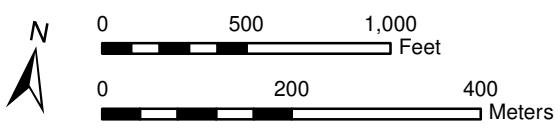
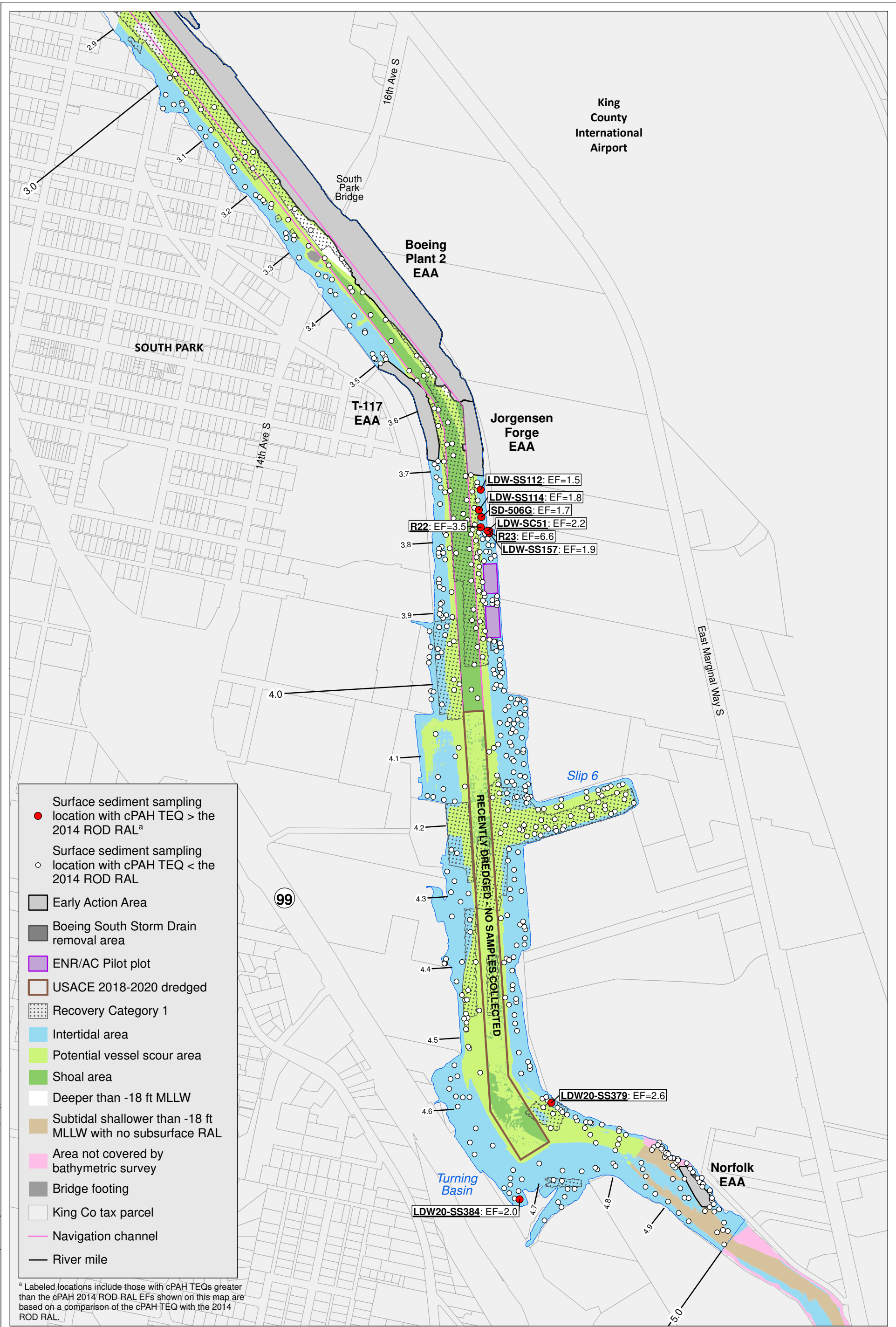


- Surface sediment location with new data for cPAHs
- ◻ Core with new data for cPAHs, 0-45 cm
- ◻ Core with new data for cPAHs, 0-60 cm
- ▽ Core with new data for cPAHs, non-RAL interval
- Surface sediment sampling location with cPAH data
- ◆ Subsurface core with cPAH data, 0-45 cm
- Subsurface core with cPAH data, 0-60 cm
- Early Action Area
- Boeing South Storm Drain removal area
- ENR/AC Pilot plot
- USACE 2018-2020 dredged
- Recovery Category 1
- Intertidal area
- Potential vessel scour area
- Shoal area
- Deeper than -18 ft MLLW
- Subtidal shallower than -18 ft MLLW with no subsurface RAL
- Area not covered by bathymetric survey
- Bridge footing
- King Co tax parcel
- Navigation channel
- River mile

LDW21-SC677 re-occupied LDW-SC53 (2006), which had a TEQ of 1,200 $\mu\text{g}/\text{kg}$ dw and a ROD RAL cPAH EF of 1.2 (0-60 cm). LDW21-SC678 re-occupied R-41 (1997), which had a TEQ of 1,200 $\mu\text{g}/\text{kg}$ dw and a ROD RAL cPAH EF of 1.2 (0-10 cm).



Prepared by craigh_7/15/22: W:\Projects\Duwamish\AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix B\Map_B-1_7297_cPAH_additional_data.mxd

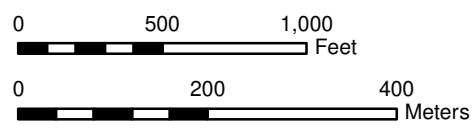


- Surface sediment sampling location with cPAH TEQ > the 2014 ROD RAL^a
- Surface sediment sampling location with cPAH TEQ < the 2014 ROD RAL
- Early Action Area
- Boeing South Storm Drain removal area
- ENR/AC Pilot plot
- USACE 2018-2020 dredged
- Recovery Category 1
- Intertidal area
- Potential vessel scour area
- Shoal area
- Deeper than -18 ft MLLW
- Subtidal shallower than -18 ft MLLW with no subsurface RAL
- Area not covered by bathymetric survey
- Bridge footing
- King Co tax parcel
- Navigation channel
- River mile

^a Labeled locations include those with cPAH TEQs greater than the cPAH 2014 ROD RAL EF values shown on this map are based on a comparison of the cPAH TEQ with the 2014 ROD RAL.

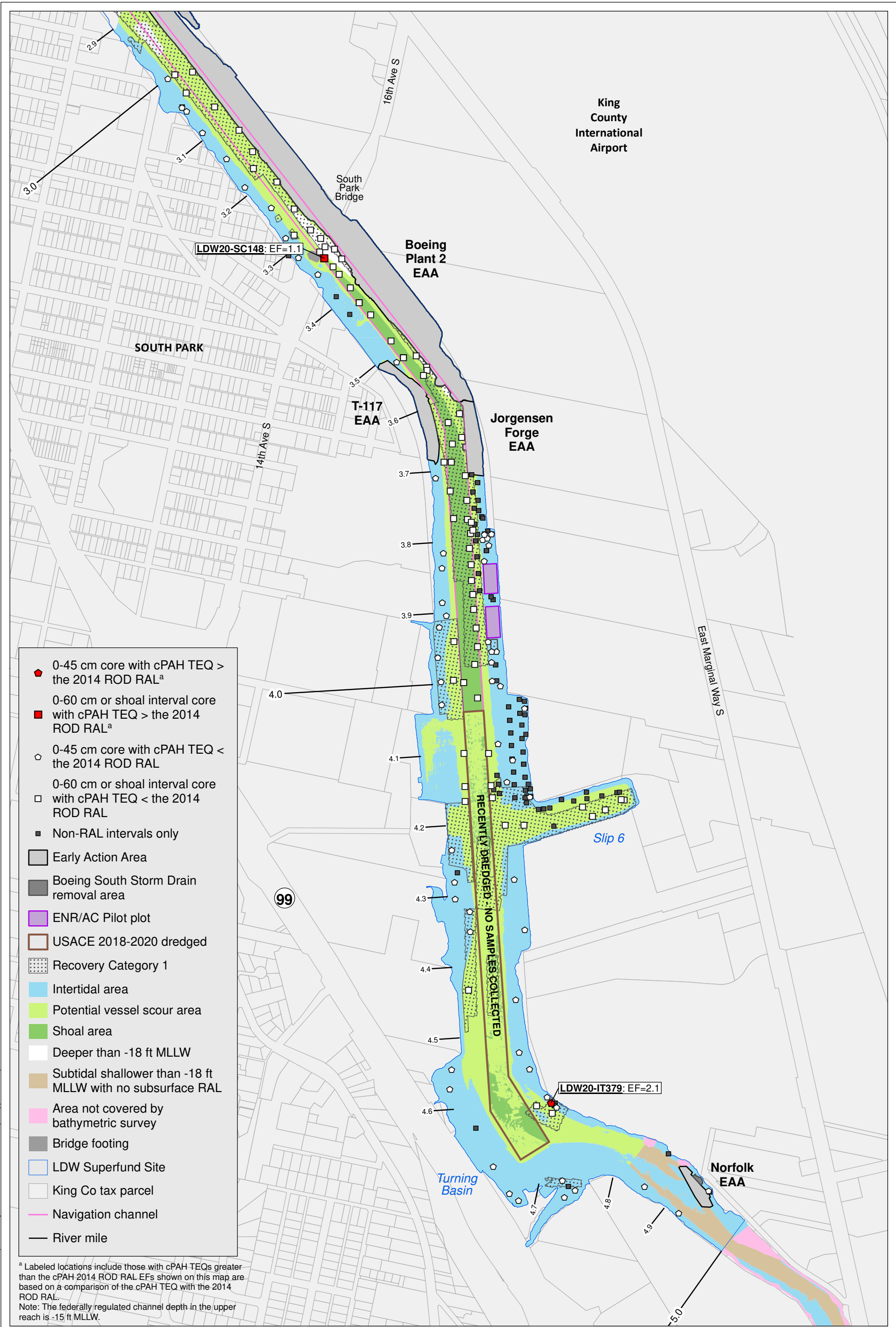


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Map B-2. cPAH TEQs greater than the 2014 ROD RAL in the surface sediment design dataset

Prepared by: craigh, 7/15/22; W:\Projects\Duwamish\AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix B\Map B-2 7297 cPAH ROD RAL.evc - Surface.mxd

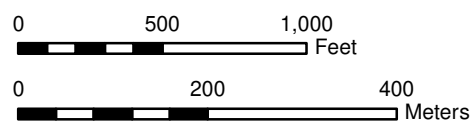


- ◆ 0-45 cm core with cPAH TEQ > the 2014 ROD RAL^a
- 0-60 cm or shoal interval core with cPAH TEQ > the 2014 ROD RAL^a
- ◇ 0-45 cm core with cPAH TEQ < the 2014 ROD RAL
- 0-60 cm or shoal interval core with cPAH TEQ < the 2014 ROD RAL
- Non-RAL intervals only
- Early Action Area
- Boeing South Storm Drain removal area
- ENR/AC Pilot plot
- USACE 2018-2020 dredged
- Recovery Category 1
- Intertidal area
- Potential vessel scour area
- Shoal area
- Deeper than -18 ft MLLW
- Subtidal shallower than -18 ft MLLW with no subsurface RAL
- Area not covered by bathymetric survey
- Bridge footing
- LDW Superfund Site
- King Co tax parcel
- Navigation channel
- River mile

^a Labeled locations include those with cPAH TEQs greater than the cPAH 2014 ROD RAL EFs shown on this map are based on a comparison of the cPAH TEQ with the 2014 ROD RAL.
 Note: The federally regulated channel depth in the upper reach is -15 ft MLLW.

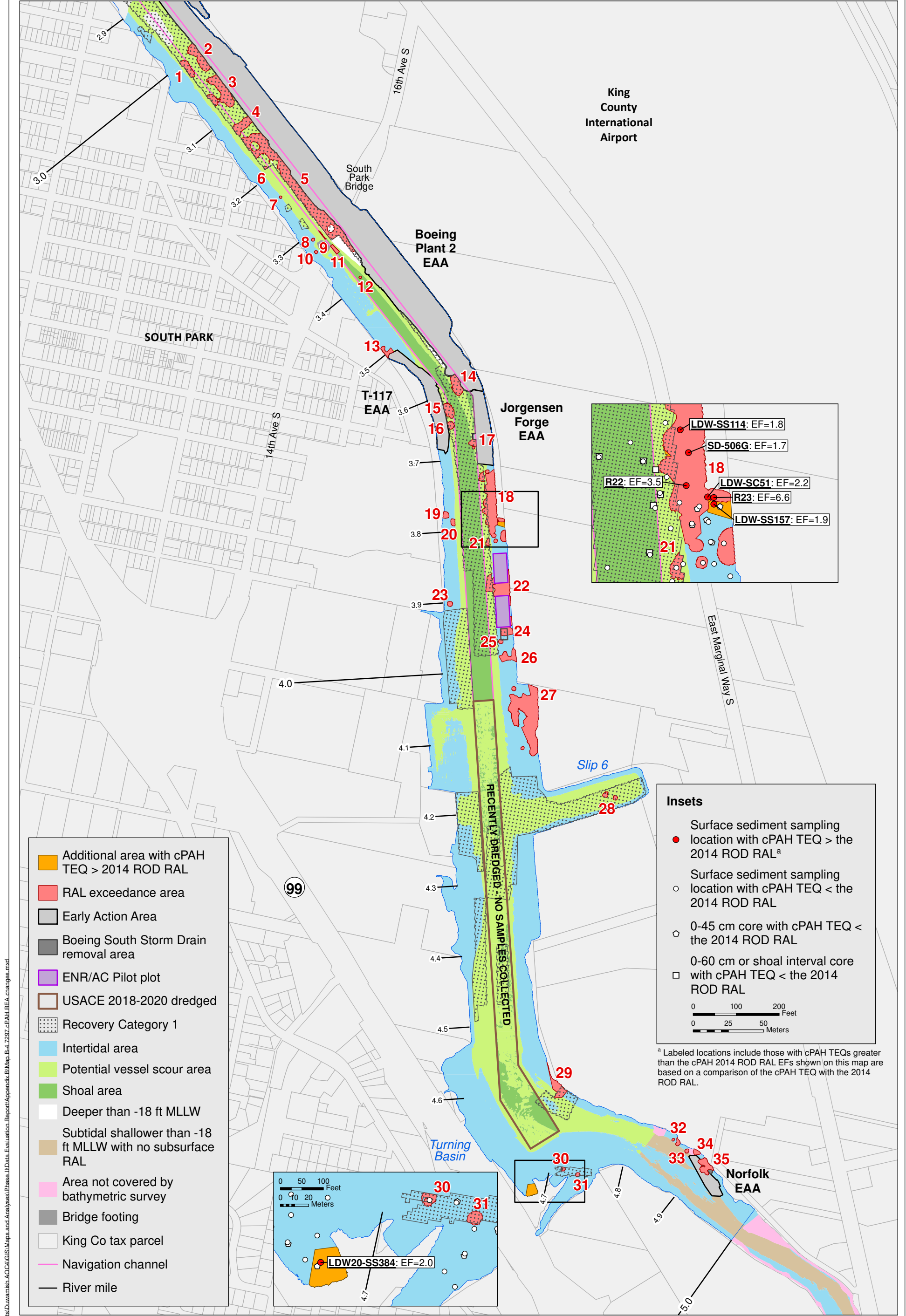


Lower Duwamish Waterway Group
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Map B-3. cPAH TEQs greater than the 2014 ROD RAL in the subsurface sediment design dataset

Prepared by: craigh, 7/15/22; W:\Projects\Duwamish\AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix B\Map_B-3_7297_cPAH ROD RAL_e.v.c - Subsurface.mxd



- Additional area with cPAH TEQ > 2014 ROD RAL
- RAL exceedance area
- Early Action Area
- Boeing South Storm Drain removal area
- ENR/AC Pilot plot
- USACE 2018-2020 dredged
- Recovery Category 1
- Intertidal area
- Potential vessel scour area
- Shoal area
- Deeper than -18 ft MLLW
- Subtidal shallower than -18 ft MLLW with no subsurface RAL
- Area not covered by bathymetric survey
- Bridge footing
- King Co tax parcel
- Navigation channel
- River mile

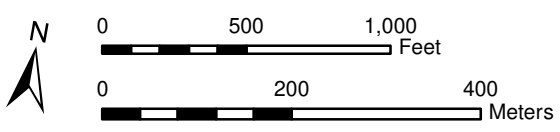
- Insets**
- Surface sediment sampling location with cPAH TEQ > the 2014 ROD RAL^a
 - Surface sediment sampling location with cPAH TEQ < the 2014 ROD RAL
 - ◊ 0-45 cm core with cPAH TEQ < the 2014 ROD RAL
 - ◻ 0-60 cm or shoal interval core with cPAH TEQ < the 2014 ROD RAL
- 0 100 200 Feet
0 25 50 Meters

^a Labeled locations include those with cPAH TEQs greater than the cPAH 2014 ROD RAL EFs shown on this map are based on a comparison of the cPAH TEQ with the 2014 ROD RAL.

