TECHNICAL MEMORANDUM
CONTAMINATED SEDIMENT 3D EXTENT
REMEDIAL DESIGN SERVICES, SWAN ISLAND BASIN PROJECT AREA
CERCLA DOCKET NO. 10-2021-001
PORTLAND HARBOR SUPERFUND SITE
PORTLAND, MULTNOMAH COUNTY, OREGON

1.0 INTRODUCTION

This Contaminated Sediment 3D Extent Technical Memorandum presents the results of horizontal and vertical refinement of the Sediment Management Area (SMA) subject to remedial action for the Swan Island Basin (SIB) Project Area within the Portland Harbor Superfund Site in Portland, Multnomah County, Oregon. Pacific Groundwater Group, Mott MacDonald, and HydroGeoLogic, Inc. (HGL) performed the work on behalf of the SIB Remedial Design (RD) Group based on the requirements of the Portland Harbor Superfund Site Record of Decision (ROD) (EPA, 2017) and the Administrative Settlement Agreement and Order on Consent (ASAOC) (EPA, 2021). The work was performed in accordance with the final PDI Work Plan, which the U.S. Environmental Protection Agency (EPA) approved in May 2022 (HGL, 2022).

1.1 OBJECTIVES AND SCOPE

As presented in the PDI Work Plan, the Sediment Management Area (SMA) is the horizontal area and vertical extent of sediment contamination that may be subject to remedial action, defined using surface and subsurface sediment chemistry data. The purpose of this 3D extent memorandum is to:

- Refine the lateral and vertical extent of contamination in relation to Remedial Action Levels (RALs), Practical Quantitation Limits (PQLs), and Principal Threat Waste thresholds (PTW) for ROD Table 21 Contaminants of Concern (COCs).
- Evaluate the nature and extent of buried contamination.
- Assess areas of uncertainty within the SMA extent.
- Estimate the total volume of sediment that may be subject to remediation based on the refined SMA horizontal and vertical extents.

To accomplish the objectives, the following technical analyses were performed:

- Horizontal interpolations of sediment exceedances and thickness of exceedances,
- Leave-one out cross-validation (LOOCV) of interpolation results where the interpolation is run iteratively leaving one result out each time.

1.2 PROJECT AREA BACKGROUND

The SIB Project Area is the active cleanup area designated in the ROD between approximately River Mile (RM) 8.1 and RM 9.2 on the northeast side of the Willamette River. The SIB Project Area is approximately 1.1 miles in length, 117 acres in size, and includes riverbanks from top of the bank to the river (Figure 1-1). The EPA ROD does not provide a boundary for in-river sediments subject to inclusion in the SMA footprint. For the purposes of this memorandum, the +13 feet North American Vertical Datum of 1988 (NAVD88) is applied as the upper limit of in-river sediment, which is consistent with the EPA Remedial Investigation report, Figure 2.2-1 and Appendix A3, Table A3-5 which reads (EPA, 2016a):

> *"An elevation of +13 ft NAVD88 (mean high water mark [MHWM]) is the elevation defining the shoreline boundary of the Portland Harbor Superfund site."*

For the purposes of this memorandum, the +13 ft NAVD88 contour is referred to as the sediment interpolation area boundary along the banks,[1] and to the Swan Island Basin Sediment Decision Unit (SDU) as the sediment interpolation area boundary in the body of the river.

2.0 SEDIMENT CHEMISTRY DATASETS

The following EPA-approved sediment chemistry datasets are used in the 3D extent analysis:

- EPA, 2016b. *Feasibility Study*, Portland Harbor Superfund Site, Portland Oregon. United States Environmental Protection Agency Region 10, Seattle, Washington.
- Geosyntec, 2016. *Sediment Sampling Data Report, Swan Island Lagoon,* Portland, Oregon. Prepared for The Marine Group, LLC and BAE Systems San Diego Ship Repair, Inc. August 12.
- AECOM and Geosyntec, 2019. *PDI Evaluation Report, Portland Harbor Pre-Remedial Design Investigation and Baseline Sampling*. Prepared for United States Environmental Protection Agency, Region 10. June 17.
- Pacific Groundwater Group (PGG), 2019a. *Surface and Subsurface Sediment Field Sampling and Data Report,* Swan Island Lagoon, Portland Harbor Superfund Site. Prepared for Daimler Trucks North America LLC. April 30.
- PGG, 2019b. *Surface and Subsurface Sediment Field Sampling and Data Report,* Swan Island Lagoon, Portland Harbor Superfund Site. Prepared for de maximis, inc. May 3.

Additionally, the following HGL-collected sediment and riverbank chemistry datasets are included in the 3D extent analysis:

[1] The nature and extent of riverbank contamination is being evaluated in a separate memorandum. For the purposes of RD, sediments and riverbank soils may be handled together.

- HGL, 2024a. *Surface and Subsurface Sediment Sampling Data Report*, Revision 2, Remedial Design Services Swan Island Basin Project Area CERCLA Docket No. 10-2021-001. December 2024.
- HGL, 2024b. *Riverbank Characterization Data Report*, Revision 2, Remedial Design Services Swan Island Basin Project Area CERCLA Docket No. 10-2021-001. December 2024.

Figure 2-1 shows the locations of surface and subsurface samples from the HGL field investigations as well as the previous investigations.

The lateral and vertical extent of contamination is defined by exceedances of the RALs, PQLs, and PTW thresholds for ROD Table 21 COCs (EPA, 2017; 2019; 2020; 2022a; 2022b). A list of Table 21 COCs and applicable threshold concentrations are presented in Table 2-1. For the purposes of this memorandum, the RAL/PQL/PTW thresholds are collectively referred to as SMA thresholds. Note that the "Additional Contaminants" listed in ROD Table 21 have PTW thresholds but do not have RALs; for these "Additional Contaminants," the PTW threshold is the SMA threshold. The RAL is the SMA threshold for all Table 17 Focused COCs (FCOCs) except 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD (EPA, 2022a), for which PQLs are used in SMA delineation.

3.0 METHODS

The Natural Neighbor interpolation method was used for the horizontal and vertical SMA refinement. EPA used this interpolation method to develop the SMAs presented in the Feasibility Study, Proposed Plan, and ROD. EPA continues to recommend this interpolation approach in the Remedial Design Guidelines and Considerations (RDGC) Appendix B, Section 12 (EPA, 2022c). The Natural Neighbor method calculates the value of each unknown point based on the surrounding measured values. The contributions of these surrounding measured values are weighted based on the area overlap between the interpolated point's Thiessen polygon versus the Thiessen polygons of the original dataset of measured values.

Natural Neighbor does not predict values outside of the range or convex hull[2] of measured values, and it does not consider anisotropy or other statistical measures. Natural Neighbor is straightforward, deterministic, nonparametric, widely used, and it is suitable for many distributions of input data.

The following subsections summarize the specific methods that were employed for evaluating the following:

- Horizontal extent of contamination for surface, subsurface, and combined surface and subsurface sediment,
- Vertical extent of contamination, and
- Volume of contaminated sediment above the SMA thresholds.

[2] A convex hull is the simple closed polygon or boundary with the minimum perimeter to contain a set of points or sample locations.

Additionally provided are the methods used to evaluate the confidence and uncertainty of the Natural Neighbor interpolation horizontal extent of contamination results using cross-validation as described in RDGC Appendix B Section 12 (EPA, 2022c).

3.1 HORIZONTAL EXTENT

The horizontal extent of contamination is estimated using ESRI's ArcGIS Pro 3.1 and the Natural Neighbor interpolation function of the Spatial Analyst extension. The surface sediment and subsurface sediment extents of contamination were evaluated separately and combined dataset. This approach allows buried contamination to be identified as areas where the subsurface horizontal extent is beyond the surface extent.

The horizontal extent interpolation process includes the following steps:

1. Generate input sediment dataset for locations within and in a buffer surrounding the Project Area. The input dataset uses both sediment and riverbank locations, which serves to extend the interpolated results to the full extent of the SDU. However, the riverbank portion of the interpolation, above +13 ft NAVD88, is clipped from the final results.
2. Assign a binary indicator value of '0' or '1' to each location's sediment concentration. Assign '0' to locations where there are no SMA threshold exceedances and '1' to locations where there are one or more SMA threshold exceedances. These assigned binary exceedance indicator values serve as the input to the Natural Neighbor interpolation method.
3. Exclude locations with no focused COC (FCOC) results and non-exceeding locations lacking FCOC results for primary drivers (i.e., polychlorinated biphenyls, TCDD, and PeCDD).[3] This criterion is conservative in that it targets exclusion of false negatives. For example, a sample that has total PCB concentrations (above RALs) and does not have dioxin/furan results is included in the interpolation, whereas a sample that has total PCB concentrations (below RALs) and does not have dioxin/furan results is excluded from the interpolation. The dataset after these excluded locations are removed represents the interpolation inputs and are presented in Table 3-1 for surface data and Table 3-2 for subsurface data.
4. Interpolate the binary exceedance indicator using the Natural Neighbor interpolation method on a 10 by 10 ft output grid. Interpolated values will range from 0 to 1 and are displayed with contour intervals of 0 percent (%) to 20%, 20% to 50%, 50% to 80%, and 80% to 100%, representing the probability of SMA threshold exceedance based on the input data.
5. Clip the interpolation results to the Project Area boundary and to the +13 ft NAVD88 elevation contour. The +13 ft NAVD88 elevation contour is shown on Figure 2-1 in relation to the Project Area and occurs in the Project Area where riverbanks are present.
6. Define the horizontal extent of contamination as the area where the interpolated values are above 0.5. The 0.5 criterion represents a 50% probability of exceedance and defines the surface and subsurface extents of contamination. The combined surface and subsurface

[3] For example, locations like N4 and SD136 where total polycyclic aromatic hydrocarbons and naphthalene concentrations do not exceed RAL/PTWs, there are no PCB, TCDD, or PeCDD results. The samples surrounding these locations are above RALs/PQLs for one or more of the driving FCOCs, PCB, TCDD, or PeCDD.

extents of contamination are all areas where either surface or subsurface interpolated values are above 0.5 and is the horizontal extent of the SMA.

7. Evaluate the uncertainty of the horizontal extent by comparing the distance between 20% and 80% probability of exceedance contours to the range of influence between samples.
8. Perform a leave-one-out cross-validation to assess the uncertainty of interpolations.

3.1.1 Surface Sediment Horizontal Extent

The surface sediment horizontal extent of contamination includes the top 30 centimeters (cm) of sediment with chemical concentrations exceeding SMA thresholds. Any sediment sample with a top depth of 0 cm and a bottom interval depth equal to or less than 30 cm was treated as surface sediment.[4]

3.1.2 Subsurface Sediment Horizontal Extent

The subsurface sediment horizontal extent of contamination includes sediments deeper than 30 cm with chemical concentrations exceeding SMA thresholds. Any sediment sample with a bottom interval depth deeper than 30 cm was treated as subsurface sediment regardless of the upper interval depth.

3.1.3 Refinement of SMA Horizontal Extent

The refinement of the horizontal SMA extent is the maximum extent of the surface and subsurface sediment extents of contamination.

3.2 VERTICAL EXTENT

The vertical extent of contamination is estimated using a dataset of sediment cores collected within a 150 ft square grid throughout the Project Area. With historical datasets included some of the grid cells contain multiple core locations as another line of evidence used when depth of contamination (DOC) is unbounded and historical surveys suggest DOC is deeper than the unbounded depth, but that historic surveys do not bound DOC. We follow EPA's approach using Natural Neighbor interpolation to define the depth of contamination described in the Feasibility Study and ROD. We performed the interpolation twice, treating unbounded cores in different ways: 1) where the depth of contamination is the bottom depth of the deepest analyzed sample interval with measured exceedances, and 2) where the maximum historical depth of the mudline is used as a proxy for depth of contamination.

The vertical extent interpolation process includes the following steps:

1. Generate the input sediment dataset for core locations within and in a buffer surrounding the Project Area. The input dataset of core locations uses both sediment and riverbank locations. The riverbank serves to extend the interpolated results to the full extent of the SDU. Any

[4] There are no samples where the upper depths greater than 0 cm and lower depth less than 30 cm (e.g., sample from 10 cm to 20 cm).

interpolation that extends above +13 ft NAVD88 is clipped from the final results.

2. Process sediment concentrations at each location to find the depth of exceedance and the number of clean confirmation samples, as performed in the Surface and Subsurface Sediment Sampling Data Report and listed in Tables 4-2a and b (HGL, 2023a). Clean confirmation in this context refers to concentrations below SMA thresholds. Note: the depth of exceedance is reported as the top of the first clean interval with no deeper exceedances, rather than the bottom of the last exceeding interval, to account for cores where core intervals were not all analyzed. If the bottom sampled core interval exceeds, the bottom of that core interval is treated as the depth of contamination.
3. Filter the dataset to remove shallow cores that do not reach clean confirmation. These short cores can artificially bias the interpolation low. The filtering method removes cores 4 ft or less in length that do not reach clean confirmation and have another core within 75 ft with SMA threshold exceedances deeper than 4 ft.
4. Interpolate the depths using the Natural Neighbor interpolation method on a 10 by 10 ft output grid. Interpolated values range from 0 to the depth of the deepest exceeding sample (19.5 ft).
5. Clip the vertical extent of contamination to the horizontal extent of contamination.
6. Assess the uncertainty of the depth of contamination interpolation results using the number and depth of clean confirmation information presented in the Surface and Subsurface Sediment Sampling Data Report (HGL, 2023a).

Additionally, the vertical extent of clean sediment (the clean sediment from the mudline downward that buries contamination and sometimes referred to as clean overburden) is similarly interpolated using the depth to the top of contamination.

3.2.1 Maximum Depth of Historical Mudline

The maximum depth of the mudline relative to the current (2022) mudline is estimated using bathymetry surveys from 1934 through 2022 (n = 42) (Table 3-3). This dataset is used as a proxy for depth of contamination in vertically unbounded areas where cores do not achieve clean confirmation and where the proxy depth is deeper than the core sample depth.

The maximum depth of historical mudline is estimated with the following steps:

1. Generate input depth point data from digital and paper maps. Paper maps were georeferenced, and depth was digitized.
2. Point data were converted, as needed, to a common vertical datum.
3. For each of the 42 bathymetry surveys, point data were interpolated on the 10 by 10 ft grid and clipped to the convex hull of the input dataset to create a separate grided depth map for each bathymetry survey.
4. The maximum depth for each 10 by 10 ft grid cell is calculated as the maximum depth

relative to the current mudline (2022)[5]. For example, if the current mudline (2022) is the lowest value in the gridded dataset then the maximum depth of historical mudline is zero. As another example, if the surveys from 1938, 1969, 2004, and 2020 record depths of 7, 14, 6, and 0 ft, the maximum value would be 14 ft from the 1969 survey for the 10 by 10 ft grid cell. Positive depth values indicate areas that have been deeper in the past.

3.2.2 Refinement of SMA Vertical Extent

The vertical SMA was estimated using sediment cores. This calculation is reliable where sediment cores have clean confirmation samples, indicating that the vertical extent has been bounded. In areas where there are no clean confirmation samples, the vertical extent is unbounded, and the maximum depth of the historical mudline was greater than estimated by using sediment cores, the maximum depth of the historical mudline was used as a proxy for the DOC. While the historical filling does not equate to contamination, the RD team interprets this historical river bottom as the maximum possible extent of contamination. The combined dataset of bounded core locations and the historical mudline for unbounded core locations is interpolated per Section 3.2.

Following EPA's approach, the Natural Neighbor interpolation was used to define the depth of contamination described in the Feasibility Study and ROD.

3.3 VOLUMETRIC ESTIMATE OF SEDIMENT MANAGEMENT AREA THRESHOLD EXCEEDING SEDIMENT

The horizontal and vertical extents of contamination provide the bounding envelope of in situ sediments exceeding SMA thresholds. The volume of in situ sediments exceeding the SMA thresholds is the area multiplied by the depth. The calculation is performed in ArcGIS using the 10 by 10 ft gridded area and interpolated vertical SMA depth (thickness) as cubic feet and converted to cubic yards. This method assumes a vertical boundary at horizontal extent of SMA and does not include a multiplier like the 1.5 to 2.0 over-dredge factor used in the FS volume estimates (EPA, 2016b).

4.0 INTERPOLATION RESULTS AND SEDIMENT MANAGEMENT AREA REFINEMENT

This section summarizes the results for the sediment horizontal extent of contamination interpolations and the refinement of the horizontal SMA extent; summarizes the vertical extent of contamination interpolation, maximum depth of historical mudline, and the SMA; and presents the estimated volume of contaminated sediment.

4.1 HORIZONTAL EXTENTS OF SEDIMENT MANAGEMENT AREA THRESHOLD CONTAMINATION

The interpolation procedures described in Section 3.1 were used to produce two interpolations for the surface and subsurface sediment input data. Interpolated values range from 0 to 1 and are

[5] The maximum depth of the historical mudline is defined as the deepest elevation from publicly available historical bathymetry surveys.

displayed with contour intervals of 0% to 20%, 20% to 50%, 50% to 80%, and 80% to 100%, representing the probability of exceedance of SMA thresholds for Table 21 focused COCs for the input data. The horizontal extent of SMA threshold exceedances in surface and subsurface sediments is shown in Figures 4-1 and 4-2, respectively. The horizontal extent of SMA threshold exceedances combined across both surface and subsurface sediments is shown in Figure 4-3.

The inclusion of riverbank data outside the sediment boundary in the horizontal extent of contamination interpolations serves to extend the interpolation domain to join with the transition to riverbank areas. The inclusion of these riverbank data, however, introduces some interpolation edge effects where riverbank exceedances cause interpolated exceedances within sediments. Areas impacted in this way are near the U.S. Coast Guard and U.S. Navy structures, next to the Port of Portland Dredge Base, a small effect near the head of the basin, and at several locations between Berths 302 and 305. These areas will be assessed during selection of remedial technology and design. Interpolation results of riverbank sediments are presented in detail in Appendix M.

4.1.1 Cross-Validation Results

Cross-validation results for the surface sediments within the SDU boundary and below +13 NAVD88 are provided in Table 4-1. Cross-validation results of exceedances for only subsurface sediments within the SDU boundary and below +13 NAVD88 are provided in Table 4-2.

Cross-validation involves repeating the interpolation once for each point in the Natural Neighbor input. In each iteration, a single point is removed from the interpolation input and the interpolation output predicts a value at the removed point. This predicted value is compared to the original measured value. The relationship between predicted and measured values across all points provides a statistically meaningful measure of the uncertainty of the interpolation to support interpretation of the interpolation results.

Cross-validation results are tallied into four categories based on the input data indicator value (0 or 1) and the interpolation predicted value binned into less than (<) 0.5 and greater than (>) 0.5 groups, corresponding to the 50% probability exceedance level used to delineate the horizontal extents of contamination. The four categories that can be used to describe the accuracy of the interpolation results:

- True Negative – measured value = 0, predicted value 0 to 0.5.
- False Negative – measured value = 0, predicted value 0.5 to 1.
- False Positive – measured value = 1, predicted value 0 to 0.5.
- True Positive – measured value = 1, predicted value 0.5 to 1.

Cross-validation results are provided in Tables 4-1 and 4-2 and shown spatially on Figures 4-4 and 4-5 for the surface and subsurface samples, respectively.

4.2 REFINEMENT OF SEDIMENT MANAGEMENT AREA HORIZONTAL EXTENT

The ROD SMA extent is updated using the interpolated horizontal extents of SMA threshold exceedances presented in Figures 4-1a and 4-2a, based on the combined outputs of surface and subsurface interpolations. For comparison, the combined surface and subsurface data are combined

then interpolated as shown on Figure 4-3. The outside boundary at the 0.5 contour (50% probability level of exceedance) of the two horizontal extents shown on Figures 4-1a and 4-2a are used for the refined SMA horizontal extent (Figure 4-6). The refined SMA excludes 0.87 acres of internal areas within the SMA extent that are below SMA thresholds.

The refined SMA extent within the SIB Project Area is approximately 109 acres, which is larger than SMA depicted in the ROD (89.4 acres) (Figure 4-6). However, the ROD SMA was delineated using only surface sediment data. Figure 4-1a shows the refined horizontal extent of surface sediment contamination (0.5 contour or 50% probability level of exceedance) within the SIB Project Area, which is approximately 89.6 acres and is comparable to the ROD SMA.

The areas where surface sediment in the SMA is below thresholds but the subsurface sediment exceeds thresholds are areas where clean surface sediment covers exceeding subsurface sediment; these areas are refer to as areas of potentially buried contamination. Areas of potentially buried contamination (pending buried contamination evaluation) in the SIB SMA are shown on Figure 4-6.

4.2.1 Uncertainty Evaluation

To assess areas and overall degree of uncertainty in the horizontal interpolation results, an uncertainty evaluation was performed following procedures described in RDGC Appendix B, Section 12 (EPA, 2022c). Areas of uncertainty in the refined SMA delineation occur when the distance between 20% and 80% probability of exceedance levels (0.2 and 0.8 contours) is greater than the range of influence between samples. EPA guidance (EPA, 2022c) suggests a 75 ft rule-of-thumb (based on half the distance between 150-ft grid samples) can be used as the range of influence between samples. A more rigorous evaluation was conducted to produce a semi-variogram to estimate the range of spatial autocorrelation, which is included in Attachment A. A semi-variogram was produced for the surface and subsurface sediment FCOCs by binary indicator (0 or 1) per the SMA threshold (Attachment A, Figure A-1[6]). The "range" of the semi-variograms provides a statistical measure of the range of influence between samples. The semi-variogram range is 786 feet for combined surface and subsurface sample results (Attachment A, Figure A-1).

The 20% to 80% probability of exceedance bands for each of the surface and subsurface interpolations are shown with the refined SMA extent on Figure 4-7. Most of the areas wider than 75 ft are only marginally wider. For example, areas where the 20% to 80% band is wider than 100 ft occur only in the mouth of the SIB. Importantly, the uncertainty evaluation shows that the SMA delineation is robustly constrained by adequate sample density. Although there is higher uncertainty near Berth 311 and the mouth of the basin near the Vigorous Dry Dock, the 20% to 80% uncertainty band is substantially narrower than the site-specific range (786 ft) resulting from the semi-variogram

[6] The semi-variogram analysis was conducted in R using the gstat package (Pebesma, E.J., 2004 Multivariable geostatistics in S: the gstat package, Computers and Geosciences, 30: 683-691). The variogram was fit automatically using a spherical model and the default fit method. The default fit method uses weights N_h/h^2 where N_h is the number of point pairs and h is the distance. For the fitting algorithm, the gstat package uses weighted least squares to fit the variogram model to the experimental variogram. The objective of the fitting algorithm is to minimize the (weighted) sum of squared errors between the fit and the data.

analysis. Nevertheless, the uncertainty of the exceedances is not well constrained and may be a potential data gap during RD. If so, the data gap will be addressed at that time.

4.3 VERTICAL EXTENT OF CONTAMINATION

The interpolation procedures described in Section 3.2 were used to produce an interpolation for the vertical extent of contamination using the sediment input data. The input dataset was filtered to remove shallow cores that do not reach clean confirmation and would bias depth low. The vertical extent, presented as an interpolated depth of contamination map, is presented in Figure 4-8.

Uncertainty in the interpolation results can be attributed to three main factors: 1) the sample interval, 2) the core recovery percentage, and 3) achieving clean confirmation. Where cores do not achieve clean confirmation and where the maximum depth of the historical mudline proxy is deeper than the core sample depth, the proxy depth is used, as described in Section 3.2.2. Use of the proxy reduces the uncertainty at the mouth and head of the basin at cores where clean confirmation was not achieved.

4.4 MAXIMUM DEPTH OF HISTORICAL MUDLINE

The procedures described in Section 3.2 were used to produce a map showing the maximum depth of mudline relative to the current (2022) mudline using bathymetry surveys from 1934 through 2022 (n = 42). The maximum depth of the historical mudline is shown on Figure 4-9 and is used as a proxy for the vertical extent of contamination in areas where cores are not bounded by clean samples and where total core depth was less than the maximum depth of the historical mudline at the core location.

4.5 REFINEMENT OF SEDIMENT MANAGEMENT AREA VERTICAL EXTENT

The depth to threshold for the ROD Selected Remedy[7] is updated using the interpolated vertical extent of cores with bounded depths (Figure 4-8) and the maximum depth of the historical mudline from bathymetry surveys (Figure 4-9). The core depth of contamination was replaced with the maximum depth of the historical mudline at only unbounded core locations where total core depth was less than the maximum depth of the historical mudline. These two datasets were combined, using those rules, to produce a single interpolation for core locations as the refined SMA vertical extent (Figure 4-10). Use of the maximum depth of the historical mudline proxy occurred primarily in the head of the basin.

4.6 VERTICAL EXENT OF CLEAN SEDIMENT

The interpolation procedures described in Section 3.2 were used to produce an interpolation for the vertical extent of clean sediment using the sediment input data for areas of potential buried contamination. Figure 4-11 depicts the interpolated depth (thickness) of clean sediment overlying areas of potential buried contamination.

[7] EPA provided the Depth to Threshold GIS geodatabase file for the Selected Remedy named "Update_dtt_SelectedRemedy.gdb" dated 06/22/2017. The 2017 Depth to Threshold GIS geodatabase was used to calculate the ROD SMA in situ volume.

