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May 3, 2019

Lonnie G. Harper & Associates, Inc.  
2746 Highway 384  
Bell City, Louisiana 70630

Attention: Mr. Chris Wheat, PE

Subject: Report Addendum #2  
BA-195 Barataria Bay Rim Marsh Creation and Nourishment  
Jefferson and Plaquemines Parishes, Louisiana  
File No. 10883-022-00

GeoEngineers Inc. (GeoEngineers) has prepared this addendum for Lonnie G. Harper & Associates, Inc. (LGH) to our February 14, 2018 Geotechnical Services Report to provide updated marsh creation curves assuming a 60-day construction period to fill marsh creation cells.

## **INTRODUCTION**

Our January 18, 2019 Report Addendum #1 documented the effect of changing the amount of time to fill a marsh creation cell during construction. As a follow-up to agency comments on the 30% design packet for the BA-195 Barataria Bay Rim Marsh Creation and Nourishment (BA-195) project, LGH and the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) requested GeoEngineers evaluate marsh creation settlement based on a 60-day fill period. Our understanding of the additional analysis is based on an e-mail from LGH dated April 18, 2019 and subsequent communications.

Analysis results and conclusions presented in this addendum are complementary to those presented in our February 14, 2018 report and the January 18, 2019 report addendum #1. Figures presented in this addendum are numbered in sequence with the existing figures from the February 14, 2018 report.

## **CONCLUSIONS AND RECOMMENDATIONS**

GeoEngineers evaluated marsh creation settlements based on a 60-day fill period for initial fill elevations ranging from elevation +1.5 feet (North American Vertical Datum of 1988 (NAVD 88), Geoid 12A) (EL +1.5) to EL +4 at mudline EL -1, mudline EL -2 and mudline EL -3. Marsh surface elevation vs. time is shown in the attached Figures H-6 through H-9. Figure H-9 is a summary figure showing the range of settlement for the same initial fill elevations with varying mudline elevation.



GeoEngineers evaluated marsh foundation settlement by adjusting foundation pressures assuming water ranges between the top of fill (early stages of fill placement and settlement) to no lower than the mean high water. Our fill period was modeled in the computer program Primary consolidation, Secondary compression and Desiccation of Dredged Fill (PSDDF) using 4 fill "lifts" placed at 2-week intervals.

GeoEngineers did not include subsidence in the fill elevation changes shown in the attached figures. Assessment of long-term project performance should consider long-term regional subsidence.

## LIMITATIONS

This addendum should be considered part of our February 14, 2018 Geotechnical Services Report, and the limitations presented in that report are applicable

## CLOSING


GeoEngineers appreciates the opportunity to work with LGH and NRCS on this project. If there are questions about this addendum, please contact us at 225.293.2460.

Sincerely,  
GeoEngineers, Inc.



