

# Upper Ohio Navigation Study

## The Upper Ohio River Modernization Tour

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US Army Corps of Engineers  
**BUILDING STRONG®**



# Upper Ohio Navigation Study, PA

## EDM



### Emsworth Locks and Dams

- River Mile 6.2
- Constructed 1919 -1922

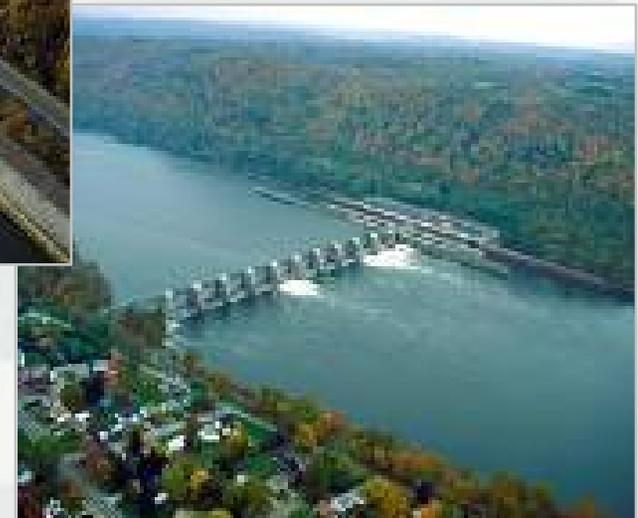


### Dashields Locks and Dam

- River Mile 13.3
- Constructed 1927 -1929

### Montgomery Locks and Dam

- River Mile 31.7
- Constructed 1932 -1936



# *Agenda*

**1. BACKGROUND**

**2. SCHEDULE**

**3. STUDY EFFORTS**

**4. TENTATIVE RECOMMENDED PLAN**



# *Upper Ohio Navigation Study Key Points Up Front*

- Deteriorating Condition of Emsworth, Dashiels and Montgomery Locks and Dams Driving the Study!
- Compelling Reason to Expeditiously Deal with Emsworth, Dashiels and Montgomery
- This is a Great Lakes and Ohio River Division Regional Study
- Mission is to Keep River Open



## *Upper Ohio River Navigation Study Study Focus*

- Actions Most Likely to Sustain Safe and Reliable Navigation on Upper Ohio River in an Environmentally Acceptable Manner
- Only Reasonable Alternatives Should be Carried Forward in Study



# Upper Ohio Navigation Study Project Location



- Located within 32 Miles of the Point in Pittsburgh



# Upper Ohio Navigation Study Background

- Linkage to Ohio River Mainstem System Study (ORMSS)
- EDM the Top Priority Out of ORMSS



Recommended Emsworth, Dashields and Montgomery Locks and Dams as the top priority on the Ohio River



# *Emsworth Locks and Dams*



## *Emsworth Locks and Dams*

- Locks and Dams Constructed 1919-1922
- Dam Reconstructed for Gated Dam in 1935-1938
- Lock Major Rehabilitation 1982 – 1985 (\$37.5M)
- Upper Pool 710.0; Lower Pool 692.0; Lift 18.0 feet
- Locks 110'x600' (main); 56'x360' (aux)
- Dams Type: Vertical Lift Crest Gates
  - ▶ Main Channel – 967' long; 8 Gates 100' long
  - ▶ Back Channel – 750' long; 6 Gates 100' long
  - ▶ Timber Pile Foundation
- Dam Rehabilitation Currently In Progress
  - ▶ BC Dam – Gates and machinery replaced 2007.
  - ▶ MC Dam – Gates, machinery and scour protection: 2008 - 2012.
  - ▶ BC Dam – Scour protection: 2010 - 2013.