4.7 ESTIMATED VOLUME OF REFINED SEDIMENT MANAGEMENT AREA

The volume of sediment exceeding the SMA threshold values is determined from the thickness and area of exceeding sediment. Thickness and depth of contamination are sometimes but not always the same value. The depth and thickness of contamination are the same when the contamination begins at the mudline (0 ft depth). In areas of buried contamination (where there is clean sediment), thickness is less than depth.

The depth/thickness of clean sediment (Figure 4-11) is subtracted from the vertical SMA extent (Figure 4-10) to estimate the thickness of sediments exceeding SMA thresholds.

The following summarizes the SMA quantities for the SIB Project Area:

- SMA Area per Figure 4-6: 109 acres
- Core only volume (in situ) per Figure 4-8 (from current mudline to depth of contamination in cores only assuming vertical slopes): 1,191,000 cubic yards
- Volume (in situ) per Figure 4-10 (from current mudline to depth of contamination assuming vertical slopes): 1,349,000 cubic yards
- Volume (in situ) per Figure 4-11 (depth/thickness of clean sediment): 62,000 cubic yards
- Volume (in situ) per Figure 4-10 less the clean sediment per Figure 4-11 (bottom of clean sediment to depth of contamination): 1,287,000 cubic yards

For comparison, the ROD Selected Remedy, calculated here using EPA's 2017 depth to threshold interpolation (see Footnote 7 on page 10) is 774,000 cubic yards (in situ).

The contaminated sediment volumes identified herein are the result of calculations completed using the data and methods presented in the report. These quantities do not represent design-level quantity estimates of final RD extent, depths, and volumes, which will be provided in the RD following additional technical analysis. The statements of quantity in this report do not imply relationships with specific remediation technologies that may be applied and are intended to be informational to provide an overall impression of the magnitude of the stated material types.

5.0 REFERENCES

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List of Tables

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Attachment

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TABLES

Table 2-1
RAL, PQL, and PTW Criteria Thresholds
Contaminated Sediment 3D Extent; Swan Island Basin Project Area, Portland, Oregon

Focused Contaminant of Concern	Threshold Type	Threshold Value
Total PCBs	RAL	75 µg/kg
Total PAHs	RAL	30,000 µg/kg
2,3,7,8-TCDD	PQL	1 pg/g
1,2,3,7,8-PeCDD	PQL	2.5 pg/g
2,3,4,7,8-PeCDF	RAL	0.2 µg/kg
DDx	RAL	160 µg/kg
2,3,7,8-TCDF	PTW	0.6 µg/kg
1,2,3,4,7,8-HxCDF	PTW	0.4 µg/kg
Total cPAHs	PTW	774,000 µg/kg
Naphthalene	PTW	140,000 µg/kg

Acronyms:
µg/kg = microgram per kilogram
pg/g = picogram per gram
cPAH = carcinogenic polycyclic aromatic hydrocarbon
DDD = dichlorodiphenyldichloroethane
DDE = dichlorodiphenyldichloroethylene
DDT = dichlorodiphenyltrichloroethane
DDx = DDD + DDE + DDT
HxCDF = 1,2,3,4,7,8-hexachlorodibenzofuran
PAH = polycyclic aromatic hydrocarbons
PCB = polychlorinated biphenyl
PCDD = polychlorinated dibenzodioxins
PCDF = polychlorinated dibenzofurans
PeCDD = 1,2,3,7,8-pentachlorodibenzo-p-dioxin
PeCDF = 2,3,4,7,8-pentachlorodibenzofuran
PTW = principal threat waste
PQL = Practical Quantitation Limit
RAL = remedial action level
TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
TCDF = 2,3,7,8-tetrachlorodibenzofuran

Footnotes:
a) RAL and PTW values are sourced from *Errata #3 for Portland Harbor Superfund Site Record of Decision, Table 6 and Table 21*, dated September 7, 2022 (EPA 2022b).

b) PQL values are used for SMA thresholds rather than the RAL for 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD from *Evaluation of consistently and reliably attained practical quantitation limits for 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD for use in Sediment Management Area delineation at the Portland Harbor Superfund Site*, dated September 7, 2022 (EPA 2022a).

