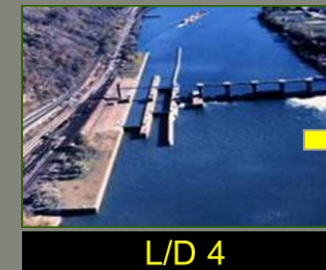
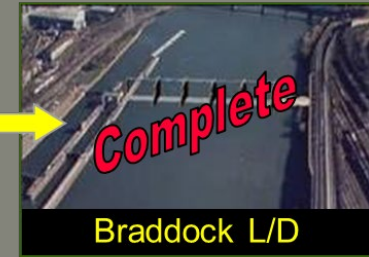


Lower Monongahela River 2-3-4 Project Update Inland Waterways Users Board Meeting No. 93

Mr. Steve Fritz
MEGA Program Manager
Pittsburgh District
Great Lakes and Ohio River Division
19 February 2020

Pre-Project Condition

Post-Project Condition



"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

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Lower Mon Bottom Line Up Front

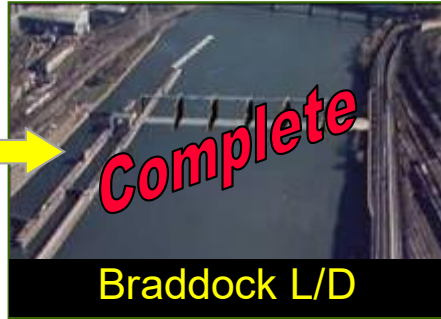
- ✓ Current Schedule: **Change in Schedule**
 - ▶ **December 2023** (Early Project Operational, 90% benefits)
 - ▶ **January 2025** (Early Project Complete)
- ✓ Current Cost: **On Budget**
 - ▶ TEP – Total Estimated Price, assuming efficient funding, at \$1.09 Billion, \$1.23 Billion including all contingencies.
- ✓ Keys:
 1. FY 2020 President's Budget for \$111 million.
 2. Minimize constrained work areas conflicts - Gantry crane to support in chamber work.
 3. Addressing long-term Charleroi Land Chamber closure - Develop conceptual designs in early 2021.
 4. Identifying known and potential future acquisitions.

NOTE: Funding & schedule information reported does not include the Charleroi Land Chamber or the Port Perry Bridge relocation.

Lower Mon - Project Overview

Pre-Project Condition

Post-Project Condition



■ Major Project Features

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

■ Financial

- 902 Limit: \$1.76 Billion
- Current Estimate at Completion \$1.09 Billion, including reasonable contingencies ^{*1}

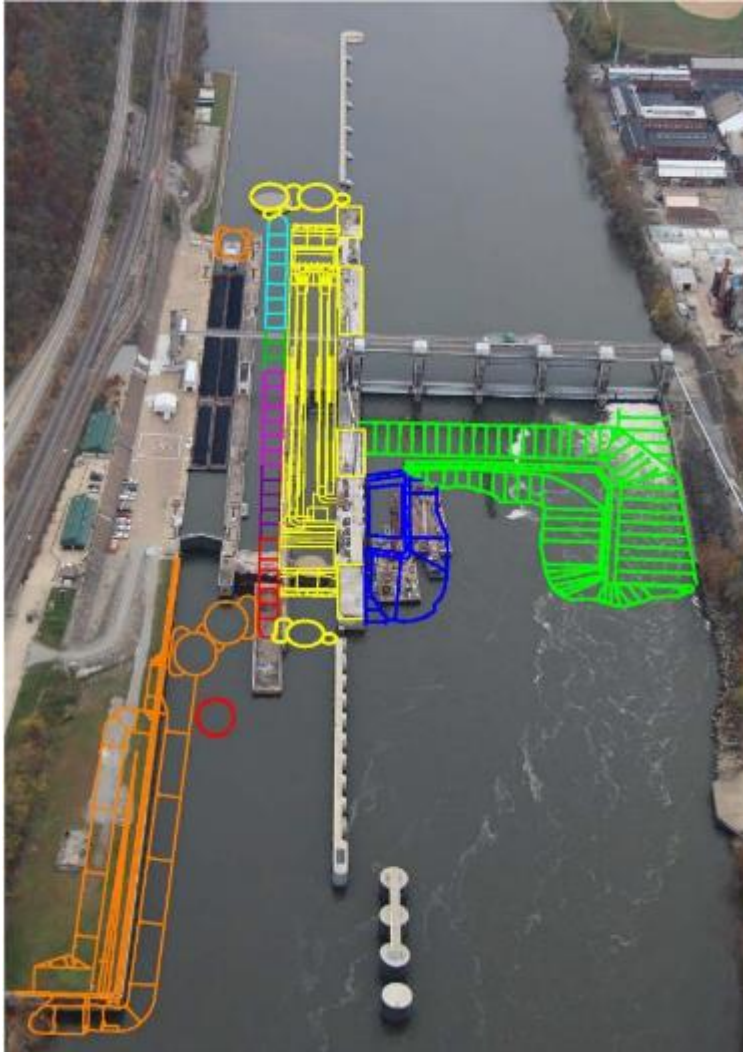
*1 does not include Land Chamber nor Port Perry Bridge

