

IWTF Projects Update Inland Waterways Users Board (Meeting No. 83)

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Agenda

- Olmsted
- Lower Mon
- KY Lock
- Chickamauga Lock

Olmsted

Bottom Line Up Front

✓ Current Schedule: **Ahead of Schedule**

- 2018 (Project Operational)
- 2022 (Project Complete)

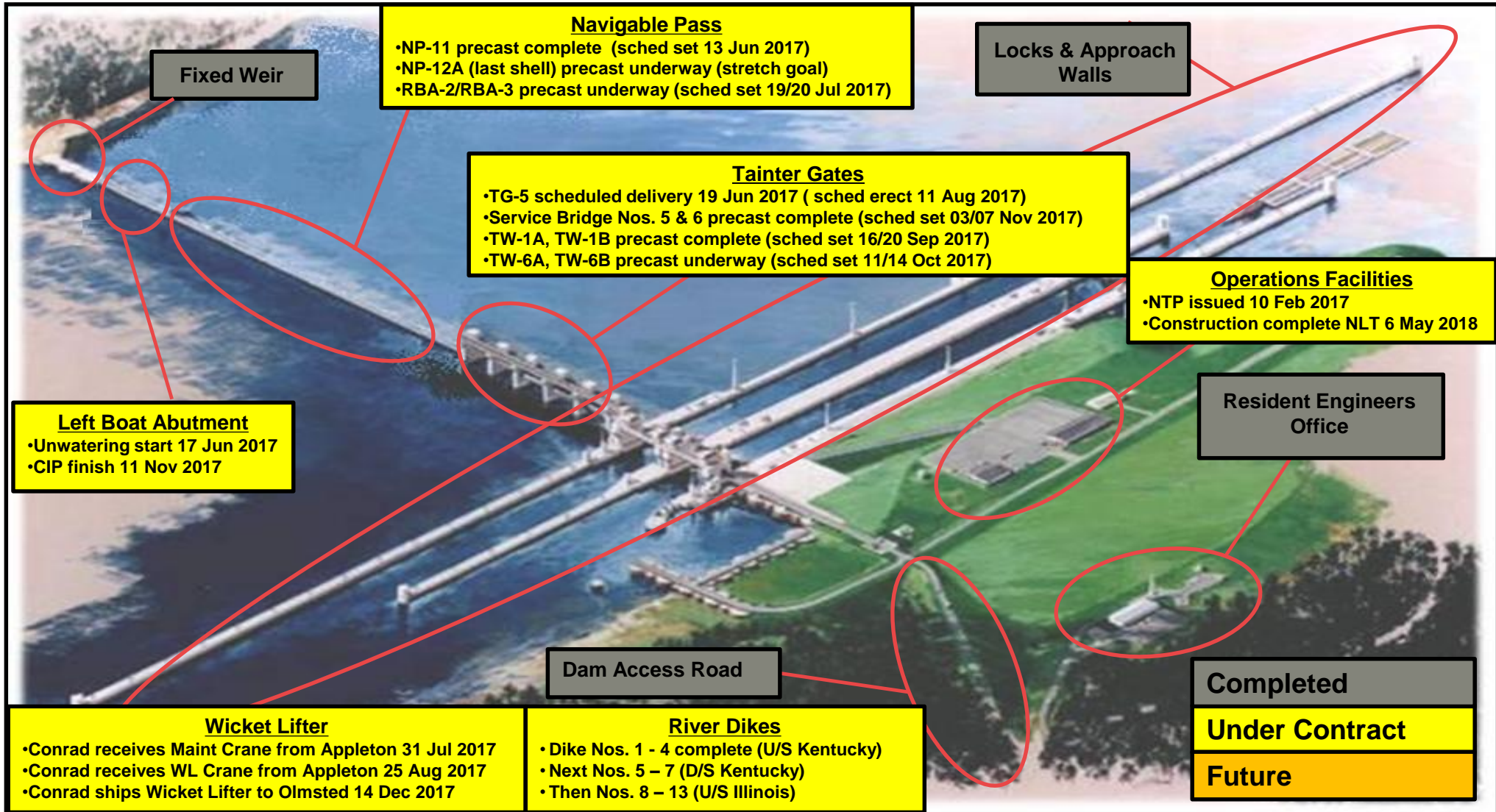
✓ Current Cost: **Under Budget**

- TEP **(\$335M+)** – Total Estimated Price (updated monthly)
- TPCS **(\$153M)** – Total Project Cost Summary (reflects FY17 update)

✓ Keys:

1. Efficient funding (annual capability) has allowed the PDT to effectively plan and execute our annual work plan.
2. Advantageous river conditions have allowed the work to expand beyond the contractual low water season (15 Jun – 30 Nov).

Olmsted Project Overview - Status



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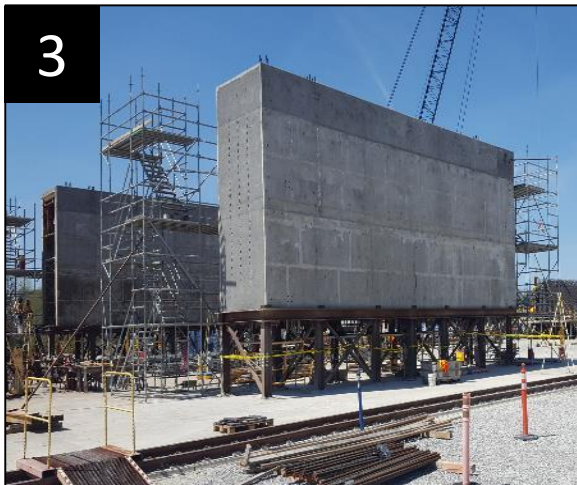
2017 High Water Season Images



