since mining and subsidence (nearly 18 years) the hydrologic system would have stabilized and any permanent changes in ground water levels, leakage between aquifers, spring discharges as a result of changes in hydraulic gradient, or changes in ground water chemistry would be well established.

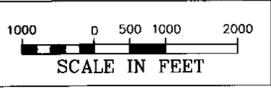
With pre-construction field inspection and investigation to identify open fractures, fissures, or highly permeable zones, appropriate engineering controls can be designed and site development implemented. The installation of underdrains, as well as low permeable cap and liner components, will control the migration of refuse-contact water and thereby prevent an impact to surrounding watersheds. This is a standard and accepted practice that is performed regardless of whether a site is undermined or not to prevent contamination of the adjacent ground and surface water.



LEGEND

- STREAMS FROM USGS QUADRANGLES
- STREAMS FROM SCS COUNTY SOIL SURVEY
- DWELLINGS WITHIN OR NEAR POTENTIAL SITES
- WETLANDS - FROM NMI MAPS
- PRIME FARMLAND SOIL UNITS
- POTENTIAL DISPOSAL AREA BOUNDARY
- SEARCH AREA BOUNDARY
- HIGH QUALITY WATERSHED BOUNDARY
- GAS TRANSMISSION LINE
- ELECTRIC TRANSMISSION LINE
- POLITICAL BOUNDARY
- STREAM SAMPLING LOCATION

Baker
 SOURCE: WIND RIDGE, ROGERSVILLE, CLAYSVILLE, AND PROSPERTY, PA USGS 7.5 MIN. QUADRANGLES



REV.	DESCRIPTION	MADE BY	CHKD BY	DATE
1	ADDED DWELLING AND PRIME FARMLAND SOIL AREA	GAH	GAH	11/16/07

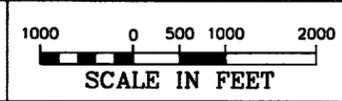
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CONSOL PENNSYLVANIA COAL COMPANY

DRAWN BY:	KCeli	DATE:	03/07
DESIGNED BY:	Chelmer	DATE:	03/07
CHECKED BY:	Chelmer	DATE:	04/07
APPROVED BY:	MSewart	DATE:	04/07

BAILEY CENTRAL MINE COMPLEX
 ALTERNATIVE ANALYSIS & SITE SELECTION STUDY
 NEW COAL REFUSE DISPOSAL AREA NO. 5
 SITE ASSESSMENT MAP

SCALE	1" = 1000'	PROJECT NO.	109957
DRAWING NO.	Area5AltAnalysisExhibit	EXHIBIT	1



REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE

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CONSOL PENNSYLVANIA COAL COMPANY

DRAWN BY: G.Hallman
 DESIGNED BY: G.Hallman
 CHECKED BY: G.Hallman
 APPROVED BY: M.Stewart

DATE: 11/07
 DATE: 11/07
 DATE: 11/07
 DATE: 11/07

BAILEY CENTRAL MINE COMPLEX
 ALTERNATIVE ANALYSIS & SITE SELECTION STUDY
 NEW COAL REFUSE DISPOSAL AREA NO. 5
 UNDERGROUND MINING LOCATIONS

SCALE: 1" = 2000'
 PROJECT NO.: 109957
 DRAWING NO.:
 EXHIBIT: 5



Consol Pennsylvania Coal Co.
1525 Pleasant Grove Road
P.O. Box J
Claysville, PA 15323

phone: 724-663-3022
fax: 724-663-3067

November 14, 2007

Mr. Craig Burda, Mining Engineer
Department of Environmental Protection
California Mining Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423

RE: Coal Refuse Disposal Area – Alternatives Analysis
Bailey Mine Complex
Consol Pennsylvania Coal Company
Richhill Township, Greene County

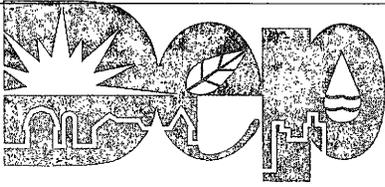
Dear Mr. Burda:

Please be advised that Consol Pennsylvania Coal Company, the owner of the tracts 2209-138 and 2209-112 attests that these parcels, identified as having prime farmland soil units, have not been used for cultivated crops for any five (5) of the past ten (10) years. Should you have any questions regarding this letter, please contact Edward Suter at 724-663-3034.

Sincerely,

A handwritten signature in black ink that reads 'David Hudson'. The signature is written in a cursive style with a large initial 'D'.

David Hudson
Vice President
Consol Pennsylvania Coal Company



Pennsylvania Department of Environmental Protection

25 Technology Drive
California Technology Park
Coal Center, PA 15423
October 12, 2007

California District Office

724-769-1100

Gregory Heilman, PE
Project Manager
Michael Baker, Jr., Inc.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

Re: Bailey Central Mine Complex
New Refuse Disposal Area, Alternatives Analysis
Greene County, PA

Dear Mr. Heilman:

We have completed a review of the coal refuse disposal site selection report accepted on April 18, 2007, for the proposed Coal Refuse Disposal Area No. 5 coal refuse disposal facility located in Greene County. The following comments were developed from the review of the report:

Miscellaneous

1. Provide copy of certified mail receipts for resource agency notification, if available.
2. Please be advised that the future coal refuse disposal permit application must demonstrate no adverse hydrologic or water quality impacts will result from coal refuse disposal activities being conducted within 100 feet of streams. Failure to provide adequate demonstration will result in the permit application being denied. Refer to page 8 of the Department's technical guidance document titled *Coal Refuse Disposal – Site Selection* for permit application requirements.
3. The executive summary states that coal refuse disposal capacity will be exhausted by 2013 and fine coal refuse is expected to be exhausted by 2012. Please provide approximate available capacity estimates and closure dates for each of the existing facilities. The introduction indicates that coal refuse disposal area no.3 slurry impoundment pool will remain open to provide water for the Bailey Mine Central Complex. Strong justification must be provided for disposal area no.3 to remain open once slurry capacity is exhausted, as substantial coarse coal refuse disposal capacity exists in the final coarse refuse fill/cover of the slurry impoundment. Available fine and coarse coal refuse disposal capacity must be utilized in a timely manner to the greatest

Received
10/15/07



extent practical to avoid premature and potentially unnecessary impacts to streams, wetlands and other resources. Permit applications will not be approved unless demonstration is provided that existing disposal capacity will be exhausted prior to affecting new sites.

4. The evaluation for the federally listed, endangered Indiana bat must be completed and approved by the resource agencies (PA Game Commission and USFWS) prior to site alternatives analysis approval. Please provide agency correspondence for our records.
5. Please provide a copy of the map submitted to the PHMC for our records.
6. Please provide copy of a map for our reference and records that depicts the properties identified in the letter from Dave Hudson regarding prime farmland soil units.
7. Please be advised that the selected alternative exists in an Environmental Justice Area, which must be address in the future permit application.
8. PHMC is requiring a Phase 1 archaeological survey to locate potentially significant archaeological resources, which must be addressed prior to permit issuance.
9. No stream and wetland mitigation proposal has been submitted to our office for consideration to date. We are requesting stream mitigation proposals be presented in the future coal refuse disposal application that will result in the restoration of a stream(s) adversely impacted by untreated mine discharges or other conditions, such as the construction of a mine water treatment facility and the development of a trust fund to adequately fund water treatment in perpetuity.
10. A small area of prime farmland soil is located just south west of the freshwater impoundment that is not shown on exhibit 1.

5.0 Initial Site Selection and Screening

11. 5.1. Please provide a map that shows the relationship between the proposed coal refuse disposal sites and underground mining.
12. 5.1. Please address the possibility of fine coal refuse slurry injection into currently abandoned (if any) or future abandoned portions of Bailey and Enlow Fork Mines.
13. 5.4. Coal refuse disposal activities are prohibited within 100-feet of a cemetery and would constitute a fatal flaw. Please revise the narrative accordingly.

6.0 Second Assessment Site Elimination

14. 6.2.1.
 - a. Table 6-2 shows that water samples collected at sites 5, 6, and 11 are exhibiting signs of high conductivity relative to surrounding streams. Please explain.

-
- b. Please explain why site 6 is exhibiting high sulfate readings in addition to high conductivity relative to surrounding streams.
 - c. Please address how the construction of refuse areas that have been longwall mined will affect the water quality of surrounding watersheds.
 15. 6.6. Alternate 2 indicates five dwellings are located within the 300-foot barrier area, although only one is shown on exhibit 1. In addition, an occupied dwelling appears to be located across the state route located on the southern side of site #5.
 16. The narrative lists engineering design measures that may be employed to reduce the impact to the adjacent high quality watershed. Please be advised the future refuse disposal area plans must be designed in a manner to prevent impacts to the high quality watershed.

If you have any questions, please feel free to give me a call.

Sincerely,



Craig Burda
Underground Mine Permit Section
District Mining Operations

Baker

Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation

Airside Business Park
100 Airside Drive
Moon Township, PA 15108

412-269-6300
FAX 412-375-3986

April 17, 2007

Mr. Joel Koricich, Environmental Group Manager
Pennsylvania Department of Environmental Protection
California District Mining Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423

Re: Consol Pennsylvania Coal Company
Bailey Central Mine Complex
Alternatives Analysis & Site Selection Study for
New Coal Refuse Disposal Area No. 5

Dear Joel:

On behalf of Consol Pennsylvania Coal Company, Baker is submitting four copies of an Alternative Analysis & Site Selection Study for a new coal refuse disposal area at the Bailey Central Mine Complex.

Should you have any questions regarding the information contained in this Study, please feel free to call me at 412-269-6096 or Ron Lehman of CPCC at 724-663-3032.

Sincerely,

MICHAEL BAKER JR., INC.



Gregory Heilmann, P.E.
Senior Engineer

cc: Ron Lehman – CPCC (w/ 2 copies)
Scott Hans – U.S. Army Corps of Engineers, Pittsburgh District (w/ 1 copy)
Cindy Tibbott – U.S. Fish and Wildlife Service (w/ 1 copy)
Jeff Kost – PA Game Commission (w/ 1 copy)
Steven Kepler – PA Fish and Boat Commission (w/ 1 copy)
Neil Bossart – Civil and Environmental Consultants (w/ 1 copy)

Marcia dual AP 9/26/04
900
Consol Ape

Received
4/18/07
jk

ChallengeUs.

2007-463

SIGN UP SHEET

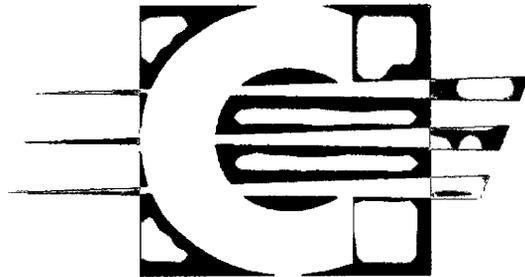
<u>NAME</u>	<u>PHONE #</u>	<u>EMAIL</u>
Neil Bossart	412 429 2324	nbossart@cecinc.com
MARK STANLEY	412-231-4498	markstanley@consolenergy.com
Jonathan Pachter	412-831-4679	jonathanpachter@consolenergy.com
Greg Heilman	412-269-6096	mheilman gheilman@msclco.com
Michael Bodnar	724-769-1073	mbodnar@state.pa.us
CRAIG BURDA	724-769-1040	CBURDA@STATE.PA.US
KERRY KAMPFER	412-831-4267	KerryKampfer@consolenergy.com
MARCIA NABERMAN	412-395-7361	MARCIA.N.NABERMAN@USACE.ARMY.MIL
STEVE KEPLER	814-359-5117	skepler@state.pa.us
Cindy Tibbott	814-234-4090	cindy_tibbott@fws.gov
Vince Humenay	814-342-8146	vhumenay@state.pa.us
JOEL FOLMAN	724-769-1090	JFolman@state.pa.us
Tim Hamilton	724 222 2080	t.hamilton@state.pa.us
RON LEHMAN	724-663-3032	ronlehman@consolenergy.com
Jim Goroncy	724-663-3042	jimgoroncy@consolenergy.com

April 2007

**BAILEY CENTRAL MINE COMPLEX
GREENE COUNTY, PENNSYLVANIA**

**ALTERNATIVE ANALYSIS &
SITE SELECTION STUDY**

**for
NEW COAL REFUSE DISPOSAL AREA NO. 5**



Prepared for

Consol Pennsylvania Coal Company

Prepared by



Michael Baker Jr., Inc.
Moon Twp., Pennsylvania


**Civil & Environmental
Consultants, Inc.**

**CONSOL PENNSYLVANIA COAL COMPANY
BAILEY CENTRAL MINE COMPLEX**

**ALTERNATIVES ANALYSIS & SITE SELECTION STUDY
NEW COAL REFUSE DISPOSAL AREA NO. 5**

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**CONSOL PENNSYLVANIA COAL COMPANY
BAILEY CENTRAL MINE COMPLEX**

**ALTERNATIVES ANALYSIS & SITE SELECTION STUDY
NEW COAL REFUSE DISPOSAL AREA NO. 5**

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2	Soil Survey Map
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B	Agency Correspondence
C	PNDI Searches

EXECUTIVE SUMMARY

Currently in the United States, approximately 52 percent of all electricity consumed by homes and business comes from coal. In addition, 37% of the electricity generated worldwide is produced from coal. Because coal is both domestically abundant and less expensive than other fuels used to generate electricity, ensuring that coal continues to be a major component of America's energy portfolio is good public policy. Coal is by far the least expensive source of power fuel per million Btu, averaging less than half the price of petroleum or natural gas.

The Energy Information Administration forecasts that coal will remain the dominant fuel used for electricity generation through at least 2025. Fuel diversity helps protect consumers against the threat of supply disruptions or price volatility. With American's demand for electricity expected to grow 40 percent by 2020, meeting the nation's growing demand for reliable, affordable electricity will require the continued utilization of all domestic energy resources.

Consol Pennsylvania Coal Company (CCPC) operates the Bailey and Enlow Fork Mines located in Washington and Greene Counties. Raw coal from these mines is processed at the Bailey Central Mine Complex (BCMC) and the clean coal is sold for use in the production of electricity. It is estimated that mining of coal from the Bailey and Enlow Fork Mines generates 1,050 direct jobs and approximately 8,300 indirect jobs (based on Frias and Rose, 1994). Coal extracted from the mines requires cleaning to remove impurities prior to sale; the cleaning results in a waste product referred to as coal refuse. Coal refuse is an inherent part of the mining process and cannot be eliminated. Accordingly, proper and environmentally sound disposal of coal refuse is a fundamental mining element.

Coal refuse disposal facilities that service large mining operations have historically been, and continue to be, located in valleys. Valley fill sites not only provide the large capacity necessary for efficient disposal, but the very nature of a valley allows mine operators to provide better environmental control of the disposal process by minimizing the affected area, utilizing natural

barriers created by the valley (sidewalls and head of hollow), and minimizing the number of hydrologic systems that are contacted.

This study summarizes the site selection process conducted by CPCC to identify a new disposal site for coal refuse generated by BCMC. Sites currently receiving coal refuse from the BCMC preparation plant are nearing capacity and available disposal capacity is expected to be depleted by 2013. Fine coal refuse disposal capacity is expected to be exhausted in 2012.

Selection of the site identified by CPCC as most suitable for disposal of coal refuse was derived through a site screening and selection process. This process followed requirements of Pennsylvania Department of Environmental Protection (PADEP) as contained in the PADEP's Technical Guidance Document (TGD) entitled "Coal Refuse Disposal-Site Selection", No. 563-2113-660, dated February 8, 1999. Additional recommendations obtained through discussions with representatives of PADEP California District Mining Office also were followed. The process included initial consideration of all sites within a 1 mile radius centered around the BCMC and the existing coal refuse disposal areas.

Evaluation of coal refuse disposal options included a search for suitable preferred sites as defined in the above-referenced PADEP TGD. Such sites generally include areas previously disturbed or degraded such as abandoned mine lands. No preferred sites were identified within the search area. Coal refuse disposal in underground mine workings as an alternative to surface disposal was considered; however, it was determined that this method was not technologically or economically feasible in this case. Thus surface disposal options in non-preferred sites were considered.

The search area was initially screened to identify areas where disposal would be prohibited such as areas where mining activities are prohibited and high quality watershed areas. Sites within these areas were eliminated from further consideration. The remainder of the search area then was screened to identify sites or combinations of adjoining sites having sufficient disposal capacity. Three potential disposal alternatives, each consisting of two or more individual sites

were identified for consideration. None of the three alternative disposal sites contain fatal flaws and were therefore subjected to a second round of assessment in which environmental and other impacts associated with each alternative were identified and compared. These factors included available storage volume, impacts to streams, wetlands, historic and archaeological sites, public roads, dwellings, endangered species, and others. Results of the second assessment indicated that development of Alternative 2 would clearly result in the least environmental impact.

Consequently, Alternative 2, consisting of Sites 5, 6, 7, 8, and 14, is the new disposal area recommended for development. This new disposal area will provide approximately 12 years of disposal capacity at the currently projected waste generation rates.

**Table 3-1
Projected Coal Refuse Production Rates**

Year	Total Clean Tons	Total Raw Tons	Cumulative Clean Tons	Cumulative Raw Tons	Total Refuse (Tons)	Total Coarse Refuse (Tons)	Total Fine Refuse (Tons)	Total Coarse Refuse (CY)	Total Fine Refuse (CY)	Total Refuse (CY)	Cumulative Total Refuse (CY)	Cumulative Coarse (CY)	Cumulative Fine (CY)
2007	21,421,426	32,095,235	21,421,426	32,095,235	10,673,809	8,218,833	2,454,976	5,293,934	4,132,956	9,426,891	9,426,891	5,293,934	4,132,956
2008	22,065,852	33,217,564	43,487,278	65,312,799	11,151,712	8,586,818	2,564,894	5,530,962	4,318,003	9,848,965	19,275,855	10,824,896	8,450,959
2009	23,473,517	35,089,573	66,960,795	100,402,372	11,616,056	8,944,363	2,671,693	5,761,264	4,497,799	10,259,064	29,534,919	16,586,161	12,948,759
2010	23,378,203	34,386,152	90,338,998	134,788,524	11,007,949	8,476,121	2,531,828	5,459,659	4,262,337	9,721,996	39,256,916	22,045,820	17,211,096
2011	23,255,570	34,192,987	113,594,568	168,981,511	10,937,417	8,421,811	2,515,606	5,424,677	4,235,027	9,659,704	48,916,619	27,470,497	21,446,123
2012	24,236,601	35,635,170	137,831,169	204,616,681	11,398,569	8,776,898	2,621,671	5,653,397	4,413,587	10,066,984	58,983,603	33,123,893	25,859,710
2013	24,608,889	36,104,355	162,440,058	240,721,036	11,495,466	8,851,509	2,643,957	5,701,455	4,451,106	10,152,561	69,136,165	38,825,348	30,310,816
2014	24,967,951	36,088,422	187,408,009	276,809,458	11,120,471	8,562,763	2,557,708	5,515,467	4,305,906	9,821,373	78,957,538	44,340,815	34,616,723
2015	25,294,072	36,425,978	212,702,081	313,235,436	11,131,906	8,571,568	2,560,338	5,521,139	4,310,334	9,831,473	88,789,010	49,861,954	38,927,057
2016	30,802,879	45,148,504	243,504,960	358,383,940	14,345,625	11,046,131	3,299,494	7,115,060	5,554,703	12,669,764	101,458,774	56,977,014	44,481,760
2017	29,064,600	43,551,362	272,569,560	401,935,302	14,486,762	11,154,807	3,331,955	7,185,061	5,609,352	12,794,413	114,253,187	64,162,075	50,091,112
2018	28,597,828	43,597,396	301,167,388	445,532,698	14,999,568	11,549,667	3,449,901	7,439,399	5,807,914	13,247,313	127,500,500	71,601,474	55,899,026
2019	30,016,602	44,745,945	331,183,990	490,278,643	14,729,343	11,341,594	3,387,749	7,305,375	5,703,281	13,008,656	140,509,156	78,906,849	61,602,307
2020	30,434,981	45,348,595	361,618,971	535,627,238	14,913,614	11,483,483	3,430,131	7,396,768	5,774,632	13,171,400	153,680,556	86,303,617	67,376,938
2021	30,253,909	45,685,285	391,872,880	581,312,523	15,431,376	11,882,160	3,549,216	7,653,565	5,975,112	13,628,677	167,309,232	93,957,182	73,352,050
2022	29,486,605	42,242,906	421,359,485	623,555,429	12,756,301	9,822,352	2,933,949	6,326,797	4,939,308	11,266,105	178,575,337	100,283,979	78,291,359
2023	31,595,479	45,344,945	452,954,964	668,900,374	13,749,466	10,587,089	3,162,377	6,819,381	5,323,867	12,143,248	190,718,586	107,103,360	83,615,226
2024	31,410,898	45,656,493	484,365,862	714,556,867	14,245,595	10,969,108	3,276,487	7,065,448	5,515,971	12,581,419	203,300,005	114,168,808	89,131,197
2025	31,276,277	45,298,168	515,642,139	759,855,035	14,021,891	10,796,856	3,225,035	6,954,497	5,429,352	12,383,848	215,683,853	121,123,304	94,560,549
2026	31,073,987	44,745,248	546,716,126	804,600,283	13,671,261	10,526,871	3,144,390	6,780,593	5,293,586	12,074,179	227,758,032	127,903,898	99,854,135
2027	29,987,311	43,530,345	576,703,437	848,130,628	13,543,034	10,428,136	3,114,898	6,716,996	5,243,936	11,960,932	239,718,964	134,620,893	105,098,071
2028	29,418,603	43,319,369	606,122,040	891,449,997	13,900,766	10,703,590	3,197,176	6,894,422	5,382,451	12,276,873	251,995,837	141,515,315	110,480,522
2029	29,111,850	43,299,716	635,233,890	934,749,713	14,187,866	10,924,657	3,263,209	7,036,816	5,493,618	12,530,434	264,526,271	148,552,131	115,974,140
2030	29,227,617	43,291,510	664,461,507	978,041,223	14,063,893	10,829,198	3,234,695	6,975,329	5,445,615	12,420,944	276,947,215	155,527,460	121,419,755
2031	29,478,646	44,337,259	693,940,153	1,022,378,482	14,858,613	11,441,132	3,417,481	7,369,489	5,753,335	13,122,824	290,070,039	162,896,949	127,173,090
2032	28,227,292	42,876,088	722,167,445	1,065,254,570	14,648,796	11,279,573	3,369,223	7,265,425	5,672,093	12,937,518	303,007,557	170,162,374	132,845,183
2033	27,699,665	42,167,931	749,867,110	1,107,422,501	14,468,266	11,140,565	3,327,701	7,175,887	5,602,191	12,778,078	315,785,635	177,338,262	138,447,374
2034	24,709,177	37,192,083	774,576,287	1,144,614,584	12,482,906	9,611,838	2,871,068	6,191,200	4,833,448	11,024,648	326,810,283	183,529,461	143,280,822
2035	5,287,990	7,690,367	779,864,277	1,152,304,951	2,402,377	1,849,830	552,547	1,191,517	930,213	2,121,730	328,932,014	184,720,978	144,211,035
Totals	779,864,277	1,152,304,951			372,440,674	286,779,319	85,661,355	184,720,978	144,211,035	328,932,014			

Assumes 77% Coarse Refuse and 23% Fine Refuse
 Assumes 115 pcf density for CCR
 Assumes 44 pcf density for FCR

1.0 INTRODUCTION

Consol Pennsylvania Coal Company (CPCC) operates the Bailey Central Mine Complex (BCMC) in Greene County, Pennsylvania. The BCMC supports the Bailey and Enlow Fork underground coal mines and includes a preparation plant facility, freshwater impoundment, and four existing coal refuse disposal areas (CRDA Nos. 1, 2, 3, and 4). The BCMC is located approximately 2.5 miles southeast of West Finley, Pennsylvania, with the coal preparation facility located on a hill overlooking Enlow Fork to the north (See Exhibit 1). BCMC produces coal that is sold primarily to electric utility companies for generation of electrical power.

Raw coal removed from the mines must be cleaned in the preparation plant to remove impurities such as rock, clay, and various other minerals before it is suitable for market. Cleaning also reduces mineral impurities thereby reducing byproducts of coal combustion. The resultant coarse and fine waste to be disposed of is referred to as coal refuse. Coal refuse has no market value and therefore must be disposed in an environmentally safe manner. Coal refuse generated by the BCMC currently is disposed in accordance with industry standards; fine coal refuse slurry is pumped into a valley upstream of an impounding structure constructed of coarse coal refuse.

The four existing coal refuse disposal areas at the BCMC consist of two slurry impoundments, CRDA Nos. 1 and 3, and two areas comprised entirely of coarse coal refuse, CRDA Nos. 2 and 4. At projected production rates, disposal capacity for fine coal refuse slurry will be exhausted in 2012. Coarse coal refuse disposal capacity will be exhausted in 2013 except for the storage volume available in the Area No. 3 cap. CPCC plans to keep the Area No. 3 pool open to provide water for the BCMC operations, therefore, additional disposal volume for coarse coal refuse will be needed before 2013. To continue to achieve long-term coal production goals for the BCMC, CPCC needs to provide for continued coal refuse disposal capabilities past 2012.

CPCC contracted with Michael Baker Jr., Inc. (Baker) to assist in selecting an appropriate and feasible coal refuse disposal area for BCMC. Civil and Environmental Consultants, Inc. (CEC)

assisted Baker by collecting site aquatic, wildlife, and water quality data and performing site evaluations relative to wetland characteristics.

This report summarizes the Site Selection Study/Alternatives Analysis for a new, fifth, disposal area for BCMC. It has been prepared to document potential environmental impacts versus the public benefits of: 1) continued development of an existing energy resource; 2) creation and prolongation of significant employment; and 3) provision of coal to generate electricity (a public utility service). It is the intent of this report to present alternatives considered, findings of the site selection process, and to identify and address environmental impacts and public benefits, both social and economic, that might occur as a result of the construction of the coal refuse disposal facility.

Each potential disposal alternative was evaluated based on information from the same source(s) to facilitate an “apples to apples” comparison and, therefore, a fair comparison. Detailed site specific information that may have been available for a specific site was not considered if information having the same degree of accuracy was not available for the other sites being evaluated and compared. Consequently, the accuracy of data presented in this report were sufficient to facilitate general site comparisons, but may depict site conditions that generally differ from those that will be determined by site specific field reconnaissance.

2.0 METHODOLOGY

The site selection process was initiated by defining the quantity of coal refuse to be disposed of and identifying a search area. Methodologies used in this report satisfy criteria established in PADEP's Technical Guidance Document (TGD Number 563-2113-660) on coal refuse disposal site selection as well as satisfying good engineering practice. After the search area was identified, reasonably available data were collected and reviewed to characterize the area and identify potential disposal sites, including any locations meeting PADEP requirements for "preferred" sites. Identified potential disposal sites were screened for an obvious lack of storage capacity and/or fatal flaws. Sites having such flaws were eliminated from further consideration. No single site having sufficient capacity was identified; therefore, individual adjoining sites were combined as needed to achieve the target disposal life. These potential disposal alternatives, each consisting of two or more individual sites, were subjected to a second assessment and comparison based on environmental criteria. After the second assessment, one site emerged as the selected site.

The search area and possible disposal sites were characterized using available published information, information available from State and Federal agencies, and results of limited field reconnaissance conducted in January - March, 2007. Data collection efforts focused on gathering the following type of information: 1) topographic mapping with planimetric type surface features (e.g., roads, buildings, streams, etc.); 2) utilities; 3) surface and underground mining activity in the area; 4) geology and water quality; 5) inventoried wetlands; 6) wildlife and aquatic resource data; and 7) inventoried cultural resources. Since large sections of the potential disposal areas are privately owned, a detailed site investigation could not be conducted for each site. Therefore, readily available information and the limited field data that could be collected without entering private property were used to compare the potential disposal alternatives. Data sources used in the preparation of this Report are provided in Section 8.

3.0 COAL REFUSE QUANTITY REQUIRING DISPOSAL

Current available Bailey and Enlow Fork Mine reserves contain an estimated 780 million tons of clean coal. At projected production rates, this represents approximately 30 years of additional coal production.

CPCC projects that the clean coal production rate will average 29.3 million tons per year during the 15-year period after current coal refuse disposal capacity is exhausted (years 2013 through 2027). Coal cleaning operations are expected to achieve an average recovery rate of 68%; consequently, an average of 13.6 million tons of coal refuse will be produced per year. It is estimated that 77% of the annual coal refuse volume will be coarse coal refuse (10.5 million tons); the remaining 23% will be fine coal refuse (3.1 million tons). Based on densities of 115 pcf for coarse coal refuse and 44 pcf for fine coal refuse, this corresponds to an annual disposal volume of approximately 12.05 million cubic yards (refer to Table 3-1). The density of 44 pcf for fine coal refuse density is the in-place density that is currently being achieved in CRDA No. 3.

CPCC's intent is to select a disposal site providing a minimum disposal life of approximately 12 years. This is consistent with the requirement in PADEP's TGD on coal refuse disposal site selection that: "it is better to have a few large coal refuse disposal areas than numerous small coal refuse disposal sites".

4.0 DEFINITION OF THE SEARCH AREA

The disposal site search area is a 1 mile radius centered around the BCMC and the existing coal refuse disposal areas as shown on Exhibit 1. The area is contained on the Wind Ridge and Rogersville USGS 7.5-minute topographic quadrangles. It lies primarily within Greene County but extends northward into neighboring Washington County. Communities within the search area include portions of Richhill, Gray, and Morris Townships in Greene County, and portions of East Finley and West Finley Townships in Washington County.

The northern portion of the search area is within the Ohio River watershed and Wheeling Creek basin and includes Owens Run, unnamed tributaries to Enlow Fork, and Enlow Fork itself. Owens Run and all unnamed tributaries to Enlow Fork have protected water use classification criteria for warm water fishes (WWF), while Enlow Fork has protected water use classification criteria for trout stocking (TSF) according to Pennsylvania Code Title 25 Chapter 93.

The southeastern portion of the search area is within the Monongahela River watershed area and includes Fletcher Run, Grinnage Run, and Grays Fork of South Fork Tenmile Creek. This portion of South Fork Tenmile Creek basin has protected water use classification criteria for high quality waters, warm water fishes (HQ-WWF).

There are no national or state parks, national wildlife refuges, wild or scenic rivers, national or state forests, or state game lands within the search area.

The majority of the search area overlies the Bailey and Enlow Fork Mines, which are owned and operated by CPCC. The Pittsburgh coal seam has been extensively deep mined in this area. These mines are expected to remain active until at least year 2035.

Predominant soil units within the search area are soils of the Dormont-Culleoka association. Dormont soils are formed in residuum and adjacent colluvium. They are characterized as deep and moderately well drained. Some hillsides blanketed with Dormont soils reportedly have slips

on them. Culleoka soils are moderately deep, well drained, residual soils which occur mostly on the ridges and hilltops. Type B Culleoka soils (CaB) are present and are characterized as prime farmland soils. Soil survey maps for the search area are provided on Exhibit 2.

The prominent geologic structural feature of the search area is the Washington Anticline that runs northeast to southwest across the search area and below the existing preparation plant area. The Finney Syncline is located northwest of the Washington Anticline and the Nineveh Syncline is located to the southeast, but both are outside of the search area. A topographic map showing structure contours (base of the Pittsburgh Coal) and the location of the Washington Anticline relative to the search area is presented as Exhibit 3.

Coal seams in the region that reportedly have mineable thickness in selected locations include the Waynesburg and Upper Freeport Coal Seams, in addition to the Pittsburgh Coal Seam. However, the Pittsburgh Coal Seam has been the only commercially attractive coal and is the only coal that is mined commercially.

5.0 INITIAL SITE SELECTION AND SCREENING

The search area was screened and evaluated to identify possible disposal sites. Underground as well as surface disposal options were evaluated; however, underground disposal was determined to be not feasible. The search area also was screened for possible disposal sites meeting PADEP requirements for “preferred sites”. No preferred sites were identified in the search area. Results of the initial site screening process identified three non-preferred disposal alternatives as candidates for the new BCMC coal refuse disposal area.

5.1 Underground Disposal Options

The potential for underground disposal of coal refuse within the search area was considered and determined not to be feasible.

There are no known inactive, abandoned, or unreclaimed mines within the project search area. As previously stated, there are two active longwall mines located within the search area around the BCMC. The Bailey Mine lies below the southern portion of the search area, whereas the Enlow Fork Mine lies beneath the northern portion of the search area, with the Enlow Fork stream valley being the approximate division between the two. These mines extract raw coal using longwall mining methods. Upon completion of a longwall mining section, the section experiences complete subsidence, filling the void space created by coal removal.

Mining techniques used at the Bailey and Enlow Fork Mines are representative of the industry standard for longwall mining. Mine subsidence at the time of mining eliminates the large void spaces in longwall mining sections, while void spaces within the active main headings offer very little disposal capacity. Significant portions of these main headings are needed for ventilation and transport/conveyance of mine personnel, mined coal, supplies, etc., and must be kept open. Utilization of areas for coal refuse disposal in near proximity to areas utilized for ventilation and conveyance of mine personnel pose serious health and safety hazards in addition to operational problems.