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Lower Mon - Project Schedule

Major Feature Construction	Last Reported Completion (Sep 2019)	Revised
Charleroi M22-M27	Jun 2020	
Charleroi Dam Stilling Basin	Nov 2022	
Charleroi River Chamber Completion (RCC)	Oct 2023	Sep 2023
Dredging Pool 3 TO 3 Award	TBD	Jul 2020
Relocations	Variable	
Lock and Dam 3 Removal	Oct 2023	Feb 2025

Lower Mon – Charleroi Ongoing / Pending Construction Plan



Description	Last Reported Completion	Current Completion (FY19 Work Plan)	Previously Planned Award	Current Planned Award	Option Expires	% Complete
M22-M27	2020	Jan 2020	Completed	Aug 14 A	NA	89%
RCC Base	2023	Oct 2023	Completed	Sep 15 A	NA	99%
RCC Opt 1	2023	Oct 2023	Completed	Aug 17 A	NA	82%
RCC Opt 2	2023	Oct 2023	Completed	Aug 17 A	NA	43%
RCC Opt 3	2023	Oct 2023	Completed	Sep 18 A	NA	52%
RCC Opt 4	2023	Oct 2023	Dec 18	Jun 19 A	NA	1%
RCC Opt 5	2023	Oct 2023	Nov 20	Jun 19 A	NA	1%
Stilling Basin	2021	Nov 2022	Sep 18	Oct 18 A	Nov 2021	16%

Notes:

- Risk informed RCC completion is 2027
- Remaining project features not shown on this slide:
 - Pool Clearing (FY21 planned award)
 - Lock and Dam 3 Removal (FY21 planned award)
 - Relocations
 - Dredging Task Order 3