1 Navigable Pass (NP) No. 11 Lift 2 (High Vel)



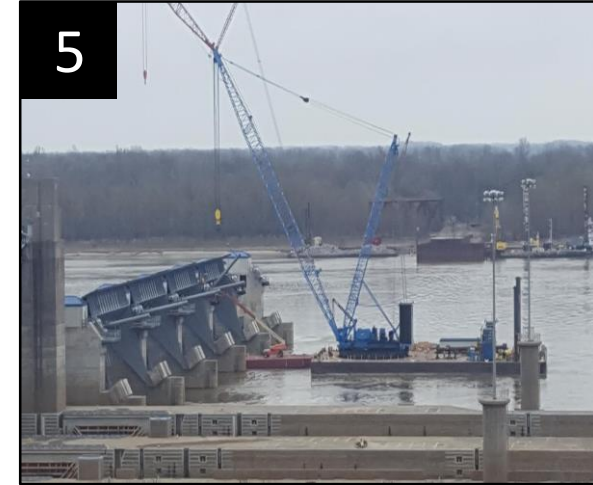
2 Right Boat Abutment (RBA) Piece No. 2



3 Training Walls (TW) 1A/1B



4 Service Bridge (SB) No. 5



5 TG 4 Cylinder Installation

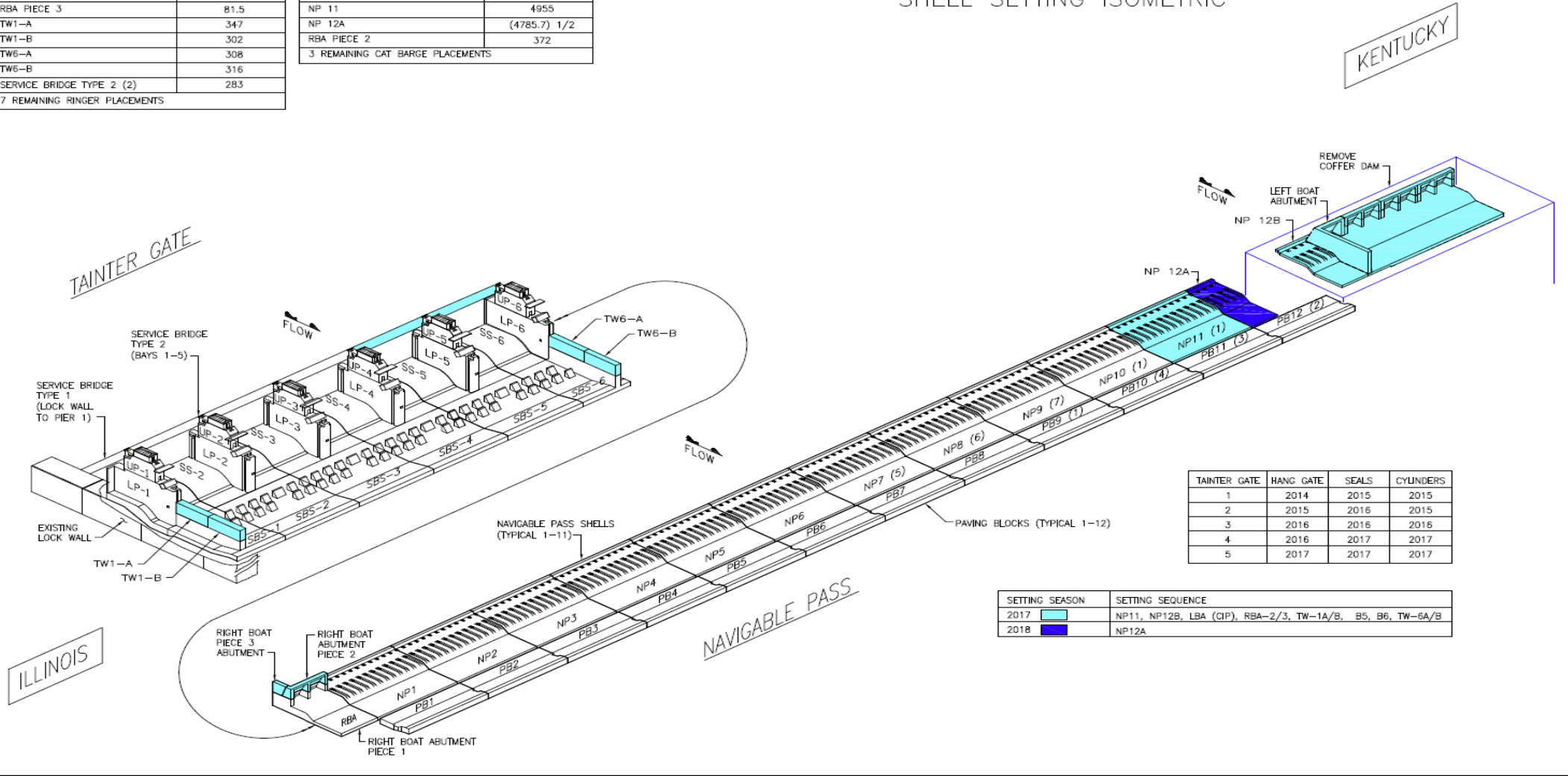
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2017 Plan-to-Complete

RINGER BARGE PLACEMENTS	
SHELL	WEIGHT (TONS)
RBA PIECE 3	81.5
TW1-A	347
TW1-B	302
TW6-A	308
TW6-B	316
SERVICE BRIDGE TYPE 2 (2)	283
7 REMAINING RINGER PLACEMENTS	

CAT BARGE PLACEMENTS	
SHELL	WEIGHT (TONS)
NP 11	4955
NP 12A	(4785.7) 1/2
RBA PIECE 2	372
3 REMAINING CAT BARGE PLACEMENTS	

SHELL SETTING ISOMETRIC



TAINTER GATE	HANG GATE	SEALS	CYLINDERS
1	2014	2015	2015
2	2015	2016	2015
3	2016	2016	2016
4	2016	2017	2017
5	2017	2017	2017

SETTING SEASON	SETTING SEQUENCE
2017	NP11, NP12B, LBA (CIP), RBA-2/3, TW-1A/B, B5, B6, TW-6A/B
2018	NP12A

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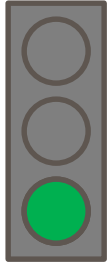


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Olmsted Project

Time and Cost Scorecard – Mar 2017



Expenditures (thru Mar)

Planned (BCWS)	\$2.183B
Earned (BCWP)	\$2.529B
Actual (ACWP)	\$2.348B

BCWP: Reports the value (based on % complete) of the work performed to date.