Table 3-1
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	0-OHW	7632373	700032.2	1
2022 SIB PDI Riverbank Sampling	0-TOB	7632429	700020.8	1
2022 SIB PDI Riverbank Sampling	100-MLW	7634890	700737.2	0
2022 SIB PDI Riverbank Sampling	100-OHW	7634887	700757.2	0
2022 SIB PDI Riverbank Sampling	100-TOB	7634940	700793.6	0
2022 SIB PDI Riverbank Sampling	101-MLW	7634784	700794.9	0
2022 SIB PDI Riverbank Sampling	101-OHW	7634800	700822.9	0
2022 SIB PDI Riverbank Sampling	101-TOB	7634849	700866.1	0
2022 SIB PDI Riverbank Sampling	102-MLW	7634705	700846.4	0
2022 SIB PDI Riverbank Sampling	102-OHW	7634737	700892.1	0
2022 SIB PDI Riverbank Sampling	102-TOB	7634778	700923.3	0
2022 SIB PDI Riverbank Sampling	103-MLW	7634647	700963.6	0
2022 SIB PDI Riverbank Sampling	103-OHW	7634684	700961.4	0
2022 SIB PDI Riverbank Sampling	103-TOB	7634701	700976.3	1
2022 SIB PDI Riverbank Sampling	104-MLW	7634599	701002.2	0
2022 SIB PDI Riverbank Sampling	104-OHW	7634603	701028.4	0
2022 SIB PDI Riverbank Sampling	104-TOB	7634624	701046.8	1
2022 SIB PDI Riverbank Sampling	105-OHW	7634523	701088.2	0
2022 SIB PDI Riverbank Sampling	105-TOB	7634534	701121.5	1
2022 SIB PDI Riverbank Sampling	106-OHW	7634451	701152.8	0
2022 SIB PDI Riverbank Sampling	106-TOB	7634465	701185.7	1
2022 SIB PDI Riverbank Sampling	107-OHW	7634352	701204.4	0
2022 SIB PDI Riverbank Sampling	107-TOB	7634375	701230.4	1
2022 SIB PDI Riverbank Sampling	108-TOB	7634293	701272.1	0
2022 SIB PDI Riverbank Sampling	109-OHW	7634192	701311.7	1
2022 SIB PDI Riverbank Sampling	109-TOB	7634220	701340	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	10-OHW	7632948	700451	1
2022 SIB PDI Riverbank Sampling	10-TOB	7632937	700389.3	1
2022 SIB PDI Riverbank Sampling	110-MLW	7634111	701353.2	0
2022 SIB PDI Riverbank Sampling	110-TOB	7634134	701401.3	0
2022 SIB PDI Riverbank Sampling	111-TOB	7634070	701468.7	1
2022 SIB PDI Riverbank Sampling	112-MLW	7633994	701496.6	0
2022 SIB PDI Riverbank Sampling	112-OHW	7634002	701535.8	0
2022 SIB PDI Riverbank Sampling	112-TOB	7634032	701568.1	0
2022 SIB PDI Riverbank Sampling	113-TOB	7633939	701617	1
2022 SIB PDI Riverbank Sampling	114-OHW	7633841	701660.5	1
2022 SIB PDI Riverbank Sampling	114-TOB	7633852	701688.3	0
2022 SIB PDI Riverbank Sampling	115-OHW	7633763	701723.5	1
2022 SIB PDI Riverbank Sampling	115-TOB	7633779	701742.2	1
2022 SIB PDI Riverbank Sampling	116-TOB	7633716	701814.3	1
2022 SIB PDI Riverbank Sampling	117-MLW	7633586	701838.8	1
2022 SIB PDI Riverbank Sampling	117-OHW	7633612	701853.5	1
2022 SIB PDI Riverbank Sampling	117-TOB	7633638	701879	0
2022 SIB PDI Riverbank Sampling	118-OHW	7633526	701906.5	1
2022 SIB PDI Riverbank Sampling	118-TOB	7633540	701919	1
2022 SIB PDI Riverbank Sampling	119-OHW	7633447	701964	1
2022 SIB PDI Riverbank Sampling	119-TOB	7633451	701980	0
2022 SIB PDI Riverbank Sampling	11-OHW	7633057	700458.2	1
2022 SIB PDI Riverbank Sampling	11-TOB	7633061	700461.3	1
2022 SIB PDI Riverbank Sampling	120-MLW	7633343	701962.4	0
2022 SIB PDI Riverbank Sampling	120-OHW	7633342	701964.1	1
2022 SIB PDI Riverbank Sampling	120-TOB	7633382	702016.6	0
2022 SIB PDI Riverbank Sampling	121-MLW	7633245	701989.3	0
2022 SIB PDI Riverbank Sampling	121-OHW	7633277	702043.3	1
2022 SIB PDI Riverbank Sampling	121-TOB	7633292	702067.9	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	122-MLW	7633171	702000.5	0
2022 SIB PDI Riverbank Sampling	122-OHW	7633170	702067	1
2022 SIB PDI Riverbank Sampling	122-TOB	7633170	702106.8	0
2022 SIB PDI Riverbank Sampling	123-OHW	7633069	702044.9	1
2022 SIB PDI Riverbank Sampling	123-TOB	7633063	702074.5	1
2022 SIB PDI Riverbank Sampling	124-MLW	7632978	702000.2	0
2022 SIB PDI Riverbank Sampling	124-OHW	7632973	702027.7	1
2022 SIB PDI Riverbank Sampling	124-TOB	7632966	702076.6	1
2022 SIB PDI Riverbank Sampling	125-MLW	7632875	701985.3	0
2022 SIB PDI Riverbank Sampling	125-OHW	7632874	702021.2	1
2022 SIB PDI Riverbank Sampling	125-TOB	7632873	702059.5	1
2022 SIB PDI Riverbank Sampling	12-MLW	7633085	700553.7	1
2022 SIB PDI Riverbank Sampling	13-MLW	7633123	700639.1	1
2022 SIB PDI Riverbank Sampling	14-MLW	7633177	700698.1	1
2022 SIB PDI Riverbank Sampling	1-OHW	7632419	700109.2	1
2022 SIB PDI Riverbank Sampling	1-TOB	7632441	700092.5	1
2022 SIB PDI Riverbank Sampling	22-MLW	7633575	700971.6	1
2022 SIB PDI Riverbank Sampling	22-OHW	7633554	700946.8	0
2022 SIB PDI Riverbank Sampling	23-OHW	7633627	700884.7	1
2022 SIB PDI Riverbank Sampling	24-OHW	7633711	700822.2	1
2022 SIB PDI Riverbank Sampling	25-OHW	7633787	700754.6	1
2022 SIB PDI Riverbank Sampling	26-OHW	7633865	700697.4	0
2022 SIB PDI Riverbank Sampling	27-OHW	7633944	700634.9	0
2022 SIB PDI Riverbank Sampling	28-OHW	7634020	700570.3	1
2022 SIB PDI Riverbank Sampling	29-OHW	7634097	700505.9	1
2022 SIB PDI Riverbank Sampling	2-OHW	7632479	700194.1	1
2022 SIB PDI Riverbank Sampling	2-TOB	7632490	700175.2	1
2022 SIB PDI Riverbank Sampling	30-MLW	7634191	700463	1
2022 SIB PDI Riverbank Sampling	30-OHW	7634175	700442.2	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	31-OHW	7634250	700381.1	1
2022 SIB PDI Riverbank Sampling	32-OHW	7634326	700313.4	1
2022 SIB PDI Riverbank Sampling	33-OHW	7634403	700251.2	1
2022 SIB PDI Riverbank Sampling	34-MLW	7634503	700211.5	1
2022 SIB PDI Riverbank Sampling	34-OHW	7634483	700188.8	1
2022 SIB PDI Riverbank Sampling	35-OHW	7634560	700126.6	1
2022 SIB PDI Riverbank Sampling	36-MLW	7634657	700083.4	1
2022 SIB PDI Riverbank Sampling	36-OHW	7634640	700061.1	0
2022 SIB PDI Riverbank Sampling	37-MLW	7634733	700020.6	1
2022 SIB PDI Riverbank Sampling	37-OHW	7634717	699998.5	0
2022 SIB PDI Riverbank Sampling	38-MLW	7634817	699962.9	1
2022 SIB PDI Riverbank Sampling	38-OHW	7634790	699953.2	0
2022 SIB PDI Riverbank Sampling	39-MLW	7634889	699895.1	1
2022 SIB PDI Riverbank Sampling	39-OHW	7634873	699871.3	0
2022 SIB PDI Riverbank Sampling	3-OHW	7632511	700281.4	1
2022 SIB PDI Riverbank Sampling	3-TOB	7632541	700301.9	1
2022 SIB PDI Riverbank Sampling	40-MLW	7634967	699835.4	1
2022 SIB PDI Riverbank Sampling	40-OHW	7634949	699814.9	0
2022 SIB PDI Riverbank Sampling	41-MLW	7635045	699772.2	1
2022 SIB PDI Riverbank Sampling	41-OHW	7635025	699749.5	1
2022 SIB PDI Riverbank Sampling	42-MLW	7635112	699714.4	1
2022 SIB PDI Riverbank Sampling	42-OHW	7635081	699703.9	0
2022 SIB PDI Riverbank Sampling	43-OHW	7635146	699669.7	1
2022 SIB PDI Riverbank Sampling	43-TOB	7635129	699647.5	1
2022 SIB PDI Riverbank Sampling	44-OHW	7635218	699571	1
2022 SIB PDI Riverbank Sampling	44-TOB	7635213	699590.6	1
2022 SIB PDI Riverbank Sampling	45-OHW	7635327	699518.5	1
2022 SIB PDI Riverbank Sampling	45-TOB	7635291	699501.4	0
2022 SIB PDI Riverbank Sampling	46-OHW	7635402	699460.4	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	46-TOB	7635373	699437	1
2022 SIB PDI Riverbank Sampling	47-OHW	7635458	699407.5	1
2022 SIB PDI Riverbank Sampling	47-TOB	7635447	699379.8	1
2022 SIB PDI Riverbank Sampling	48-MLW	7635557	699349.8	1
2022 SIB PDI Riverbank Sampling	48-OHW	7635554	699345	1
2022 SIB PDI Riverbank Sampling	48-TOB	7635528	699315.5	1
2022 SIB PDI Riverbank Sampling	49-OHW	7635621	699270.6	0
2022 SIB PDI Riverbank Sampling	49-TOB	7635601	699253.4	1
2022 SIB PDI Riverbank Sampling	4-MLW	7632464	700399.7	0
2022 SIB PDI Riverbank Sampling	4-OHW	7632517	700377.2	0
2022 SIB PDI Riverbank Sampling	4-TOB	7632553	700389.9	1
2022 SIB PDI Riverbank Sampling	50-OHW	7635698	699206.6	0
2022 SIB PDI Riverbank Sampling	50-TOB	7635683	699188.1	1
2022 SIB PDI Riverbank Sampling	51-OHW	7635771	699161	1
2022 SIB PDI Riverbank Sampling	51-TOB	7635769	699136.6	0
2022 SIB PDI Riverbank Sampling	52-OHW	7635854	699081	1
2022 SIB PDI Riverbank Sampling	52-TOB	7635830	699063.8	1
2022 SIB PDI Riverbank Sampling	53-MLW	7635949	699033.1	1
2022 SIB PDI Riverbank Sampling	53-OHW	7635940	699022.9	0
2022 SIB PDI Riverbank Sampling	53-TOB	7635912	699017.4	1
2022 SIB PDI Riverbank Sampling	54-OHW	7636000	698970.3	0
2022 SIB PDI Riverbank Sampling	54-TOB	7635977	698923.3	1
2022 SIB PDI Riverbank Sampling	55-OHW	7636079	698893.2	0
2022 SIB PDI Riverbank Sampling	55-TOB	7636072	698865.8	1
2022 SIB PDI Riverbank Sampling	56-MLW	7636179	698845.1	1
2022 SIB PDI Riverbank Sampling	56-OHW	7636177	698829.6	0
2022 SIB PDI Riverbank Sampling	56-TOB	7636151	698811.1	1
2022 SIB PDI Riverbank Sampling	57-MLW	7636252	698778.2	1
2022 SIB PDI Riverbank Sampling	57-OHW	7636238	698753.8	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	57-TOB	7636211	698751.4	1
2022 SIB PDI Riverbank Sampling	58-OHW	7636324	698708.2	1
2022 SIB PDI Riverbank Sampling	59-MLW	7636392	698668.4	1
2022 SIB PDI Riverbank Sampling	59-OHW	7636407	698615.4	0
2022 SIB PDI Riverbank Sampling	5-MLW	7632450	700506.8	0
2022 SIB PDI Riverbank Sampling	5-OHW	7632533	700494.7	1
2022 SIB PDI Riverbank Sampling	5-TOB	7632572	700478.4	1
2022 SIB PDI Riverbank Sampling	60-MLW	7636492	698597	1
2022 SIB PDI Riverbank Sampling	60-OHW	7636474	698578	1
2022 SIB PDI Riverbank Sampling	61-MLW	7636566	698538.5	1
2022 SIB PDI Riverbank Sampling	61-OHW	7636550	698516.5	1
2022 SIB PDI Riverbank Sampling	62-MLW	7636649	698466.1	0
2022 SIB PDI Riverbank Sampling	62-OHW	7636619	698458.7	1
2022 SIB PDI Riverbank Sampling	62-TOB	7636605	698404.3	0
2022 SIB PDI Riverbank Sampling	63-MLW	7636698	698397.2	0
2022 SIB PDI Riverbank Sampling	63-OHW	7636684	698362	1
2022 SIB PDI Riverbank Sampling	63-TOB	7636659	698339.2	0
2022 SIB PDI Riverbank Sampling	64-MLW	7636709	698430.3	0
2022 SIB PDI Riverbank Sampling	64-TOB	7636794	698352.3	0
2022 SIB PDI Riverbank Sampling	65-MLW	7636789	698489.7	0
2022 SIB PDI Riverbank Sampling	65-OHW	7636833	698457.7	0
2022 SIB PDI Riverbank Sampling	65-TOB	7636855	698428.7	0
2022 SIB PDI Riverbank Sampling	66-MLW	7636814	698568.4	0
2022 SIB PDI Riverbank Sampling	66-OHW	7636894	698545.6	0
2022 SIB PDI Riverbank Sampling	66-TOB	7636927	698523.6	0
2022 SIB PDI Riverbank Sampling	67-MLW	7636918	698642.3	0
2022 SIB PDI Riverbank Sampling	67-TOB	7636966	698596.4	0
2022 SIB PDI Riverbank Sampling	68-MLW	7636947	698732.2	0
2022 SIB PDI Riverbank Sampling	68-OHW	7636984	698713.3	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	68-TOB	7637015	698703.4	0
2022 SIB PDI Riverbank Sampling	69-MLW	7637011	698817.1	0
2022 SIB PDI Riverbank Sampling	69-OHW	7637038	698794.2	0
2022 SIB PDI Riverbank Sampling	69-TOB	7637066	698777.5	0
2022 SIB PDI Riverbank Sampling	6-OHW	7632564	700559.4	1
2022 SIB PDI Riverbank Sampling	6-TOB	7632583	700528.3	1
2022 SIB PDI Riverbank Sampling	70-MLW	7637061	698911.8	0
2022 SIB PDI Riverbank Sampling	70-OHW	7637129	698885.1	0
2022 SIB PDI Riverbank Sampling	71-MLW	7637010	698938	0
2022 SIB PDI Riverbank Sampling	71-OHW	7637141	698949.1	0
2022 SIB PDI Riverbank Sampling	71-TOB	7637174	698970.7	0
2022 SIB PDI Riverbank Sampling	72-MLW	7636998	699028.5	0
2022 SIB PDI Riverbank Sampling	72-OHW	7637073	699087.8	1
2022 SIB PDI Riverbank Sampling	72-TOB	7637090	699098.3	1
2022 SIB PDI Riverbank Sampling	73-MLW	7636925	699099.3	0
2022 SIB PDI Riverbank Sampling	73-OHW	7636991	699162.2	1
2022 SIB PDI Riverbank Sampling	73-TOB	7636990	699181.7	1
2022 SIB PDI Riverbank Sampling	74-MLW	7636892	699117.4	0
2022 SIB PDI Riverbank Sampling	74-OHW	7636914	699210.9	1
2022 SIB PDI Riverbank Sampling	74-TOB	7636965	699217.6	1
2022 SIB PDI Riverbank Sampling	75-MLW	7636796	699196.6	0
2022 SIB PDI Riverbank Sampling	75-OHW	7636835	699245.1	0
2022 SIB PDI Riverbank Sampling	75-TOB	7636865	699303.3	1
2022 SIB PDI Riverbank Sampling	76-MLW	7636711	699253.1	0
2022 SIB PDI Riverbank Sampling	76-OHW	7636752	699307.8	1
2022 SIB PDI Riverbank Sampling	76-TOB	7636805	699363.7	1
2022 SIB PDI Riverbank Sampling	77-MLW	7636627	699315.6	0
2022 SIB PDI Riverbank Sampling	77-OHW	7636684	699376.4	1
2022 SIB PDI Riverbank Sampling	77-TOB	7636721	699421.7	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	78-MLW	7636532	699391.7	1
2022 SIB PDI Riverbank Sampling	78-OHW	7636559	699424.4	0
2022 SIB PDI Riverbank Sampling	78-TOB	7636597	699485.9	1
2022 SIB PDI Riverbank Sampling	79-MLW	7636482	699461.8	0
2022 SIB PDI Riverbank Sampling	79-OHW	7636518	699486.1	0
2022 SIB PDI Riverbank Sampling	79-TOB	7636571	699509.1	0
2022 SIB PDI Riverbank Sampling	7-OHW	7632660	700558	0
2022 SIB PDI Riverbank Sampling	7-TOB	7632655	700514.1	1
2022 SIB PDI Riverbank Sampling	80-MLW	7636423	699538	0
2022 SIB PDI Riverbank Sampling	80-OHW	7636441	699584.9	1
2022 SIB PDI Riverbank Sampling	80-TOB	7636490	699583	1
2022 SIB PDI Riverbank Sampling	81-MLW	7636350	699612.6	0
2022 SIB PDI Riverbank Sampling	81-OHW	7636375	699634.9	0
2022 SIB PDI Riverbank Sampling	81-TOB	7636397	699660.8	1
2022 SIB PDI Riverbank Sampling	82-MLW	7636267	699647.5	0
2022 SIB PDI Riverbank Sampling	82-OHW	7636318	699700.9	1
2022 SIB PDI Riverbank Sampling	82-TOB	7636330	699749.8	1
2022 SIB PDI Riverbank Sampling	83-MLW	7636218	699740.9	0
2022 SIB PDI Riverbank Sampling	83-OHW	7636233	699756.4	0
2022 SIB PDI Riverbank Sampling	83-TOB	7636247	699799.6	0
2022 SIB PDI Riverbank Sampling	84-MLW	7636155	699837.9	0
2022 SIB PDI Riverbank Sampling	84-OHW	7636172	699864.3	0
2022 SIB PDI Riverbank Sampling	84-TOB	7636185	699854.7	0
2022 SIB PDI Riverbank Sampling	85-MLW	7636063	699856.7	0
2022 SIB PDI Riverbank Sampling	85-OHW	7636091	699893.7	1
2022 SIB PDI Riverbank Sampling	85-TOB	7636092	699904.5	1
2022 SIB PDI Riverbank Sampling	86-MLW	7635982	699913.9	0
2022 SIB PDI Riverbank Sampling	86-OHW	7636012	699956	1
2022 SIB PDI Riverbank Sampling	86-TOB	7636035	699986.9	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	87-MLW	7635882	699953.2	0
2022 SIB PDI Riverbank Sampling	87-OHW	7635923	700013.5	0
2022 SIB PDI Riverbank Sampling	87-TOB	7635947	700045.1	1
2022 SIB PDI Riverbank Sampling	88-MLW	7635808	699990.5	0
2022 SIB PDI Riverbank Sampling	88-OHW	7635874	700085.4	0
2022 SIB PDI Riverbank Sampling	88-TOB	7635884	700101	1
2022 SIB PDI Riverbank Sampling	89-MLW	7635742	700056.5	0
2022 SIB PDI Riverbank Sampling	89-OHW	7635789	700153.8	1
2022 SIB PDI Riverbank Sampling	89-TOB	7635801	700167.5	0
2022 SIB PDI Riverbank Sampling	8-MLW	7632763	700533.6	0
2022 SIB PDI Riverbank Sampling	8-OHW	7632761	700527	0
2022 SIB PDI Riverbank Sampling	8-TOB	7632753	700483.5	1
2022 SIB PDI Riverbank Sampling	90-MLW	7635640	700129.6	0
2022 SIB PDI Riverbank Sampling	90-OHW	7635700	700208.5	1
2022 SIB PDI Riverbank Sampling	90-TOB	7635735	700219.5	1
2022 SIB PDI Riverbank Sampling	91-MLW	7635588	700168.3	0
2022 SIB PDI Riverbank Sampling	91-OHW	7635630	700263.2	1
2022 SIB PDI Riverbank Sampling	91-TOB	7635671	700300.7	1
2022 SIB PDI Riverbank Sampling	92-MLW	7635503	700245.4	0
2022 SIB PDI Riverbank Sampling	92-OHW	7635537	700292.1	0
2022 SIB PDI Riverbank Sampling	92-TOB	7635567	700307.3	1
2022 SIB PDI Riverbank Sampling	93-MLW	7635417	700304.1	0
2022 SIB PDI Riverbank Sampling	93-OHW	7635466	700383.5	1
2022 SIB PDI Riverbank Sampling	93-TOB	7635478	700405.2	1
2022 SIB PDI Riverbank Sampling	94-MLW	7635357	700350.5	0
2022 SIB PDI Riverbank Sampling	94-OHW	7635423	700435.3	1
2022 SIB PDI Riverbank Sampling	94-TOB	7635431	700451.6	1
2022 SIB PDI Riverbank Sampling	95-MLW	7635284	700378.5	0
2022 SIB PDI Riverbank Sampling	95-OHW	7635355	700481.3	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	95-TOB	7635384	700506.5	1
2022 SIB PDI Riverbank Sampling	96-MLW	7635163	700472.7	0
2022 SIB PDI Riverbank Sampling	96-OHW	7635236	700565.1	1
2022 SIB PDI Riverbank Sampling	96-TOB	7635239	700575	0
2022 SIB PDI Riverbank Sampling	97-MLW	7635096	700533.4	0
2022 SIB PDI Riverbank Sampling	97-OHW	7635155	700615.4	1
2022 SIB PDI Riverbank Sampling	97-TOB	7635159	700643.4	1
2022 SIB PDI Riverbank Sampling	98-MLW	7635018	700610.6	0
2022 SIB PDI Riverbank Sampling	98-OHW	7635033	700635.8	0
2022 SIB PDI Riverbank Sampling	98-TOB	7635057	700674.1	0
2022 SIB PDI Riverbank Sampling	99-MLW	7634935	700669.2	0
2022 SIB PDI Riverbank Sampling	99-OHW	7634957	700696.3	1
2022 SIB PDI Riverbank Sampling	99-TOB	7634976	700712.4	0
2022 SIB PDI Riverbank Sampling	9-OHW	7632849	700488.7	1
2022 SIB PDI Riverbank Sampling	9-TOB	7632847	700448	1
2022 SIB PDI Sediment Sampling	B05	7633428	701879.1	0
2022 SIB PDI Sediment Sampling	B06	7633477	701825.6	1
2022 SIB PDI Sediment Sampling	B07	7633590	701720.6	1
2022 SIB PDI Sediment Sampling	B09	7633849	701561.1	0
2022 SIB PDI Sediment Sampling	B18	7634878	700672.8	0
2022 SIB PDI Sediment Sampling	B24	7635609	700131.5	0
2022 SIB PDI Sediment Sampling	B25	7635735	700054.6	0
2022 SIB PDI Sediment Sampling	B31	7636402	699475.8	0
2022 SIB PDI Sediment Sampling	B32	7636550	699391.1	0
2022 SIB PDI Sediment Sampling	B33	7636661	699294.9	0
2022 SIB PDI Sediment Sampling	C05	7633311	701846.8	1
2022 SIB PDI Sediment Sampling	C06	7633441	701738.5	0
2022 SIB PDI Sediment Sampling	C07	7633555	701646.2	1
2022 SIB PDI Sediment Sampling	C22	7635299	700198.5	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	C23	7635403	700125.1	1
2022 SIB PDI Sediment Sampling	C24	7635531	700048	1
2022 SIB PDI Sediment Sampling	C25	7635634	699934.8	1
2022 SIB PDI Sediment Sampling	C26	7635751	699831.3	1
2022 SIB PDI Sediment Sampling	C27	7635846	699730.3	1
2022 SIB PDI Sediment Sampling	C28	7635965	699665	1
2022 SIB PDI Sediment Sampling	C32	7636459	699238.1	1
2022 SIB PDI Sediment Sampling	C34	7636681	699076.8	1
2022 SIB PDI Sediment Sampling	C36	7636997	698891.6	1
2022 SIB PDI Sediment Sampling	C37	7636938	698833.1	1
2022 SIB PDI Sediment Sampling	D05	7633214	701699.3	1
2022 SIB PDI Sediment Sampling	D06	7633350	701635.3	1
2022 SIB PDI Sediment Sampling	D18	7634723	700480.3	1
2022 SIB PDI Sediment Sampling	D35	7636704	698857.3	1
2022 SIB PDI Sediment Sampling	D37	7636873	698715.2	0
2022 SIB PDI Sediment Sampling	E04	7633016	701696	1
2022 SIB PDI Sediment Sampling	E06	7633231	701526.1	1
2022 SIB PDI Sediment Sampling	E08	7633470	701328.7	1
2022 SIB PDI Sediment Sampling	E36	7636709	698645.8	1
2022 SIB PDI Sediment Sampling	E37	7636776	698608.7	0
2022 SIB PDI Sediment Sampling	F20	7634787	700081.9	1
2022 SIB PDI Sediment Sampling	G01	7632528	701704.8	1
2022 SIB PDI Sediment Sampling	G02	7632603	701654.3	1
2022 SIB PDI Sediment Sampling	G07	7633166	701204.7	1
2022 SIB PDI Sediment Sampling	H01	7632378	701631.2	1
2022 SIB PDI Sediment Sampling	H02	7632488	701553.1	1
2022 SIB PDI Sediment Sampling	H06	7632958	701145.5	1
2022 SIB PDI Sediment Sampling	H08	7633171	700946.3	1
2022 SIB PDI Sediment Sampling	I03	7632510	701331	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	I05	7632738	701131	1
2022 SIB PDI Sediment Sampling	I06	7632843	701046.5	1
2022 SIB PDI Sediment Sampling	I08	7633117	700821	1
2022 SIB PDI Sediment Sampling	J03	7632399	701207.8	1
2022 SIB PDI Sediment Sampling	J08	7632918	700630	0
2022 SIB PDI Sediment Sampling	K01	7632118	701263.4	1
2022 SIB PDI Sediment Sampling	K03	7632324	701080.3	1
2022 SIB PDI Sediment Sampling	K04	7632437	701019.9	1
2022 SIB PDI Sediment Sampling	L04	7632355	700883.7	1
2022 SIB PDI Sediment Sampling	L09	7632974	700520.1	0
2022 SIB PDI Sediment Sampling	M04	7632246	700759	1
2022 SIB PDI Sediment Sampling	N00	7631659	701080	0
2022 SIB PDI Sediment Sampling	N07	7632403	700371.6	1
2022 SIB PDI Sediment Sampling	P07	7632288	700189.2	0
2018 SIB DeMaximus Sampling	A-9.03	7636154	698937	1
2018 SIB DeMaximus Sampling	B-9.00	7636028	699123	1
2018 SIB DeMaximus Sampling	B-9.15	7636684	698591	1
2018 SIB DeMaximus Sampling	C-8.94	7635895	699372	1
2018 SIB DeMaximus Sampling	D-8.83	7635503	699808	1
2018 SIB DeMaximus Sampling	D-8.90	7635824	699557	1
2018 SIB DeMaximus Sampling	D-8.90-SC	7635829	699554	1
2018 SIB DeMaximus Sampling	D-9.09	7636573	698900	1
2018 SIB DeMaximus Sampling	D-9.09-SC	7636560	698897	1
2018 SIB DeMaximus Sampling	E-8.99	7636181	699356	1
2018 SIB DeMaximus Sampling	E-9.02	7636341	699211	1
2018 SIB DeMaximus Sampling	E-9.02-SC	7636330	699215	1
2018 SIB DeMaximus Sampling	G-9.15	7636972	698933	0
2018 SIB DTNA Sampling	A1	7633984	701473	0
2018 SIB DTNA Sampling	A2	7633927	701400	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2018 SIB DTNA Sampling	A3	7633863	701327	1
2018 SIB DTNA Sampling	A4	7633800	701243	1
2018 SIB DTNA Sampling	A5	7633737	701167	1
2018 SIB DTNA Sampling	A6	7633676	701091	1
2018 SIB DTNA Sampling	A7	7633613	701014	1
2018 SIB DTNA Sampling	B1	7634039	701364	0
2018 SIB DTNA Sampling	B3	7633943	701263	1
2018 SIB DTNA Sampling	B5	7633816	701104	1
2018 SIB DTNA Sampling	B7	7633689	700951	1
2018 SIB DTNA Sampling	C4	7633957	701118	1
2018 SIB DTNA Sampling	D2	7634154	701206	0
2018 SIB DTNA Sampling	D3	7634097	701133	1
2018 SIB DTNA Sampling	D5	7633970	700978	1
2018 SIB DTNA Sampling	D6-SC	7633913	700913	1
2018 SIB DTNA Sampling	D7	7633844	700823	1
2018 SIB DTNA Sampling	F1	7634355	701129	0
2018 SIB DTNA Sampling	F2	7634318	701080	0
2018 SIB DTNA Sampling	F3	7634253	701005	1
2018 SIB DTNA Sampling	F5	7634124	700852	1
2018 SIB DTNA Sampling	F7	7634001	700696	1
2018 SIB DTNA Sampling	G6	7634140	700711	1
2018 SIB DTNA Sampling	H1	7634512	701005	0
2018 SIB DTNA Sampling	H2	7634467	700952	1
2018 SIB DTNA Sampling	H3	7634406	700879	1
2018 SIB DTNA Sampling	H3-SC	7634399	700882	1
2018 SIB DTNA Sampling	H5	7634279	700722	1
2018 SIB DTNA Sampling	H7	7634152	700569	1
2018 SIB DTNA Sampling	J1	7634604	700919	0
2018 SIB DTNA Sampling	J2	7634615	700815	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2018 SIB DTNA Sampling	J3	7634556	700747	1
2018 SIB DTNA Sampling	J3-SC	7634552	700761	0
2018 SIB DTNA Sampling	J5	7634428	700600	1
2018 SIB DTNA Sampling	J5-SC	7634424	700618	1
2018 SIB DTNA Sampling	J6-SC	7634373	700517	1
2018 SIB DTNA Sampling	J7	7634304	700441	1
2018 SIB DTNA Sampling	L1	7634830	700759	0
2018 SIB DTNA Sampling	L3	7634719	700627	1
2018 SIB DTNA Sampling	L3-SC	7634702	700623	0
2018 SIB DTNA Sampling	L5	7634586	700477	1
2018 SIB DTNA Sampling	L7	7634491	700340	1
2018 SIB DTNA Sampling	M4	7634730	700480	1
2018 SIB DTNA Sampling	N1	7634981	700630	0
2018 SIB DTNA Sampling	N3	7634869	700496	1
2018 SIB DTNA Sampling	N5	7634746	700343	1
2018 SIB DTNA Sampling	N7	7634641	700178	1
2018 SIB DTNA Sampling	O7	7634695	700126	1
2018 SIB DTNA Sampling	P1	7635135	700497	0
2018 SIB DTNA Sampling	P3	7635059	700347	1
2018 SIB DTNA Sampling	P5	7634898	700215	1
2018 SIB DTNA Sampling	Q2	7635155	700380	0
2018 SIB DTNA Sampling	Q6	7634912	700077	1
2018 SIB DTNA Sampling	R1	7635294	700378	0
2018 SIB DTNA Sampling	R3	7635176	700233	1
2018 SIB DTNA Sampling	R4-SC	7635121	700172	1
2018 SIB DTNA Sampling	R5	7635053	700092	1
2018 SIB DTNA Sampling	T1	7635454	700257	0
2018 SIB DTNA Sampling	T3	7635333	700118	1
2018 SIB DTNA Sampling	T5	7635209	699964	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area, Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2018 SIB DTNA Sampling	T6	7635145	699887	1
2018 SIB DTNA Sampling	T7	7635076	699811	1
FS Data	AN-CTPD-04	7629291	701085	1
FS Data	AN-CTPD-04	7629291	701085	1
FS Data	AN-CTPD-05	7629438	700917	1
FS Data	AN-CTPD-05	7629438	700917	1
FS Data	B017	7629032	703508	0
FS Data	BT019	7629738	703017	0
FS Data	DM-I	7630193	702264	0
FS Data	DM-J	7629206	702878	0
FS Data	G340	7629132	703362	0
FS Data	G342	7629487	703272	0
FS Data	G346	7629677	703127	0
FS Data	G347	7629829	703080	0
FS Data	G352	7629915	702615	0
FS Data	G354	7629655	702581	0
FS Data	G363	7630855	701899	1
FS Data	G365	7629439	701925	1
FS Data	G369	7628723	701753	0
FS Data	G373	7630475	701576	0
FS Data	G374	7629098	701390	0
FS Data	G378	7629932	701133	0
FS Data	G381	7629326	701091	1
FS Data	G428	7632227	698581	0
FS Data	G680	7628850	703289	0
FS Data	G681	7628170	702860	0
FS Data	G682	7628420	702407	0
FS Data	G683	7629060	703089	0
FS Data	G6841	7629040	703430	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	G6842	7629040	703425	0
FS Data	G685	7629240	702917	0
FS Data	G686	7629320	703280	0
FS Data	G687	7628990	701596	0
FS Data	G691	7629970	702301	0
FS Data	G693	7629090	701305	0
FS Data	G699	7630660	699690	0
FS Data	G711	7631250	699126	0
FS Data	G713	7631960	698616	0
FS Data	G715	7632590	698423	0
FS Data	G718	7632580	698167	0
FS Data	GRAB-07	7628865	702973	0
FS Data	GSP07E	7629620	703266	0
FS Data	PSY38	7630268	702116	0
FS Data	PSY39	7629802	701563	0
FS Data	SD096	7629308	703491	1
FS Data	SD098	7629412	702947	0
FS Data	SD099	7629597	703184	0
FS Data	SD103	7629828	702997	0
FS Data	SD106	7630172	702447	0
FS Data	SD111	7630640	702063	0
FS Data	SD119	7630882	701874	0
FS Data	WR-BC-29	7628564	702584	1
FS Data	WR-PG-29	7630278	702243	0
FS Data	WR-PG-78	7631300	699190	0
FS Data	WR-PG-80	7631603	698947	0
FS Data	WR-PG-82	7631954	698611	0
FS Data	WR-PG-84	7632267	698329	0
2019 PDI Baseline Sediment Sampling	SC-S188	7632397	700393	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2019 PDI Baseline Sediment Sampling	SC-S192	7633157	700691	1
2019 PDI Baseline Sediment Sampling	S167	7631557	700487	1
2019 PDI Baseline Sediment Sampling	S168	7631786	700724	0
2019 PDI Baseline Sediment Sampling	S169	7632323	701322	1
2019 PDI Baseline Sediment Sampling	S170	7632561	701509	1
2019 PDI Baseline Sediment Sampling	S171	7632036	700861	0
2019 PDI Baseline Sediment Sampling	S172	7633003	701854.3	0
2019 PDI Baseline Sediment Sampling	S173	7632835	701593	1
2019 PDI Baseline Sediment Sampling	S174	7632342	700986	0
2019 PDI Baseline Sediment Sampling	S175	7632030	700521	0
2019 PDI Baseline Sediment Sampling	S176	7632589	701161	1
2019 PDI Baseline Sediment Sampling	S177	7633187	701784.8	1
2019 PDI Baseline Sediment Sampling	S178	7632910	701345	1
2019 PDI Baseline Sediment Sampling	S179	7632397	700715	1
2019 PDI Baseline Sediment Sampling	S180	7633172	701481	1
2019 PDI Baseline Sediment Sampling	S181	7632200	699815	0
2019 PDI Baseline Sediment Sampling	S182	7632361	700502	1
2019 PDI Baseline Sediment Sampling	S183	7632673	700729	1
2019 PDI Baseline Sediment Sampling	S184	7633133	700912	1
2019 PDI Baseline Sediment Sampling	S186	7633602	701698.1	1
2019 PDI Baseline Sediment Sampling	S187	7633257	701299	1
2019 PDI Baseline Sediment Sampling	S191	7632887	700639	1
2019 PDI Baseline Sediment Sampling	S193	7633812	701396	1
2019 PDI Baseline Sediment Sampling	S194	7633680	701121	1
2019 PDI Baseline Sediment Sampling	S195	7631432	698404	0
2019 PDI Baseline Sediment Sampling	S196	7631258	698152	0
2019 PDI Baseline Sediment Sampling	S197	7631730	698304	1
2019 PDI Baseline Sediment Sampling	S198	7633954	701062	1
2019 PDI Baseline Sediment Sampling	S199	7634151	701235	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2019 PDI Baseline Sediment Sampling	S200	7634163	700983	1
2019 PDI Baseline Sediment Sampling	S201	7633972	700779	1
2019 PDI Baseline Sediment Sampling	S202	7631947	698096	0
2019 PDI Baseline Sediment Sampling	S203	7634188	700568	1
2019 PDI Baseline Sediment Sampling	S204	7634614	700790	1
2019 PDI Baseline Sediment Sampling	S205	7632164	697888	0
2019 PDI Baseline Sediment Sampling	S206	7631956	697427	0
2019 PDI Baseline Sediment Sampling	S207	7632372	697684	1
2019 PDI Baseline Sediment Sampling	S208	7634582	700374	1
2019 PDI Baseline Sediment Sampling	S209	7632580	697495	0
2019 PDI Baseline Sediment Sampling	S210	7632398	697248	0
2019 PDI Baseline Sediment Sampling	S211	7634775	700176	1
2019 PDI Baseline Sediment Sampling	S212	7632754	697317	0
2019 PDI Baseline Sediment Sampling	S213	7634978	700102	1
2019 PDI Baseline Sediment Sampling	S214	7635232	700349	1
2019 PDI Baseline Sediment Sampling	S215	7635089	699831	1
2019 PDI Baseline Sediment Sampling	S216	7635303	699927	1
2019 PDI Baseline Sediment Sampling	S217	7633147	697053	0
2019 PDI Baseline Sediment Sampling	S220	7635597	699935	1
2019 PDI Baseline Sediment Sampling	S221	7633369	696928	1
2019 PDI Baseline Sediment Sampling	S223	7635700	699689	1
2019 PDI Baseline Sediment Sampling	S224	7635820	699908	0
2019 PDI Baseline Sediment Sampling	S225	7635741	699425	1
2019 PDI Baseline Sediment Sampling	S228	7635595	697268	0
2019 PDI Baseline Sediment Sampling	S229	7635918	699205	1
2019 PDI Baseline Sediment Sampling	S230	7636113	699488	1
2019 PDI Baseline Sediment Sampling	S231	7636044	699322	1
2019 PDI Baseline Sediment Sampling	S233	7636394	699383	1
2019 PDI Baseline Sediment Sampling	S234	7636307	698925	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2019 PDI Baseline Sediment Sampling	S235	7636478	699075	1
2019 PDI Baseline Sediment Sampling	S236	7636637	699212	0
2019 PDI Baseline Sediment Sampling	S238	7636453	698738	1
2019 PDI Baseline Sediment Sampling	S239	7636757	698963	1
2019 PDI Baseline Sediment Sampling	S240	7636940	699117	1
2019 PDI Baseline Sediment Sampling	S241	7636658	698751	1
2019 PDI Baseline Sediment Sampling	S242	7636712	698491	0
2019 PDI Baseline Sediment Sampling	S243	7635767	697130	0
2019 PDI Baseline Sediment Sampling	B233	7630142	702499.2	0
2019 PDI Baseline Sediment Sampling	B234	7630372	701968.6	1
2019 PDI Baseline Sediment Sampling	B238	7630462	702251.5	0
2019 PDI Baseline Sediment Sampling	B240	7630606	702120.5	0
2019 PDI Baseline Sediment Sampling	B242	7630096	701211	0
2019 PDI Baseline Sediment Sampling	B243	7631000	701846.8	0
2019 PDI Baseline Sediment Sampling	B244	7631194	701764.1	0
2019 PDI Baseline Sediment Sampling	B247	7631398	701518.9	0
2019 PDI Baseline Sediment Sampling	B248	7631595	701593.8	0
2019 PDI Baseline Sediment Sampling	B249	7631874	701537.8	1
2019 PDI Baseline Sediment Sampling	B250	7630574	700347.1	0
2019 PDI Baseline Sediment Sampling	B252	7632252	701599.4	0
2019 PDI Baseline Sediment Sampling	B254	7632684	701781.7	0
2019 PDI Baseline Sediment Sampling	B255	7632104	701151.4	0
2019 PDI Baseline Sediment Sampling	B256	7631132	699981.1	0
2019 PDI Baseline Sediment Sampling	B258	7631433	700500.7	0
2019 PDI Baseline Sediment Sampling	B259	7632124	700586.9	1
2019 PDI Baseline Sediment Sampling	B260	7632396	701491	1
2019 PDI Baseline Sediment Sampling	B263	7633390	701789.1	1
2019 PDI Baseline Sediment Sampling	B264	7632232	700355.7	0
2019 PDI Baseline Sediment Sampling	B265	7633515	701484.1	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2019 PDI Baseline Sediment Sampling	B266	7632220	699954.8	0
2019 PDI Baseline Sediment Sampling	B267	7631464	699199.6	0
2019 PDI Baseline Sediment Sampling	B270	7632213	699411.3	0
2019 PDI Baseline Sediment Sampling	B271	7633497	701229.9	1
2019 PDI Baseline Sediment Sampling	B272	7632274	699836.8	0
2019 PDI Baseline Sediment Sampling	B273	7633886	701103.6	1
2019 PDI Baseline Sediment Sampling	B274	7632666	699432	0
2019 PDI Baseline Sediment Sampling	B276	7632548	698917.1	0
2019 PDI Baseline Sediment Sampling	B278	7632984	699264.8	0
2019 PDI Baseline Sediment Sampling	B279	7634338	700951.7	1
2019 PDI Baseline Sediment Sampling	B280	7634456	700653.6	1
2019 PDI Baseline Sediment Sampling	B281	7633218	699042.6	0
2019 PDI Baseline Sediment Sampling	B282	7632336	698185.9	0
2019 PDI Baseline Sediment Sampling	B284	7634659	700444.5	1
2019 PDI Baseline Sediment Sampling	B285	7633353	698903	0
2019 PDI Baseline Sediment Sampling	B287	7633091	698216.4	0
2019 PDI Baseline Sediment Sampling	B288	7634891	700392	1
2019 PDI Baseline Sediment Sampling	B289	7633722	698595.1	0
2019 PDI Baseline Sediment Sampling	B294	7635392	700110	1
2019 PDI Baseline Sediment Sampling	B296	7635407	699679.5	1
2019 PDI Baseline Sediment Sampling	B302	7635748	699431.3	1
2019 PDI Baseline Sediment Sampling	B303	7635973	699584.5	1
2019 PDI Baseline Sediment Sampling	B308	7636175	699079.1	1
2019 PDI Baseline Sediment Sampling	B313	7636412	698728.5	1
2019 PDI Baseline Sediment Sampling	B315	7636896	698740.5	0
FS Data	08B032	7635672	700118	0
FS Data	08R003	7632470	700554	1
FS Data	08R040	7633542	701749	1
FS Data	09B028	7636751	699247	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	09R001C10	7636499	698625	0
FS Data	09R001C20	7636510	698623	0
FS Data	09R001C30	7636501	698627	1
FS Data	B020	7636937	699124	0
FS Data	BT022	7632897	701768	1
FS Data	BT023	7632320	700695	1
FS Data	BT026	7634741	700605	1
FS Data	BT029	7636556	699261	1
FS Data	C421	7635857	699174	1
FS Data	C430	7636676	698546	1
FS Data	DM-1	7633426	701436	1
FS Data	DM-16	7636100	698955	1
FS Data	DM-9	7632226	700630	0
FS Data	G364	7633227	701940	1
FS Data	G367	7632899	701890	1
FS Data	G372-2	7632677	701611	1
FS Data	G376	7632578	701176	1
FS Data	G379	7633968	701101	1
FS Data	G380	7634411	701091	1
FS Data	G382	7633572	701048	1
FS Data	G383	7634633	700848	1
FS Data	G384-1	7632704	700805	0
FS Data	G384-2	7632709	700800	1
FS Data	G385	7634358	700782	1
FS Data	G388	7634812	700730	1
FS Data	G390	7632882	700586	1
FS Data	G392	7632330	700479	1
FS Data	G393	7634311	700444	1
FS Data	G395	7631732	700352	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	G396	7635223	700364	0
FS Data	G397	7634964	700280	1
FS Data	G398	7632210	700249	0
FS Data	G402	7634697	700125	1
FS Data	G405	7635931	699879	0
FS Data	G408	7635087	699825	1
FS Data	G411	7636162	699779	0
FS Data	G415	7635480	699496	1
FS Data	G416	7635988	699453	1
FS Data	G417	7636470	699382	1
FS Data	G421	7635858	699170	1
FS Data	G425	7636995	698956	0
FS Data	G426	7636237	698838	1
FS Data	G430	7636706	698453	0
FS Data	G706	7632130	700386	0
FS Data	GSP08E	7633755	701678	0
FS Data	M0201	7635987	699917	0
FS Data	M0202	7635968	699893	0
FS Data	M0203	7635926	699866	0
FS Data	M02031	7635929	699868	0
FS Data	M0204	7636017	699863	0
FS Data	M0205	7635923	699915	0
FS Data	M0302	7637043	698939	0
FS Data	M0303	7636996	698945	0
FS Data	M0304	7637013	698898	1
FS Data	M0305	7636984	698990	0
FS Data	NA-4B	7636029	699419	1
FS Data	PP01M101	7634596	700807	1
FS Data	PP01M103	7634607	700863	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	PP01M104	7634667	700803	0
FS Data	PP01M105	7634662	700879	1
FS Data	PP01M106	7634617	700828	0
FS Data	PP01M107	7634738	700793	0
FS Data	PP01M108	7634592	700958	0
FS Data	PP01M109	7634615	700877	1
FS Data	PP01M110	7634673	700814	0
FS Data	PSY01	7636982	698942	1
FS Data	PSY03	7636721	698439	0
FS Data	PSY04	7636448	699063	1
FS Data	PSY05	7636194	699537	1
FS Data	PSY06	7635814	699946	0
FS Data	PSY07	7635390	699854	1
FS Data	PSY08	7634600	700861	1
FS Data	PSY10	7635099	699791	1
FS Data	PSY11	7634520	700646	1
FS Data	PSY12	7634192	701249	1
FS Data	PSY14	7633852	700855	1
FS Data	PSY15	7633464	701803	1
FS Data	PSY16	7633660	701377	1
FS Data	PSY17	7633604	701007	1
FS Data	PSY18	7633020	701925	1
FS Data	PSY19	7632990	701624	1
FS Data	PSY20	7632900	701345	1
FS Data	PSY21	7632610	701721	1
FS Data	PSY22	7632592	701303	1
FS Data	PSY23	7632670	701124	0
FS Data	PSY25	7632240	701116	0
FS Data	PSY26	7632855	701911	1