Prepared by: craigh_7/15/22; W:\Projects\Duwamish\AOC\GIS\Maps and Analysis\Phase II\Data\Evaluation\Report\Appendix B\Map_B-4_7297_cPAH_EEA_changes.mxd

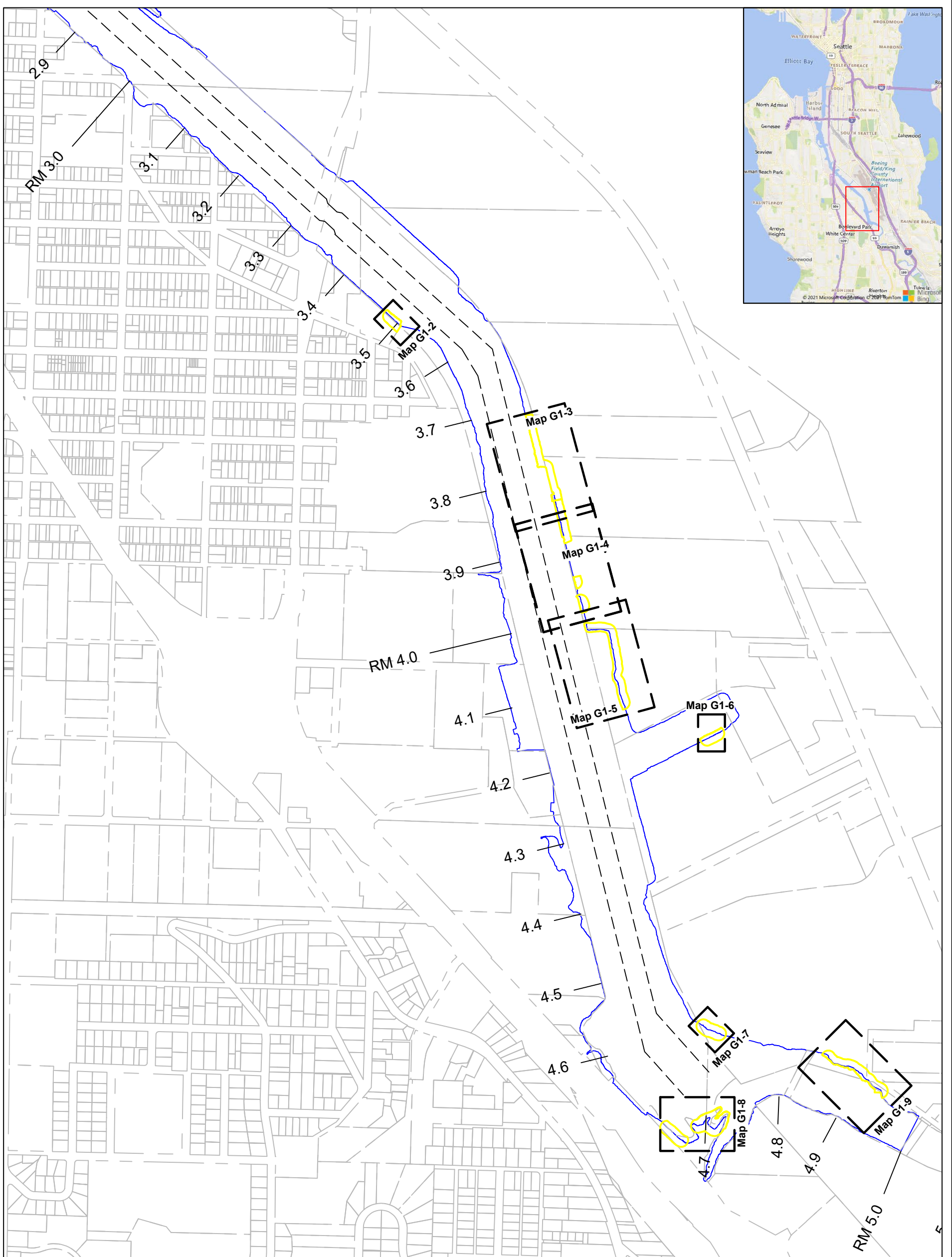


Lower Duwamish Waterway Group
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Map B-4. Additional RAL exceedance areas in the upper reach based on the use of the 2014 ROD RAL for cPAHs

PRE-DESIGN INVESTIGATION DATA EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022



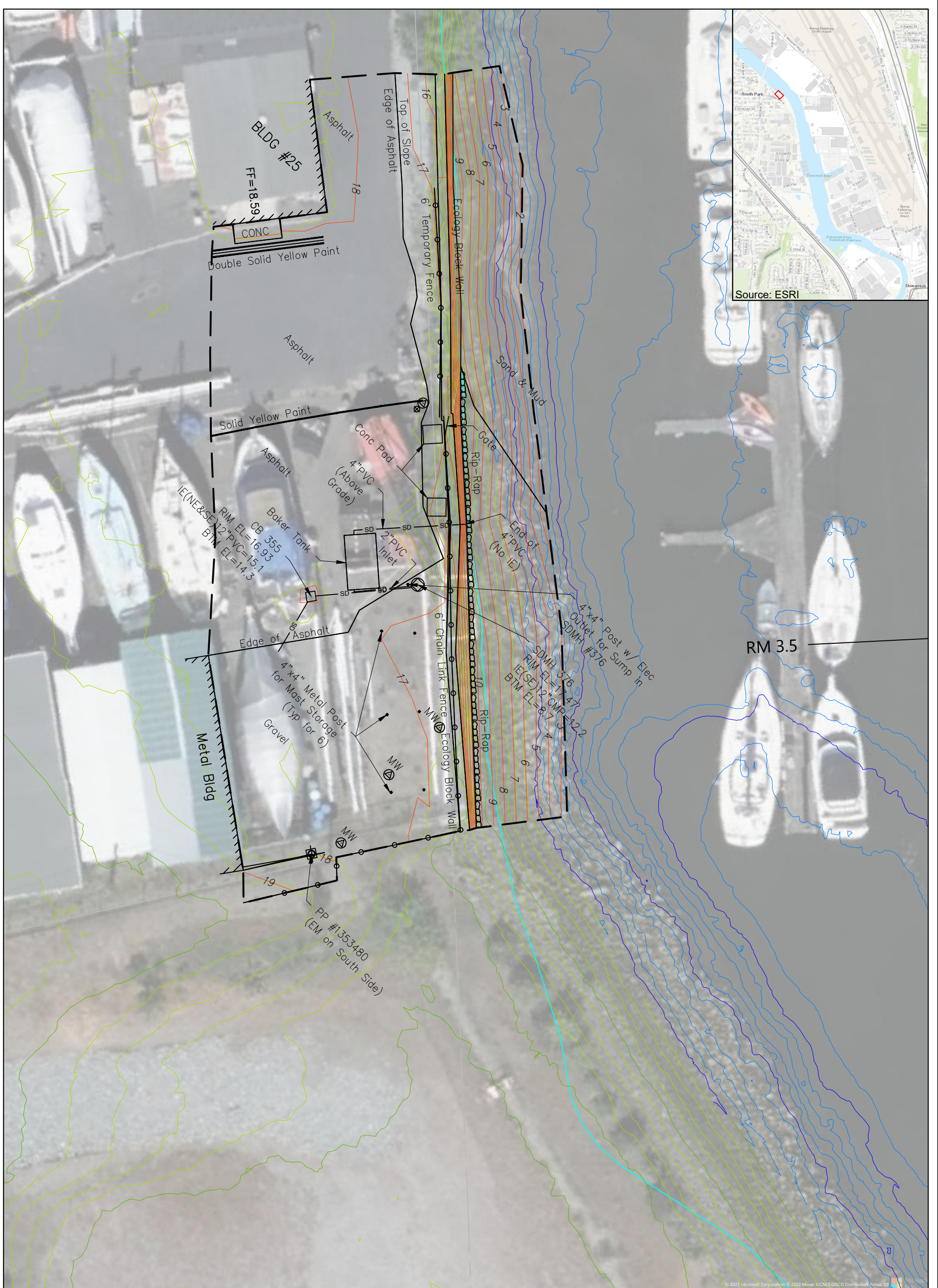
Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021.
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet; WSDOT MON GP17005-176 & GP17005-181
Vertical Datum: Mean Lower Low Water (MLLW), MLLW Converted from NAD88 (NAVD88 + 2.34' to MLLW).
Vertical benchmarks:
 COS BM 3765-4302 2" Brass Disk SET AT 8TH AVE S & S Portland St in center of conc walk. EL:13.322 (NAVD88), Converted EL:15.662 (MLLW)
 COS BM SNV-5411 2" Brass disk stamped COS top of curb around US Bank sign, at southeast corner, East Marginal Way S & S Michigan St. EL: 16.866 (NAVD 88) Converted EL: 19.226 (MLLW)

- Legend:**
- Federal Navigation Channel
 - Channel Centerline
 - LDW Upper Reach Approximate Boundary
 - Topographic Survey Area

Map G1-1.
Topographic Survey Areas and Geodetic Control Survey
 PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH
 JULY 15, 2022



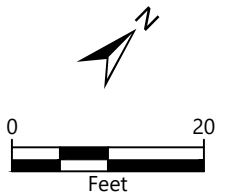
Jul 12, 2022 3:38pm tgrjga \\nalia\CAD\Projects\0067-King County\LDW Upper Reach\Engineering Services\0067-RP-024 Topo Survey.dwg Map G1-1



Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LiDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidar_data_restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

Legend:

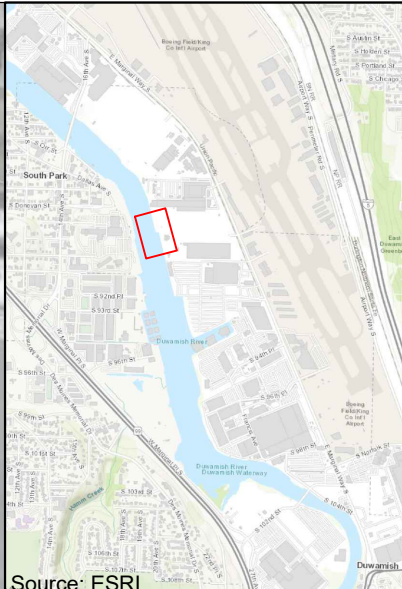
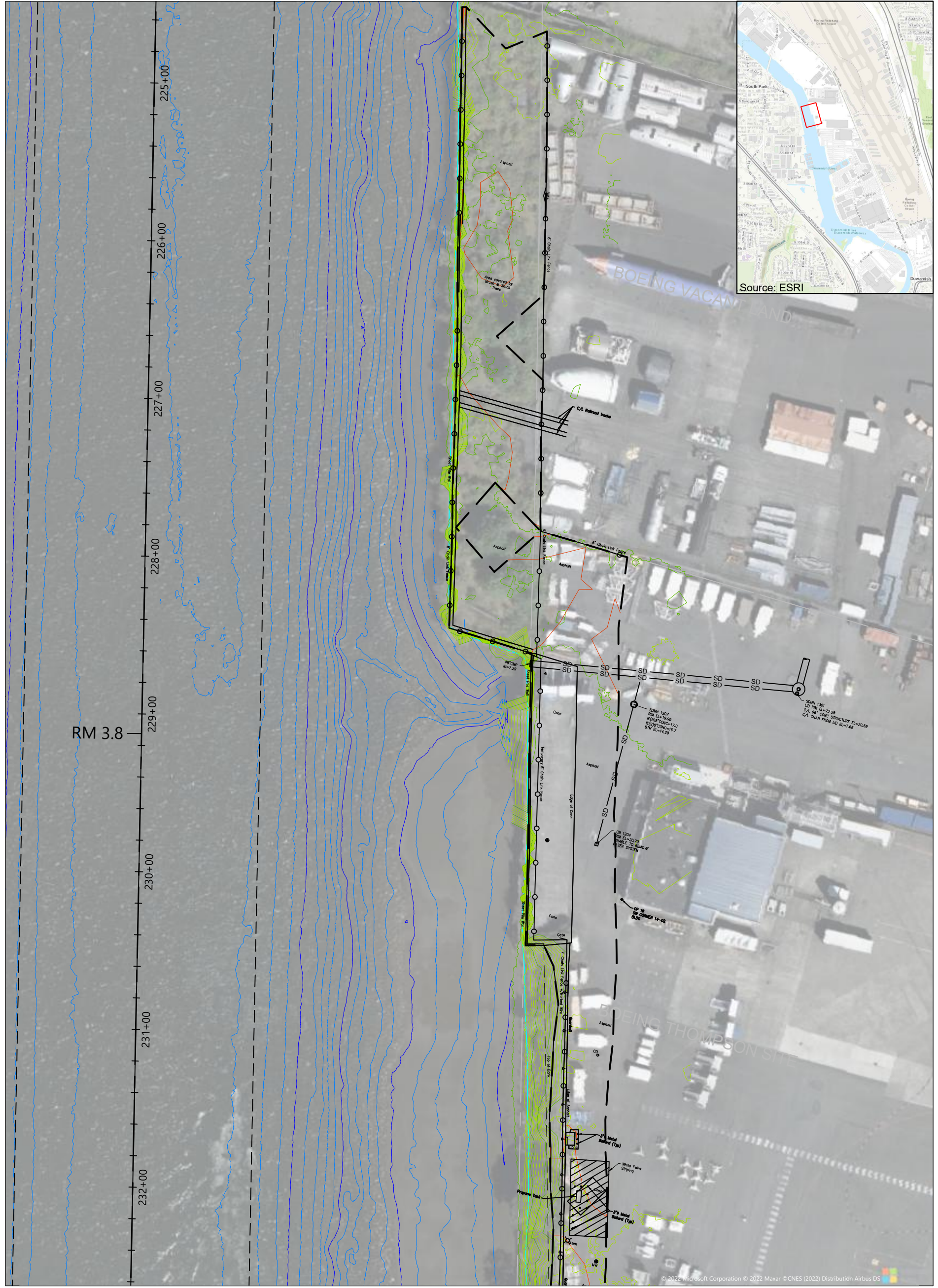
- Federal Navigation Channel
- 2021 True North Survey Limits
- Channel Centerline
- 2021 True North Contours (1' & 5' Intervals)
- LDW Upper Reach Approximate Boundary
- 2019/2020 Bathymetry by Others (1' & 5' Intervals)
- 2016 LiDAR by Others (1' & 5' Intervals)



**Map G1-2.
Topographic Survey Area,
River Mile Area 3.5W**

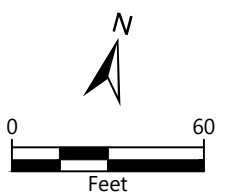
PRE-DESIGN INVESTIGATION DATA EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

Jul 12, 2022 3:54pm tgriga \\nalia\CAD\Projects\0067-King County\LDW Upper Reach\Engineering Services\0067-RP-021 True North Survey.dwg Map G1-3



Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LiDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidar_data_restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

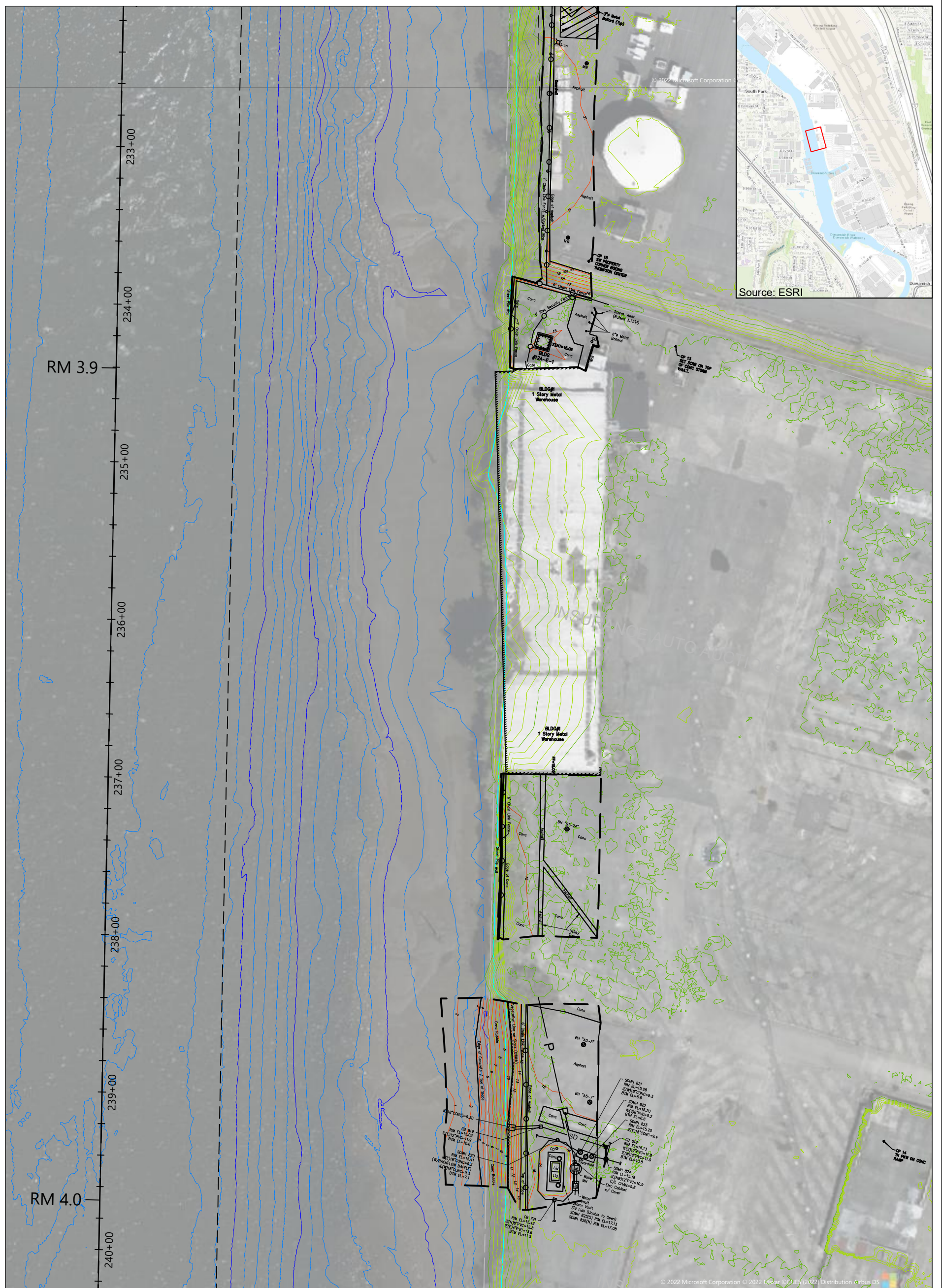
- Legend:**
- Federal Navigation Channel
 - 2021 True North Survey Limits
 - Channel Centerline
 - 2021 True North Contours (1' & 5' Intervals)
 - LDW Upper Reach Approximate Boundary
 - 2019/2020 Bathymetry by Others (1' & 5' Intervals)
 - 2016 LiDAR by Others (1' & 5' Intervals)