Joshua M. Pruett, PE  
Engineer

JMP:DSE:kc



David S. Eley, PE  
Principal



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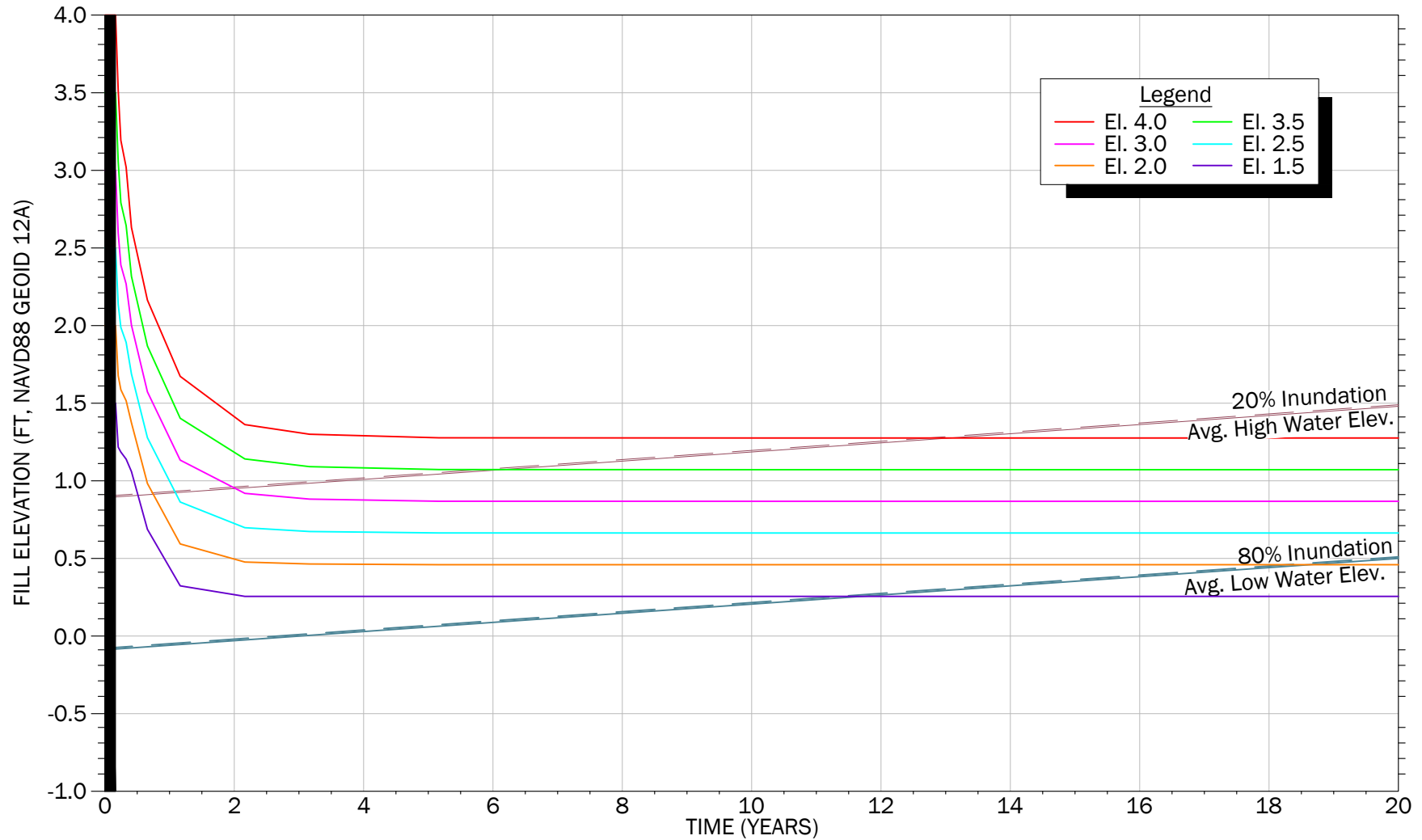
## Attachments

Figure H-6. Marsh Fill Elevation vs. Time – 60-day Fill Period – Mudline El -1 ft.

Figure H-7. Marsh Fill Elevation vs. Time – 60-day Fill Period – Mudline El -2 ft.

Figure H-8. Marsh Fill Elevation vs. Time – 60-day Fill Period – Mudline El -3 ft.