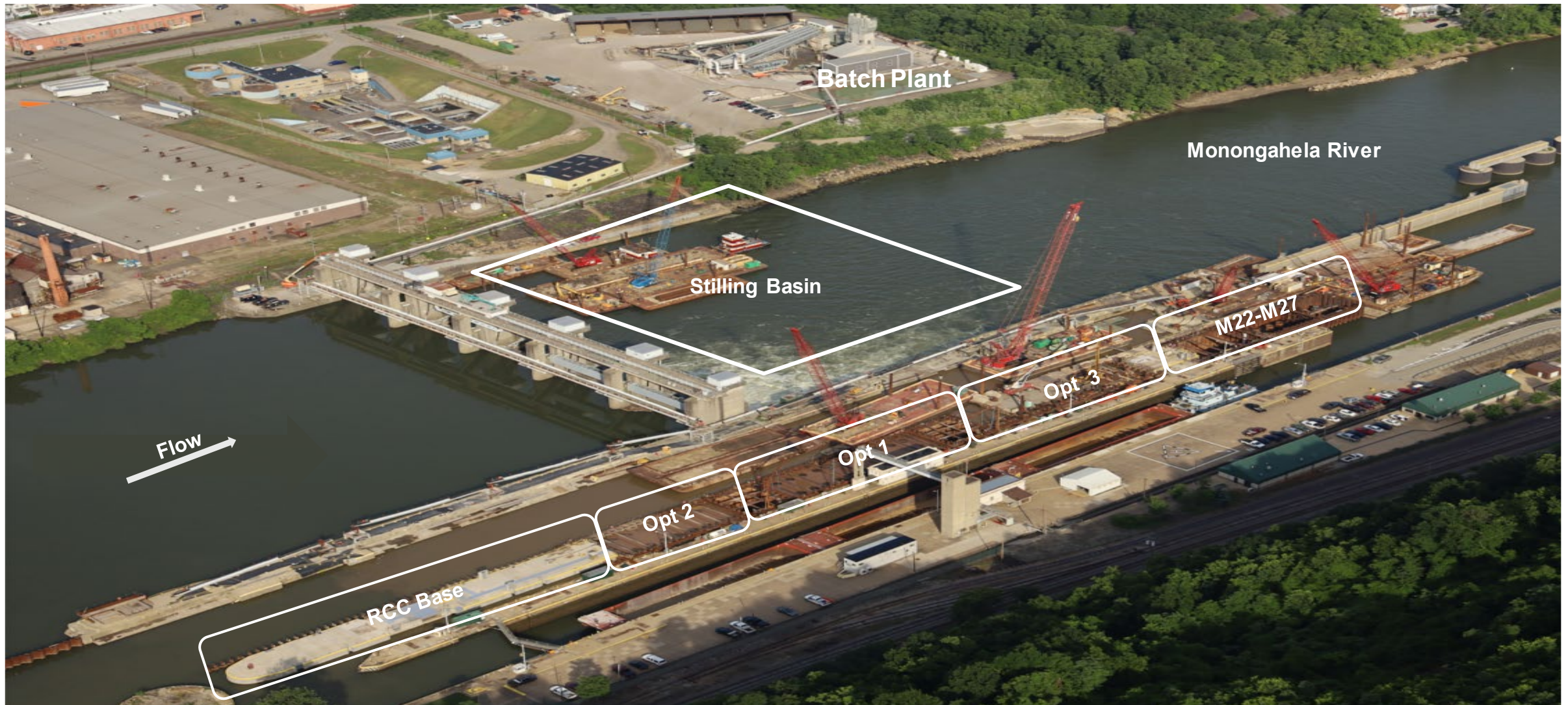
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Charleroi Overall Construction Footprint



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Charleroi Construction Images



1 – River Chamber Completion Contract, installation of R-8 thru R10 secant piles along the river wall

2 – M22-M27 Contract, M27 last lift (down stream bullnose)

3 – Stilling Basin Contract - Concrete placement in abutment wall pipe piles



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Charleroi Construction Images



1 – Stilling Basin Contract , grout bag demonstration setup
2 – M22-M27 Contract, M25 tremie seal and drilled shafts

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Locks and Dams 2, 3, and 4, Monongahela River, PA

Current Project Estimate ^{*1} : \$1.23B (\$2.76B)	ARRA	CG	IWTF	Total
Allocations through FY2016:	\$68,261,203	\$338,640,646	\$338,640,652	\$745,542,501
FY17 Allocation:	NA	\$41,005,000	\$41,005,000	\$82,010,000
FY18 Allocation:	NA	\$48,150,000	\$48,150,000	\$96,300,000
FY19 Allocation:	NA	\$44,606,606	\$44,606,606	\$89,213,213
FY20 Budget: (\$111 M, not yet allocated)	NA			TBD
Total Allocations to Date:	\$68,261,203	\$472,402,253	\$472,402,258	\$1,013,065,714
Remaining Balance:		\$110,384,643	\$110,384,643	\$220,769,286
Remaining Balance Change From Last Meeting:				