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	PSY27	7632978	700503	1
FS Data	PSY28	7633808	701622	1
FS Data	PSY29	7632462	700667	1
FS Data	PSY30	7632374	700281	0
FS Data	PSY31	7632206	700998	0
FS Data	PSY32	7632172	700720	0
FS Data	PSY33	7632042	700576	0
FS Data	PSY43	7632144	699988	0
FS Data	S0201	7636753	698381	0
FS Data	S0202	7636721	698419	0
FS Data	S0203	7636711	698463	0
FS Data	S0204	7636631	698522	0
FS Data	S0205	7636798	698499	0
FS Data	SD127	7631978	700739	0
FS Data	SD128	7632608	701220	1
FS Data	SD130	7632188	700553	0
FS Data	SD133	7632878	700638	1
FS Data	SD141	7635788	699600	1
FS Data	07B023	7632735	701945	0
FS Data	07R040	7631050	701045	0
FS Data	DM-22	7631830	701152	0
FS Data	DM-H	7632230	699218	0
FS Data	G370	7631400	701688	0
FS Data	G375	7631316	701312	0
FS Data	G386	7631218	700777	0
FS Data	G387	7631469	700750	0
FS Data	G400	7631382	700177	0
FS Data	G406	7632081	699831	0
FS Data	G409	7632417	699715	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	G412	7632639	699564	0
FS Data	G414	7631328	699530	0
FS Data	G419	7633075	699270	0
FS Data	G420	7633248	699162	0
FS Data	G424	7633355	698968	0
FS Data	G696	7631800	701482	0
FS Data	G697	7631520	701216	0
FS Data	G700	7631770	701124	0
FS Data	G705	7631690	700113	0
FS Data	G707	7630930	699607	0
FS Data	G710	7631820	699137	0
FS Data	GRAB-08	7630670	700643	0
FS Data	PSY24	7632234	701543	0
FS Data	PSY34	7631791	700976	0
FS Data	PSY35	7631698	700850	0
FS Data	PSY36	7631378	700838	0
FS Data	PSY37	7631194	701640	0
FS Data	PSY40	7630602	700977	0
FS Data	PSY41	7631370	700587	0
FS Data	PSY42	7631236	700417	0
FS Data	PSY44	7631992	699805	0
FS Data	PSY45	7632878	699404	0
FS Data	PSY46	7632756	699256	0
FS Data	SD116	7630600	701848	0
FS Data	SD121	7630834	701303	0
FS Data	SD122	7631102	701653	0
FS Data	SD124	7631346	700919	0
FS Data	SD125	7631764	701197	0
FS Data	WR-PG-76	7630991	699586	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	DM-I	7630193	702264	0
FS Data	G363	7630855	701899	1
FS Data	G365	7629439	701925	1
FS Data	G378	7629932	701133	0
FS Data	G428	7632227	698581	0
FS Data	G691	7629970	702301	0
FS Data	G699	7630660	699690	0
FS Data	G711	7631250	699126	0
FS Data	G713	7631960	698616	0
FS Data	G715	7632590	698423	0
FS Data	G718	7632580	698167	0
FS Data	PSY38	7630268	702116	0
FS Data	PSY39	7629802	701563	0
FS Data	PSY47	7633746	698760	0
FS Data	PSY48	7633546	698600	0
FS Data	SD106	7630172	702447	0
FS Data	SD111	7630640	702063	0
FS Data	SD119	7630882	701874	0
FS Data	SD138	7633725	698744	0
FS Data	WR-PG-29	7630278	702243	0
FS Data	WR-PG-78	7631300	699190	0
FS Data	WR-PG-80	7631603	698947	0
FS Data	WR-PG-82	7631954	698611	0
FS Data	WR-PG-84	7632267	698329	0
FS Data	S149	7629032	703552.8	0
FS Data	S152	7629319	703458.1	0
FS Data	B222	7628153	702598	0
FS Data	B224	7628817	703173.9	0
FS Data	B226	7629474	703291.7	0

Table 3-1 (continued)
Surface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	B227	7628725	702267.8	0
FS Data	B228	7628989	702414	0
FS Data	B229	7629172	702586.3	0
FS Data	B231	7629321	702393.5	0
FS Data	B235	7629188	701649.6	0

Acronyms:
SIB = Swan Island Basin
FS = Feasibility Study
PDI = Pre-Design Investigation

Indicator values of '0' represent non-exceedance. Indicator values of '1' represent exceedance.

Table 3-2
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	100-OHW	7634887	700757.2	0
2022 SIB PDI Riverbank Sampling	100-TOB	7634940	700793.6	0
2022 SIB PDI Riverbank Sampling	101-TOB	7634849	700866.1	0
2022 SIB PDI Riverbank Sampling	102-MLW	7634705	700846.4	0
2022 SIB PDI Riverbank Sampling	102-OHW	7634737	700892.1	0
2022 SIB PDI Riverbank Sampling	102-TOB	7634778	700923.3	0
2022 SIB PDI Riverbank Sampling	103-OHW	7634684	700961.4	0
2022 SIB PDI Riverbank Sampling	104-TOB	7634624	701046.8	1
2022 SIB PDI Riverbank Sampling	106-TOB	7634465	701185.7	0
2022 SIB PDI Riverbank Sampling	110-MLW	7634111	701353.2	0
2022 SIB PDI Riverbank Sampling	112-MLW	7633994	701496.6	0
2022 SIB PDI Riverbank Sampling	112-TOB	7634032	701568.1	0
2022 SIB PDI Riverbank Sampling	113-TOB	7633939	701617	1
2022 SIB PDI Riverbank Sampling	114-TOB	7633852	701688.3	0
2022 SIB PDI Riverbank Sampling	115-TOB	7633779	701742.2	0
2022 SIB PDI Riverbank Sampling	116-TOB	7633716	701814.3	1
2022 SIB PDI Riverbank Sampling	118-TOB	7633540	701919	1
2022 SIB PDI Riverbank Sampling	119-OHW	7633447	701964	1
2022 SIB PDI Riverbank Sampling	119-TOB	7633451	701980	0
2022 SIB PDI Riverbank Sampling	120-OHW	7633342	701964.1	1
2022 SIB PDI Riverbank Sampling	122-MLW	7633171	702000.5	0
2022 SIB PDI Riverbank Sampling	122-TOB	7633170	702106.8	0
2022 SIB PDI Riverbank Sampling	123-TOB	7633063	702074.5	0
2022 SIB PDI Riverbank Sampling	125-TOB	7632873	702059.5	1
2022 SIB PDI Riverbank Sampling	49-OHW	7635621	699270.6	0
2022 SIB PDI Riverbank Sampling	57-TOB	7636211	698751.4	0

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	5-OHW	7632533	700494.7	0
2022 SIB PDI Riverbank Sampling	62-MLW	7636649	698466.1	0
2022 SIB PDI Riverbank Sampling	63-MLW	7636698	698397.2	0
2022 SIB PDI Riverbank Sampling	64-MLW	7636709	698430.3	0
2022 SIB PDI Riverbank Sampling	64-TOB	7636794	698352.3	0
2022 SIB PDI Riverbank Sampling	65-OHW	7636833	698457.7	0
2022 SIB PDI Riverbank Sampling	66-MLW	7636814	698568.4	0
2022 SIB PDI Riverbank Sampling	66-OHW	7636894	698545.6	0
2022 SIB PDI Riverbank Sampling	66-TOB	7636927	698523.6	0
2022 SIB PDI Riverbank Sampling	67-MLW	7636918	698642.3	0
2022 SIB PDI Riverbank Sampling	67-OHW	7636947	698624.2	1
2022 SIB PDI Riverbank Sampling	67-TOB	7636966	698596.4	0
2022 SIB PDI Riverbank Sampling	68-OHW	7636984	698713.3	0
2022 SIB PDI Riverbank Sampling	68-TOB	7637015	698703.4	0
2022 SIB PDI Riverbank Sampling	72-MLW	7636998	699028.5	0
2022 SIB PDI Riverbank Sampling	72-OHW	7637073	699087.8	0
2022 SIB PDI Riverbank Sampling	72-TOB	7637090	699098.3	1
2022 SIB PDI Riverbank Sampling	73-OHW	7636991	699162.2	1
2022 SIB PDI Riverbank Sampling	73-TOB	7636990	699181.7	1
2022 SIB PDI Riverbank Sampling	74-OHW	7636914	699210.9	0
2022 SIB PDI Riverbank Sampling	74-TOB	7636965	699217.6	1
2022 SIB PDI Riverbank Sampling	75-OHW	7636835	699245.1	0
2022 SIB PDI Riverbank Sampling	75-TOB	7636865	699303.3	1
2022 SIB PDI Riverbank Sampling	76-MLW	7636711	699253.1	0
2022 SIB PDI Riverbank Sampling	76-TOB	7636805	699363.7	1
2022 SIB PDI Riverbank Sampling	77-MLW	7636627	699315.6	0
2022 SIB PDI Riverbank Sampling	77-OHW	7636684	699376.4	1
2022 SIB PDI Riverbank Sampling	78-OHW	7636559	699424.4	0
2022 SIB PDI Riverbank Sampling	79-MLW	7636482	699461.8	0

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	79-OHW	7636518	699486.1	0
2022 SIB PDI Riverbank Sampling	79-TOB	7636571	699509.1	0
2022 SIB PDI Riverbank Sampling	80-MLW	7636423	699538	1
2022 SIB PDI Riverbank Sampling	81-MLW	7636350	699612.6	0
2022 SIB PDI Riverbank Sampling	81-OHW	7636375	699634.9	0
2022 SIB PDI Riverbank Sampling	81-TOB	7636397	699660.8	1
2022 SIB PDI Riverbank Sampling	82-MLW	7636267	699647.5	0
2022 SIB PDI Riverbank Sampling	83-TOB	7636247	699799.6	0
2022 SIB PDI Riverbank Sampling	84-MLW	7636155	699837.9	0
2022 SIB PDI Riverbank Sampling	84-OHW	7636172	699864.3	0
2022 SIB PDI Riverbank Sampling	84-TOB	7636185	699854.7	0
2022 SIB PDI Riverbank Sampling	85-OHW	7636091	699893.7	0
2022 SIB PDI Riverbank Sampling	85-TOB	7636092	699904.5	1
2022 SIB PDI Riverbank Sampling	86-MLW	7635982	699913.9	1
2022 SIB PDI Riverbank Sampling	87-MLW	7635882	699953.2	0
2022 SIB PDI Riverbank Sampling	87-OHW	7635923	700013.5	0
2022 SIB PDI Riverbank Sampling	87-TOB	7635947	700045.1	1
2022 SIB PDI Riverbank Sampling	88-MLW	7635808	699990.5	0
2022 SIB PDI Riverbank Sampling	88-OHW	7635874	700085.4	0
2022 SIB PDI Riverbank Sampling	89-MLW	7635742	700056.5	0
2022 SIB PDI Riverbank Sampling	89-OHW	7635789	700153.8	1
2022 SIB PDI Riverbank Sampling	90-MLW	7635640	700129.6	0
2022 SIB PDI Riverbank Sampling	90-OHW	7635700	700208.5	1
2022 SIB PDI Riverbank Sampling	90-TOB	7635735	700219.5	0
2022 SIB PDI Riverbank Sampling	91-TOB	7635671	700300.7	1
2022 SIB PDI Riverbank Sampling	92-MLW	7635503	700245.4	0
2022 SIB PDI Riverbank Sampling	92-TOB	7635567	700307.3	1
2022 SIB PDI Riverbank Sampling	93-OHW	7635466	700383.5	1
2022 SIB PDI Riverbank Sampling	93-TOB	7635478	700405.2	1

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Riverbank Sampling	94-TOB	7635431	700451.6	1
2022 SIB PDI Riverbank Sampling	95-TOB	7635384	700506.5	1
2022 SIB PDI Riverbank Sampling	96-OHW	7635236	700565.1	0
2022 SIB PDI Riverbank Sampling	97-OHW	7635155	700615.4	0
2022 SIB PDI Riverbank Sampling	97-TOB	7635159	700643.4	0
2022 SIB PDI Riverbank Sampling	98-OHW	7635033	700635.8	0
2022 SIB PDI Riverbank Sampling	98-TOB	7635057	700674.1	1
2022 SIB PDI Riverbank Sampling	99-OHW	7634957	700696.3	0
2022 SIB PDI Riverbank Sampling	99-TOB	7634976	700712.4	0
2022 SIB PDI Sediment Sampling	B04	7633275	701954.5	1
2022 SIB PDI Sediment Sampling	B05	7633428	701879.1	0
2022 SIB PDI Sediment Sampling	B08	7633746	701656.6	0
2022 SIB PDI Sediment Sampling	B09	7633849	701561.1	1
2022 SIB PDI Sediment Sampling	B10	7633960	701455.6	0
2022 SIB PDI Sediment Sampling	B11	7634079	701339.6	0
2022 SIB PDI Sediment Sampling	B13	7634296	701132.6	0
2022 SIB PDI Sediment Sampling	B18	7634878	700672.8	0
2022 SIB PDI Sediment Sampling	B22	7635361	700324.8	0
2022 SIB PDI Sediment Sampling	B23	7635484	700227.1	0
2022 SIB PDI Sediment Sampling	B24	7635609	700131.5	0
2022 SIB PDI Sediment Sampling	B25	7635735	700054.6	0
2022 SIB PDI Sediment Sampling	B26	7635801	699950.6	0
2022 SIB PDI Sediment Sampling	B31	7636402	699475.8	0
2022 SIB PDI Sediment Sampling	B32	7636550	699391.1	0
2022 SIB PDI Sediment Sampling	B33	7636661	699294.9	0
2022 SIB PDI Sediment Sampling	B34	7636772	699186.9	0
2022 SIB PDI Sediment Sampling	B35	7636873	699088.2	0
2022 SIB PDI Sediment Sampling	C05	7633311	701846.8	1
2022 SIB PDI Sediment Sampling	C06	7633437	701730.9	0

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	C07	7633555	701646.2	1
2022 SIB PDI Sediment Sampling	C08	7633668	701555.9	1
2022 SIB PDI Sediment Sampling	C09	7633773	701463.4	1
2022 SIB PDI Sediment Sampling	C10	7633895	701372.2	1
2022 SIB PDI Sediment Sampling	C11	7634001	701245	1
2022 SIB PDI Sediment Sampling	C12	7634119	701159.7	1
2022 SIB PDI Sediment Sampling	C13	7634238	701062.2	1
2022 SIB PDI Sediment Sampling	C14	7634365	700978.6	1
2022 SIB PDI Sediment Sampling	C18	7634806	700574.1	1
2022 SIB PDI Sediment Sampling	C19	7634931	700480.8	1
2022 SIB PDI Sediment Sampling	C20	7635072	700356.8	1
2022 SIB PDI Sediment Sampling	C22	7635299	700198.5	1
2022 SIB PDI Sediment Sampling	C23	7635403	700125.1	1
2022 SIB PDI Sediment Sampling	C24	7635531	700048	1
2022 SIB PDI Sediment Sampling	C25	7635634	699934.8	1
2022 SIB PDI Sediment Sampling	C26	7635751	699831.3	1
2022 SIB PDI Sediment Sampling	C27	7635846	699730.3	1
2022 SIB PDI Sediment Sampling	C28	7635965	699665	1
2022 SIB PDI Sediment Sampling	C30	7636212	699455.5	1
2022 SIB PDI Sediment Sampling	C31	7636313	699360.1	1
2022 SIB PDI Sediment Sampling	C33	7636562	699172.8	1
2022 SIB PDI Sediment Sampling	C34	7636681	699076.8	1
2022 SIB PDI Sediment Sampling	C35	7636800	698981.5	1
2022 SIB PDI Sediment Sampling	C37	7636938	698833.1	1
2022 SIB PDI Sediment Sampling	D02	7632847	701945.5	0
2022 SIB PDI Sediment Sampling	D05	7633214	701699.3	1
2022 SIB PDI Sediment Sampling	D06	7633350	701635.3	1
2022 SIB PDI Sediment Sampling	D07	7633462	701510.4	1
2022 SIB PDI Sediment Sampling	D08	7633561	701420.8	1

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	D10	7633795	701231.7	1
2022 SIB PDI Sediment Sampling	D12	7634042	701041.1	1
2022 SIB PDI Sediment Sampling	D13	7634151	700964	1
2022 SIB PDI Sediment Sampling	D14	7634262	700863.3	1
2022 SIB PDI Sediment Sampling	D15	7634396	700760.4	1
2022 SIB PDI Sediment Sampling	D17	7634629	700569	1
2022 SIB PDI Sediment Sampling	D18	7634723	700480.3	1
2022 SIB PDI Sediment Sampling	D19	7634835	700388.9	1
2022 SIB PDI Sediment Sampling	D22	7635237	700076.6	1
2022 SIB PDI Sediment Sampling	D23	7635324	699993.4	1
2022 SIB PDI Sediment Sampling	D25	7635545	699816.8	1
2022 SIB PDI Sediment Sampling	D26	7635652	699726.2	1
2022 SIB PDI Sediment Sampling	D30	7636121	699342.3	1
2022 SIB PDI Sediment Sampling	D31	7636228	699242.6	1
2022 SIB PDI Sediment Sampling	D33	7636474	699051.2	1
2022 SIB PDI Sediment Sampling	D35	7636704	698857.3	1
2022 SIB PDI Sediment Sampling	D36	7636802	698764.1	1
2022 SIB PDI Sediment Sampling	D37	7636873	698715.2	1
2022 SIB PDI Sediment Sampling	E02	7632797	701874.5	1
2022 SIB PDI Sediment Sampling	E03	7632908	701783.6	1
2022 SIB PDI Sediment Sampling	E04	7633016	701696	1
2022 SIB PDI Sediment Sampling	E05	7633131	701605.9	1
2022 SIB PDI Sediment Sampling	E06	7633231	701526.1	1
2022 SIB PDI Sediment Sampling	E07	7633353	701403.1	1
2022 SIB PDI Sediment Sampling	E08	7633470	701328.7	1
2022 SIB PDI Sediment Sampling	E09	7633588	701222.4	1
2022 SIB PDI Sediment Sampling	E10	7633705	701130.8	1
2022 SIB PDI Sediment Sampling	E11	7633822	701022.7	1
2022 SIB PDI Sediment Sampling	E13	7634061	700848.4	1

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	E14	7634168	700745.6	1
2022 SIB PDI Sediment Sampling	E15	7634288	700662.5	1
2022 SIB PDI Sediment Sampling	E17	7634516	700459.9	1
2022 SIB PDI Sediment Sampling	E18	7634635	700363.5	1
2022 SIB PDI Sediment Sampling	E19	7634750	700270.1	1
2022 SIB PDI Sediment Sampling	E20	7634864	700182.1	1
2022 SIB PDI Sediment Sampling	E22	7635099	699985.6	1
2022 SIB PDI Sediment Sampling	E23	7635213	699888.1	1
2022 SIB PDI Sediment Sampling	E24	7635306	699788.3	1
2022 SIB PDI Sediment Sampling	E25	7635444	699694.8	1
2022 SIB PDI Sediment Sampling	E26	7635573	699617.4	1
2022 SIB PDI Sediment Sampling	E27	7635677	699504.6	1
2022 SIB PDI Sediment Sampling	E28	7635807	699414.3	1
2022 SIB PDI Sediment Sampling	E29	7635909	699327.7	1
2022 SIB PDI Sediment Sampling	E30	7636025	699232.5	1
2022 SIB PDI Sediment Sampling	E31	7636140	699128	1
2022 SIB PDI Sediment Sampling	E32	7636260	699038.6	1
2022 SIB PDI Sediment Sampling	E33	7636367	698935.4	1
2022 SIB PDI Sediment Sampling	E34	7636488	698845.1	1
2022 SIB PDI Sediment Sampling	E35	7636611	698749.9	1
2022 SIB PDI Sediment Sampling	E36	7636709	698645.8	1
2022 SIB PDI Sediment Sampling	E37	7636776	698608.7	1
2022 SIB PDI Sediment Sampling	F02	7632694	701778.2	1
2022 SIB PDI Sediment Sampling	F03	7632792	701674.7	1
2022 SIB PDI Sediment Sampling	F04	7632922	701583.2	1
2022 SIB PDI Sediment Sampling	F05	7633040	701502.3	1
2022 SIB PDI Sediment Sampling	F06	7633151	701386	1
2022 SIB PDI Sediment Sampling	F08	7633383	701207.7	1
2022 SIB PDI Sediment Sampling	F09	7633510	701116	1

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	F11	7633736	700933	1
2022 SIB PDI Sediment Sampling	F12	7633856	700833.8	1
2022 SIB PDI Sediment Sampling	F13	7633973	700749	1
2022 SIB PDI Sediment Sampling	F14	7634082	700649	1
2022 SIB PDI Sediment Sampling	F17	7634434	700356.7	1
2022 SIB PDI Sediment Sampling	F18	7634551	700273.4	1
2022 SIB PDI Sediment Sampling	F20	7634787	700081.9	1
2022 SIB PDI Sediment Sampling	F21	7634901	699978.9	1
2022 SIB PDI Sediment Sampling	F22	7634998	699886.7	1
2022 SIB PDI Sediment Sampling	F23	7635122	699777.8	1
2022 SIB PDI Sediment Sampling	F25	7635367	699617.8	1
2022 SIB PDI Sediment Sampling	F27	7635587	699389.3	1
2022 SIB PDI Sediment Sampling	F28	7635699	699295.2	1
2022 SIB PDI Sediment Sampling	F31	7636062	699031.6	1
2022 SIB PDI Sediment Sampling	F32	7636177	698907.9	1
2022 SIB PDI Sediment Sampling	F35	7636524	698657.6	1
2022 SIB PDI Sediment Sampling	F37	7636678	698476.9	1
2022 SIB PDI Sediment Sampling	G01	7632528	701704.8	1
2022 SIB PDI Sediment Sampling	G02	7632603	701654.3	1
2022 SIB PDI Sediment Sampling	G04	7632820	701470.2	1
2022 SIB PDI Sediment Sampling	G06	7633049	701290.6	1
2022 SIB PDI Sediment Sampling	G07	7633166	701204.7	1
2022 SIB PDI Sediment Sampling	G08	7633330	701144.4	1
2022 SIB PDI Sediment Sampling	H01	7632378	701631.2	1
2022 SIB PDI Sediment Sampling	H02	7632488	701553.1	1
2022 SIB PDI Sediment Sampling	H03	7632608	701446.8	0
2022 SIB PDI Sediment Sampling	H04	7632729	701366.2	0
2022 SIB PDI Sediment Sampling	H06	7632958	701145.5	1
2022 SIB PDI Sediment Sampling	H07	7633063	701111.8	1

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	H08	7633171	700946.3	1
2022 SIB PDI Sediment Sampling	I03	7632510	701331	0
2022 SIB PDI Sediment Sampling	I04	7632629	701233.8	1
2022 SIB PDI Sediment Sampling	I05	7632738	701131	1
2022 SIB PDI Sediment Sampling	I06	7632843	701046.5	1
2022 SIB PDI Sediment Sampling	I08	7633117	700821	1
2022 SIB PDI Sediment Sampling	J03	7632399	701207.8	1
2022 SIB PDI Sediment Sampling	J06	7632769	700930.5	1
2022 SIB PDI Sediment Sampling	J08	7632918	700630	1
2022 SIB PDI Sediment Sampling	K01	7632118	701263.4	1
2022 SIB PDI Sediment Sampling	K03	7632324	701080.3	1
2022 SIB PDI Sediment Sampling	K04	7632437	701019.9	0
2022 SIB PDI Sediment Sampling	K07	7632798	700698.7	1
2022 SIB PDI Sediment Sampling	L03	7632233	700994.7	1
2022 SIB PDI Sediment Sampling	L04	7632355	700883.7	1
2022 SIB PDI Sediment Sampling	L05	7632432	700790.1	1
2022 SIB PDI Sediment Sampling	L06	7632573	700684.1	1
2022 SIB PDI Sediment Sampling	L07	7632678	700616.7	1
2022 SIB PDI Sediment Sampling	L08	7632836	700566.4	0
2022 SIB PDI Sediment Sampling	L09	7632974	700520.1	0
2022 SIB PDI Sediment Sampling	M04	7632246	700759	1
2022 SIB PDI Sediment Sampling	M05	7632372	700672.4	1
2022 SIB PDI Sediment Sampling	N00	7631659	701080	1
2022 SIB PDI Sediment Sampling	N03	7632037	700731.5	1
2022 SIB PDI Sediment Sampling	N05	7632252	700562.8	1
2022 SIB PDI Sediment Sampling	N07	7632403	700371.6	1
2022 SIB PDI Sediment Sampling	O04	7632060	700531	1
2022 SIB PDI Sediment Sampling	O07	7632362	700280.3	1
2022 SIB PDI Sediment Sampling	P07	7632288	700189.2	1