Figure H-9. Marsh Fill Elevation vs. Time – 60-day Fill Period – Summary



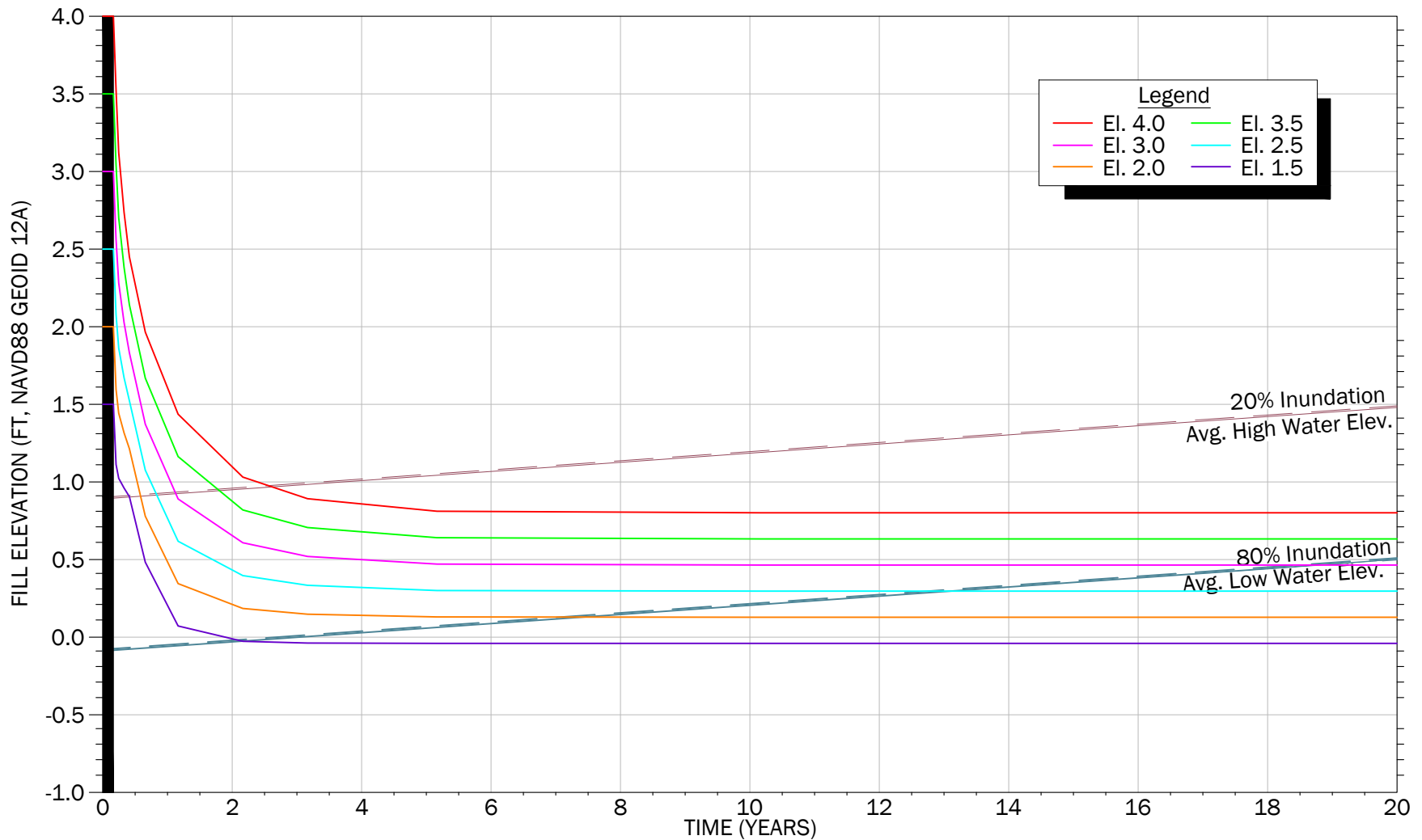
FILL ELEVATION (FEET NAVD88)							
INITIAL FILL PLACEMENT	END OF CONSTRUCTION	6 MONTHS	1 YEAR	3 YEARS	5 YEARS	10 YEARS	20 YEARS
1.5	1.5	0.9	0.4	0.3	0.3	0.3	0.3
2.0	2.0	1.2	0.7	0.5	0.5	0.5	0.5
2.5	2.5	1.5	1.0	0.7	0.7	0.7	0.7
3.0	3.0	1.8	1.3	0.9	0.9	0.9	0.9
3.5	3.5	2.2	1.5	1.1	1.1	1.1	1.1
4.0	4.0	2.5	1.8	1.3	1.3	1.3	1.3

**Marsh Fill Elevation vs Time - 60 Day Fill Period  
Mudline EI -1 ft.**

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Marsh Creation and Nourishment  
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**Figure H-6**