Changes:

Funding Overview

- Original Authorized Cost: \$556M
- 902 Limit: \$1.76B
- ARRA Funding (FY09-FY15): \$68.3M
- Engineering & Design Cost: \$694M^{*2}
- Supervision & Admin Cost: \$183M^{*3}
- Mitigation: \$12M
- Fully Funded Estimate: \$2.76B

Next Steps

- Award Pool 3 Dredging (FY 2020) Task Order #3

Current Status of the Project

- Charleroi M22 – M27 – Placing mass concrete in M23 and M24
- Charleroi RCC – All options awarded. All middle wall drilled shafts are complete.
- **Pool 3 Dredging 46% complete.**

*1. Total Project Cost update – May 2018. Cost for 90% of project benefits increased from \$1.22B to \$1.23B. Total project cost increased from \$2.73B to \$2.76B.

*2. \$694M includes all Engineering & Engineering During Construction, including \$473M for the Charleroi Land Chamber, \$378 million of which is inflation.

*3. \$183M includes all construction contract Supervision and Administration, including \$120M for the Charleroi Land Chamber, \$102 million of which is inflation.

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Locks and Dams 2, 3, and 4, Monongahela River, PA

Schedule of Remaining Work	Design Initiated	Contract Award	Construction Complete *2	Project Benefits*3	Capitalized Cost Closeout*3
Charleroi River Wall	1-Oct-95	27-Sep-04	30-May-16	2023	2025
Charleroi Emptying Basin	1-Oct-95	30-Sep-13	11-Nov-15	2023	2025
Charleroi River Chamber (M22-M27)	1-Oct-95	15-Aug-14	FY 2020 S	2023	2025
Charleroi Dam Stilling Basin	1-Oct-95	30 Oct -18	FY 2023 S	2023	2025
Charleroi River Chamber Completion	1-Oct-95	16-Sep-15	FY 2023 S	2023	2025
L/D 3 Removal	2020 S	2021 S	FY 2025 S	2023	2025
Dredging	1-Oct-95	29-Sep-17	FY 2021 S	2023	2025
Municipal Relocations *1	1-Oct-95	Multiple	Multiple	NA	2025

- * 1: To complete all municipal relocations, multiple relocation agreements are required.
- * 2: Dates are achievable based on the most efficient funding profile (early schedule).
- * 3: Project benefit and close out dates are based on the most efficient funding profile & breaching of Dam 3. Early contract completion for Dam 3 removal extends into **2025**.
- 4. Charleroi dam stilling basin completion is scheduled for November 2022.

Actual

"S"= Scheduled

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Lower Monongahela River Project

Time and Cost Scorecard (Data Date of 31 December 2019)



Expenditures

	No Contingency	Contingency Included
Planned (BCWS)	\$874.5M	\$719.3M
Earned (BCWP)	\$808.4M	\$889.6M
Actual (ACWP)	\$824.4M	\$824.4M
	CPI = 0.98	CPI 1.08

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

Target:

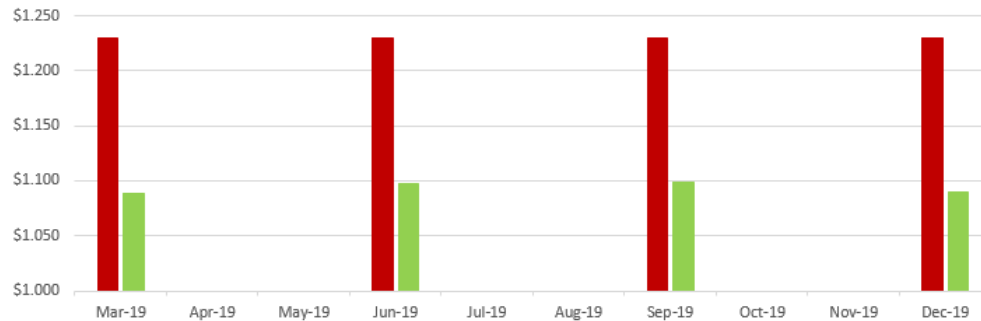
Actual as compared to Planned: (<1% = Green); (>1% and <3% = Yellow); and (>3% = Red)