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2022 SIB PDI Sediment Sampling	R02	7631556	700405.7	1
2022 SIB PDI Sediment Sampling	R04	7631797	700214.9	1
2022 SIB PDI Sediment Sampling	R06	7632020	700012.9	0
2018 SIB DeMaximus Sampling	D-8.90-SC	7635829	699554	1
2018 SIB DeMaximus Sampling	D-9.09-SC	7636560	698897	1
2018 SIB DeMaximus Sampling	E-9.02-SC	7636330	699215	1
2018 SIB DTNA Sampling	D6-SC	7633913	700913	1
2018 SIB DTNA Sampling	H3-SC	7634399	700882	1
2018 SIB DTNA Sampling	J3-SC	7634552	700761	1
2018 SIB DTNA Sampling	J5-SC	7634424	700618	1
2018 SIB DTNA Sampling	J6-SC	7634373	700517	1
2018 SIB DTNA Sampling	L3-SC	7634702	700623	0
2018 SIB DTNA Sampling	R4-SC	7635121	700172	1
FS Data	C07-08	7629447	701410	0
FS Data	C342	7629490	703271	1
FS Data	C346	7629680	703130	0
FS Data	C347	7629831	703082	1
FS Data	C352	7629917	702613	1
FS Data	C361	7628841	701998	1
FS Data	C381	7629325	701102	0
FS Data	C686	7629320	703267	0
FS Data	C709	7631280	699268	0
FS Data	PSY39C	7629797	701567	1
FS Data	SD096	7629308	703491	1
FS Data	SD106	7630172	702447	1
FS Data	WR-VC-29	7630229	701912	0
FS Data	WR-VC-31	7630762	701735	0
2019 PDI Baseline Sediment Sampling	SC-S172	7633079	701822.8	1
2019 PDI Baseline Sediment Sampling	SC-S176	7632580	701142	0

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
2019 PDI Baseline Sediment Sampling	SC-S178	7632924	701360	1
2019 PDI Baseline Sediment Sampling	SC-S185	7633610	701765.8	0
2019 PDI Baseline Sediment Sampling	SC-S191	7632841	700635	1
2019 PDI Baseline Sediment Sampling	SC-S192	7633157	700691	1
2019 PDI Baseline Sediment Sampling	SC-S198	7633947	701084	1
2019 PDI Baseline Sediment Sampling	SC-S203	7634196	700567	1
2019 PDI Baseline Sediment Sampling	SC-S213	7634978	700088	1
2019 PDI Baseline Sediment Sampling	SC-S219	7635291	699681	0
2019 PDI Baseline Sediment Sampling	SC-S221	7633366	696928	1
2019 PDI Baseline Sediment Sampling	SC-S228	7635604	697277	0
2019 PDI Baseline Sediment Sampling	SC-S229	7635913	699199	1
2019 PDI Baseline Sediment Sampling	SC-S230	7636107	699486	1
2019 PDI Baseline Sediment Sampling	SC-S238	7636441	698745	1
FS Data	C364	7633221	701914	1
FS Data	C372	7632674	701615	1
FS Data	C379	7633967	701104	1
FS Data	C380	7634400	701094	0
FS Data	C382	7633581	701040	1
FS Data	C383	7634624	700853	1
FS Data	C384	7632708	700810	1
FS Data	C388	7634809	700729	0
FS Data	C392	7632327	700473	1
FS Data	C393	7634314	700441	1
FS Data	C396	7635198	700375	0
FS Data	C397	7634958	700281	1
FS Data	C402	7634686	700108	1
FS Data	C405	7635930	699876	1
FS Data	C415	7635472	699503	0
FS Data	C417	7636451	699339	1

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	C421	7635857	699174	1
FS Data	C425-1	7636990	698949	0
FS Data	C425-2	7636988	698951	1
FS Data	C426	7636240	698876	1
FS Data	C430	7636676	698546	1
FS Data	C702	7632070	700984	1
FS Data	C703	7632380	701347	1
FS Data	C706	7632130	700371	1
FS Data	C708	7632950	700958	1
FS Data	DM-20	7632042	700489	1
FS Data	DMMU1	7633135	700671	1
FS Data	DMMU4	7631879	700459	0
FS Data	DMMU5	7632097	700289	0
FS Data	NA-4B	7636029	699419	1
FS Data	PSY01C	7636902	698942	1
FS Data	PSY07C	7635396	699852	1
FS Data	PSY11C	7634536	700645	1
FS Data	PSY16C	7633654	701376	1
FS Data	PSY18C	7633016	701934	1
FS Data	PSY20C	7632898	701343	1
FS Data	PSY23C	7632642	701120	1
FS Data	PSY27C	7632965	700540	0
FS Data	PSY30C	7632334	700320	0
FS Data	PSY43C	7632146	699983	1
FS Data	SD127	7631978	700739	1
FS Data	SD133	7632878	700638	1
FS Data	SD141	7635788	699600	1
FS Data	C09-11	7630265	700641	0
FS Data	C12-14	7630878	700002	0

Table 3-2 (continued)
Subsurface Exceedance Indicator Values
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Source Dataset	Location ID	X	Y	Exceedance Indicator Value
FS Data	C15-17	7632059	699082	0
FS Data	C373	7630470	701575	0
FS Data	C386	7631222	700773	1
FS Data	C400	7631383	700180	1
FS Data	C409	7632424	699722	1
FS Data	C420	7633249	699166	1
FS Data	C714	7633080	699191	0
FS Data	DMMU2	7631557	700773	0
FS Data	PSY24C	7632232	701544	1
FS Data	PSY34C	7631786	700968	1
FS Data	PSY36C	7631384	700841	1
FS Data	SD116	7630600	701848	0
FS Data	SD122	7631102	701653	1
FS Data	SD125	7631764	701197	1
FS Data	C07-08	7629447	701410	0
FS Data	C18-20	7633072	698318	0
FS Data	C709	7631280	699268	0
FS Data	PSY39C	7629797	701567	1
FS Data	SD106	7630172	702447	1
FS Data	SD138	7633725	698744	1
FS Data	WR-VC-29	7630229	701912	0
FS Data	WR-VC-31	7630762	701735	0

Acronyms:
SIB = Swan Island Basin
FS = Feasibility Study
PDI = Pre-Design Investigation

Indicator values of '0' represent non-exceedance. Indicator values of '1' represent exceedance.

Table 3-3
Bathymetry Survey Information
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Year	Survey Source	Original Data Format	Map No.	Description
1934	Port	P	WR 34-1 5&6/18	Survey of Portland Harbor Willamette River Area Adjoining Airport Section No 5 & 6
1938	NOAA	P	H06334	Hydrographic Survey No. H-6334, Kelley Point to Swan Island
1945	COE	P	WR-1-60-3	Willamette River, Mouth to Broadway Bridge
1954	NOAA	D	H08113	Hydrographic Survey no. 8113, Portland-Willamette River, Swan Island
1962	Port	P	YA-61-20-B	Swan Island Dredging Berth 6, 7 & 8, As Constructed
1962	Port	P	YA-61-20-A	Swan Island Dredging Berth 6, 7 & 8
1965	COE	P	WR-8-26	Mile 7.5 to Broadway Bridge, Condition Survey
1966	COE	P	WR-8-32	Swan Island Lagoon, Condition Survey
1968	COE	P	WR-8-38	Swan Island Lagoon, Condition Survey
1969	COE	P	WR-8-41	Willamette Sheet 3, Mile 7.5 to Broadway Bridge, Condition Survey
1970	COE	P	WR-8-43	Swan Island Lagoon, Condition Survey
1973	COE	P	WR-8-52	Mile 7.5 to Broadway Bridge, Predredge
1973	COE	P	WR-8-49	Mile 7.5 to Broadway Bridge, Condition Survey
1974	COE	P	WR-8-55	Mile 7.5 to Broadway Bridge, Postdredge, Channel Lines
1976	Port	P	SI 76-3	Swan Island Industrial Park Maintenance Dredging Disposal Condition Survey

Table 3-3 (continued)
Bathymetry Survey Information
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Year	Survey Source	Original Data Format	Map No.	Description
1977	Port	P	SI 77-500	Swan Island Lagoon Post Dredge Soundings
1978	Port	P	YA-78-504	Swan Island Ship Repair Yard Soundings Berth 305 & 306
1978	Port	P	YA-78-32 1/1	Swan Island Ship Repair Yard Sonar Testing Basin Dredging Plan & Section
1980	Port	P	YA-80-9	Hydrographic Survey Willamette River Ship Repair Yard
1980	Port	P	(HS) YA 80-18 1/1	Portland Ship Repair Yard Sonar Testing Basin
1981	Port	P	YA 81-15 1/1	Portland Ship Repair Yard DryDock #3 Basin Dredging Pland & Sections
1983	Port	P	YA 85-23 1/1	Portland Ship Repair Yard Berth 301-305 Dredging
1984	COE	P	WR-8-76	Mile 7.5 to Broadway Bridge, Postdredge, Channel Lines
1985	Port	P	DD 85-1 1/1	Portland Ship Repair Yard Drydock No. 4 Hydrographic Survey Compiled 1985
1985	Port	P	DD 85-3 1/1	Portland Ship Repair Yard Dry Docks No.1 & No. 3 Soundings Facility Recertification
1987	Port	P	YA 87-501 1/1 C	Soundings Upper Lagoon Area
1989	Port	P	YA 92-7 2/2 (C-2)	Berth 311 Dredging Plan and Section
1989	Port	P	YA 89-500 1&2/12	Hydrographic Survey Swan Island Basin
1990	Port	P	YA 90-500 1/1 (C-1)	Hydrographic Surveys Plan
1992	Port	P	DD 92-1 1/1 (SU-1)	Vessel Track Plot Dry Dock #1 Pre-Dredge
1992	Port	P	DD 92-2 2/4 (SU-2)	Vessel Track Plot Dry Dock #4 Post-Dredge
1992	COE	D	WR-8-102	Mile 7.5 to Broadway Bridge, Condition

Table 3-3 (continued)
Bathymetry Survey Information
Contaminated Sediment 3D Extent; Swan Island Basin Project Area,
Portland, Oregon

Year	Survey Source	Original Data Format	Map No.	Description
1994	Port	P	DD 94-1 1/1 (C-1)	Dry Dock #3 Basin Dredging Plan and Sections
2001	DEA	D	Allbathy10	
2002	DEA	D	sht4 and 5	
2003	DEA	D	bathy10_03	
2004	DEA	D	bathyft04	
2009	DEA	D	s4 and S5	
2015	Vigor	D	Vigor 2015 2x2	Vigor 2015 Facility Shoal Biased 2x2
2018	DEA	D		Pre-Design Group Investigation
2018	NOAA	D	NOAA2018_F00744_MBAB_50cm_NRT3_300kHz_1of1	F00744: National Ocean Service Hydrographic Survey , 2018-08-11
2022	HGL	D	Unified Bathymetry V.3	2022 survey with data gaps filled by most recent surveys

Acronyms:
D = Digital (GIS data)
COE = United States Army Corp of Engineers
DEA = David Evans Associates, Inc.
HGL = HydroGeoLogic, Inc.
NOAA = National Oceanic and Atmospheric Administration
P = Paper map
Port = Port of Portland

Table 4-1
Cross-Validation Summary of the SDU Surface Sediment Exceedance Interpolation Contaminated Sediment 3D Extent; Swan Island Basin Project Area, Portland, Oregon

Class	Measured Value	Predicted Value Bin	Number of Occurrences	Percent of Occurrences
True Negative	0	0 to 0.5	111	28.6
False Negative	0	0.5 to 1	36	9.3
False Positive	1	0 to 0.5	36	9.3
True Positive	1	0.5 to 1	205	52.8

Cross-validation was performed on a total of 388 sample locations.

Table 4-2
Cross-Validation Summary of the SDU Subsurface Sediment Exceedance Interpolation Contaminated Sediment 3D Extent; Swan Island Basin Project Area, Portland, Oregon

Class	Measured Value	Predicted Value Bin	Number of Occurrences	Percent of Occurrences
True Negative	0	0 to 0.5	36	14.1
False Negative	0	0.5 to 1	22	8.6
False Positive	1	0 to 0.5	19	7.5
True Positive	1	0.5 to 1	178	69.8

Cross-validation was performed on a total of 255 sample locations.

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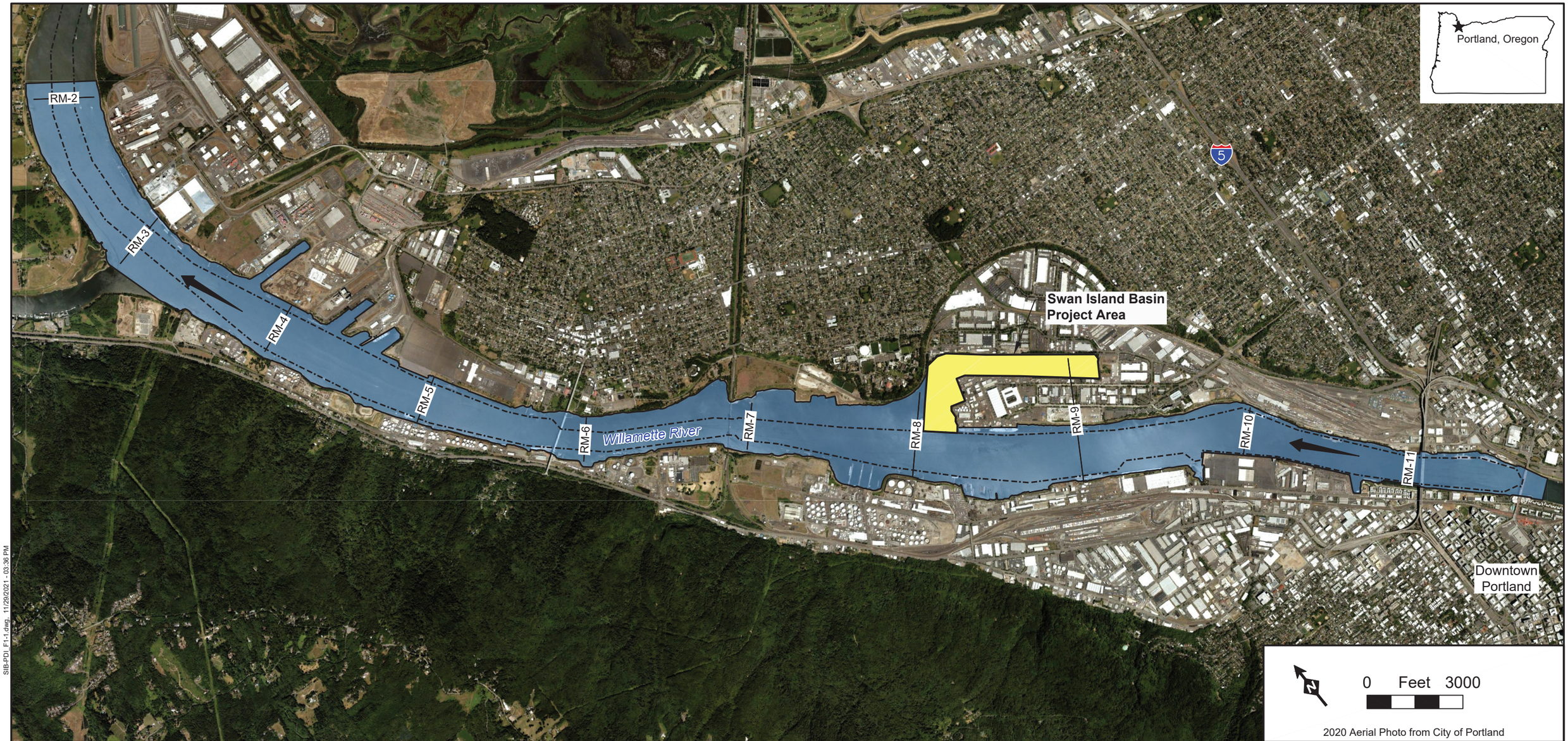
FIGURES



SIB-PDI_F1-1.dwg, 11/29/2021 - 03:36 PM

Federal Navigation Channel (NOAA, 2016)

River Flow Direction

Swan Island Basin Project Area

Portland Harbor Superfund Site Boundary (River Mile 1.9 to 11.8)

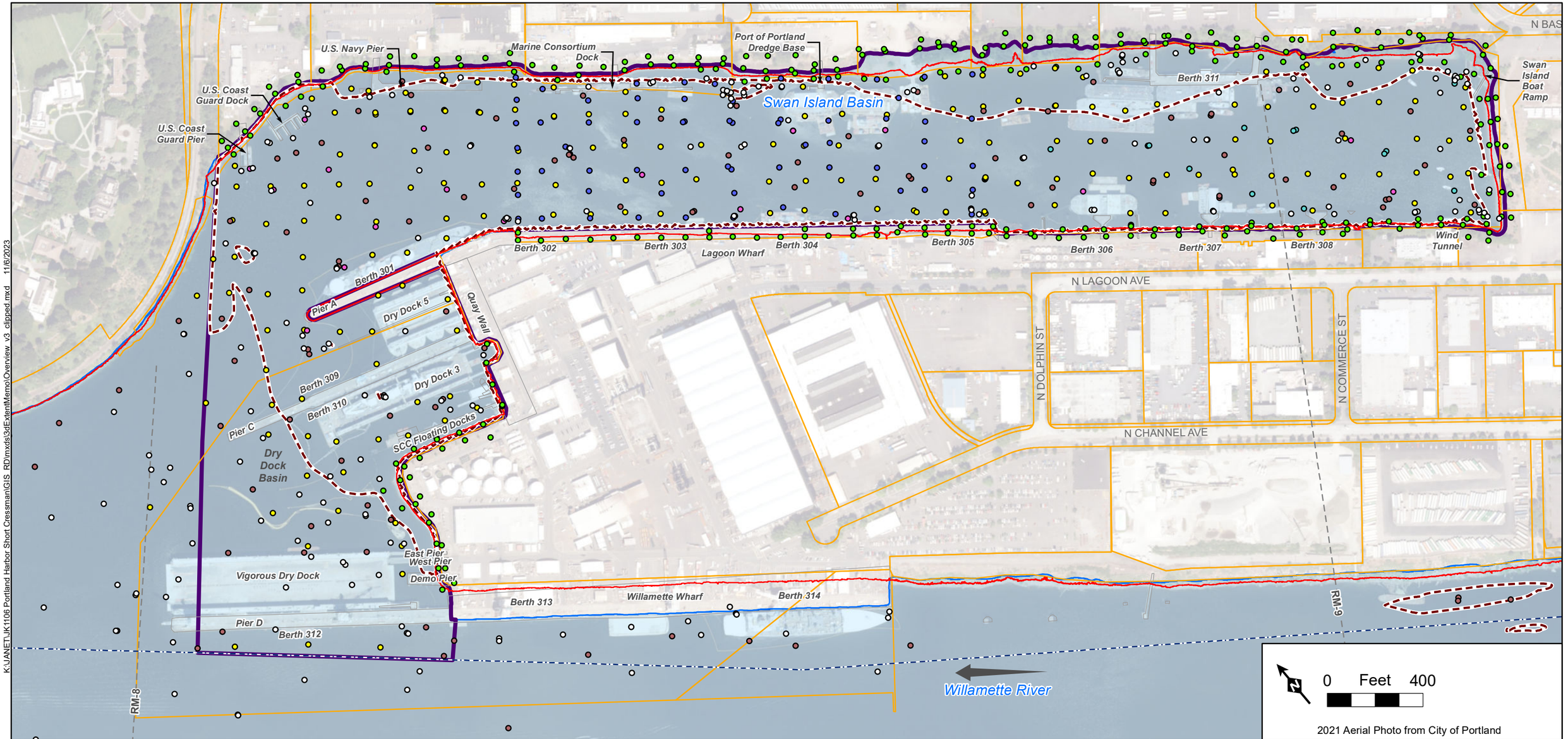
Notes:
NOAA - National Oceanic and Atmospheric Administration
RM - River Mile
SIB - Swan Island Basin

Source:
NOAA, 2016. Booklet Chart, Willamette River – Swan Island Basin, NOAA Chart 18527 at URL: https://www.charts.noaa.gov/BookletChart/18527_BookletChart.pdf - Navigation Channel

Figure 1-1
SIB Project Area Location Map

Prepared on 7/26/2022
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



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River Mile (RM)
Swan Island Sediment Decision Unit (SDU)
ROD Sediment Management Area (SMA)
Federal Navigation Channel (USACE, 2020)
Docks and Structures
Tax Lot Boundary
Ordinary High Water (City of Portland, 2013)
+13-foot NAVD88 Contour

River Flow Direction

Sediment Sample Locations

- EPA, 2016 (Feasibility Study)
- Geosyntec, 2016
- Pacific Groundwater Group, 2019a (DTNA)
- Pacific Groundwater Group, 2019b (de maximis)
- AECOM and Geosyntec, 2019 (Pre-RD Investigation)
- HGL 2023a (Surface and Subsurface Data Report)
- HGL 2023b (Riverbank Data Report)

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

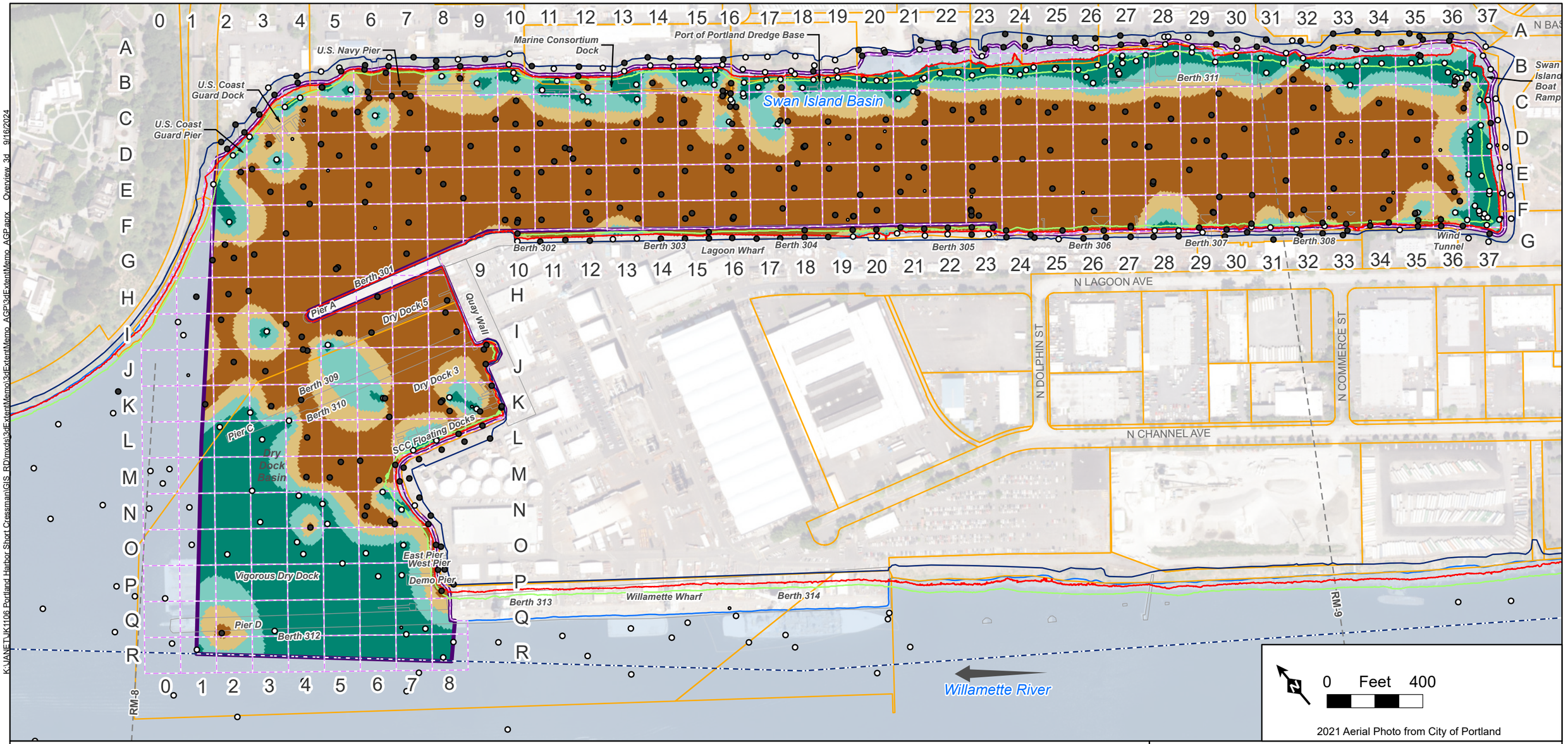
Figure 2-1

Sediment Sample Locations

Prepared on: 11/6/2023
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP

K:\ANET\JK1106 Portland Harbor Short Cressman\GIS_RD\mxds\3dExtentMemo\3dExtentMemo_AGP\3dExtentMemo_AGP.aprx Overview_3d 9/16/2024



- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

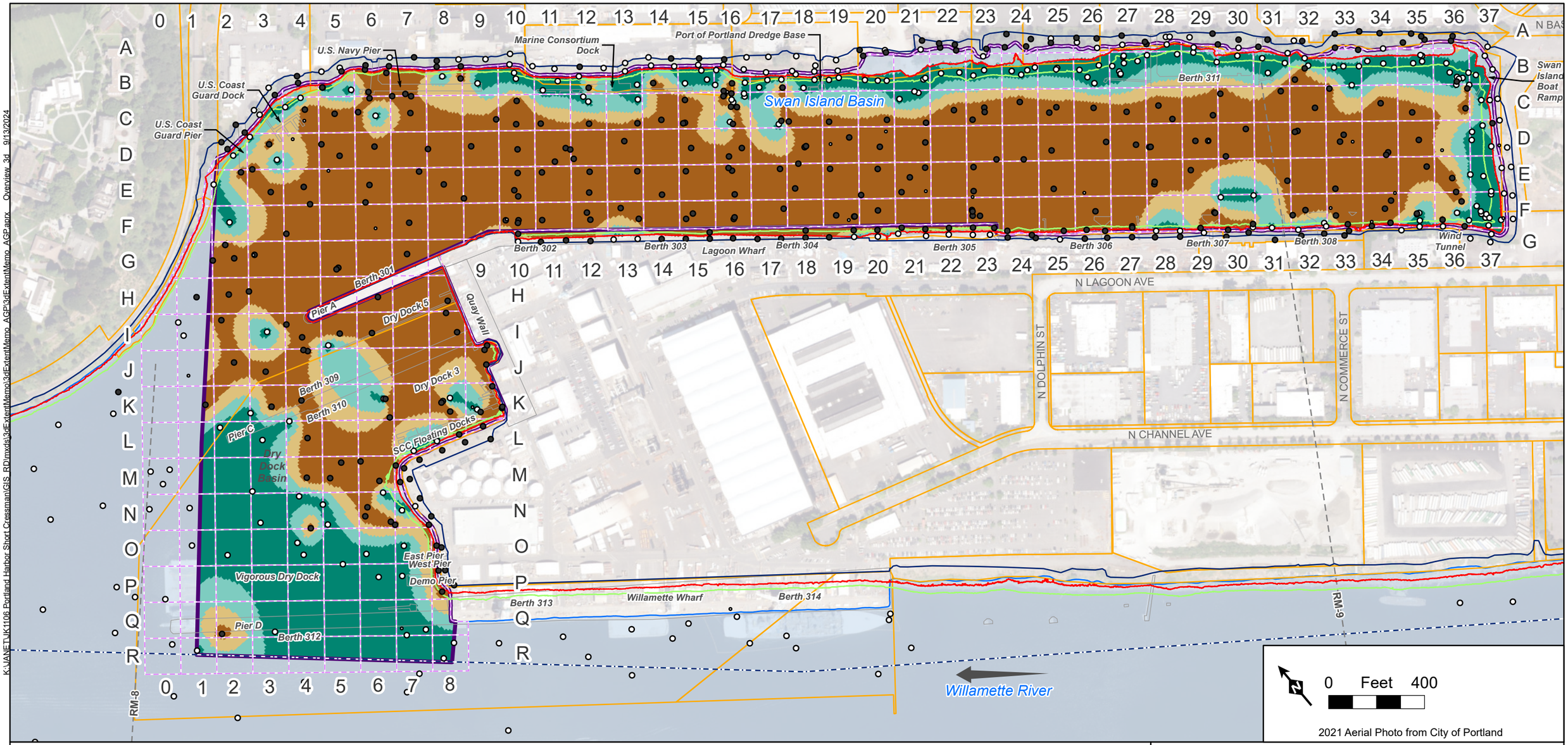
Surface Sediment" is the top 30 cm of sediment.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Figure 4-1a

Horizontal Extent of Surface Sediment Exceedances

Prepared on: 9/16/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP



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- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

Notes:
NAVD88 – North American Vertical Datum of 1988
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

Surface Sediment" is the top 30 cm of sediment.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Total PCBs are from Aroclor and congener summations. When there are two Total PCB results (Arolcor and congener summations), exceedances occur when one or both results are above the threshold value.

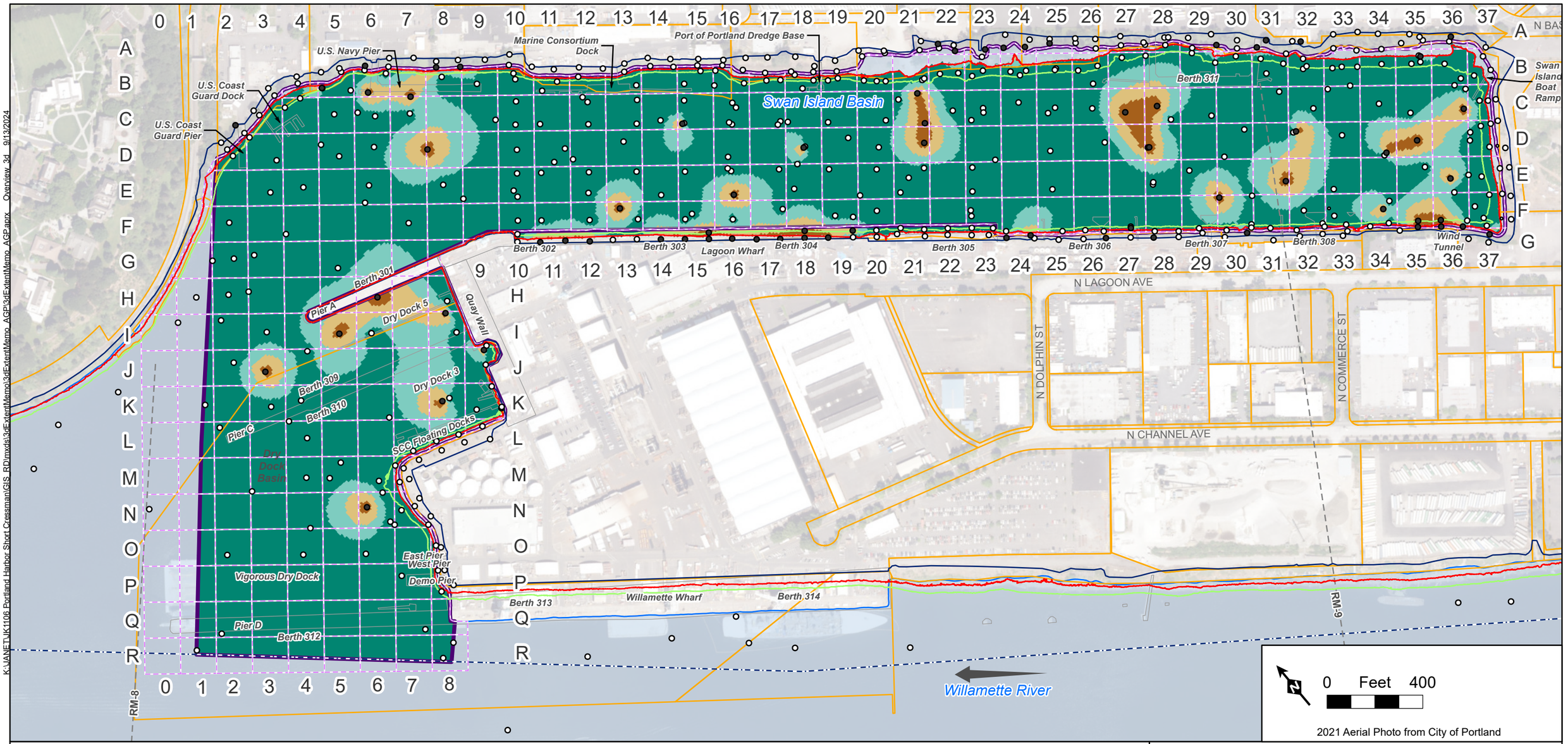
River Flow Direction

Figure 4-1b

Horizontal Extent of Surface Sediment Exceedances – PCBs

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP



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Project Area Grid
River Mile (RM)
Swan Island Sediment Decision Unit (SDU)
Federal Navigation Channel (USACE, 2020)
Docks and Structures
Tax Lot Boundary
Top of Bank (TOB)
Ordinary High Water (City of Portland, 2013)
+13-foot NAVD88 Contour
Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

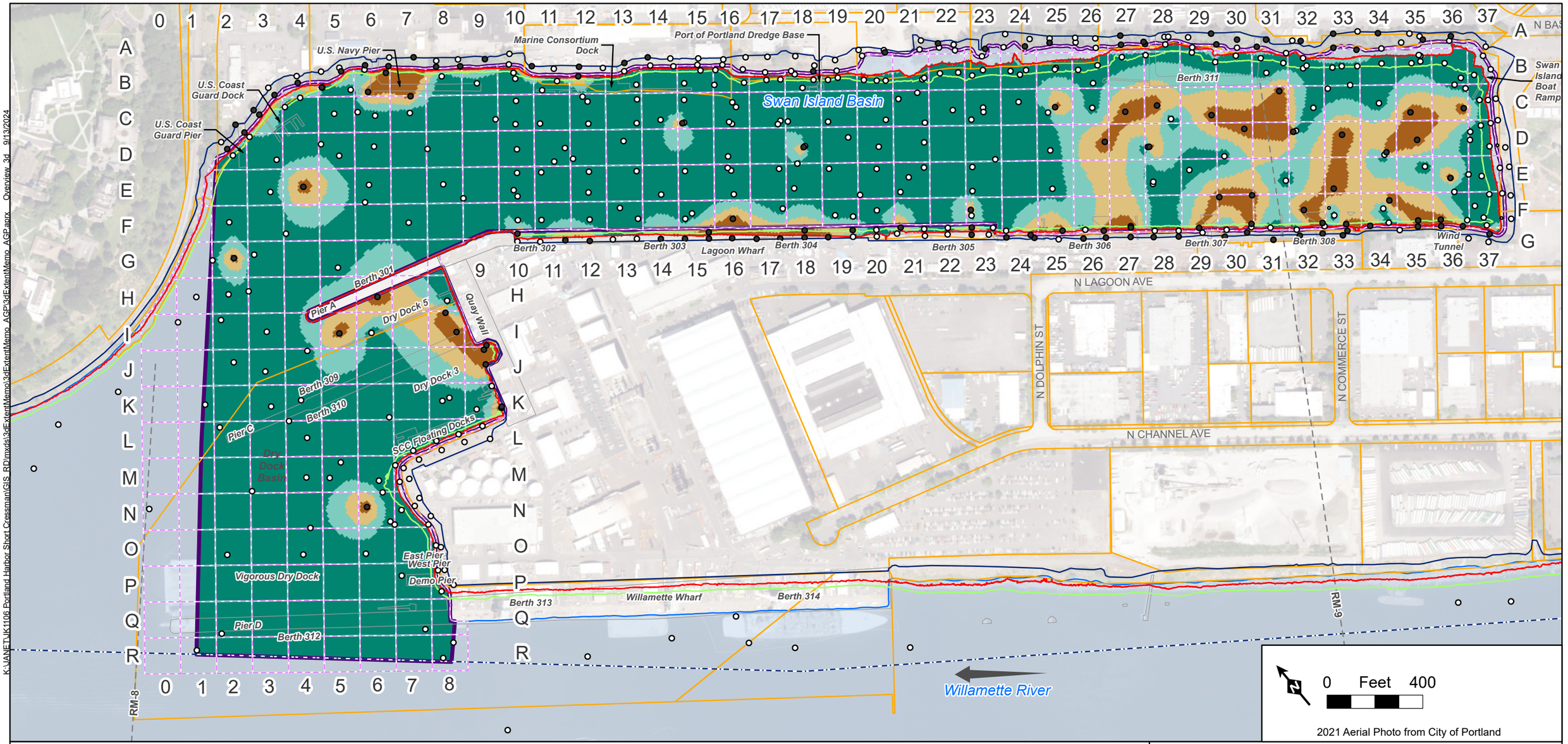
Surface Sediment" is the top 30 cm of sediment.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Figure 4-1c

Horizontal Extent of Surface Sediment Exceedances – TCDD

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP



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- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

Surface Sediment" is the top 30 cm of sediment.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Figure 4-1d

Horizontal Extent of Surface Sediment Exceedances – PeCDD

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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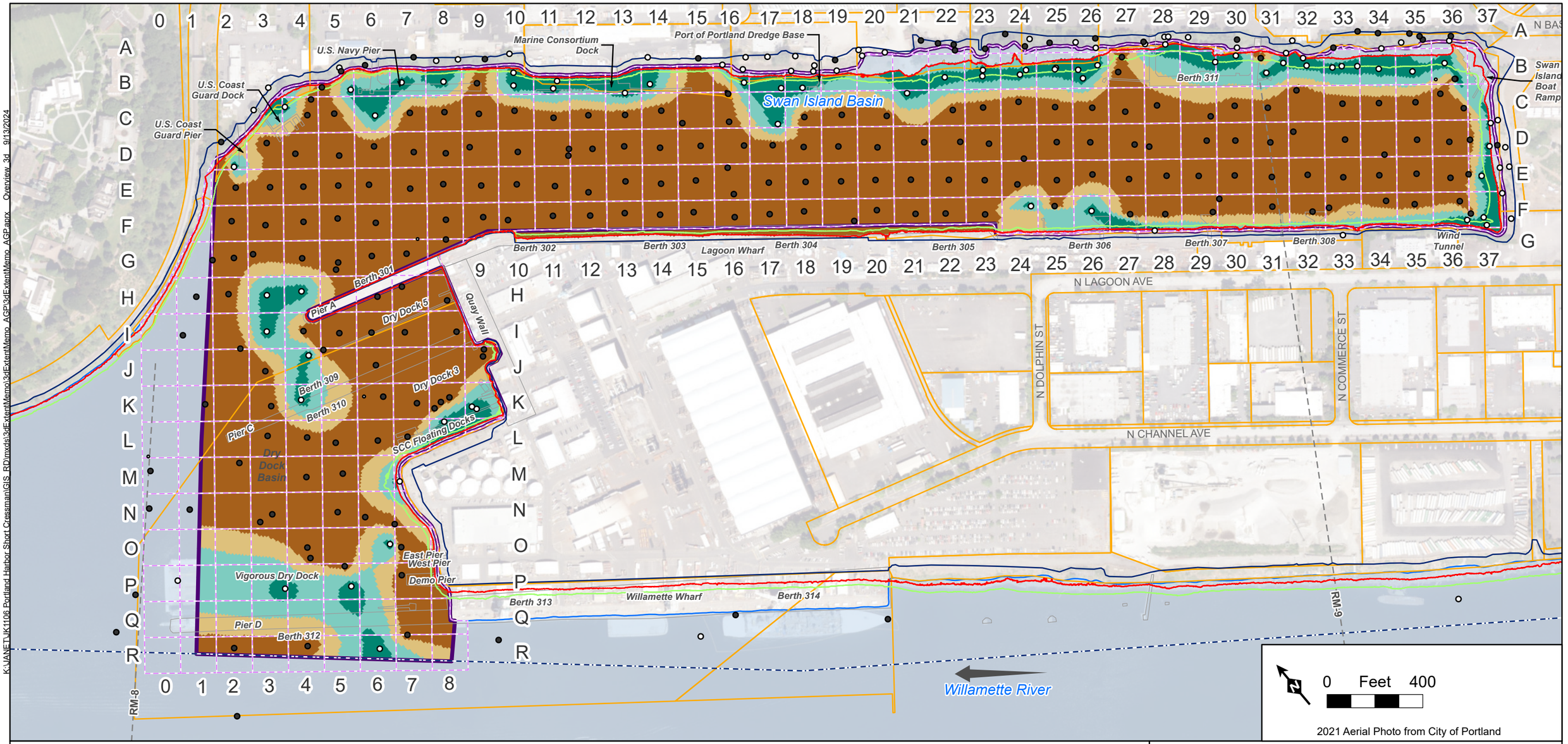

- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

Subsurface Sediment" is any sediment deeper than 30 cm.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Figure 4-2a

Horizontal Extent of Subsurface Sediment Exceedances

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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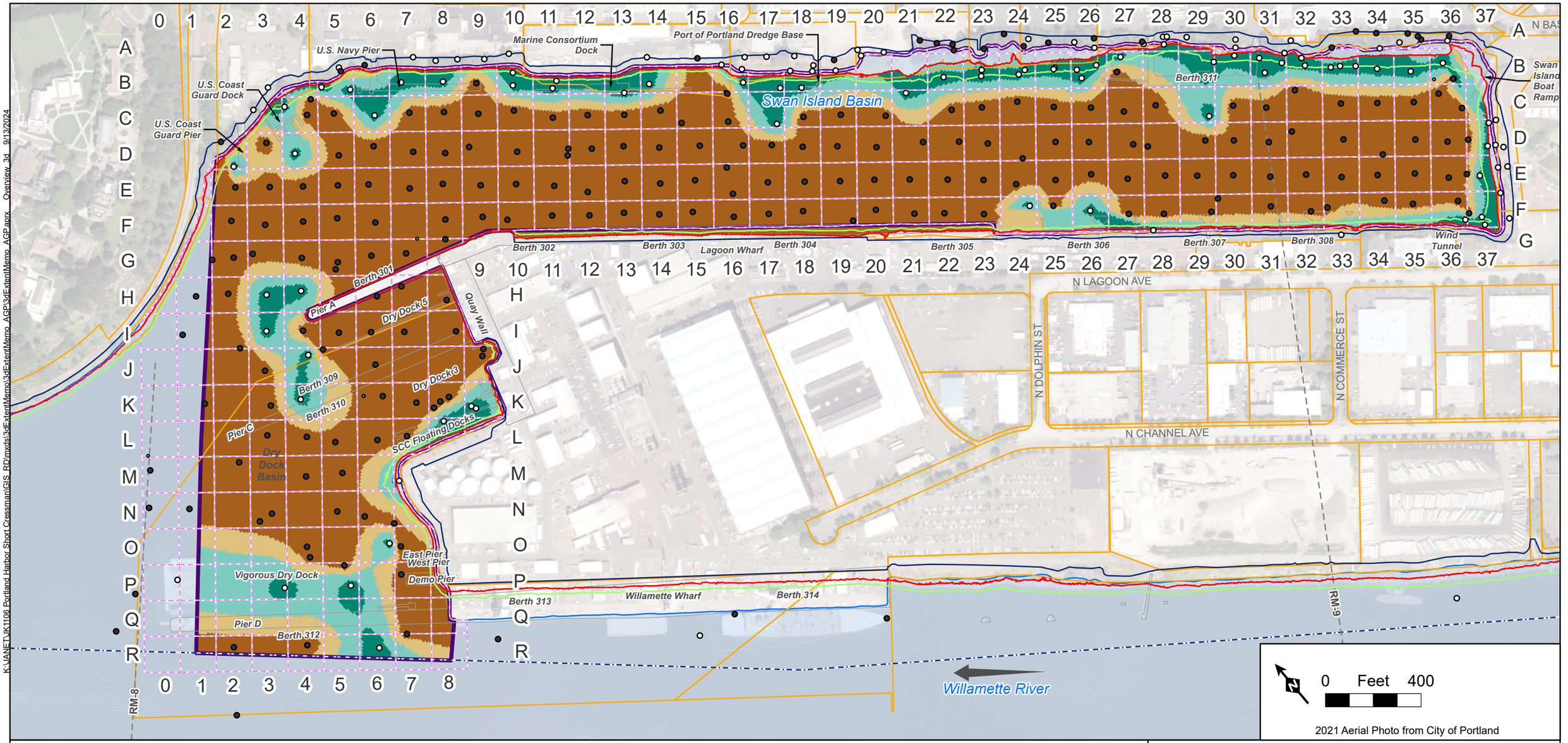

- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

Subsurface Sediment" is any sediment deeper than 30 cm.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Total PCBs are from Aroclor and congener summations. When there are two Total PCB results (Arolcor and congener summations), exceedances occur when one or both results are above the threshold value.

River Flow Direction

Figure 4-2b

Horizontal Extent of Subsurface Sediment Exceedances – PCBs

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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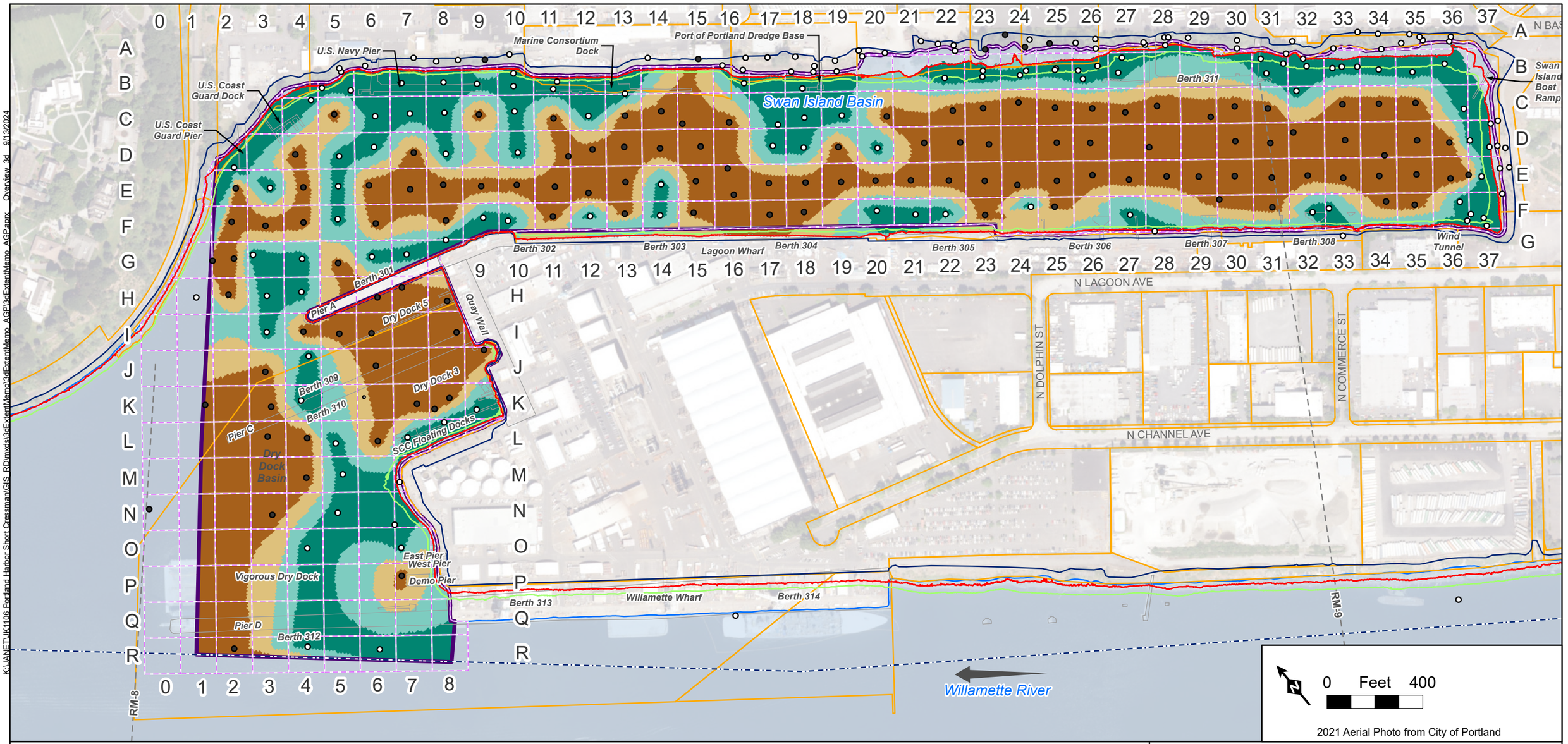

- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

Subsurface Sediment" is any sediment deeper than 30 cm.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Figure 4-2c