Map G1-3.
Topographic Survey Area,
River Mile 3.8E

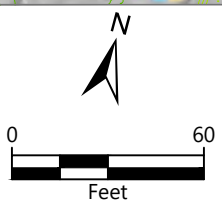
PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH

JULY 15, 2022



Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LiDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidarata_restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

- Legend:**
- Federal Navigation Channel
 - Channel Centerline
 - LDW Upper Reach Approximate Boundary
 - 2021 True North Survey Limits
 - 2021 True North Contours (1' & 5' Intervals)
 - 2019/2020 Bathymetry by Others (1' & 5' Intervals)
 - 2016 LiDAR by Others (1' & 5' Intervals)

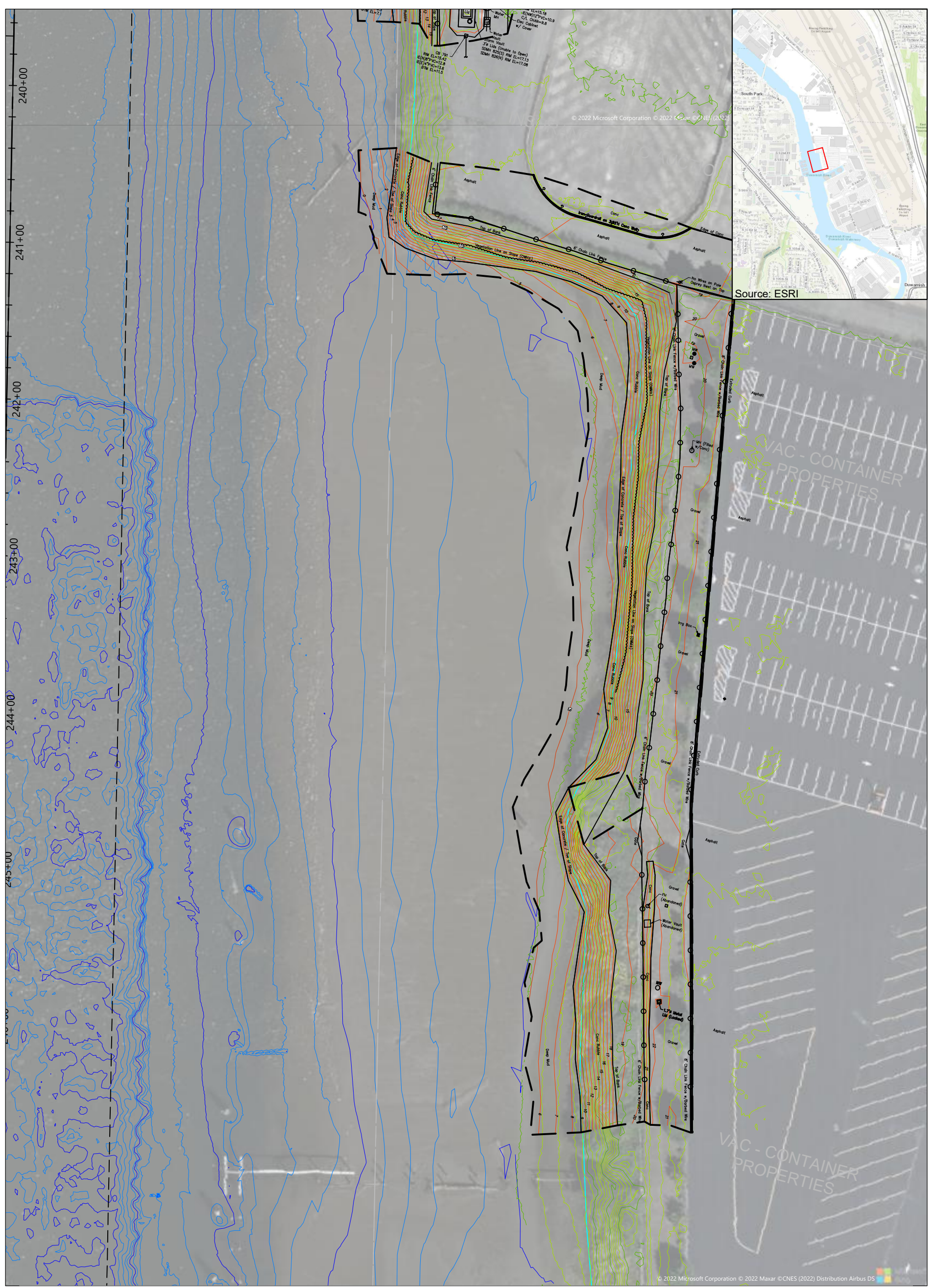


Map G1-4.
Topographic Survey Area,
River Mile 3.9E

PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH

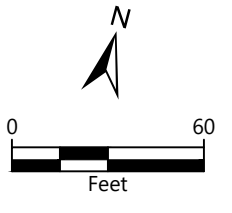
JULY 15, 2022

Jul 12, 2022 3:56pm tgriga \\galia\CAD\Projects\0067-King County\LDW Upper Reach\Engineering Services\0067-RP-021 True North Survey.dwg Map G1-5



Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LIDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidar_data_restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

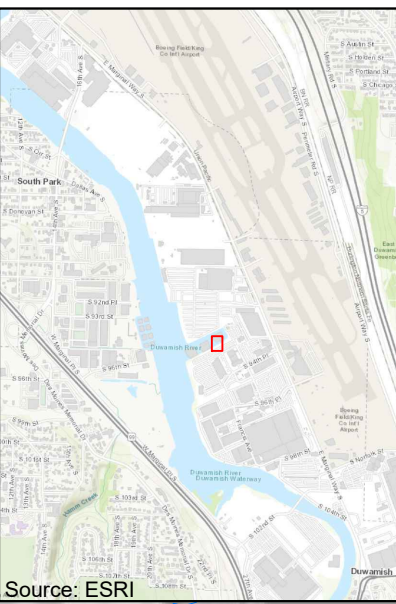
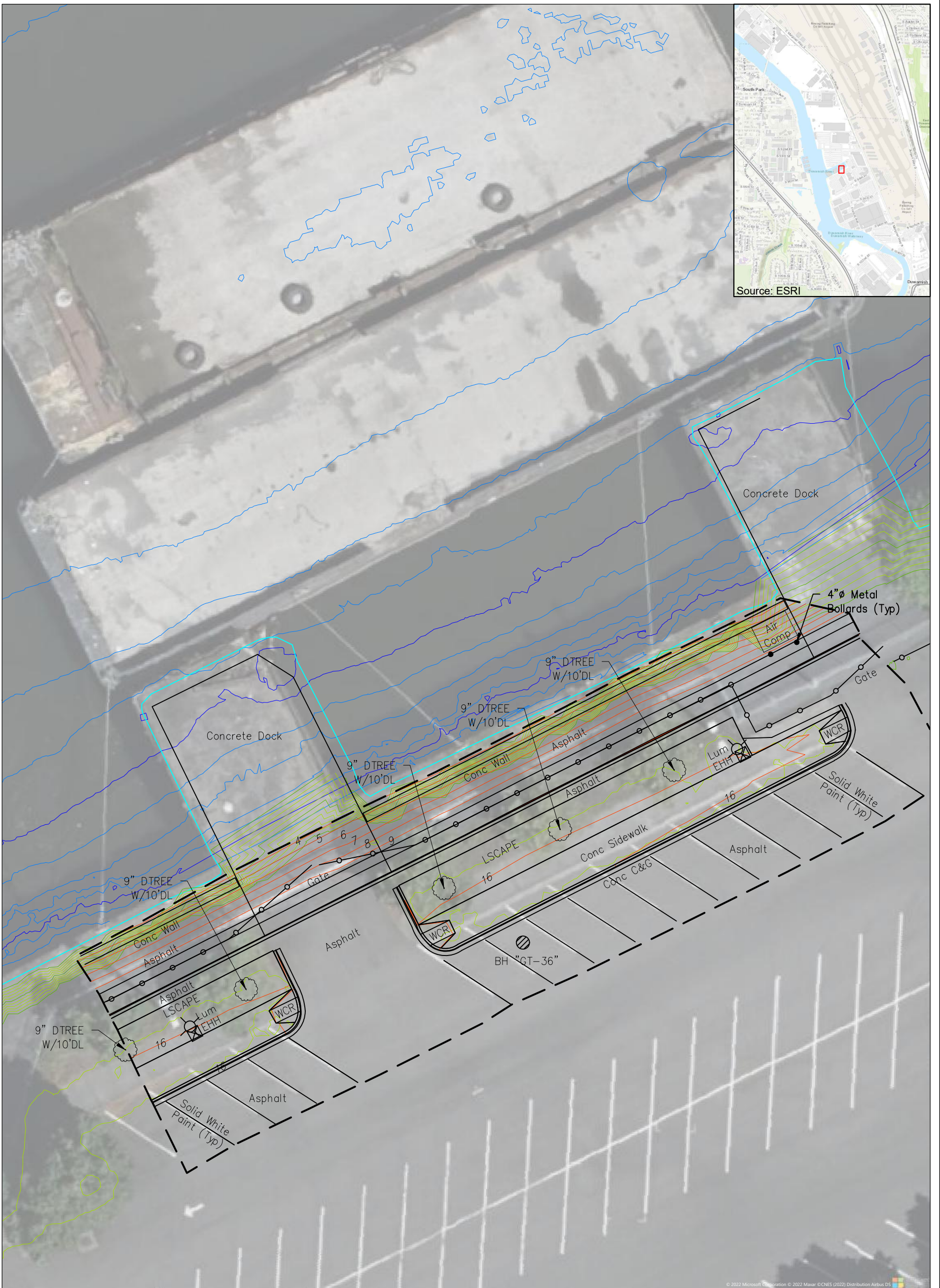
- Legend:**
- Federal Navigation Channel
 - Channel Centerline
 - LDW Upper Reach Approximate Boundary
 - 2021 True North Survey Limits
 - 2021 True North Contours (1' & 5' Intervals)
 - 2019/2020 Bathymetry by Others (1' & 5' Intervals)
 - 2016 LiDAR by Others (1' & 5' Intervals)



Map G1-5.
Topographic Survey Area,
River Mile Area 4.1E

PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH

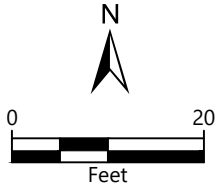
JULY 15, 2022



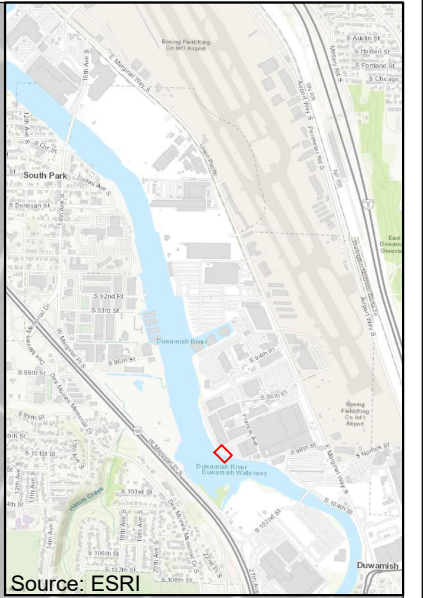
Jul 12, 2022 3:57 pm tgriga \\galia\CAD\Projects\0067-King County\LDW Upper Reach\Engineering Services\0067-RP-021 True North Survey.dwg Map G1-6

Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LiDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidar_data_restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

- Legend:**
- Federal Navigation Channel
 - 2021 True North Survey Limits
 - Channel Centerline
 - 2021 True North Contours (1' & 5' Intervals)
 - LDW Upper Reach Approximate Boundary
 - 2019/2020 Bathymetry by Others (1' & 5' Intervals)
 - 2016 LiDAR by Others (1' & 5' Intervals)

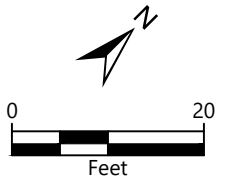


Map G1-6.
Topographic Survey Area,
River Mile 4.2E (Slip 6)
 PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH
 JULY 15, 2022



Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LiDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidardata/restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

- Legend:**
- Federal Navigation Channel
 - 2021 True North Survey Limits
 - Channel Centerline
 - 2021 True North Contours (1' & 5' Intervals)
 - LDW Upper Reach Approximate Boundary
 - 2019/2020 Bathymetry by Others (1' & 5' Intervals)
 - 2016 LiDAR by Others (1' & 5' Intervals)



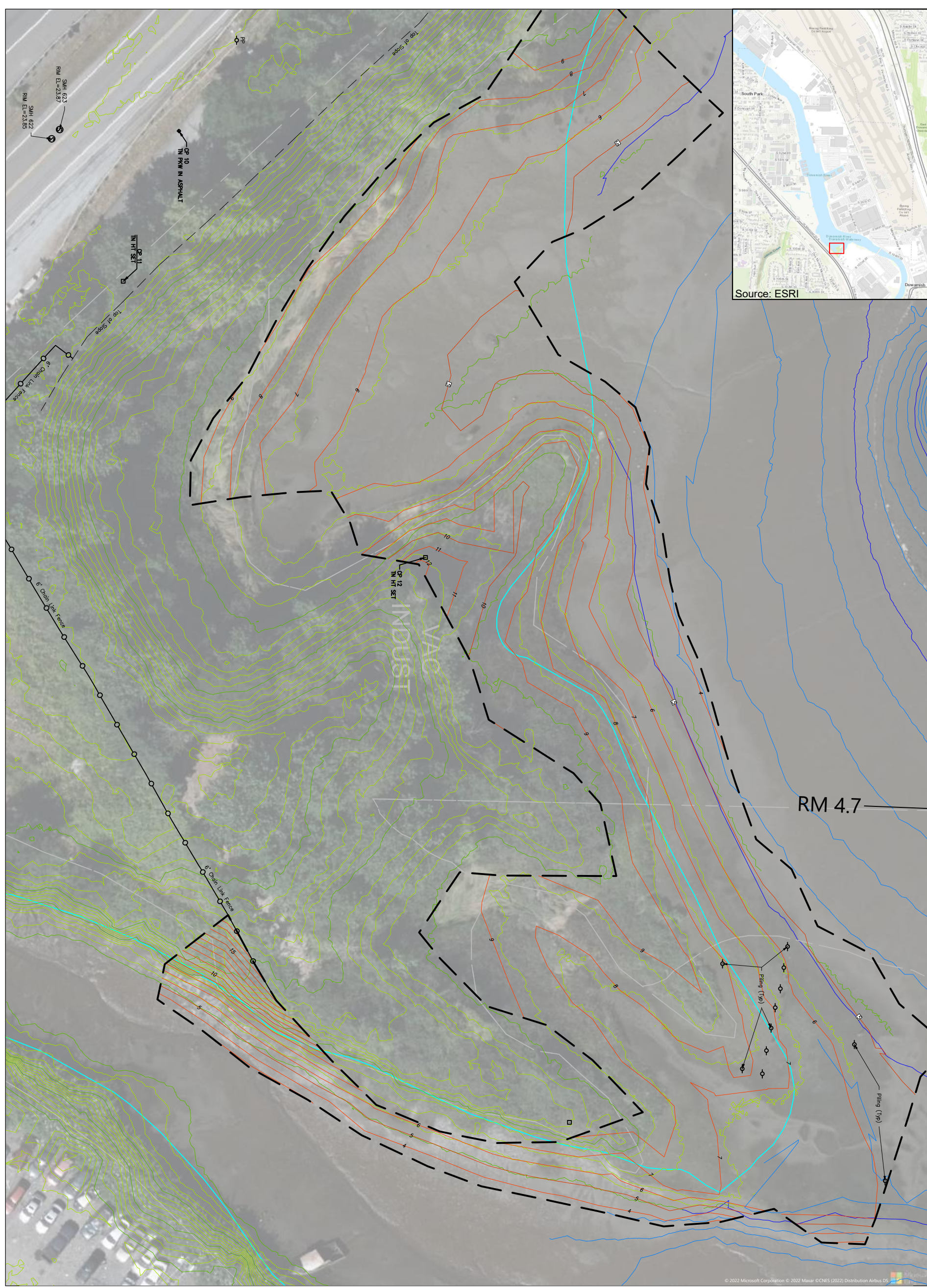
Map G1-7.
Topographic Survey Area,
River Mile 4.6E

PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH

JULY 15, 2022

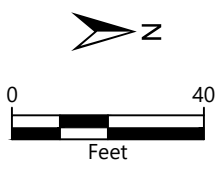
Jul 12, 2022 3:57 pm tgriga \\galia\CAD\Projects\0067-King County\LDW Upper Reach\Engineering Services\0067-RP-021 True North Survey.dwg Map G1-7

\\gala\CAD\Projects\0067-King County\LDW Upper Reach\Engineering Services\0067-RP-021 True North Survey.dwg Map G1-8
 Jul 12, 2022 3:58pm tgriga



Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LIDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidardata/restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

- Legend:**
- Federal Navigation Channel
 - 2021 True North Survey Limits
 - Channel Centerline
 - 2021 True North Contours (1' & 5' Intervals)
 - LDW Upper Reach Approximate Boundary
 - 2019/2020 Bathymetry by Others (1' & 5' Intervals)
 - 2016 LiDAR by Others (1' & 5' Intervals)



Map G1-8.
Topographic Survey Area,
River Mile 4.7W

PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH

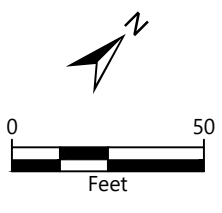
JULY 15, 2022

\\galia\CAD\Projects\0067-King County\LDW Upper Reach\Engineering Services\0067-RP-021 True North Survey.dwg Map G1-9
 Jul 12, 2022 3:59pm tgriga



Source: Topographic survey by True North Land Surveying, Inc. performed between June 30, 2021 and August 10, 2021. Bathymetric survey by Northwest Hydro performed between April 18, 2019 and May 15, 2019. Additional survey by Northwest Hydro performed June 2020. Composite bathymetry data updated December 23, 2020. 2016 LiDAR by Puget Sound LiDAR Consortium http://pugetsoundlidar.ess.washington.edu/lidardata/restricted/projects/2016king_county.html
Horizontal Datum: Washington State Plane, North Zone, North American Datum of 1983/91, U.S. Survey Feet
Vertical Datum: Mean Lower Low Water (MLLW)

- Legend:**
- Federal Navigation Channel
 - 2021 True North Survey Limits
 - Channel Centerline
 - 2021 True North Contours (1' & 5' Intervals)
 - LDW Upper Reach Approximate Boundary
 - 2019/2020 Bathymetry by Others (1' & 5' Intervals)
 - 2016 LiDAR by Others (1' & 5' Intervals)

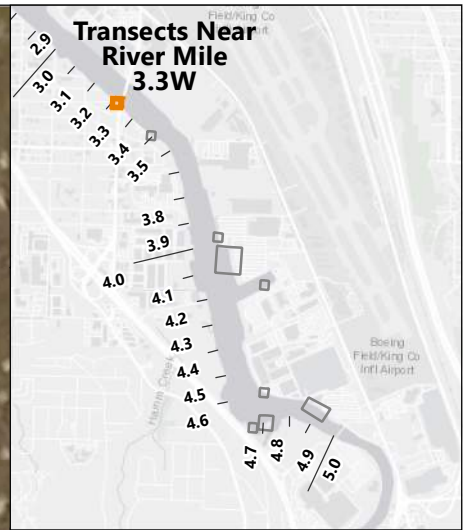


Map G1-9.
Topographic Survey Area,
River Mile 4.9E

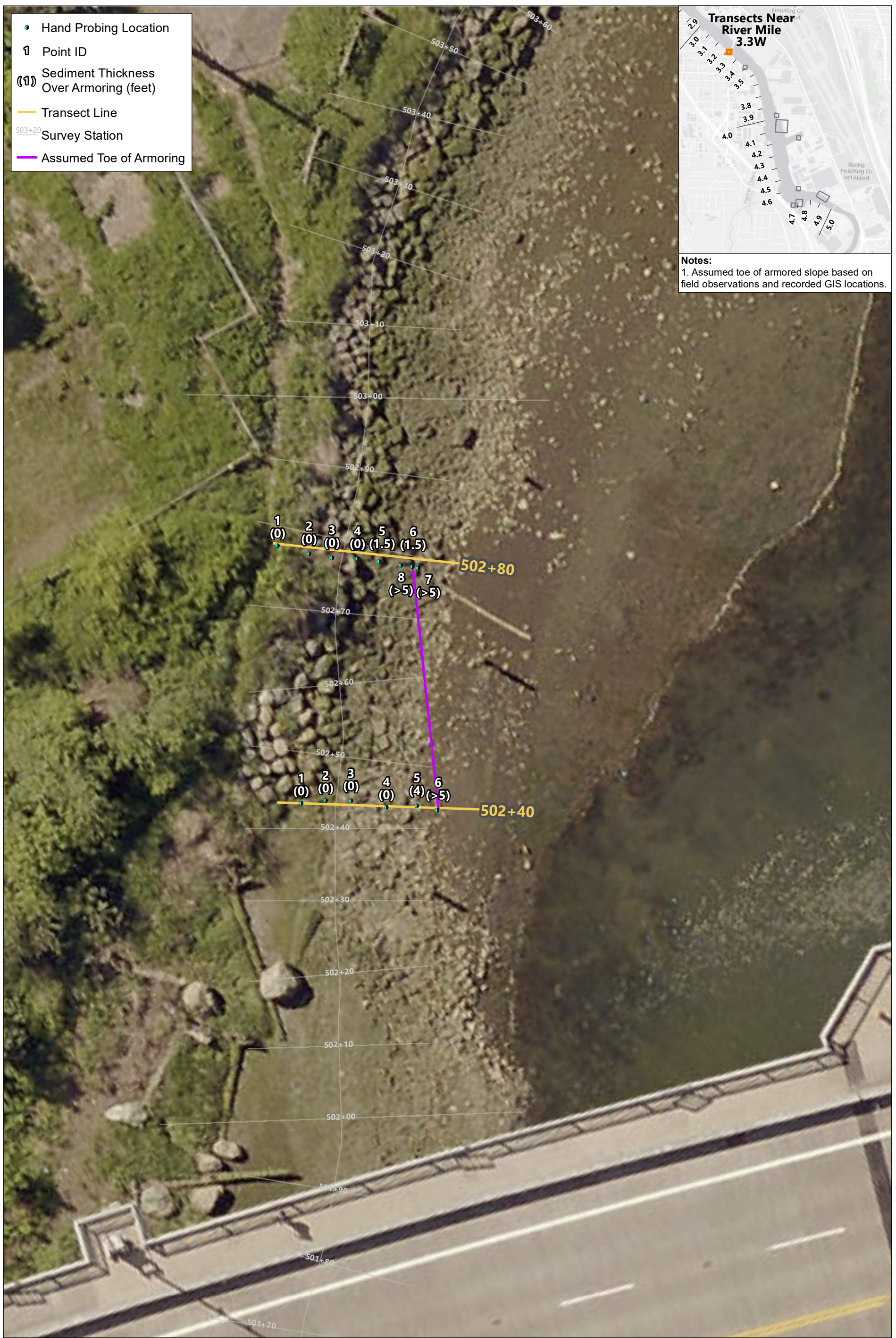
PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH

JULY 15, 2022

- Hand Probing Location
- ① Point ID
- (①) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station
- Assumed Toe of Armoring



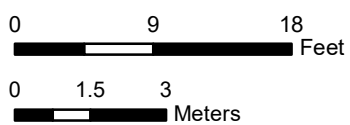
Notes:
 1. Assumed toe of armored slope based on field observations and recorded GIS locations.



Prepared by jolive, 7/15/2022, \\nrcas\GIS\Jobs\KingCounty_0067\LDW\Map\Reports\Data\Evaluation\Report\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



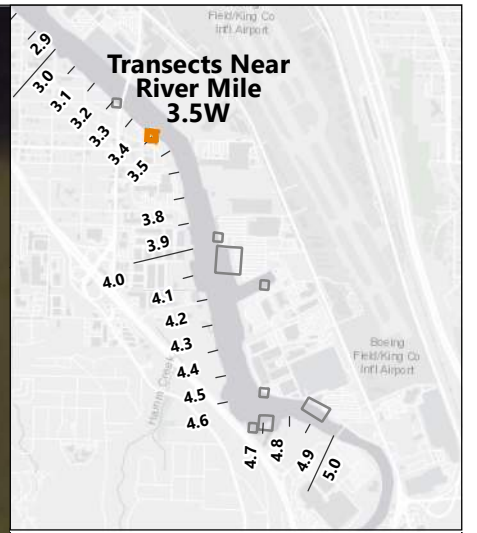
Lower Duwamish Waterway Group
 Port of Seattle / City of Seattle / King County / The Boeing Company



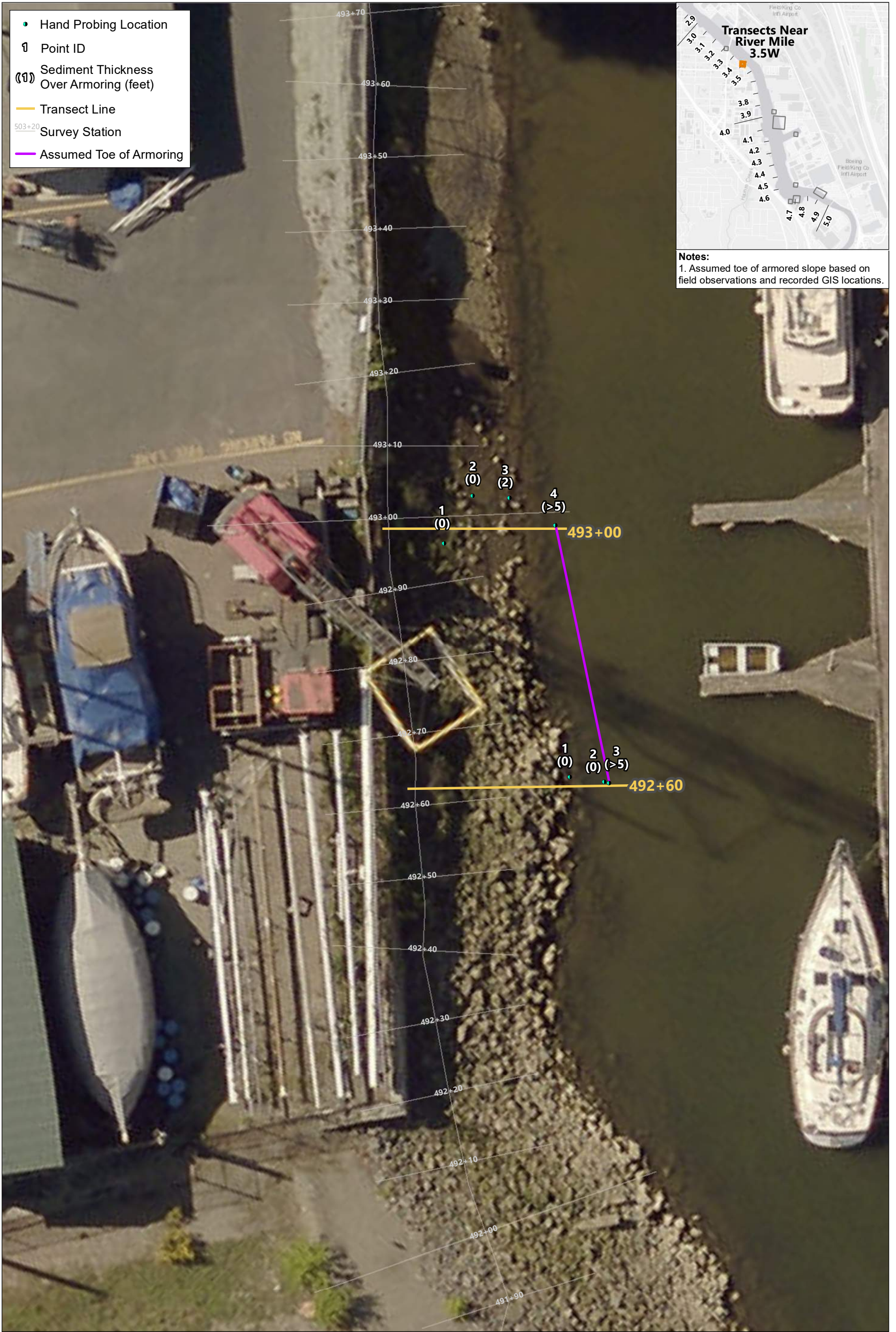
**Map H-1. Transects Near River Mile 3.3W
 Sediment Thickness Measurements**

PRE-DESIGN INVESTIGATION DATA
 EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

- Hand Probing Location
- ① Point ID
- (①) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station
- Assumed Toe of Armoring



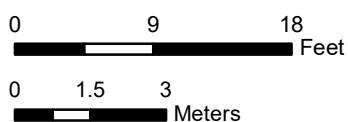
Notes:
 1. Assumed toe of armored slope based on field observations and recorded GIS locations.



Prepared by jolive, 7/15/2022, \\nrcas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\EvaluationReport\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



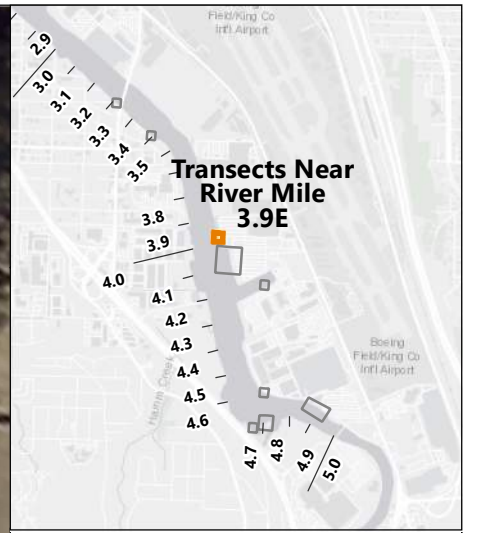
Lower Duwamish Waterway Group
 Port of Seattle / City of Seattle / King County / The Boeing Company



**Map H-2. Transects Near River Mile 3.5W
 Sediment Thickness Measurements**

PRE-DESIGN INVESTIGATION DATA
 EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

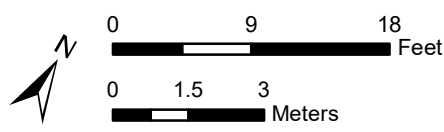
- Hand Probing Location
- ① Point ID
- (①) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station
- Assumed Toe of Armoring



Notes:
 1. Assumed toe of armored slope based on field observations and recorded GIS locations.