Values shown reflect project sunk cost of \$550.6M thru FY 2014.

EAC = \$1.09 B TPC = \$1.23 B

Budget

Lower Mon Project TEP Trend



	Mar-19	Jun-19	Sep-19	Dec-19
Baseline Cost with Risk	\$1.230	\$1.230	\$1.230	\$1.230
TEP (billions)	\$1.089	\$1.097	\$1.098	\$1.090

■ Baseline Cost with Risk ■ TEP (billions)

Schedule

(Baseline)/(Current Early)

Operational (Realize over 90% of project Benefits) 2027 / 2023

Project Complete 2029 / 2025



Major Activity Schedule

Activity	Baseline	Current
Dredging T.O.3 Award	30 Sep 2019	31 Jul 2020
L/D 3 Removal 100% Design	31 Jan 2021	31 Jan 2021
Middle Wall Complete	29 Feb 2021	29 Feb 2021
Miter Gates and Misc. Metals Painting Complete	31 Oct 2022	31 Oct 2022

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Discussion



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Backup Slides

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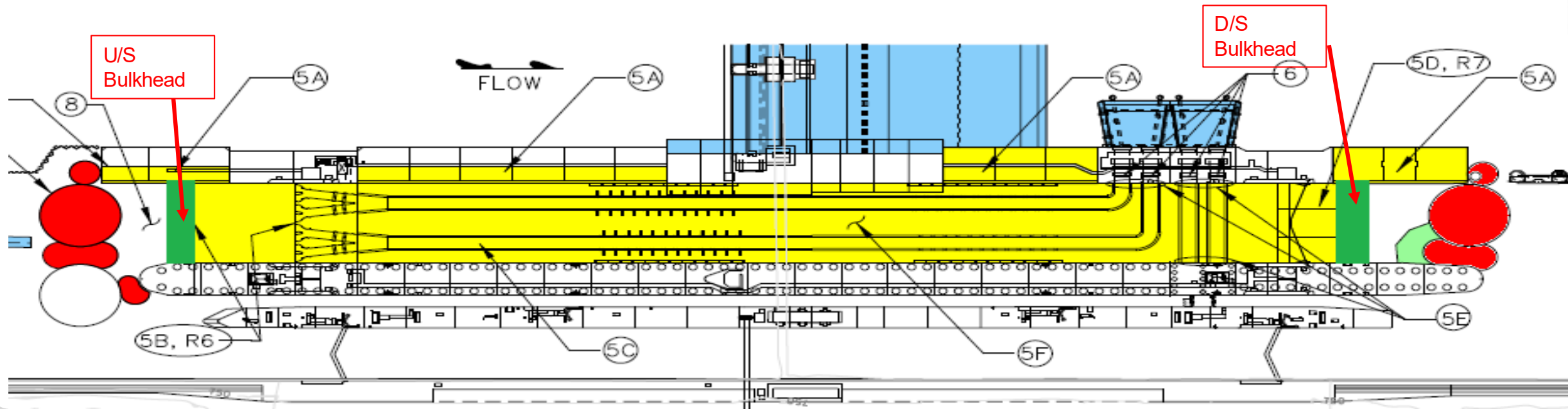
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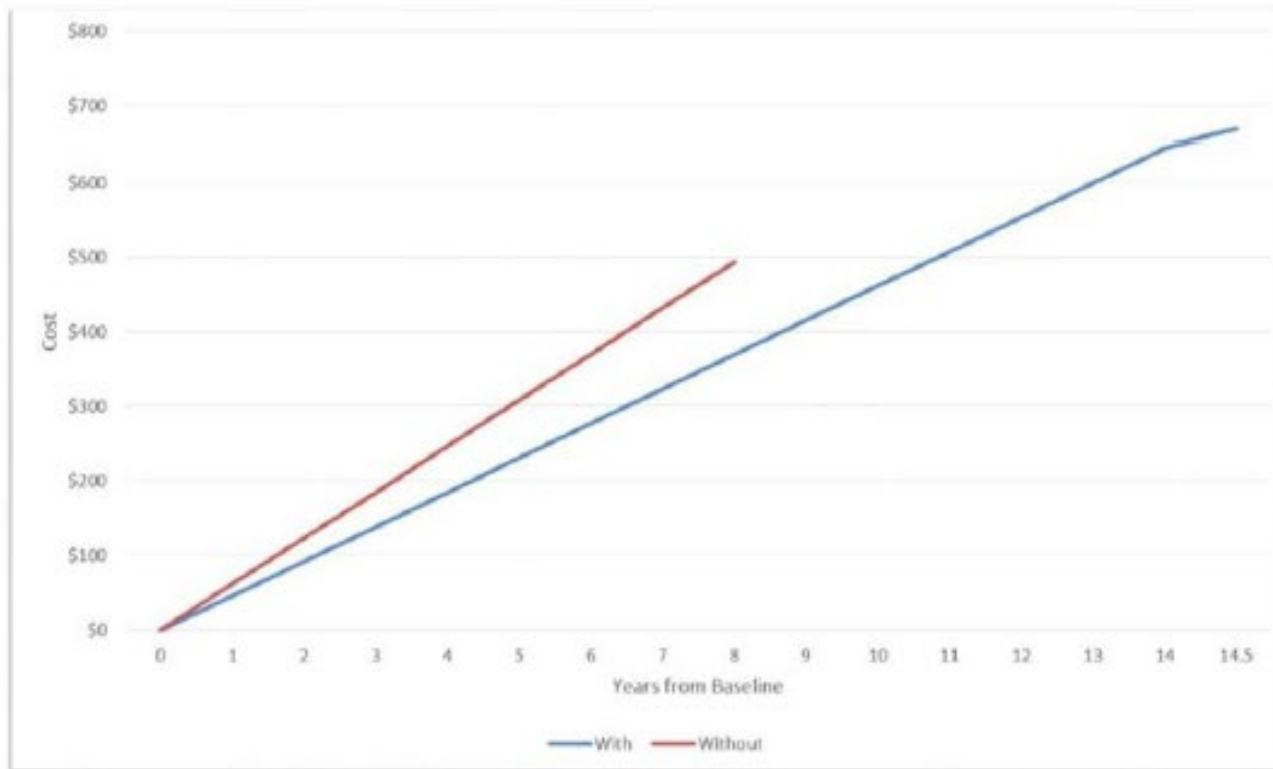


Potential time saving measures



EVM Curve

With Contingency vs. Without Contingency



Understanding Curve:

Distributing contingency costs requires those costs distributed over contingency time, therefore, in the case of lowermon, the burn rate per year is higher with the “without contingency” scenario.

BACwc = TPC = \$1,220M. Since we sunk \$550M before we baselined, we have \$669M budgeted after baseline.