Target:

Actual as compared to Planned: (<1% = Green) (>1%and <3% = Yellow) and (>3% = Red)

Schedule (thru Mar)

	(PACR)/(Current)
Project Complete	April 2026/Mar 2022
Dam Operational	Oct 2022/Oct 2018

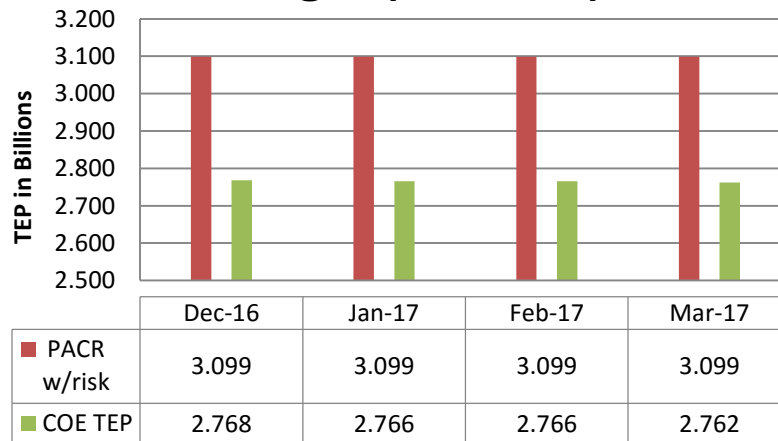
Measures: Planned project completion and Dam contract operational dates

Target:

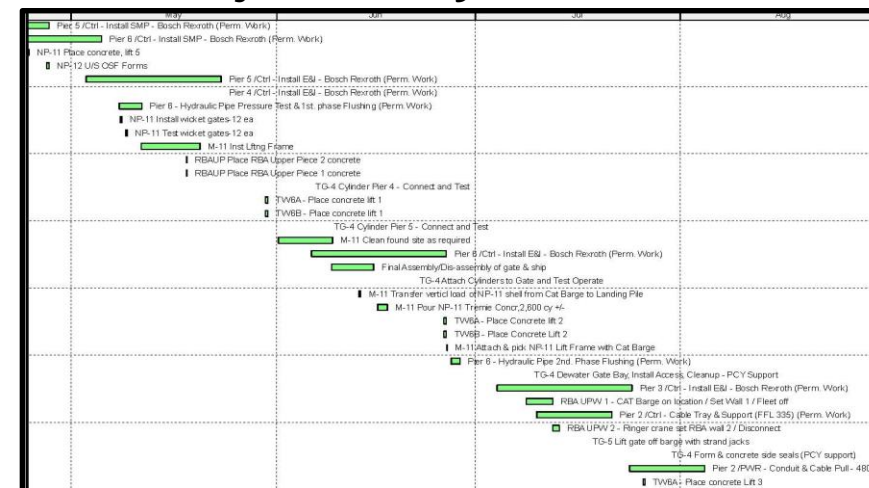
Green: Current = PACR-12 months
 Yellow: Current = PACR-11 months to PACR-7 months
 Red: Current = PACR-6 months to after PACR date



Budget (thru Mar)



Major Activity Schedule



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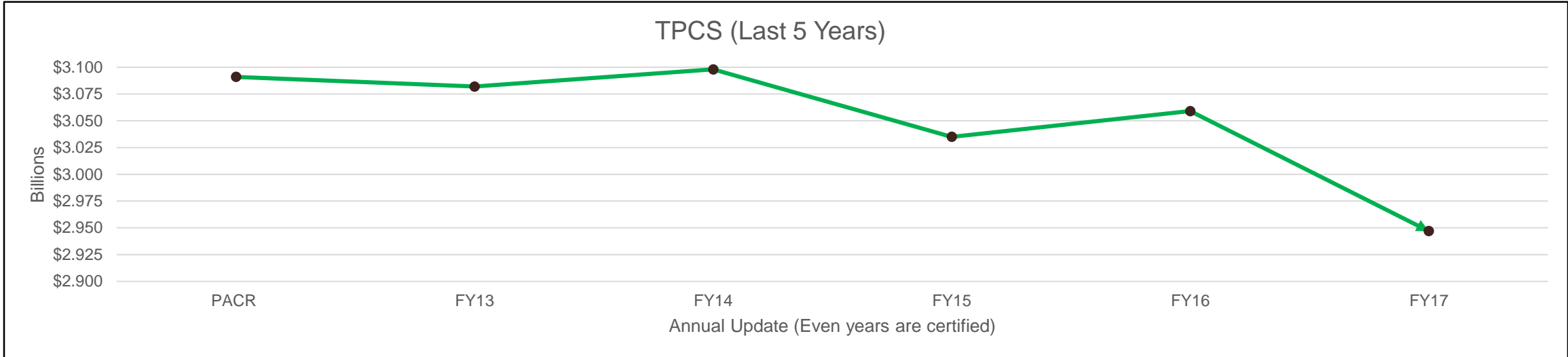


