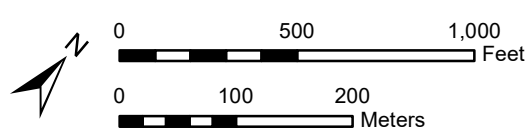
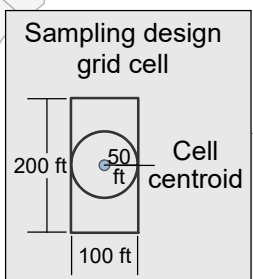
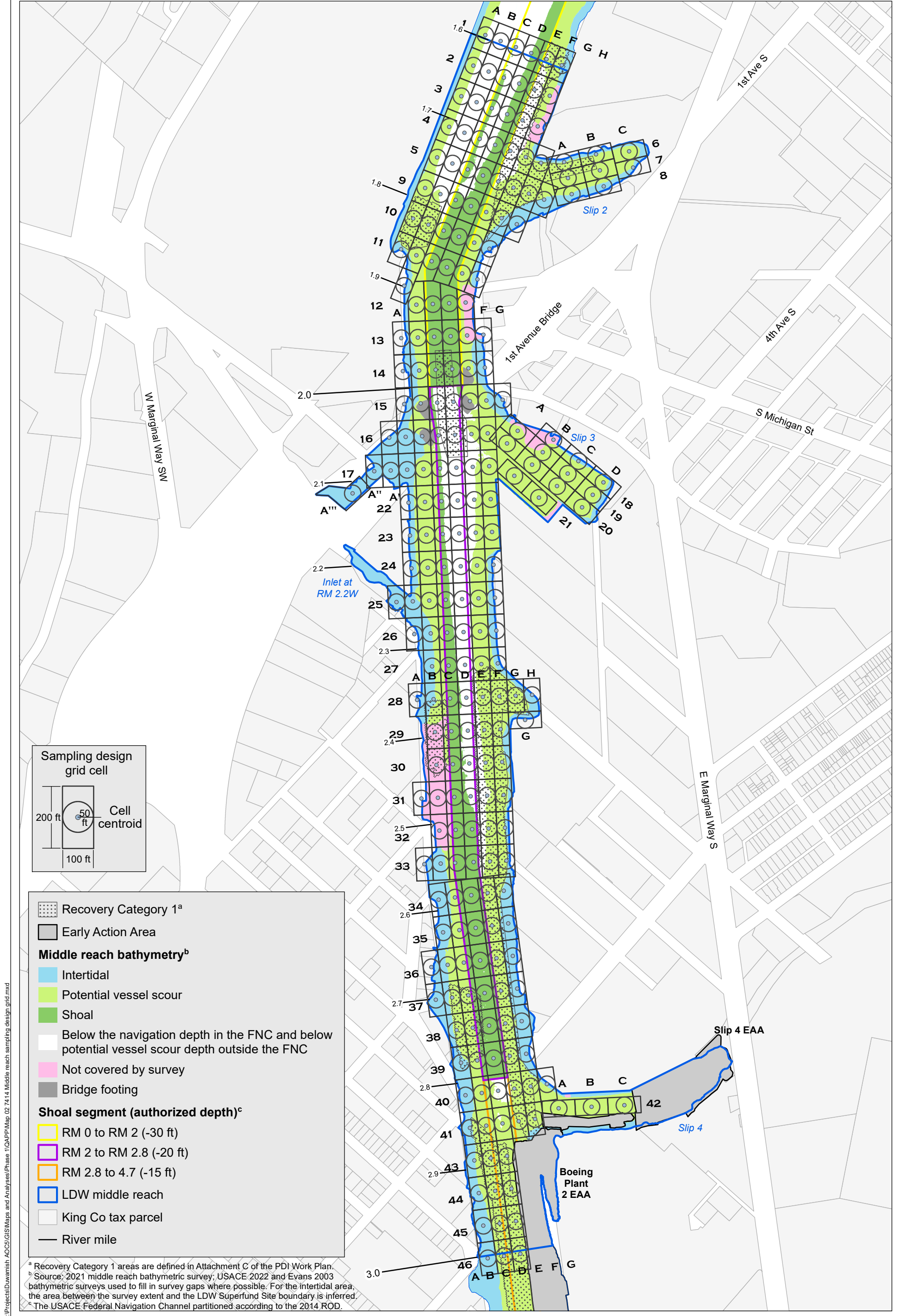


- Recovery Category 1<sup>a</sup>
- Early Action Area
- Middle reach bathymetry<sup>b</sup>**
- Intertidal area
- Subtidal area
- Shoal area
- Not covered by bathymetric survey
- Bridge footing
- Shoal segment (authorized depth)<sup>c</sup>**
- RM 0 to RM 2 (-30 ft)
- RM 2 to RM 2.8 (-20 ft)
- RM 2.8 to 4.7 (-15 ft)
- LDW middle reach
- King Co tax parcel
- River mile

<sup>a</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.  
<sup>b</sup> Source: 2021 middle reach bathymetric survey; USACE 2022 and Evans 2003 bathymetric surveys used to fill in survey gaps where possible. For the intertidal area, the area between the survey extent and the LDW Superfund Site boundary is inferred.  
<sup>c</sup> The USACE Federal Navigation Channel partitioned according to the 2014 ROD.



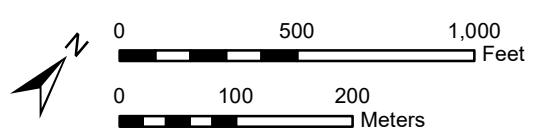
Prepared by nicolase. 10/13/2022. W:\Projects\Duwamish\_AOC5\GIS\Maps and Analyses\Phase 1\QAPP\Map 01 7419 Middle Reach Vicinity Map.mxd



- Recovery Category 1<sup>a</sup>
- Early Action Area
- Middle reach bathymetry<sup>b</sup>**
- Intertidal
- Potential vessel scour
- Shoal
- Below the navigation depth in the FNC and below potential vessel scour depth outside the FNC
- Not covered by survey
- Bridge footing
- Shoal segment (authorized depth)<sup>c</sup>**
- RM 0 to RM 2 (-30 ft)
- RM 2 to RM 2.8 (-20 ft)
- RM 2.8 to 4.7 (-15 ft)
- LDW middle reach
- King Co tax parcel
- River mile

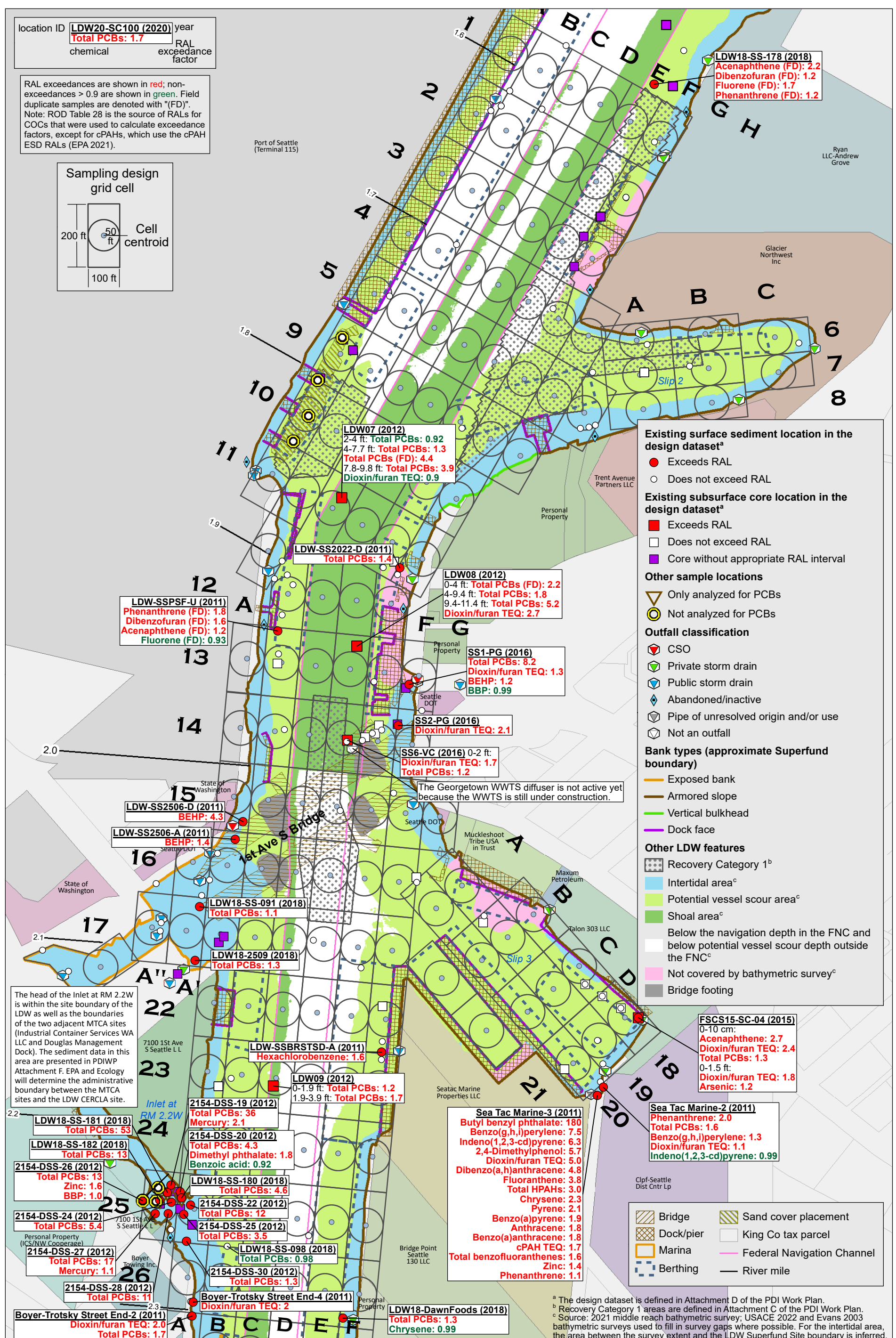
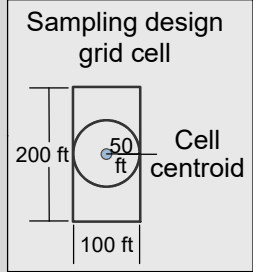
<sup>a</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.  
<sup>b</sup> Source: 2021 middle reach bathymetric survey; USACE 2022 and Evans 2003 bathymetric surveys used to fill in survey gaps where possible. For the intertidal area, the area between the survey extent and the LDW Superfund Site boundary is inferred.  
<sup>c</sup> The USACE Federal Navigation Channel partitioned according to the 2014 ROD.