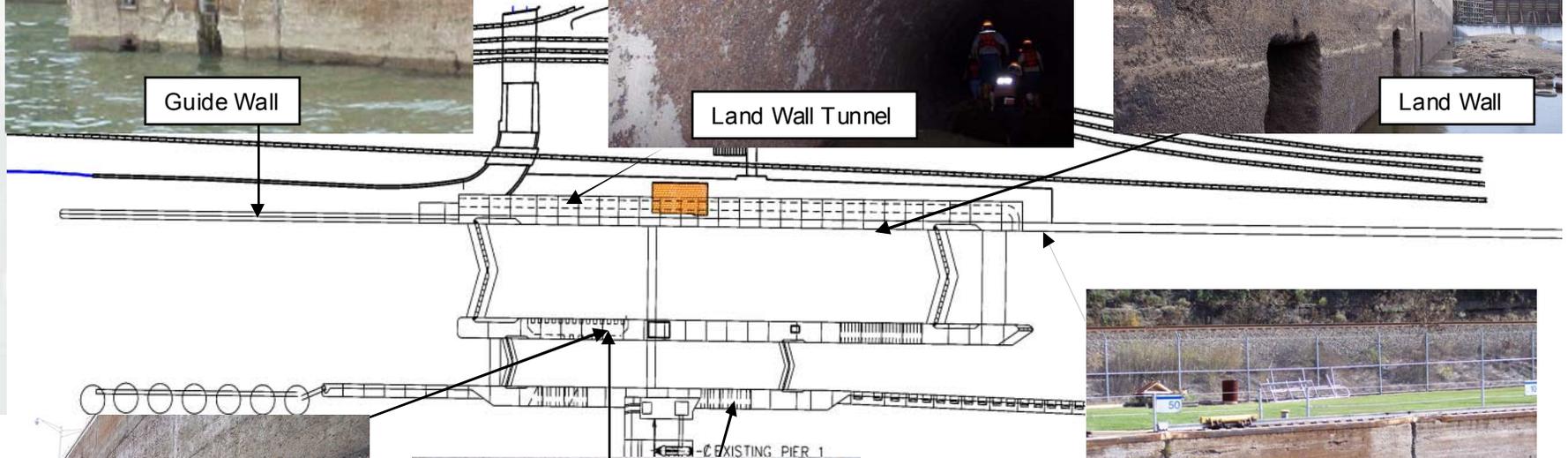
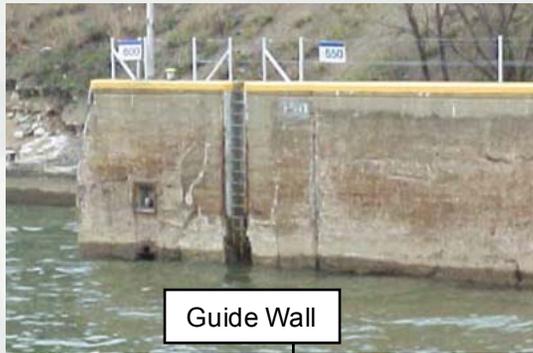


## *Emsworth Locks and Dams Issues*

- Lock Condition
  - ▶ Age: 88 years old
  - ▶ Stability
  - ▶ Concrete
  - ▶ Cracking
- Dam
  - ▶ Gate Failures
  - ▶ Scour



# Emsworth Locks – Problem Areas



# *Dashields Locks and Dam*



Fixed Crest Dam

Locks on Left Bank

Flow



## *Dashiels Locks and Dam*

- Locks and Dam Constructed 1927-1929
- Lock Major Rehabilitation 1987-1990 (\$33.5M)
- Upper Pool 692.0; Lower Pool 682.0; Lift 10.0 feet
- Locks 110'x600' (main); 56'x360' (aux)
- Dams Type: Concrete Fixed Crest Dam
  - ▶ Overall length – 1,585 feet
  - ▶ Rock Foundation