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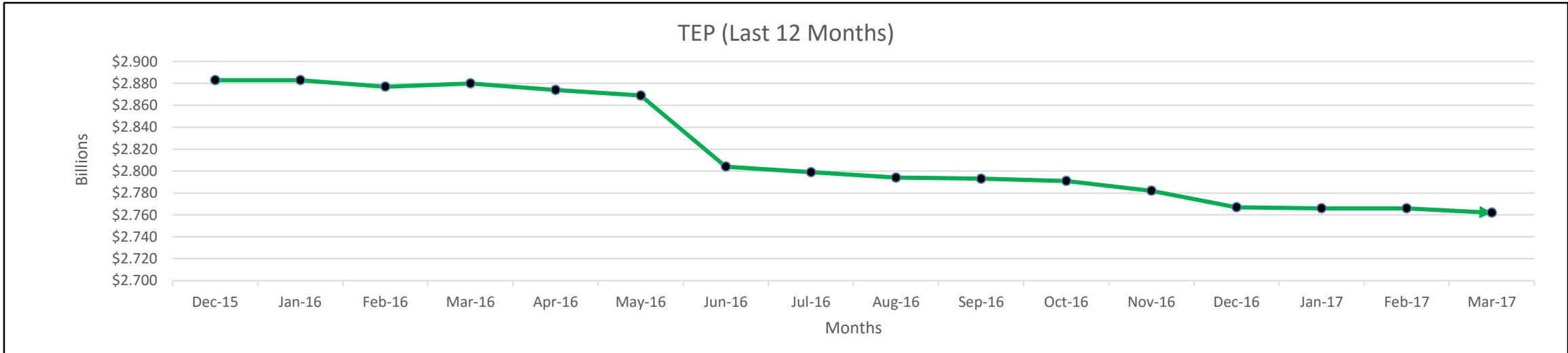


12 Month Cost Trends

TPCS (Last 5 Years)



TEP (Last 12 Months)



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Olmsted Finishing Strong

- ✓ Equipment Disposition
 - In excess of \$150M (original acquisition value) and over 10,000 discrete items
 - Pursuing a deviation to FAR and FMR regulatory guidance to obtain a “direct sale” authority in addition to existing reutilization, screening and GSA disposal methods to **maximize efficiency and increase ROI**
 - Responded (28 Apr) to Congressional inquiry regarding number of items, value of items, current available authorities, and disposition of proceeds

- ✓ “Out Year” Marine Work Packages
 - Advancing J&As to advance various marine scopes of work concurrent with Dam construction and within operational footprint
 - Miter Gate Repairs and Culvert Flushing (1st of 3) submitted (24 Apr) to PARC
 - Benefits include advancing project “completion”, mitigating post operational “navigation lane” impacts and utilizing existing materials, skilled labor and equipment

Discussion



Olmsted Locks and Dam
Wicket Lifter Barge



Olmsted Locks and Dam
Super Gantry Crane

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Building Strong
Finishing Strong

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Lower Mon Bottom Line Up Front

✓ **Current Schedule: On Schedule**

- ▶ 2022 (Project Operational)
- ▶ 2023 (Project Complete)

✓ **Current Cost: On Budget**

- ▶ TEP (\$1.2 B) – Total Estimated Price – Cost recertified at \$1.33B, assuming no FY17 funds. Assuming efficient funding, the estimated cost remains at \$1.22B.

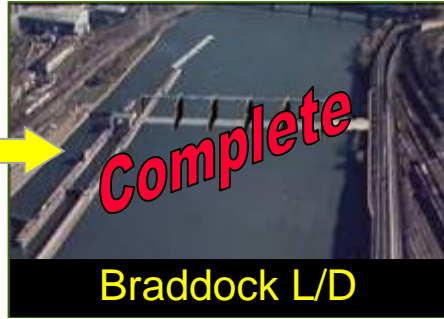
✓ **Keys:**

1. In an effort to reduce cost and schedule impacts, associated with no FY17 funding, the district has begun discussions with the River Chamber Completion Contractor regarding extending the expiration of Option 1 until 30 Sep 2018.
2. Continue to investigate alternatives to bring the project in ahead of schedule.
 - Reduction in construction restrictions
 - Design changes
 - Removal of L/D 3 is the final critical path item, following breach (benefits)
 - L/D 3 removal contract performance period– reduction possible, will be evaluated when P&S are developed.

Lower Mon - Project Overview

Pre-Project Condition

Post-Project Condition



Major Project Features

- New Dam at Braddock
- New Locks at Charleroi
- Dredging
- Removal of Locks and Dam 3
- Relocations

Financial

- 902 Limit: \$1.76 Billion
- Current Estimate at Completion \$1.2 Billion, including contingencies *1

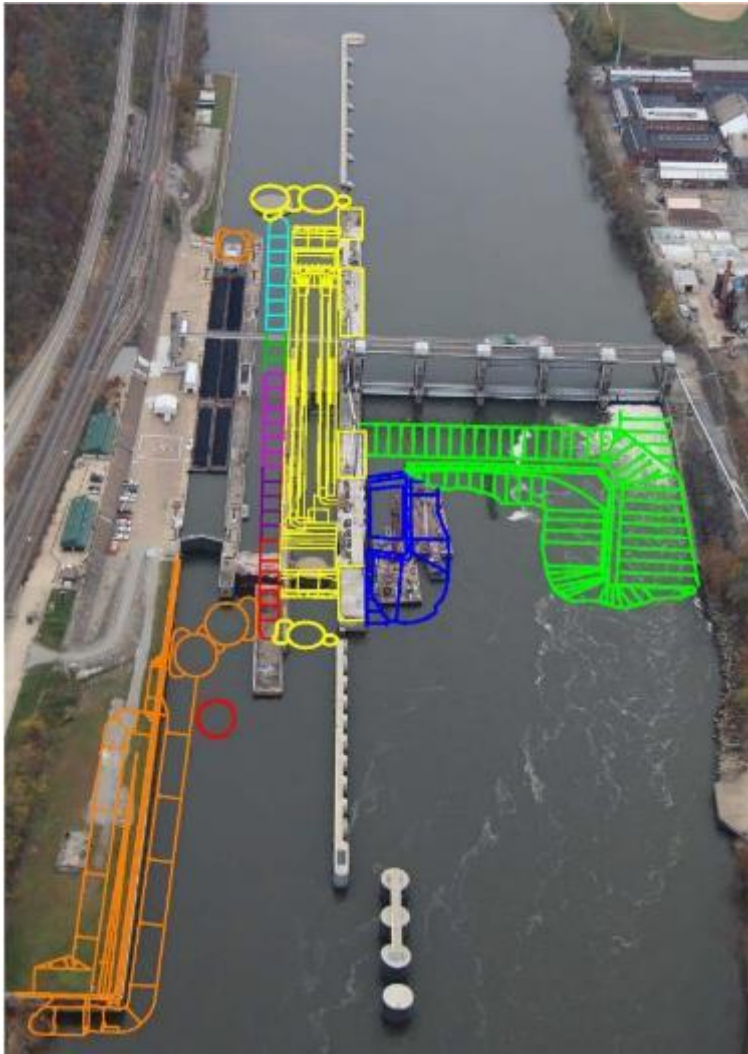
*1 does not include Land Chamber nor Port Perry Bridge