Backstowing within the mine void created by longwall mining before roof collapse is impractical. It is not a proven technology for a fast moving longwall face, and would increase risks to worker safety. The system would add to the complexity of an already complex industrial setting creating negative impacts to the health and safety of underground miners. It would require additional surface support facilities and injection boreholes.

Transportation of coal refuse into the mine would require extensive conveyance systems to bring both coarse and fine coal refuse from the preparation plant to an injection borehole and additional conveyance facilities to transport and place the coal refuse underground within the mine void. These systems would require surface disturbances for conveyor and injection point facilities and supporting access roads. A large number of injection boreholes would be needed to facilitate disposal throughout the entire mine area. Conveyance systems would have to be moved and/or extended as new injection boreholes were activated.

Placement of coal refuse underground would increase risks to the health and safety of mine workers. Pneumatic conveyance systems used to transport coarse coal refuse underground can generate a significant amount of dust, especially if the material is dry. Also, pneumatic machinery is very noisy, and sparks produced at the discharge end of a pneumatic pipe could create a fire or explosion hazard. Maximum compaction of coarse coal refuse in ventilated areas is essential in order to prevent spontaneous combustion. Proper compaction of coarse coal refuse would be impossible in the confined spaces of the underground mine workings.

Fine coal refuse would have to be transported to the backstowing area hydraulically. The large amounts of water required to transport fine refuse would expose workers to increased flooding hazards and increase the volume of water requiring conveyance and treatment. Operationally, it would be nearly impossible to handle the large volume of water that would be required to transport the fine coal refuse to underground disposal areas and make it difficult to recycle clarified water to the preparation plant for re-use. Approximately 6,000 gallons per minute of water is currently utilized to transport fine coal refuse to the slurry impoundment. Within the

pool of the slurry impoundment settling occurs allowing the clarified water to be recycled back to the preparation plant thus minimizing the amount of fresh water imported into the cleaning plant circuit. Fresh water to supplement the coal cleaning process and mining operations is drawn from Enlow Fork stream. During summer months there are extended periods when low flow conditions prohibit pumping water from Enlow Fork. During these times it would be impossible to operate without recycling clarified slurry water. Similar settling and recycling of water for re-use would be extremely difficult, if not impossible, in the current underground mine configurations for the Bailey and Enlow Fork Mines.

Dr. Christopher Bise, currently Chairman of the West Virginia University Department of Mining Engineering, has concluded that underground stowing technology cannot keep pace with the production potential of U.S. longwall systems, and such practices decrease coal production while significantly increasing costs (Bise, et al. 1993). Due to the operational, technology, safety, and economic concerns, use of the Bailey or Enlow Fork Mines for coal refuse disposal was determined not to be feasible.

5.2 Preferred Sites

The search area has no preferred sites available for development of the new coal refuse disposal areas.

Inquiries to the PADEP Bureau of Mining and Reclamation and the PADEP California District Mining Office revealed no inactive, abandoned, or unreclaimed mine sites within the search area. A search of the Pennsylvania Brownfields Directory revealed no brownfields within the search area. Similarly, an inquiry to the CERCLIS listings available from the United States EPA revealed no hazardous waste sites within the search area. Results and correspondence from the preferred site searches are provided in Appendix A.

To further investigate the existence, if any, of a preferred site, water quality and benthic macroinvertebrate samples were collected for analysis from the primary stream within sites

having potential for coal refuse disposal. Sample collection and analysis was performed by CEC and results of their study are discussed in detail in Section 6.2 of this Report. Stream characterization data for each potential site indicate water quality conditions generally supportive of aquatic life and were in compliance with Chapter 93 water quality standards. Analytical results indicate that water quality and benthic macroinvertebrate measurements are all very comparable between the sites and that no site qualifies as a preferred site due to degraded water quality.

5.3 Potential Disposal Sites

Possible surface sites for the new BCMC disposal area were identified within the search area. Because the disposal facility must include an impoundment to accommodate fine coal refuse slurry, and must provide a sizeable amount of storage capacity, the search focused on valley fill type sites. CPCC's intent is to select a disposal site providing a minimum disposal life of approximately 12 years. Therefore, only sites, or combinations of adjoining sites providing as much disposal capacity as feasible were deemed appropriate. As indicated below, the lowest disposal life among the alternatives is just above 12 years.

Locations within the South Fork Tenmile Creek watershed were not investigated because they are located in a High-Quality Watershed (HQW). This area is shown on Exhibit 1. Fourteen sites within the remainder of the search area that appeared to have a significant amount of storage capacity were assigned reference numbers as shown on Exhibit 1. Sites 3 and 4 were included even though the majority of these sites are outside the search area. Small valleys present within the search area were eliminated from further consideration due to the obvious lack of sufficient volume.

Conceptual grading plans for each of the 14 sites were developed using USGS topographic mapping to assess available capacity. Each grading plan was developed based on a common set of criteria to promote consistency. The grading plans assumed a simplified embankment configuration constructed between the ridge tops at the downstream end of the valleys. Each site

layout included sufficient downstream area for construction of a sedimentation control pond and each incorporated a flat top surface at approximately the same elevation of the surrounding ridge tops. The disposal height along saddle areas between ridge tops generally was limited to about 40 feet or less. Grading plans for sites bordering the HQW were configured to avoid a saddle dam on the ridge bordering the HQW and to include a buffer between the disposal area and HQW drainage divide for channel construction. Other criteria related to staging, cap requirements, and drainage control will be considered during final design and may result in different grading plans and storage volumes.

Potential storage volumes then were calculated for each of the sites based on the conceptual layout criteria described above. A summary of the calculated storage volume for each site is provided on Table 5-1. As indicated on Table 5-1, no site has sufficient storage volume by itself to accommodate even 10 years of disposal. Therefore, the only potential options for disposal are feasible combinations of adjoining sites that would provide disposal capacities approaching 15-years of disposal life. Three combinations were identified as potential coal refuse disposal alternatives and were subjected to a second assessment. They are:

- Alternate 1 – Adjoining valleys designated as Sites 1, 2, 9, 10, and 12 in the northern portion of the search area. It is comprised of the five valleys across Enlow Fork and Enon Church Road from BCMC. It includes township roads T-448 and T-451 through sections of Sites 2 and 10, respectively. Alternate 1 has approximately 12.5 years of disposal capacity (150,339,000 CY) and a total disposal surface area of approximately 776 acres.
- Alternate 2 - The valleys designated as Sites 5, 6, 7, 8, and 14 adjacent to the south/south western boundary of BCMC. The area is bordered on the south/south west by State Route 4007. Alternate 2 has approximately 12.1 years of disposal capacity (145,701,000 CY) and a total disposal surface area of approximately 760 acres.
- Alternate 3 - Adjoining valleys designated as Sites 3 and 4 at the northeastern end of the search area. Boothe Run flows through Site 3. Sites 3 and 4 include State Routes 4014 and

4009, respectively. Site 4 also includes a section of township road T-603. Alternate 3 has approximately 14.5 years of disposal capacity (175,181,000 CY) and a total disposal surface area of approximately 1,078 acres.

5.4 Fatal Flaws

Before proceeding to the second assessment, an investigation was performed to determine if any of the 3 alternatives have apparent fatal flaws relative to disposal facility development. Flaws identified as fatal in PADEP's TGD for coal refuse disposal site selection include:

- Prime farmlands.
- An exceptional value watershed as defined under Chapter 93 (relating to water quality standards).
- Sites known to contain threatened or endangered animals listed exclusively under the Commonwealth's protection programs.
- An area that is hydrologically connected to and contributes at least 5% of the drainage to wetlands designated as exceptional value under Chapter 105 (relating to dam safety and waterway management) unless a larger percentage contribution is authorized by the Department after consultation with the Fish and Boat Commission.
- A watershed less than 4 square miles in area upstream of the intake of a public water supply.
- A watershed less than 4 square miles in area upstream of the upstream limit of a public recreational impoundment.
- Sites known to contain Federally listed threatened or endangered plants or animals.

The following areas where mining is prohibited or limited per 025 Pa. Code §86.102 also were considered fatal flaws:

- Within the boundaries of the National Park System, Wildlife Refuge System, National System of Trails, Wilderness Preservation System, or Wild and Scenic Rivers System.
- On Federal Lands within the boundaries of a National Forest.

- At a location which would adversely affect a publicly-owned park or place included on the National Register of Historic Places.
- Within the Commonwealth park system.
- Within a Commonwealth forest picnic area.
- Within the game land system of the Commonwealth.
- Within the boundaries of the Pennsylvania Scenic River Systems.
- Within 300 feet of a public building, school, church, community building, or public park.

The following other areas listed per 025 Pa. Code §86.102 were not considered to be fatal flaws since it was assumed that the final design of the refuse area could be revised to avoid the item, or that the appropriate variances/waivers could be obtained if necessary:

- Within 100 feet of a cemetery.
- Within 100 feet of the outside right-of-way of a public road
- Within 300 feet of an occupied dwelling
- Within 100 feet of a perennial or intermittent stream.

Based on information gathered for this study, none of the three alternative disposal sites appear to have fatal flaws and were therefore carried forward to undergo a second assessment as discussed in Section 6.0.

Results of the PNDI Search indicated the potential for state listed endangered plants for Alternative 1 (Sites 2 and 9) and Alternative 2 (Sites 6, 7, and 8). However, the presence of state listed endangered plants is not a fatal flow. Refer to Section 6.11 for a more detailed discussion on threatened and endangered species.

As shown on Exhibit 1, prime farmland soil units are present within the boundaries of all three alternatives. However, the presence of prime farmland soil units was not considered a fatal flaw for any of the three alternatives. The prime farmland soil unit areas within Alternative 1 are either wooded, which indicates that the areas have not been historically used as cropland, or are

located on the edge of the site and could be avoided during final design if necessary. The prime farmland soil unit areas within Alternative 2 (Site 5) have not been historically used as cropland. The prime farmland soil unit areas within Alternative 3 (Site 3) are not wooded and are not owned by CPCC. Therefore, it could not definitively be determined if these prime farmland soil unit areas can be classified as prime farmlands. It was assumed for this study that these areas have not been used as cropland and therefore, Alternative 3 was carried forward to undergo a second assessment. A more detailed investigation on prime farmlands will need to be conducted if either Alternative 1 or 3 is selected for the next coal refuse disposal area.

**TABLE 5-1
SITE STORAGE VOLUME SUMMARY**

Site No.	Storage Volume (CY)	Years Of Capacity
1	19,155,000	1.6
2	26,659,000	2.2
3	87,720,000	7.3
4	87,461,000	7.3
5	69,596,000	5.8
6	16,240,000	1.3
7	19,962,000	1.7
8	25,332,000	2.1
9	30,401,000	2.5
10	58,232,000	4.8
11	15,082,000	1.3
12	15,892,000	1.3
13	18,882,000	1.6
14	14,571,000	1.2

6.0 SECOND ASSESSMENT SITE ELIMINATION

For the second assessment, the three disposal site alternatives were evaluated and compared relative to their potential environmental impacts, public benefits, and other relevant parameters. Parameters chosen for additional evaluation and quantification are derived from the PADEP TGD for coal refuse disposal site selection and from discussions with PADEP California District Mining Office representatives. They are:

- Storage Volume Efficiency
- Aquatic Resources
 - Water Quality
 - Streams
 - Wetlands
 - Ponds
- Public Water Supplies
- Areas Previously Disturbed
- Historic and Archaeological Sites
- Dwellings
- Utilities
- Aesthetics
- Public Roads
- Land Use and Wildlife
- Threatened and Endangered Species
- Geology/Hydrology

Table 6-1 summarizes and compares impacts associated with each alternative. For each parameter, the alternative(s) having the most favorable result (i.e., least impact) are shaded. More than one alternative was shaded for a given parameter when the impacts were considered to be roughly equal. More detailed discussion of alternative impacts relative to each parameter are presented in the following subsections.

6.1 Storage Volume Efficiency

Since the disposal life provided by each of the three alternates varies, a fair comparison of the alternatives relative to storage volume is only possible by evaluating and comparing the disposal volume provided per acre of disposal area. The highest value of disposal volume per acre indicates optimal use of the proposed facility development and thus would be rated the highest for disposal efficiency. The estimated volume per acre is shown on Table 6-1. Alternatives 1 and 2 exhibit similar values of 193,700 and 191,700 cubic yards per acre of disturbed area and are ranked highest relative to storage volume efficiency. The value for Alternative 3 is roughly 15 % lower than the value for Alternative 2. Note the areas shown are disposal areas only. Actual facility areas will be larger to accommodate other features such as access roads, channels, soil stockpiles, and conveyors, etc.

6.2 Aquatic Resources

6.2.1 Water Quality

Stream sampling was performed by CEC on January 29 through 31, 2007 for all fourteen potential sites investigated in the initial site screening. Samples were collected from a location within the potential disposal site when the sampling location was accessible from CPCC-owned property. Otherwise, samples were collected at bridges and road right-of-ways nearest to the possible disposal sites. The sampling locations are shown on Exhibit 1. Temperature, conductivity, dissolved oxygen (DO), pH, and stream discharge rates were measured at the stream sampling stations concurrently with benthic macroinvertebrate sample collection. Water samples also were collected at each sampling station and sent to G & C Coal Analysis Laboratory in Summersville, PA, to be analyzed for pH, total alkalinity, total acidity, total iron, total manganese and total sulfate. A summary of the sample results is provided on Table 6-2.

Water quality measurements taken in the field were all very comparable among the 12 sites. These measurements ranged from 0.1°C to 3.2°C, 11.2 to 16.5 mg/l DO, 99 to 413 µS/cm for conductivity and 7.35 to 8.16 for pH. Conductivity measurements exhibited the greatest differences, with Sites 5 and 6 having over 300 µS/cm. However, all measurements indicate water quality conditions generally supportive of aquatic life. Discharges ranged from 0.08 cfs (Site 12) to 0.96 cfs (Site 3).

Laboratory analysis of stream water quality revealed that all of the water quality measurements were in compliance with Chapter 93 water quality standards. Laboratory pH for the 12 sites ranged from 6.93 to 8.67. Other laboratory analytical measurements ranged from 83 to 215 mg/l for total alkalinity, -211 to -75 mg/l for total acidity, <0.04 mg/l of total Fe, <0.02 to 0.03 mg/l of total manganese, and 37 to 124 mg/l of total SO₄. Total suspended solids (TSS) ranged from 4 to 14 mg/l.

Benthic macroinvertebrate samples were collected using a modification of the USEPA's Rapid Bioassessment Protocol, Single Habitat Approach (USEPA 1999). Stream access was limited to public access areas (i.e., bridges and right-of-ways) at some of the sites, so it was not possible to collect benthic samples within the specified 100-meter reach. Instead, the best available riffle habitat within the public access areas was sampled for a composite benthic sample at each alternative site. Therefore, the habitat sampled might not consist of optimal riffle habitat for that particular stream. The benthic macroinvertebrate sampling was standardized for the sampling locations. Stream invertebrate samples were sorted, identified, and enumerated in CEC's laboratory. CEC taxonomists identified most insect taxa to the genus level and other taxa to the lowest practical level. The benthic macroinvertebrate metrics calculated for the 14 sites included: (1) number of taxa (taxa richness); (2) dominant taxon; (3) percent dominant taxon; (4) Shannon-Weaver Diversity Index; (5) percent abundance of EPT taxa (mayflies, stoneflies, and caddisflies); (6) number of EPT taxa; and (7) number of PA intolerant taxa. Table 6-3 presents a summary of all benthic macroinvertebrate metrics.

The benthic samples indicate that streams within all of the alternative sites support benthic macroinvertebrate assemblages typical of headwater streams draining predominantly wooded watersheds. The total number of benthic taxa ranged from 17 to 31, with chironomids (midges) comprising the majority of the organisms (27-48%) in three of the streams and *Allocapnia* (20-31%) in four of the streams. The streams support a relatively high number of EPT taxa (11-21) and pollution intolerant taxa (11-19), indicating moderately good water quality. All of the Shannon-Weaver Diversity Index scores for the sites were categorized as “good” or better (>2.5). Site 5 had the lowest Shannon-Weaver Diversity Index with a 2.96 (good). Site 2 had the highest Shannon-Weaver Diversity Index with a 4.02 (excellent). Site 3 had the highest number of taxa (31). Site 12 had the highest number of EPT taxa (21) and the highest number of pollution intolerant taxa (15). Site 1 had the lowest number of taxa (17), Site 1 had the lowest number of EPT taxa (11) and Site 4 had the lowest number of pollution intolerant taxa (11).

Results of the stream sampling and analysis program indicate that the three potential disposal alternatives are roughly equal relative to water quality, including that indicated by benthic macroinvertebrate population. Therefore, none of the alternatives was ranked more or less favorably relative to this criterion.

6.2.2 Stream Length

Stream impacts were assessed by determining the length of stream encroachment that would result from development of each potential disposal alternative. For each of the three alternatives, the individual site footprints shown on Exhibit 1 were assumed to be impacted. Sedimentation pond areas are included within the footprints shown on Exhibit 1. Stream lengths at each site were established initially using USGS topographic mapping. Those stream lengths were supplemented based on mapping presented in the USDA Soil Conservation Service Soil Survey for Washington County.

The extent and locations of stream reaches established for each of the disposal alternatives are shown on Exhibit 1. Estimated stream lengths for each alternative are presented on Table 6-1, along with the disposal volume provided per linear foot of stream impacted. Since the disposal life provided by each of the three alternatives varies, a fair comparison of the alternatives relative to stream length impacts is possible by evaluating and comparing the disposal volume provided per foot of stream impacted. The highest value of disposal volume per linear foot indicates optimal use of the stream length that will be taken and thus the most favorable alternative. Alternative 2 exhibits a value on the order of 4,500 cubic yards per linear foot of stream and is considered most favorable relative to stream impacts. Alternative 2 also impacts the smallest length of stream.

CPCC acknowledges that stream lengths established from USGS and SCS mapping may not be the same as those identified by a detailed field survey. However, a comparison between USGS/SCS stream lengths and actual field delineated stream lengths for the CRDA Nos. 3 and 4 permitted area indicates the USGS/SCS source provides a reasonably accurate estimate of stream length. Presented as Exhibit 4 is a topographic map of the CRDA Nos. 3 and 4 Site before development showing stream lengths determined from both sources. Approximately 13,200 linear feet of stream encroachment was permitted compared to the 15,240 linear feet indicated by the USGS/SCS data. The USGS/SCS reported stream length value is roughly 15% higher than the field delineated length. Therefore, use of USGS/SCS streams for disposal alternate comparison is fair and reasonable.

6.2.3 Wetlands

Potential wetland acreage present on each alternative site was estimated by CEC from the acreage of hydric soil map units identified on USDA/SCS county soil survey maps. To determine a more accurate estimate of actual jurisdictional wetlands on the sites, a ratio was derived using the field data from the CRDA Nos. 3 and 4 coal refuse disposal application. A factor was calculated for the ratio between the actual areas of jurisdictional wetlands determined by field methods to the area of wetlands determined using hydric soil acreage.

A jurisdictional wetland delineation performed for CRDA Nos. 3 and 4 as part of the permit application for that facility identified 1.382 acres of wetlands. The hydric soil components acreage for the CRDA Nos. 3 and 4 Site was computed from the NRCS digital soil survey data using a Geographic Information System (GIS) model. The GIS model identified all soil units within the CRDA Nos. 3 and 4 Site and reported the total area for each soil type and their estimated percent hydric component. The total area of each soil type then was multiplied by its estimated percent hydric component to obtain an estimate of the hydric component acreage. All hydric soil component units for the CRDA Nos. 3 and 4 Site were summed (3.84 acres) and then divided by the area of delineated jurisdictional wetlands (1.382 acres) to obtain a ratio of 0.36 for the reference site.

The GIS model also was used to identify the total area of hydric soil components for each alternative site. The identified hydric soil component acreage for each alternative site was multiplied by the wetland ratio (0.36) to compute the estimated potential wetland acreage for each alternative site. Table 6-4 presents the NRCS hydric soil map unit acreage, the estimated hydric soil component acreage, and the estimated wetland acreage derived from the hydric soil components for each alternative site.

Additionally, USF&WS NWI maps were reviewed to document previously photo-interpreted wetlands and deep-water habitats. Using a GIS model, each identified NWI was further investigated to determine its USF&WS classification and acreage. NWI wetlands for each alternative site are also presented in Table 6-4.

Wetland areas determined from the hydric soil ratio methodology were combined with NWI wetland and pond areas to establish the total wetland area used for alternative comparison. Table 6-4 presents the total wetland acreage. Alternative 3 was determined to have the highest amount of wetland area at 5.34 acres, whereas Alternatives 1 and 2 are estimated to have similar amounts at 1.37 and 1.78 acres, respectively. Since the disposal life provided by the alternatives varies, a fair comparison of the alternatives relative to wetland impacts is only possible by comparing the area of wetlands impacted per year of disposal life (the lower

the value the better). Alternative 3 will impact approximately 0.37 acres of wetlands per year of disposal and Alternative 1 and 2 will impact approximately 0.11 and 0.15 acres of wetlands per year of disposal, respectively. Since Alternatives 1 and 2 are only 0.04 acres/year apart they are rated essentially equal and most favorable in this category.

6.2.4 Ponds

Ponds were identified by CEC using USF&WS NWI maps and 2004 color aerial photographs. The GIS model prepared by CEC was used to identify deep water habitats classified as palustrine open water (POW) on NWI maps and to measure the acreage. Total acreages of NWI deep-water habitats for each alternative site are presented in Table 6-4 as NWI Ponds. Because NWI maps are based on 1980s aerial photography and do not reflect recent changes in land use, 2004 color aerial photographs also were used to identify ponds within each alternative site. Table 6-4 includes pond area identified with the aerial photography for each alternative site.

6.2.5 Total Aquatic Resource Impacts

An estimate of the total area of aquatic resources was also determined for each site as shown on Tables 6-1 and 6-4. Aquatic resources include the area of wetlands, ponds, and streams. The stream area for each site was estimated by multiplying the stream length by 3 feet (the estimated average stream width). Alternative 3 was determined to have the highest amount of total aquatic resources area at 9.63 acres, whereas Alternatives 1 and 2 are estimated to have similar amounts at 0.35 and 0.33 acres, respectively. Since the disposal life provided by the alternatives varies, a fair comparison of the alternatives relative to aquatic resources impacts is only possible by comparing the area of impacts per year of disposal life (the lower the value the better). Alternative 3 will impact approximately 0.66 acres of total aquatic resources per year of disposal and Alternative 1 and 2 will impact approximately 0.35 and 0.33 acres of total aquatic resources per year of disposal, respectively. Since Alternatives 1

and 2 are only 0.02 acres/year apart they are rated essentially equal and most favorable in this category.

6.3 Public Water Supplies

PADEP Bureau of Water Supply and Community Health has no record of a public water supply within the watershed or of an aquifer using a subsurface groundwater source within one half mile of the search area. PADEP stated that the nearest public water supply is the Claysville Water Authority; reportedly a reservoir dam located approximately 8 miles north of the search area. It is therefore concluded that none of the potential disposal alternatives will impact community drinking water supplies and all three alternatives are rated equal under this evaluation parameter. See Appendix B for correspondence from PADEP Water Standards and Facility Regulation.

6.4 Area Previously Disturbed

There are relatively minor disturbances at each of the sites consisting primarily of those associated with dwellings, farms, roadways, and/or mine related facilities operated by CPCC. There also are gas transmission lines, electric transmission lines, and gas wells located within each of the alternatives. Although there are disturbances within each alternative site, they occupy relatively small portions of the overall area, and all three alternatives are rated equal under this evaluation parameter. See Exhibit 1 for notable features.

In addition to the minor disturbances mentioned above, the Alternative 1 area encompasses the Enlow Fork Newland Airshaft facility situated within Site 10. Parallel 138 KV and 69 KV transmission lines are located within Sites 10 and 1. No other significant surface facilities are apparent within the Alternative 1 area.

Additional disturbances within the Alternative 2 area include the Bailey 1 South Shaft facility at the northwest corner of Site 5 and a 69 KV transmission line across Site 8.

The Alternative 3 area includes a section of the Enlow C5 Bleeder shaft facility within Site 3, water handling boreholes in Site 3, and a 500 KV transmission line across both Sites 3 and 4.

6.5 Historic and Archaeological Sites

There are no recorded historic or archaeological sites within any of the three alternatives. However, the Pennsylvania Historical and Museum Commission (PHMC) has indicated there is a high probability that archaeological resources exist within the footprints of all three alternatives (see correspondence in Appendix B). Based on the limited information currently available, all three alternatives are rated equal in terms of impacts to historical and archaeological sites.

Appropriate archaeological investigations will be performed for the selected alternative sites prior to submittal of the project permit application and PHMC approval will be obtained for the sites as required.

6.6 Dwellings

Information obtained from planimetric mapping, aerial photographs, and the site visit were used to estimate the number of dwellings located within 300 feet of each potential alternative disposal area. The estimated number of dwellings located within 300 feet of each alternative is:

- Alternative 1: 13
- Alternative 2: 5
- Alternative 3: 32

As indicated by the above, Alternative 2 would impact significantly fewer dwellings than Alternatives 1 or 3 and is considered the most favorable relative to this evaluation parameter. Also note that the five dwellings listed for Alternative 2 are located in the 300 foot buffer area, no dwellings are located within the site boundaries for Alternative 2.

6.7 Utilities

Information on existing utilities in the search area was obtained from the Pennsylvania One Call System, Baker's site visit, aerial photographs, and underground mining maps previously prepared by CPCC for the Bailey and Enlow Mines. Based on the results of this investigation, it appears that the all three alternative sites would impact gas transmission lines, electric transmission lines, and local telephone/electric service lines that are generally located along the public roadways. The location of the gas and electric transmission lines in the search area are shown on Exhibit 1. A summary of the utility impacts is provided below and is also shown on Table 6-1.

	Gas Transmission Lines	Electric Transmission Lines	Telephone and Electric Service Lines
Alternative 1	3,000	11,000	7,000
Alternative 2	7,000	3,000	0
Alternative 3	9,500	13,000	24,000

Alternate 2 is rated the highest in this evaluation parameter since it would result in the least impact to gas and electric transmission lines, and it will not impact any local telephone and electric service lines.

6.8 Aesthetics

No significant differences in the appearance of a coal refuse disposal area within any of the three alternative sites during disposal operations or after final reclamation are anticipated.

Aesthetic impacts would be similar for Alternatives 1 and 3. Disposal sites within each of these alternatives would be visible from nearby roads and some nearby residences. Conveyors necessary to transport refuse from the preparation plant to the disposal areas

within either alternative would cross heavily traveled public roads and result in adverse aesthetic impacts.

Alternative 2 is similar to Alternatives 1 and 3 in that it would be visible from nearby roads and some nearby residences; however, the conveyor for this alternative would not have to cross any public roads. Therefore, Alternative 2 is considered the most favorable relative to this evaluation parameter.

6.9 Public Roadways

Disposal sites forming Alternative 2 will not encroach upon any public roads. Development of Alternative 1 would impact approximately 12,200 feet of township roads. Development of Alternative 3 would impact approximately 2,500 feet of township roads and 21,600 feet of state roads. A summary of the total lengths of roadway impacts for each alternative is provided on Table 6-1.

State roads that are impacted will most likely have to be relocated. Township roads that are impacted will have to be either relocated or abandoned. Impacts to public roadways were estimated from information obtained from USGS Quadrangles and PennDOT Type 5 Township Road Maps.

Since development of Alternative 2, unlike the other two alternatives, will not impact any public roads, Alternative 2 has been ranked higher relative to this criterion.

6.10 Land Use and Wildlife

CEC performed a land use/land cover classification of the alternative sites to determine the types and percentages of existing habitats/cover present. Land use/land cover classes identified within the project area included: agricultural, hardwood forest, transitional

(reverting agricultural fields), low order streams, headwater wetlands, ponds, industrial, and urban.

Habitat for each alternative site was determined by using a land cover dataset published by Penn State University (2003). This dataset recognizes a total of 15 land cover types based on interpretation of aerial photographs. Of the 15 land cover types included in the dataset, 9 different land cover types were found within the alternative sites. GIS software was used to combine some of the similar land cover types into wildlife habitats (e.g., deciduous forest, mixed forest, and coniferous forest were combined into hardwood forest).

The acreages of wildlife habitats for each site are presented in Table 6-5. Hardwood forest and agricultural land are the most prominent habitat types present within the alternative sites. Four of the sites (Sites 3, 4, 5, and 7) contain ponds or lakes ranging from 0.02 to 0.64 acre. None of the alternative sites were shown to contain more than 1.76 acres of low order streams. Headwater wetland habitat ranged from 0.02 to 2.70 acres. Two of the alternative sites (4 and 10) contained large enough areas of residential homes to be classified as urban habitat by the Penn State land cover dataset.

All of the alternative sites were dominated by the hardwood forest habitat, except Site 4 which was dominated by agricultural habitats. Although present at each site, transitional habitat was not dominant at any of the sites.

A windshield survey from public access points was completed in February 2007 for all the alternative sites. The survey spanned three days and consisted of driving public roads, accessing streams along bridge crossing, and wildlife viewing along public parking areas. Because of the limited nature of the windshield survey and the similarity of the wildlife observations at the sites, the wildlife observations have been combined and are considered representative of all sites. In addition to the windshield surveys, recent (2004-2006) data from previous field studies conducted in the project vicinity are also included in the field observations.

Potential wildlife impacts resulting from development of a coal refuse disposal site appear to be of similar magnitude for all of the sites based on reasonably available data. As a result, no one site and, therefore, no one alternative was ranked more or less favorable relative to this evaluation criterion.

The wildlife distribution by habitat is also provided on Table 6-5. A brief description of known and potential wildlife occurrences in the search area is provided in the following sections.

Mammals

Mammals observed or indicated by tracks and signs during the windshield survey and during previous studies in the area include Virginia opossum, little brown bat, northern long-eared bat, eastern pipistrelle, big brown bat, red bat, eastern cottontail, eastern chipmunk, woodchuck, gray squirrel, fox squirrel, American beaver, raccoon, gray fox, eastern coyote, striped skunk, and white-tailed deer.

Birds

The alternative sites offer a wide range of habitat types for bird populations including urban, agricultural, hardwood forest, headwater wetland, low order streams, ponds, and transitional. The highest number of avian species can be expected to occur in the hardwood forest and transitional habitats. Many of the species of birds that can occur within the sites are considered habitat generalist and can be expected to be found inhabiting several habitat types.

Birds observed or indicated by calls, tracks, and signs during the windshield survey and adjacent areas, and during previous studies in the area include turkey vulture, Canada goose, mallard, wild turkey, mourning dove, eastern screech-owl, Pileated woodpecker, blue jay, American crow, black-capped chickadee, tufted titmouse, white-breasted nuthatch, eastern bluebird, northern cardinal, song sparrow, brown-headed cowbird, purple finch, and house finch.

Reptiles and Amphibians

A majority of the reptile and amphibian species can be found in hardwood forests, headwater wetlands, and transitional habitats. Most of the amphibians will occupy differing habitats throughout the year. Many of them require either ephemeral or semi-permanent to permanent water bodies for reproduction and offspring development.

Reptiles and amphibians observed or indicated by calls or other signs during the windshield survey from public access points and adjacent areas, and during previous studies in the area include spotted salamander, red-spotted newt, northern dusky salamander, northern two-lined salamander, eastern American toad, northern spring peeper, bull frog, green frog, pickerel frog, northern leopard frog, common snapping turtle, eastern box turtle, northern black racer, black rat snake, northern water snake, queen snake, and eastern garter snake.

Fish

The proposed alternative sites are all located within the watershed of Enlow Fork, which drains to the Ohio River. Fish species present at the sites are limited to ponds and lakes and headwater streams habitat types. No natural ponds and lakes were identified within any of the sites. These man-made ponds are most likely privately stocked waters with various species of pan fish and largemouth bass.

Fish observed during recent fish surveys of headwater tributaries to Enlow Fork include; central stoneroller, bluntnose minnow, blacknose dace, creek chub, white sucker, northern hogsucker, bluegill, green sunfish, fantail darter, and Johnny darter.

6.11 Threatened and Endangered Species

Inquiries into the possible presence of threatened and endangered species were performed by CEC. Requests for information were submitted to the PADEP Pennsylvania Natural Diversity Inventory (PNDI) as an initial step. The PNDI searches indicated that all three

alternatives had potential impacts to ecological resources. Sites 2 and 9 (Alternative 1); Sites 6, 7, and 8 (Alternative 2); and Sites 3 and 4 (Alternative 3) each had one potential conflict with an ecological resource under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources (PADCNR). Sites 1, 5, 10, 12, and 14 were cleared of any impacts to ecological resources. Copies of the PNDI search results are provided in Appendix C.

Subsequent correspondence received from the PADCNR stated that the Nuttall's Hedge-nettle (*Stachys nuttallii*) may be located within Sites 2, 6, 7, 8, and 9; and that the Passion-flower (*Passiflora lutea*) may be located within Site 7. Both the Nuttall's Hedge-nettle and the Passion-flower are state endangered plants. PADCNR indicated that no impacts are anticipated for Alternative 3 (Sites 3 and 4). Copies of the PADCNR correspondence are provided in Appendix B.