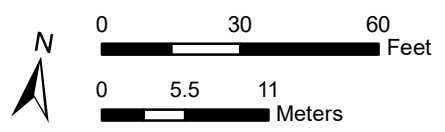


Prepared by jolive, 7/15/2022, \\nrcas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\Evaluation\Report\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd

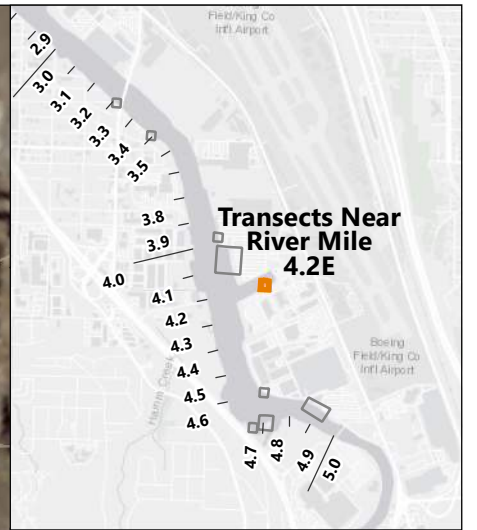




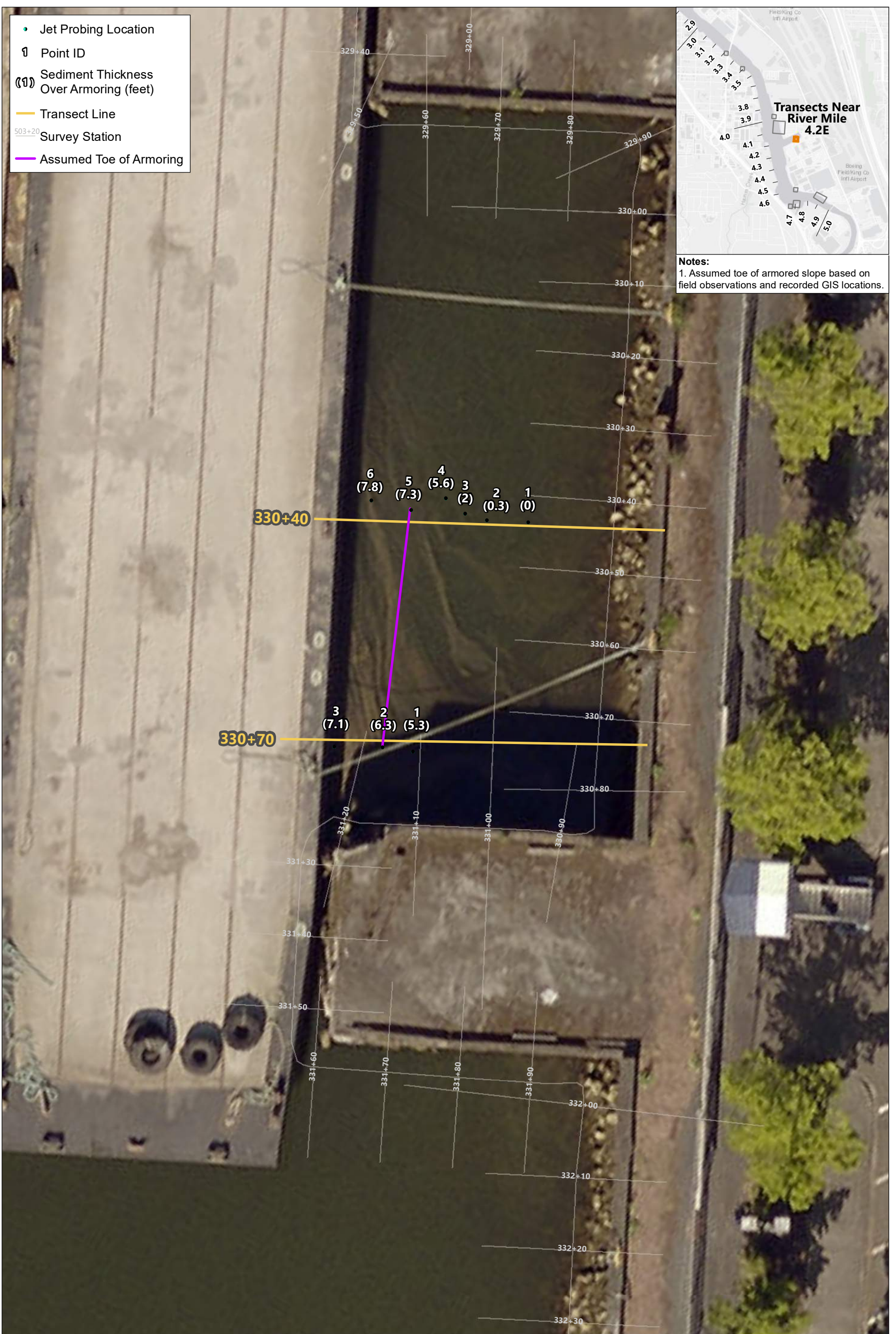
Prepared by jolive, 7/15/2022, \\nccas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\EvaluationReport\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



- Jet Probing Location
- ① Point ID
- (①) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station
- Assumed Toe of Armoring



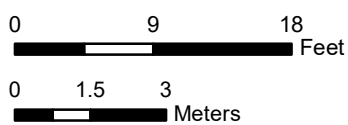
Notes:
 1. Assumed toe of armored slope based on field observations and recorded GIS locations.



Prepared by jolive, 7/15/2022, \\nrcas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\EvaluationReport\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



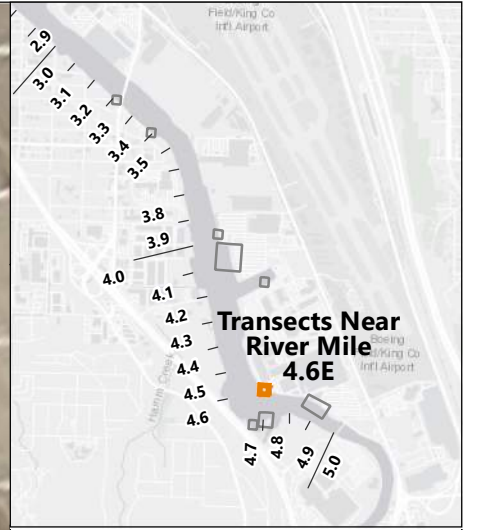
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**Map H-5. Transects Near River Mile 4.2E
 Sediment Thickness Measurements**

PRE-DESIGN INVESTIGATION DATA
 EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

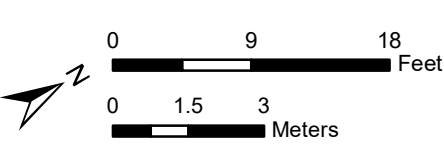
- Hand Probing Location
- ① Point ID
- (①) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station



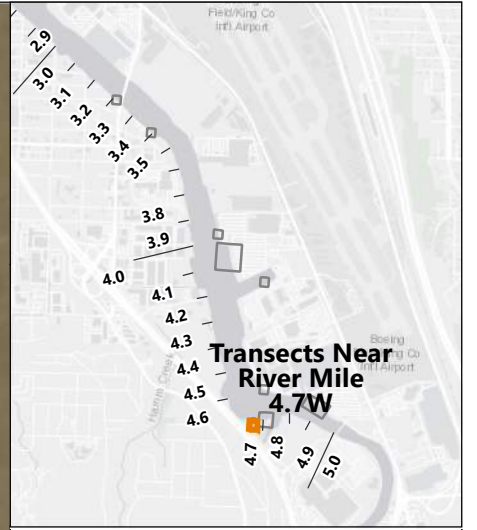
Notes:
1. Armoring not identified within this area.



Prepared by jolive, 7/15/2022, \\nrcas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\Evaluation\Report\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



- Hand Probing Location
- ① Point ID
- (①) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station



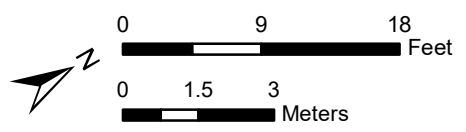
Notes:
1. Armoring not identified within this area.



Prepared by jolive, 7/15/2022, \\nrcas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\Evaluation\Report\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



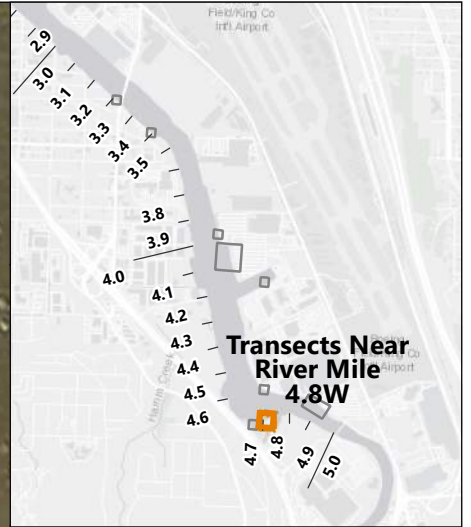
Lower Duwamish Waterway Group
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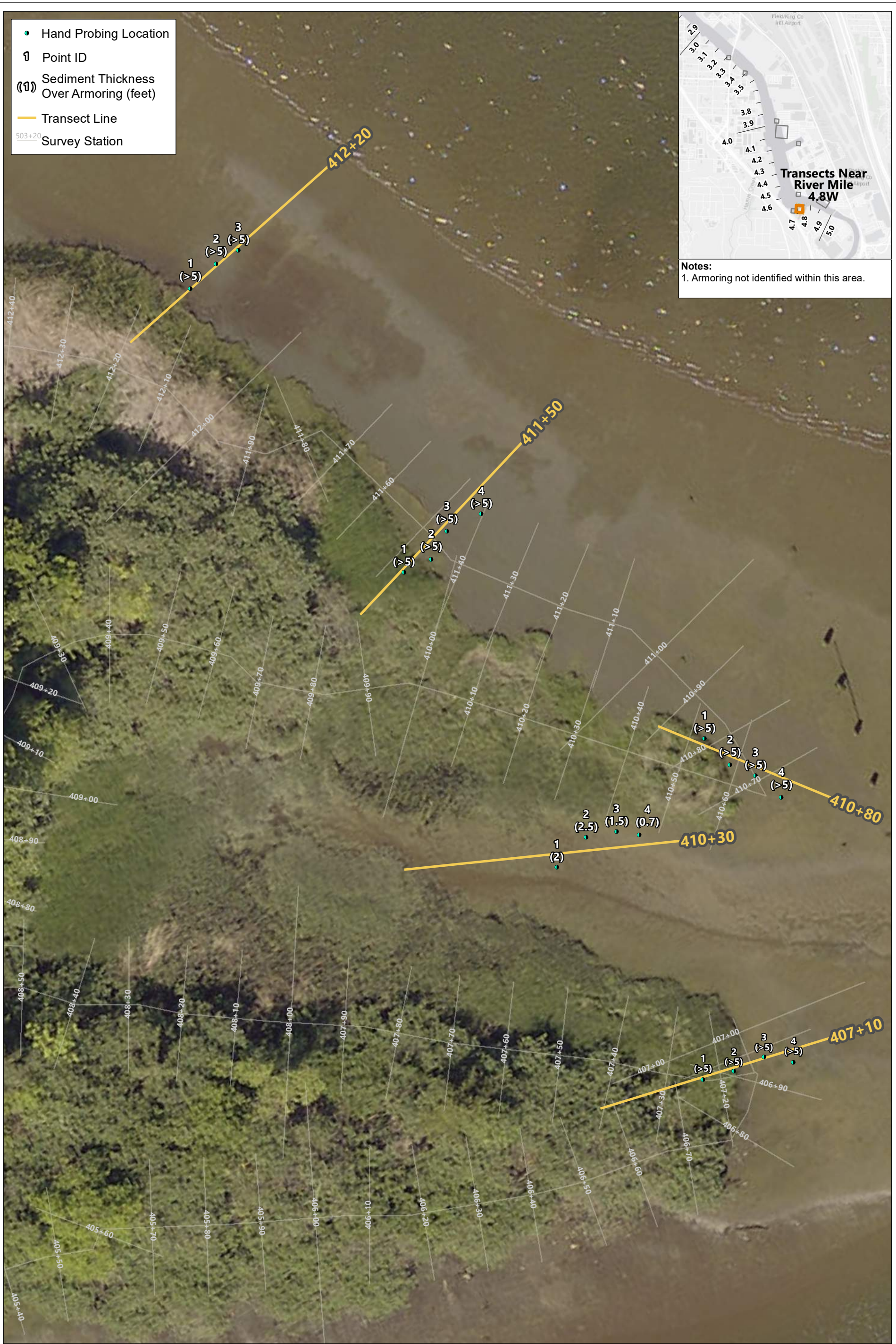
**Map H-7. Transects Near River Mile 4.7W
Sediment Thickness Measurements**

PRE-DESIGN INVESTIGATION DATA
EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

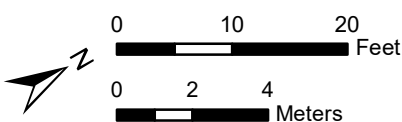
- Hand Probing Location
- 1 Point ID
- (1) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station



Notes:
1. Armoring not identified within this area.



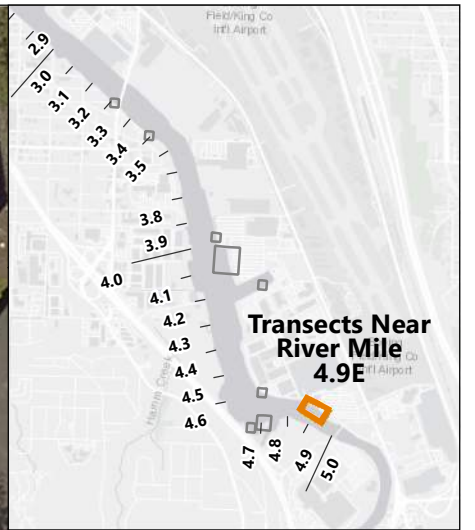
Prepared by jolive, 7/15/2022, \\nccas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\EvaluationReport\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



**Map H-8. Transects Near River Mile 4.8W
Sediment Thickness Measurements**

PRE-DESIGN INVESTIGATION DATA
EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

- Hand Probing Location
- ① Point ID
- (①) Sediment Thickness Over Armoring (feet)
- Transect Line
- 503+20 Survey Station
- Assumed Toe of Armoring



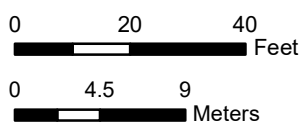
Notes:
 1. Assumed toe of armored slope based on field observations and recorded GIS locations.



Prepared by jolive, 7/15/2022, \\nccas\GIS\Jobs\KingCounty_0067\LDW\Mapa\Reports\Data\EvaluationReport\AQ_KC_LDW_DER_AppxH_SedimentThickness_Fig01-09.mxd



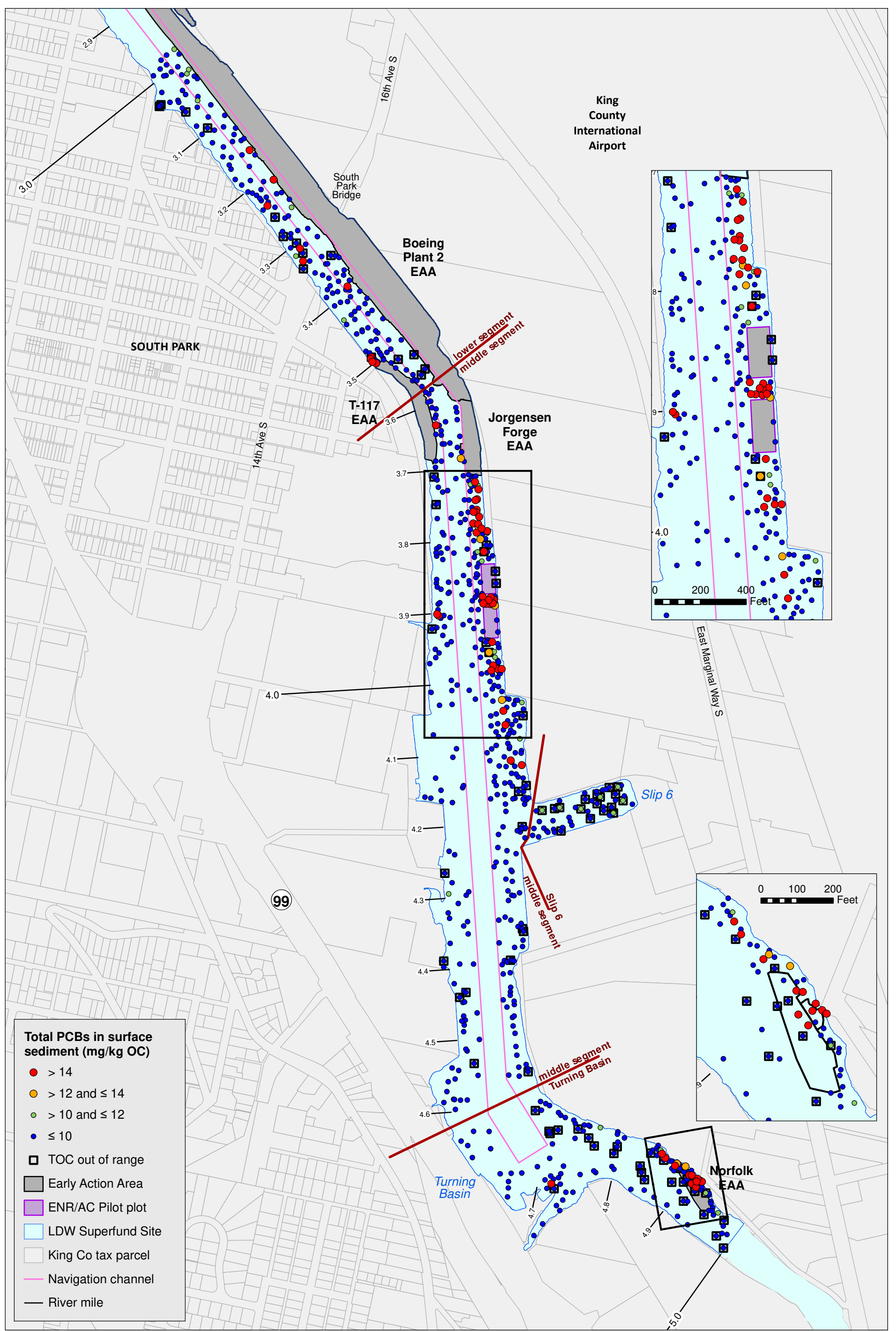
Lower Duwamish Waterway Group
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**Map H-9. Transects Near River Mile 4.9E
 Sediment Thickness Measurements**

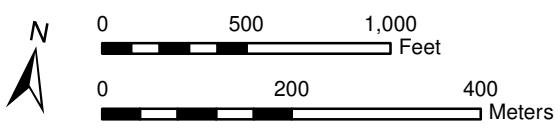
PRE-DESIGN INVESTIGATION DATA
 EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