Horizontal Extent of Subsurface Sediment Exceedances – TCDD

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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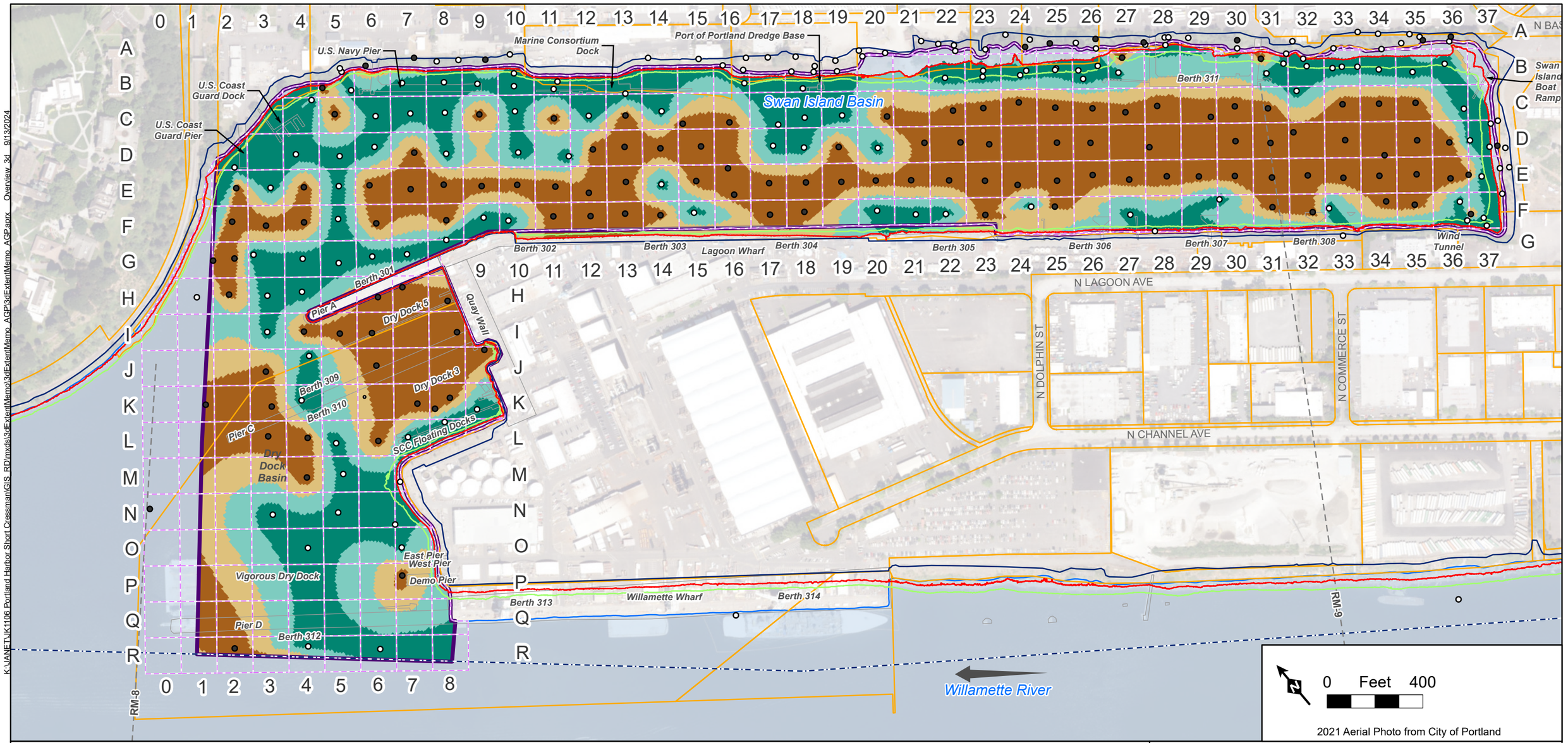


- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

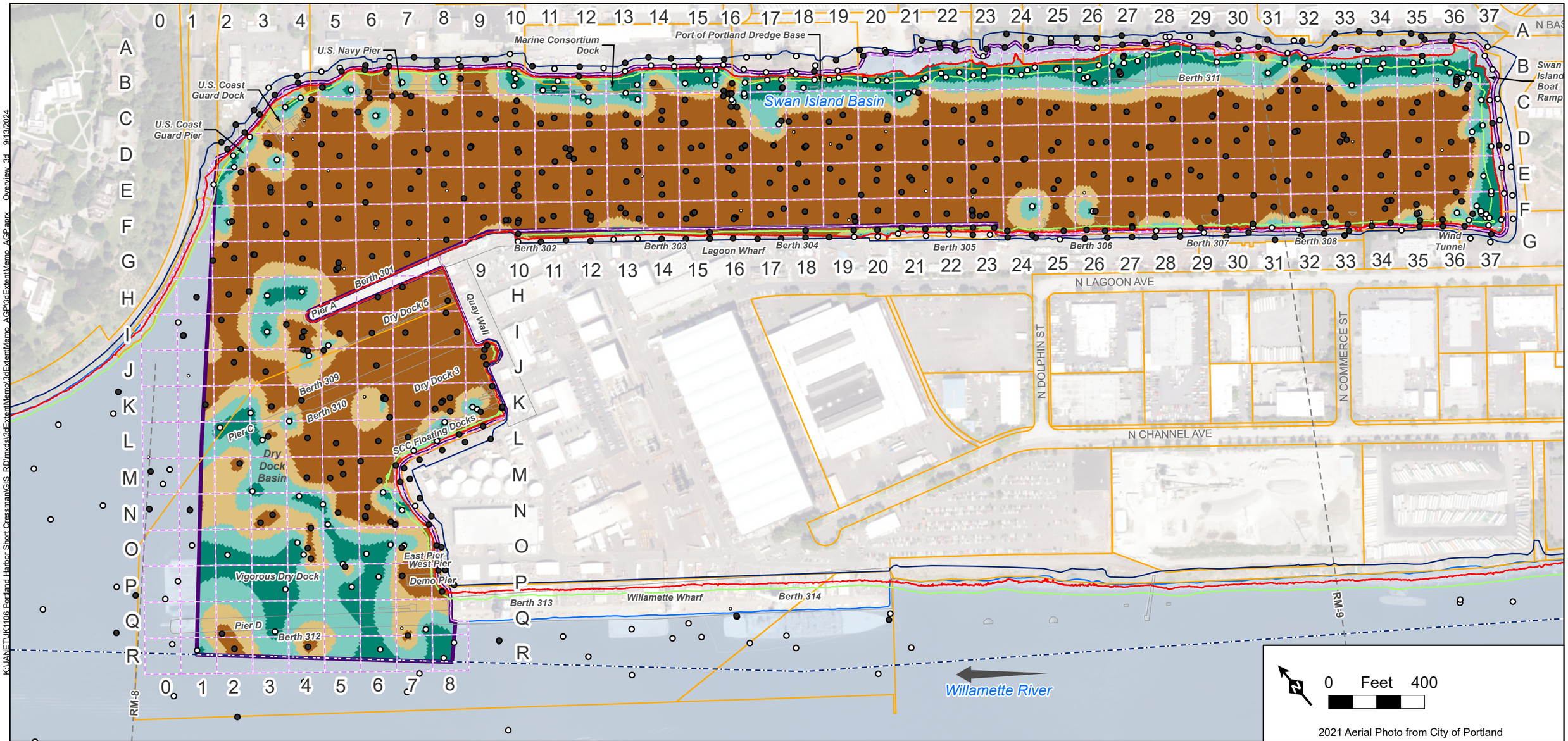
Subsurface Sediment" is any sediment deeper than 30 cm.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Figure 4-2d

Horizontal Extent of Subsurface Sediment Exceedances – PeCDD

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP



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Project Area Grid
River Mile (RM)
Swan Island Sediment Decision Unit (SDU)
Federal Navigation Channel (USACE, 2020)
Docks and Structures
Tax Lot Boundary
Top of Bank (TOB)
Ordinary High Water (City of Portland, 2013)
+13-foot NAVD88 Contour
Mean Low Water (MLW)

M Project Area Grid Label

Indicator Exceedance Data Location
- Point excluded from interpolation
- 0
- 1

Indicator Exceedance Probability
- 0% to 20%
- 20% to 50%
- 50% to 80%
- 80% to 100%

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

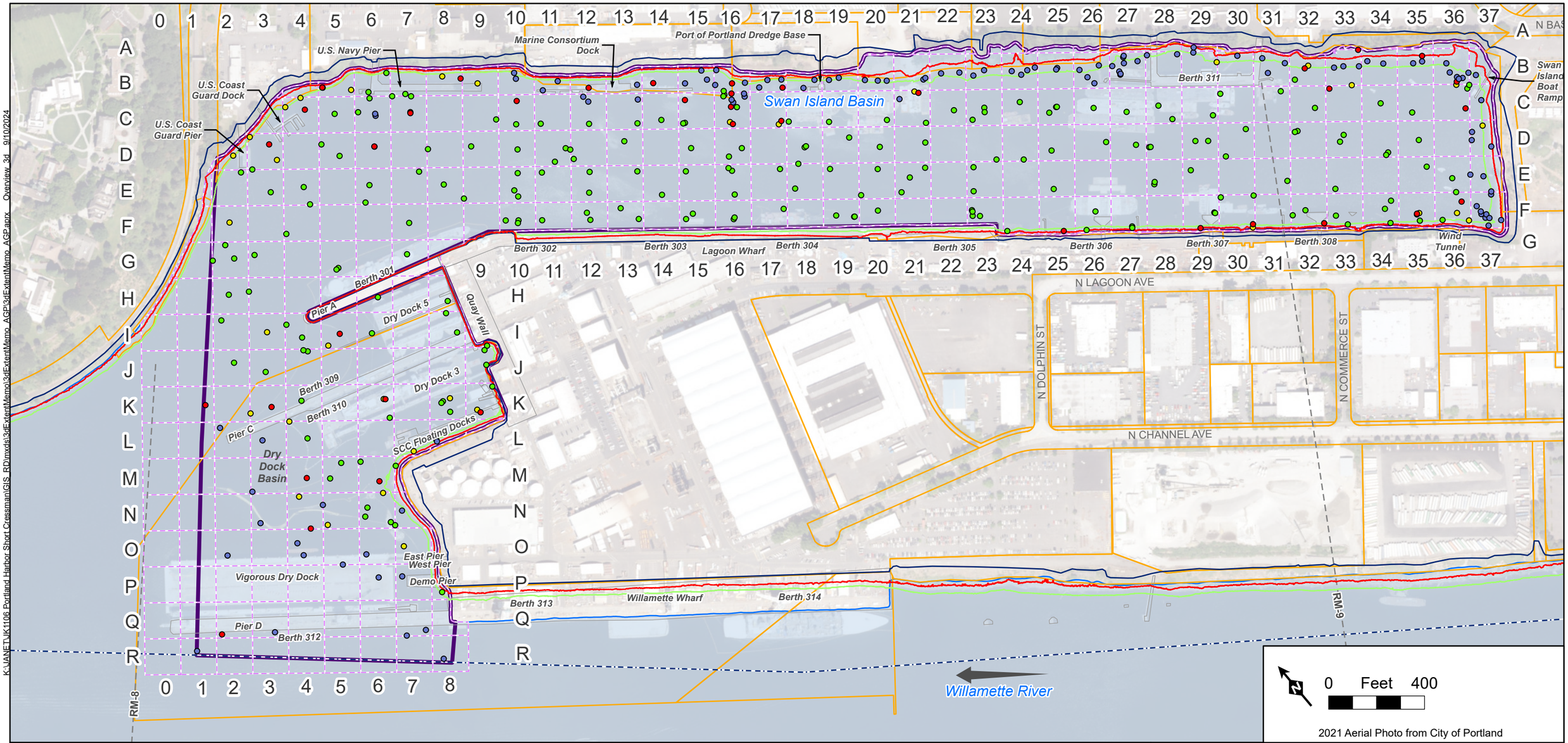
Surface Sediment" is the top 30 cm of sediment.
Subsurface Sediment" is any sediment deeper than 30 cm.
An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

Figure 4-3

Horizontal Extent of Combined Sediment Exceedances

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP



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- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Cross-Validation Category
- False Positive
- False Negative
- True Negative
- True Positive

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

River Flow Direction

Figure 4-4

Cross-Validation – Horizontal Extent of Surface Sediment Exceedances

Prepared on: 9/10/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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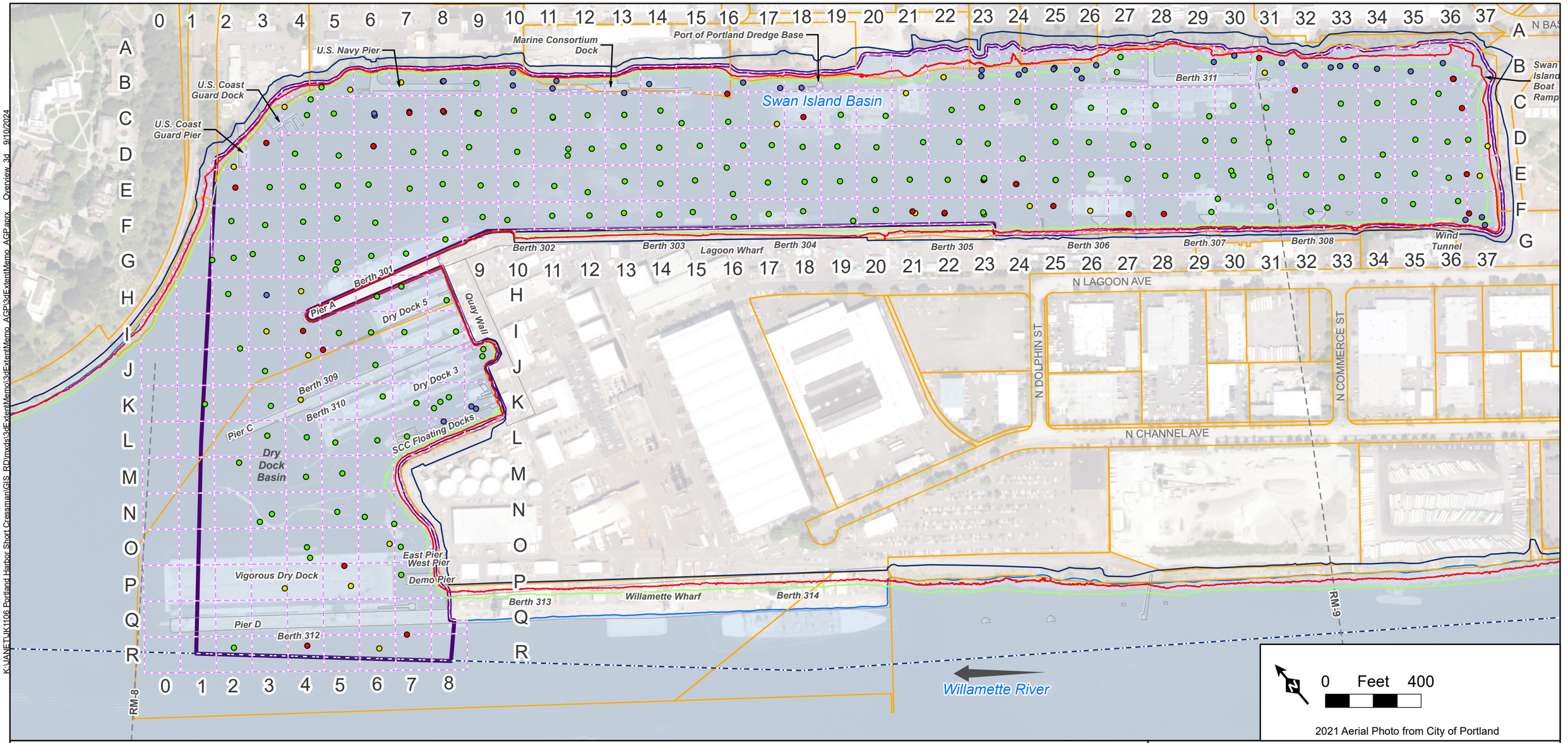

- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)

M Project Area Grid Label

Cross-Validation Category
- False Positive
- False Negative
- True Negative
- True Positive

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
USACE – U.S. Army Corps of Engineers

Figure 4-5

Cross-Validation – Horizontal Extent of Subsurface Sediment Exceedances

Prepared on: 9/10/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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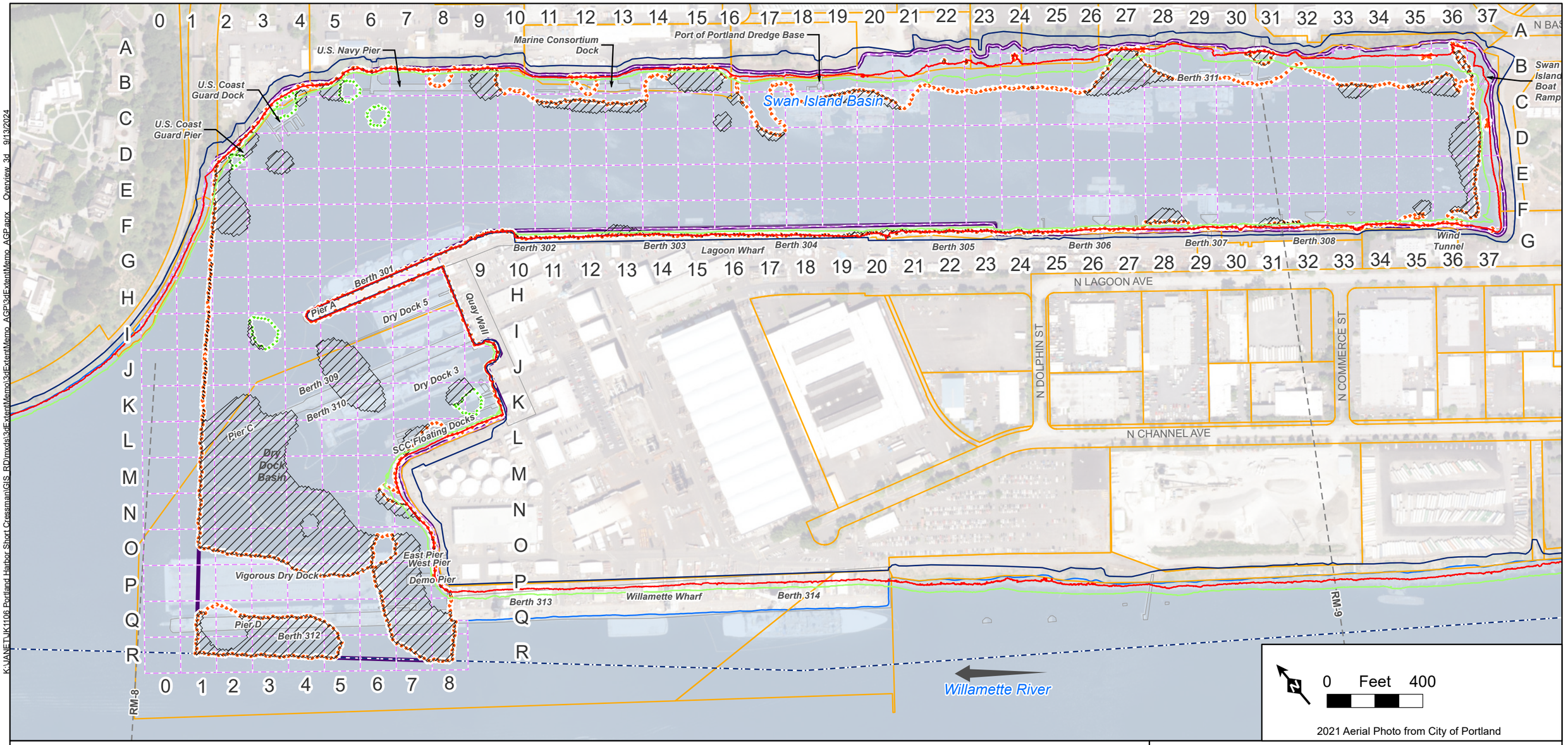

- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)
- M Project Area Grid Label
- Refined SMA Horizontal Extent
- Internal Areas Below SMA threshold
- Areas Pending Buried Contamination Evaluation

Notes:
NAVD88 – North American Vertical Datum of 1988
PQL – Practical Quantitation Limit
PTW – Principal Threat Waste
RAL – Remedial Action Level
SCC – Shipyard Commerce Center
SMA – Sediment Management Area
USACE – U.S. Army Corps of Engineers

The boundary of the SMA corresponds to 50% probability of exceeding SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Buried contamination is defined as 1 ft or more of clean sediment overlying contaminated sediment (i.e., where the horizontal extent of subsurface contamination extends beyond horizontal extent of surface contamination).
Interpolations are clipped to the Project Area

River Flow Direction

Figure 4-6
Refined SMA Horizontal Extent

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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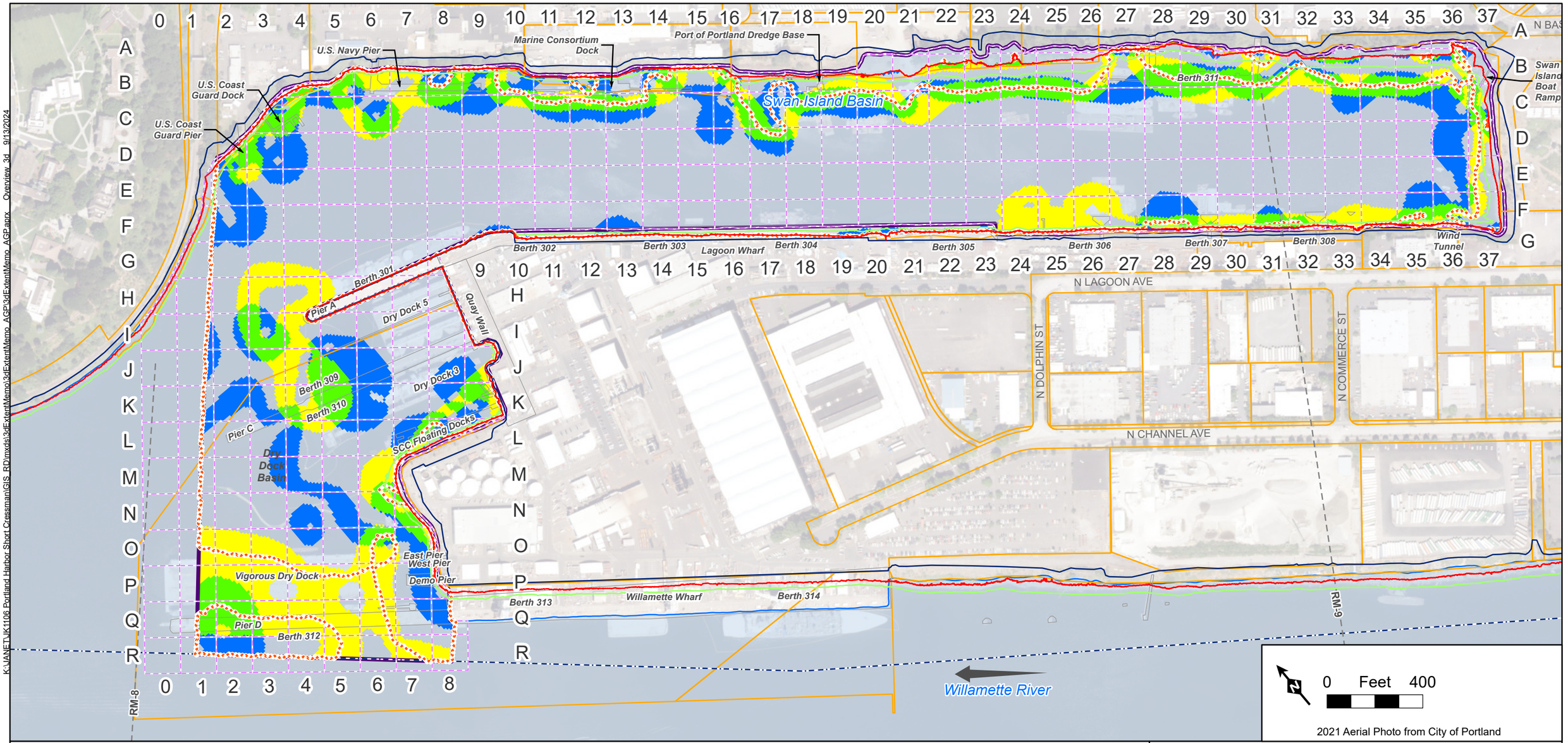

- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)
- M Project Area Grid Label

20% to 80% Indicator Exceedance Probability
- In Surface Sediment
- In Subsurface Sediment
- In Both Surface and Subsurface Sediment
- Refined SMA Horizontal Extent

Notes:
NAVD88 – North American Vertical Datum of 1988
PQL – Practical Quantitation Limit
PTW – Principal Threat Waste
RAL – Remedial Action Level
ROD – Record of Decision
SCC – Shipyard Commerce Center
SMA – Sediment Management Area
USACE – U.S. Army Corps of Engineers

An "exceedance" is defined as an exceedance of the SMA threshold.
SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

River Flow Direction

Figure 4-7

SMA Uncertainty Evaluation

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

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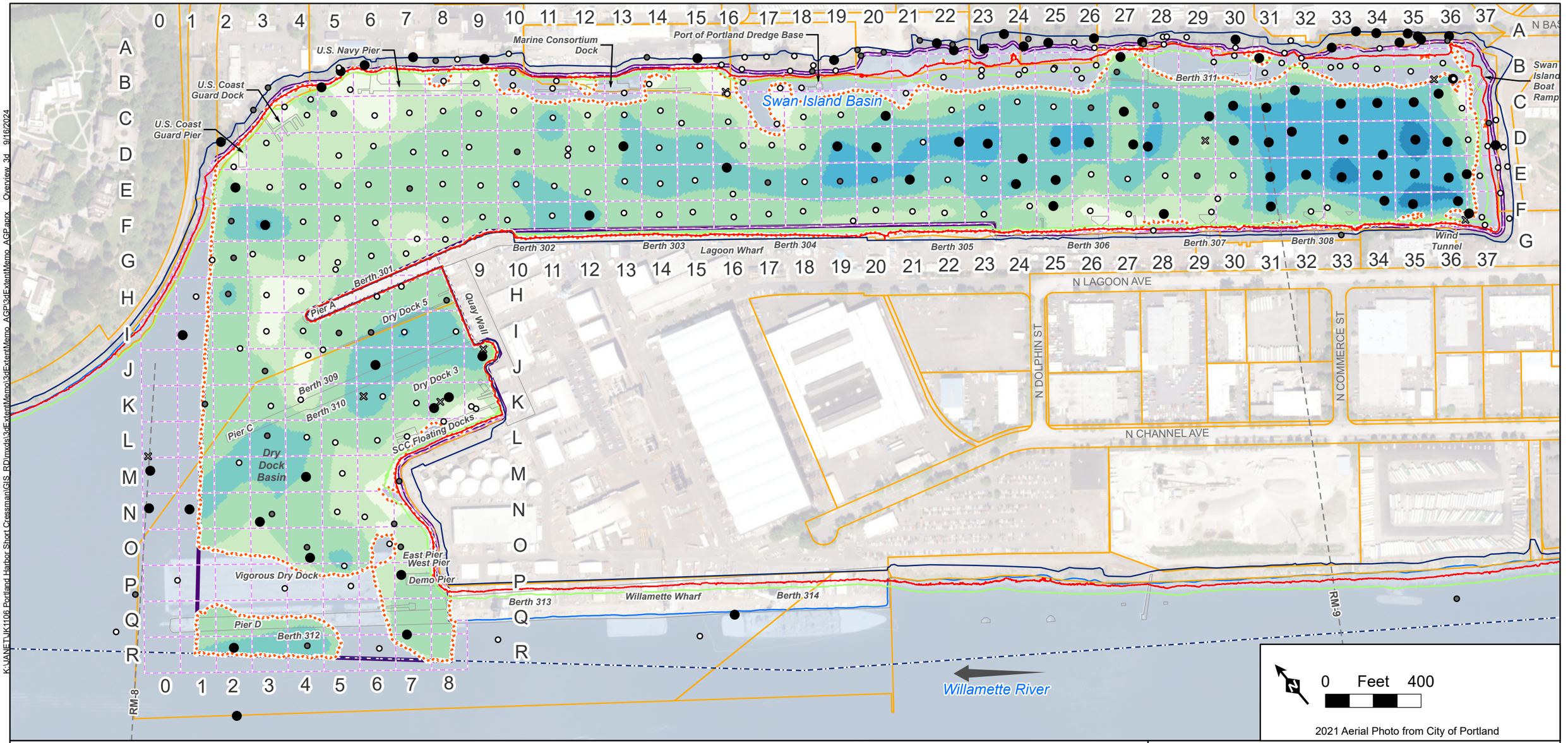


- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)
- M Project Area Grid Label

- Refined SMA Horizontal Extent
- Core Locations Included in Interpolation, Did not Reach Clean
- Core Locations Included in Interpolation, Reached Clean (1ft)
- Core Locations Included in Interpolation, Reached Clean (>2ft)
- Core Locations Excluded from Interpolation

Depth in Feet
- 0 - 2
- 2.1 - 4
- 4.1 - 8
- 8.1 - 12
- 12.1 - 16
- 16.1 - 20
- 20.1 - 30

Notes:
NAVD88 – North American Vertical Datum of 1988
PQL – Practical Quantitation Limit
PTW – Principal Threat Waste
RAL – Remedial Action Level
ROD – Record of Decision
SCC – Shipyard Commerce Center
SMA – Sediment Management Area
USACE – U.S. Army Corps of Engineers

SMA threshold refers to the RAL/PQL/PTW thresholds collectively.
Interpolations are clipped to the Project Area.