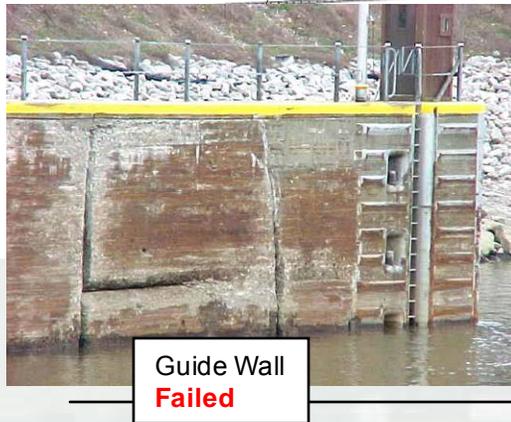
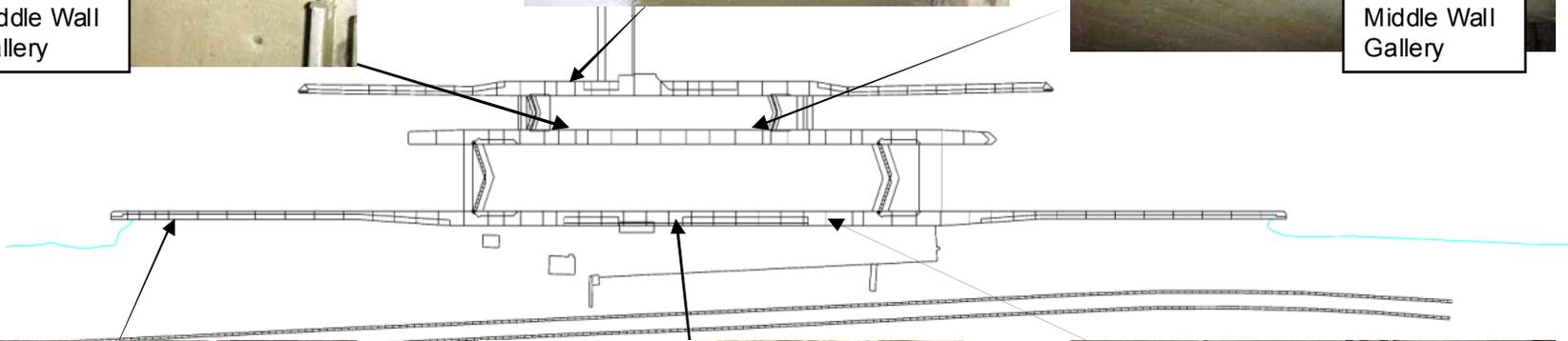