Since PADCNR indicated that no impacts to threatened and endangered species are anticipated for Alternate 3, it is considered the most favorable relative to this criterion.

6.12 Geology/Hydrology

The geologic/hydrogeologic setting of the three sites is generally similar except that the HQW is adjacent to the southeastern sides of Site 5 of Alternative 2 and Site 4 of Alternative 3. Both sites are candidates for slurry impoundment development. As shown on Exhibit 3, structure contours indicate that bedrock forming the ridge separating Site 4 and the HQW dips approximately 2 to 3 percent to the southeast, towards the HQW. Site 5 on the other hand is situated in the vicinity of the axis of the anticline where bedrock dips more gently (generally less than 2%) in a predominantly northeast direction, toward CRDA No. 1, along an alignment that parallels the HQW. Without consideration of engineering controls that would be incorporated into the facility design to control seepage from the disposal area, Alternative 1 would be most favorable relative to this geology/hydrogeology and Alternative 3 least favorable. However, site development for any of the alternatives would require

installation of underdrains, as well as a low permeability cap component and liner, for control of exfiltration to adjacent watersheds, thereby reducing the impact of the adjacent high quality watershed on the Alternative settings.

**TABLE 6-1
SUMMARY OF SECOND ASSESSMENT**

1, 2, 9, 10, 12 5, 6, 7, 8, 11 3, 4

Category	Unit	Alternative No. 1	Alternative No. 2	Alternative No. 3
Total Capacity	CY	150,339,000	145,701,000	175,181,000
Disposal Life	Years	12.5	12.1	14.5
Area	Acres	776	760	1078
Storage Volume Efficiency	CY/AC	193,700	191,700	162,500
Water Quality	N/A	Meets Chapter 93 Standards		
Stream Impacts	LF	43,130	32,120	51,840
Stream Impact Efficiency	CY/LF	3,500	4,500	3,400
Wetland Impacts	Acres	1.37	1.78	5.34
Annual Wetland Impacts	AC/YR	0.11	0.15	0.37
Total Aquatic Resource Impacts	Acres	4.34	4.04	9.63
Annual Total Aquatic Resource Impacts	AC/YR	0.35	0.33	0.66
Public Water Supplies	N/A	None		
Area Previously Disturbed	N/A	Minor		
Historic and Archaeological Sites	N/A	None Recorded		
Dwellings within 300 Feet	Each	13	5	32
Utility Impacts - Total		21,000	10,000	46,500
Gas Transmission Lines	LF	3,000	7,000	9,500
Electric Transmission Lines	LF	11,000	3,000	13,000
Telephone and Electric Service Lines	LF	7,000	0	24,000
Aesthetics	N/A	Minor W/ Conveyor Crossing	Minor	Minor W/ Conveyor Crossing
Township Road Impacts	LF	12,200	0	2,500
State Road Impacts	LF	0	0	21,600
Threatened and Endangered Species	Each	2 Potential	3 Potential	None
Geology/Hydrology	N/A	Does Not Border HQW	Borders HQW	Borders HQW

Highlighted entry indicates "most favorable" for given category.

**TABLE 6-2
STREAM WATER QUALITY**

Site	Field Measurements					Lab Measurements					
	Discharge (cfs)	Temp. (°C)	DO (mg/l)	Conductivity (µS)	Field pH	Lab pH	Total Alk. (mg/L)	Total Acid. (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total SO ₄ (mg/L)
1	0.22	2.2	13.9	227	7.73	7.53	154.28	-147.33	<0.04	<0.02	60.7
2	0.27	0.1	15.8	155	7.91	8.08	185.09	-167.43	<0.04	<0.02	51.1
3	0.96	0.4	12.4	187	7.83	8.67	134.32	-109.14	<0.04	<0.02	51.9
4	0.85	0.3	12.3	127	7.44	6.93	83.38	-75.17	<0.04	<0.02	36.7
5	0.52	0.8	14.1	413	8.16	7.88	163.70	-158.39	<0.04	0.03	69.9
6	0.11	1.1	16.5	308	8.09	8.18	162.37	-157.79	<0.04	<0.02	124.0
7	0.12	2.2	11.2	239	8.17	7.77	164.76	-163.61	<0.04	<0.02	52.6
8	0.16	1.2	13.4	214	8.12	7.85	160.27	-157.58	<0.04	<0.02	56.1
9	0.39	1.2	11.9	219	8.10	7.91	164.54	-151.96	<0.04	<0.02	52.6
10	0.61	3.2	12.6	249	8.13	7.98	173.60	-171.25	<0.04	<0.02	67.8
11	0.20	1.6	11.4	299	7.99	8.17	214.97	-210.85	<0.04	<0.02	57.6
12	0.08	0.2	15.5	99	7.35	7.22	89.38	-76.38	<0.04	<0.02	38.1
13	0.08	0.6	12.2	200	7.69	7.04	86.80	-80.20	<0.04	<0.02	53.9
14	0.15	0.3	13.9	125	7.67	7.04	92.68	-88.64	<0.04	<0.02	35.5
Chapter 93 Standards ¹	-	-	5.0 min	-	6 - 9	6 - 9	20 min	-	1.5 max	1.0 max	-

¹ Surface water quality standards from Title 25, Chapter 93 of the Pa Code - Displayed as range, minimum, or maximum necessary for attainment of designation.

Alternative 1 Sites
Alternative 2 Sites
Alternative 3 Sites

**TABLE 6-3
BENTHIC MACROINVERTEBRATE COMMUNITY METRICS**

METRICS	Site 1	Site 2	Site 3	Site 4	Site 5
Number Collected	222	212	206	214	211
Number of Taxa	17	27	31	25	23
Percent Dominant Taxon	29%	15%	20%	48%	44%
Dominant Taxon	Amphinemura	Ephemerella	Allocaepnia	Chironomidae	Chironomidae
Shannon-Weaver Diversity Index	3.04	4.02	3.93	3.14	2.96
Percent Abundance of EPT Taxa	63%	78%	65%	36%	36%
Number of EPT Taxa	11	19	19	15	12
Number of PA Intolerant Taxa	12	14	13	11	13

METRICS	Site 6	Site 7	Site 8	Site 9	Site 10
Number Collected	215	202	205	215	209
Number of Taxa	28	23	25	23	24
Percent Dominant Taxon	27%	28%	25%	20%	29%
Dominant Taxon	Chironomidae	Ameletus	Allocaepnia	Allocaepnia	Prostoia
Shannon-Weaver Diversity Index	3.46	3.52	3.74	3.56	3.48
Percent Abundance of EPT Taxa	67%	81%	86%	79%	66%
Number of EPT Taxa	18	16	20	17	16
Number of PA Intolerant Taxa	17	16	18	14	13

METRICS	Site 11	Site 12	Site 13	Site 14
Number Collected	206	191	192	210
Number of Taxa	23	30	16	20
Percent Dominant Taxon	21%	16%	39%	31%
Dominant Taxon	Prostoia	Epeorus	Chironomidae	Allocaepnia
Shannon-Weaver Diversity Index	3.44	4.00	2.92	3.22
Percent Abundance of EPT Taxa	62%	83%	39%	80%
Number of EPT Taxa	10	21	9	13
Number of PA Intolerant Taxa	9	19	10	12

Alternative 1 Sites
Alternative 2 Sites
Alternative 3 Sites

**TABLE 6-4
AQUATIC RESOURCES SUMMARY**

Subsite	NRCS ¹ Hydric Soil Map Units (Acres)	NRCS ¹ Estimated Hydric Component (Acres)	Wetlands ² Estimated from Hydric Component (Acres)	NWI ³ Wetlands Excluding Ponds (Acres)	NWI ³ Ponds Excluding Wetlands (Acres)	Additional Ponds ⁴ from Aerials (Acres)	USGS ⁵ and NRCS ¹ Streams (Acres)	Total ⁶ Estimated Wetlands (Acres)	Total of All ⁷ Aquatic Resources (Acres)
1	15.29	0.21	0.08	0.00	0.00	0.00	0.43	0.08	0.51
2	22.30	0.37	0.13	0.00	0.00	0.00	0.35	0.13	0.48
3	105.58	6.60	2.38	0.22	0.01	0.63	1.70	2.59	4.93
4	128.21	7.51	2.70	0.05	0.08	0.00	1.87	2.75	4.69
5	60.68	3.33	1.20	0.08	0.02	0.00	1.05	1.28	2.35
6	1.47	0.15	0.05	0.00	0.00	0.00	0.30	0.05	0.35
7	4.79	0.36	0.13	0.00	0.00	0.00	0.32	0.13	0.45
8	13.38	0.73	0.26	0.00	0.03	0.00	0.31	0.26	0.60
9	33.07	1.37	0.49	0.00	0.00	0.00	0.62	0.49	1.11
10	50.69	1.15	0.41	0.00	0.00	0.00	1.21	0.41	1.62
12	18.47	0.69	0.25	0.00	0.00	0.00	0.36	0.25	0.61
14	11.04	0.15	0.05	0.00	0.00	0.00	0.24	0.05	0.29

¹ From USDA/NRCS, Soil Survey of Washington and Greene Counties Pennsylvania, 2006.

² Multiply NRCS Hydric Components by 0.36 Factor.

³ U.S. Fish & Wildlife Service, National Wetlands Inventory, 1981 to present.

⁴ USDA-FSA Aerial Photography Field Office, National Agriculture Imagery Program (NAIP), 2004.

⁵ U.S. Geological Survey, 7.5 minute DRG. 1998.

⁶ Sum of Wetlands Estimated from Hydric Components and NWI Wetlands.

⁷ Sum of Wetlands Estimated from Hydric Components, NWI Wetlands, NWI Ponds, Additional Ponds, and Streams.

Alternative 1 Sites

Alternative 2 Sites

Alternative 3 Sites

**TABLE 6-5
LAND USE/WILDLIFE HABITATS**

LAND USE/WILDLIFE HABITAT AREAS

Site	Hardwood Forest (Acres)	Agricultural (Acres)	Transitional (Acres)	Low Order Streams (Acres)	Headwater Wetland (Acres)	Industrial (Acres)	Ponds and Lakes (Acres)	Urban (Acres)
1	56.7	35.9	14.5	0.43	0.08	0.00	0.00	0.0
2	125.9	3.1	0.2	0.35	0.13	0.00	0.00	0.0
3	233.0	195.5	67.4	1.70	2.59	0.00	0.64	0.0
4	210.6	281.4	79.0	1.87	2.75	0.00	0.08	0.4
5	212.8	101.2	34.0	1.05	1.28	3.96	0.02	0.0
6	73.5	2.6	1.4	0.30	0.05	0.00	0.00	0.0
7	90.8	8.1	6.2	0.32	0.13	0.00	0.00	0.0
8	123.7	5.7	3.9	0.31	0.26	0.00	0.03	0.0
9	121.4	10.9	16.4	0.62	0.49	0.00	0.00	0.0
10	246.0	30.9	24.4	1.21	0.41	0.00	0.00	0.2
12	77.0	1.7	3.9	0.36	0.25	0.00	0.00	0.0
14	58.6	18.2	9.5	0.24	0.05	0.00	0.00	0.0

WILDLIFE DISTRIBUTION BY HABITAT

	Hardwood Forest	Agricultural	Transitional	Low Order Streams	Headwater Wetland	Industrial	Ponds and Lakes	Urban
Mammals	36	24	28	3	28	7	2	21
Birds	101	69	107	4	51	28	42	67
Amphibians & Reptile	31	9	27	9	28	6	10	7
Fish	0	0	0	58	0	0	28	0
Totals	168	102	162	74	107	41	82	95

Alternative 1 Sites

Alternative 2 Sites

Alternative 3 Sites

7.0 CONCLUSIONS

The total capacity of existing disposal areas serving BCMC is expected to be depleted by 2013. However, mining removal and processing of existing Enlow Fork and Bailey Mine reserves will produce an anticipated quantity of coal refuse large enough to justify permitting/design of a new disposal area having more than 12 years of additional storage capacity. Based on the preceding analysis, the best method for achieving continued coal refuse disposal at BCMC is by developing a new coal refuse disposal area. Analysis of the search area reveals that no alternative is better than Alternative 2 for development of the necessary coal refuse disposal facility. No other alternative can be considered more favorable when considering: 1) disposal efficiency, 2) impacts to streams, 3) impacts to aquatic resources, 4) impacts to dwellings, 5) impacts to utilities, 6) impacts to public roadways, and 7) and aesthetics. Table 6-1 presents a summary of the site assessment. Since the second assessment clearly indicated that Alternative 2 was the most favorable for development of a new coal refuse area, a third assessment was not needed.

As a result, CPCC proposes Alternative 2 for development as the next BCMC coal refuse disposal area. No other alternative is considered more favorable, and construction of the coal refuse disposal facility is necessary for continued operation of the Bailey and Enlow Fork Mines. Development of this disposal facility will benefit the public indirectly by facilitating continuation of the thousands of direct and indirect jobs associated with the mines and by allowing coal to be moved and processed for production of electricity without causing substantial impacts to the environment.

Alternative 2 consists of 5 valleys (Sites 5, 6, 7, 8, and 14) located south of the BCMC and existing CRDA No. 1. It is anticipated that Site 5 will be developed as a slurry impoundment and Sites 6, 7, 8, and 14 will be developed as coarse refuse disposal areas. Sites 5 and 14 will be developed initially. Development of Sites 6, 7, or 8 will not be initiated until additional capacity is needed.

Although it is not considered to be a fatal flaw, PADCNR stated that the Nuttall's Hedge-nettle may be located within Sites 6, 7 and 8 and that the Passion-flower may be located within Site 7. Both the Nuttall's Hedge-nettle and the Passion-flower are state endangered plants. Therefore, a field survey will be performed by a qualified botanist during the appropriate flowering seasons to determine the presence (if any) and location of the Nuttall's Hedge-nettle and the Passion-flower. If either plant is discovered within Sites 6, 7 and/or 8, CPCC will work with PADEP to develop an acceptable plan for mitigating its disturbance.

In addition, appropriate archaeological investigations will be performed for the Alternative 2 sites prior to submittal of the project permit application and PHMC approval will be obtained for the sites as required.

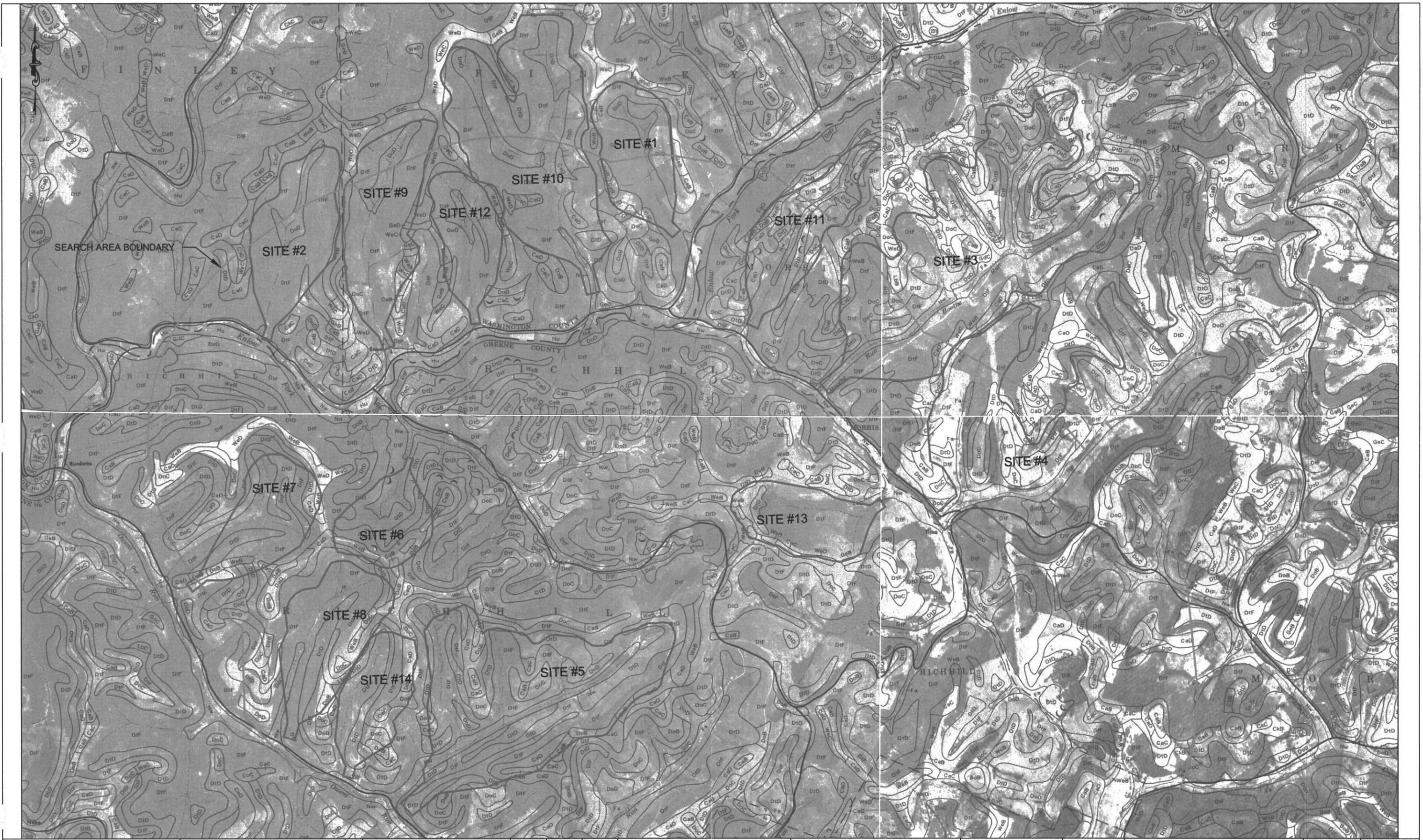
8.0 DATA SOURCES

- USGS 7.5 Minute Series Topographic Maps: Prosperity, PA; Claysville, PA; Rogersville, PA; and Wind Ridge, PA.
- Pennsylvania Code Title 25 Chapter 93. Water Quality Standards.
- USDA Soil Conservation Service Soil Survey of Greene & Washington Counties.
- USDA Natural Resources Conservation Service, Greene County.
- Pennsylvania Game Commission – Harrisburg, PA.
- U.S. Fish and Wildlife Service National Wetlands Inventory Maps.
- U.S. Environmental Protection Agency - Region 3 - Comprehensive Environmental Response, Compensation & Liability Info. System (CERCLIS) list of Hazardous Waste Sites.
- U.S. Environmental Protection Agency - Region 3 - National Priorities List, Active Superfund Sites.
- U.S. Environmental Protection Agency - Region 3 – CERCLIS Abandoned Mine Land Inventory.
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- PennDOT Roadway Map of Greene & Washington Counties.
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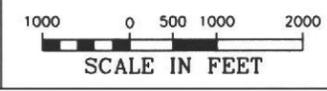
Baker

Michael Baker Jr., Inc.
EXHIBITS



Baker

SOURCE: SOIL SURVEY OF GREENE AND WASHINGTON COUNTIES, PENNSYLVANIA



REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE

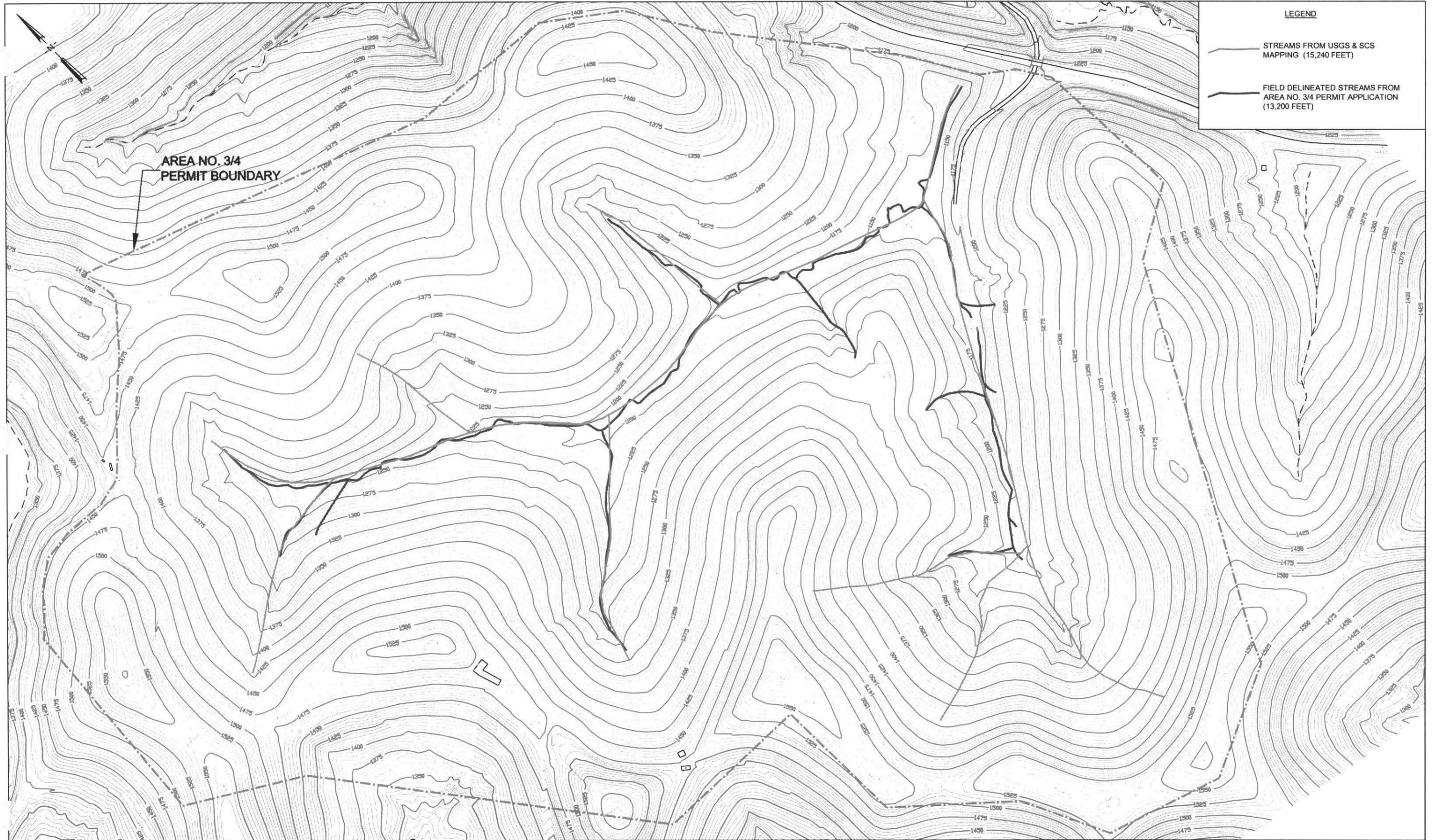
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CONSOL PENNSYLVANIA COAL COMPANY

DRAWN BY	KConti	DATE	03/07
DESIGNED BY	GHelman	DATE	03/07
CHECKED BY	GHelman	DATE	04/07
APPROVED BY	MStewart	DATE	04/07

BAILEY CENTRAL MINE COMPLEX
ALTERNATIVE ANALYSIS & SITE SELECTION STUDY
NEW COAL REFUSE DISPOSAL AREA NO. 5
SOIL SURVEY MAP

SCALE	1" = 2000'	PROJECT NO.	109957
DRAWING NO.	SoilMapFigure	EXHIBIT	2



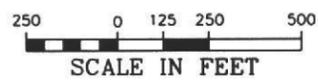
LEGEND

— STREAMS FROM USGS & SCS MAPPING (15,240 FEET)

— FIELD DELINEATED STREAMS FROM AREA NO. 3/4 PERMIT APPLICATION (13,200 FEET)

AREA NO. 3/4
PERMIT BOUNDARY

Baker



REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE

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COAL COMPANY

DRAWN BY:	KConti
DESIGNED BY:	GHeliman
CHECKED BY:	GHeliman
APPROVED BY:	MStewart

DATE:	03/07	BAILEY CENTRAL MINE COMPLEX
DATE:	03/07	ALTERNATIVE ANALYSIS & SITE SELECTION STUDY
DATE:	04/07	NEW COAL REFUSE DISPOSAL AREA NO. 5
DATE:	04/07	CRDA NOS. 3 & 4 STREAM LENGTH COMPARISON

SCALE	1" = 500'	PROJECT NO.	109957
DRAWING NO.	Area3-4StreamFigure	EXHIBIT	4

Baker

Michael Baker Jr., Inc.

APPENDIX A

Preferred Site Search Results

P e n n s y l v a n i a sitefinder

Recycling Real Estate
into **Investment Opportunities**

[Change Criteria](#)

- Find A Site
- Close The Deal
- List/Edit Your Site
- Sold/Leased Sites
- Success Stories
- About PA's Land Recycling Program
- About PA SiteFinder
- Site Map
- Contact Us
- User Information & Helpdesk
- Home

Find A Site

Site Listing

Current Search Criteria:

Location(s): Greene, Washington ←

Transaction Type: Sale & Lease

All sale price ranges

All lease price ranges

All property sizes (acres)

All building sizes (square feet)

Current search has returned 9 available sites.

211 South Vine Street Plaza – OUTSIDE OF PROJECT AREA Lease
Great location at stop light on State Rt 88 in the borough of Carmichaels. 10,000+ car count. Beautiful construction completed in early 2005. Offering build out & lease incentives. Currently one 1800Ft end-cap and one 900Ft. suite are available for lease.

Property

Property Size: 0.8 Acres

Building Space: 6750 Sq. Ft.

Municipality: Borough of Carmichaels

County: Greene

Contact

Bernie Kurincak

(724) 966-9848

brandy@alltel.net

[More Details](#)

EverGreene Technology Park – OUTSIDE OF PROJECT AREA Lease or Sale
Rooted in Nature, connected to the World No stop lights to Washington DC, International Airport and Downtown Pittsburgh Located at Route 79 Interchange, within 20 miles of major east - west US Routes 70 and 68

Property

Property Size: 20 Acres

Municipality: Franklin Township

County: Greene

Contact

Donald Chappel

Greene County Industrial Development Authority

www.evergreenepark.net

(724) 627-9259

dchappel@evergreenepark.net

[More Details](#)

Lantz Farm – OUTSIDE OF PROJECT AREA Lease or Sale
No stop lights to Washington DC, International Airport and Downtown Pittsburgh Located at Route 79 Interchange, within 20 miles of major east - west US Routes 70 and 68

Property

Property Size: 228 Acres

Building Space: 0 Sq. Ft.

Municipality: Franklin Township

County: Greene

Contact

Donald Chappel

Greene County Industrial Development Authority

www.evergreenepark.net

(724) 627-9259

dchappel@evergreenepark.net

[More Details](#)

Mather Coal Reclamation Site - OUTSIDE OF PROJECT AREA - **Sale**
 This 3.83-acre Greene County property may be developed for commercial or industrial use. No buildings onsite to inhibit your plans. Call to find out more.

Property

Property Size: 3.83 Acres
 Municipality: Morgan Township
 County: Greene

Contact

Donald Chappel
 Greene County Industrial Development Authority
 (724) 627-9259
dchappel@greenecountyida.org

[More Details](#)

Mather Coal Reclamation Site - OUTSIDE OF PROJECT AREA - **Sale**
 This 14.32-acre Greene County property may be developed for commercial or industrial use. No buildings onsite to inhibit your plans. Call to find out more.

Property

Property Size: 14.32 Acres
 Municipality: Jefferson Township
 County: Greene

Contact

Donald Chappel
 Greene County Industrial Development Authority
 (724) 627-9259
dchappel@greenecountyida.org

[More Details](#)

Mather Coal Reclamation Site - OUTSIDE OF PROJECT AREA - **Sale**
 This 2.53-acre Greene County property may be developed for commercial or industrial use. No buildings onsite to inhibit your plans. Call to find out more.

Property

Property Size: 2.53 Acres
 Municipality: Morgan Township
 County: Greene

Contact

Donald Chappel
 Greene County Industrial Development Authority
 (724) 627-9259
dchappel@greenecountyida.org

[More Details](#)

Mt. Morris Consol - OUTSIDE OF PROJECT AREA **Lease or Sale**
 Excellent access to major north - south and east - west corridors

Property

Property Size: 23.87 Acres
 Building Space: 10000 Sq. Ft.
 Municipality: Perry Township
 County: Greene

Contact

Donald Chappel
 Greene County Industrial Development Authority
www.evergreenepark.net
 (724) 627-9259
dchappel@evergreenepark.net

[More Details](#)

Detroit Street - OUTSIDE OF PROJECT AREA **Sale**
 Rail access, LERTA, 1 mile from I-79, 1 mile from Downtown District

Property

Property Size: 11.5 Acres
 Building Space: 74500 Sq. Ft.
 Municipality: City of Washington
 County: Washington

Contact

Susan Morgan
 Redevelopment Authority of Washington County
InvestWashingtonCounty.com
 (724) 228-6875

susan.morgan@racw.net

[More Details](#)

Donora Industrial Park - OUTSIDE OF PROJECT AREA - Sale
This 11 acre level site's features include access roads, all utilities, direct access to the River, rail service with Norfolk Southern, and a major access road that links the Park to Interstate 70.

Property

Property Size: 11 Acres
Municipality: Borough of Donora
County: Washington

Contact

Joe Koval
Redevelopment Authority of County of Washington
www.wash-co-redev-auth.org
(724) 228-6875
racwsusan@aol.com

[More Details](#)

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Find A Site

Site Details

211 South Vine Street Plaza

Great location at stop light on State Rt 88 in the borough of Carmichaels. 10,000+ car count. Beautiful construction completed in early 2005. Offering build out & lease incentives. Currently one 1800Ft end-cap and one 900Ft. suite are available for lease.

Address

211 South Vine Street
Carmichaels, PA 15320

Property Description

SiteFinder ID#: 1544
County: Greene
Municipality: Borough of Carmichaels
Property Size: 0.8 Acres
Building Space: 6750 Sq. Ft.
Zoning: All Approved
Usable Buildings: 5
Building Condition: Beautiful construction completed in 2005
Utility Access: All
Other Information: New professional/retail plaza located at stop light in borough of Carmichaels.



[Click to Enlarge](#)

Incentives

Contact

Bernie Kurincak
(724) 966-9848
brandy@alltel.net

Pricing Information

Price: 0

Environmental Information

Condition:
Assessments:
Response
Actions:

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Find A Site

Site Details

EverGreene Technology Park

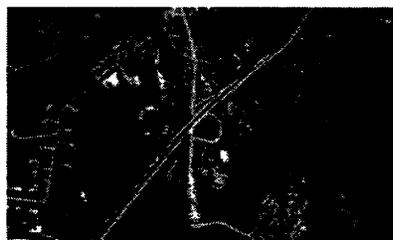
Rooted in Nature, connected to the World No stop lights to Washington DC, International Airport and Downtown Pittsburgh Located at Route 79 Interchange, within 20 miles of major east - west US Routes 70 and 68

Address

Route 21 and Progress Drive
Waynesburg, PA 15370

Property Description

SiteFinder ID#: 1387
County: Greene
Municipality: Franklin Township
Property Size: 20 Acres
Building Space:
Zoning: Commercial/ Industrial
Usable Buildings: 0
Building Condition: build to suit
Utility Access: Broadband access up to OC-3
Other Information: Adjacent to Greene County Airport, all public utilities on site, acreage or build to suit



[Click to Enlarge](#)

Incentives

Keystone Opportunity Zone

Contact

Donald Chappel
Greene County Industrial
Development Authority
(724) 627-9259
dchappel@evergreenepark.net

Pricing Information

Price: 50000

Environmental Information

Condition: Excellent
Assessments: Phase I Assessment completed
Response Actions: former strip mine site, fully reclaimed

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Find A Site

Site Details

Lantz Farm

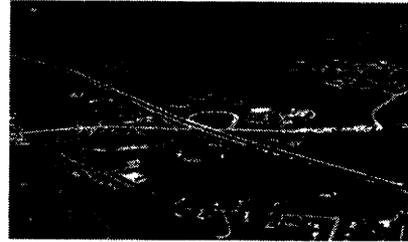
No stop lights to Washington DC, International Airport and Downtown Pittsburgh Located at Route 79 Interchange, within 20 miles of major east - west US Routes 70 and 68

Address

Route 21 and Progress Drive
Waynesburg , PA 15370

Property Description

SiteFinder ID#: 1388
County: Greene
Municipality: Franklin Township
Property Size: 228 Acres
Building Space: 0 Sq. Ft.
Zoning: Commercial/ Industrial
Usable Buildings: 0
Building Condition: Will build to suit
Utility Access: All utilities, rail, broadband access up to OC-3
Other Information: Acreage or build to suit, located at Rt. 79 exit, 20 miles to major east west routes, located adjacent to Greene County Airport, all public utilities on site



Click to Enlarge

Incentives

Keystone Opportunity Zone

Contact

Donald Chappel
Greene County Industrial
Development Authority
(724) 627-9259
dchappel@evergreenpark.net

Pricing Information

Price: 50000

Environmental Information

Condition: Excellent
Assessments: Phase I Assessment completed
Response Actions: former strip mine site, fully reclaimed

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Mather Coal Reclamation Site

This 3.83-acre Greene County property may be developed for commercial or industrial use. No buildings onsite to inhibit your plans. Call to find out more.