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Lower Mon - Project Schedule

Major Feature Construction	Last Reported Completion (Feb 2017) No FY17 W.P.	Last Reported Completion (Feb 2017) with FY17 W.P.	Revised (with FY17 W.P.)
Charleroi M22-M27	FY 2019		
Charleroi Dam Stilling Basin	FY 2021		
Charleroi River Chamber Completion	FY 2027	FY 2023	
Dredging Pool 3	FY 2027	FY 2022	
Relocations	Variable		
Lock and Dam 3 Removal	FY 2027	FY 2023	

Lower Mon – Charleroi Ongoing / Pending Construction Plan



Description	Last Reported Completion	Current Completion (FY17 Work Plan)	Current Completion (No FY17 Work Plan)	Previously Planned Award	Current Planned Award	Option Expires	% Complete
M22-M27	2019	2019	2019	Completed		NA	48%
RCC Base	2023	2023	2019	Completed		NA	69%
RCC Opt 1	2023	2023	2027	May 17	May 17	30 Sep 17	NA
RCC Opt 2	2023	2023	2027	Jun17	Jun17	30 Sep 18	NA
RCC Opt 3	2023	2023	2027	Nov 17	Nov 17	30 Sep 18	NA
RCC Opt 4	2023	2023	2027	Dec 18	Dec 18	31 Mar 20	NA
RCC Opt 5	2023	2023	2027	Nov 20	Nov 20	31 Mar 21	NA
Stilling Basin	2021	2021	2021	Oct 18	Oct 18	NA	NA

Notes:

- RCC – River Chamber Completion
- RCC Option 1 will **not likely** be awarded in May17, Project delay day for day thereafter.
- RCC Option 2 will be awarded in June17, funds permitting
- Risk informed RCC completion is 2027.
- Remaining project features not shown on this slide:
 - Dredging (Late FY17 planned award)
 - Pool Clearing (FY21 planned award)
 - Lock and Dam 3 Removal (FY21 planned award)
 - Relocations

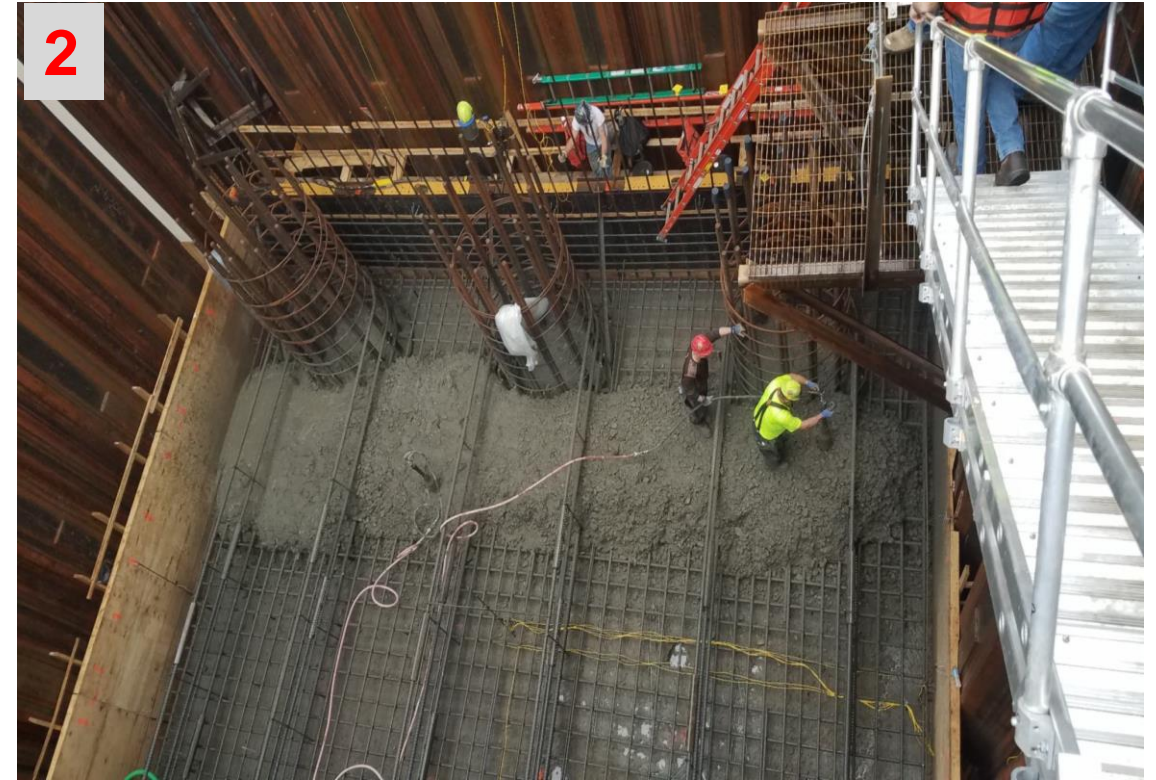
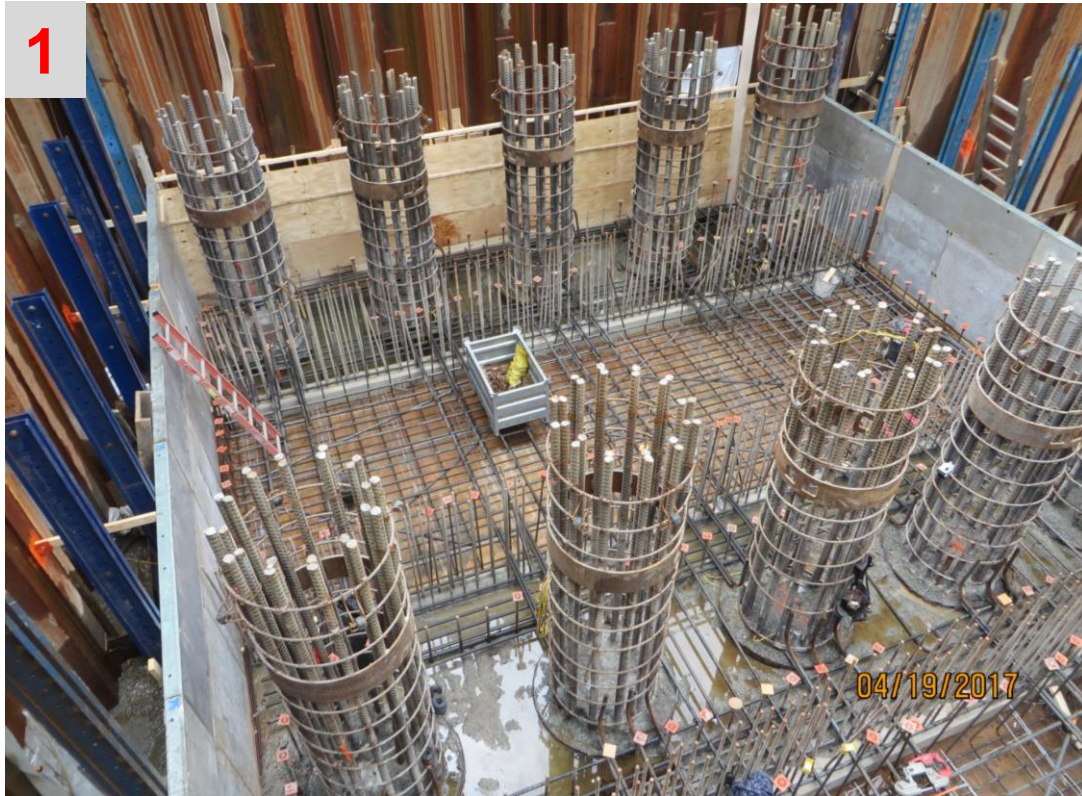
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Charleroi Construction Images