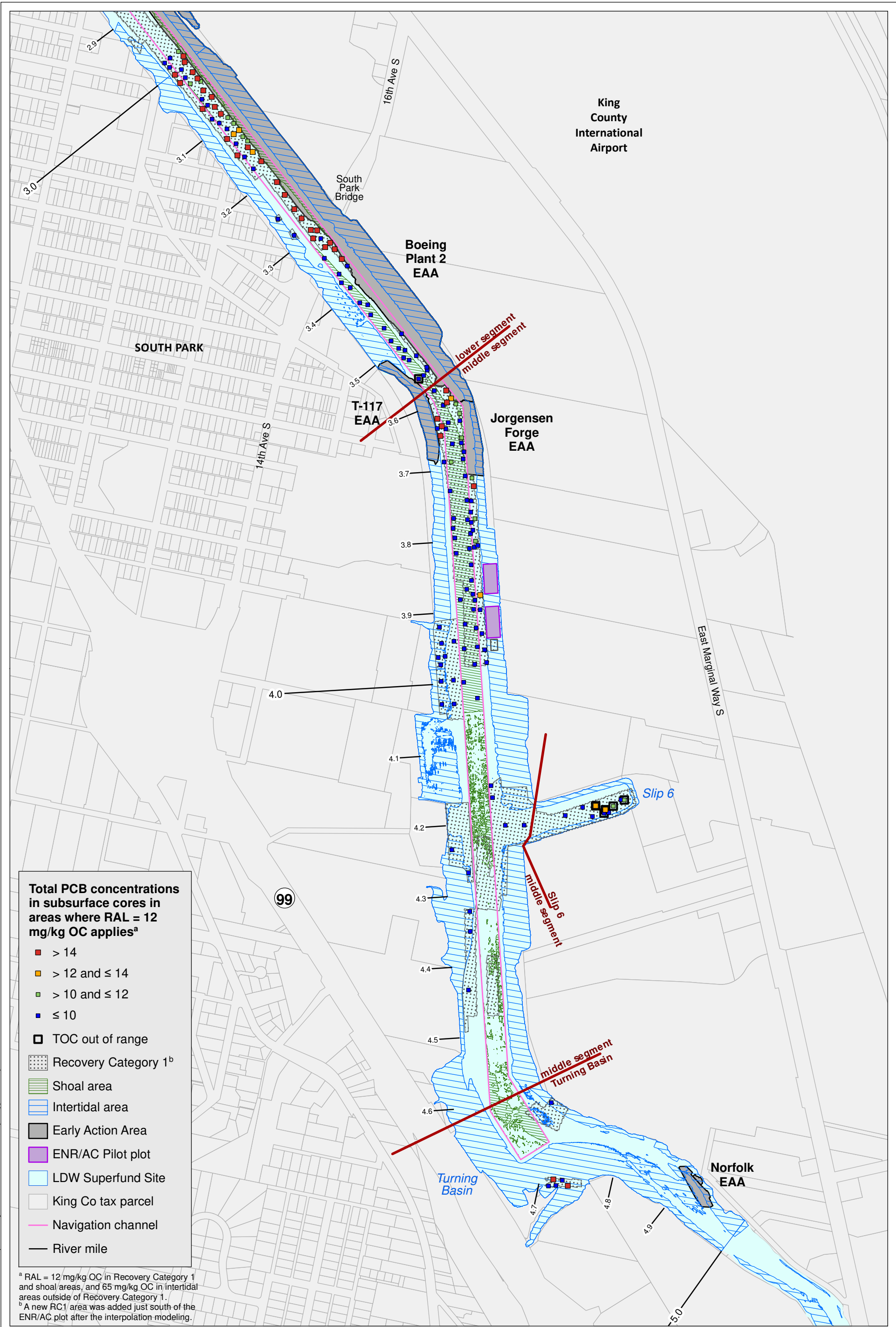
Prepared by craigh, 7/15/22; W:\Projects\Duwamish AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-1a_7335_Surfisrd near-RAL_bins.mxd



Total PCBs in surface sediment (mg/kg OC)

- > 14
- > 12 and ≤ 14
- > 10 and ≤ 12
- ≤ 10
- TOC out of range
- Early Action Area
- ENR/AC Pilot plot
- LDW Superfund Site
- King Co tax parcel
- Navigation channel
- River mile

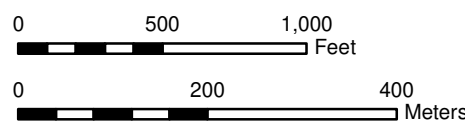




Prepared by: craigh_7/15/22; W:\Projects\Duwamish\AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-1b_7335 Subsurf near-RAL bins -12.mxd

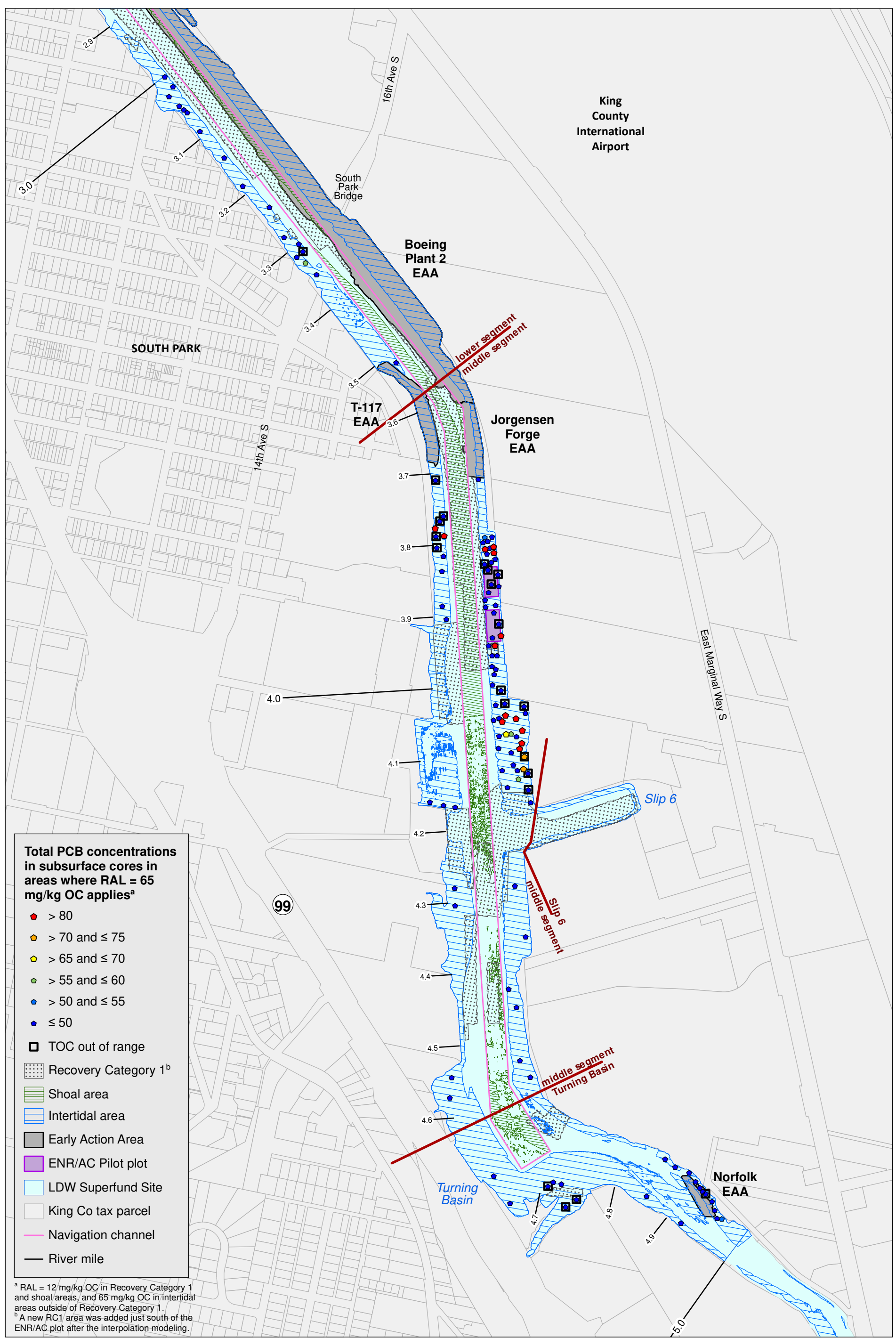


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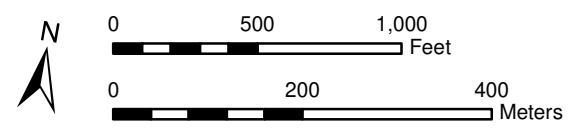
Map K-1b. Total PCBs (mg/kg OC) in areas where subsurface RAL = 12 mg/kg OC

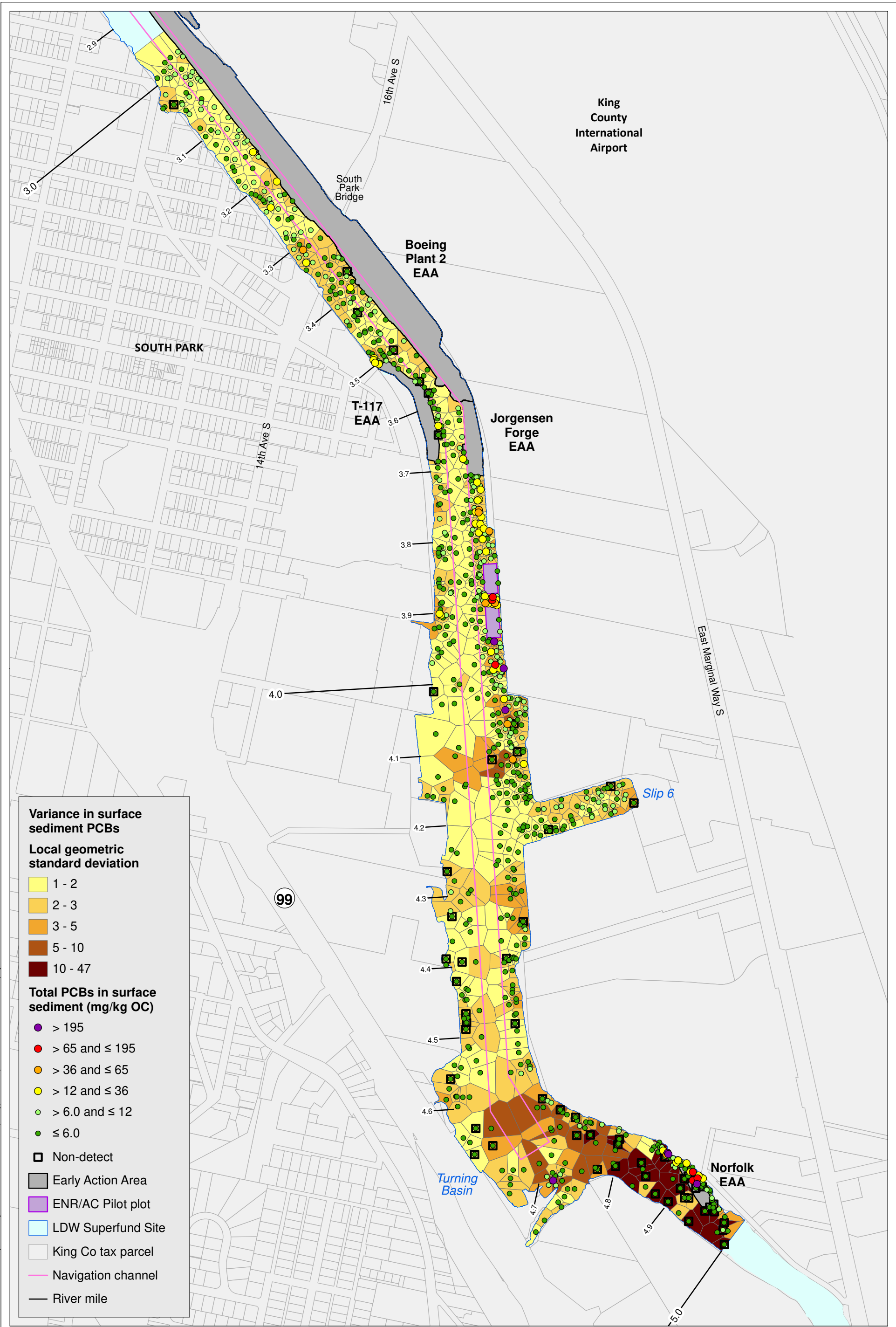
PRE-DESIGN INVESTIGATION DATA EVALUATION
 REPORT FOR THE LDW UPPER REACH JULY 15, 2022



- Total PCB concentrations in subsurface cores in areas where RAL = 65 mg/kg OC applies^a**
- ◆ > 80
 - ◆ > 70 and ≤ 75
 - ◆ > 65 and ≤ 70
 - ◆ > 55 and ≤ 60
 - ◆ > 50 and ≤ 55
 - ◆ ≤ 50
 - TOC out of range
 - ▨ Recovery Category 1^b
 - ▨ Shoal area
 - ▨ Intertidal area
 - ▨ Early Action Area
 - ▨ ENR/AC Pilot plot
 - ▨ LDW Superfund Site
 - ▨ King Co tax parcel
 - Navigation channel
 - River mile

^a RAL = 12 mg/kg OC in Recovery Category 1 and shoal areas, and 65 mg/kg OC in intertidal areas outside of Recovery Category 1.
^b A new RC1 area was added just south of the ENR/AC plot after the interpolation modeling.





Variance in surface sediment PCBs

Local geometric standard deviation

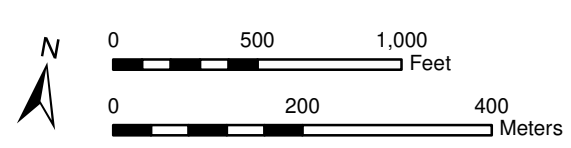
- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 10
- 10 - 47

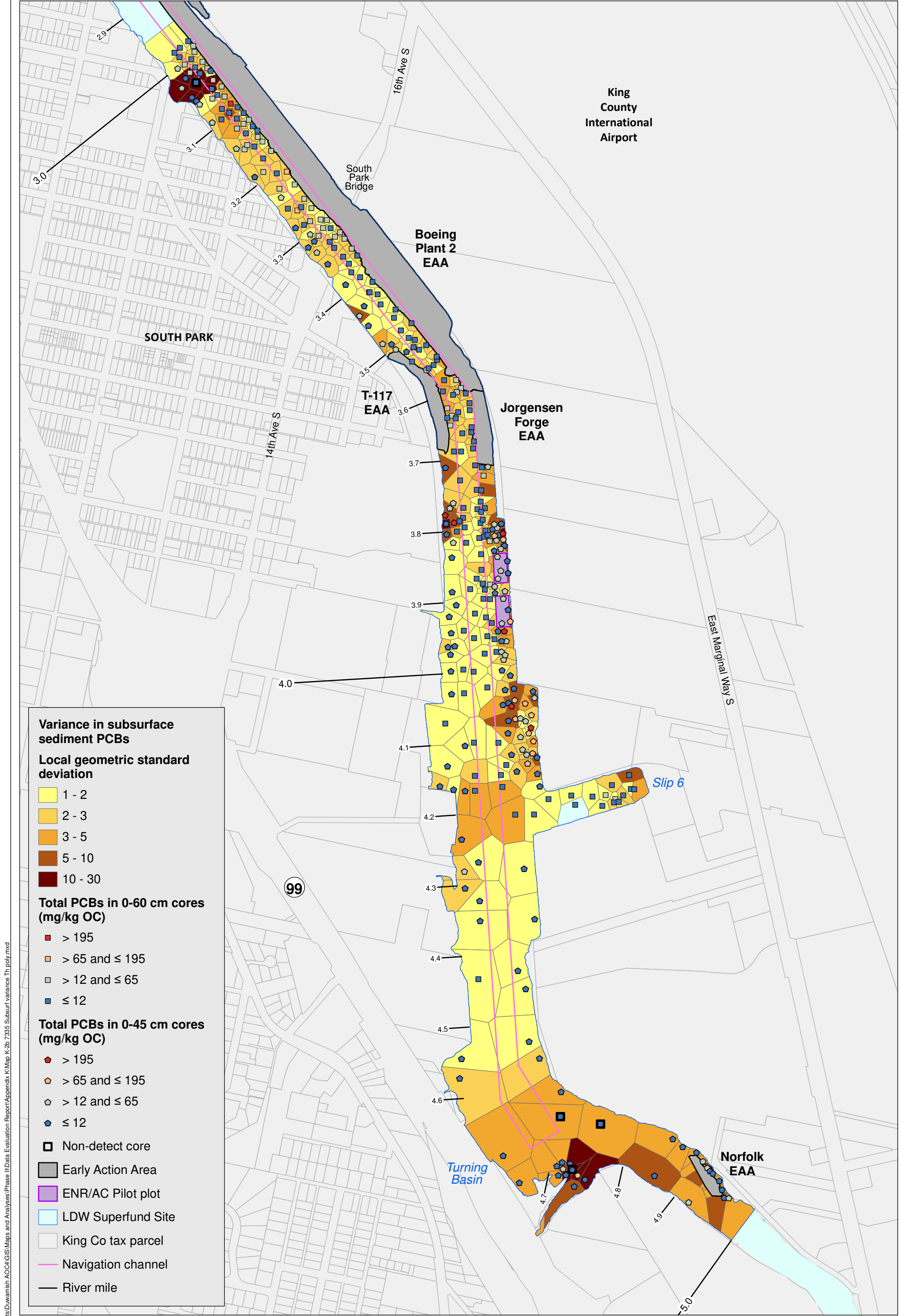
Total PCBs in surface sediment (mg/kg OC)

- > 195
- > 65 and ≤ 195
- > 36 and ≤ 65
- > 12 and ≤ 36
- > 6.0 and ≤ 12
- ≤ 6.0