BACnc = \$1,069M. Same idea, \$518M budgeted after baseline.
Budgeted Time/Duration @ Completion = BTACwc = 5,293 days = 14.5 years

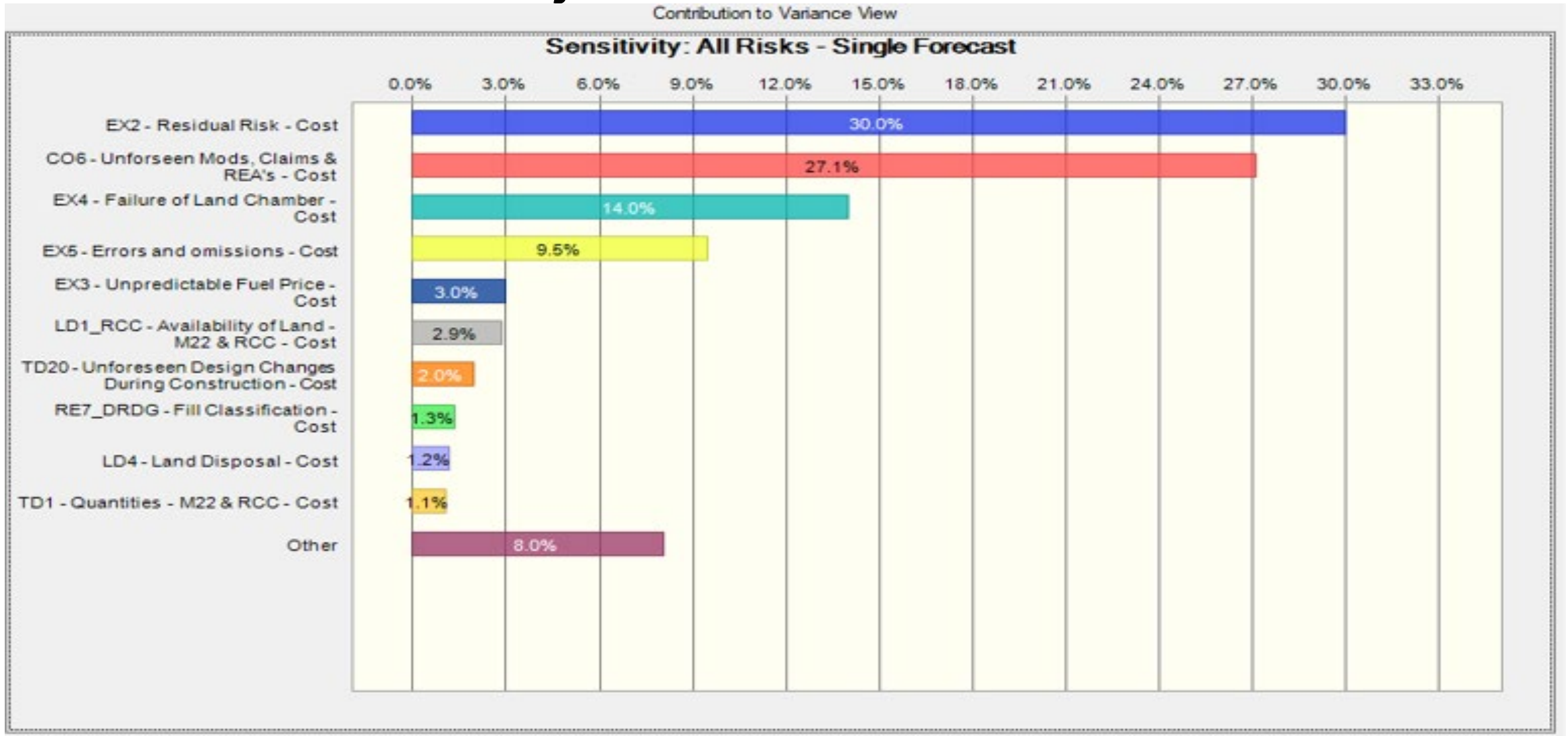
BTACnc = 3,072 days = 8.4 years

“With contingency” scenario is $\$669\text{M} / 14.5 \text{ yrs} = \46.17M/yr