Prepared by nicolase\_10/13/2022; W:\Projects\Duwamish\_AOC5\GIS\Maps and Analyses\Phase 1\QAPP\Map\_02\_7414\_Middle\_reach\_sampling\_design\_grid.mxd



location ID **LDW20-SC100 (2020)** year  
 chemical **Total PCBs: 1.7** RAL  
 exceedance factor

RAL exceedances are shown in red; non-exceedances > 0.9 are shown in green. Field duplicate samples are denoted with "(FD)". Note: ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).



**LDW18-SS-178 (2018)**  
 Acenaphthene (FD): 2.2  
 Dibenzofuran (FD): 1.2  
 Fluorene (FD): 1.7  
 Phenanthrene (FD): 1.2

**LDW07 (2012)**  
 2-4 ft: Total PCBs: 0.92  
 4-7.7 ft: Total PCBs: 1.3  
 Total PCBs (FD): 4.4  
 7.8-9.8 ft: Total PCBs: 3.9  
 Dioxin/furan TEQ: 0.9

**LDW-SS2022-D (2011)**  
 Total PCBs: 1.4

**LDW08 (2012)**  
 0-4 ft: Total PCBs (FD): 2.2  
 4-9.4 ft: Total PCBs: 1.8  
 9.4-11.4 ft: Total PCBs: 5.2  
 Dioxin/furan TEQ: 2.7

**LDW-SSPSF-U (2011)**  
 Phenanthrene (FD): 1.8  
 Dibenzofuran (FD): 1.6  
 Acenaphthene (FD): 1.2  
 Fluorene (FD): 0.93

**SS1-PG (2016)**  
 Total PCBs: 8.2  
 Dioxin/furan TEQ: 1.3  
 BEHP: 1.2  
 BBP: 0.99

**SS2-PG (2016)**  
 Dioxin/furan TEQ: 2.1

**SS6-VC (2016)** 0-2 ft:  
 Dioxin/furan TEQ: 1.7  
 Total PCBs: 1.2

**LDW-SS2506-D (2011)**  
 BEHP: 4.3

**LDW-SS2506-A (2011)**  
 BEHP: 1.4

**LDW18-SS-091 (2018)**  
 Total PCBs: 1.1

**LDW18-2509 (2018)**  
 Total PCBs: 1.3

**LDW-SSBRSTD-A (2011)**  
 Hexachlorobenzene: 1.6

**LDW09 (2012)**  
 0-1.9 ft: Total PCBs: 1.2  
 1.9-3.9 ft: Total PCBs: 1.7

**2154-DSS-19 (2012)**  
 Total PCBs: 36  
 Mercury: 2.1

**2154-DSS-20 (2012)**  
 Total PCBs: 4.3  
 Dimethyl phthalate: 1.8  
 Benzoic acid: 0.92

**LDW18-SS-180 (2018)**  
 Total PCBs: 4.6

**2154-DSS-22 (2012)**  
 Total PCBs: 12

**2154-DSS-25 (2012)**  
 Total PCBs: 3.5

**LDW18-SS-098 (2018)**  
 Total PCBs: 0.98

**2154-DSS-30 (2012)**  
 Total PCBs: 1.3

**Boyer-Trotsky Street End-4 (2011)**  
 Dioxin/furan TEQ: 2

**LDW18-DawnFoods (2018)**  
 Total PCBs: 1.3  
 Chrysene: 0.99

**Sea Tac Marine-3 (2011)**  
 Butyl benzyl phthalate: 180  
 Benzo(g,h,i)perylene: 7.5  
 Indeno(1,2,3-cd)pyrene: 6.3  
 2,4-Dimethylphenol: 5.7  
 Dioxin/furan TEQ: 5.0  
 Dibenzo(a,h)anthracene: 4.8  
 Fluoranthene: 3.8  
 Total HPAHs: 3.0  
 Chrysene: 2.3  
 Pyrene: 2.1  
 Benzo(a)pyrene: 1.9  
 Anthracene: 1.8  
 Benzo(a)anthracene: 1.8  
 cPAH TEQ: 1.7  
 Total benzofluoranthenes: 1.6  
 Zinc: 1.4  
 Phenanthrene: 1.1

**FSCS15-SC-04 (2015)**  
 0-10 cm:  
 Acenaphthene: 2.7  
 Dioxin/furan TEQ: 2.4  
 Total PCBs: 1.3  
 0-1.5 ft:  
 Dioxin/furan TEQ: 1.8  
 Arsenic: 1.2

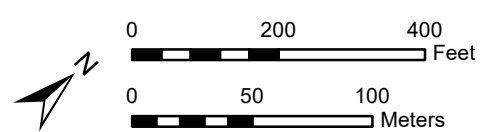
**Sea Tac Marine-2 (2011)**  
 Phenanthrene: 2.0  
 Total PCBs: 1.6  
 Benzo(g,h,i)perylene: 1.3  
 Dioxin/furan TEQ: 1.1  
 Indeno(1,2,3-cd)pyrene: 0.99

- Existing surface sediment location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
- Existing subsurface core location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
  - Core without appropriate RAL interval
- Other sample locations**
- ▽ Only analyzed for PCBs
  - Not analyzed for PCBs
- Outfall classification**
- ▽ CSO
  - ▽ Private storm drain
  - ▽ Public storm drain
  - ▽ Abandoned/inactive
  - ▽ Pipe of unresolved origin and/or use
  - ▽ Not an outfall
- Bank types (approximate Superfund boundary)**
- Exposed bank
  - Armored slope
  - Vertical bulkhead
  - Dock face
- Other LDW features**
- Recovery Category 1<sup>b</sup>
  - Intertidal area<sup>c</sup>
  - Potential vessel scour area<sup>c</sup>
  - Shoal area<sup>c</sup>
  - Below the navigation depth in the FNC and below potential vessel scour depth outside the FNC<sup>c</sup>
  - Not covered by bathymetric survey<sup>c</sup>
  - Bridge footing

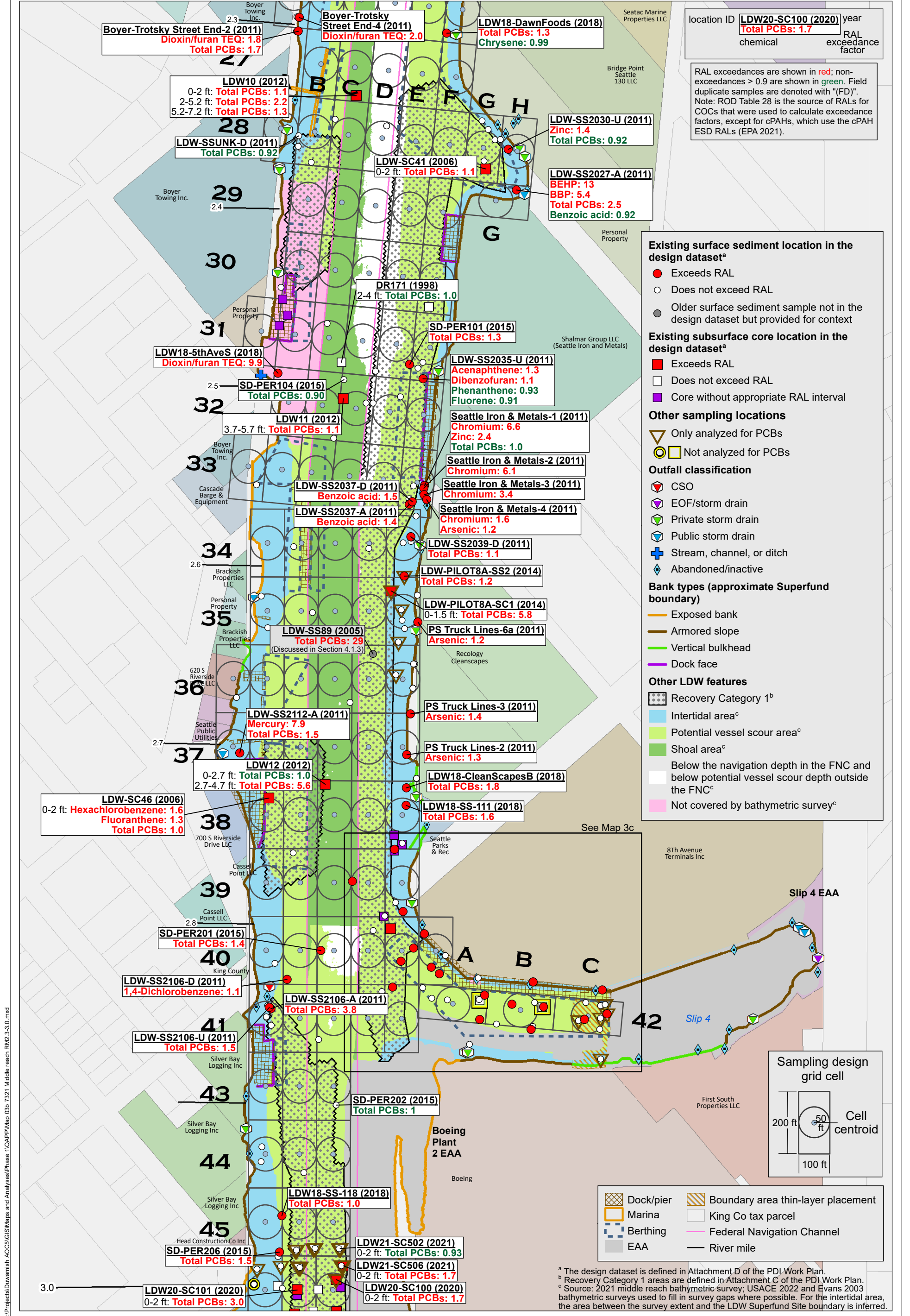
The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.

The Georgetown WWTS diffuser is not active yet because the WWTS is still under construction.

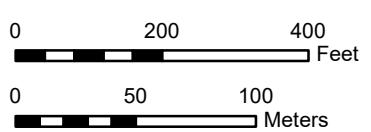
<sup>a</sup> The design dataset is defined in Attachment D of the PDI Work Plan.  
<sup>b</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.  
<sup>c</sup> Source: 2021 middle reach bathymetric survey; USACE 2022 and Evans 2003 bathymetric surveys used to fill in survey gaps where possible. For the intertidal area, the area between the survey extent and the LDW Superfund Site boundary is inferred.