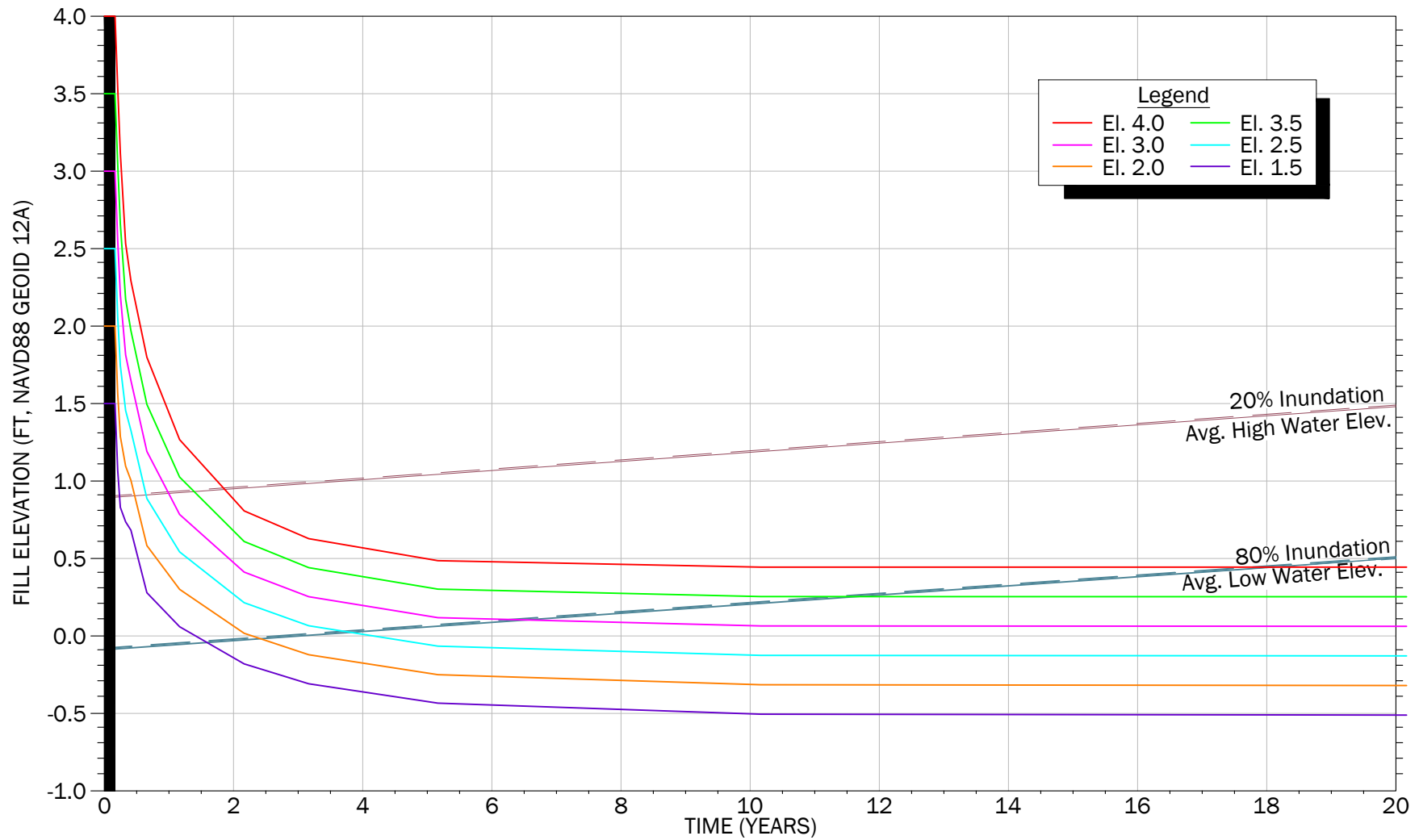
FILL ELEVATION (FEET NAVD88)							
INITIAL FILL PLACEMENT	END OF CONSTRUCTION	6 MONTHS	1 YEAR	3 YEARS	5 YEARS	10 YEARS	20 YEARS
1.5	1.5	0.7	0.2	0.0	0.0	0.0	0.0
2.0	2.0	1.1	0.5	0.1	0.1	0.1	0.1
2.5	2.5	1.4	0.8	0.3	0.3	0.3	0.3
3.0	3.0	1.7	1.0	0.5	0.5	0.5	0.5
3.5	3.5	2.0	1.3	0.7	0.6	0.6	0.6
4.0	4.0	2.3	1.6	0.9	0.8	0.8	0.8