Address

Mather, PA 15346

Property Description

SiteFinder ID#: 426
 County: Greene
 Municipality: Morgan Township
 Property Size: 3.83 Acres
 Building Space:
 Zoning: Commercial or Industrial Development
 Usable Buildings: 0
 Building Condition:
 Utility Access:
 Other Information:



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Incentives

Contact

Donald Chappel
 Greene County Industrial Development Authority
 (724) 627-9259
dchappel@greencountyida.org

Pricing Information

Price: 57450

Environmental Information

Condition: Contact site representative
 Assessments: Contact site representative
 Response Actions: Contact site representative

Community Profile

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Find A Site

Site Details

Mather Coal Reclamation Site

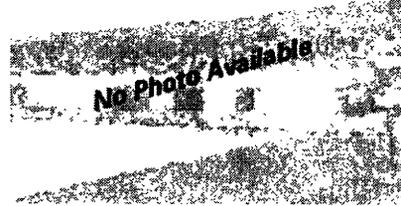
This 14.32-acre Greene County property may be developed for commercial or industrial use. No buildings onsite to inhibit your plans. Call to find out more.

Address

Mather, PA 15346

Property Description

SiteFinder ID#: 427
 County: Greene
 Municipality: Jefferson Township
 Property Size: 14.32 Acres
 Building Space:
 Zoning: Commercial or Industrial Development
 Usable Buildings: 0
 Building Condition:
 Utility Access:
 Other Information:



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Incentives

Contact

Donald Chappel
 Greene County Industrial
 Development Authority
 (724) 627-9259
dchappel@greencountyida.org

Pricing Information

Price: 214800

Environmental Information

Condition: Contact site representative
 Assessments: Contact site representative
 Response Actions: Contact site representative

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Find A Site

Site Details

Mather Coal Reclamation Site

This 2.53-acre Greene County property may be developed for commercial or industrial use. No buildings onsite to inhibit your plans. Call to find out more.

Address

Mather, PA 15346

Property Description

SiteFinder ID#: 428
 County: Greene
 Municipality: Morgan Township
 Property Size: 2.53 Acres
 Building Space:
 Zoning: Commercial or Industrial
 Development
 Usable Buildings: 0
 Building
 Condition:
 Utility Access:
 Other Information:



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Incentives

Contact

Donald Chappel
 Greene County Industrial
 Development Authority
 (724) 627-9259
dchappel@greencountyida.org

Pricing Information

Price: 37950

Environmental Information

Condition: Contact site representative
 Assessments: Contact site representative
 Response: Contact site representative
 Actions:

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Find A Site

Site Details

Mt. Morris Consol
Excellent access to major north - south and east - west corridors

Address

Interstate 79 Exit 1, Old Daisytown Road
 Mount Morris, PA 15349

Property Description

SiteFinder ID#: 1389
 County: Greene
 Municipality: Perry Township
 Property Size: 23.87 Acres
 Building Space: 10000 Sq. Ft.
 Zoning: commercial/industrial
 Usable Buildings: 1
 Building Condition: utility building; needs work
 Utility Access: all public utilities available
 Other Information: excellent access to Route 79 and major east -west corridors - Routes 68 and 70 25 miles to Washington PA and Morgantown WV



Click to Enlarge

Incentives

Keystone Opportunity Zone

Contact

Donald Chappel
 Greene County Industrial
 Development Authority
 (724) 627-9259
dchappel@evergreenepark.net

Pricing Information

Price: 20000

Environmental Information

Condition: Remediated
 Assessments: No known contaminates
 Response Actions:

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Find A Site

Site Details

Detroit Street
Rail access, LERTA, 1 mile from I-79, 1 mile from Downtown District

Address

41 Detroit Street
Washington, PA 15301

Property Description

SiteFinder ID#: 1537
County: Washington
Municipality: City of Washington
Property Size: 11.5 Acres
Building Space: 74500 Sq. Ft.
Zoning: Development District
Usable Buildings: 2
Building Condition: Industrial and warehouse
Utility Access: All
Other Information: Can be sold as one parcel or multiple parcels



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Incentives

Infrastructure to be installed by Authority

Contact

Susan Morgan
Redevelopment Authority of Washington County
(724) 228-6875
susan.morgan@racw.net

Pricing Information

Price: 575000

Environmental Information

Condition: Act 2 Clearance
Assessments: Full assessment has been completed
Response Actions: Remediation of contaminants from a fire involving stored tires

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Site Details

Donora Industrial Park

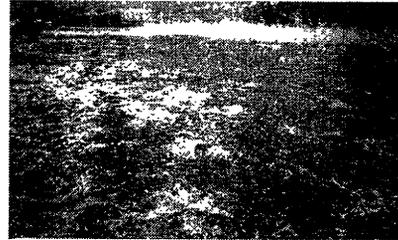
This 11 acre level site's features include access roads, all utilities, direct access to the River, rail service with Norfolk Southern, and a major access road that links the Park to Interstate 70.

Address

Giliffa Dr.
Donora, PA 15033

Property Description

SiteFinder ID#: 1424
 County: Washington
 Municipality: Borough of Donora
 Property Size: 11 Acres
 Building Space:
 Zoning: M3 - Heavy Industrial District
 Usable Buildings: 0
 Building Condition:
 Utility Access: All public utilities
 Other Information:



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Incentives

The Washington County Revolving Loan Fund and the Redevelopment Authority Incentive Loan Fund are available to qualified businesses.

Contact

Joe Koval
 Redevelopment Authority of
 County of Washington
 (724) 228-6875
racwsusan@aol.com

Pricing Information

Price: 30000

Environmental Information

Condition: No environmental hazards exist.
 Assessments: In addition, Penn Dot gave complete environmental clearance of the entire park as part of the requirements prior to their designing of the new industrial park access road.
 Response Actions: None

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U.S. Environmental Protection Agency

Abandoned Mine Lands (AML)

Contact Us | Print Version Search:



EPA Home > Superfund > Abandoned Mine Lands > AML Site Information > AML sites with EPA Removals/Emergency Responses AML Site Information

AML sites with EPA Removals/Emergency Responses

A total of 74 mining sites were found to have had removals completed onsite (organized by Region in the spreadsheet). Various sites have had multiple removal actions completed onsite. Individual sites and their associated removals are separated with alternating shading in the table.

Other AML Site Information

NPL Sites

AML CERCLIS Inventory

AML sites with EPA Removals/Emergency Responses

Site Name	EPA ID	Rg	St.	Site Sub Category/SIC code/RFF code	Actual Completion Date	Action Lead
<u>ELY COPPER MINE</u>	VTD988366571	1	VT	Metals	5/11/1995	EPA Fund-Financed
<u>ELIZABETH MINE</u>	VTD988366621	1	VT	Metals	5/25/1995	EPA Fund-Financed
<u>U.S. RADIUM CORP.</u>	NJD980654172	2	NJ	RFF = 4	9/29/1989	PRP REMOVAL
	NJD980654172	2	NJ	RFF = 4	2/28/1991	PRP REMOVAL
	NJD980654172	2	NJ	RFF = 4	4/4/1993	REMOVAL
<u>LI TUNGSTEN RP.</u>	NYD986882660	2	NY	Primary metals/mineral processing	6/12/1990	Responsible Party
	NYD986882660	2	NY	Primary metals/mineral processing	1/12/1996	Coast Guard
	NYD986882660	2	NY	Primary metals/mineral processing	8/9/1996	EPA Fund-Financed
	NYD986882660	2	NY	Primary metals/mineral processing	10/29/1998	EPA Fund-Financed
	NYD986882660	2	NY	Primary metals/mineral processing		Responsible Party
<u>W.R. GRACE & CO., INC. WAYNE INTERIM STORAGE SITE (USDOE)</u>	NJ1891837980	2	NJ	Primary metals/mineral processing	10/22/1997	Federal Facilities
	NJ1891837980	2	NJ	Primary metals/mineral processing	3/20/2000	Federal Facilities
	NJD067387472	2	NJ	Primary metals/mineral processing		EPA Fund-Financed
<u>BUTLER MINE NEL</u>	PAD980508451	3	PA	RFF = 4	3/31/1986	REMOVAL
<u>ALMERTON ZINC PILE</u>	PAD002395887	3	PA	RFF = 4	5/17/1995	PRP REMOVAL
	PAD002395887	3	PA	RFF = 4	3/25/1998	REMOVAL

OUTSIDE PROJECT AREA

	PAD002395887	3	PA	RFF = 4	11/1/1999	REMOVAL
FOOTE MINERAL CO.	PAD077087989	3	PA	Primary metals/mineral processing	3/20/2000	Responsible Party
OKS CREEK/SITKIN SMELTING & REFINING, INC.	PAD980829493	3	PA	Primary metals/mineral processing	3/20/1992	EPA Fund-Financed
	PAD980829493	3	PA	Primary metals/mineral processing	4/25/1996	EPA Fund-Financed
	PAD980829493	3	PA	Primary metals/mineral processing	10/8/1999	Responsible Party
STAUFFER CHEMICAL CO. (TARPON SPRINGS)	FLD010596013	4	FL	Primary metals/mineral processing	9/25/1998	Responsible Party
NATIONAL SOUTHWIRE ALUMINUM CO.	KYD049062375	4	KY	Primary metals/mineral processing	9/29/1997	Responsible Party
MACALLOY CORPORATION	SCD003360476	4	SC	Primary metals/mineral processing	11/4/1999	Responsible Party
COPPER BASIN MINING DISTRICT	TN0001890839	4	TN	Metals		Responsible Party
SYDNEY MINE SLUDGE PONDS	FLD000648055	4	FL	Phosphate Rock	7/1/1989	PRP REMOVAL
ALABAMA STATE LEAD CO. (ALCO)	ALD041906173	4	AL	Primary metals/mineral processing	11/30/1993	EPA Fund-Financed
	ALD041906173	4	AL	Primary metals/mineral processing		Responsible Party
TORCH LAKE	MID980901946	5	MI	Mine tailings disposal	3/30/1992	Responsible Party
CIMARRON MINING CORP.	NMD980749378	6	NM	Gold Ores	8/31/1987	REMOVAL
CIMARRON MINING CORP.	NMD980749378	6	NM	Gold Ores	5/28/1992	REMOVAL
CLEVELAND MILL	NMD981155930	6	NM	Mine tailings disposal	12/10/1998	Responsible Party
NATIONAL ZINC CORP.	OKD000829440	6	OK	Primary metals/mineral processing	2/2/1994	EPA Fund-Financed
	OKD000829440	6	OK	Primary metals/mineral processing	8/23/1995	Responsible Party
TAR CREEK (OTTAWA COUNTY)	OKD980629844	6	OK	Metals	10/12/1985	EPA Fund-Financed
	OKD980629844	6	OK	Metals	5/23/2000	EPA Fund-Financed
	OKD980629844	6	OK	Metals		EPA Fund-Financed
TEX-TIN CORP.	TXD062113329	6	TX	Primary	10/6/1989	EPA Fund-

OUTSIDE PROJECT AREA

				metals/mineral processing		Financed
	TXD062113329	6	TX	Primary metals/mineral processing	6/30/1998	Responsible Party
	TXD062113329	6	TX	Primary metals/mineral processing	6/15/1999	EPA Fund-Financed
	TXD062113329	6	TX	Primary metals/mineral processing	10/7/1999	Responsible Party
	TXD062113329	6	TX	Primary metals/mineral processing	6/10/2000	EPA Fund-Financed
	TXD062113329	6	TX	Primary metals/mineral processing	8/9/2000	Responsible Party
<u>CHEROKEE COUNTY</u>	KSD980741862	7	KS	Metals	2/27/1987	EPA Fund-Financed
	KSD980741862	7	KS	Metals	9/20/1988	EPA Fund-Financed
	KSD980741862	7	KS	Metals	2/16/1991	EPA Fund-Financed
	KSD980741862	7	KS	Metals	2/28/1996	EPA Fund-Financed
<u>ORONOGO- D'ENWEG MINING T</u>	MOD980686281	7	MO	Mine tailings disposal	3/12/1996	EPA Fund-Financed
	MOD980686281	7	MO	Mine tailings disposal	9/30/2002	Responsible Party
	MOD980686281	7	MO	Mine tailings disposal		EPA Fund-Financed
<u>BIG RIVER MINE TAILINGS/ST. JOE MINERALS CORP.</u>	MOD981126899	7	MO	Mine tailings disposal	5/29/2001	Responsible Party
	MOD981126899	7	MO	Mine tailings disposal	1/31/2002	EPA Fund-Financed
<u>LAWRENCE COUNTY MINING AREA SITES</u>	MON000703982	7	MO	Metals	9/25/1998	EPA Fund-Financed
<u>OMAHA LEAD</u>	NESFN0703481	7	NE	Primary metals/mineral processing		EPA Fund-Financed
<u>VASQUEZ BOULEVARD AND I-70</u>	CO0002259588	8	CO	Primary metals/mineral processing	10/1/1999	EPA Fund-Financed
	CO0002259588	8	CO	Primary metals/mineral processing	10/9/2001	EPA Fund-Financed
	CO0002259588	8	CO	Primary metals/mineral processing		EPA Fund-Financed
<u>BROTHERSE</u>	CO0012044960	8	CO	Metals	9/4/2001	Responsible Party
<u>EAGLE MINE</u>	COD081961518	8	CO	Metals	6/15/1984	EPA Fund-Financed

	COD081961518	8	CO	Metals	11/25/1991	EPA Fund-Financed
CENTRAL CITY, CLEAR CREEK	COD980717557	8	CO	Metals	4/29/1987	EPA Fund-Financed
	COD980717557	8	CO	Metals	12/9/1988	EPA Fund-Financed
	COD980717557	8	CO	Metals	9/14/1991	EPA Fund-Financed
	COD980717557	8	CO	Metals	6/16/1993	Responsible Party
	COD980717557	8	CO	Metals	4/29/1994	Responsible Party
	COD980717557	8	CO	Metals	6/9/1994	Responsible Party
	COD980717557	8	CO	Metals	9/23/1994	Responsible Party
	COD980717557	8	CO	Metals	6/9/1995	Responsible Party
	COD980717557	8	CO	Metals	4/19/1996	Responsible Party
	COD980717557	8	CO	Metals	11/10/1996	Responsible Party
	COD980717557	8	CO	Metals	11/12/1996	EPA Fund-Financed
	COD980717557	8	CO	Metals	12/14/1998	State, Fund Financed
	LIFORNIA GJLCH	COD980717938	8	CO	Metals	5/29/1986
COD980717938		8	CO	Metals	8/31/1992	Responsible Party
COD980717938		8	CO	Metals	6/4/1993	EPA Fund-Financed
COD980717938		8	CO	Metals	9/20/1994	EPA Fund-Financed
COD980717938		8	CO	Metals	5/26/1998	Responsible Party
COD980717938		8	CO	Metals	6/30/1998	Responsible Party
COD980717938		8	CO	Metals	6/30/1998	EPA Fund-Financed
COD980717938		8	CO	Metals	7/2/1998	EPA Fund-Financed
COD980717938		8	CO	Metals	7/22/1998	Responsible Party
COD980717938		8	CO	Metals	8/18/1998	EPA Fund-Financed
COD980717938		8	CO	Metals	8/19/1998	EPA Fund-Financed
COD980717938		8	CO	Metals	12/15/1998	Responsible Party
COD980717938		8	CO	Metals	2/5/1999	Responsible Party

	COD980717938	8	CO	Metals	10/4/1999	EPA Fund-Financed
	COD980717938	8	CO	Metals	10/12/1999	Responsible Party
	COD980717938	8	CO	Metals	10/28/1999	Responsible Party
	COD980717938	8	CO	Metals	10/29/1999	Responsible Party
	COD980717938	8	CO	Metals	12/1/1999	Responsible Party
	COD980717938	8	CO	Metals	4/21/2000	Responsible Party
	COD980717938	8	CO	Metals	10/13/2000	EPA Fund-Financed
	COD980717938	8	CO	Metals	12/28/2000	EPA Fund-Financed
	COD980717938	8	CO	Metals	8/14/2001	Responsible Party
	COD980717938	8	CO	Metals		EPA Fund-Financed
SMUGGLER MOUNTAIN	COD980806277	8	CO	Metals	9/17/1985	Responsible Party
	COD980806277	8	CO	Metals	8/22/1991	EPA Fund-Financed
	COD980806277	8	CO	Metals	9/25/1996	EPA Fund-Financed
ELTERTOWN SITE	COD983769738	8	CO	Primary metals/mineral processing	5/23/1994	EPA Fund-Financed
	COD983769738	8	CO	Primary metals/mineral processing	6/8/1995	EPA Fund-Financed
	COD983769738	8	CO	Primary metals/mineral processing	11/1/1995	Responsible Party
	COD983769738	8	CO	Primary metals/mineral processing	11/1/1995	EPA Fund-Financed
	COD983769738	8	CO	Primary metals/mineral processing	2/8/1996	EPA Fund-Financed
SUMMITVILLE MINE	COD983778432	8	CO	Metals	12/15/1994	EPA Fund-Financed
	COD983778432	8	CO	Metals	7/21/1995	EPA Fund-Financed
	COD983778432	8	CO	Metals	6/3/1996	EPA Fund-Financed
	COD983778432	8	CO	Metals	8/13/1996	EPA Fund-Financed
	COD983778432	8	CO	Metals	10/30/1998	EPA Fund-Financed
	COD983778432	8	CO	Metals	1/27/2000	EPA Fund-Financed

LIBBY ASBESTOS SITE	MT0009083840	8	MT	Non-metal minerals	10/24/1995	Responsible Party
	MT0009083840	8	MT	Non-metal minerals	12/18/1995	EPA Fund-Financed
RKER HUGHESVILLE MINING DISTRICT	MT6122307485	8	MT	Metals	10/31/1998	Responsible Party
EAST HELENA SITE	MTD006230346	8	MT	Primary metals/mineral processing	8/20/1999	Responsible Party
ANACONDA CO. SMELTER	MTD093291656	8	MT	Primary metals/mineral processing	9/13/1988	EPA Fund-Financed
	MTD093291656	8	MT	Primary metals/mineral processing	11/4/1992	Responsible Party
	MTD093291656	8	MT	Primary metals/mineral processing	6/3/1994	Responsible Party
	MTD093291656	8	MT	Primary metals/mineral processing	9/30/1996	Responsible Party
	MTD093291656	8	MT	Primary metals/mineral processing	4/28/1999	EPA Fund-Financed
BASIN MINING AREA	MTD982572562	8	MT	Metals	11/13/2001	Responsible Party
	MTD982572562	8	MT	Metals		EPA Fund-Financed
UPPER TENMILE CREEK MINING AREA	MTSFN7578012	8	MT	Metals	9/14/2001	EPA Fund-Financed
	MTSFN7578012	8	MT	Metals	9/21/2001	EPA Fund-Financed
	MTSFN7578012	8	MT	Metals	12/16/2002	EPA Fund-Financed
ANNIE CREEK MINE TAILINGS	SDD987666013	8	SD	Mine tailings disposal	11/9/1995	Responsible Party
GILT EDGE MINE	SDD987673985	8	SD	Metals	12/11/2001	EPA Fund-Financed
	SDD987673985	8	SD	Metals		EPA Fund-Financed
EUREKA MILLS	UT0002240158	8	UT	Primary metals/mineral processing		EPA Fund-Financed
JACOBS SMELTER	UT0002391472	8	UT	Primary metals/mineral processing	10/2/2000	EPA Fund-Financed
	UT0002391472	8	UT	Primary metals/mineral processing	11/28/2001	Responsible Party
	UT0002391472	8	UT	Primary metals/mineral processing	2/27/2002	Responsible Party
KENNECOTT	UTD000826404	8	UT	Metals	5/6/1993	Responsible

(SOUTH ZONE)						Party
	UTD000826404	8	UT	Metals	6/6/1994	Responsible Party
	UTD000826404	8	UT	Metals	5/11/1995	Responsible Party
	UTD000826404	8	UT	Metals	5/25/1995	EPA Fund-Financed
	UTD000826404	8	UT	Metals	10/9/1996	EPA Fund-Financed
	UTD070926811	8	UT	Primary metals/mineral processing	1/24/1995	EPA Fund-Financed
	UTD070926811	8	UT	Primary metals/mineral processing	1/24/1995	Federal Enforcement
	UTD070926811	8	UT	Primary metals/mineral processing		Responsible Party
<u>MIDVALE SLAG</u>	UTD081834277	8	UT	Primary metals/mineral processing	12/14/1990	EPA Fund-Financed
	UTD081834277	8	UT	Primary metals/mineral processing	6/20/1991	EPA Fund-Financed
	UTD081834277	8	UT	Primary metals/mineral processing	5/24/1995	EPA Fund-Financed
	UTD081834277	8	UT	Primary metals/mineral processing	11/8/1996	EPA Fund-Financed
	UTD081834277	8	UT	Primary metals/mineral processing	4/17/1997	EPA Fund-Financed
	UTD081834277	8	UT	Primary metals/mineral processing	6/30/1997	EPA Fund-Financed
	UTD081834277	8	UT	Primary metals/mineral processing	3/31/1999	EPA Fund-Financed
	UTD081834277	8	UT	Primary metals/mineral processing	10/19/2001	EPA Fund-Financed
<u>SHARON STEEL CORP. (MIDVALE TAILINGS)</u>	UTD980951388	8	UT	Primary metals/mineral processing	9/25/1989	Responsible Party
	UTD980951388	8	UT	Primary metals/mineral processing	4/10/1992	EPA Fund-Financed
	UTD980951388	8	UT	Primary metals/mineral processing	12/15/1993	EPA Fund-Financed
<u>RAY SMELTER</u>	UTD980951420	8	UT	Primary metals/mineral processing	4/1/1998	Responsible Party

	UTD980951420	8	UT	Primary metals/mineral processing	9/24/2001	Responsible Party
<u>AMERICAN FORK CANYON/UINTA NATIONAL</u>	UTD988074951	8	UT	Metals		EPA Fund-Financed
<u>DENVER RADIUM SITE</u>	COD980716955	8	CO	Uranium-Radium-Vanadium Ores	9/27/1985	REMOVAL
	COD980716955	8	CO	Uranium-Radium-Vanadium Ores	8/30/1989	REMOVAL
	COD980716955	8	CO	Uranium-Radium-Vanadium Ores	8/27/1993	PRP REMOVAL
<u>MOUAT INDUSTRIES</u>	MTD021997689	8	MT	Primary Nonferrous Metals, NEC	4/13/1990	REMOVAL
	MTD021997689	8	MT	Primary Nonferrous Metals, NEC	11/1/1994	PRP REMOVAL
	MTD021997689	8	MT	Primary Nonferrous Metals, NEC	8/25/1996	PRP REMOVAL
<u>SILVER BOW CREEK/BUTTE AREA</u>	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	9/30/1988	REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	10/15/1988	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	11/21/1989	REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	12/11/1989	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	1/17/1992	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining	10/30/1992	REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining		

				Services, Primary Copper		
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	12/2/1992	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	4/15/1994	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	1/11/1995	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	7/15/1996	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	6/27/2002	PRP REMOVAL
	MTD980502777	8	MT	Copper Ores, Gold Ores, Lead and Zinc Ores, Metal Mining Services, Primary Copper	4/15/1994	PRP REMOVAL
<u>CARSON RIVER MERCURY SITE</u>	NVD980813646	9	NV	Mine tailings disposal	1/30/1991	Responsible Party
	NVD980813646	9	NV	Mine tailings disposal	9/8/1991	Responsible Party
<u>AEROJET GENERAL CORP.</u>	CAD980358832	9	CA	Gold Ores	11/22/1995	PRP REMOVAL
	CAD980358832	9	CA	Gold Ores		REMOVAL
<u>CELTOR CHEMICAL WORKS</u>	CAD980638860	9	CA	Copper Ores, Primary Copper	12/21/1983	REMOVAL
<u>RIVERBANK ARMY AMMUNITION PLANT</u>	CA7210020759	9	CA	Primary metals/mineral processing	12/19/1990	Federal Facilities
	CA7210020759	9	CA	Primary metals/mineral processing	12/4/1992	Federal Facilities
	CA7210020759	9	CA	Primary metals/mineral processing	12/30/1993	Federal Facilities
<u>IRON MOUNTAIN</u>	CAD980498612	9	CA	Metals	3/3/1989	EPA Fund-

MINE						Financed
	CAD980498612	9	CA	Metals	9/15/1994	Responsible Party
	CAD980498612	9	CA	Metals	3/15/1998	EPA Fund-Financed
LEVIATHAN MINE	CAD980673685	9	CA	Metals	6/8/1998	EPA Fund-Financed
	CAD980673685	9	CA	Metals	9/29/1998	Responsible Party
	CAD980673685	9	CA	Metals	11/1/2000	Responsible Party
	CAD980673685	9	CA	Metals	9/30/2001	Responsible Party
	CAD980673685	9	CA	Metals	11/27/2001	Responsible Party
	CAD980673685	9	CA	Non-metal minerals	6/8/1998	EPA Fund-Financed
	CAD980673685	9	CA	Non-metal minerals	9/29/1998	Responsible Party
	CAD980673685	9	CA	Non-metal minerals	11/1/2000	Responsible Party
	CAD980673685	9	CA	Non-metal minerals	9/30/2001	Responsible Party
	CAD980673685	9	CA	Non-metal minerals	11/27/2001	Responsible Party
LPHUR BANK MERCURY MINE	CAD980893275	9	CA	Mine tailings disposal	6/21/1993	EPA Fund-Financed
	CAD980893275	9	CA	Mine tailings disposal	10/30/1993	EPA Fund-Financed
	CAD980893275	9	CA	Mine tailings disposal	6/23/1998	EPA Fund-Financed
	CAD980893275	9	CA	Mine tailings disposal	1/14/2000	EPA Fund-Financed
	CAD980893275	9	CA	Mine tailings disposal	1/18/2001	EPA Fund-Financed
LAVA CAP MINE	CAD983618893	9	CA	Metals	7/15/1998	EPA Fund-Financed
	CAD983618893	9	CA	Primary metals/mineral processing	7/15/1998	EPA Fund-Financed
APPLE VALLEY MERCURY SITE	CAN000905899	9	CA	Metals	1/12/2002	EPA Fund-Financed
CIMA ROAD MINE WASTE SITE	CAN000905903	9	CA	Metals	3/29/2002	EPA Fund-Financed
TALACHE MINE	ID0002007250	10	ID	Mine tailings disposal	6/30/1999	Responsible Party
	ID0002007250	10	ID	Mine tailings disposal	4/6/2001	Responsible Party
	ID0002007250	10	ID	Mine tailings disposal		Responsible Party
BUNKER HILL MINING &	IDD048340921	10	ID	Primary metals/mineral	6/25/1986	EPA Fund-Financed

METALLURGICAL COMPLEX				processing		
	IDD048340921	10	ID	Primary metals/mineral processing	9/1/1986	EPA Fund-Financed
	IDD048340921	10	ID	Primary metals/mineral processing	9/30/1989	EPA Fund-Financed
	IDD048340921	10	ID	Primary metals/mineral processing	10/12/1990	EPA Fund-Financed
	IDD048340921	10	ID	Primary metals/mineral processing	1/15/1993	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	9/21/1994	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	12/1/1994	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	5/19/1995	EPA Fund-Financed
	IDD048340921	10	ID	Primary metals/mineral processing	9/30/1995	EPA Fund-Financed
	IDD048340921	10	ID	Primary metals/mineral processing	3/11/1996	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	9/30/1997	EPA Fund-Financed
	IDD048340921	10	ID	Primary metals/mineral processing	11/4/1999	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	3/30/2001	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	5/29/2001	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	1/31/2002	Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing		Responsible Party
	IDD048340921	10	ID	Primary metals/mineral processing	10/24/1995	EPA Fund-Financed
BLACKBIRD MINE	IDD980725832	10	ID	Metals	12/18/1995	Responsible Party
	IDD980725832	10	ID	Metals	10/31/1998	Responsible Party
	IDD980725832	10	ID	Metals	8/20/1999	Responsible Party

	IDD980725832	10	ID	Metals	10/31/2001	Responsible Party
EASTERN SHAUD FLATS CONTAMINATION	IDD984666610	10	ID	Primary metals/mineral processing	6/8/1998	Responsible Party
CONTINENTAL MINE	IDN001002317	10	ID	Metals		EPA Fund-Financed
FREMONT NATIONAL FOREST/WHITE KING AND LUCKY LASS URANIUM MINES (USDA)	OR7122307658	10	OR	Metals	3/20/1996	Federal Facilities
REYNOLDS METALS COMPANY	ORD009412677	10	OR	Primary metals/mineral processing	5/30/1999	Responsible Party
	ORD009412677	10	OR	Primary metals/mineral processing		Responsible Party
KAISER ALUMINUM (MEAD WORKS)	WAD000065508	10	WA	Primary metals/mineral processing	4/30/1979	PRP Lead Under State
ALDER MILL	WAD980722847	10	WA	Mine tailings disposal	10/30/2002	EPA Fund-Financed
	WAD980722847	10	WA	Mine tailings disposal		Responsible Party
ANDERSON- HOUN MINE	WAN001002309	10	WA	Metals	1/2/2002	EPA Fund-Financed
	WAN001002309	10	WA	Metals		EPA Fund-Financed

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AML CERCLIS Inventory

This page provides information on AML sites in the CERCLIS Database. Sites listed on this page include those that are on the NPL as well as many that are not on the NPL. For additional information on sites on the National Priorities List, please visit the [NPL Sites](#) page.

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Other AML Site Information

- [NPL Sites](#)
- [AML CERCLIS Inventory](#)
- [AML sites with EPA Removals/Emergency Responses](#)

Site Name	Region	State	Site Identification Number (CERCLIS ID #)
CALLAHAN MINING CORP	1	ME	MED980524128
KERRAMERICAN MINE (FORMER)	1	ME	MED055715775
ORE HILL MINE	1	NH	NHN000103157
ELIZABETH MINE	1	VT	VTD988366621
ELY COPPER MINE	1	VT	VTD988366571
PIKE HILL COPPER MINE	1	VT	VTD988366720
GLEN RIDGE RADIUM	2	NJ	NJD980785646
MONTCLAIR/WEST ORANGE RADIUM	2	NJ	NJD980785653
RINGWOOD MINES/LANDFILL	2	NJ	NJD980529739
U.S. RADIUM CORP.	2	NJ	NJD980654172
W.R. GRACE & CO., INC./WAYNE INTERIM STORAGE SITE (USDOE)	2	NJ	NJ1891837980
LI TUNGSTEN CORP.	2	NY	NYD986882660
VERMICULITE BG1	3	DE	DEN000305644
AMBLER ASBESTOS PILES	3	PA	PAD000436436
BUTLER MINE TUNNEL	3	PA	PAD980508451
FOOTE MINERAL CO.	3	PA	PAD077087989
FRANKLIN SLAG PILE	3	PA	PASFN0305549
HUTCHINSON MINE PCB SITE	3	PA	PAD982364275
JACKS CREEK/SITKIN SMELTING & REFINING, INC.	3	PA	PAD980829493
PALMERTON ZINC PILE	3	PA	PAD002395887
SHARON STEEL CORP.	3	PA	PAD001933175
HYMAN VIENER & SONS	3	VA	VAD003112364
LOUISA MINE (VA VERMICULITE LTD.)	3	VA	VAN000305634
U.S. TITANIUM	3	VA	VAD980705404
VERMICULITE NU 1	3	VA	VAN000305645
BLACK FORK FISH KILL	3	WV	WVD988803227

OUTSIDE OF PROJECT AREA



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- CERCLIS Database
- Site Documents
- Data Element Dictionary (DED)
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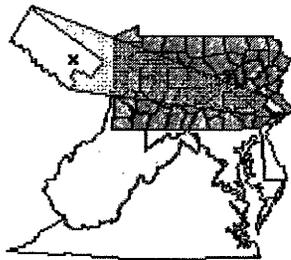
Superfund Site Progress Profile
AMBLER ASBESTOS PILES (EPA ID: PAD000436436)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: [Site Location](#), [Cleanup Progress Summary](#), [Cleanup Impact Summary](#), [Contamination & Exposure](#), [Cleanup Process & Progress](#), and [Government Performance and Results Act \(GPRA\) Milestones](#). Please use the links and the "More Details..." box to find more details on this site.

More Details...

- [More In-Depth Site Details](#) (EPA Regional Content)
- [Site Contacts](#) (EPA Cleanup Managers, etc.)
- [Site Description Prior to Cleanup](#)
- [Additional Site Documents](#)
- [Other Names for this Site](#) (Aliases)

Site Location



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[EPA Region 3](#) >
 Serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia

Site Address: LOCUST STREET
 AMBLER,
 Pennsylvania
 19002

County: MONTGOMERY

U.S. Congressional District: 13

Population within one mile: 10,001-50,000

Cleanup Progress Summary



Deleted from the NPL

Physical cleanup activities have been completed.