## *Dashiels Locks and Dam*

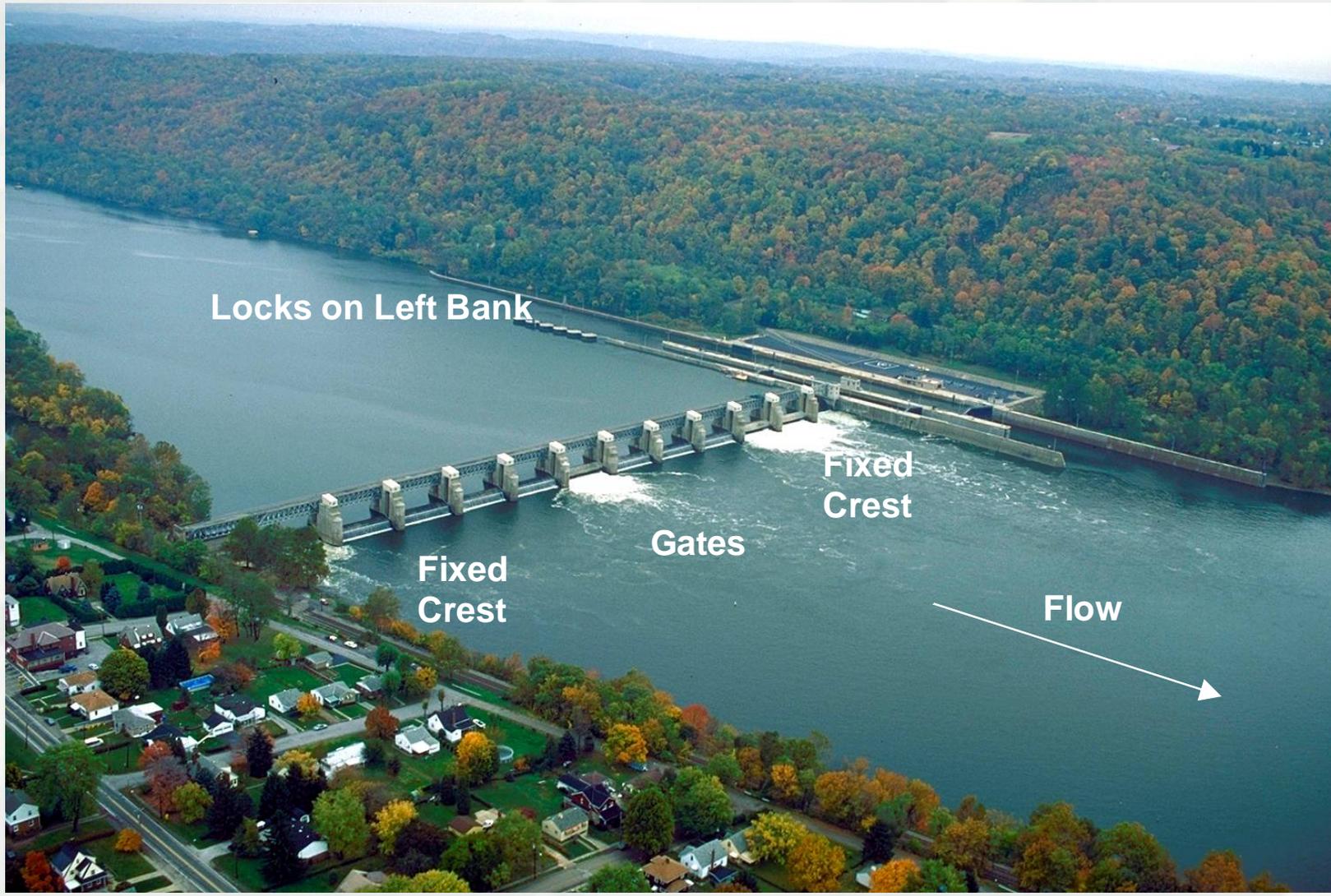
- Lock Condition
  - ▶ Age: 81 years old
  - ▶ Concrete
  - ▶ Cracking
  - ▶ Stability



# Dashiels Locks – Problem Areas



# Montgomery Locks and Dam



## *Montgomery Locks and Dam*

- Locks and Dam Constructed 1932-1936
- Major Rehabilitation 1985 – 1989 (\$32.0M)
- Upper Pool 682.0; Lower Pool 664.5; Lift 17.5 feet
- Locks 110'x600' (main); 56'x360' (aux)
- Dam Type: Vertical Lift Crest Gates & Fixed Crest
  - ▶ 10 gates – 100 feet long
  - ▶ Overall Length 1,379 feet
- Emergency Gate Repairs/Replacements - Ongoing
  - ▶ Barge accident in 2006 destroyed gates 4 and 8 – Replaced
  - ▶ Four gates repaired – 2007; 3-5 year life
  - ▶ Additional repairs scheduled for FY10
- Emergency Scour Protection - Completed
  - ▶ Repair scour hole downstream of gate bay #1
- Dam: Interim Risk Reduction Plan - 2010



# Montgomery Locks and Dam Issues



## ▪ Lock Condition

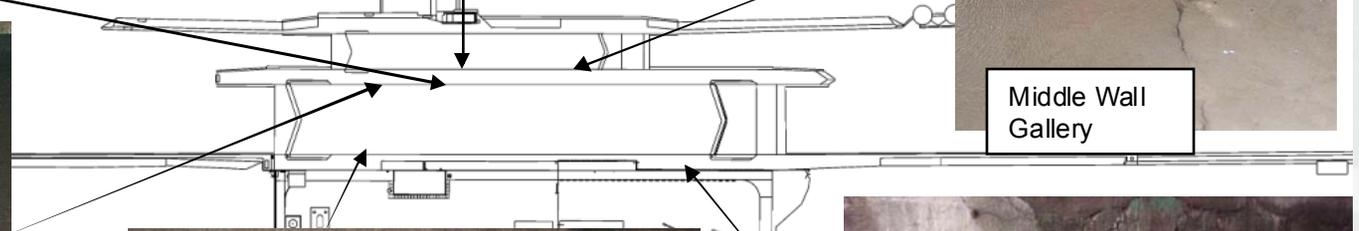
- ▶ Age: 74 years old
- ▶ Stability
- ▶ Concrete
- ▶ Cracking