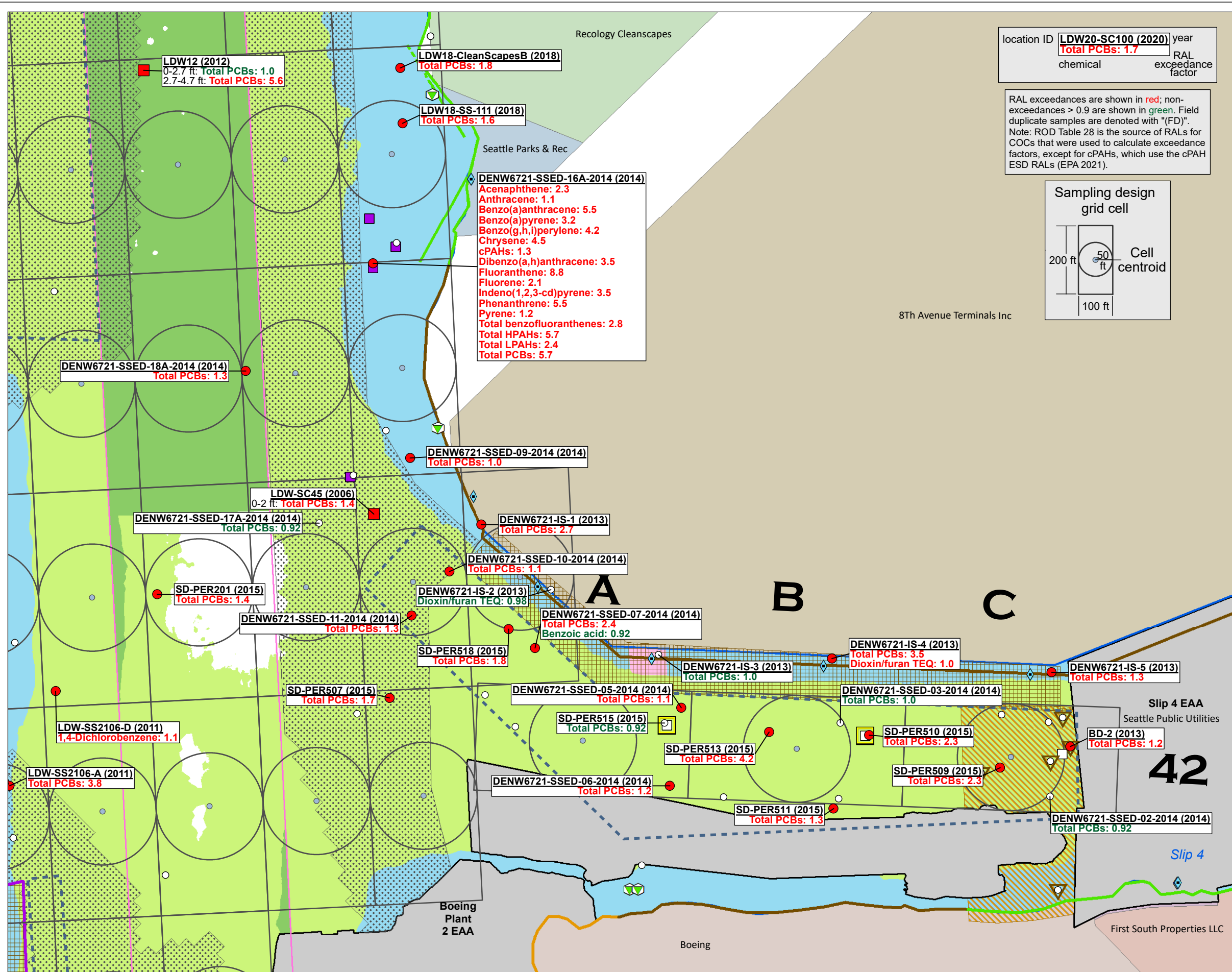
**Map 3a. Middle reach Phase I sediment sampling grids with existing design data (RM 1.6 to RM 2.3)**



Prepared by nicolas. 10/13/2022. W:\Projects\Duwamish\_AOC5\GIS\Maps and Analyses\Phase I\QAPP\Map 03b 7321 Middle reach\_RM2.3-3.0.mxd



Prepared by nicolase, 10/13/2022, W:\Projects\Duwamish ACCS\GIS\Maps and Analysis\Phase 1\QAPP\Map\_03c\_7321\_Middle\_reach\_Slip\_4.mxd

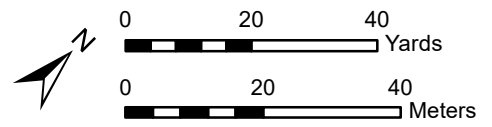


**Map 3c. Middle reach Phase I sediment sampling grids with existing design data (Slip 4)**

LDW QAPP FOR REMEDIAL DESIGN OF MIDDLE REACH: PRE-DESIGN INVESTIGATION **OCTOBER 21, 2022**

**Windward environmental LLC** **ANCHOR QEA**

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



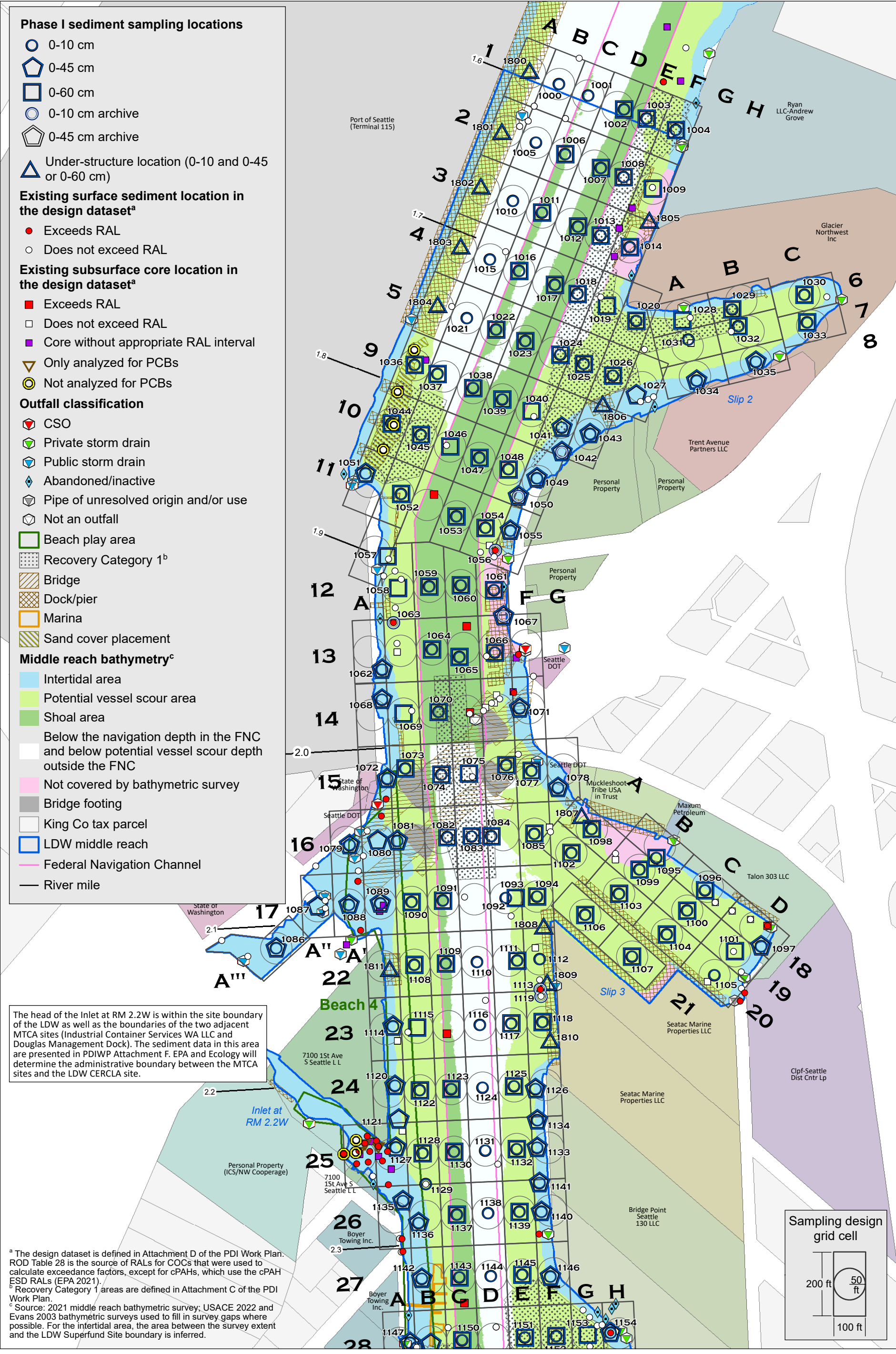
**Map 3c. Middle reach Phase I sediment sampling grids with existing design data (Slip 4)**

LDW QAPP FOR REMEDIAL DESIGN OF MIDDLE REACH: PRE-DESIGN INVESTIGATION **OCTOBER 21, 2022**

**Windward environmental LLC** **ANCHOR QEA**

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

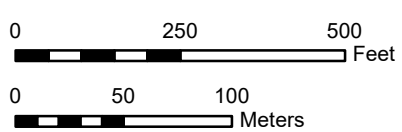
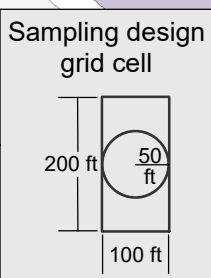
Prepared by nicolas. 10/13/2022. W:\Projects\Duwamish\_ACS\GIS\Maps and Analyses\Phase I\QAPP\Map 04a 7414 Middle reach sediment sampling design RMI.62.3.mxd



- Phase I sediment sampling locations**
- 0-10 cm
  - ◐ 0-45 cm
  - ◑ 0-60 cm
  - ◒ 0-10 cm archive
  - ◓ 0-45 cm archive
  - △ Under-structure location (0-10 and 0-45 or 0-60 cm)
- Existing surface sediment location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
- Existing subsurface core location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
  - Core without appropriate RAL interval
  - ▽ Only analyzed for PCBs
  - Not analyzed for PCBs
- Outfall classification**
- ◓ CSO
  - ◑ Private storm drain
  - ◒ Public storm drain
  - ◐ Abandoned/inactive
  - ◑ Pipe of unresolved origin and/or use
  - ◓ Not an outfall
- Beach play area**
- ◑ Beach play area
- Recovery Category 1<sup>b</sup>**
- ◑ Recovery Category 1<sup>b</sup>
- Infrastructure**
- ◑ Bridge
  - ◑ Dock/pier
  - ◑ Marina
  - ◑ Sand cover placement
- Middle reach bathymetry<sup>c</sup>**
- ◑ Intertidal area
  - ◑ Potential vessel scour area
  - ◑ Shoal area
  - ◑ Below the navigation depth in the FNC and below potential vessel scour depth outside the FNC
  - ◑ Not covered by bathymetric survey
  - ◑ Bridge footing
  - ◑ King Co tax parcel
  - ◑ LDW middle reach
  - ◑ Federal Navigation Channel
  - ◑ River mile