[view detailed list of cleanup activities at this site >>](#)

The National Priorities List (NPL) is the list of the most hazardous sites, also known as Superfund sites, across the U.S. and its territories.

This site is cleaned up, is no longer a threat to human health, has been deleted from the NPL, and is known as a Deleted NPL site ([see glossary](#)).

Potentially Responsible Parties (PRPs) were involved in the cleanup effort ([see glossary](#)).

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



Under current conditions at this site, potential or actual human exposures are under control.

Also at this site:

2,532,090 cubic yards of soil or other solid-based media ([see glossary](#)) have been treated, stabilized, or removed (roughly equivalent to 2 Empire State buildings).

1,900,000 gallons of water or other liquid-based media ([see glossary](#)) have been treated, stabilized, or removed (roughly equivalent to 2 and a half Olympic size swimming pools).

The Problem: Contamination & Exposure

Contamination

Contaminants (i.e., hazardous substances, pollutants or contaminants) can be found in

Exposure

At each site, EPA determines the possibility for human and ecological contact (i.e., exposure) with

several different types of materials on the site including soil and other solid-based media and water or another liquid-based medium. The contaminants listed via the links below are considered the contaminants of concern to be addressed by cleanup actions at the site. (see [glossary](#))

Contaminated Media: Debris, Sediment, Soil

EPA classifies contaminants found into groups or types (listed below). To view all contaminants of concern at the site click on the view detailed list link.

Types of Contaminants: Inorganics, PAH

[see glossary definition for "types of contaminants" >>](#)

[view detailed list of contaminants at this site >>](#)

[ATSDR ToxFacts information on contaminants](#)

[EXIT disclaimer](#)

contaminants at the site. If the possibility for exposure to contamination exists, EPA conducts a study known as a risk assessment. During the risk assessment, EPA determines if the site poses a risk to humans, and if so, identifies actions that can be taken to control any possible exposure to humans until site cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



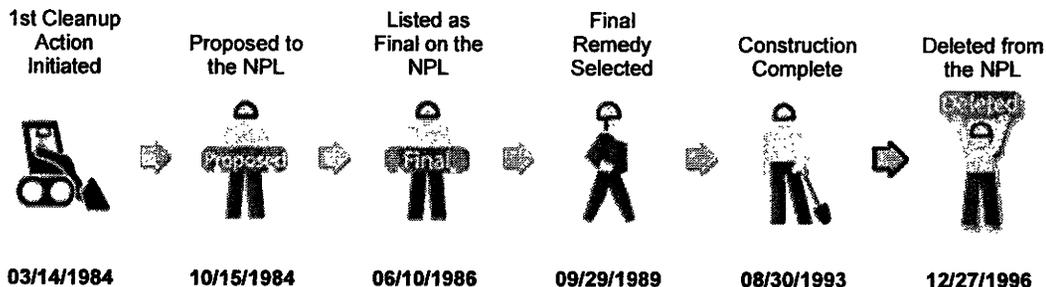
Under current conditions at this site, potential or actual human exposures are under control.

[^^ back to top | view glossary >>](#)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 2		09/29/1989	01/09/1992	04/28/1993	
OU 1		09/30/1988	06/08/1992	04/28/1993	

OU 0	02/02/1990				
------	------------	--	--	--	--

Complete Underway [view activities details >>](#) [view OU details >>](#)
[more in-depth site details](#) (EPA Regional Content)

* At many sites an action, called a "Removal Action" (see [glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

Land Reuse

After cleanup, the land at some sites (not all sites) can often be used for recreational or other purposes. EPA tries to select cleanup options that encourage and support future use of a site.

All/portion of site in reuse.

Non-Residential Use: 2.5 acres
 Residential Use: 00 acres
 Total Use: 2.5 acres

[see glossary definition for "non-residential use," "residential use," and "land reuse" >>](#)

Post-Construction

Post-Construction (see [glossary](#)) is the stage following completion of the majority of physical cleanup. The goal of Post-Construction is to ensure that the cleanup provides for the long-term protection of human health and the environment.

One of the activities performed during Post-Construction is a review of the remedies undertaken at a site. These reviews take place every five years and are known as five-year reviews (see [glossary](#)).

Last five-year review at this site: 2002

Next five-year review start date: 2006

[view a list of five-year reviews >>](#)

[^^ back to top | view glossary >>](#)

Government Performance & Results Act (GPRA) Milestones

EPA is required to report on the following milestones under the Government Performance & Results Act. [More information.](#)

Milestone	see glossary definitions for GPRA milestones >> Status
Final Site Assessment Decision	Yes (10/15/1984)
Final Remedy Selected	Yes (09/29/1989)
Human Exposure Under Control	Under current conditions at this site, potential or actual human exposures are under control.
Contaminated Groundwater Migration Under Control	Not a groundwater site.
Construction Complete	Yes (08/30/1993)

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Superfund Site Progress Profile

BUTLER MINE TUNNEL

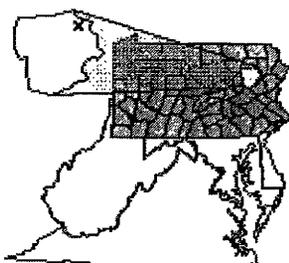
(EPA ID: PAD980508451)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: [Site Location](#), [Cleanup Progress Summary](#), [Cleanup Impact Summary](#), [Contamination & Exposure](#), [Cleanup Process & Progress](#), and [Government Performance and Results Act \(GPRA\) Milestones](#). Please use the links and the "More Details..." box to find more details on this site.

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[Additional Site Documents](#)
[Other Names for this Site](#) (Aliases)

Site Location



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Site: SUSQUEHANNA
 Address: RIVER
 PITTSTON TOWNSHIP,
 Pennsylvania
 18640

County: LUZERNE

U.S. Congressional District: 11

Population within one mile: 10,001-50,000

Cleanup Progress Summary



Construction Complete

Physical cleanup activities have been completed.

[view detailed list of cleanup activities at this site >>](#)

The National Priorities List (NPL) is the list of the most hazardous sites, also known as Superfund sites, across the U.S. and its territories.

This site is on the NPL and is known as a "Final" NPL site ([see glossary](#)).

Potentially Responsible Parties (PRPs) were involved in the cleanup effort ([see glossary](#)).

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



Under current conditions at this site, potential or actual human exposures are under control.

Also at this site:

60 cubic yards of soil or other solid-based media ([see glossary](#)) have been treated, stabilized, or removed (roughly equivalent to 4 dump trucks).

The Problem: Contamination & Exposure

Contamination

Contaminants (i.e., hazardous substances, pollutants or contaminants) can be found in several different types of materials on the site including soil and other solid-based media and water or another liquid-based medium. The contaminants listed via the links below are considered the contaminants of concern to be addressed by cleanup actions at the site. ([see glossary](#))

Exposure

At each site, EPA determines the possibility for human and ecological contact (i.e., exposure) with contaminants at the site. If the possibility for exposure to contamination exists, EPA conducts a study known as a risk assessment. During the risk assessment, EPA determines if the site poses a risk to humans, and if so, identifies actions that can be taken to control any possible exposure to humans until site cleanup has been completed.

Contaminated Media: Surface Water

EPA classifies contaminants found into groups or types (listed below). To view all contaminants of concern at the site click on the view detailed list link.

Types of Contaminants: Base Neutral Acids, Inorganics, Oil & Grease, PAH, VOC

[see glossary definition for "types of contaminants" >>](#)

[view detailed list of contaminants at this site >>](#)

[ATSDR ToxFacts information on contaminants](#)
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Once complete, cleanup provides long-term human health and environmental protection at the site.



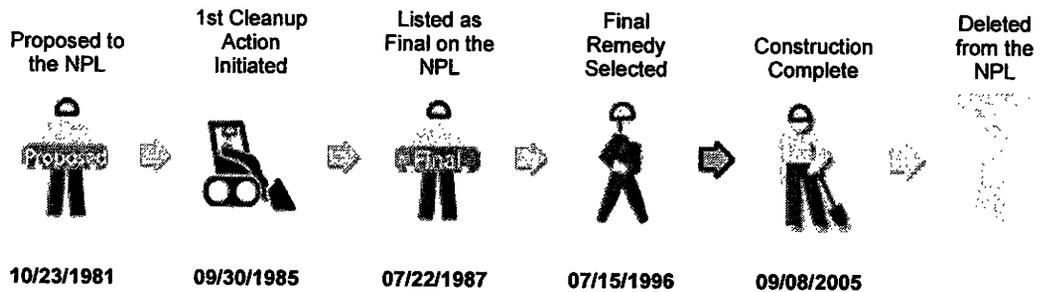
Under current conditions at this site, potential or actual human exposures are under control.

[^^ back to top | view glossary >>](#)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 1		07/15/1996	12/30/2003		
OU 0	03/31/1986				

Complete Underway [view activities details >>](#) [view OU details >>](#)
[more in-depth site details \(EPA Regional Content\)](#)

* At many sites an action, called a "Removal Action" ([see glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

Land Reuse

After cleanup, the land at some sites (not all sites) can often be used for recreational or other purposes. EPA tries to select cleanup options that encourage and support future use of a site.

All or a portion of this site is ready for reuse.

Non-Residential Use: 2 acres
Residential Use: 00 acres
Total Use: 2 acres

[see glossary definition for "non-residential use," "residential use," and "land reuse" >>](#)

Post-Construction

Post-Construction ([see glossary](#)) is the stage following completion of the majority of physical cleanup. The goal of Post-Construction is to ensure that the cleanup provides for the long-term protection of human health and the environment.

Next five-year review start date: 2009

[^^ back to top | view glossary >>](#)

Government Performance & Results Act (GPRA) Milestones

EPA is required to report on the following milestones under the Government Performance & Results Act. [More information.](#)

Milestone	<u>see glossary definitions for GPRA milestones >></u> Status
Final Site Assessment Decision	Yes (06/10/1986)
Final Remedy Selected	Yes (07/15/1996)
Human Exposure Under Control	Under current conditions at this site, potential or actual human exposures are under control.
Contaminated Groundwater Migration Under Control	Not a groundwater site.
Construction Complete	Yes (09/08/2005)

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FOOTE MINERAL CO. (EPA ID:

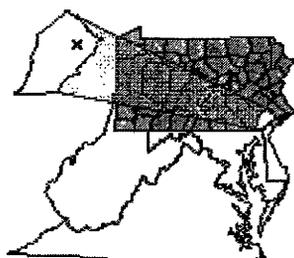
PAD077087989)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: [Site Location](#), [Cleanup Progress Summary](#), [Cleanup Impact Summary](#), [Contamination & Exposure](#), [Cleanup Process & Progress](#), and [Government Performance and Results Act \(GPRA\) Milestones](#). Please use the links and the "More Details..." box to find more details on this site.

More Details...

- [More In-Depth Site Details](#) (EPA Regional Content)
- [Site Contacts](#) (EPA Cleanup Managers, etc.)
- [Site Description Prior to Cleanup](#)
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- [Other Names for this Site](#) (Aliases)

Site Location



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 Serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia

Site Address: 15 S BACTON HILL RD
 EAST WHITELAND TOWNSHIP, Pennsylvania 19355

County: CHESTER

U.S. Congressional District: 07

Population within one mile: 1,001-5,000

Cleanup Progress Summary



Remedy Selected



Early Action Initiated/Completed

Physical cleanup activities have started.

[view detailed list of cleanup activities at this site >>](#)

The National Priorities List (NPL) is the list of the most hazardous sites, also known as Superfund sites, across the U.S. and its territories.

This site is on the NPL and is known as a "Final" NPL site ([see glossary](#)).

Potentially Responsible Parties (PRPs) are involved in the cleanup effort ([see glossary](#)).

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



Under current conditions at this site, potential or actual human exposures are under control.

Also at this site:

33 people were provided alternative drinking water to prevent them from drinking contaminated water.

The Problem: Contamination & Exposure

Contamination

Contaminants (i.e., hazardous substances, pollutants or contaminants) can be found in several different types of materials on the site including soil and other solid-based media and water or another liquid-based medium. ([see glossary](#))

Exposure

At each site, EPA determines the possibility for human and ecological contact (i.e., exposure) with contaminants at the site. If the possibility for exposure to contamination exists, EPA conducts a study known as a risk assessment. During the risk assessment, EPA determines if the site poses a risk to humans, and if so, identifies actions that

Contaminated Media: Data not available

EPA classifies contaminants found into groups or types.

Types of Contaminants: Data not available

[see glossary definition for "types of contaminants" >>](#)

[ATSDR ToxFacts information on contaminants](#)
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can be taken to control any possible exposure to humans until site cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



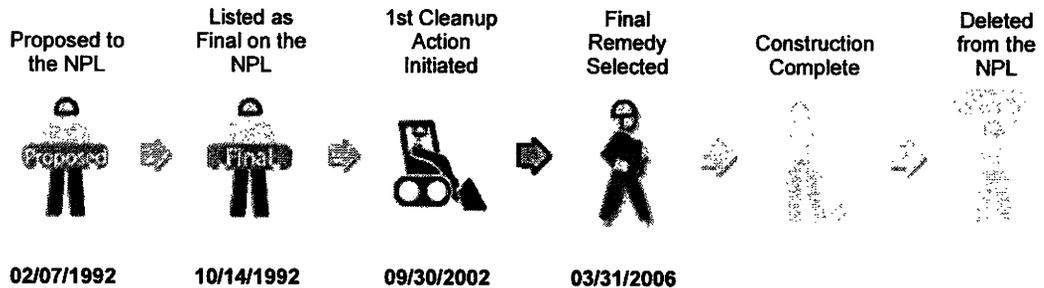
Under current conditions at this site, potential or actual human exposures are under control.

[^^ back to top | view glossary >>](#)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 1		03/31/2006			
OU 0					

Complete

Underway

[view activities details >>](#) [view OU details >>](#)
[more in-depth site details](#) (EPA Regional Content)

* At many sites an action, called a "Removal Action" ([see glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

Land Reuse

Post-Construction

After cleanup, the land at some sites (not all sites) can often be used for recreational or other purposes. EPA tries to select cleanup options that encourage and support future use of a site.

Post-Construction (see glossary) is the stage following completion of the majority of physical cleanup. The goal of Post-Construction is to ensure that the cleanup provides for the long-term protection of human health and the environment.

All or a portion of this site is ready for reuse.

Non-Residential Use: 36 acres
 Residential Use: 00 acres
 Total Use: 36 acres

see glossary definition for "non-residential use," "residential use," and "land reuse" >>

[^^ back to top | view glossary >>](#)

Government Performance & Results Act (GPRA) Milestones

EPA is required to report on the following milestones under the Government Performance & Results Act. [More information.](#)

[see glossary definitions for GPRA milestones >>](#)

Milestone	Status
Final Site Assessment Decision	Yes (02/07/1992)
Final Remedy Selected	Yes (03/31/2006)
Human Exposure Under Control	Under current conditions at this site, potential or actual human exposures are under control.
Contaminated Groundwater Migration Under Control	Contaminated groundwater migration at this site is under control.
Construction Complete	No

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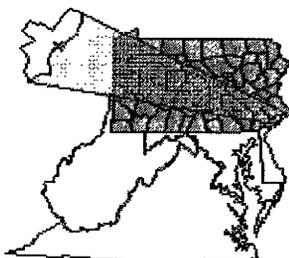
Superfund Site Progress Profile
FRANKLIN SLAG PILE (MDC) (EPA ID: PASFN0305549)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: [Site Location](#), [Cleanup Progress Summary](#), [Cleanup Impact Summary](#), [Contamination & Exposure](#), [Cleanup Process & Progress](#), and [Government Performance and Results Act \(GPRA\) Milestones](#). Please use the links and the "More Details..." box to find more details on this site.

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- [Site Description Prior to Cleanup](#)
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- [Other Names for this Site](#) (Aliases)

Site Location



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Site Address: 3110 CASTOR AVENUE
 PHILADELPHIA, Pennsylvania 19134

County: PHILADELPHIA

U.S. Congressional District: 03

Population within one mile: 5,001-10,000

Cleanup Progress Summary



Study Underway



Early Action Initiated/Completed

Physical cleanup activities have started.
[view detailed list of cleanup activities at this site >>](#)

The National Priorities List (NPL) is the list of the most hazardous sites, also known as Superfund sites, across the U.S. and its territories.

This site is on the NPL and is known as a "Final" NPL site ([see glossary](#)).

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



Under current conditions at this site, potential or actual human exposures are under control.

Also at this site:

110,000 cubic yards of soil or other solid-based media ([see glossary](#)) have been treated, stabilized, or removed (roughly equivalent to 20 and a half football fields, covered 1 yard deep).

200 gallons of water or other liquid-based media ([see glossary](#)) have been treated, stabilized, or removed (roughly equivalent to 5 bathtubs full).

The Problem: Contamination & Exposure

Contamination

Contaminants (i.e., hazardous substances,

Exposure

At each site, EPA determines the possibility for

pollutants or contaminants) can be found in several different types of materials on the site including soil and other solid-based media and water or another liquid-based medium. (see [glossary](#))

Contaminated Media: Data not available

EPA classifies contaminants found into groups or types.

Types of Contaminants: Data not available

[see glossary definition for "types of contaminants" >>](#)

[ATSDR ToxFacts information on contaminants](#)
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human and ecological contact (i.e., exposure) with contaminants at the site. If the possibility for exposure to contamination exists, EPA conducts a study known as a risk assessment. During the risk assessment, EPA determines if the site poses a risk to humans, and if so, identifies actions that can be taken to control any possible exposure to humans until site cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



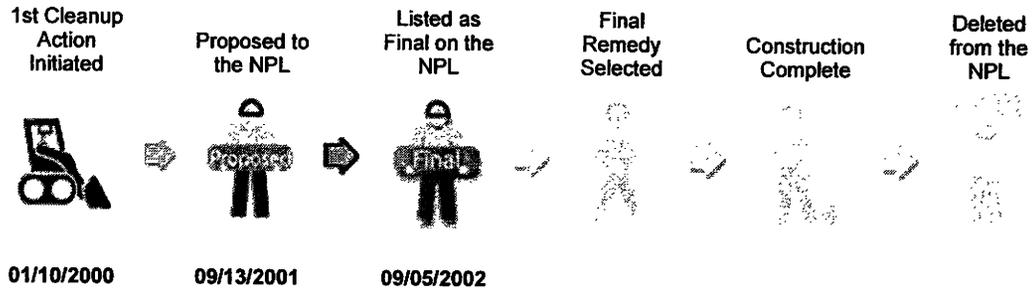
Under current conditions at this site, potential or actual human exposures are under control.

[^^ back to top | view glossary >>](#)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 1					
OU 0	10/06/2000				

Complete Underway

[view activities details >>](#) [view OU details >>](#)
[more in-depth site details](#) (EPA Regional Content)

* At many sites an action, called a "Removal Action" ([see glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

Land Reuse

After cleanup, the land at some sites (not all sites) can often be used for recreational or other purposes. EPA tries to select cleanup options that encourage and support future use of a site.

see glossary definition for "non-residential use," "residential use," and "land reuse" >>

Post-Construction

Post-Construction (see glossary) is the stage following completion of the majority of physical cleanup. The goal of Post-Construction is to ensure that the cleanup provides for the long-term protection of human health and the environment.

^^ back to top | view glossary >>

Government Performance & Results Act (GPRA) Milestones

EPA is required to report on the following milestones under the Government Performance & Results Act. More information.

Milestone	<u>see glossary definitions for GPRA milestones >></u> Status
Final Site Assessment Decision	Yes (09/13/2001)
Final Remedy Selected	No
Human Exposure Under Control	Under current conditions at this site, potential or actual human exposures are under control.
Contaminated Groundwater Migration Under Control	Not a groundwater site.
Construction Complete	No

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[Actions](#) | [Contaminants](#) | [Site-Specific Documents](#)**Site Name:** HUTCHINSON MINE PCB SITE**Street:** HWY. 136**City / State / ZIP:** HUTCHINSON, PA 15640**NPL Status:** Not on the NPL**Non-NPL Status:** NFRAP**EPA ID:** PAD982364275**EPA Region:** 03**County:** WESTMORELAND**Federal Facility Flag:** Not a Federal Facility**Incident Category:** Mines/Tailings[Return to Search Results](#)[Return to Search CERCLIS](#)

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Superfund Site Progress Profile
JACKS CREEK/SITKIN SMELTING & REFINING, INC. (EPA ID: PAD980829493)

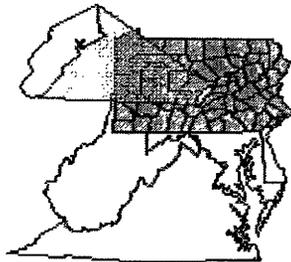
[More Details...](#)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: [Site Location](#), [Cleanup Progress Summary](#), [Cleanup Impact Summary](#), [Contamination & Exposure](#), [Cleanup Process & Progress](#), and [Government Performance and Results Act \(GPRA\) Milestones](#). Please use the links and the "More Details..." box to find more details on this site.



- [More In-Depth Site Details](#) (EPA Regional Content)
- [Site Contacts](#) (EPA Cleanup Managers, etc.)
- [Site Description Prior to Cleanup](#)
- [Additional Site Documents](#)
- [Other Names for this Site](#) (Aliases)

Site Location



[Get an interactive map](#)

EPA Region 3 >
 Serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia

Site Address: PO BOX 708
 MAITLAND, Pennsylvania
 17044

County: MIFFLIN

U.S. Congressional District: 05

Population within one mile: 101-1,000

Cleanup Progress Summary



Construction Complete

Physical cleanup activities have been completed.

[view detailed list of cleanup activities at this site >>](#)

The National Priorities List (NPL) is the list of the most hazardous sites, also known as Superfund sites, across the U.S. and its territories.

This site is on the NPL and is known as a "Final" NPL site ([see glossary](#)).

Potentially Responsible Parties (PRPs) were involved in the cleanup effort ([see glossary](#)).

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



Under current conditions at this site, potential or actual human exposures are under control.

Also at this site:

145 cubic yards of soil or other solid-based media ([see glossary](#)) have been treated, stabilized, or removed (roughly equivalent to 9 and a half dump trucks) .

39 people were provided alternative drinking water to prevent them from drinking contaminated water.

The Problem: Contamination & Exposure

Contamination

Contaminants (i.e., hazardous substances, pollutants or contaminants) can be found in several different types of materials on the site including soil and other solid-based media and water or another liquid-based medium. The

Exposure

At each site, EPA determines the possibility for human and ecological contact (i.e., exposure) with contaminants at the site. If the possibility for exposure to contamination exists, EPA conducts a study known as a risk assessment. During the risk

contaminants listed via the links below are considered the contaminants of concern to be addressed by cleanup actions at the site. ([see glossary](#))

Contaminated Media: Debris, Sediment, Sludge, Soil

EPA classifies contaminants found into groups or types (listed below). To view all contaminants of concern at the site click on the view detailed list link.

Types of Contaminants:
Dioxins/Dibenzofurans, Metals, PCBs

[see glossary definition for "types of contaminants" >>](#)

[view detailed list of contaminants at this site >>](#)

[ATSDR ToxFacts information on contaminants](#)
[EXIT disclaimer >](#)

assessment, EPA determines if the site poses a risk to humans, and if so, identifies actions that can be taken to control any possible exposure to humans until site cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



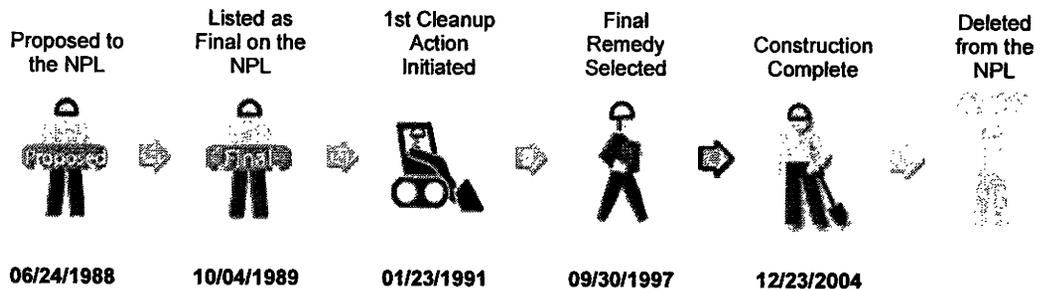
Under current conditions at this site, potential or actual human exposures are under control.

[^^ back to top | view glossary >>](#)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 1		09/30/1997	03/24/2004	09/27/2005	
OU 0	10/08/1999				

Complete

Underway

[view activities details >>](#)

[view OU details >>](#)

[more in-depth site details](#) (EPA Regional Content)

* At many sites an action, called a "Removal Action" ([see glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

Land Reuse

After cleanup, the land at some sites (not all sites) can often be used for recreational or other purposes. EPA tries to select cleanup options that encourage and support future use of a site.

All or a portion of this site is ready for reuse.

Non-Residential Use: 100 acres
Residential Use: 00 acres
Total Use: 100 acres

[see glossary definition for "non-residential use," "residential use," and "land reuse" >>](#)

Post-Construction

Post-Construction ([see glossary](#)) is the stage following completion of the majority of physical cleanup. The goal of Post-Construction is to ensure that the cleanup provides for the long-term protection of human health and the environment.

One of the activities performed during Post-Construction is a review of the remedies undertaken at a site. These reviews take place every five years and are known as five-year reviews ([see glossary](#)).

Last five-year review at this site: 2006

[view a list of five-year reviews >>](#)

[^^ back to top | view glossary >>](#)

Government Performance & Results Act (GPRA) Milestones

EPA is required to report on the following milestones under the Government Performance & Results Act. [More information.](#)

Milestone	see glossary definitions for GPRA milestones >> Status
Final Site Assessment Decision	Yes (06/24/1988)
Final Remedy Selected	Yes (09/30/1997)
Human Exposure Under Control	Under current conditions at this site, potential or actual human exposures are under control.
Contaminated Groundwater Migration Under Control	Contaminated groundwater migration at this site is under control.
Construction Complete	Yes (12/23/2004)

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Superfund Site Progress Profile

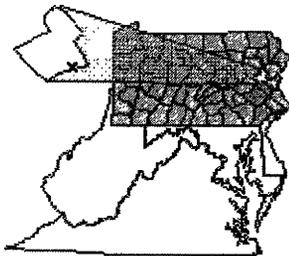
PALMERTON ZINC PILE (EPA ID: PAD002395887)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: [Site Location](#), [Cleanup Progress Summary](#), [Cleanup Impact Summary](#), [Contamination & Exposure](#), [Cleanup Process & Progress](#), and [Government Performance and Results Act \(GPRA\) Milestones](#). Please use the links and the "More Details..." box to find more details on this site.

More Details...

- [More In-Depth Site Details](#) (EPA Regional Content)
- [Site Contacts](#) (EPA Cleanup Managers, etc.)
- [Site Description Prior to Cleanup](#)
- [Additional Site Documents](#)
- [Other Names for this Site](#) (Aliases)

Site Location



[Get an interactive map](#)

[EPA Region 3](#) >
Serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia

Site Address: 211 FRANKLIN ST
PALMERTON, Pennsylvania 18071

County: CARBON

U.S. Congressional District: 11

Population within one mile: 5,001-10,000

A Technical Assistance Grant ([see glossary](#)) was awarded to aid the community surrounding this site.

Cleanup Progress Summary



Construction Underway



Early Action Initiated/Completed

Physical cleanup activities have started.

[view detailed list of cleanup activities at this site >>](#)

The National Priorities List (NPL) is the list of the most hazardous sites, also known as Superfund sites, across the U.S. and its territories.

This site is on the NPL and is known as a "Final" NPL site ([see glossary](#)).

Potentially Responsible Parties (PRPs) are involved in the cleanup effort ([see glossary](#)).

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



EPA is working to ensure that potential or actual human exposures are under control.

Also at this site:

1,620,643 cubic yards of soil or other solid-based media ([see glossary](#)) have been treated, stabilized, or removed (roughly equivalent to 1 Empire State buildings).

The Problem: Contamination & Exposure

Contamination

Contaminants (i.e., hazardous substances, pollutants or contaminants) can be found in several different types of materials on the site including soil and other solid-based media and

Exposure

At each site, EPA determines the possibility for human and ecological contact (i.e., exposure) with contaminants at the site. If the possibility for exposure to contamination exists, EPA conducts a

water or another liquid-based medium. The contaminants listed via the links below are considered the contaminants of concern to be addressed by cleanup actions at the site. ([see glossary](#))

Contaminated Media: Groundwater, Sediment, Sludge, Soil, Surface Water

EPA classifies contaminants found into groups or types (listed below). To view all contaminants of concern at the site click on the view detailed list link.

Types of Contaminants: Metals

[see glossary definition for "types of contaminants" >>](#)

[view detailed list of contaminants at this site >>](#)

[ATSDR ToxFacts information on contaminants](#)

[EXIT disclaimer >](#)

study known as a risk assessment. During the risk assessment, EPA determines if the site poses a risk to humans, and if so, identifies actions that can be taken to control any possible exposure to humans until site cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



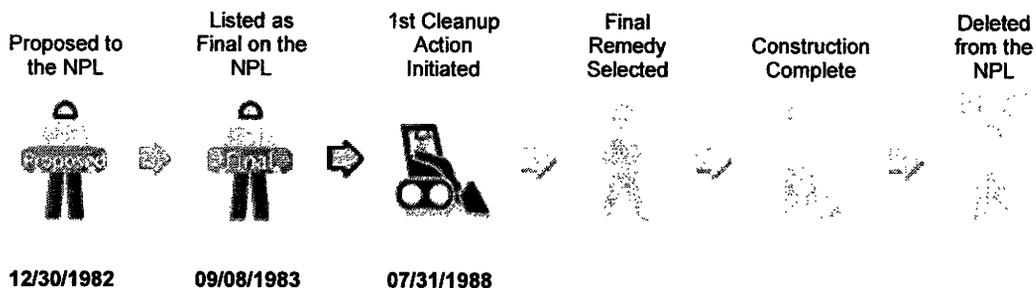
EPA is working to ensure that potential or actual human exposures are under control.

[^^ back to top | view glossary >>](#)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 4					
OU 3		10/09/2001	09/30/2003	03/31/2006	

OU 2		06/30/1995	08/27/2002	09/29/2005	
OU 1		09/14/1987		12/12/1997	
OU 0	11/01/1999				

Complete Underway [view activities details >>](#) [view OU details >>](#)
[more in-depth site details](#) (EPA Regional Content)

* At many sites an action, called a "Removal Action" ([see glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

Land Reuse

After cleanup, the land at some sites (not all sites) can often be used for recreational or other purposes. EPA tries to select cleanup options that encourage and support future use of a site.

All or a portion of this site is ready for reuse.

Non-Residential Use: 4500 acres
 Residential Use: 2000 acres
 Total Use: 6500 acres

[see glossary definition for "non-residential use," "residential use," and "land reuse" >>](#)

Post-Construction

Post-Construction ([see glossary](#)) is the stage following completion of the majority of physical cleanup. The goal of Post-Construction is to ensure that the cleanup provides for the long-term protection of human health and the environment.

One of the activities performed during Post-Construction is a review of the remedies undertaken at a site. These reviews take place every five years and are known as five-year reviews ([see glossary](#)).

Last five-year review at this site: 2002

[view a list of five-year reviews >>](#)

[^^ back to top | view glossary >>](#)

Government Performance & Results Act (GPRA) Milestones

EPA is required to report on the following milestones under the Government Performance & Results Act. [More information.](#)

Milestone	see glossary definitions for GPRA milestones >> Status
Final Site Assessment Decision	Yes (12/30/1982)
Final Remedy Selected	No
Human Exposure Under Control	EPA is working to ensure that potential or actual human exposures are under control.
Contaminated Groundwater Migration Under Control	EPA is working to ensure that contaminated groundwater migration is under control.
Construction Complete	No

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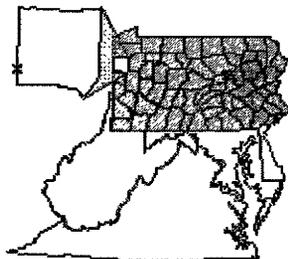
Superfund Site Progress Profile
SHARON STEEL CORP
(FARRELL WORKS DISPOSAL AREA) (EPA ID: PAD001933175)

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- [Site Description Prior to Cleanup](#)
- [Additional Site Documents](#)
- [Other Names for this Site](#) (Aliases)

This profile provides you with information on EPA's cleanup progress at this Superfund site. This information includes: [Site Location](#), [Cleanup Progress Summary](#), [Cleanup Impact Summary](#), [Contamination & Exposure](#), [Cleanup Process & Progress](#), and [Government Performance and Results Act \(GPR\) Milestones](#). Please use the links and the "More Details..." box to find more details on this site.

Site Location



[Get an interactive map](#)

EPA Region 3 >
 Serving Delaware, District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia

Site Address: OHIO STREET
 HICKORY TOWNSHIP,
 Pennsylvania
 16159

County: MERCER

U.S. Congressional District: 04

Population within one mile: 1,001-5,000

Cleanup Progress Summary



Study Underway

Physical cleanup activities have not started.