## ▪ Dam Condition

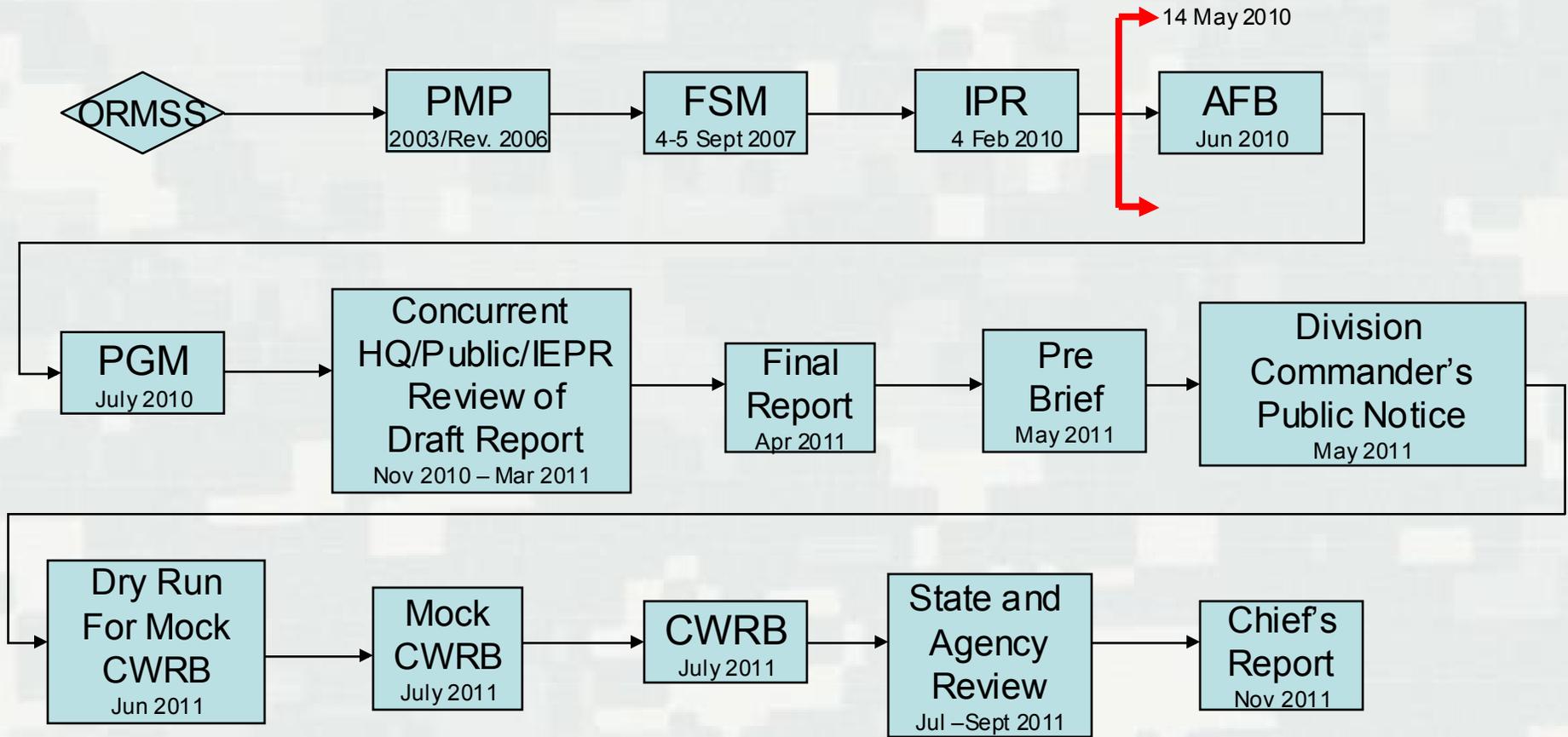
- ▶ Gate Failures
- ▶ Dam Pier Cracking
- ▶ Scour
- ▶ Dam Safety Action Class (DSAC) II



# Montgomery Locks – Problem Areas



# Upper Ohio Navigation Study Schedule Update



# *Upper Ohio Navigation Study Schedule Update*

- Objective: Complete study and obtain authorization in 2011.