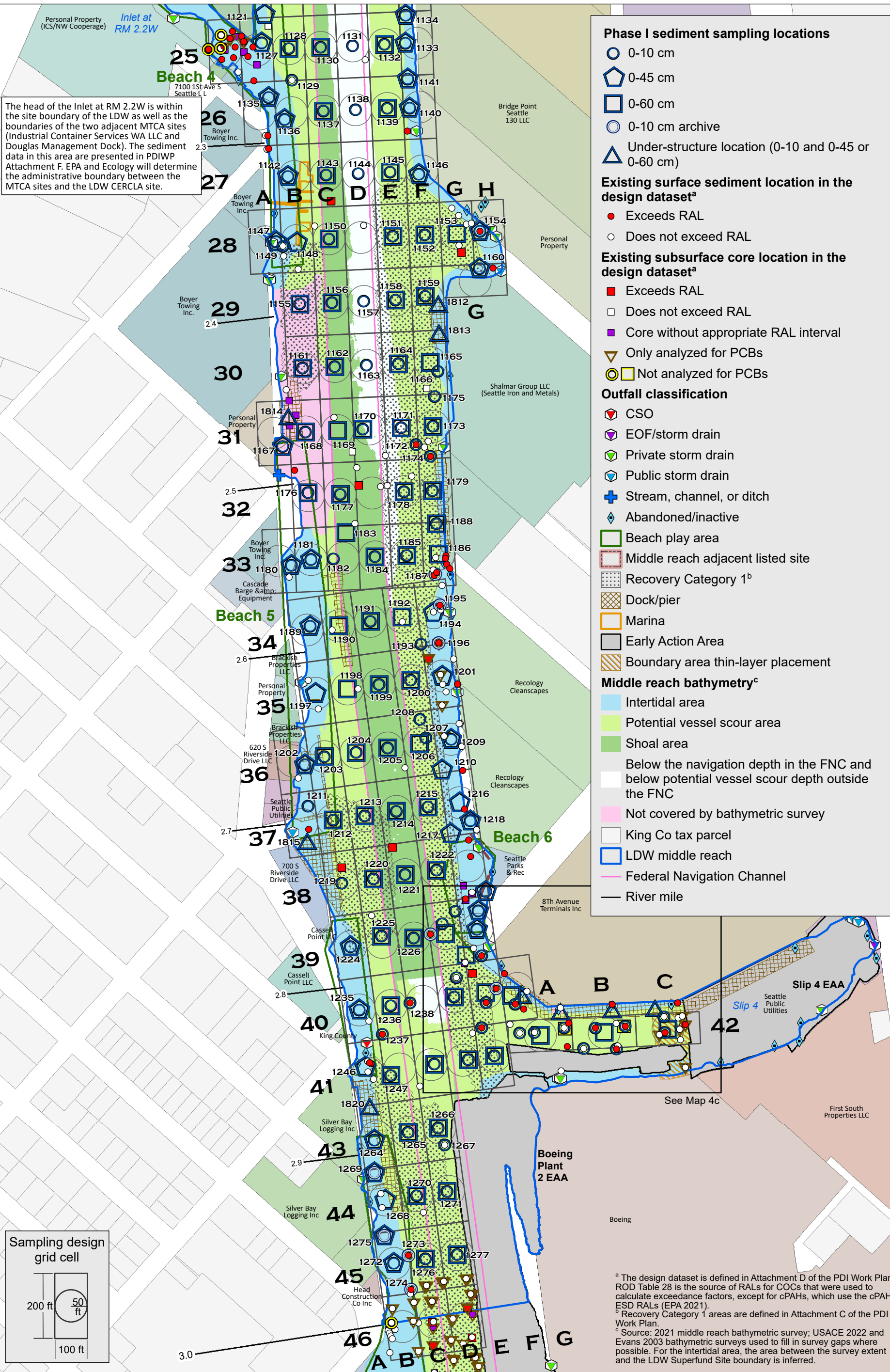
The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.

<sup>a</sup> The design dataset is defined in Attachment D of the PDI Work Plan. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).  
<sup>b</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.  
<sup>c</sup> Source: 2021 middle reach bathymetric survey; USACE 2022 and Evans 2003 bathymetric surveys used to fill in survey gaps where possible. For the intertidal area, the area between the survey extent and the LDW Superfund Site boundary is inferred.



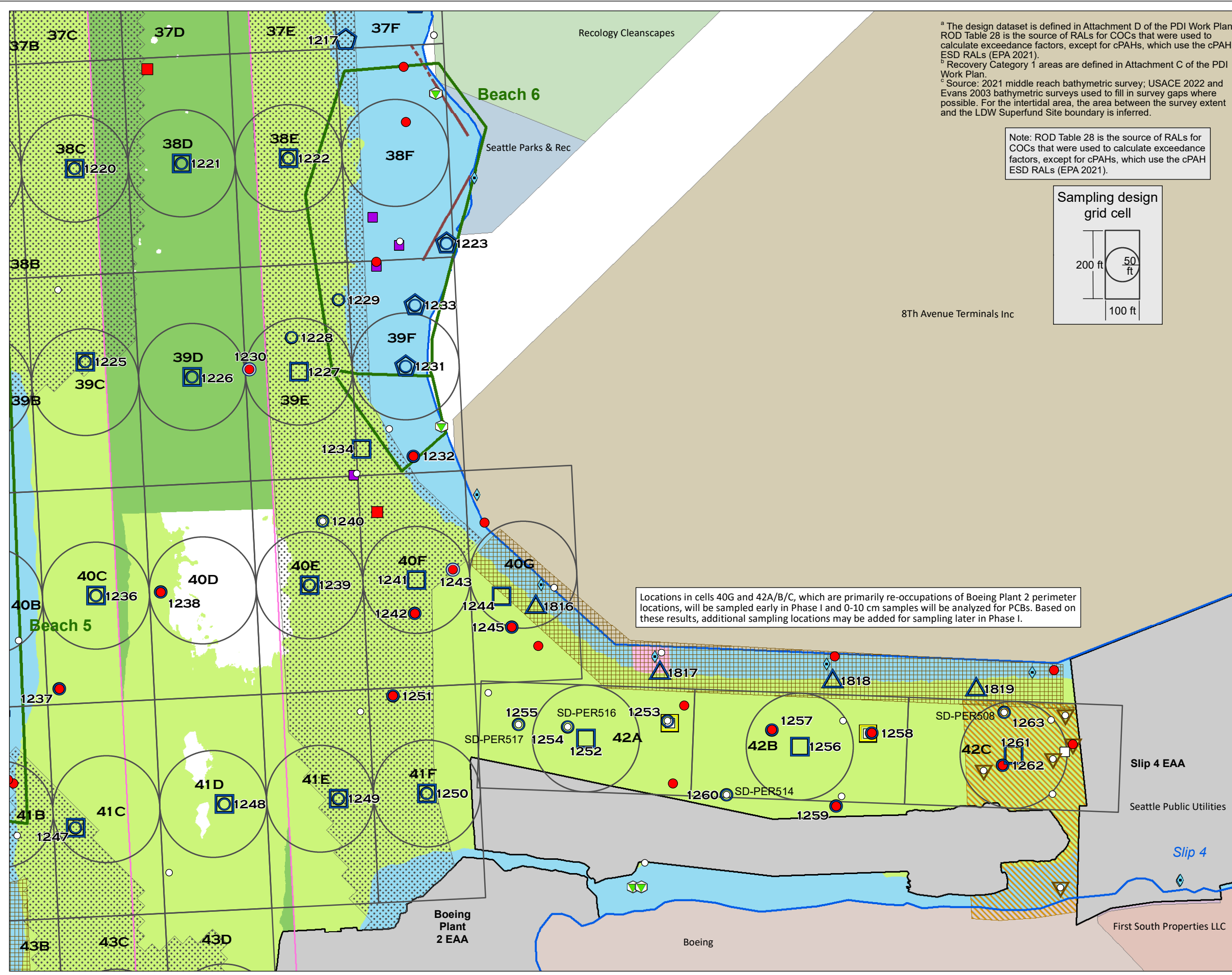
**Map 4a. Middle reach Phase I sediment sampling locations (RM 1.6 to RM 2.3)**

LDW QAPP FOR REMEDIAL DESIGN OF MIDDLE REACH: PRE-DESIGN INVESTIGATION      OCTOBER 21, 2022



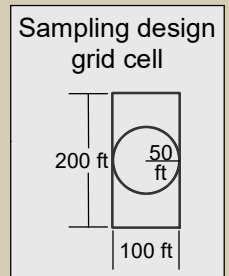
**Map 4b. Middle reach Phase I sediment sampling locations (RM 2.3 to RM 3.0)**

Prepared by nicolase\_10/13/2022; W:\Projects\Duwamish\AOC\GIS\Maps and Analysis\Phase 1\QAPP\Map\_04c\_7414\_Middle\_reach\_sampling\_design\_Slip\_4.mxd



<sup>a</sup> The design dataset is defined in Attachment D of the PDI Work Plan. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).  
<sup>b</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.  
<sup>c</sup> Source: 2021 middle reach bathymetric survey; USACE 2022 and Evans 2003 bathymetric surveys used to fill in survey gaps where possible. For the intertidal area, the area between the survey extent and the LDW Superfund Site boundary is inferred.

Note: ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).



Locations in cells 40G and 42A/B/C, which are primarily re-occupations of Boeing Plant 2 perimeter locations, will be sampled early in Phase I and 0-10 cm samples will be analyzed for PCBs. Based on these results, additional sampling locations may be added for sampling later in Phase I.