[view detailed list of cleanup activities at this site >>](#)

The National Priorities List (NPL) is the list of the most hazardous sites, also known as Superfund sites, across the U.S. and its territories.

This site is on the NPL and is known as a "Final" NPL site ([see glossary](#)).

Cleanup Impact Summary

At each site, EPA assesses the risk to humans and the environment and determines the best approach to address the risk. During initial site studies and cleanup, EPA determines if current human exposures to contaminants are under control and takes actions to control any possible human exposures until cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



Under current conditions at this site, potential or actual human exposures are under control.

The Problem: Contamination & Exposure

Contamination

Contaminants (i.e., hazardous substances, pollutants or contaminants) can be found in several different types of materials on the site including soil and other solid-based media and water or another liquid-based medium. ([see glossary](#))

Exposure

At each site, EPA determines the possibility for human and ecological contact (i.e., exposure) with contaminants at the site. If the possibility for exposure to contamination exists, EPA conducts a study known as a risk assessment. During the risk assessment, EPA determines if the site poses a risk to humans, and if so, identifies actions that

Contaminated Media: Data not available

EPA classifies contaminants found into groups or types.

Types of Contaminants: Data not available

[see glossary definition for "types of contaminants" >>](#)

[ATSDR ToxFacts information on contaminants](#)
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can be taken to control any possible exposure to humans until site cleanup has been completed. Once complete, cleanup provides long-term human health and environmental protection at the site.



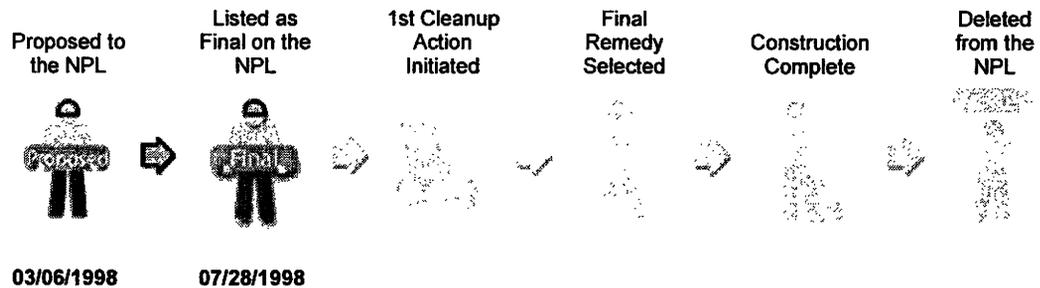
Under current conditions at this site, potential or actual human exposures are under control.

[^^ back to top | view glossary >>](#)

The Solution: Cleanup Process & Progress

Major Site Cleanup Milestones

[see glossary definitions for major site cleanup milestones >>](#)



Cleanup Activities At This Site

[see glossary definitions for cleanup activities >>](#)

There are many stages of cleanup, including site study, remedy selection, remedy design, remedy construction, and post-construction. Activities undertaken early in the cleanup process focus on understanding problems at the site while those taken later in the cleanup process focus on physically addressing those problems identified.

Many NPL sites are large and complicated. These sites are often broken up into smaller areas to make cleanup easier and more manageable. These areas are called "Operable Units" or OUs ([see glossary](#)).

The chart below shows the different types of activities that are underway or complete at each of the cleanup areas (operable units) at the site. Some activities apply to the entire site, EPA assigns these activities to the site-wide operable unit (designated as OU 0).

Cleanup Areas (Operable Units)	Removal *	Study and Remedy Selection	Remedy Design	Remedy Construction	Post-Construction
OU 1					
OU 0					

Complete Underway [view activities details >>](#) [view OU details >>](#)
[more in-depth site details](#) (EPA Regional Content)

* At many sites an action, called a "Removal Action" ([see glossary](#)), must be taken to eliminate immediate and near-term threats to human health and the environment. Removal actions do not occur at all sites.

Land Reuse

Post-Construction

After cleanup, the land at some sites (not all sites) can often be used for recreational or other purposes. EPA tries to select cleanup options that encourage and support future use of a site.

[see glossary definition for "non-residential use," "residential use," and "land reuse" >>](#)

Post-Construction ([see glossary](#)) is the stage following completion of the majority of physical cleanup. The goal of Post-Construction is to ensure that the cleanup provides for the long-term protection of human health and the environment.

[^^ back to top | view glossary >>](#)

Government Performance & Results Act (GPRA) Milestones

EPA is required to report on the following milestones under the Government Performance & Results Act. [More information.](#)

Milestone	see glossary definitions for GPRA milestones >> Status
Final Site Assessment Decision	Yes (03/06/1998)
Final Remedy Selected	No
Human Exposure Under Control	Under current conditions at this site, potential or actual human exposures are under control.
Contaminated Groundwater Migration Under Control	At this site, EPA is still working to determine whether contaminated groundwater migration is under control.
Construction Complete	No

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U.S. Environmental Protection Agency

National Priorities List

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Basic Site Query Results

Active Superfund Sites

On October 24, 2006 at 1:48:55 PM ET, you searched for the following Superfund criteria:

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County: Washington, Greene

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OUTSIDE PROJECT
AREA

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If you would like to revise your query, click the "Back" button in your browser to return to the search options form.

State	City	Site Name	NPL Status	Site Listing Narrative	Site Fact Sheet	ROD Info	Area Map
	CHARLEROI	WELCH'S LANDFILL	Non-NPL	-	-	-	-
PA	DENBO	MARCUS-PAULSEN SITE	Non-NPL	-	-	-	-
PA	JEFFERSON TWP	MAYS/BOLOGNA	Non-NPL	-	-	-	-
PA	MCDONALD	GOLDSCHMIDT HCL ACID SPILL	Non-NPL	-	-	-	-
PA	NEW EAGLE	NEW EAGLE CHEMICAL FIRE	Non-NPL	-	-	-	-
PA	NEW EAGLE	VERMICULITE TOR1	Non-NPL	-	-	-	-
PA	UNION TWP	ELRAMA SCHOOL	Non-NPL	-	-	-	-
PA	WASHINGTON	NATIONAL GRANULATING INC, TIRE FIRE	Non-NPL	-	-	-	-
PA	WASHINGTON COUNTY	MANGANAS PAINT SITE	Non-NPL	-	-	-	-
PA	WEIRTON	CHEMICAL LEAMAN TANK LINES, INC	Non-NPL	-	-	-	-
PA	WEST ALEXANDER	WEST ALEXANDER RADIATION E.R.	Non-NPL	-	-	-	-

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CERCLIS Database

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Search Criteria:

Active vs. Archived: **Active** *What are active and archived sites?*
 County: **WASHINGTON**
 State(s): **Pennsylvania**
 Region(s): **03**

Found **11** site(s) that match your search criteria listed above.
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Save results in Excel format

All OUTSIDE PROJECT AREA

Displaying sites 1 through 11

EPA ID ▼	Site Name ▼	City ▼	County ▼	State ▼	NPL Status ▼
PAD047201835	CHEMICAL LEAMAN TANK LINES, INC	WEIRTON	WASHINGTON	PA	Not NPL
PAD981034994	ELRAMA SCHOOL	UNION TWP	WASHINGTON	PA	Not NPL
PAN000305886	GOLDSCHMIDT HCL ACID SPILL	MCDONALD	WASHINGTON	PA	Not NPL
PASFN0305526	MANGANAS PAINT SITE	EIGHTY FOUR	WASHINGTON	PA	Not NPL
PA0001411552	MARCUS-PAULSEN SITE	DENBO	WASHINGTON	PA	Not NPL
PAD980693303	MAYS/BOLOGNA	JEFFERSON TWP	WASHINGTON	PA	Not NPL
PA0001897263	NATIONAL GRANULATING INC, TIRE FIRE	WASHINGTON	WASHINGTON	PA	Not NPL
PA0000987842	NEW EAGLE CHEMICAL FIRE	NEW EAGLE	WASHINGTON	PA	Not NPL
PAN000305593	VERMICULITE TOR1	NEW EAGLE	WASHINGTON	PA	Not NPL
PAD980554554	WELCH'S LANDFILL	CHARLEROI	WASHINGTON	PA	Not NPL
PAN000305786	WEST ALEXANDER RADIATION E.R.	WEST ALEXANDER	WASHINGTON	PA	Not NPL

Displaying sites 1 through 11

DISCLAIMER: Be advised that the data contained in these profiles are intended solely for informational purposes use by employees of the U.S. Environmental Protection Agency for management of the Superfund program. They are not intended for use in calculating Cost Recovery Statutes of Limitations and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. EPA reserves the right to change these data at any time without public notice.

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Dictionary \(DED\)](#)[Order Superfund
Products](#)**CERCLIS Database****Search Results****Search Criteria:**

Active vs. Archived:

Active *What are active and archived sites?*

County:

GREENE

State(s):

Pennsylvania

Region(s):

03Found **0** site(s) that match your search criteria listed above.To conduct another search, return to the [Search CERCLIS](#) page or request a [Customized SIS Report](#).

DISCLAIMER: Be advised that the data contained in these profiles are intended solely for informational purposes use by employees of the U.S. Environmental Protection Agency for management of the Superfund program. They are not intended for use in calculating Cost Recovery Statutes of Limitations and cannot be relied upon to create any rights, substantive or procedural, enforceable by any party in litigation with the United States. EPA reserves the right to change these data at any time without public notice.

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Baker

Michael Baker Jr., Inc.

APPENDIX B

Agency Correspondence



Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

March 22, 2007

Neil Bossart
 Civil & Environmental Consultants, Inc.
 FAX: 412-429-2114 (hard copy will NOT follow)

<i>Pennsylvania Natural Diversity Inventory Review, PNDI Number</i>	20070208076814
Area No. 5 Alt Site 2	
East Finley Twp.; Washington County	

Dear Mr. Bossart,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

NO PROJECT IMPACT ANTICIPATED
 PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

POTENTIAL PROJECT IMPACT
 Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. Therefore, further coordination with this office is necessary to avoid potential impacts to the above listed resources.

Please provide the following information so that a more accurate determination can be made:

A survey for the following should be conducted at the appropriate time of year by a qualified botanist:
Stachys nuttallii (PA Endangered)--wooded mountain slopes; flowers June-July.

If the land type(s) does not exist on site, a survey will not be necessary. Please contact our office to inform us if the habitat is not present. If the habitat is present, please have the botanist fill out the field survey form <http://www.naturalheritage.state.pa.us/InternetFieldSurveyForm.pdf>. The botanist may contact us prior to the survey for additional information. All PA listed species should be searched for during the site visit and occurrences reported to our office. Survey results should be submitted to our office for review and comment. Mitigation measures and monitoring may be requested if species or communities of special concern are found on or adjacent to site. If you need a list of qualified surveyors, contact our office.

COMMENTS: Please note habitat and flowering time of *Stachys nuttallii* and have a qualified botanist conduct a survey during the appropriate time of the year.

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

To complete your review of state and federally-listed species of special concern (those NOT under DCNR's responsibility), please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission have been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen
 Rebecca H. Bowen, Environmental Review Specialist
 DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ crbowen@state.pa.us

Stewardship Partnership Service



Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

March 22, 2007

Neil Bossart
 Civil & Environmental Consultants, Inc.
 FAX: 412-429-2114 (hard copy will NOT follow)

Pennsylvania Natural Diversity Inventory Review, PNDI Numbers 20070208076834

Area No. 5 Alt Site 3

Morris Twp.; Washington County

Dear Mr. Bossart,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or a species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under the Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

NO PROJECT IMPACT ANTICIPATED

PNDI records indicate that no known occurrences of species or resources of special concern under DCNR's jurisdiction occur in the vicinity of the project. Therefore, we do not anticipate the project referenced above will impact plants, natural communities, terrestrial invertebrates and geologic features of special concern. No further coordination with DCNR is needed for this project.

PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

POTENTIAL PROJECT IMPACT - UNDER FURTHER REVIEW

Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. This project has been passed on to our review committee. The committee will contact the applicant/consultant directly if more information is needed to assess the project's potential impacts. Response time is typically less than a month after the date on this notification.

COMMENTS:

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

This finding applies to impacts to plants, natural communities, terrestrial invertebrates and geologic features only. To complete your review of state and federally-listed species of special concern, please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission has been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen

Rebecca H. Bowen, Environmental Review Specialist FOR Chris Firestone, Plant Program Mgr
 DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-rbowen@state.pa.us

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Bureau of Forestry

March 22, 2007

Neil Bossart
Civil & Environmental Consultants, Inc.
FAX: 412-429-2114 (hard copy will NOT follow)

Pennsylvania Natural Diversity Inventory Review, PNDI Numbers 20070208076837
Area No. 5 Alt Site 4
Morris Twp.; Washington County

Dear Mr. Bossart,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or a species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under the Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

NO PROJECT IMPACT ANTICIPATED

PNDI records indicate that no known occurrences of species or resources of special concern under DCNR's jurisdiction occur in the vicinity of the project. Therefore, we do not anticipate the project referenced above will impact plants, natural communities, terrestrial invertebrates and geologic features of special concern. No further coordination with DCNR is needed for this project.

PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

POTENTIAL PROJECT IMPACT - UNDER FURTHER REVIEW

Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. This project has been passed on to our review committee. The committee will contact the applicant/consultant directly if more information is needed to assess the project's potential impacts. Response time is typically less than a month after the date on this notification.

COMMENTS:

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

This finding applies to impacts to plants, natural communities, terrestrial invertebrates and geologic features only. To complete your review of state and federally-listed species of special concern, please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission has been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen

Rebecca H. Bowen, Environmental Review Specialist FOR Chris Firestone, Plant Program Mgr
DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-rbowen@state.pa.us

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Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

March 22, 2007

Neil Bossart
 Civil & Environmental Consultants, Inc.
 FAX: 412-429-2114 (hard copy will NOT follow)

Pennsylvania Natural Diversity Inventory Review, PNDI Number	20070208076838
Area No. 5 Alt Site 6	
Rich Hill Twp.; Washington County	

Dear Mr. Bossart,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

NO PROJECT IMPACT ANTICIPATED
 PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

POTENTIAL PROJECT IMPACT
 Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. Therefore, further coordination with this office is necessary to avoid potential impacts to the above listed resources.

Please provide the following information so that a more accurate determination can be made:

A survey for the following should be conducted at the appropriate time of year by a qualified botanist:
Stachys nuttallii (PA Endangered)—wooded mountain slopes; flowers June-July.

If the land type(s) does not exist on site, a survey will not be necessary. Please contact our office to inform us if the habitat is not present. If the habitat is present, please have the botanist fill out the field survey form <http://www.naturalheritage.state.pa.us/InternetFieldSurveyForm.pdf>. The botanist may contact us prior to the survey for additional information. All PA listed species should be searched for during the site visit and occurrences reported to our office. Survey results should be submitted to our office for review and comment. Mitigation measures and monitoring may be requested if species or communities of special concern are found on or adjacent to site. If you need a list of qualified surveyors, contact our office.

COMMENTS: Please note habitat and flowering time of *Stachys nuttallii* and have a qualified botanist conduct a survey during the appropriate time of the year.

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

To complete your review of state and federally-listed species of special concern (those NOT under DCNR's responsibility), please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission have been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen
 Rebecca H. Bowen, Environmental Review Specialist
 DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-rcbowen@state.pa.us

Stewardship Partnership Service



Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

March 22, 2007

Neil Bossart
 Civil & Environmental Consultants, Inc.
 FAX: 412-429-2114 (hard copy will NOT follow)

<i>Pennsylvania Natural Diversity Inventory Review, PNDI Number</i>	20070208076841
Area No. 5 Alt Site 7	
Rich Hill Twp.; Washington County	

Dear Mr. Bossart,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

NO PROJECT IMPACT ANTICIPATED
 PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

POTENTIAL PROJECT IMPACT
 Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. Therefore, further coordination with this office is necessary to avoid potential impacts to the above listed resources.

Please provide the following information so that a more accurate determination can be made:

A survey for the following should be conducted at the appropriate time of year by a qualified botanist:
Stachys nuttallii (PA Endangered)—wooded mountain slopes; flowers June-July.
Passiflora lutea (PA Endangered)—riverbanks and thickets; flowers July.

If the land type(s) does not exist on site, a survey will not be necessary. Please contact our office to inform us if the habitat is not present. If the habitat is present, please have the botanist fill out the field survey form <http://www.naturalheritage.state.pa.us/InternetFieldSurveyForm.pdf>. The botanist may contact us prior to the survey for additional information. All PA listed species should be searched for during the site visit and occurrences reported to our office. Survey results should be submitted to our office for review and comment. Mitigation measures and monitoring may be requested if species or communities of special concern are found on or adjacent to site. If you need a list of qualified surveyors, contact our office.

COMMENTS: Please note habitat and flowering time of *Stachys nuttallii* and *Passiflora lutea* and have a qualified botanist conduct a survey during the appropriate time of the year.

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

To complete your review of state and federally-listed species of special concern (those NOT under DCNR's responsibility), please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission have been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen
 Rebecca H. Bowen, Environmental Review Specialist
 DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-rcbowen@state.pa.us

Stewardship Partnership Service



Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

March 22, 2007

Neil Bossart
 Civil & Environmental Consultants, Inc.
 FAX: 412-429-2114 (hard copy will NOT follow)

Pennsylvania Natural Diversity Inventory Review, PNDI Number	20070208076843
Area No. 5 Alt Site 8	
Rich Hill Twp.; Washington County	

Dear Mr. Bossart,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

NO PROJECT IMPACT ANTICIPATED
 PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.

POTENTIAL PROJECT IMPACT
 Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. Therefore, further coordination with this office is necessary to avoid potential impacts to the above listed resources.

Please provide the following information so that a more accurate determination can be made:

A survey for the following should be conducted at the appropriate time of year by a qualified botanist:

Stachys nuttallii (PA Endangered)—wooded mountain slopes; flowers June-July.

If the land type(s) does not exist on site, a survey will not be necessary. Please contact our office to inform us if the habitat is not present. If the habitat is present, please have the botanist fill out the field survey form (<http://www.naturalheritage.state.pa.us/InternetFieldSurveyForm.pdf>). The botanist may contact us prior to the survey for additional information. All PA listed species should be searched for during the site visit and occurrences reported to our office. Survey results should be submitted to our office for review and comment. Mitigation measures and monitoring may be requested if species or communities of special concern are found on or adjacent to site. If you need a list of qualified surveyors, contact our office.

COMMENTS: Please note habitat and flowering time of *Stachys nuttallii* and have a qualified botanist conduct a survey during the appropriate time of the year.

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

To complete your review of state and federally-listed species of special concern (those NOT under DCNR's responsibility), please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission have been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen

Rebecca H. Bowen, Environmental Review Specialist

DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-bowen@state.pa.us

Stewardship Partnership Service



Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

March 22, 2007

Neil Bossart
 Civil & Environmental Consultants, Inc.
 FAX: 412-429-2114 (hard copy will NOT follow)

<i>Pennsylvania Natural Diversity Inventory Review, PNDI Number</i>	20070208076844
Area No. 5 Alt Site 9	
East Finley Twp.; Washington County	

Dear Mr. Bossart,

This responds to your request about a Pennsylvania Natural Diversity Inventory (PNDI) ER Tool "Potential Impact" or species of special concern impact review. We screened this project for potential impacts to species and resources of special concern under Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

<input type="checkbox"/> NO PROJECT IMPACT ANTICIPATED PNDI records indicate special concern species or resources are located in the vicinity of the project. However, based on the information submitted to us concerning the nature of the project, the immediate location, and our detailed resource information, we determined that no impact is likely. No further coordination with DCNR is needed for this project.
<input checked="" type="checkbox"/> POTENTIAL PROJECT IMPACT Based on our PNDI map review we determined potential impacts to species and/or resources of special concern. Therefore, further coordination with this office is necessary to avoid potential impacts to the above listed resources.
<input type="checkbox"/> Please provide the following information so that a more accurate determination can be made:
<input checked="" type="checkbox"/> A survey for the following should be conducted at the appropriate time of year by a qualified botanist: <i>Stachys nuttallii</i> (PA Endangered)—wooded mountain slopes; flowers June-July.
If the land type(s) does not exist on site, a survey will not be necessary. Please contact our office to inform us if the habitat is not present. If the habitat is present, please have the botanist fill out the field survey form http://www.naturalheritage.state.pa.us/Internet/FieldSurveyForm.pdf . The botanist may contact us prior to the survey for additional information. All PA listed species should be searched for during the site visit and occurrences reported to our office. Survey results should be submitted to our office for review and comment. Mitigation measures and monitoring may be requested if species or communities of special concern are found on or adjacent to site. If you need a list of qualified surveyors, contact our office.
COMMENTS: Please note habitat and flowering time of <i>Stachys nuttallii</i> and have a qualified botanist conduct a survey during the appropriate time of the year.

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

To complete your review of state and federally-listed species of special concern (those NOT under DCNR's responsibility), please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission have been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen
 Rebecca H. Bowen, Environmental Review Specialist
 DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-bowen@state.pa.us

Stewardship Partnership Service

Baker

Michael Baker Jr., Inc.
A Unit of Michael Baker Corporation

Airside Business Park
100 Airside Drive
Moon Township, PA

March 14, 2007

Ms. Pam Russell
Pennsylvania Department of Environmental Resources
100 New Salem Road, Suite 175
Uniontown, PA 15401

RE: Alternatives Site Study
Morris, Richhill, Gray, West Finley, and East Finley Townships
Washington and Greene Counties

Dear Ms. Russell:

Michael Baker Jr., Inc. is currently performing an alternatives analysis study for a future disposal area. The outlined study area encompasses approximately 9,300 acres of which one area will be selected for development. The study area is located in the Townships and Counties as listed above and shown on the accompanying mapping. We desire to select a site that is most suitable based on comparison of environmental, economic, social, and technical factors. As part of our evaluation we request identification of any: 1) public water supplies lying within or near the study area shown on the attached drawing, and/or 2) bodies of water or aquifers serving as significant sources of public water supply downstream of the proposed area. If you need additional information, please feel free to contact me at (724) 269-6022.

Thank you for your assistance.

Sincerely,

MICHAEL BAKER JR., INC.



Michele Stewart, PE
Project Manager

ChallengeUs.



Pennsylvania Department of Environmental Protection

Water Standards and Facility Regulation
100 New Salem Road, Suite 175
Uniontown, PA 15401
March 16, 2007

UNIONTOWN DISTRICT OFFICE

PHONE: 724-439-7331
FAX: 724-439-7352

Michael Baker, Jr. Inc.
Attn: Michele Stewart, P.E.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108-2783

Re: Public water sources and intakes down stream from proposed site for Consol/Bailey Mine refuse, Washington & Greene Counties.

Ms. Stewart,

There is one (1) public water systems (PWS) that has surface water intakes within approximately ten (10) miles of the proposed mining activity. There are no (0) ground water sources within one half (1/2) mile of the proposed mining activity. The affected PWS is:

1. Claysville Water Authority; reservoir dam approximately 8 miles north of proposed activity.

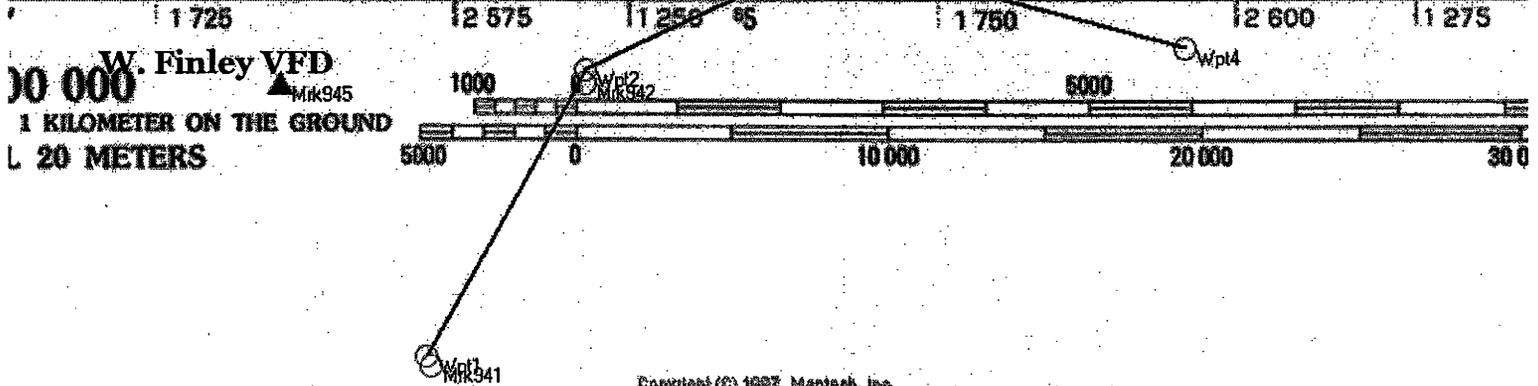
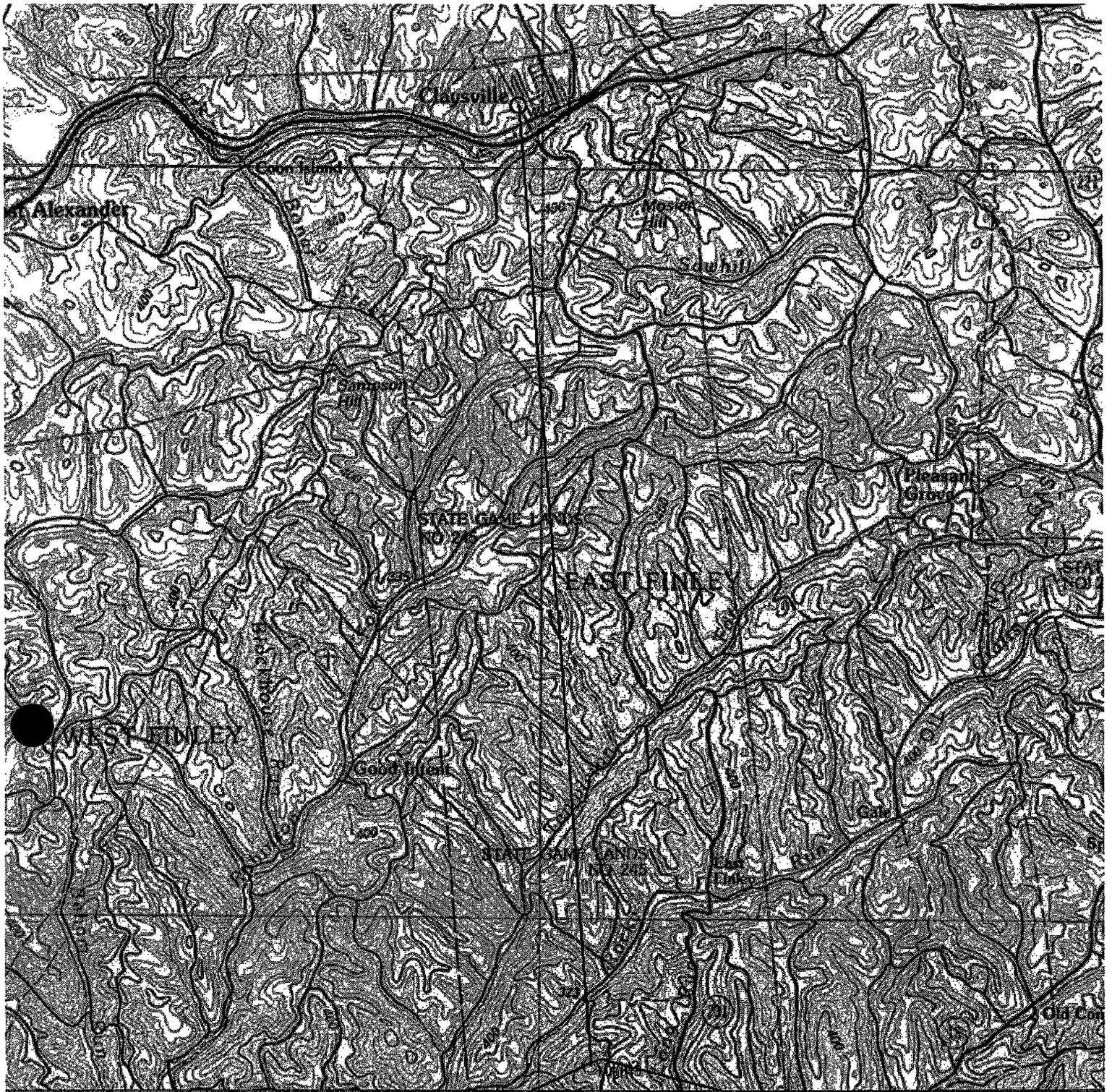
If you require any further information, please contact me at the above number.

Sincerely,

Pamela P. Russell
Sanitarian

Enclosure







Commonwealth of Pennsylvania
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093
www.phmc.state.pa.us

April 11, 2007

RECEIVED
APR 11 2007

MICHAEL BAKER JR., INC.

Michael Baker Jr., Inc.
Attn: David A. Anderson, Ph. D., R.P.A.
Airside Business Park
100 Airside Drive
Moon Township, PA 15108

RE: ER# 85-0390-059-A45
COE Section 404 Permit: Fourteen Potential Coal
Refuse Sites, Consol Pennsylvania Coal Company,
Bailey Mine Complex, Richhill Township,
Greene County

Dear Mr. Anderson:

The Bureau for Historic Preservation (the State Historic Preservation Office) has reviewed the above named project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended in 1980 and 1992, and the regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation as revised in 1999. These requirements include consideration of the project's potential effect upon both historic and archaeological resources. Our comments are as follows:

Historic Resources

All federal agency permitted/licensed/funded projects requiring the comments of the Pennsylvania State Historic Preservation Officer should include the funding program, a project description, project location, and cultural resource site information as outlined in 36 CFR Part 800.4 (Identifying Historic Properties). Because your request does not include sufficient information, we are unable to proceed with our review until the information on the attached form is provided. The 30 day review period required by the regulations (36 CFR Part 800.4(d)(i) and Part 800.11) does not begin until adequate information to complete our review is provided.

Archaeological Resources

Based on an evaluation by our staff, there is a high probability that significant archaeological sites are located in this project area. These resources could be adversely affected by project activities. Although there are no recorded archaeological sites within the project boundaries, the soil type, topographic setting, slope direction, and distance to water of the project area are similar to the settings of known archaeological sites in the



Consol Pennsylvania Coal Co.
1525 Pleasant Grove Road
P.O. Box J
Claysville, PA 15323

phone: 724-663-3022
fax: 724-663-3067

March 6, 2007

Mr. Craig Burda, Mining Engineer
Department of Environmental Protection
California Mining Office
25 Technology Drive
California Technology Park
Coal Center, PA 15423

RE: Coal Refuse Disposal Area – Alternatives Analysis
Bailey Mine Complex
Consol Pennsylvania Coal Company (CPCC)
Richhill Township, Greene County

Dear Mr. Burda:

Please be advised that Consol Pennsylvania Coal Company, the owner of the tracts 2209-136, 2209-137, 2209-140, 2209-141, 2209-145 and 2210-121, attests that these parcels, identified as having prime farmland soil units, have not been used for cultivated crops for any five (5) of the past ten (10) years. Should you have any questions regarding this letter, please contact Edward Suter at 724-663-3034.

Sincerely,

A handwritten signature in black ink that reads 'David Hudson'.

David Hudson
Vice President
Consol Pennsylvania Coal Company

Page 2
Mr. Anderson
April 11, 2007

vicinity. A Phase I archaeological survey of the project area is required to locate potentially significant archaeological resources. Guidelines and instructions for conducting Phase I surveys are available on our web site at <http://www.phmc.state.pa.us/bhp/Inventories/ArchaeologyGuidelines.pdf> or from our office upon request.

If you have any questions or comments regarding historic resources, please contact Ann Safley at (717) 787-9121. If you have any questions or comments concerning archaeological resources, please contact Mark Shaffer at (717) 783-9900.

Sincerely,

Mark Shaffer for

Douglas C. McLearn, Chief
Division of Archaeology & Protection

cc: COE, Pittsburgh
DEP, California District Mining Office
Mark McConaughy

enclosure

RECEIVED
APR 11 2007
MICHAEL BAKER JR., INC.



Michael Baker Jr., Inc.

*Airside Business Park
100 Airside Drive
Moon Township, PA 15108*

*(412) 269-6300
FAX (412) 375-3989*

CERTIFIED MAIL

February 28, 2007

Division of Archaeology and Protection
Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
400 North Street
Commonwealth Keystone Building 2nd Floor
Harrisburg, PA 17120-0093

RE: Request for consultation for new potential coal refuse disposal for Consol Pennsylvania Coal Company's existing Bailey Mine Complex, Richhill Township, Greene County, Pennsylvania.

Dear Sir/Madam:

Michael Baker Jr., Inc. is performing a site selection study/alternative analysis for a new coal refuse disposal area for Consol Pennsylvania Coal Company's (CPCC) Bailey Mine Complex located in Richhill Township, Greene County. The search area for potential new refuse sites encompasses a one mile radius from the existing Bailey coal disposal refuse sites and preparation plant. Fourteen potential sites within the search area have been identified for further evaluation and are indicated on the enclosed map. Also included on the map is a table indicating the number of acres of each potential refuse site. A review of archaeological site and historic structure/district data available on the Cultural Resources Geographic Information System revealed an absence of previously recorded historic resources (both archaeological sites and historic structures/districts) within the fourteen areas under consideration.