- Non-detect
- Early Action Area
- ENR/AC Pilot plot
- LDW Superfund Site
- King Co tax parcel
- Navigation channel
- River mile

Prepared by: craigh, 7/15/22; W:\Projects\Duwamish AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-2a 7335 Surfised variance Th poly.mxd





Variance in subsurface sediment PCBs

Local geometric standard deviation

- 1 - 2
- 2 - 3
- 3 - 5
- 5 - 10
- 10 - 30

Total PCBs in 0-60 cm cores (mg/kg OC)

- > 195
- > 65 and ≤ 195
- > 12 and ≤ 65
- ≤ 12

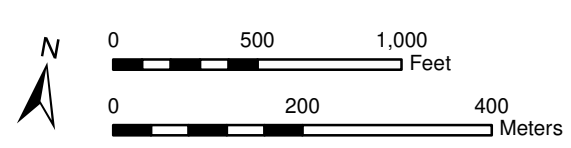
Total PCBs in 0-45 cm cores (mg/kg OC)

- > 195
- > 65 and ≤ 195
- > 12 and ≤ 65
- ≤ 12
- Non-detect core

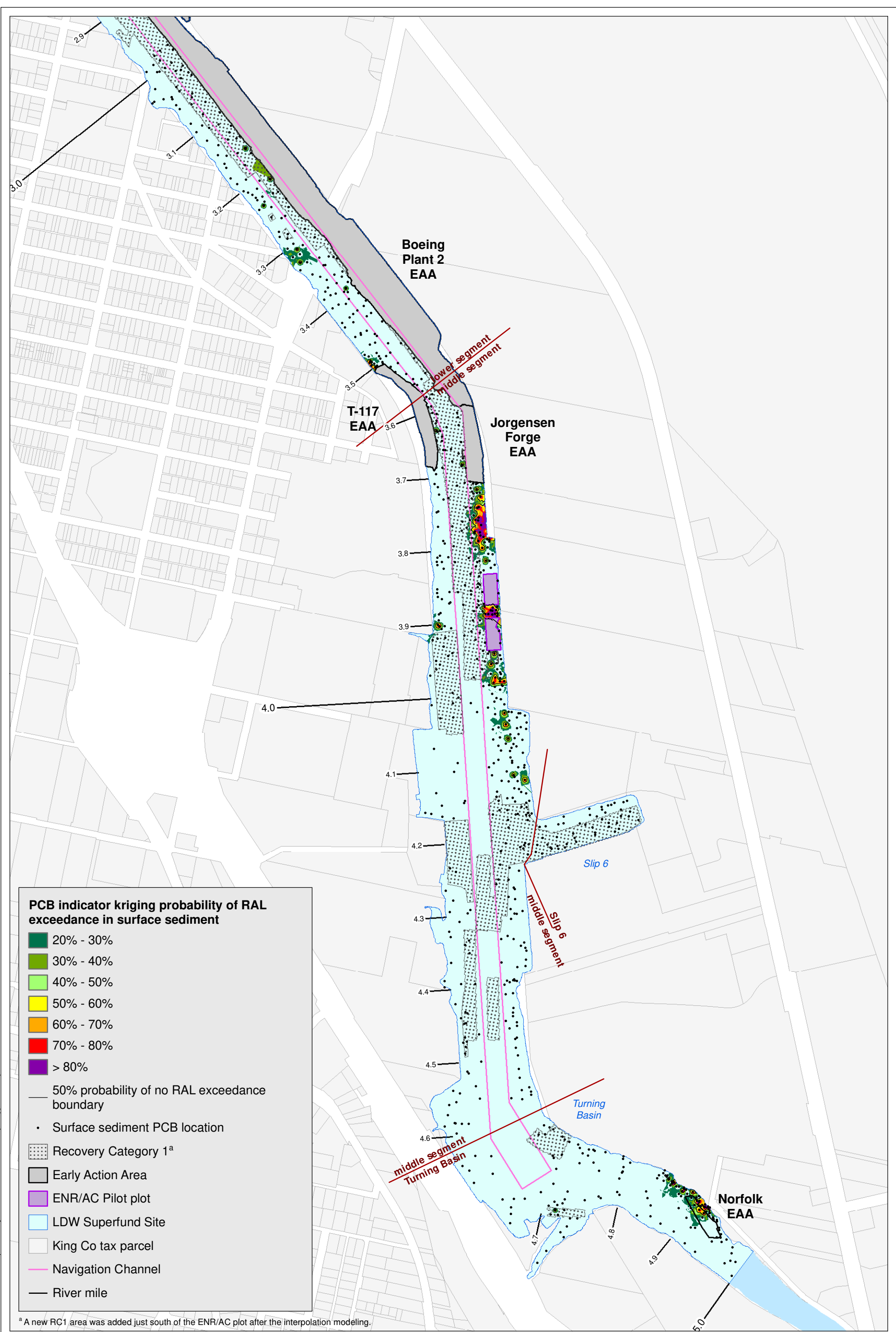
Legend:

- Early Action Area
- ENR/AC Pilot plot
- LDW Superfund Site
- King Co tax parcel
- Navigation channel
- River mile

Prepared by: craigh, 7/15/22; W:\Projects\Duwamish AOC\GIS\Maps and Analysis\Phase II\Data Evaluation\Report\Appendix K\Map K-2b_7335 Subsurf variance Th poly.mxd



Prepared by: craigh, 7/15/22; W:\Projects\Duwamish AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-3a_T216_Surfisrd Total PCB IK.mxd

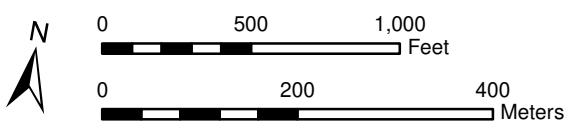


PCB indicator kriging probability of RAL exceedance in surface sediment

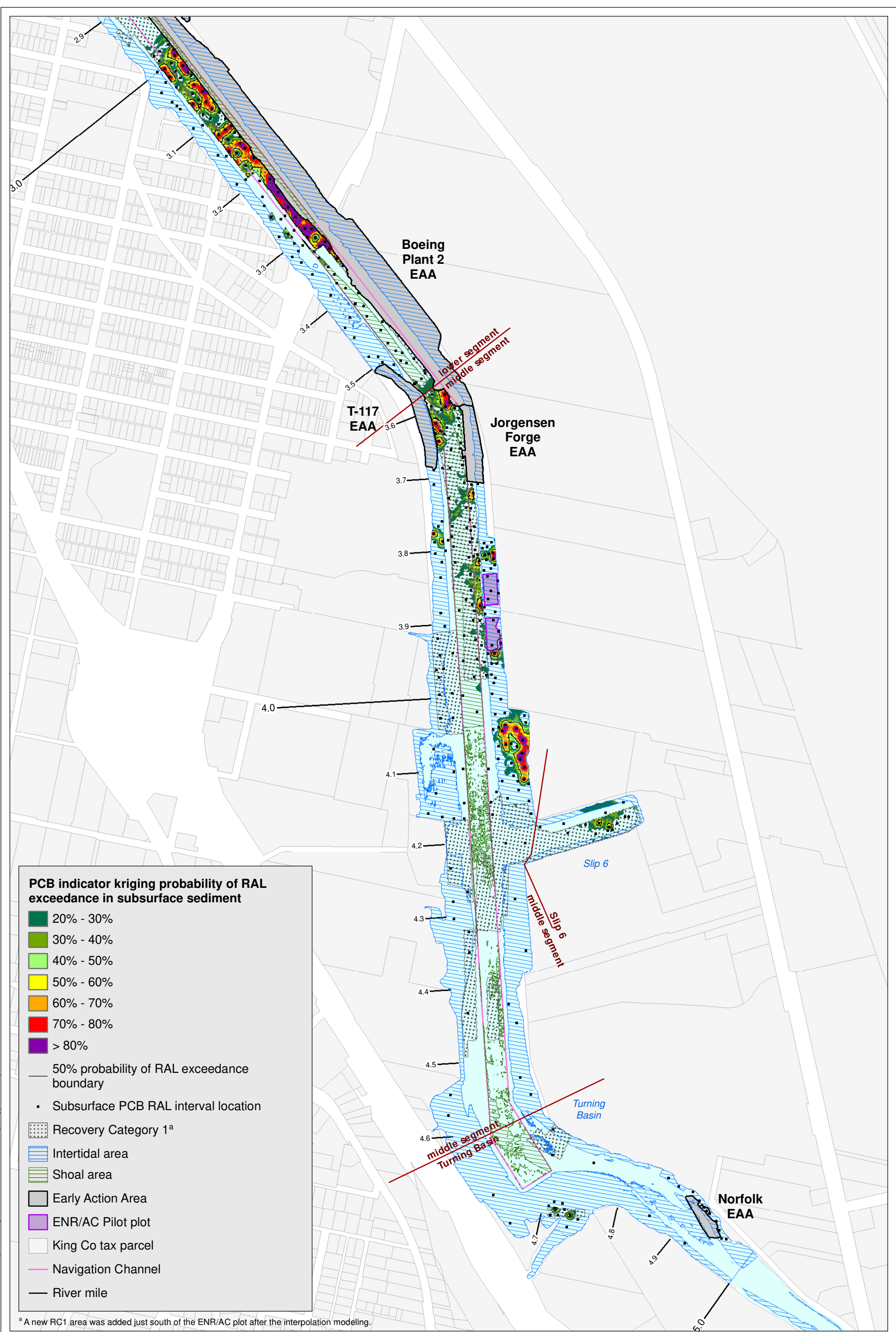
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- > 80%

- 50% probability of no RAL exceedance boundary
- Surface sediment PCB location
- Recovery Category 1^a
- Early Action Area
- ENR/AC Pilot plot
- LDW Superfund Site
- King Co tax parcel
- Navigation Channel
- River mile

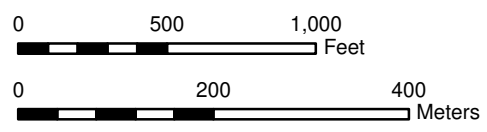
^a A new RC1 area was added just south of the ENR/AC plot after the interpolation modeling.



Prepared by: craigh, 7/15/22; W:\Projects\Duwamish\AOC4\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-3b_7216_Subsurf Total PCB IK.mxd



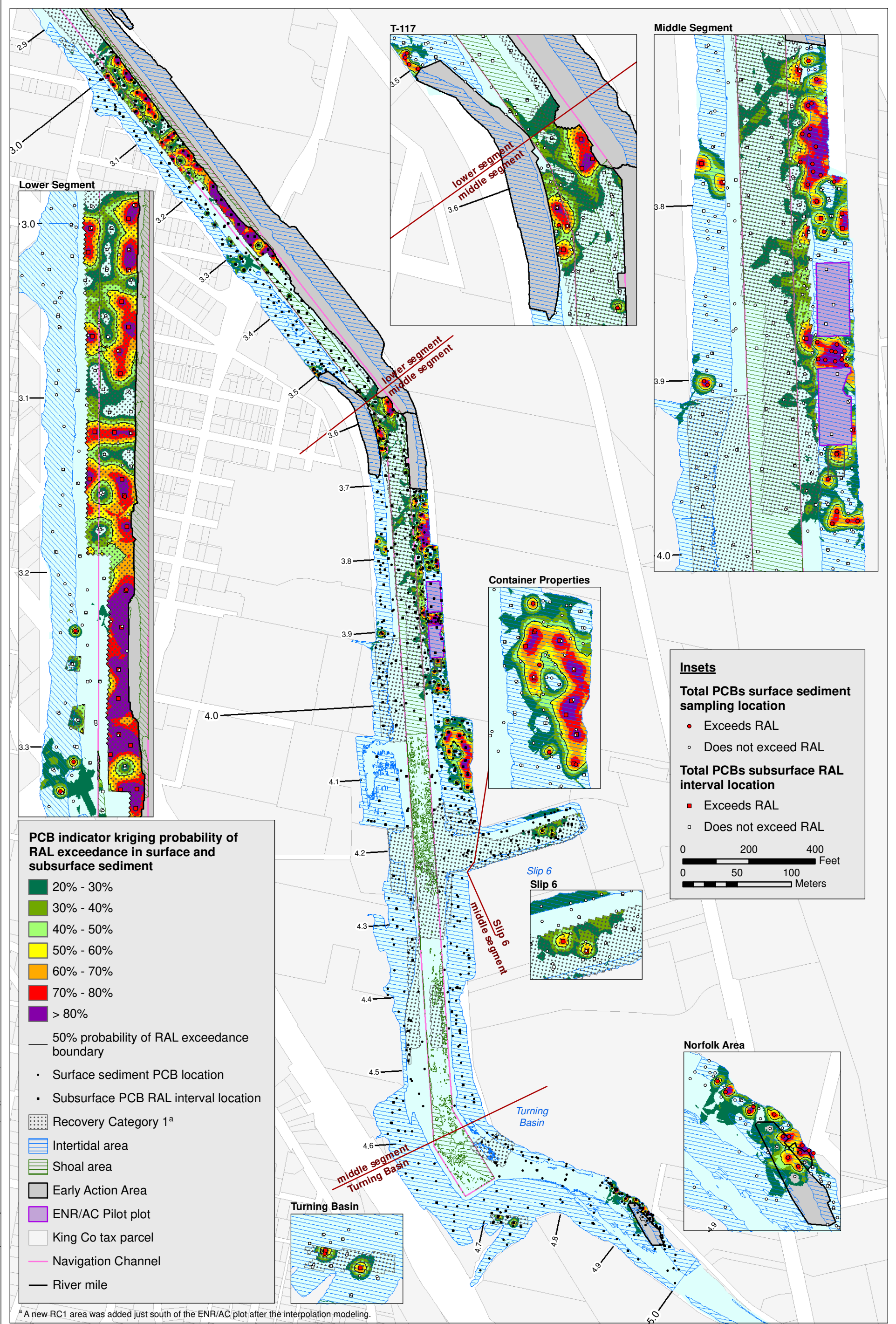
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Map K-3b. Total PCB subsurface sediment indicator kriging interpolation

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Prepared by: craigh_7/15/22: W:\Projects\Duwamish ACC4\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-3c: 7216 Combined Total PCB IK.mxd



PCB indicator kriging probability of RAL exceedance in surface and subsurface sediment

- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- > 80%

— 50% probability of RAL exceedance boundary

- Surface sediment PCB location
- Subsurface PCB RAL interval location

- Recovery Category 1^a
- Intertidal area
- Shoal area
- Early Action Area
- ENR/AC Pilot plot
- King Co tax parcel
- Navigation Channel
- River mile

Insets

Total PCBs surface sediment sampling location

- Exceeds RAL
- Does not exceed RAL

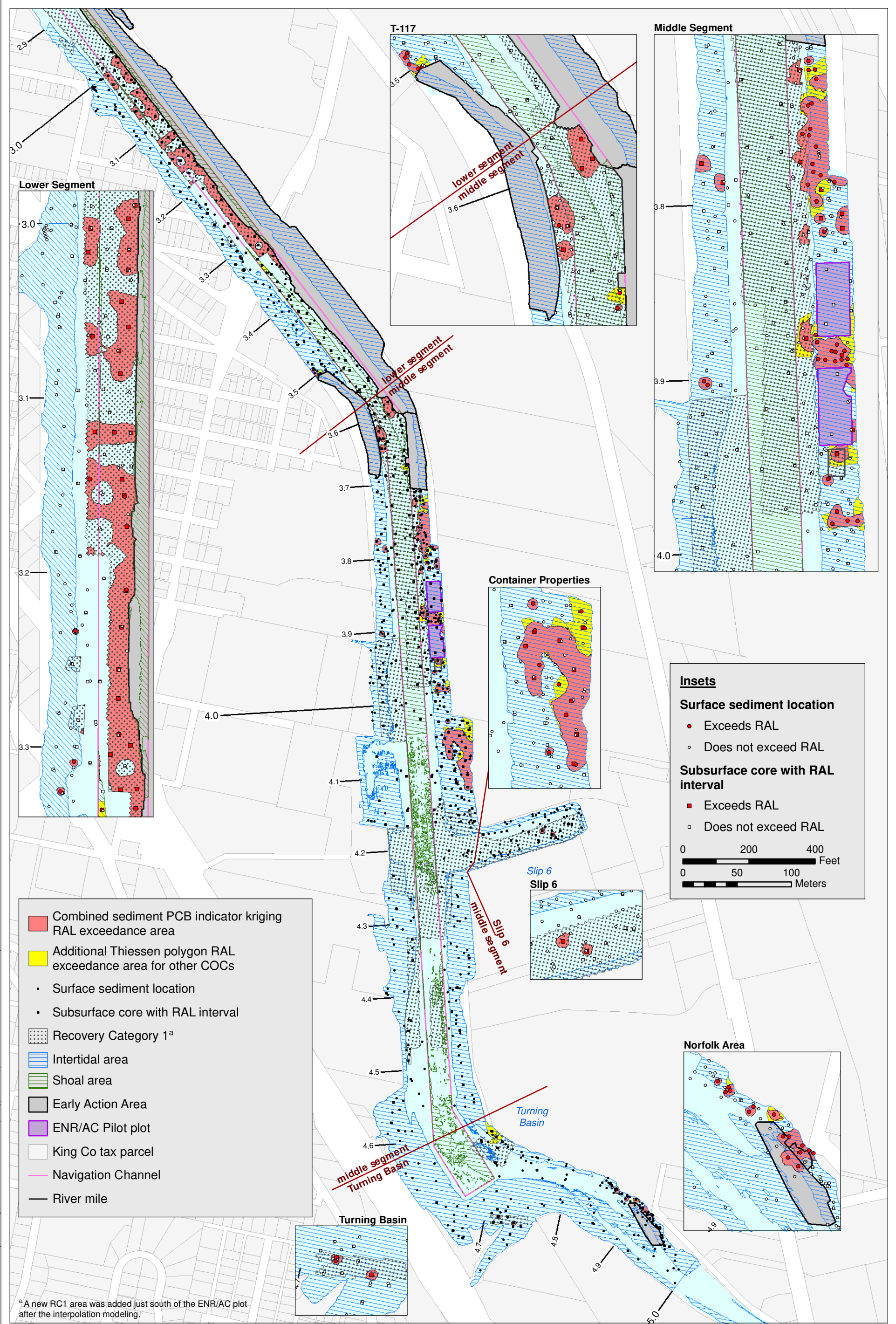
Total PCBs subsurface RAL interval location

- Exceeds RAL
- ◻ Does not exceed RAL

0 200 400 Feet
0 50 100 Meters

^a A new RC1 area was added just south of the ENR/AC plot after the interpolation modeling.