- 1 - M22-M27 Contract: Preparing for first mass concrete lift M22
- 2 - RCC Base Contract: Placing first mass concrete lift in M7.

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Lower Monongahela River Project Time and Cost Scorecard

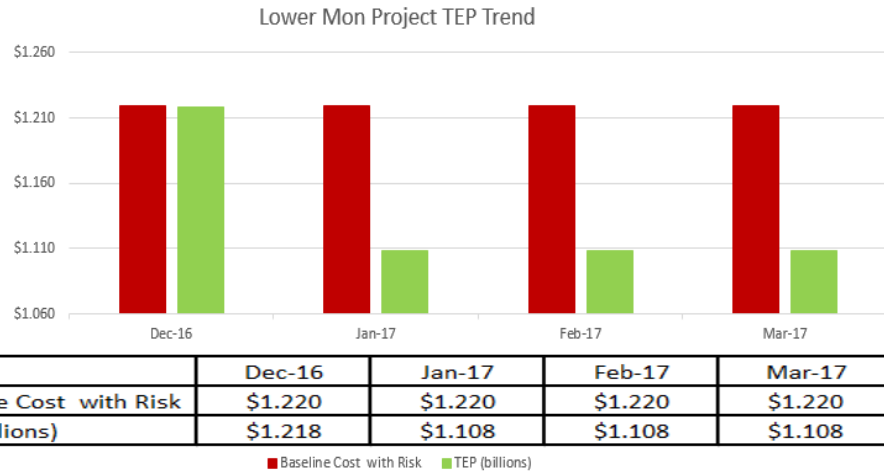


Expenditures

Planned (BCWS _{nc})	\$683.7M
Earned (BCWP _{nc})	\$636.1M
Actual (ACWP)	\$659.4M

Target: Actual as compared to Planned: (<5% = Green); (>5% and <10% = Yellow); and (>10% = Red)
 Values shown reflect project sunk cost of \$550.6M thru FY 2014 and Current data thru March 2017
 CV = -3.7%, CPI=0.97
 EAC = \$1.108B TPC = \$1.220 B

Budget



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Schedule

(Baseline)/(Current Early)

<i>Operational (Realize over 90% of project Benefits)</i>	<i>2027 / 2022 *</i>
<i>Operational (Realize over 90% of project Benefits)</i>	<i>2027 / 2026 **</i>
<u><i>Project Complete</i></u>	<u><i>2029 / 2028</i></u>

* With FY 2017 work plan funding
 ** Without FY 2017 work plan funding

Major Activity Schedule

Activity	Baseline	Current
Award RCC Option 1 (w/ concrete)	NA	May 17 ^{*1}
Award RCC Option 2 (w/ concrete)	NA	Jun 17
Stilling Basin Model	FY17	Completed
Dredging RTA	FY17	May 17

*1 – Not likely achievable



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Discussion

Aerial view of Charleroi Lock Construction



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KY Lock Addition BLUF

■ Bottom Line Up Front

▶ Downstream Cofferdam Construction

- \$27.5M in Options expiration date is 31 May 2017.
- Reduction in Navigation impacts:
 - ▷ Value Engineering Proposal to eliminate underwater blasting increases safety and reduces amount of lock closures
 - ▷ Planned tow size restriction dropped because of development of alternate procedures by Port Captains and Lockmaster

▶ Level III Economic Update is proceeding full tilt

KY Lock Project Overview

Bridges Superstructures - \$104M
Completed Jul 2014

Bridges Substructures - \$44M
Completed Mar 2006

D/S Excavation
Award – Sept. 2018

D/S Cofferdam - \$67.1M
Sept. 2016 Base Award
at \$39.6M.