**Phase I sediment sampling locations**

- 0-10 cm
- ⬠ 0-45 cm
- ◻ 0-60 cm
- 0-10 cm archive
- ⬠ 0-45 cm archive
- △ Under-structure location (0-10 and 0-45 or 0-60 cm)

**Existing surface sediment location in the design dataset<sup>a</sup>**

- Exceeds RAL
- Does not exceed RAL

**Existing subsurface core location in the design dataset<sup>a</sup>**

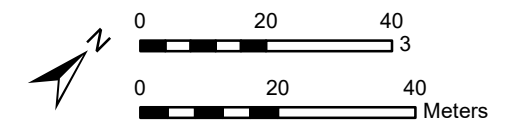
- Exceeds RAL
- Does not exceed RAL
- Core without appropriate RAL interval
- ▽ Only analyzed for PCBs
- ◻ Not analyzed for PCBs

**Outfall classification**

- ⬠ CSO
- ⬠ Private storm drain
- ⬠ Abandoned/inactive
- ⬠ Beach play area
- ⬠ Recovery Category 1<sup>b</sup>
- ⬠ Dock/pier
- ⬠ Early Action Area
- ⬠ Boundary area thin-layer placement

**Middle reach bathymetry<sup>c</sup>**

- ⬠ Intertidal area
- ⬠ Potential vessel scour area
- ⬠ Shoal area
- ⬠ Below the navigation depth in the FNC and below potential vessel scour depth outside the FNC
- ⬠ Not covered by bathymetric survey
- ⬠ King Co tax parcel
- ⬠ Federal Navigation Channel

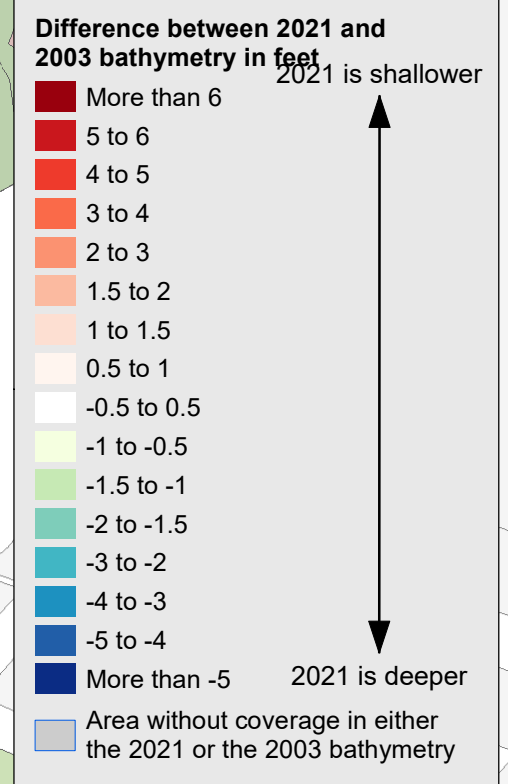
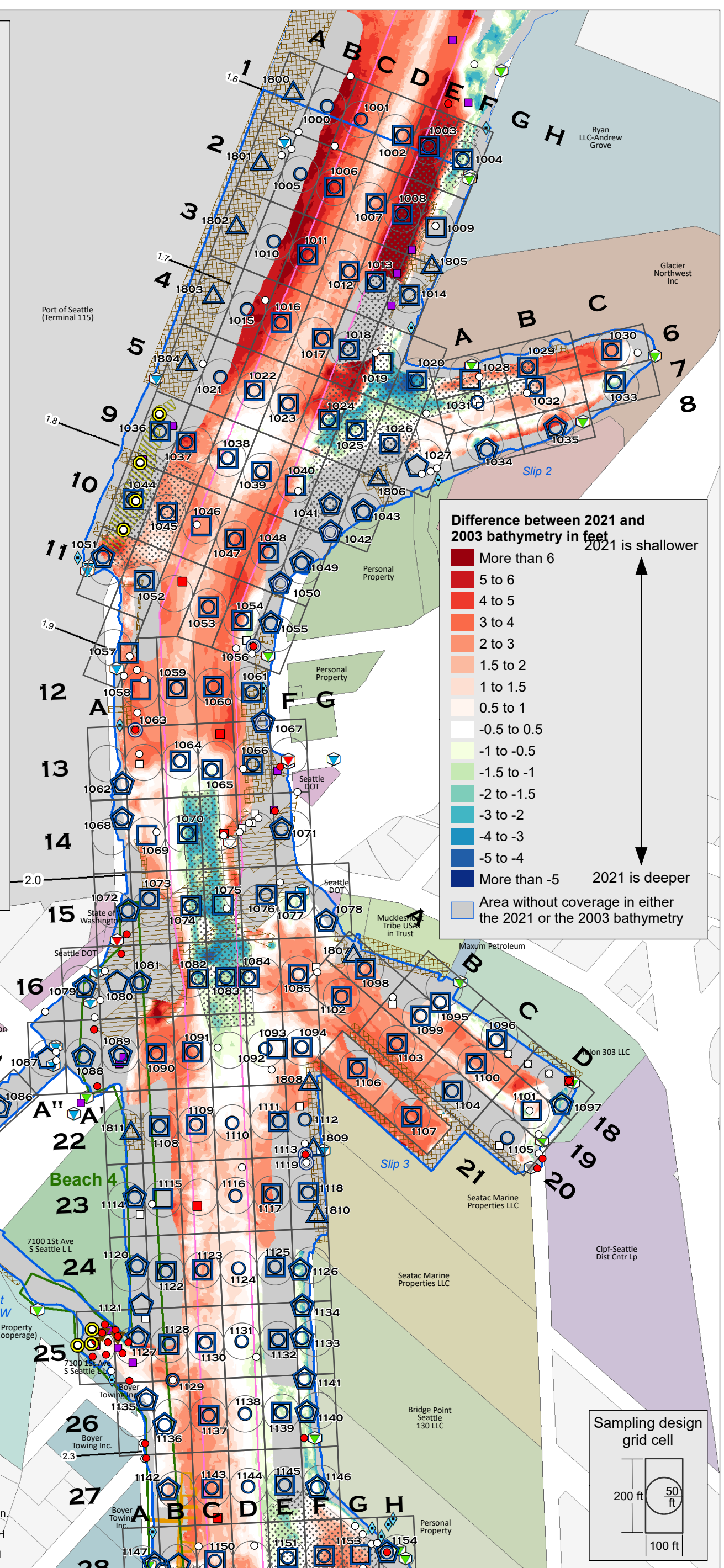


**Map 4c. Middle reach Phase I sediment sampling locations (Slip 4)**

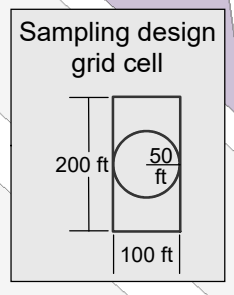
LDW QAPP FOR REMEDIAL DESIGN OF MIDDLE REACH: PRE-DESIGN INVESTIGATION      OCTOBER 21, 2022



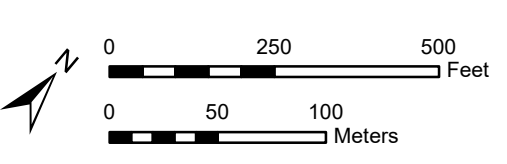
- Phase I sediment sampling locations**
- 0-10 cm
  - ◐ 0-45 cm
  - ◑ 0-60 cm
  - ◒ 0-10 cm archive
  - ◓ 0-45 cm archive
  - △ Under-structure location (0-10 and 0-45 or 0-60 cm)
- Existing surface sediment location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
- Existing subsurface core location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
  - Core without appropriate RAL interval
  - ▽ Only analyzed for PCBs
  - Not analyzed for PCBs
- Outfall classification**
- ◇ CSO
  - ◇ Private storm drain
  - ◇ Public storm drain
  - ◇ Abandoned/inactive
  - ◇ Pipe of unresolved origin and/or use
  - ◇ Not an outfall
- Other features:**
- Beach play area
  - ▨ Recovery Category 1<sup>b</sup>
  - ▨ Bridge
  - ▨ Dock/pier
  - ▨ Marina
  - ▨ Sand cover placement
  - ▨ King Co tax parcel
  - ▨ LDW middle reach
  - ▨ Federal Navigation Channel
  - River mile



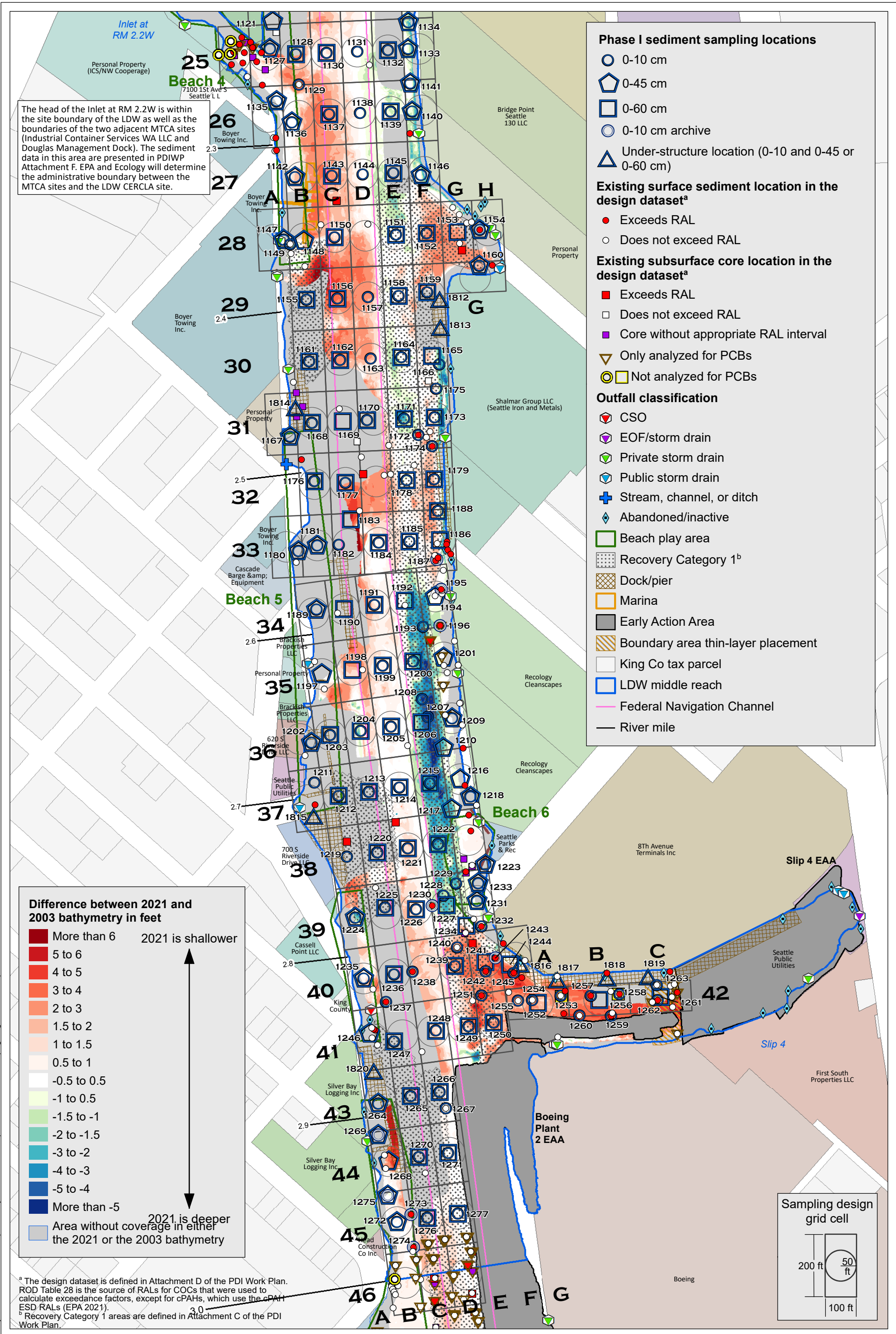
The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.