**Marsh Fill Elevation vs Time - 60 Day Fill Period**  
**Mudline El -2 ft.**

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**GEOENGINEERS**

**Figure H-7**



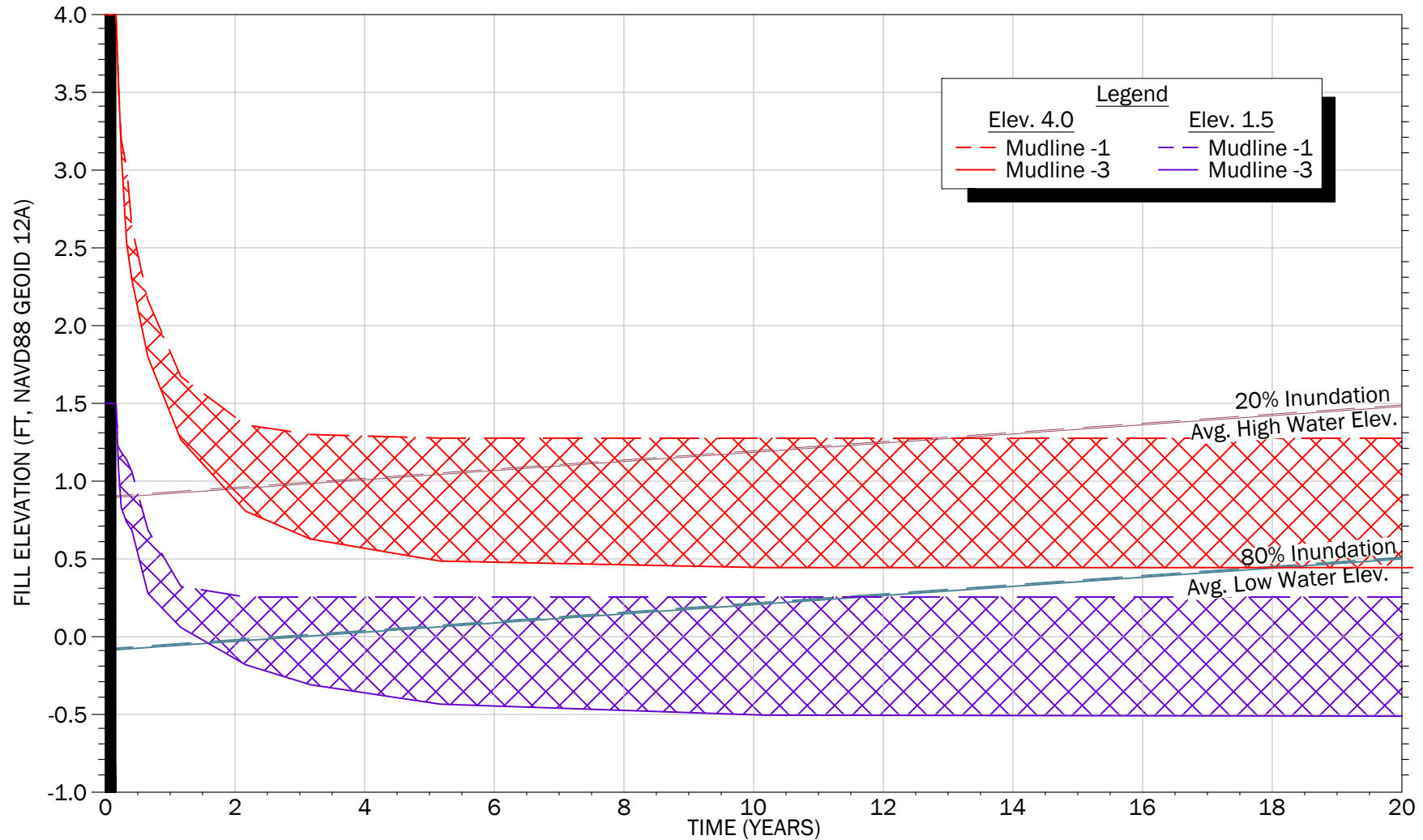
FILL ELEVATION (FEET NAVD88)							
INITIAL FILL PLACEMENT	END OF CONSTRUCTION	6 MONTHS	1 YEAR	3 YEARS	5 YEARS	10 YEARS	20 YEARS
1.5	1.5	0.5	0.1	-0.3	-0.4	-0.5	-0.5
2.0	2.0	0.8	0.4	-0.1	-0.3	-0.3	-0.3
2.5	2.5	1.2	0.6	0.1	-0.1	-0.1	-0.1
3.0	3.0	1.5	0.9	0.3	0.1	0.1	0.1
3.5	3.5	1.8	1.2	0.5	0.3	0.3	0.3
4.0	4.0	2.1	1.4	0.7	0.5	0.4	0.4

**Marsh Fill Elevation vs Time - 60 Day Fill Period  
Mudline El -3 ft.**

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**Figure H-8**



FILL ELEVATION (FEET NAVD88)								
MUDLINE ELEVATION	INITIAL FILL PLACEMENT	END OF CONSTRUCTION	6 MONTHS	1 YEAR	3 YEARS	5 YEARS	10 YEARS	20 YEARS
-1 FT	1.5	1.5	0.9	0.4	0.3	0.3	0.3	0.3
	4.0	4.0	2.5	1.8	1.3	1.3	1.3	1.3
-3 FT	1.5	1.5	0.5	0.1	-0.3	-0.4	-0.5	-0.5
	4.0	4.0	2.1	1.4	0.7	0.5	0.4	0.4

### Marsh Fill Elevation vs Time - 60 Day Fill Period Summary

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Figure H-9