“Without contingency” = $\$518\text{M} / 8.4 \text{ years} = \61.72/yr

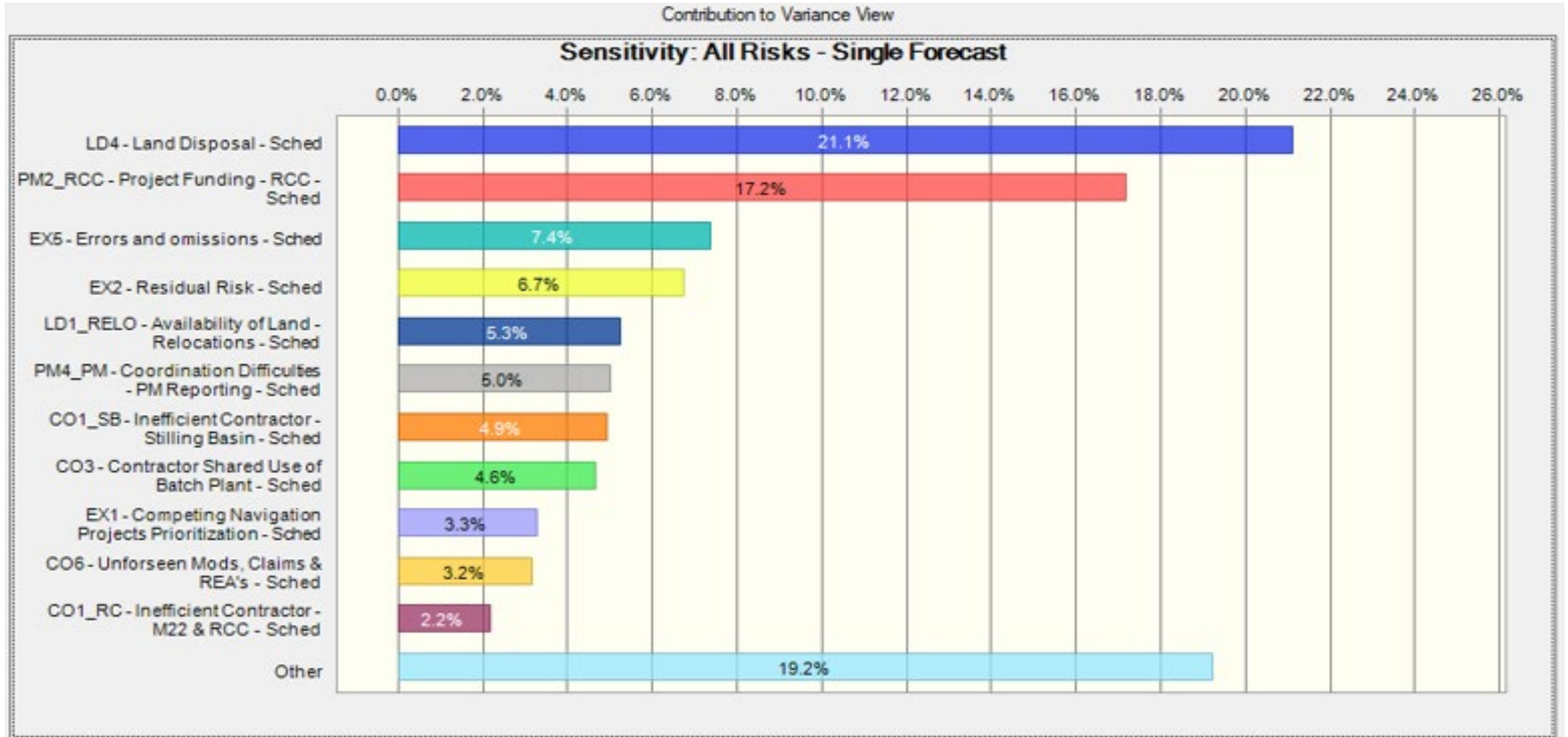
Lower Mon - Risk Bar Charts

Project Cost Risk Factors



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Project Schedule Risk Factors



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