The Pennsylvania Department of Environmental Protection (PADEP) Technical Guidance Document entitled "Coal Refuse Disposal-Site Selection" requires all entities proposing to develop new coal refuse disposal sites select a site(s) that is most suitable based on a comparison of environmental, economic, social, and technical factors. As part of our evaluation, the presence of historic and archaeological resources within the potential sites must be evaluated. It is anticipated that a Coal Mining Activity Permit from PADEP District Mining Office and a Federal Section 404 Permit from US Army Corps of Engineers, Pittsburgh District will be required for this project.

ChallengeUs.

Baker

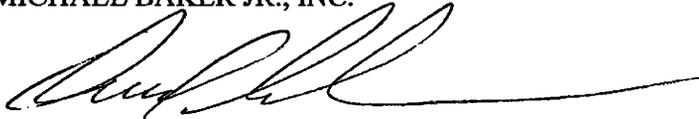
Bureau for Historic Preservation
February 28, 2007
Page 2

As an applicant for a state and federal permit, CPCC is required to take into account the effect of the proposed undertaking on any district, site, building, structure, or object that is listed in or eligible for the National Register of Historic Places. On behalf of the CPCC, and pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing agencies, 36 CFR §800, Protection of Historic Properties, as revised August 5, 2004, and per 36 CFR §800.3(c) we are initiating consultation, and solicit your opinion on the above project.

We kindly request that you respond within 30 days of receipt of this letter. Thank you for your consideration. If you have any questions on technical aspects of the project or require additional information please contact me at 412-269-4623.

Sincerely,

MICHAEL BAKER JR., INC.

A handwritten signature in black ink, appearing to read 'David A. Anderson', with a long horizontal flourish extending to the right.

David A. Anderson, Ph.D., R.P.A.
Manager
Cultural and Natural Resources Section

Attachment
DAA/daa

Baker

Michael Baker Jr., Inc.
APPENDIX C

PNDI Search Results

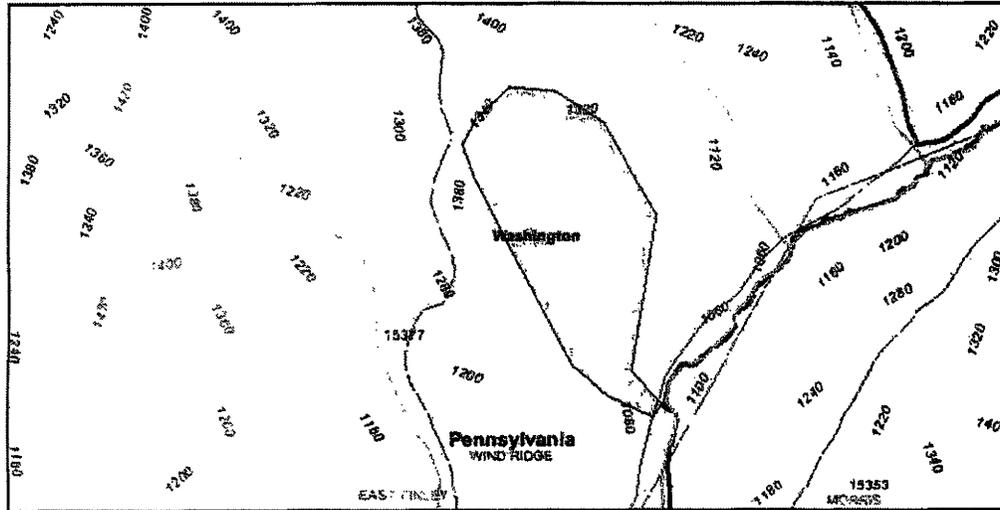
PNDI Project Environmental Review Receipt

Project Search ID: 20070206076161

Project Name: Bailey Area No. 5 Alt Site 1

Date: 2/6/2007 1:40:33 PM

Project Location



Project Name: Bailey Area No. 5 Alt Site 1

On Behalf Of: Self

Project Search ID: 20070206076161

Date: 2/6/2007 1:40:27 PM

of Potential Impacts: 0

Jurisdictional Agency:

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.98253 N, -80.39644 W

Degrees Minutes Seconds: 39° 58' 57.1" N, 80° 23' 47.2" W

Lambert: -672446.36639357, 369258.84577396 ft

ZIP Code: 15377

County: Washington

Township/Municipality: EAST FINLEY

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 103.1 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

0 Known Impacts

Under the Following Agencies' Jurisdiction:
None

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076161

Project Name: Bailey Area No. 5 Alt Site 1

Date: 2/6/2007 1:40:33 PM

Pennsylvania Natural Diversity Inventory (PNDI) records do **NOT** indicate any known impacts on special concern species and resources within the project area. DEP requires a signed copy of this receipt with permit applications being submitted as indication that an environmental review has been conducted and completed. See DEP PNDI policy at www.naturalheritage.state.pa.us for more information.

Based on the information you provided, no further coordination is required by the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, or the Pennsylvania Department of Conservation and Natural Resources with regard to special concern species, natural communities, or outstanding geologic features. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

DISCLAIMER

The PNDI environmental review website is a preliminary environmental screening tool. It is not a substitute for information obtained from a field survey of the project area conducted by a biologist. Such surveys may reveal previously undocumented populations of species of special concern. In addition, the PNDI only contains information about species occurrences that have actually been reported to the Pennsylvania Natural Heritage Program.

Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076161

Project Name: Bailey Area No. 5 Alt Site 1

Date: 2/6/2007 1:40:33 PM

The web site is intended solely for the purpose of screening projects for potential impacts on resources of special concern in accordance with the instructions provided on the web site. Use of the web site for any other purpose or in any other way is prohibited and subject to criminal prosecution under federal and state law, including but not limited to the following: Computer Fraud and Abuse Act of 1986, as amended, 18 U.S.C. § 1030; Pennsylvania Crimes Code, § 4911 (tampering with public records or information), § 7611 (unlawful use of computer and other computer crimes), § 7612 (disruption of service), § 7613 (computer theft), § 7614 (unlawful duplication), and § 7615 (computer trespass).

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This review is based on the project information that was entered. The jurisdictional agencies and DEP require that the review be redone if the project area, location, or the type of project changes. If additional information on species of special concern becomes available, this review may be reconsidered by the jurisdictional agency.

PRIVACY and SECURITY

This web site operates on a Commonwealth of Pennsylvania computer system. It maintains a record of each environmental review search result as well as contact information for the project applicant. These records are maintained for internal tracking purposes. Information collected in this application will be made available only to the jurisdictional agencies and to the Department of Environmental Protection, except if required for law enforcement purposes—see paragraph below.

This system is monitored to ensure proper operation, to verify the functioning

of applicable security features, and for other like purposes. Anyone using this system consents to such monitoring and is advised that if such monitoring reveals evidence of possible criminal activity, system personnel may provide the evidence to law enforcement officials. See Terms of Use.

Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

Signature: Neil Bossart

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossart

Address: 333 Baldwin Road

City, State, Zip: Pittsburgh Pa 15265

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076161

Project Name: Bailey Area No. 5 Alt Site 1

Date: 2/6/2007 1:40:33 PM

Phone: (412) 489-2324

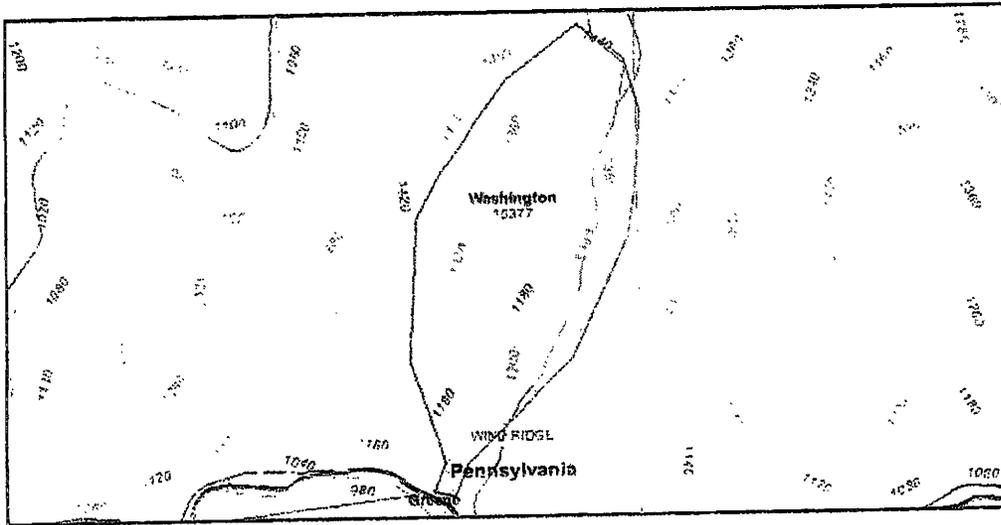
Email: wrossa17@cecinc.com

The following contact information is for the agencies involved in this Pennsylvania Natural Diversity Inventory environmental review process. Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076814
Project Name: Area No. 5 Alt Site 2
Date: 2/8/2007 3:01:58 PM

Project Location



Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

1 Potential Impacts

Under the Following Agencies' Jurisdiction:
Pennsylvania Department of Conservation
and Natural Resources

Project Name: Area No. 5 Alt Site 2
On Behalf Of: Private Individual
Project Search ID: 20070208076814
Date: 2/8/2007 3:01:52 PM
of Potential Impacts: 1
Jurisdictional Agency:
Pennsylvania Department of Conservation and Natural Resources
Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)
Project Location
Decimal Degrees: 39.97701 N, -80.43075 W
Degrees Minutes Seconds: 39° 58' 37.2" N, 80° 25' 50.7" W
Lambert: -680562.90779465, 367850.11413435 ft
ZIP Code: 15377
County: Washington
Township/Municipality: EAST FINLEY, WEST FINLEY
USGS 7.5 Minute Quadrangle ID: 789
Quadrangle Name: WIND RIDGE
Project Area: 135.7 acres

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076814
Project Name: Area No. 5 Alt Site 2
Date: 2/8/2007 3:01:58 PM

Pennsylvania Natural Diversity Inventory (PNDI) records indicate there are potential impacts on special concern species and resources within the project area. If the project is pursued, the jurisdictional agency/agencies indicated require that the instructions below regarding potential impacts and/or avoidance measures be followed in their entirety.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

1 potential impact

The Applicant should MAIL/FAX a copy of this Project Environmental Review Receipt, a cover letter with project narrative, acreage to be impacted, how construction/maintenance activity is to be accomplished, township/municipality and county where project is located, and a USGS 7.5 minute quadrangle with project boundary and quad name marked on the map.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number (717) 772-0271

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

DISCLAIMER

The PNDI environmental review website is a preliminary environmental screening tool. It is not a substitute for information obtained from a field survey of the project area conducted by a biologist. Such surveys may reveal previously undocumented populations of species of special concern. In addition, the PNDI only contains information about species occurrences that have actually been reported to the Pennsylvania Natural Heritage Program.

Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076814

Project Name: Area No. 5 Alt Site 2

Date: 2/8/2007 3:01:58 PM

TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

The web site is intended solely for the purpose of screening projects for potential impacts on resources of special concern in accordance with the instructions provided on the web site. Use of the web site for any other purpose or in any other way is prohibited and subject to criminal prosecution under federal and state law, including but not limited to the following: Computer Fraud and Abuse Act of 1986, as amended, 18 U.S.C. § 1030; Pennsylvania Crimes Code, § 4911 (tampering with public records or information), § 7611 (unlawful use of computer and other computer crimes), § 7612 (disruption of service), § 7613 (computer theft), § 7614 (unlawful duplication), and § 7615 (computer trespass).

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This review is based on the project information that was entered. The jurisdictional agencies and DEP require that the review be redone if the project area, location, or the type of project changes. If additional information on species of special concern becomes available, this review may be reconsidered by the jurisdictional agency.

PRIVACY and SECURITY

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maintained for internal tracking purposes. Information collected in this application will be made available only to the jurisdictional agencies and to the Department of Environmental Protection, except if required for law enforcement purposes—see paragraph below.

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In order for this project to be considered for subsequent review, a signed and initialed copy of this receipt is required by the agency or agencies indicated. DEP requires that a signed and initialed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted in applications for permits requiring PNDI review. See DEP PNDI policy at www.naturalheritage.state.pa.us or visit the following websites for further information.

Regional Offices

[Http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf](http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf)

District Mining Operations

[Http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm](http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm)

Oil and Gas Management

[Http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomernNeeds.htm](http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomernNeeds.htm)

Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076814
Project Name: Area No. 5 Alt Site 2
Date: 2/8/2007 3:01:58 PM

Signature: Neil Bassett

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bassett

Address: 333 Baldwin Rd.

City, State, Zip: Pittsburgh Pa 15205

Phone: (412) 429-2324

Email: nbassett@cecinc.com

The following contact information is for the agencies involved in this

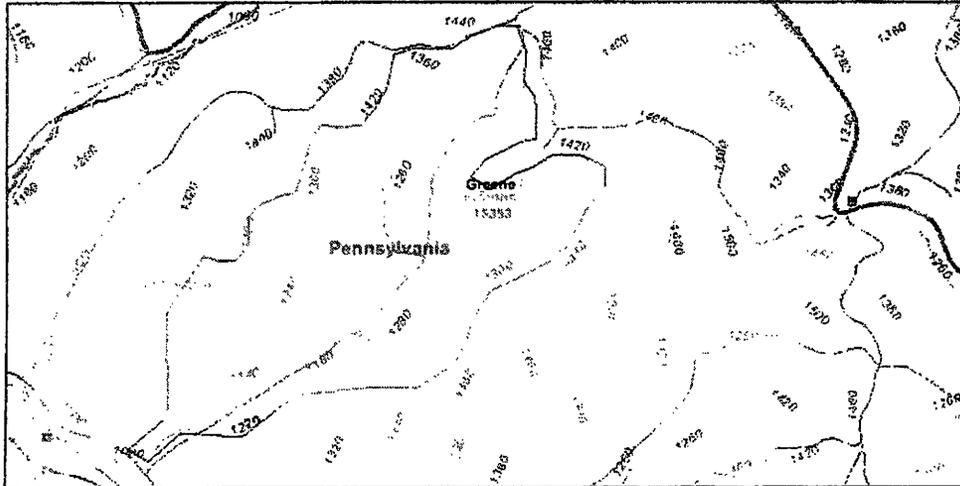
Pennsylvania Natural Diversity Inventory environmental review process.
Please read this entire receipt carefully as it contains instructions for how to
contact these agencies for further review of this particular project.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076834
Project Name: Area No. 5 Alt Site 3
Date: 2/8/2007 3:41:28 PM

Project Location



Project Name: Area No. 5 Alt Site 3
On Behalf Of: Private Individual
Project Search ID: 20070208076834
Date: 2/8/2007 3:41:22 PM
of Potential Impacts: 1
Jurisdictional Agency:
Pennsylvania Department of Conservation and Natural Resources
Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)
Project Location
Decimal Degrees: 39.9736 N, -80.38549 W
Degrees Minutes Seconds: 39° 58' 24.9" N, 80° 23' 7.8" W
Lambert: -665060.99653506, 367165.43680137 ft
ZIP Code: 15353
County: Greene
Township/Municipality: MORRIS
USGS 7.5 Minute Quadrangle ID: 789
Quadrangle Name: WIND RIDGE
Project Area: 527.7 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

1 Potential Impacts

Under the Following Agencies' Jurisdiction:
Pennsylvania Department of Conservation
and Natural Resources

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076834
Project Name: Area No. 5 Alt Site 3
Date: 2/8/2007 3:41:28 PM

Pennsylvania Natural Diversity Inventory (PNDI) records indicate there are potential impacts on special concern species and resources within the project area. If the project is pursued, the jurisdictional agency/agencies indicated require that the instructions below regarding potential impacts and/or avoidance measures be followed in their entirety.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features, and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

1 potential Impact

The Applicant should MAIL/FAX a copy of this Project Environmental Review Receipt, a cover letter with project narrative, acreage to be impacted, how construction/maintenance activity is to be accomplished, township/municipality and county where project is located, and a USGS 7.5 minute quadrangle with project boundary and quad name marked on the map.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076834

Project Name: Area No. 5 Alt Site 3

Date: 2/8/2007 3:41:28 PM

TERMS OF USE

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The web site is intended solely for the purpose of screening projects for potential impacts on resources of special concern in accordance with the instructions provided on the web site. Use of the web site for any other purpose or in any other way is prohibited and subject to criminal prosecution under federal and state law, including but not limited to the following: Computer Fraud and Abuse Act of 1986, as amended, 18 U.S.C. § 1030; Pennsylvania Crimes Code, § 4911 (tampering with public records or information), § 7611 (unlawful use of computer and other computer crimes), § 7612 (disruption of service), § 7613 (computer theft), § 7614 (unlawful duplication), and § 7615 (computer trespass).

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This review is based on the project information that was entered. The jurisdictional agencies and DEP require that the review be redone if the project area, location, or the type of project changes. If additional information on species of special concern becomes available, this review may be reconsidered by the jurisdictional agency.

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In order for this project to be considered for subsequent review, a signed and initialed copy of this receipt is required by the agency or agencies indicated. DEP requires that a signed and initialed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted in applications for permits requiring PNDI review. See DEP PNDI policy at www.naturalheritage.state.pa.us or visit the following websites for further information.

Regional Offices

[Http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf](http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf)

District Mining Operations

[Http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm](http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm)

Oil and Gas Management

[Http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm](http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm)

Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076834
Project Name: Area No. 5 Alt Site 3
Date: 2/8/2007 3:41:28 PM

Signature: Neil Bossart

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

Phone: (412) 429-2324

Email: nbossart@cecinc.com

Pennsylvania Natural Diversity Inventory environmental review process.
Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

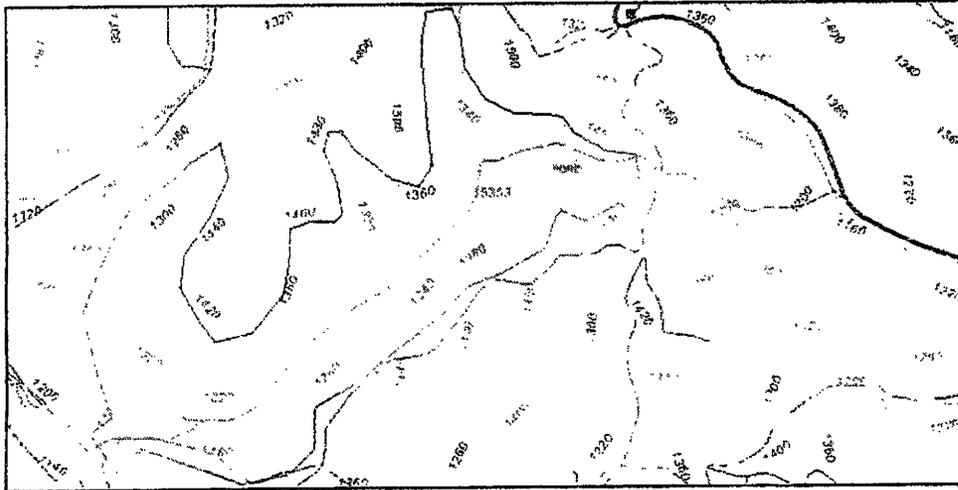
Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

The following contact information is for the agencies involved in this

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076837
Project Name: Area No.5 Alt Site 4
Date: 2/8/2007 3:46:27 PM

Project Location



Project Name: Area No.5 Alt Site 4
On Behalf Of: Private Individual
Project Search ID: 20070208076837
Date: 2/8/2007 3:46:21 PM
of Potential Impacts: 1
Jurisdictional Agency:
Pennsylvania Department of Conservation and Natural Resources
Project Category: Mining,Coal (strip, deep, long-wall, refuse disposal)
Project Location
Decimal Degrees: 39.96487 N, -80.37524 W
Degrees Minutes Seconds: 39° 57' 53.5" N, 80° 22' 30.9" W
Lambert: -662435.63302577, 363696.58125799 ft
ZIP Code: 15353
County: Greene
Township/Municipality: MORRIS
USGS 7.5 Minute Quadrangle ID: 789
Quadrangle Name: WIND RIDGE
Project Area: 578.8 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

1 Potential Impacts

Under the Following Agencies' Jurisdiction:
Pennsylvania Department of Conservation
and Natural Resources

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076837
Project Name: Area No.5 Alt Site 4
Date: 2/8/2007 3:46:27 PM

Pennsylvania Natural Diversity Inventory (PNDI) records indicate there are potential impacts on special concern species and resources within the project area. If the project is pursued, the jurisdictional agency/agencies indicated require that the instructions below regarding potential impacts and/or avoidance measures be followed in their entirety.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

1 potential impact

The Applicant should MAIL/FAX a copy of this Project Environmental Review Receipt, a cover letter with project narrative, acreage to be impacted, how construction/maintenance activity is to be accomplished, township/municipality and county where project is located, and a USGS 7.5 minute quadrangle with project boundary and quad name marked on the map.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

DISCLAIMER

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Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076837

Project Name: Area No.5 Alt Site 4

Date: 2/8/2007 3:46:27 PM

TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

The web site is intended solely for the purpose of screening projects for potential impacts on resources of special concern in accordance with the instructions provided on the web site. Use of the web site for any other purpose or in any other way is prohibited and subject to criminal prosecution under federal and state law, including but not limited to the following: Computer Fraud and Abuse Act of 1986, as amended, 18 U.S.C. § 1030; Pennsylvania Crimes Code, § 4911 (tampering with public records or information), § 7611 (unlawful use of computer and other computer crimes), § 7612 (disruption of service), § 7613 (computer theft), § 7614 (unlawful duplication), and § 7615 (computer trespass).

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The terms of use may be revised from time to time. By continuing to use the web site after changes to the terms have been posted, the user has agreed to accept such changes.

This review is based on the project information that was entered. The jurisdictional agencies and DEP require that the review be redone if the project area, location, or the type of project changes. If additional information on species of special concern becomes available, this review may be reconsidered by the jurisdictional agency.

PRIVACY and SECURITY

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maintained for internal tracking purposes. Information collected in this application will be made available only to the jurisdictional agencies and to the Department of Environmental Protection, except if required for law enforcement purposes—see paragraph below.

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In order for this project to be considered for subsequent review, a signed and initialed copy of this receipt is required by the agency or agencies indicated. DEP requires that a signed and initialed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted in applications for permits requiring PNDI review. See DEP PNDI policy at www.naturalheritage.state.pa.us or visit the following websites for further information.

Regional Offices

[Http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf](http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf)

District Mining Operations

[Http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm](http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm)

Oil and Gas Management

[Http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm](http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm)

Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076837
Project Name: Area No.5 Alt Site 4
Date: 2/8/2007 3:46:27 PM

Signature: Neil Bossart

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

Phone: (412) 424-2324

Email: nbossart@cecinc.com

The following contact information is for the agencies involved in this

Pennsylvania Natural Diversity Inventory environmental review process.
Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

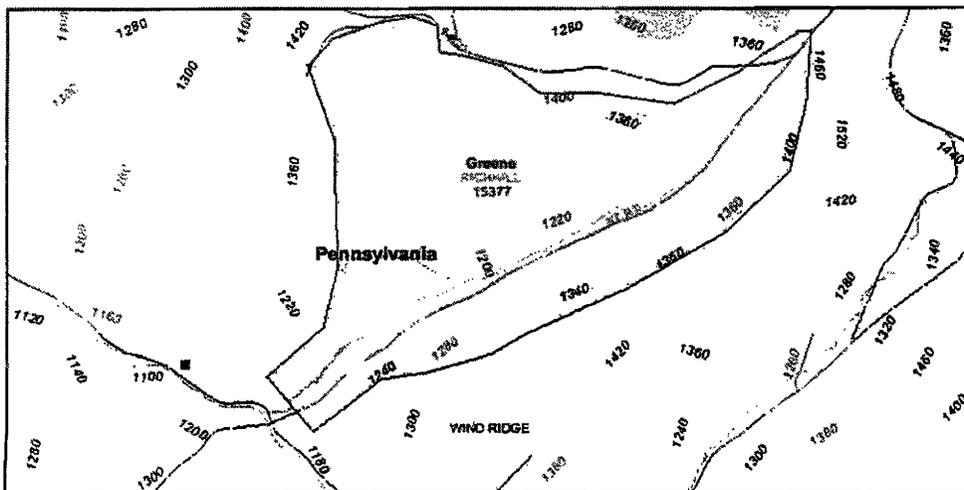
PNDI Project Environmental Review Receipt

Project Search ID: 20070206076171

Project Name: Bailey Area No. 5 Alt Site 5

Date: 2/6/2007 2:12:39 PM

Project Location



Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

0 Known Impacts

Under the Following Agencies' Jurisdiction:
None

Project Name: Bailey Area No. 5 Alt Site 5

On Behalf Of: Self

Project Search ID: 20070206076171

Date: 2/6/2007 2:12:33 PM

of Potential Impacts: 0

Jurisdictional Agency:

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.95971 N, -80.4181 W

Degrees Minutes Seconds: 39° 57' 35" N, 80° 25' 5.2" W

Lambert: -675714.36097488, 357166.03858723 ft

ZIP Code: 15377

County: Greene

Township/Municipality: RICHHILL

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 363.5 acres

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076171

Project Name: Bailey Area No. 5 Alt Site 5

Date: 2/6/2007 2:12:39 PM

Pennsylvania Natural Diversity Inventory (PNDI) records do **NOT** indicate any known impacts on special concern species and resources within the project area. DEP requires a signed copy of this receipt with permit applications being submitted as indication that an environmental review has been conducted and completed. See DEP PNDI policy at www.naturalheritage.state.pa.us for more information.

Based on the information you provided, no further coordination is required by the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, or the Pennsylvania Department of Conservation and Natural Resources with regard to special concern species, natural communities, or outstanding geologic features. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

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Pennsylvania State Programmatic General Permit (PASPGP)

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TERMS OF USE

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PNDI Project Environmental Review Receipt

Project Search ID: 20070206076171
Project Name: Bailey Area No. 5 Alt Site 5
Date: 2/6/2007 2:12:39 PM

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Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

Signature: Chris Bauer

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossert

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076171

Project Name: Bailey Area No. 5 Alt Site 5

Date: 2/6/2007 2:12:39 PM

Phone: (412) 429-2324

Email: nbussard@CEC Inc.com

The following contact information is for the agencies involved in this Pennsylvania Natural Diversity Inventory environmental review process. Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

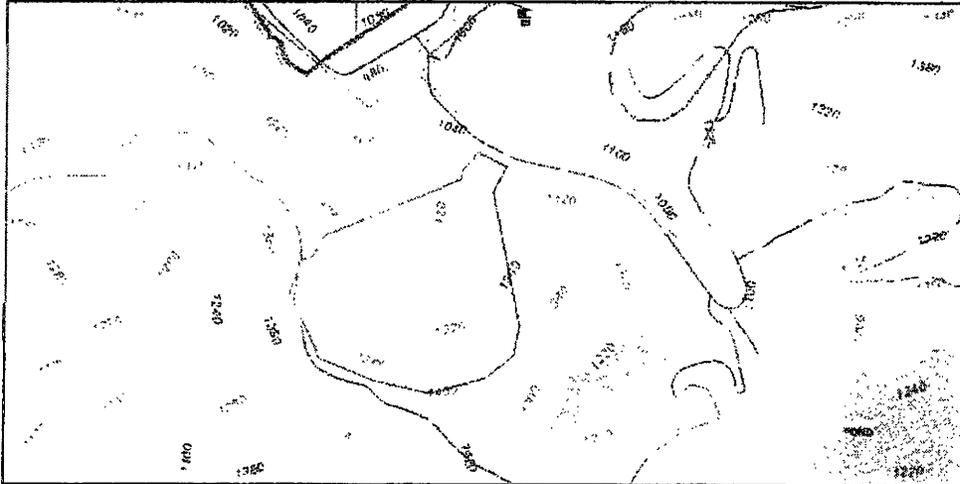
PNDI Project Environmental Review Receipt

Project Search ID: 20070208076838

Project Name: Area No. 5 Alt Site 6

Date: 2/8/2007 3:48:57 PM

Project Location



Project Name: Area No. 5 Alt Site 6

On Behalf Of: Private Individual

Project Search ID: 20070208076838

Date: 2/8/2007 3:48:51 PM

of Potential Impacts: 1

Jurisdictional Agency:

Pennsylvania Department of Conservation and Natural Resources

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.96989 N, -80.42003 W

Degrees Minutes Seconds: 39° 58' 11.6" N, 80° 25' 12.2" W

Lambert: -678748.44751394, 361454.22519186 ft

ZIP Code: 15377

County: Greene

Township/Municipality: RICHHILL

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 95.1 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

1 Potential Impacts

Under the Following Agencies' Jurisdiction
Pennsylvania Department of Conservation
and Natural Resources

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076838
Project Name: Area No. 5 Alt Site 6
Date: 2/8/2007 3:48:57 PM

Pennsylvania Natural Diversity Inventory (PNDI) records indicate there are potential impacts on special concern species and resources within the project area. If the project is pursued, the jurisdictional agency/agencies indicated require that the instructions below regarding potential impacts and/or avoidance measures be followed in their entirety.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

1 potential impact

The Applicant should MAIL/FAX a copy of this Project Environmental Review Receipt, a cover letter with project narrative, acreage to be impacted, how construction/maintenance activity is to be accomplished, township/municipality and county where project is located, and a USGS 7.5 minute quadrangle with project boundary and quad name marked on the map.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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Pennsylvania State Programmatic General Permit (PASPGP)

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PNDI Project Environmental Review Receipt

Project Search ID: 20070208076838

Project Name: Area No. 5 Alt Site 6

Date: 2/8/2007 3:48:57 PM

TERMS OF USE

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Regional Offices

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District Mining Operations

[Http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm](http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm)

Oil and Gas Management

[Http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm](http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm)

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PNDI Project Environmental Review Receipt

Project Search ID: 20070208076838
Project Name: Area No. 5 Alt Site 6
Date: 2/8/2007 3:48:57 PM

Signature: Neil Bossart

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

Phone: (412) 429-2324

Email: nbossart@cecinc.com

The following contact information is for the agencies involved in this

Pennsylvania Natural Diversity Inventory environmental review process.
Please read this entire receipt carefully as it contains instructions for how to
contact these agencies for further review of this particular project.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

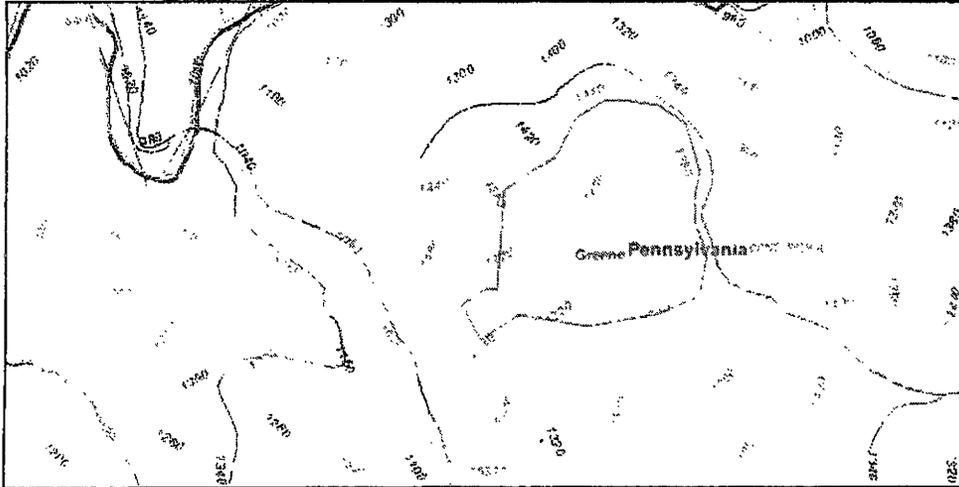
PNDI Project Environmental Review Receipt

Project Search ID: 20070208076841

Project Name: Area No. 5 Alt Site 7

Date: 2/8/2007 3:51:47 PM

Project Location



Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

1 Potential Impacts

Under the Following Agencies' Jurisdiction:
Pennsylvania Department of Conservation
and Natural Resources

Project Name: Area No. 5 Alt Site 7

On Behalf Of: Self

Project Search ID: 20070208076841

Date: 2/8/2007 3:51:41 PM

of Potential Impacts: 1

Jurisdictional Agency:

Pennsylvania Department of Conservation and Natural Resources

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.96345 N, -80.43534 W

Degrees Minutes Seconds: 39° 57' 48.4" N, 80° 26' 7.3" W

Lambert: -681286.78979509, 361253.67178698 ft

ZIP Code: 15377

County: Greene

Township/Municipality: RICHHILL

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 121.2 acres

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076841

Project Name: Area No. 5 Alt Site 7

Date: 2/8/2007 3:51:47 PM

Pennsylvania Natural Diversity Inventory (PNDI) records indicate there are potential impacts on special concern species and resources within the project area. If the project is pursued, the jurisdictional agency/agencies indicated require that the instructions below regarding potential impacts and/or avoidance measures be followed in their entirety.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

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1 potential impact

The Applicant should MAIL/FAX a copy of this Project Environmental Review Receipt, a cover letter with project narrative, acreage to be impacted, how construction/maintenance activity is to be accomplished, township/municipality and county where project is located, and a USGS 7.5 minute quadrangle with project boundary and quad name marked on the map.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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Pennsylvania State Programmatic General Permit (PASPGP)

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PNDI Project Environmental Review Receipt

Project Search ID: 20070208076841

Project Name: Area No. 5 Alt Site 7

Date: 2/8/2007 3:51:47 PM

TERMS OF USE

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District Mining Operations

[Http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm](http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm)

Oil and Gas Management

[Http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm](http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm)

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PNDI Project Environmental Review Receipt

Project Search ID: 20070208076841
Project Name: Area No. 5 Alt Site 7
Date: 2/8/2007 3:51:47 PM

Signature: Neil Bossart

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

Phone: (412) 429-2324

Email: nbossart@cecinc.com

The following contact information is for the agencies involved in this

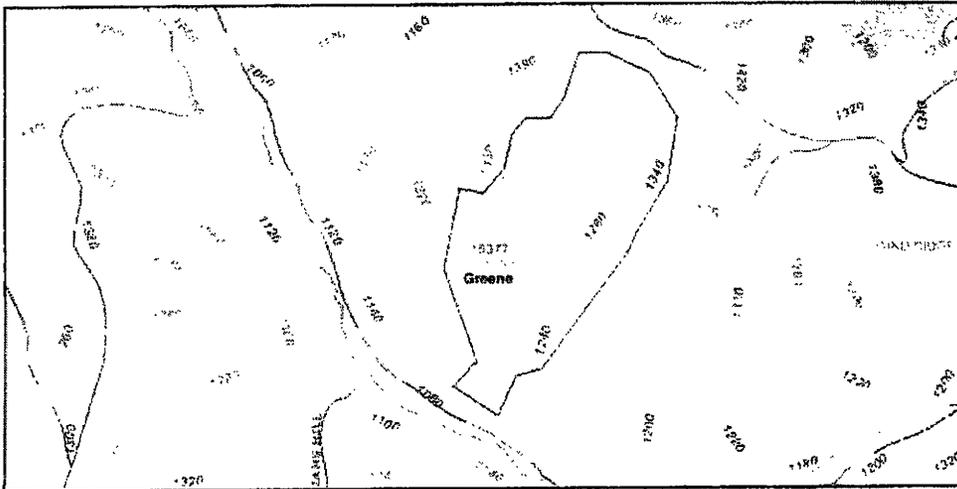
Pennsylvania Natural Diversity Inventory environmental review process.
Please read this entire receipt carefully as it contains instructions for how to
contact these agencies for further review of this particular project.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number (717) 772-0271

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076843
Project Name: Area No. 5 Alt Site 8
Date: 2/8/2007 3:54:25 PM

Project Location



Project Name: Area No. 5 Alt Site 8

On Behalf Of: Private Individual

Project Search ID: 20070208076843

Date: 2/8/2007 3:54:19 PM

of Potential Impacts: 1

Jurisdictional Agency:

Pennsylvania Department of Conservation and Natural Resources

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.95338 N, -80.42993 W

Degrees Minutes Seconds: 39° 57' 12.2" N, 80° 25' 47.8" W

Lambert: -680280.40958973, 358403.01908389 ft

ZIP Code: 15377

County: Greene

Township/Municipality: RICHHILL

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 130.3 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

1 Potential Impacts

Under the Following Agencies' Jurisdiction:
Pennsylvania Department of Conservation
and Natural Resources

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076843
Project Name: Area No. 5 Alt Site 8
Date: 2/8/2007 3:54:25 PM

Pennsylvania Natural Diversity Inventory (PNDI) records indicate there are potential impacts on special concern species and resources within the project area. If the project is pursued, the jurisdictional agency/agencies indicated require that the instructions below regarding potential impacts and/or avoidance measures be followed in their entirety.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

1 potential impact

The Applicant should MAIL/FAX a copy of this Project Environmental Review Receipt, a cover letter with project narrative, acreage to be impacted, how construction/maintenance activity is to be accomplished, township/municipality and county where project is located, and a USGS 7.5 minute quadrangle with project boundary and quad name marked on the map.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

DISCLAIMER

The PNDI environmental review website is a preliminary environmental screening tool. It is not a substitute for information obtained from a field survey of the project area conducted by a biologist. Such surveys may reveal previously undocumented populations of species of special concern. In addition, the PNDI only contains information about species occurrences that have actually been reported to the Pennsylvania Natural Heritage Program.

Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076843

Project Name: Area No. 5 Alt Site 8

Date: 2/8/2007 3:54:25 PM

TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

The web site is intended solely for the purpose of screening projects for potential impacts on resources of special concern in accordance with the instructions provided on the web site. Use of the web site for any other purpose or in any other way is prohibited and subject to criminal prosecution under federal and state law, including but not limited to the following: Computer Fraud and Abuse Act of 1986, as amended, 18 U.S.C. § 1030; Pennsylvania Crimes Code, § 4911 (tampering with public records or information), § 7611 (unlawful use of computer and other computer crimes), § 7612 (disruption of service), § 7613 (computer theft), § 7614 (unlawful duplication), and § 7615 (computer trespass).

The PNHP reserves the right at any time and without notice to modify or suspend the web site and to terminate or restrict access to it.

The terms of use may be revised from time to time. By continuing to use the web site after changes to the terms have been posted, the user has agreed to accept such changes.

This review is based on the project information that was entered. The jurisdictional agencies and DEP require that the review be redone if the project area, location, or the type of project changes. If additional information on species of special concern becomes available, this review may be reconsidered by the jurisdictional agency.

PRIVACY and SECURITY

This web site operates on a Commonwealth of Pennsylvania computer system. It maintains a record of each environmental review search result as well as contact information for the project applicant. These records are

maintained for internal tracking purposes. Information collected in this application will be made available only to the jurisdictional agencies and to the Department of Environmental Protection, except if required for law enforcement purposes—see paragraph below.

This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system consents to such monitoring and is advised that if such monitoring reveals evidence of possible criminal activity, system personnel may provide the evidence to law enforcement officials. See Terms of Use.

In order for this project to be considered for subsequent review, a signed and initialed copy of this receipt is required by the agency or agencies indicated. DEP requires that a signed and initialed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted in applications for permits requiring PNDI review. See DEP PNDI policy at www.naturalheritage.state.pa.us or visit the following websites for further information.

Regional Offices

[Http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf](http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf)

District Mining Operations

[Http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm](http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm)

Oil and Gas Management

[Http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm](http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm)

Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076843
Project Name: Area No. 5 Alt Site 8
Date: 2/8/2007 3:54:25 PM

Signature: Neil Bossart

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

Phone: (412) 429-2324

Email: nbossart@cecinc.com

The following contact information is for the agencies involved in this

Pennsylvania Natural Diversity Inventory environmental review process.
Please read this entire receipt carefully as it contains instructions for how to
contact these agencies for further review of this particular project.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

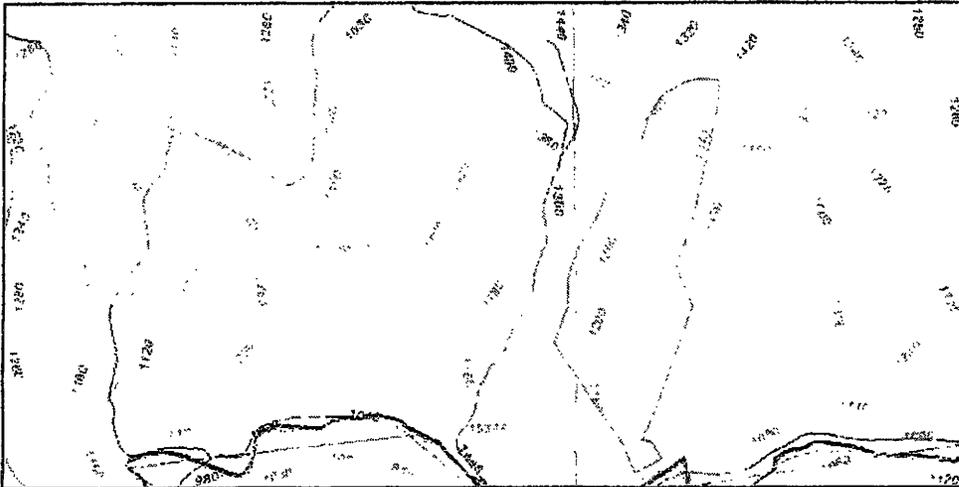
PNDI Project Environmental Review Receipt

Project Search ID: 20070208076844

Project Name: Area No. 5 Alt Site 9

Date: 2/8/2007 3:57:20 PM

Project Location



Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

1 Potential Impacts

Under the Following Agencies' Jurisdiction:
Pennsylvania Department of Conservation
and Natural Resources

Project Name: Area No. 5 Alt Site 9

On Behalf Of: Private Individual

Project Search ID: 20070208076844

Date: 2/8/2007 3:57:15 PM

of Potential Impacts: 1

Jurisdictional Agency:

Pennsylvania Department of Conservation and Natural Resources

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.97702 N, -80.42091 W

Degrees Minutes Seconds: 39° 58' 37.3" N, 80° 25' 15.3" W

Lambert: -678603.65194654, 367623.83366997 ft

ZIP Code: 15377

County: Washington

Township/Municipality: EAST FINLEY, WEST FINLEY

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 130.3 acres

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076844

Project Name: Area No. 5 Alt Site 9

Date: 2/8/2007 3:57:20 PM

Pennsylvania Natural Diversity Inventory (PNDI) records indicate there are potential impacts on special concern species and resources within the project area. If the project is pursued, the jurisdictional agency/agencies indicated require that the instructions below regarding potential impacts and/or avoidance measures be followed in their entirety.

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This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

1 potential impact

The Applicant should MAIL/FAX a copy of this Project Environmental Review Receipt, a cover letter with project narrative, acreage to be impacted, how construction/maintenance activity is to be accomplished, township/municipality and county where project is located, and a USGS 7.5 minute quadrangle with project boundary and quad name marked on the map.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076844

Project Name: Area No. 5 Alt Site 9

Date: 2/8/2007 3:57:20 PM

TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

The web site is intended solely for the purpose of screening projects for potential impacts on resources of special concern in accordance with the instructions provided on the web site. Use of the web site for any other purpose or in any other way is prohibited and subject to criminal prosecution under federal and state law, including but not limited to the following: Computer Fraud and Abuse Act of 1986, as amended, 18 U.S.C. § 1030; Pennsylvania Crimes Code, § 4911 (tampering with public records or information), § 7611 (unlawful use of computer and other computer crimes), § 7612 (disruption of service), § 7613 (computer theft), § 7614 (unlawful duplication), and § 7615 (computer trespass).

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PRIVACY and SECURITY

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Regional Offices

[Http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf](http://www.dep.state.pa.us/dep/deputate/fieldops/map.pdf)

District Mining Operations

[Http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm](http://www.dep.state.pa.us/dep/deputate/minres/Districts/homepage/Default.htm)

Oil and Gas Management

[Http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm](http://www.dep.state.pa.us/dep/deputate/minres/OILGAS/CustomerNeeds.htm)

Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

PNDI Project Environmental Review Receipt

Project Search ID: 20070208076844

Project Name: Area No. 5 Alt Site 9

Date: 2/8/2007 3:57:20 PM

Signature: Mark B...

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

Phone: (412) 429-2324

Email: nbossart@cecinc.com

Pennsylvania Natural Diversity Inventory environmental review process.
Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

Ecological Services Section
Pennsylvania Department of Conservation and Natural Resources
Bureau of Forestry
P.O. Box 8552
Harrisburg, PA 17105-8552
FAX Number: (717) 772-0271

The following contact information is for the agencies involved in this

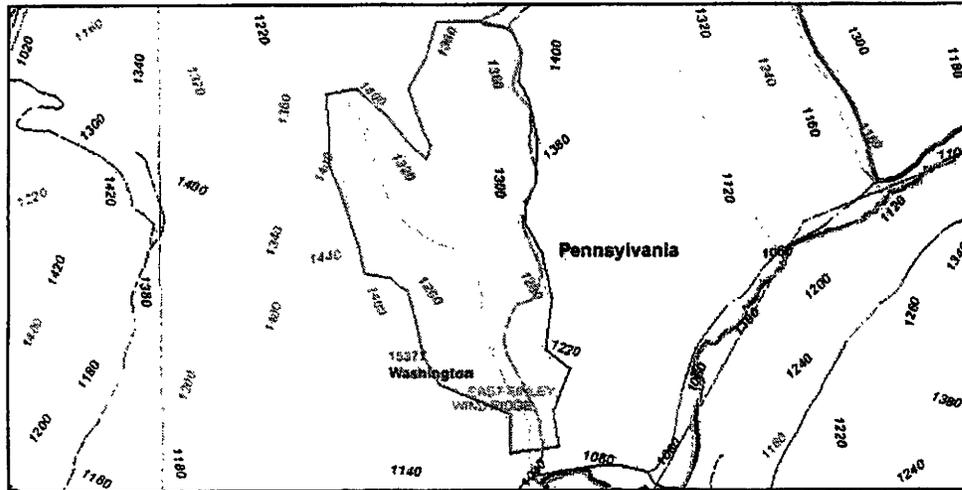
PNDI Project Environmental Review Receipt

Project Search ID: 20070206076197

Project Name: Bailey Area No. 5 Alt Site 10

Date: 2/6/2007 2:35:33 PM

Project Location



Project Name: Bailey Area No. 5 Alt Site 10

On Behalf Of: Self

Project Search ID: 20070206076197

Date: 2/6/2007 2:35:27 PM

of Potential Impacts: 0

Jurisdictional Agency:

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.98623 N, -80.41216 W

Degrees Minutes Seconds: 39° 59' 10.4" N, 80° 24' 43.8" W

Lambert: -674964.36643476, 369593.99392720 ft

ZIP Code: 15377

County: Washington

Township/Municipality: EAST FINLEY

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 313.5 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

0 Known Impacts

Under the Following Agencies' Jurisdiction:
None

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076197

Project Name: Bailey Area No. 5 Alt Site 10

Date: 2/6/2007 2:35:33 PM

Pennsylvania Natural Diversity Inventory (PNDI) records do **NOT** indicate any known impacts on special concern species and resources within the project area. DEP requires a signed copy of this receipt with permit applications being submitted as indication that an environmental review has been conducted and completed. See DEP PNDI policy at www.naturalheritage.state.pa.us for more information.

Based on the information you provided, no further coordination is required by the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, or the Pennsylvania Department of Conservation and Natural Resources with regard to special concern species, natural communities, or outstanding geologic features. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

DISCLAIMER

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Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076197
Project Name: Bailey Area No. 5 Alt Site 10
Date: 2/6/2007 2:35:33 PM

The web site is intended solely for the purpose of screening projects for potential impacts on resources of special concern in accordance with the instructions provided on the web site. Use of the web site for any other purpose or in any other way is prohibited and subject to criminal prosecution under federal and state law, including but not limited to the following: Computer Fraud and Abuse Act of 1986, as amended, 18 U.S.C. § 1030; Pennsylvania Crimes Code, § 4911 (tampering with public records or information), § 7611 (unlawful use of computer and other computer crimes), § 7612 (disruption of service), § 7613 (computer theft), § 7614 (unlawful duplication), and § 7615 (computer trespass).

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This review is based on the project information that was entered. The jurisdictional agencies and DEP require that the review be redone if the project area, location, or the type of project changes. If additional information on species of special concern becomes available, this review may be reconsidered by the jurisdictional agency.

PRIVACY and SECURITY

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This system is monitored to ensure proper operation, to verify the functioning

of applicable security features, and for other like purposes. Anyone using this system consents to such monitoring and is advised that if such monitoring reveals evidence of possible criminal activity, system personnel may provide the evidence to law enforcement officials. See Terms of Use.
Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

Signature: Neil Bassett

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: Neil

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bassett

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076197

Project Name: Bailey Area No. 5 Alt Site 10

Date: 2/6/2007 2:35:33 PM

Phone: (412) 424-2324

Email: ntrossat@cecinc.com

The following contact information is for the agencies involved in this Pennsylvania Natural Diversity Inventory environmental review process. Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

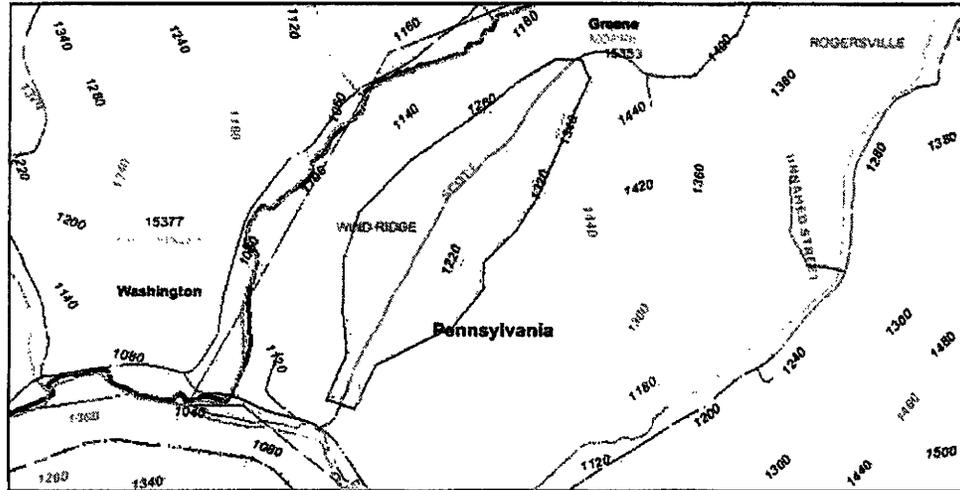
PNDI Project Environmental Review Receipt

Project Search ID: 20070206076203

Project Name: Bailey Area No. 5 Alt Site 11

Date: 2/6/2007 2:39:27 PM

Project Location



Project Name: Bailey Area No. 5 Alt Site 11

On Behalf Of: Self

Project Search ID: 20070206076203

Date: 2/6/2007 2:39:21 PM

of Potential Impacts: 0

Jurisdictional Agency:

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.97771 N, -80.39122 W

Degrees Minutes Seconds: 39° 58' 39.8" N, 80° 23' 28.4" W

Lambert: -669006.22694162, 367580.39382301 ft

ZIP Code: 15353

County: Greene

Township/Municipality: MORRIS

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 121.4 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

0 Known Impacts

Under the Following Agencies' Jurisdiction:
None

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076203

Project Name: Bailey Area No. 5 Alt Site 11

Date: 2/6/2007 2:39:27 PM

Pennsylvania Natural Diversity Inventory (PNDI) records do **NOT** indicate any known impacts on special concern species and resources within the project area. DEP requires a signed copy of this receipt with permit applications being submitted as indication that an environmental review has been conducted and completed. See DEP PNDI policy at www.naturalheritage.state.pa.us for more information.

Based on the information you provided, no further coordination is required by the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, or the Pennsylvania Department of Conservation and Natural Resources with regard to special concern species, natural communities, or outstanding geologic features. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076203

Project Name: Bailey Area No. 5 Alt Site 11

Date: 2/6/2007 2:39:27 PM

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Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

Signature: Neil Bossert

Date: 2/5/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bossert

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076203

Project Name: Bailey Area No. 5 Alt Site 11

Date: 2/6/2007 2:39:27 PM

Phone:

(412) 429-2327

Email:

nboss@tsecinc.com

The following contact information is for the agencies involved in this Pennsylvania Natural Diversity Inventory environmental review process. Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

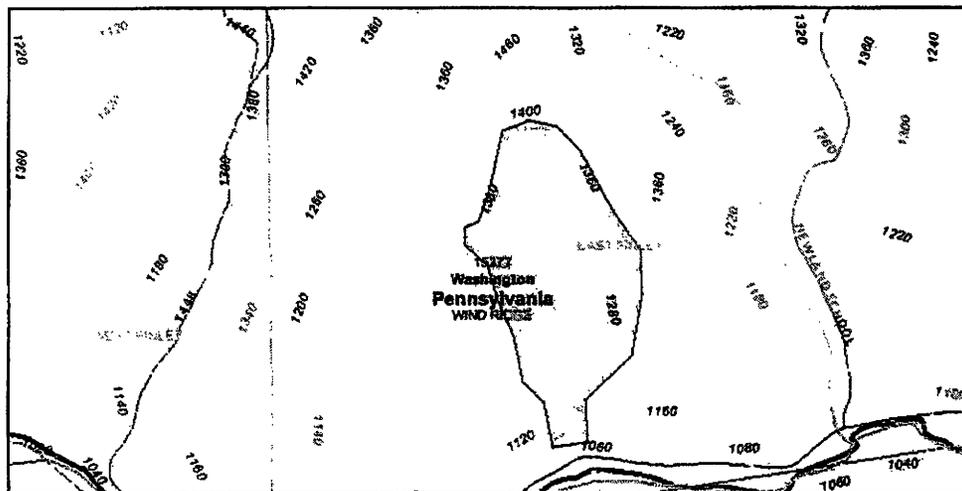
PNDI Project Environmental Review Receipt

Project Search ID: 20070206076206

Project Name: Bailey Area No. 5 Alt Site 12

Date: 2/6/2007 2:43:09 PM

Project Location



Project Name: Bailey Area No. 5 Alt Site 12

On Behalf Of: Self

Project Search ID: 20070206076206

Date: 2/6/2007 2:43:03 PM

of Potential Impacts: 0

Jurisdictional Agency:

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.98643 N, -80.41474 W

Degrees Minutes Seconds: 39° 59' 11.1" N, 80° 24' 53.1" W

Lambert: -676599.51769897, 367289.50056097 ft

ZIP Code: 15377

County: Washington

Township/Municipality: EAST FINLEY

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 78.0 acres

Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

0 Known Impacts

Under the Following Agencies' Jurisdiction:
None

CB

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076206

Project Name: Bailey Area No. 5 Alt Site 12

Date: 2/6/2007 2:43:09 PM

Pennsylvania Natural Diversity Inventory (PNDI) records do **NOT** indicate any known impacts on special concern species and resources within the project area. DEP requires a signed copy of this receipt with permit applications being submitted as indication that an environmental review has been conducted and completed. See DEP PNDI policy at www.naturalheritage.state.pa.us for more information.

Based on the information you provided, no further coordination is required by the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, or the Pennsylvania Department of Conservation and Natural Resources with regard to special concern species, natural communities, or outstanding geologic features. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

These determinations were based on the project-specific information you provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the information you provided does not accurately reflect this project, or if project plans change, DEP and the jurisdictional agencies require that another PNDI review be conducted.

This response represents the most up-to-date summary of the PNDI data files and is good for one(1) year from the date of this PNDI Project Environmental Review Receipt.

DISCLAIMER

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Pennsylvania State Programmatic General Permit (PASPGP)

Please note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Chester, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) are required by DEP to comply with the bog turtle habitat screening requirements of the PASPGP.

TERMS OF USE

Upon signing into the PNDI environmental review website, and as a condition of using it, you agreed to certain terms of use. These are as follows:

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076206

Project Name: Bailey Area No. 5 Alt Site 12

Date: 2/6/2007 2:43:09 PM

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Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

Signature: *Neil Barsart*

Date: 2/5/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: *Neil Barsart*

Address: *333 Baldwin Rd*

City, State, Zip: *Pittsburgh Pa 15205*

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076206

Project Name: Bailey Area No. 5 Alt Site 12

Date: 2/6/2007 2:43:09 PM

Phone:

(412) 429-2324

Email:

mbassett@cecinc.com

The following contact information is for the agencies involved in this Pennsylvania Natural Diversity Inventory environmental review process. Please read this entire receipt carefully as it contains instructions for how to contact these agencies for further review of this particular project.

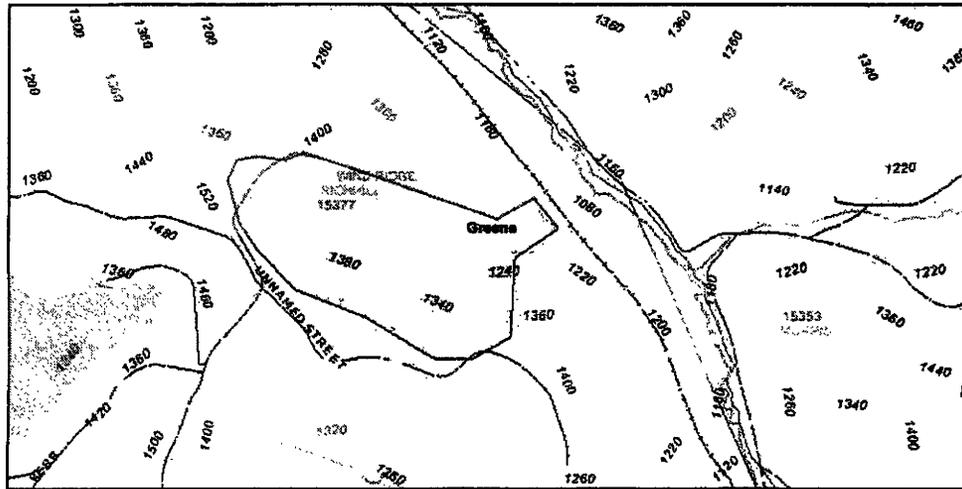
PNDI Project Environmental Review Receipt

Project Search ID: 20070206076214

Project Name: Bailey Area No. 5 Alt Site 13

Date: 2/6/2007 2:48:55 PM

Project Location



Location Accuracy

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

0 Known Impacts

Under the Following Agencies' Jurisdiction:
None

Project Name: Bailey Area No. 5 Alt Site 13

On Behalf Of: Self

Project Search ID: 20070206076214

Date: 2/6/2007 2:48:50 PM

of Potential Impacts: 0

Jurisdictional Agency:

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.9682 N, -80.39218 W

Degrees Minutes Seconds: 39° 58' 5.5" N, 80° 23' 31.9" W

Lambert: -669176.44217027, 360977.44606624 ft

ZIP Code: 15377

County: Greene

Township/Municipality: RICHHILL

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 89.2 acres

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076214

Project Name: Bailey Area No. 5 Alt Site 13

Date: 2/6/2007 2:48:55 PM

Pennsylvania Natural Diversity Inventory (PNDI) records do **NOT** indicate any known impacts on special concern species and resources within the project area. DEP requires a signed copy of this receipt with permit applications being submitted as indication that an environmental review has been conducted and completed. See DEP PNDI policy at www.naturalheritage.state.pa.us for more information.

Based on the information you provided, no further coordination is required by the Pennsylvania Game Commission, the Pennsylvania Fish and Boat Commission, or the Pennsylvania Department of Conservation and Natural Resources with regard to special concern species, natural communities, or outstanding geologic features. This response does not reflect potential agency concerns regarding impacts to other ecological resources, such as wetlands.

Based on the project-specific information you provided, no impacts to federally listed, proposed, or candidate species are anticipated. Therefore, no further consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.* is required with the U.S. Fish and Wildlife Service. Because no take of federally listed species is anticipated, none is authorized. For a list of species that could occur in your project area (but have not been documented in PNDI), please see the county lists of threatened, endangered, and candidate species. A field visit or survey may reveal previously undocumented populations of one or more threatened or endangered species with a project area. If it is determined that any federally listed species occur in your project area, the U.S. Fish and Wildlife Service requires that you initiate consultation to identify and resolve any conflicts. This response does not reflect potential Fish and Wildlife Service concerns under the Fish and Wildlife Coordination Act or other authorities.

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TERMS OF USE

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PNDI Project Environmental Review Receipt

Project Search ID: 20070206076214

Project Name: Bailey Area No. 5 Alt Site 13

Date: 2/6/2007 2:48:55 PM

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Signature: Neil Bassart

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bassart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076214

Project Name: Bailey Area No. 5 Alt Site 13

Date: 2/6/2007 2:48:55 PM

Phone: (412) 429-2324

Email: nbossart@cecinc.com

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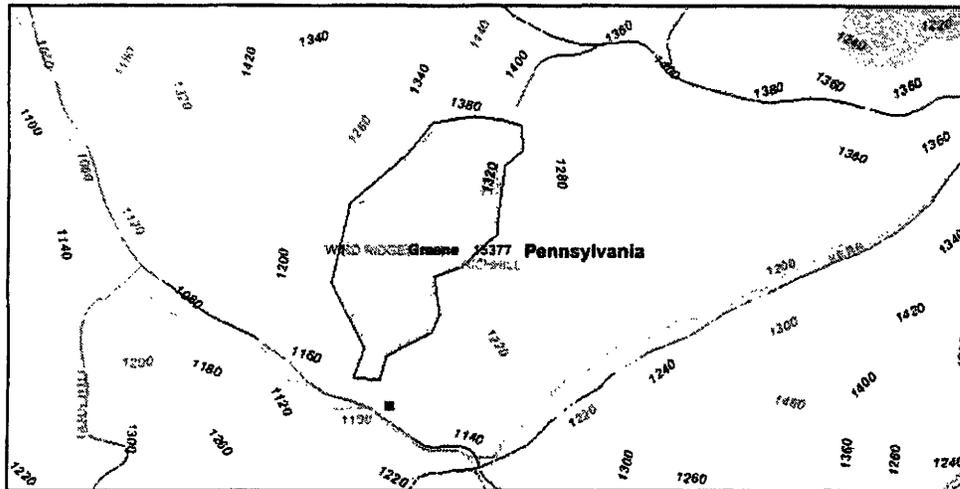
PNDI Project Environmental Review Receipt

Project Search ID: 20070206076221

Project Name: Bailey Area No. 5 Alt Site 14

Date: 2/6/2007 2:55:39 PM

Project Location



Project Name: Bailey Area No. 5 Alt Site 14

On Behalf Of: Self

Project Search ID: 20070206076221

Date: 2/6/2007 2:55:33 PM

of Potential Impacts: 0

Jurisdictional Agency:

Project Category: Mining, Coal (strip, deep, long-wall, refuse disposal)

Project Location

Decimal Degrees: 39.95002 N, -80.42409 W

Degrees Minutes Seconds: 39° 57' 0.1" N, 80° 25' 26.8" W

Lambert: -679160.14132838, 357183.04363350 ft

ZIP Code: 15377

County: Greene

Township/Municipality: RICHHILL

USGS 7.5 Minute Quadrangle ID: 789

Quadrangle Name: WIND RIDGE

Project Area: 75.8 acres

Location Accuracy

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0 Known Impacts

Under the Following Agencies' Jurisdiction:
None

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076221

Project Name: Bailey Area No. 5 Alt Site 14

Date: 2/6/2007 2:55:39 PM

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Print this Project Review Receipt using your Internet browser's print function and keep it as a record of your search.

Signature: David Brown

Date: 2/8/07

Project applicant on whose behalf this search was conducted:

APPLICANT

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

Email: _____

PERSON CONDUCTING SEARCH (if not applicant)

Contact Name: Neil Bassart

Address: 333 Baldwin Rd

City, State, Zip: Pittsburgh Pa 15205

PNDI Project Environmental Review Receipt

Project Search ID: 20070206076221

Project Name: Bailey Area No. 5 Alt Site 14

Date: 2/6/2007 2:55:39 PM

Phone:

(412) 429-2324

Email:

mboissier@cecinc.com

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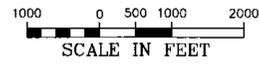


LEGEND

- STREAMS FROM USGS QUADRANGLES
- STREAMS FROM SCS COUNTY SOIL SURVEY
- DWELLINGS WITHIN OR NEAR POTENTIAL SITES
- WETLANDS - FROM NWI MAPS
- PRIME FARMLAND SOIL UNITS
- POTENTIAL DISPOSAL AREA BOUNDARY
- SEARCH AREA BOUNDARY
- HIGH QUALITY WATERSHED BOUNDARY
- GAS TRANSMISSION LINE
- ELECTRIC TRANSMISSION LINE
- POLITICAL BOUNDARY
- STREAM SAMPLING LOCATION

Baker

SOURCE: HIND RIDGE, ROBERTSVILLE, CLAYVILLE, AND PROSPERITY, PA. USGS 7.5 MIN. QUADRANGLES



REV.	REVISION DESCRIPTION	MADE BY	CHKD BY	DATE

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CONSOL PENNSYLVANIA COAL COMPANY

DRAWN BY: KCent
 DESIGNED BY: GHeithman
 CHECKED BY: GHeithman
 APPROVED BY: MStewart

DATE: 03/07
 DATE: 03/07
 DATE: 04/07
 DATE: 04/07

BAILEY CENTRAL MINE COMPLEX
 ALTERNATIVE ANALYSIS & SITE SELECTION STUDY
 NEW COAL REFUSE DISPOSAL AREA NO. 5
 SITE ASSESSMENT MAP

SCALE: 1" = 1000'
 PROJECT NO: 109957
 DRAWING NO: 1
 EXHIBIT: 1