## NEW LOCK CONSTRUCTION PLANS

	Main (River Chamber)	Auxiliary (Land Chamber)
1.	New 110 x 600	New 110 x 600
2.	New 110 x 800	New 110 x 600
3.	New 110 x 1200	New 110 x 600
4.	New 110 x 600	Adv Maintenance of existing 600
5.	New 110 x 800	Adv Maintenance of existing 600
6.	New 110 x 1200	Adv Maintenance of existing 600
7.	New 110 x 600	Fix as Fail of existing 600
8.	New 110 x 800	Fix as Fail of existing 600
9.	New 110 x 1200	Fix as Fail of existing 600
10.	New 110 x 600	Close After Failure of existing 600
11.	New 110 x 800	Close After Failure of existing 600
12.	New 110 x 1200	Close After Failure of existing 600



# *Upper Ohio Navigation Study Engineering*

## Engineering Analysis:

- Risk and Reliability
- Conceptual Design
- Screening Level Cost Estimates
- Screening Level Construction Schedules
- Environmental Compliance Support
- Real Estate Support



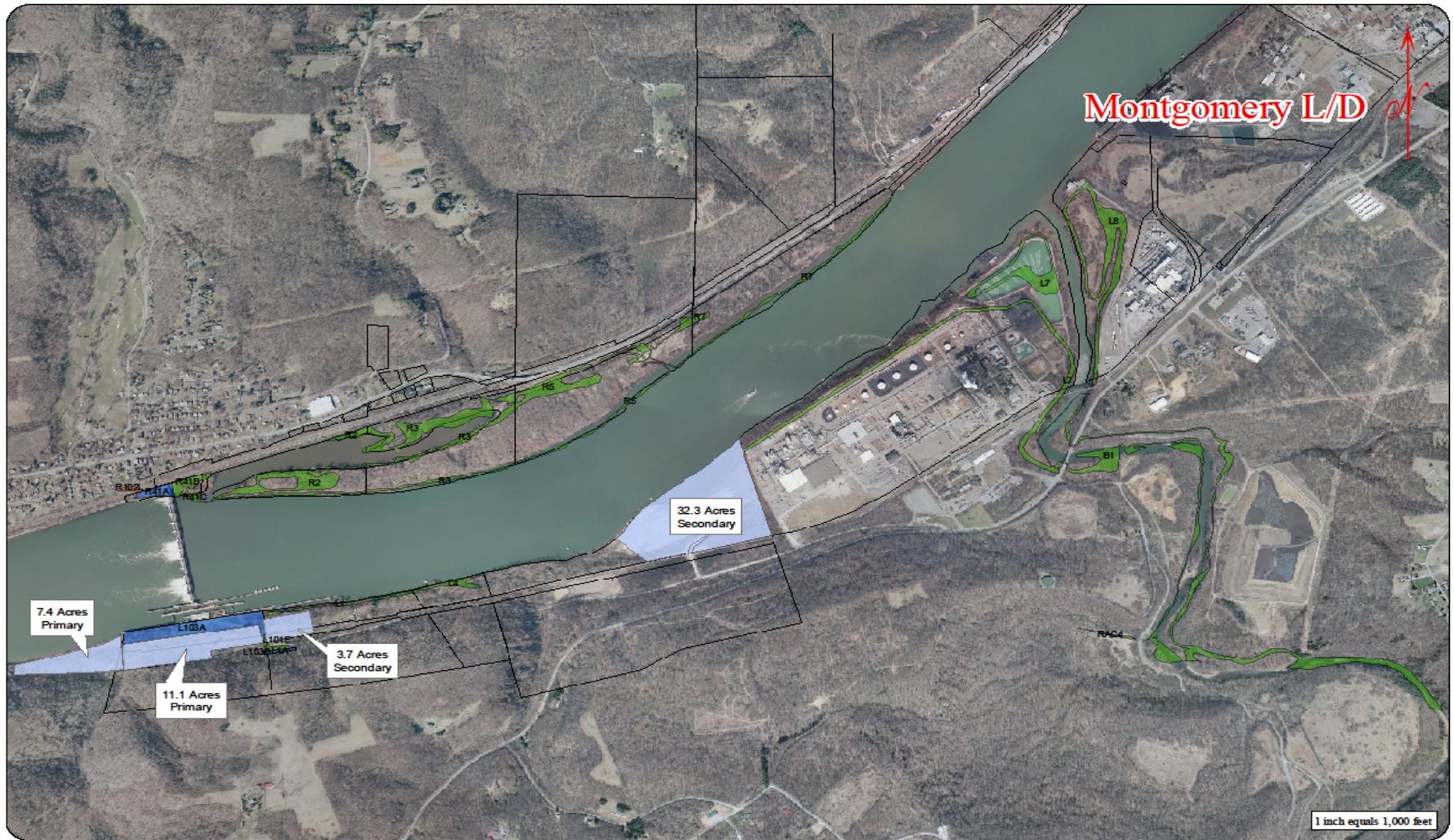
# Upper Ohio Navigation Study Engineering