<sup>a</sup> The design dataset is defined in Attachment D of the PDI Work Plan. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).  
<sup>b</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.



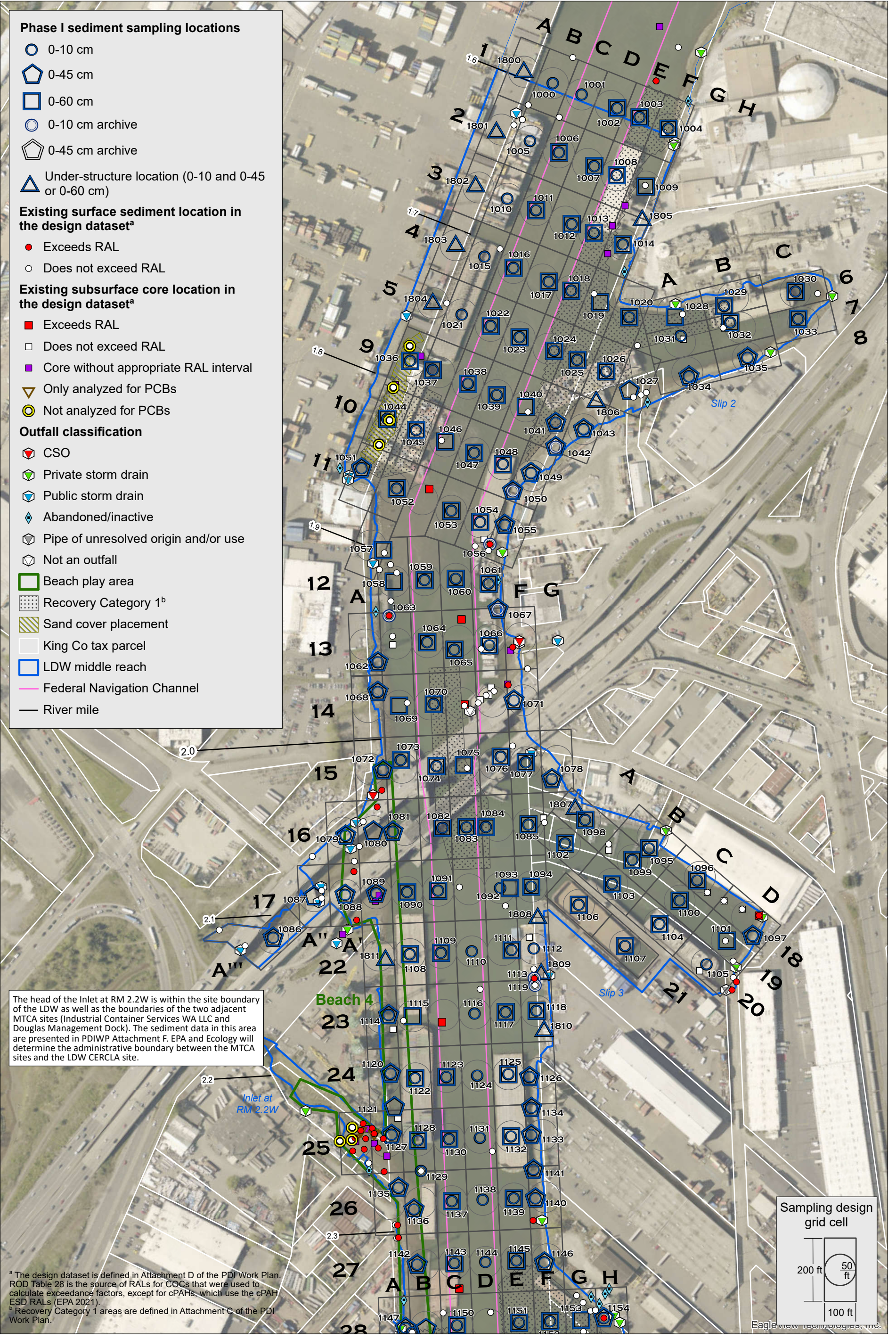
Prepared by nicolas. 9/20/2022. W:\Projects\Duwamish AOC\GIS\Maps and Analyses\Phase 1\QAPP\Map\_057\_7414\_Middle\_reach\_sampling\_design\_RM1.6-2.3\_isopach.mxd



**Map 5b. Middle reach Phase I sediment sampling locations with the isopach analysis results (RM 2.3 to RM 3.0)**

Prepared by nicolas. 10/13/2022. W:\Projects\Duwamish\_AOC\GIS\Maps and Analyses\Phase I\QAPP\Map\_05b\_7414\_Middle\_reach\_sampling\_locations\_RM2\_3\_3\_0\_isopach.mxd

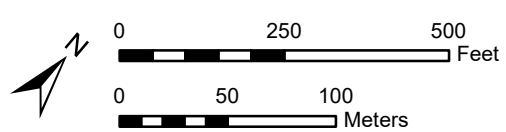
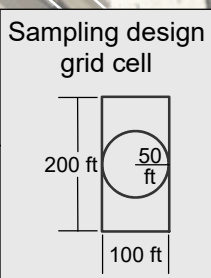
Prepared by nicolas. 10/13/2022. W:\Projects\Duwamish\_AOC5\GIS\Maps and Analyses\Phase I\QAPP\Map 06a 7414 Middle reach sampling design RMT1\_62\_3 - aerial.mxd

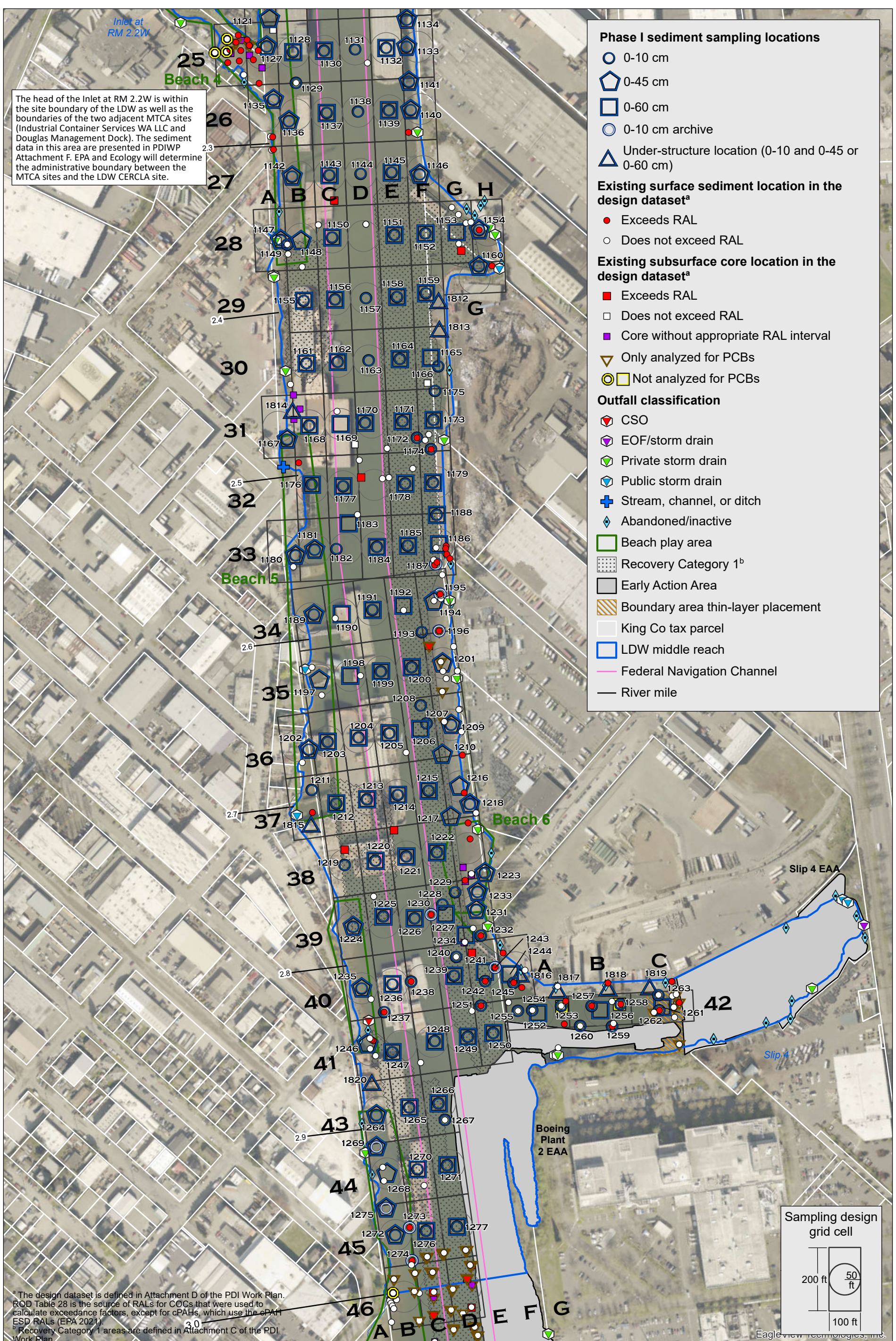


- Phase I sediment sampling locations**
- 0-10 cm
  - ◐ 0-45 cm
  - ◑ 0-60 cm
  - (with dot) 0-10 cm archive
  - ◐ (with dot) 0-45 cm archive
  - △ Under-structure location (0-10 and 0-45 or 0-60 cm)
- Existing surface sediment location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
- Existing subsurface core location in the design dataset<sup>a</sup>**
- Exceeds RAL
  - Does not exceed RAL
  - (purple) Core without appropriate RAL interval
  - ▽ Only analyzed for PCBs
  - (yellow) Not analyzed for PCBs
- Outfall classification**
- ◀ CSO
  - ◀ (green) Private storm drain
  - ◀ (blue) Public storm drain
  - ◀ (grey) Abandoned/inactive
  - ◀ (grey) Pipe of unresolved origin and/or use
  - ◀ (white) Not an outfall
- Other features**
- ▭ (green) Beach play area
  - ▭ (dotted) Recovery Category 1<sup>b</sup>
  - ▭ (yellow) Sand cover placement
  - ▭ (white) King Co tax parcel
  - ▭ (blue) LDW middle reach
  - (pink) Federal Navigation Channel
  - (black) River mile

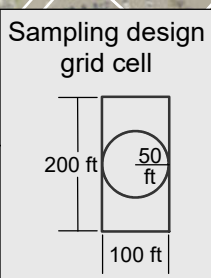
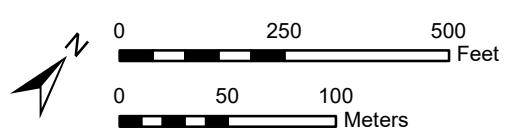
The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.