U/S Miter Gate Fab. - \$5.6M
Completed Dec 2016

D/S Lock
Award – Sept. 2019

Upstream Cofferdam - \$17M
Completed Nov 2006

Upstream Lock - \$110M
Completed Feb 2017

Approach Walls
Award – Sept. 2021

Site, Demolition, &
Utilities
Award – Sept. 2017

Lock & Associated Facilities	\$1,044M
TVA Transmission Towers	13M
P & L Railroad	97M
Hwy 62 and other roadways	100M
Total	\$1,254M
\$471M Obl thru Sep 2016 = 38% complete	



Downstream Cofferdam Table Top Exercise Safety Meetings



BUILDING 1. 4 Feb 2016 – Initial planning with Nav Industry and USCG; 2. 16 Feb 2017 Contractor, Nav Industry, and USCG; 3. 14 March 2017 Nav Industry, USCG & Contractor; 4. 15 March 2017 at 0600 with Lock Operators and Contractor

KY Lock Project Schedule

Major Feature Construction	Award	Complete ²	Revised
Upstream Lock Monoliths Construction	Jan 2010	Feb 2017	Complete
Downstream Cofferdam Construction	Sep 2016	Sep 2019	
Site, Demolition & Utilities	Sep 2017	Nov 2018	
Downstream Lock Excavation Construction	Sep 2018	Dec 2020	
Downstream Lock Construction	Sep 2019	Mar 2024	
Approach Walls Construction	Sep 2021	Nov 2023	
Risk Based Total Project Cost Estimate	Mar 2016	3 Jan 2017	Complete
Economic Update	Jan 2017	Jan 2018	
Post Authorization Change Report for 902 Exceedance ¹	Jul 2017	Mar 2018	

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¹902 Exceedance expected by FY2022

²New schedule associated with new cost estimate. Assumes no risk. 80% confidence schedule adds 46 months to project completion date)



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Cost Estimate Comparison

Feature	Authorized Cost	2017 TPCE	Difference	Per Cent Difference
	(FY2017 Price Level)	(FY2017 Price Level)		
Approach Channels	\$6,338,182	\$11,501,124	\$5,162,942	81%
Lock Monoliths	\$160,213,038	\$217,039,656	\$56,826,618	35%
Lock Excavation	\$12,903,034	\$23,784,911	\$10,881,877	84%
Electrical	\$12,075,155	\$9,993,022	-\$2,082,133	-17%
Gates & Machinery	\$46,307,430	\$53,100,199	\$6,792,769	15%
Cofferdams	\$52,712,225	\$94,358,499	\$41,646,274	79%
Hwy & RR Relocations	\$60,374,265	\$163,968,191	\$103,593,926	172%
Approach Walls	\$39,793,810	\$99,224,879	\$59,431,069	149%
Plan, Eng, & Design	\$70,604,371	\$125,324,501	\$54,720,130	78%
Constr. Management	\$32,733,138	\$50,448,542	\$17,715,404	54%
Total	\$734,419,913	\$1,180,973,724	\$446,553,811	61%

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Note: All costs above are first costs,
not fully funded. 18



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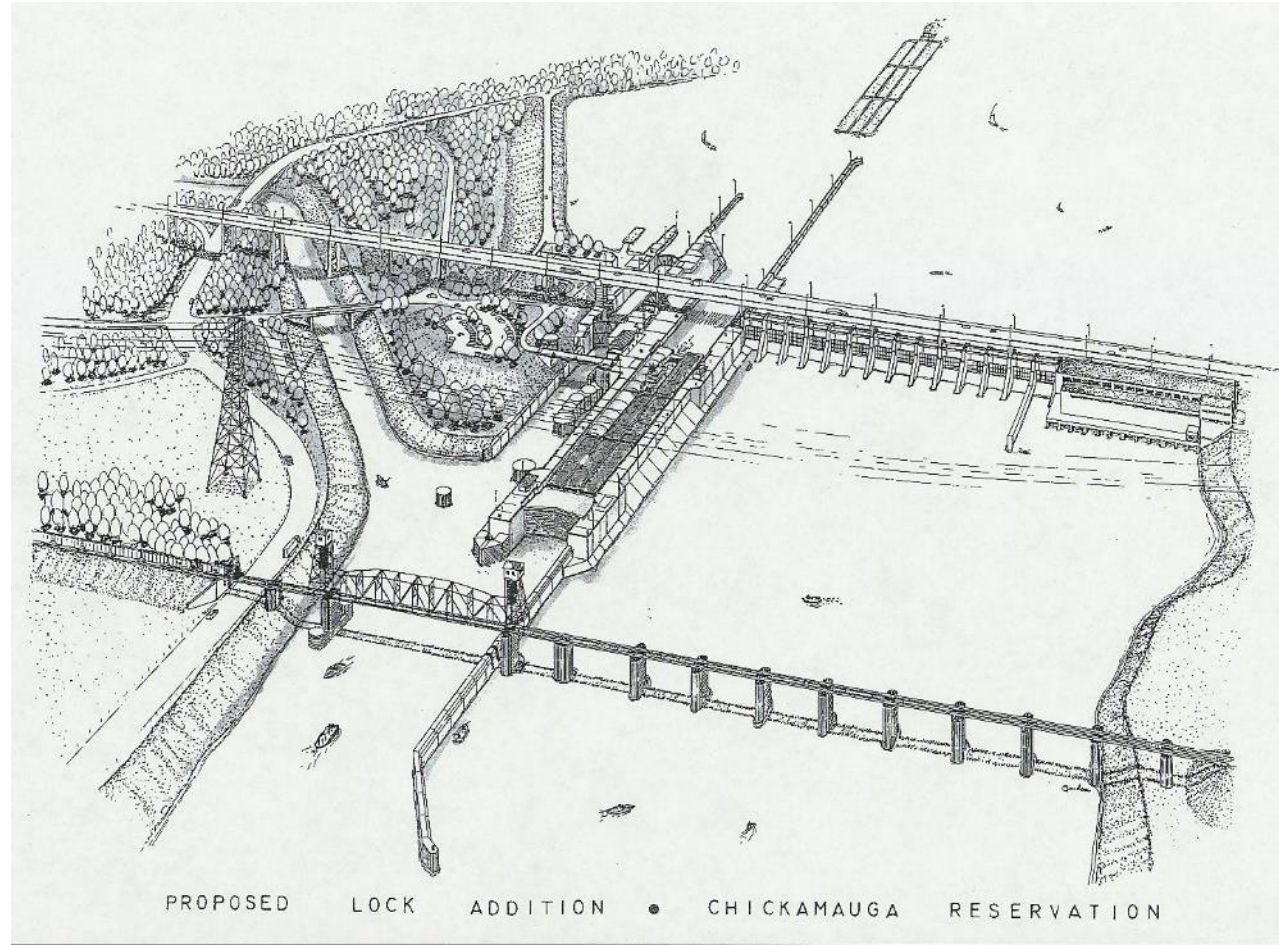
KY Lock