# Upper Ohio Navigation Study Engineering



# Upper Ohio Navigation Study Engineering



# Alt #1 – Dual New 110'x600' Lock Chambers



Imagery Date: Jun 2007

40°30'10.32" N 80°05'19.59" W elev 708 ft

©2009 Google  
Eye alt 4437 ft

# Alt #4 – New Single 110'x600' Lock Chamber



# *Upper Ohio Navigation Study Environmental*

## Environmental Analysis:

- Environmental Baseline
  - Cultural Resources
  - Fish and Mussel Surveys
  - Substrate Analysis
  - Work Area Surveys
- Cumulative Effects
- Fish Passage
- National Ecosystem Restoration (NER)



# *Upper Ohio Navigation Study Environmental*

## National Ecosystem Restoration - NER



# *Upper Ohio Navigation Study Environmental*

## NER – Foreshore Dike Example



# Upper Ohio Navigation Study Environmental

## NER – Montgomery Slough



# *Upper Ohio Navigation Study*

## *Economics*

### Economic Analysis:

- Capacity
- Traffic Projections (Coal and Non-Coal)
- Transportation Rate Analysis
- Externalities
- Modeling



# *Upper Ohio Navigation Study Formulation*

- Evaluated in Four Areas
  - ▶ National Economic Development
  - ▶ Regional Economic Development
  - ▶ Environmental Quality
  - ▶ Other Social Effects
  
- Formulation Criteria
  - ▶ Completeness
  - ▶ Effectiveness
  - ▶ Efficiency
  - ▶ Acceptability by the State and local entities



# *Upper Ohio Navigation Study*

## *TENTATIVE RECOMMEND PLAN*



## *Upper Ohio Navigation Study Tentative Recommended Plan*

- ▶ New 110'x600' Main River Chamber
- ▶ Deferred New Auxiliary Land Chamber
  - Minimum 110'x600'
  - Final size verified prior to construction
- ▶ Same at Emsworth, Dashiields and Montgomery