<sup>a</sup> The design dataset is defined in Attachment D of the PDI Work Plan. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).  
<sup>b</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.





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**Phase I dioxin/furan sediment sampling locations**

- 0-10 cm
- ◐ 0-45 cm
- ◑ 0-60 cm
- △ Under-structure location (0-10 and 0-45 or 0-60 cm)

**Other Phase I sediment sampling locations**

- 0-10 cm
- ◐ 0-45 cm
- ◑ 0-60 cm
- △ Under-structure location (0-10 and 0-45 or 0-60 cm)

**Existing dioxin/furan surface sediment location (ng/kg TEQ)<sup>a</sup>**

- > 25
- > 20 and ≤ 25
- > 10 and ≤ 20
- ≤ 10

**Existing dioxin/furan subsurface core location (ng/kg TEQ)<sup>a</sup>**

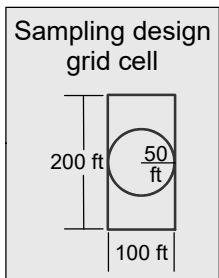
- > 25
- > 20 and ≤ 25
- > 10 and ≤ 20
- ≤ 10

**Outfall classification**

- ⬇ CSO
- ⬇ Private storm drain
- ⬇ Public storm drain
- ⬇ Abandoned/inactive
- ⬇ Pipe of unresolved origin and/or use
- ⬇ Not an outfall

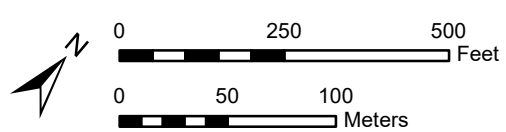
- ▭ Beach play area
- ▨ Recovery Category 1<sup>b</sup>
- ▨ Bridge
- ▨ Dock/pier
- ▨ Marina
- ▨ Sand cover placement
- Middle reach bathymetry<sup>c</sup>**
  - ▨ Intertidal area
  - ▨ Potential vessel scour area
  - ▨ Shoal area
- ▨ Below the navigation depth in the FNC and below potential vessel scour depth outside the FNC
- ▨ Not covered by bathymetric survey
- ▨ Bridge footing
- ▨ King Co tax parcel
- ▨ LDW middle reach
- ▨ Federal Navigation Channel
- River mile

The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.



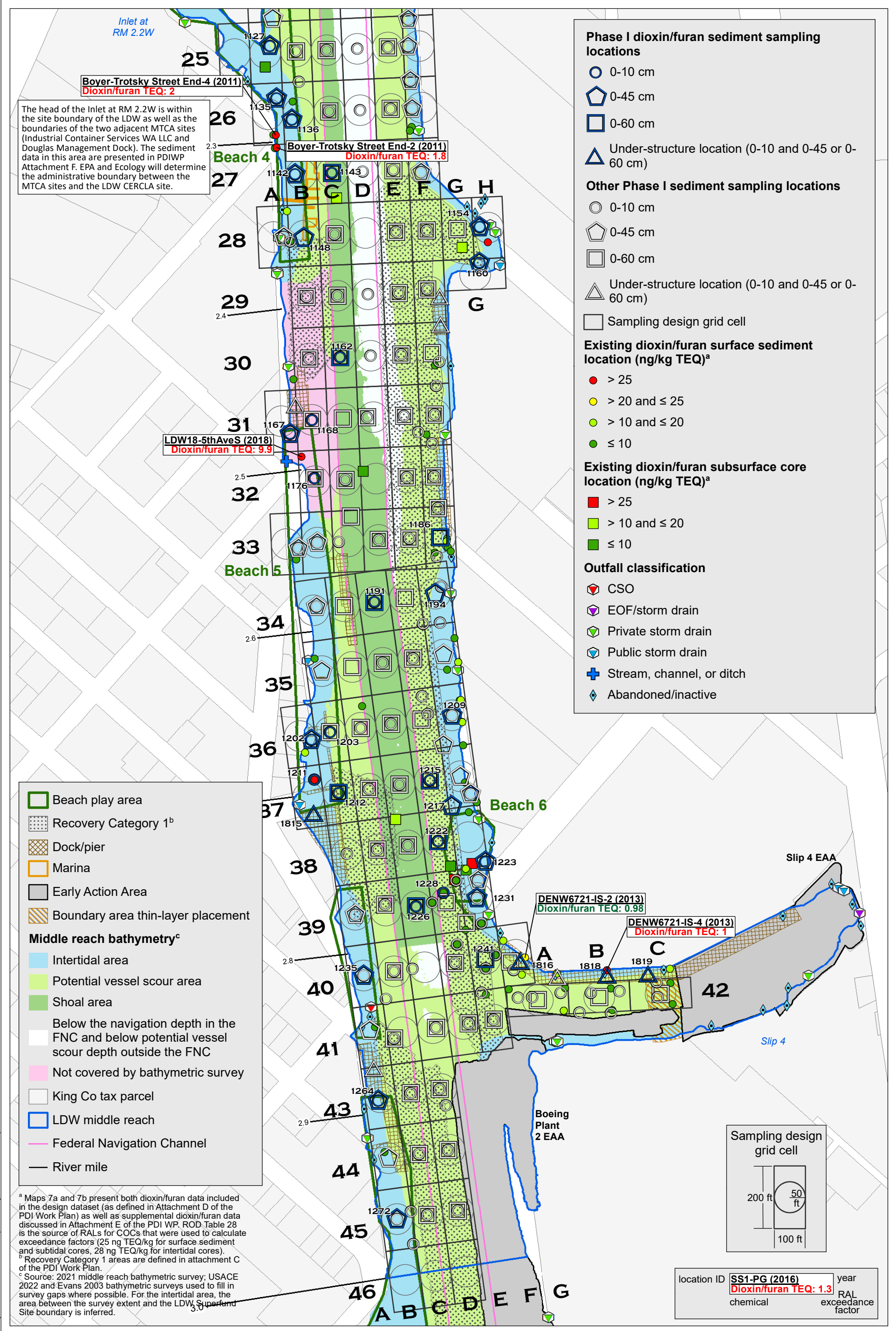
location ID	year	RAL
SS1-PG (2016)	2016	1.3
Dioxin/furan TEQ: 1.3		
chemical		exceedance factor

<sup>a</sup> Maps 7a and 7b present both dioxin/furan data included in the design dataset (as defined in Attachment D of the PDI Work Plan) as well as supplemental dioxin/furan data discussed in Attachment E of the PDI WP. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors (25 ng TEQ/kg for surface sediment and subtidal cores, 28 ng TEQ/kg for intertidal cores).  
<sup>b</sup> Recovery Category 1 areas are defined in attachment C of the PDI Work Plan.  
<sup>c</sup> Source: 2021 middle reach bathymetric survey; USACE 2022 and Evans 2003 bathymetric surveys used to fill in survey gaps where possible. For the intertidal area, the area between the survey extent and the LDW Superfund Site boundary is inferred.



**Map 7a. Middle reach Phase I sediment sampling locations for dioxins/furans (RM 1.6 to RM 2.3)**

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The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.

- Beach play area
  - Recovery Category 1<sup>b</sup>
  - Dock/pier
  - Marina
  - Early Action Area
  - Boundary area thin-layer placement
- Middle reach bathymetry<sup>c</sup>**
- Intertidal area
  - Potential vessel scour area
  - Shoal area
  - Below the navigation depth in the FNC and below potential vessel scour depth outside the FNC
  - Not covered by bathymetric survey
- King Co tax parcel
  - LDW middle reach
  - Federal Navigation Channel
  - River mile

<sup>a</sup> Maps 7a and 7b present both dioxin/furan data included in the design dataset (as defined in Attachment D of the PDI Work Plan) as well as supplemental dioxin/furan data discussed in Attachment E of the PDI WP. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors (25 ng TEQ/kg for surface sediment and subtidal cores, 28 ng TEQ/kg for intertidal cores).  
<sup>b</sup> Recovery Category 1 areas are defined in attachment C of the PDI Work Plan.  
<sup>c</sup> Source: 2021 middle reach bathymetric survey; USACE 2022 and Evans 2003 bathymetric surveys used to fill in survey gaps where possible. For the intertidal area, the area between the survey extent and the LDW Superfund Site boundary is inferred.

**Phase I dioxin/furan sediment sampling locations**

- 0-10 cm
- ⬠ 0-45 cm
- 0-60 cm
- △ Under-structure location (0-10 and 0-45 or 0-60 cm)

**Other Phase I sediment sampling locations**

- 0-10 cm
- ⬠ 0-45 cm
- 0-60 cm
- △ Under-structure location (0-10 and 0-45 or 0-60 cm)
- Sampling design grid cell

**Existing dioxin/furan surface sediment location (ng/kg TEQ)<sup>a</sup>**

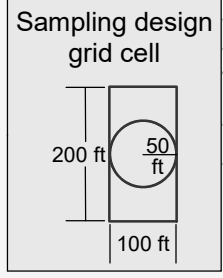
- > 25
- > 20 and ≤ 25
- > 10 and ≤ 20
- ≤ 10

**Existing dioxin/furan subsurface core location (ng/kg TEQ)<sup>a</sup>**

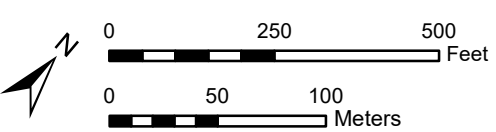
- > 25
- > 10 and ≤ 20
- ≤ 10

**Outfall classification**

- ⬠ CSO
- ⬠ EOF/storm drain
- ⬠ Private storm drain
- ⬠ Public storm drain
- ⊕ Stream, channel, or ditch
- ⬠ Abandoned/inactive