Summary and Challenges

- \$27.5M in Downstream Cofferdam Options expire on 31 May 2017.
- Recent years average delays at KY Lock >9 hours and traffic levels remain robust. This should bode well for benefits in ongoing Economic Update.
- 902 Limit is \$819M vs. current TPCE of \$1.25B – Post Authorization Change Report being developed in concert with Economic Update

Chickamauga Lock Replacement Agenda

- BLUF / Project Overview
- Construction Photos
- Schedule
- Challenges



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Chickamauga Lock Replacement BLUF

- **Bottom Line Up Front**
 - Lock Excavation contract is underway, includes unexercised options valued at approximately \$7.25M. A contract modification to extend the options expiration date from 31 May 2017 to 31 Jul 2017 at no additional cost is underway.
 - FY17 Efficient funding remains at \$37M, District developing plans for potential FY17 award of Lock Chamber contract.
 - District is developing a Post Authorization Change Report (PACR) due to certified total project cost estimate of \$755M exceeding the current authorized 902 limit of \$482M.

Chickamauga – Project Overview

Road & Bridges - \$6M
Completed Feb 2007

Lock & Associated Facilities	\$749M
Road and Bridges	6M
Total	\$755M

\$216M Obl thru 2nd Qtr FY17 = 29% complete

Bridge Fabrication - \$400K
Completed June 2011

Decommissioning/Site Work
Award scheduled: Sep '20

Gates & Valves - \$17M
Awarded Sep 2009, Comp 2012

Approach Beams - \$14M
Awarded Apr 2010, Comp 2013

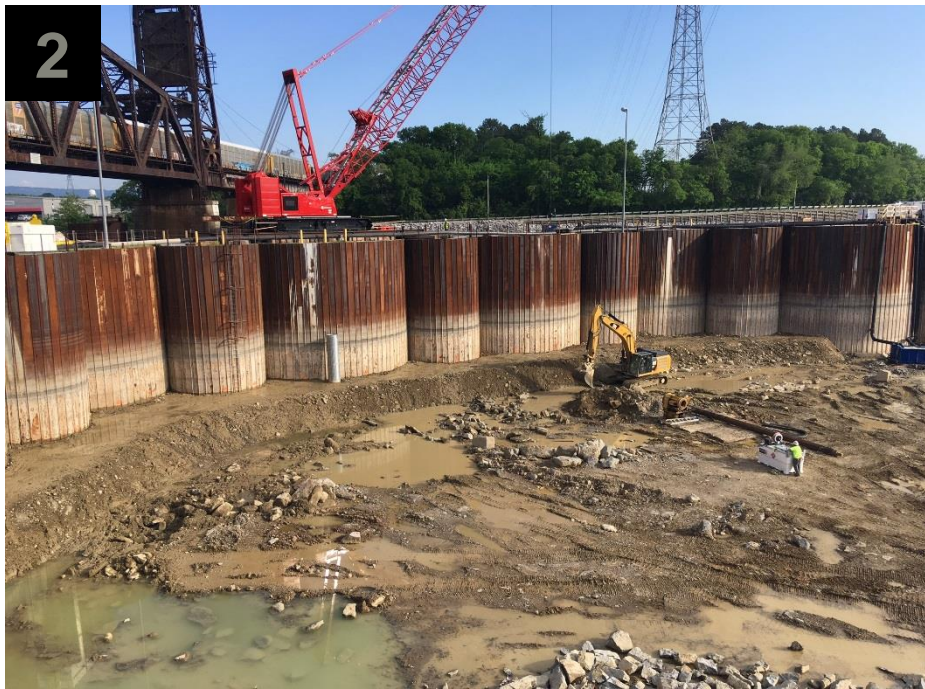
Lock Chamber
Award scheduled: Sep '17

Lock Excavation - \$33.2M
Sep '16 Award Base and 2
Options at \$26M.

Cofferdam - \$89M
Awarded Sep 2006, Comp 2012

Cofferdam Stabilization - \$3.1M
Awarded Sep 2015, Comp 2016

Approach Walls
Award scheduled: Sep '21



1. Site visit by acting ASA (CW), Doug Lamont, on 28 February 2017; 2. Installation of stability berm to support downstream wall of cofferdam during rock excavation; 3. 24 April 2017 – High water event.

Chickamauga Lock Project Schedule

Major Feature Construction	Award	Complete	Revised
Lock Excavation Construction	Sep 2016	Sep 2018	
Lock Chamber	Sep 2017	Dec 2023	
Site Work and Decommission Existing Lock	Sep 2020	Sept 2024	
Approach Walls Construction	Sep 2021	Dec 2023	
PACR for 902 Exceedance ¹	Oct 2016	FY18	Completion mile ²

¹ 902 Exceedance expected by FY2020 with efficient funding.

² Completion date revised after project briefing to HQ USACE Change Control Board.

Chickamauga Lock Summary and Challenges

- **Delayed funding in FY17 is compressing time available for:**
 - ▶ Exercising remaining Lock Excavation contract options.
 - ▶ Lock Chamber contract solicitation/award in FY17.
- **Project developing Post Authorization Change Report (PACR) due to current cost estimate exceeding the current authorized 902 limit.**