# Dashields Dual New 110'x600' Lock Chambers



Imagery Date: Jun 2007

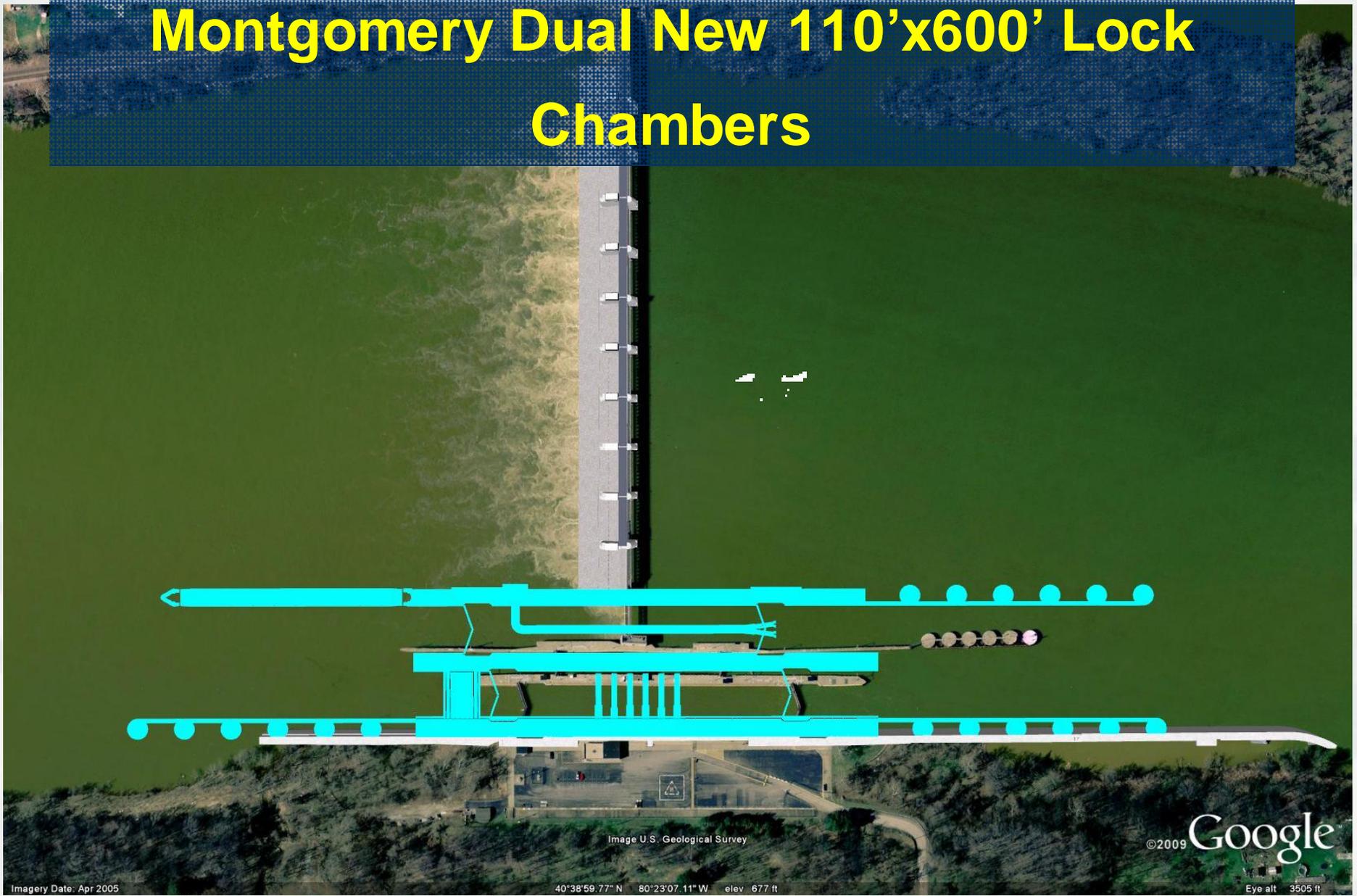
Image U.S. Geological Survey

40°33'01.05" N 80°12'15.34" W elev. 689 ft

©2009 Google

Eye alt 3720 ft

# Montgomery Dual New 110'x600' Lock Chambers



# Conclusion

- Reinvestment at Emsworth, Dashiels and Montgomery an Urgent Priority
- Prompt Completion of Upper Ohio Feasibility Report Essential



# Contact Information

## Resources

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