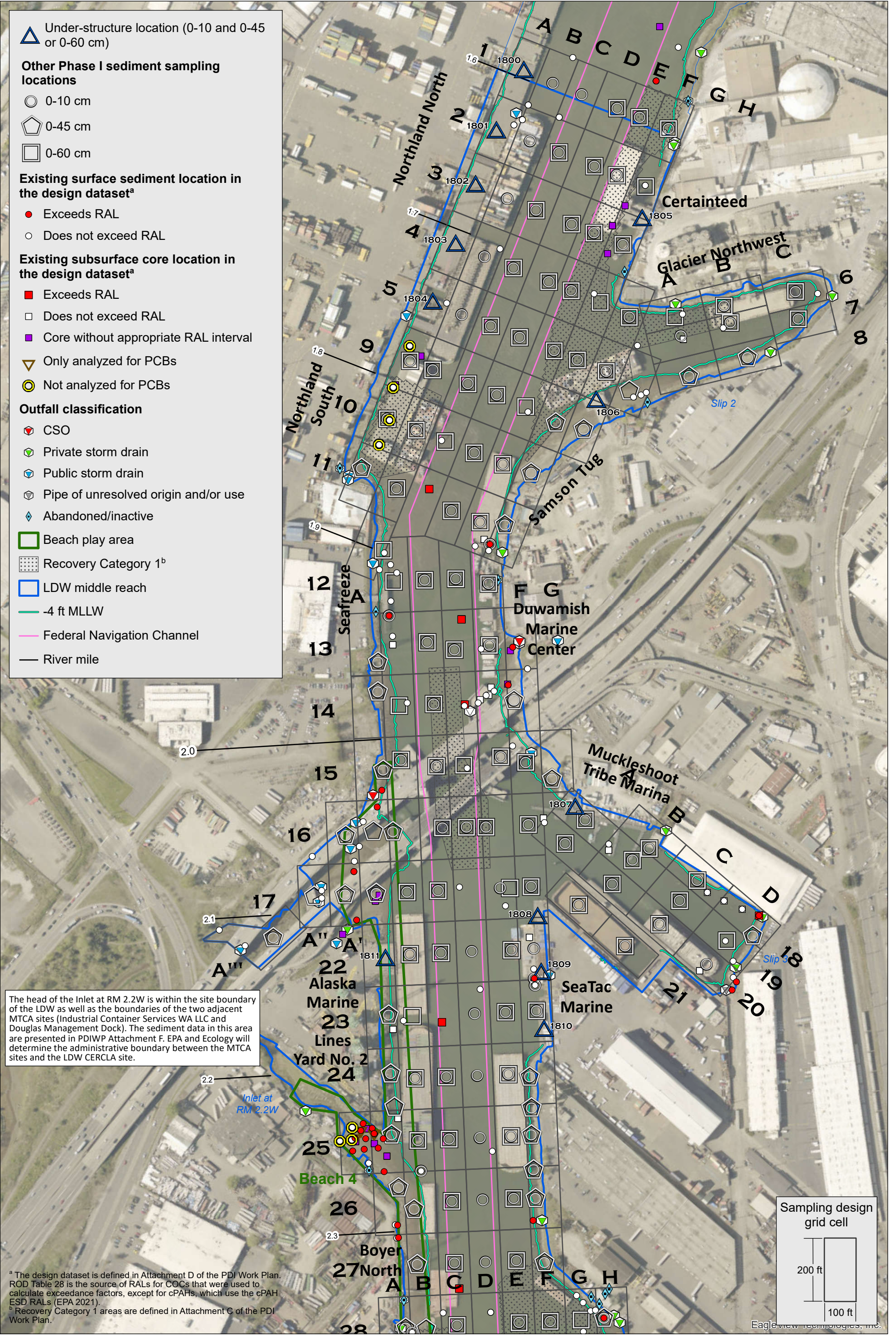


location ID	SS1-PG (2016)	year	
	Dioxin/furan TEQ: 1.3	RAL	
	chemical	exceedance	factor



**Map 7b. Middle reach Phase I sediment sampling locations for dioxins/furans (RM 2.3 to RM 3.0)**  
 LDW QAPP FOR REMEDIAL DESIGN OF MIDDLE REACH: PRE-DESIGN INVESTIGATION  
 OCTOBER 21, 2022

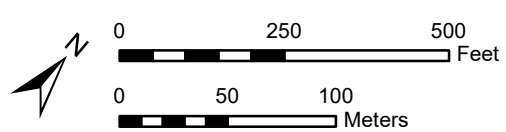
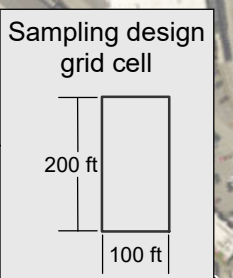
Prepared by nicolas. 10/13/2022. W:\Projects\Duwamish\_AOC5\GIS\Maps and Analyses\Phase 1\QAPP\Map 07b\_7397\_Middle\_reach\_DF\_locs\_RM2.3-0.mxd



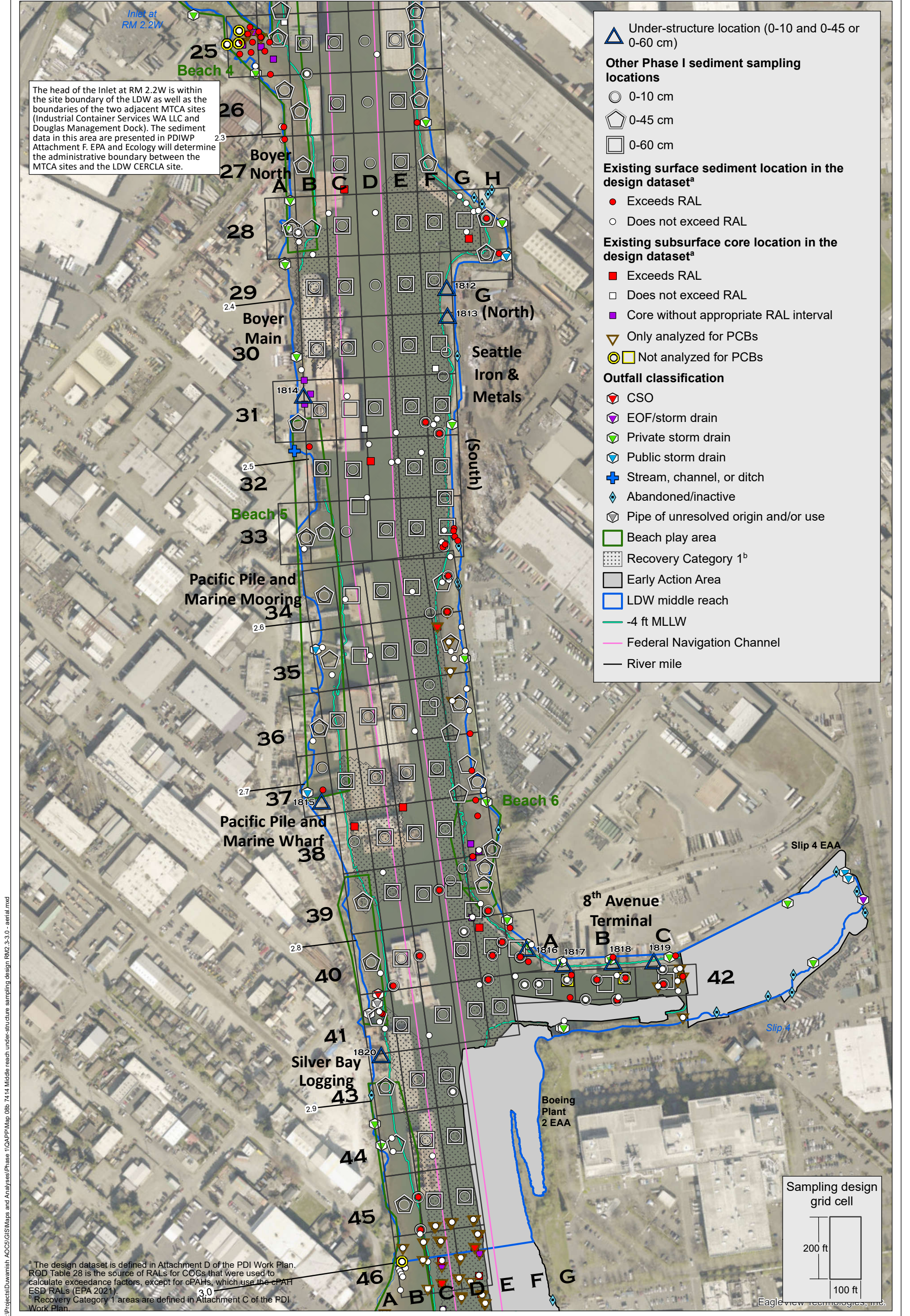
- △ Under-structure location (0-10 and 0-45 or 0-60 cm)
- Other Phase I sediment sampling locations**
- 0-10 cm
- ◐ 0-45 cm
- ◑ 0-60 cm
- Existing surface sediment location in the design dataset<sup>a</sup>**
- Exceeds RAL
- Does not exceed RAL
- Existing subsurface core location in the design dataset<sup>a</sup>**
- Exceeds RAL
- Does not exceed RAL
- Core without appropriate RAL interval
- ▽ Only analyzed for PCBs
- Not analyzed for PCBs
- Outfall classification**
- ▽ CSO
- ▽ Private storm drain
- ▽ Public storm drain
- ▽ Pipe of unresolved origin and/or use
- ◇ Abandoned/inactive
- Beach play area
- ▨ Recovery Category 1<sup>b</sup>
- LDW middle reach
- -4 ft MLLW
- Federal Navigation Channel
- River mile

The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.

<sup>a</sup> The design dataset is defined in Attachment D of the PDI Work Plan. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).  
<sup>b</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.



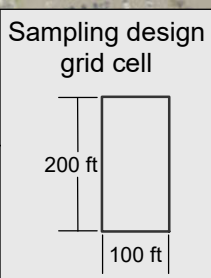
Prepared by nicolas. 10/13/2022. W:\Projects\Duwamish\_AOC5\GIS\Maps and Analyses\Phase I\QAPP\Map 08a 7414 Middle reach under-structure sampling design RM1.6-2.3 - aerial.mxd



The head of the Inlet at RM 2.2W is within the site boundary of the LDW as well as the boundaries of the two adjacent MTCA sites (Industrial Container Services WA LLC and Douglas Management Dock). The sediment data in this area are presented in PDIWP Attachment F. EPA and Ecology will determine the administrative boundary between the MTCA sites and the LDW CERCLA site.

- Under-structure location (0-10 and 0-45 or 0-60 cm)
- Other Phase I sediment sampling locations**
- 0-10 cm
- 0-45 cm
- 0-60 cm
- Existing surface sediment location in the design dataset<sup>a</sup>**
- Exceeds RAL
- Does not exceed RAL
- Existing subsurface core location in the design dataset<sup>a</sup>**
- Exceeds RAL
- Does not exceed RAL
- Core without appropriate RAL interval
- Only analyzed for PCBs
- Not analyzed for PCBs
- Outfall classification**
- CSO
- EOF/storm drain
- Private storm drain
- Public storm drain
- Stream, channel, or ditch
- Abandoned/inactive
- Pipe of unresolved origin and/or use
- Beach play area
- Recovery Category 1<sup>b</sup>
- Early Action Area
- LDW middle reach
- 4 ft MLLW
- Federal Navigation Channel
- River mile

<sup>a</sup> The design dataset is defined in Attachment D of the PDI Work Plan. ROD Table 28 is the source of RALs for COCs that were used to calculate exceedance factors, except for cPAHs, which use the cPAH ESD RALs (EPA 2021).  
<sup>b</sup> Recovery Category 1 areas are defined in Attachment C of the PDI Work Plan.



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