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- Combined sediment PCB indicator kriging RAL exceedance area
- Additional Thiessen polygon RAL exceedance area for other COCs
- Surface sediment location
- Subsurface core with RAL interval
- Recovery Category 1^a
- Intertidal area
- Shoal area
- Early Action Area
- ENR/AC Pilot plot
- King Co tax parcel
- Navigation Channel
- River mile

Insets

Surface sediment location

- Exceeds RAL
- Does not exceed RAL

Subsurface core with RAL interval

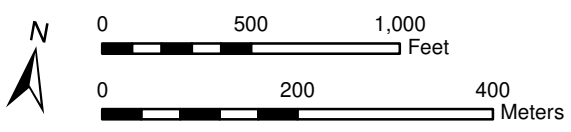
- Exceeds RAL
- ◻ Does not exceed RAL

0 200 400 Feet
0 50 100 Meters

^a A new RC1 area was added just south of the ENR/AC plot after the interpolation modeling.

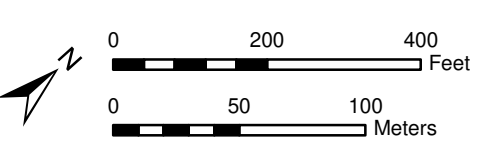
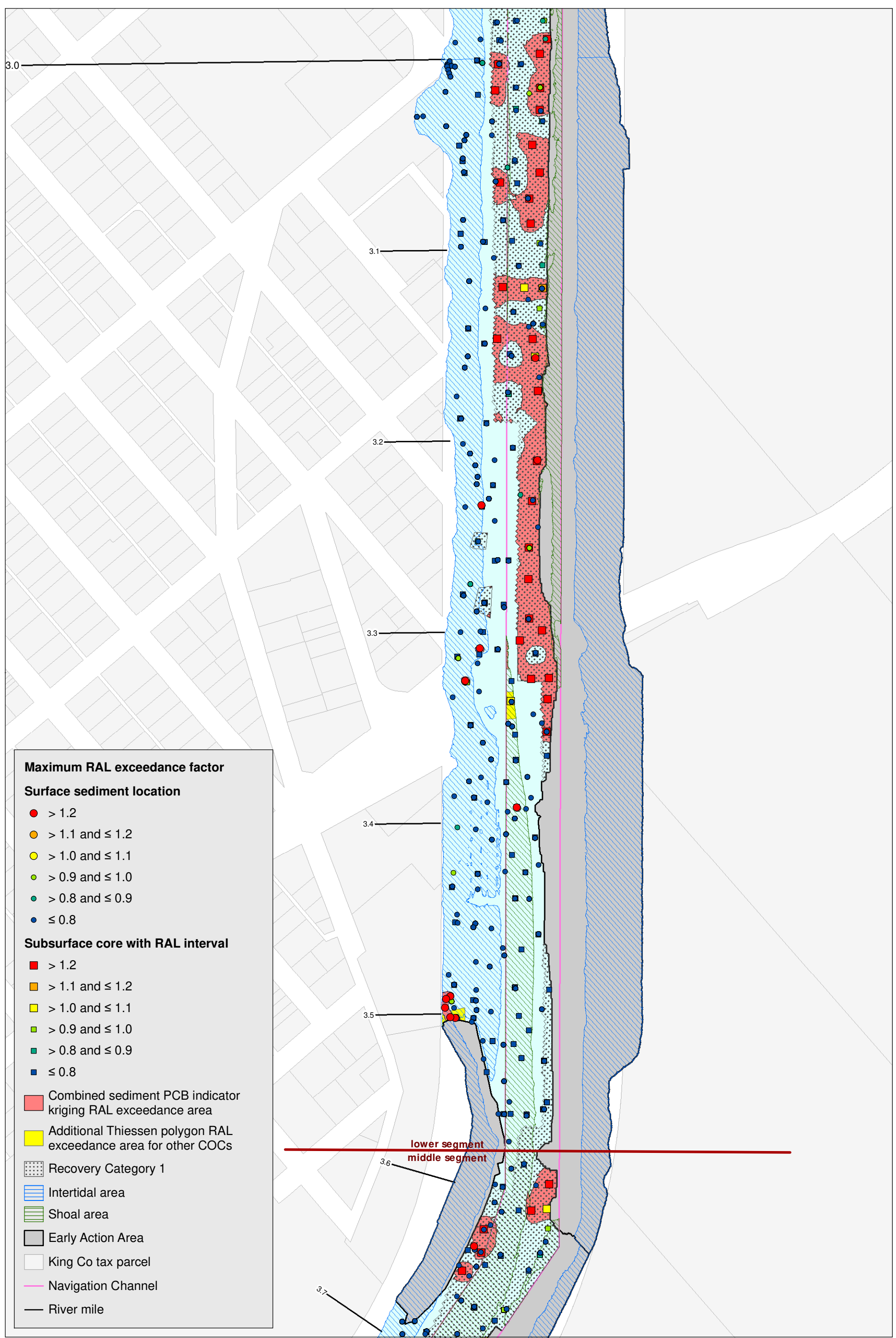


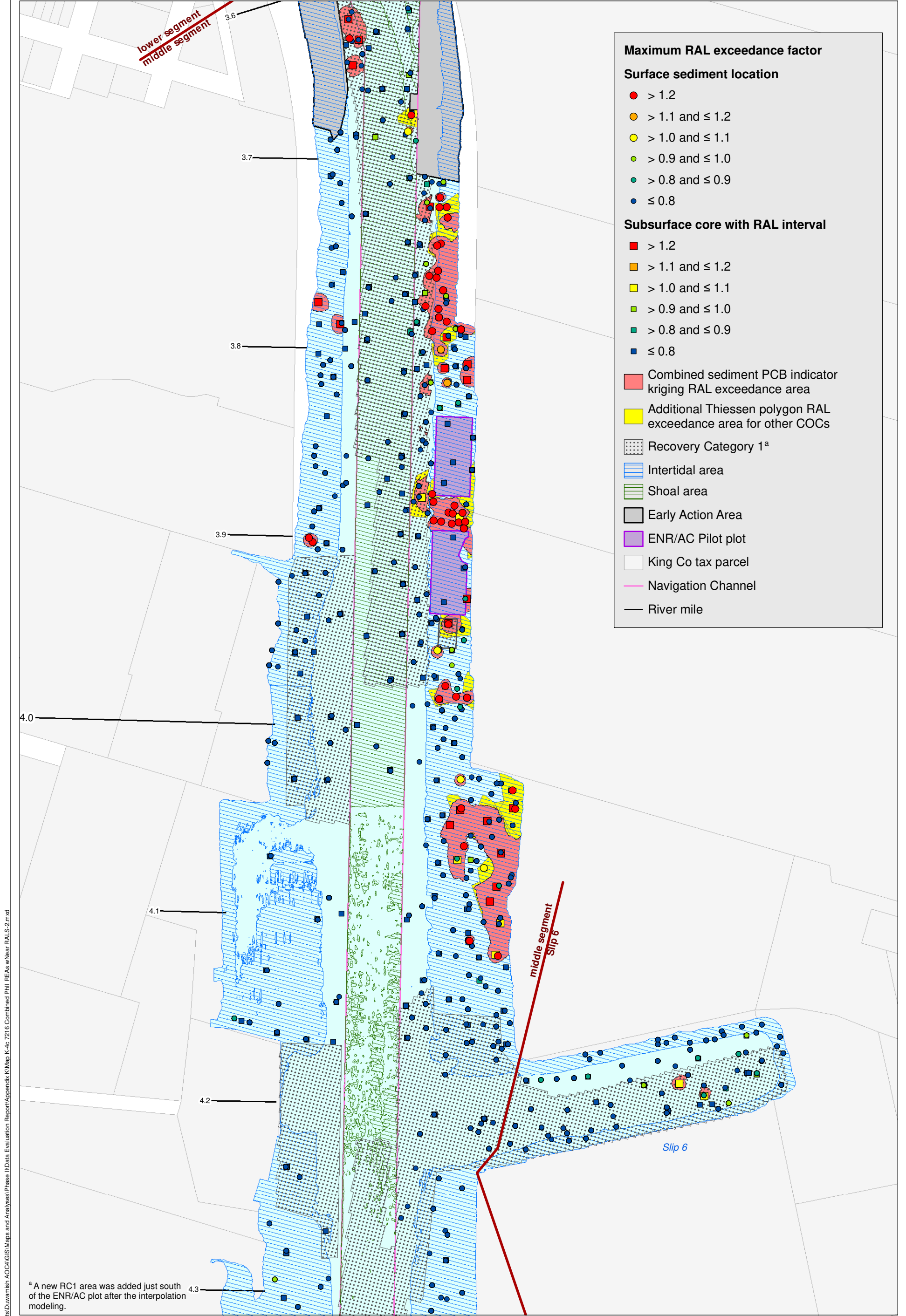
Lower Duwamish Waterway Group
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Map K-4a. Total PCB combined surface and subsurface sediment indicator kriging interpolation with Thiessen polygons for other COCs
PRE-DESIGN INVESTIGATION DATA EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

Prepared by craigh_7/15/22: W:\Projects\Duwamish\AOC4\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-4b_7216 Combined Phil REAs wNear RALS-1.mxd





Maximum RAL exceedance factor

Surface sediment location

- > 1.2
- > 1.1 and ≤ 1.2
- > 1.0 and ≤ 1.1
- > 0.9 and ≤ 1.0
- > 0.8 and ≤ 0.9
- ≤ 0.8

Subsurface core with RAL interval

- > 1.2
- > 1.1 and ≤ 1.2
- > 1.0 and ≤ 1.1
- > 0.9 and ≤ 1.0
- > 0.8 and ≤ 0.9
- ≤ 0.8

■ Combined sediment PCB indicator kriging RAL exceedance area

■ Additional Thiessen polygon RAL exceedance area for other COCs

▨ Recovery Category 1^a

▨ Intertidal area

▨ Shoal area

▨ Early Action Area

▨ ENR/AC Pilot plot

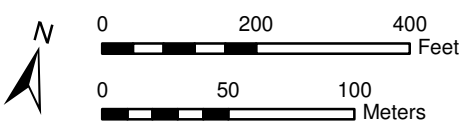
▨ King Co tax parcel

— Navigation Channel

— River mile

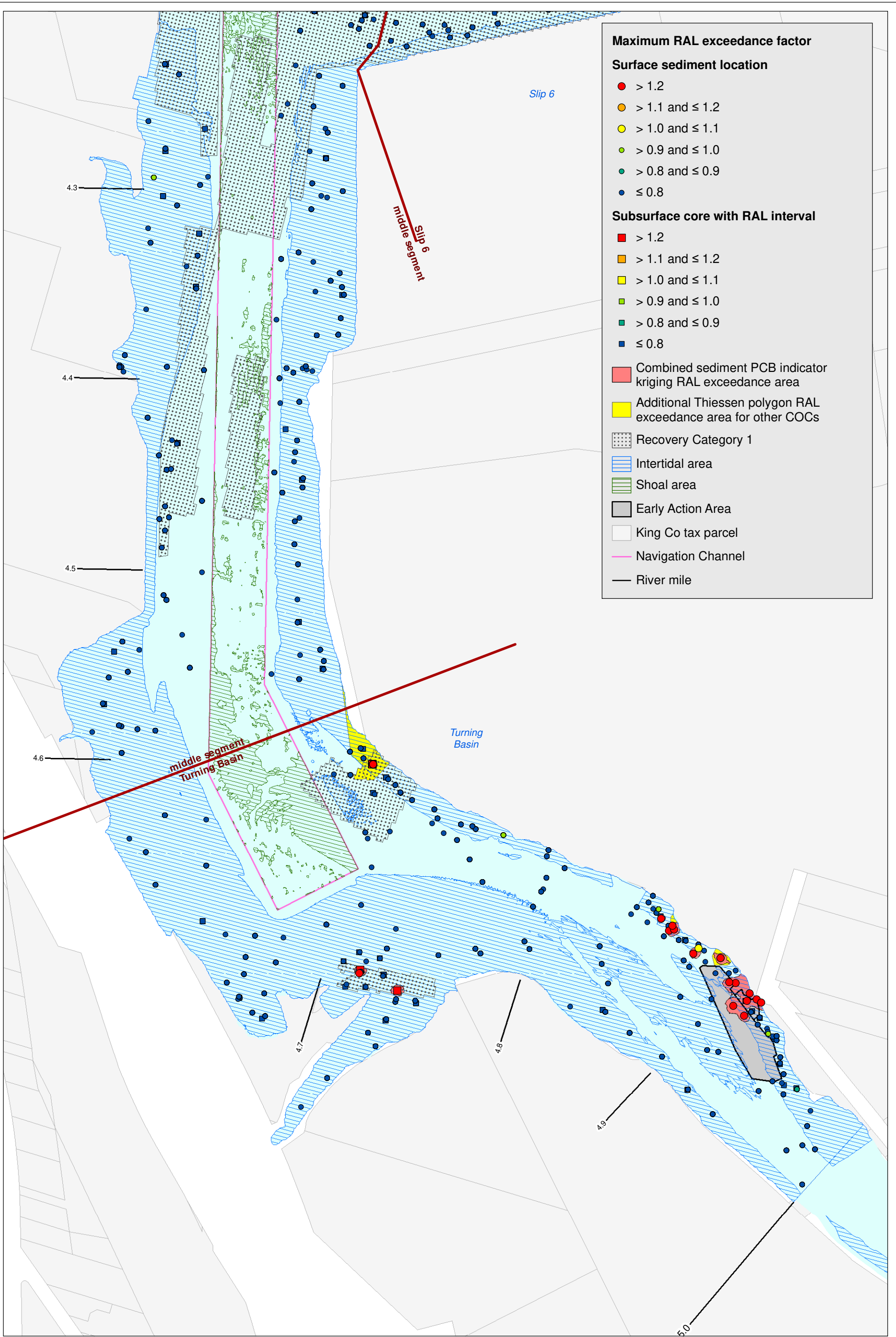
^a A new RC1 area was added just south of the ENR/AC plot after the interpolation modeling.

Prepared by craigh_7/15/22: W:\Projects\Duwamish_AOC4\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-4c_7216 Combined Phil BEAs wNear RALS-2.mxd



Map K-4c. Combined RAL exceedance areas (PCB interpolation and Thiessen polygons for other COCs) with RAL exceedances, RM 3.7 to RM 4.3

PRE-DESIGN INVESTIGATION DATA EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022



Maximum RAL exceedance factor

Surface sediment location

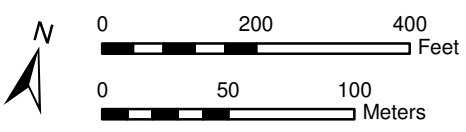
- > 1.2
- > 1.1 and ≤ 1.2
- > 1.0 and ≤ 1.1
- > 0.9 and ≤ 1.0
- > 0.8 and ≤ 0.9
- ≤ 0.8

Subsurface core with RAL interval

- > 1.2
- > 1.1 and ≤ 1.2
- > 1.0 and ≤ 1.1
- > 0.9 and ≤ 1.0
- > 0.8 and ≤ 0.9
- ≤ 0.8

- Combined sediment PCB indicator kriging RAL exceedance area
- Additional Thiessen polygon RAL exceedance area for other COCs
- Recovery Category 1
- Intertidal area
- Shoal area
- Early Action Area
- King Co tax parcel
- Navigation Channel
- River mile

Prepared by craigh_7/15/22: W:\Projects\Duwamish AOC\GIS\Maps and Analyses\Phase II\Data Evaluation\Report\Appendix K\Map K-4d 7216 Combined Phil REAs wNear RALS-3.mxd



Map K-4d. Combined RAL exceedance areas (PCB interpolation and Thiessen polygons for other COCs) with RAL exceedances, RM 4.3 to RM 5.0
 PRE-DESIGN INVESTIGATION DATA EVALUATION REPORT FOR THE LDW UPPER REACH JULY 15, 2022

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