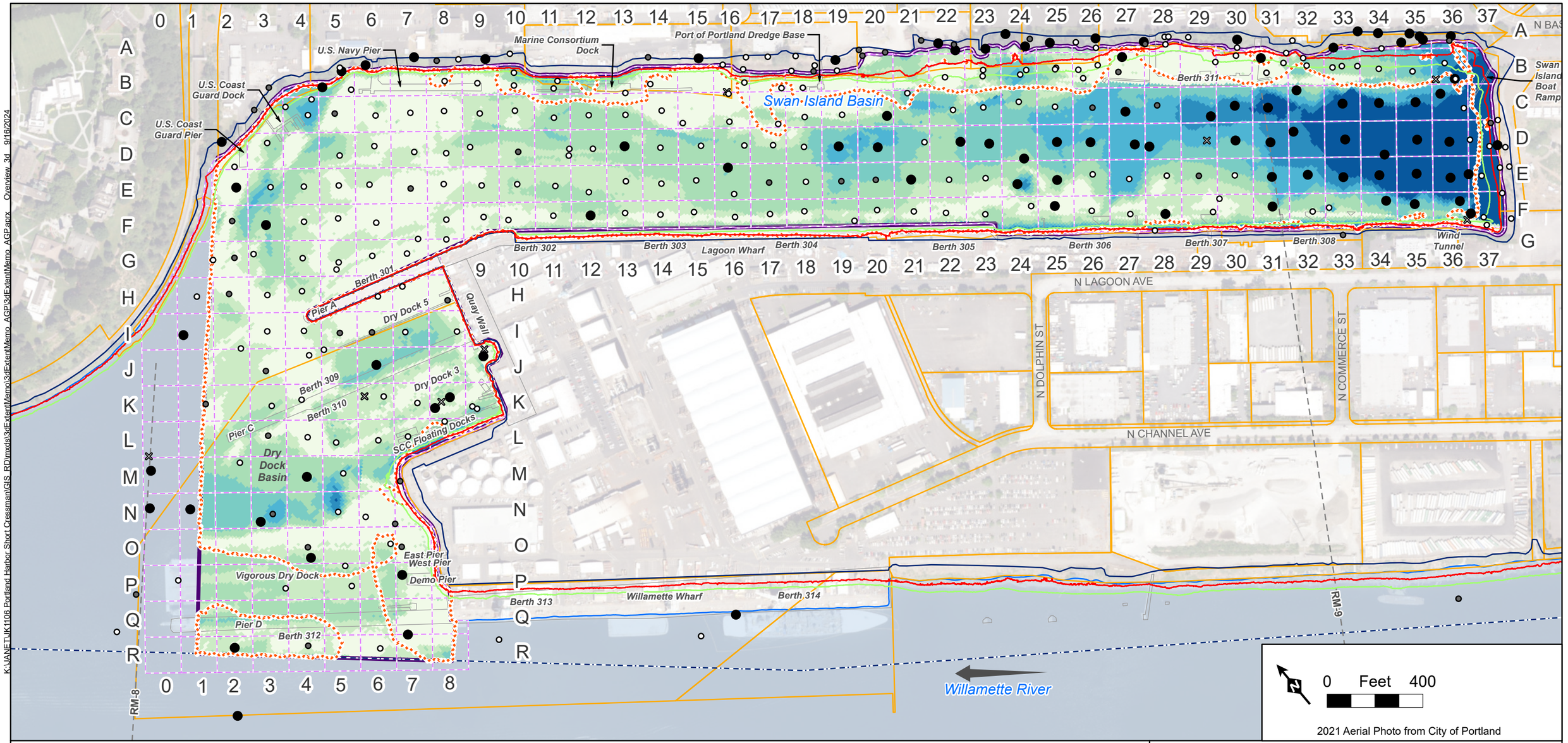
River Flow Direction

Figure 4-8

Depth of Sediments Exceeding SMA Threshold

Prepared on: 9/16/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP



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- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)
- M Project Area Grid Label

- Refined SMA Horizontal Extent
- Core Locations Included in Interpolation, Did not Reach Clean
- Core Locations Included in Interpolation, Reached Clean (1ft)
- Core Locations Included in Interpolation, Reached Clean (>2ft)
- Core Locations Excluded from Interpolation

Depth in Feet
- 0 - 2
- 2.1 - 4
- 4.1 - 8
- 8.1 - 12
- 12.1 - 16
- 16.1 - 20
- 20.1 - 70

Notes:
NAVD88 – North American Vertical Datum of 1988
ROD – Record of Decision
SCC – Shipyard Commerce Center
SMA – Sediment Management Area
USACE – U.S. Army Corps of Engineers

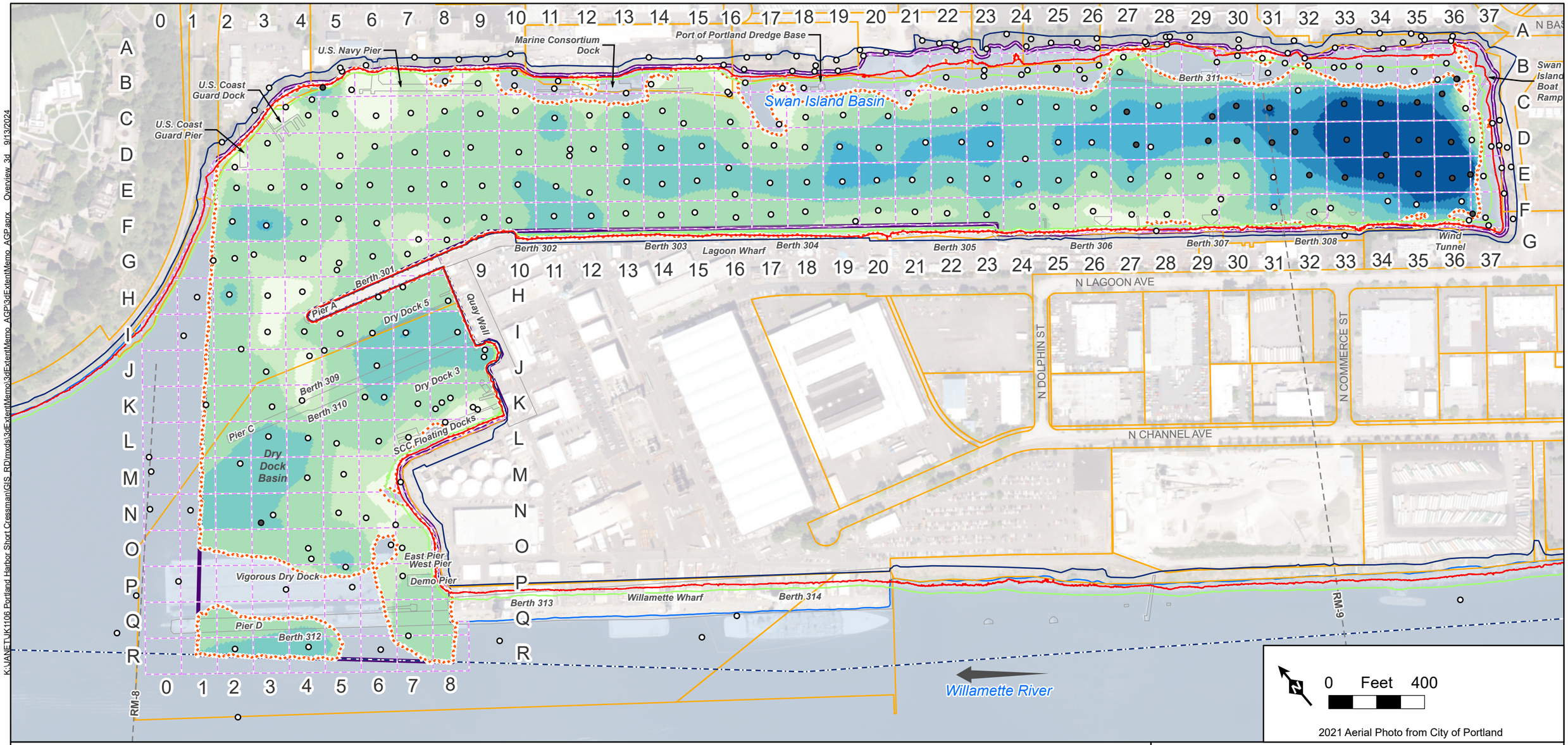
Interpolations are clipped to the Project Area.

River Flow Direction

Figure 4-9
Depth of Historical Mudline

Prepared on: 9/16/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP



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- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)
- M Project Area Grid Label
- Refined SMA Horizontal Extent

Thickness Value Source
- Core Data
- Historical Bathymetry

Depth in Feet
- 0 - 2
- 2.1 - 4
- 4.1 - 8
- 8.1 - 12
- 12.1 - 16
- 16.1 - 20
- 20.1 - 40

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
SCC – Shipyard Commerce Center
SMA – Sediment Management Area
USACE – U.S. Army Corps of Engineers

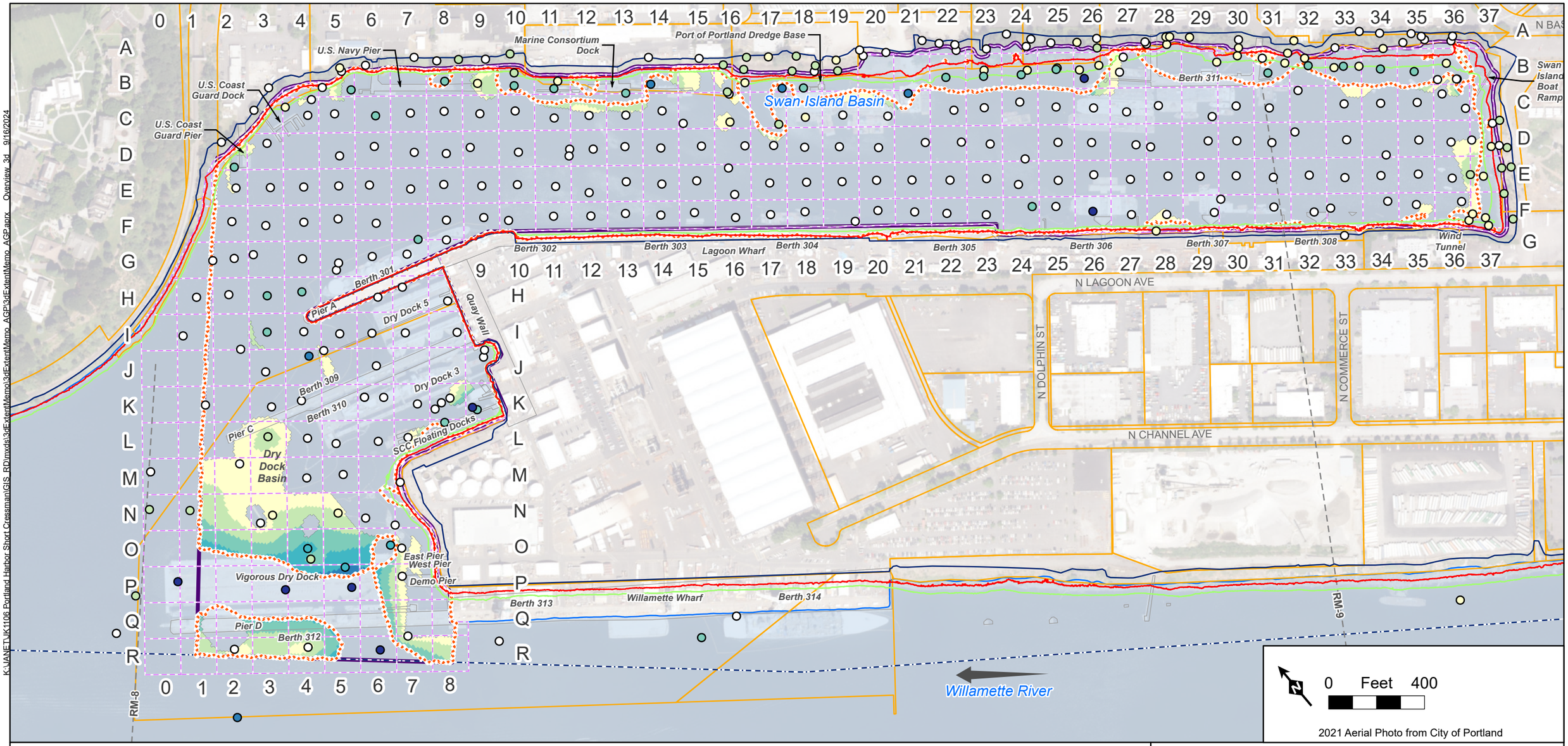
Interpolations are clipped to the Project Area

Figure 4-10
Refined SMA Vertical Extent

Prepared on: 9/13/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP

K:\ANE\WK1106 Portland Harbor Short Cressman\GIS_RD\mxds\3dExtentMemo\3dExtentMemo_AGP\3dExtentMemo_AGP.aprx Overview_3d 9/16/2024



- Project Area Grid
- River Mile (RM)
- Swan Island Sediment Decision Unit (SDU)
- Federal Navigation Channel (USACE, 2020)
- Docks and Structures
- Tax Lot Boundary
- Top of Bank (TOB)
- Ordinary High Water (City of Portland, 2013)
- +13-foot NAVD88 Contour
- Mean Low Water (MLW)
- M Project Area Grid Label

Refined SMA Horizontal Extent

Depth to Potential Buried Contamination (in feet)

- 0.0 - 1.0
- 1.1 - 2.0
- 2.1 - 4.0
- 4.1 - 6.0
- 6.1 - 8.0
- 8.1 - 10.0
- 10.1 - 15.0

Depth to Potential Buried Contamination (in feet)

- 1 - 2
- 2.1 - 4
- 4.1 - 6
- 6.1 - 8
- 8.1 - 10
- 10.1 - 15

River Flow Direction

Notes:
NAVD88 – North American Vertical Datum of 1988
SCC – Shipyard Commerce Center
SMA – Sediment Management Area
USACE – U.S. Army Corps of Engineers

Interpolations are clipped to the Project Area

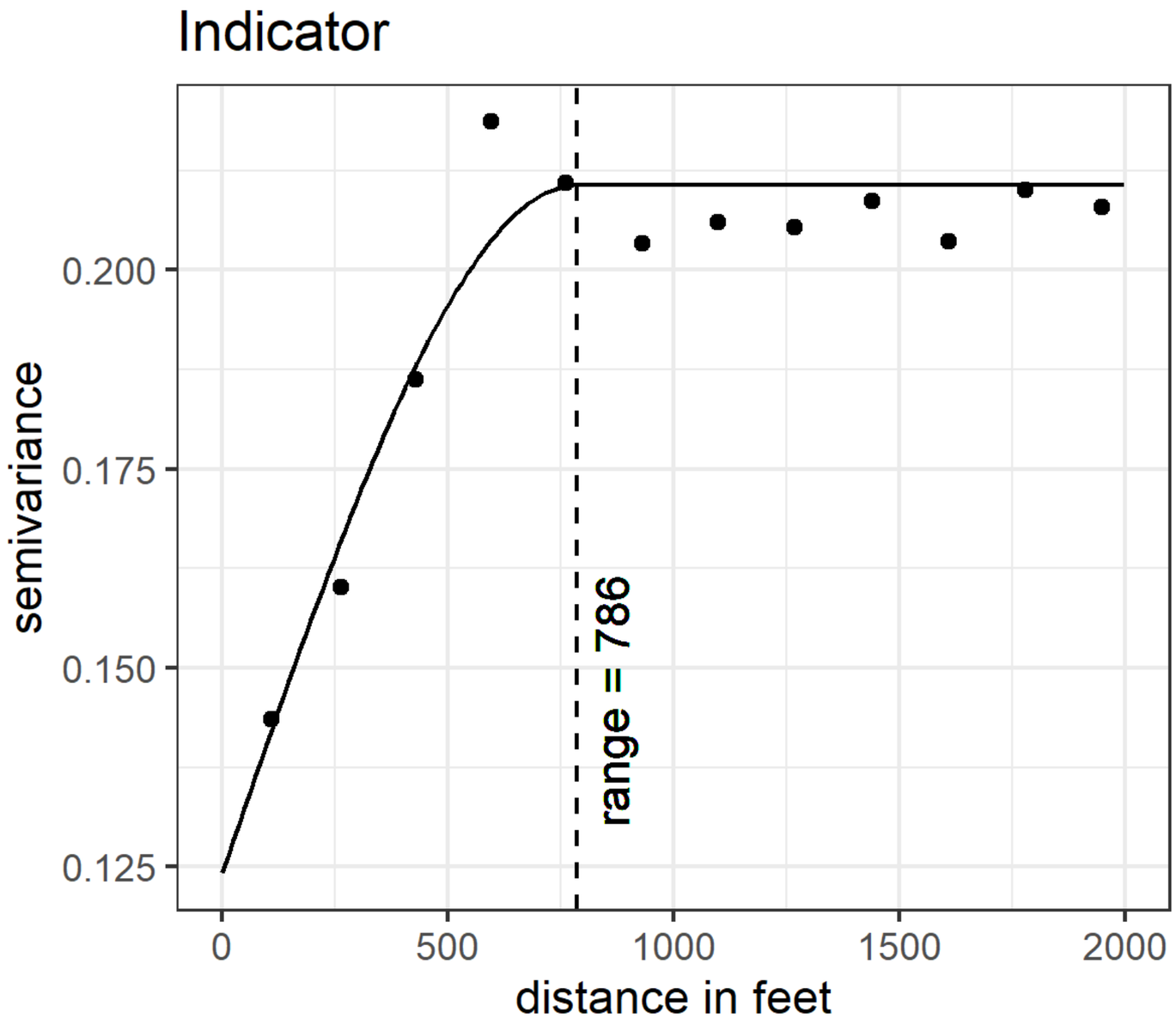
Figure 4-11

Depth to Potential Buried Contamination

Prepared on: 9/16/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL MOTT MACDONALD
BRIDGEWATER GROUP

ATTACHMENT A
SEMI-VARIOGRAMS



Notes:

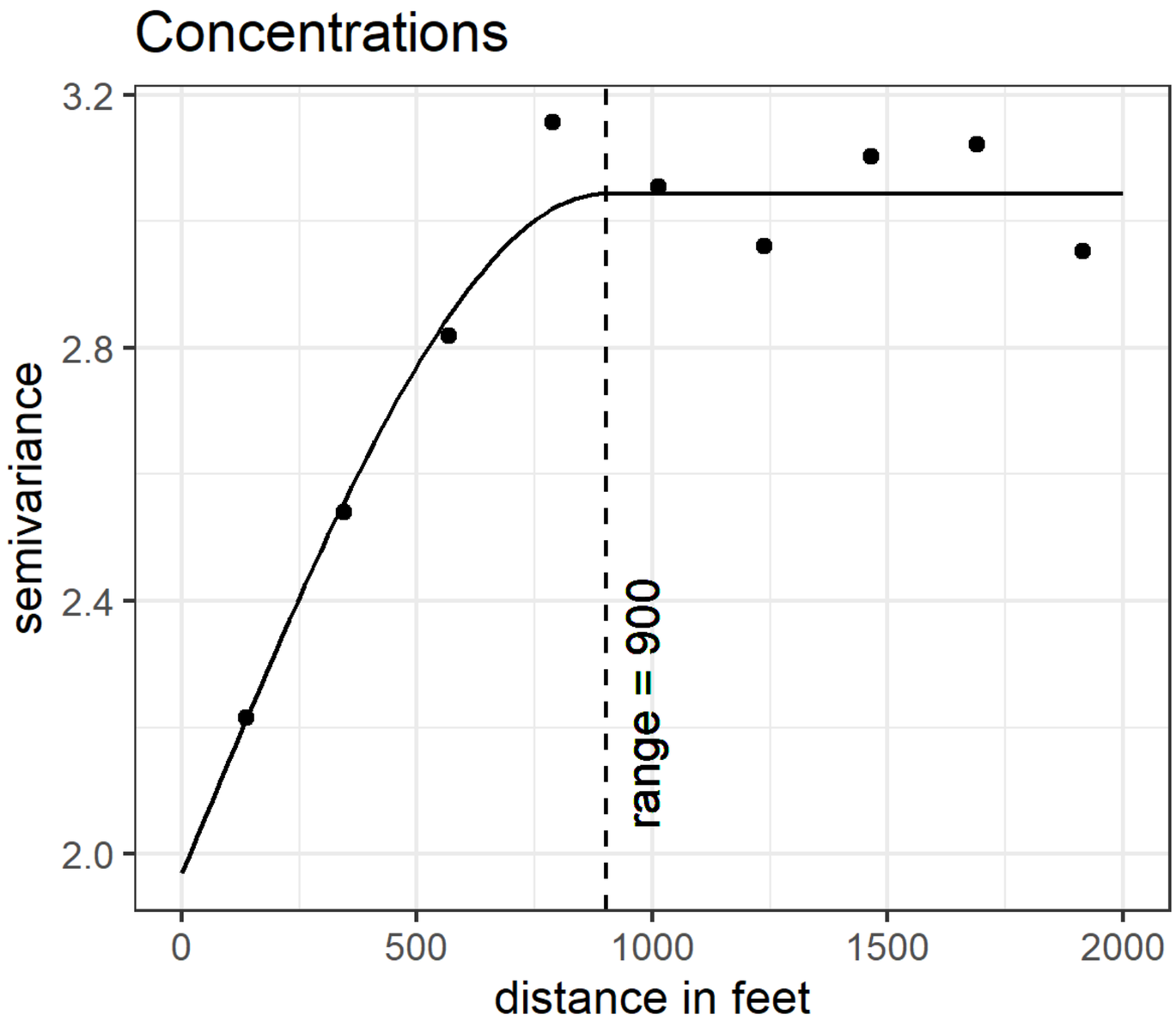
1. Input data are indicator values (0 or 1) relative to the SMA Threshold for the analyte.
2. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
3. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-1

Focused COCs, Semi-variogram, Surface and Subsurface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



Notes:

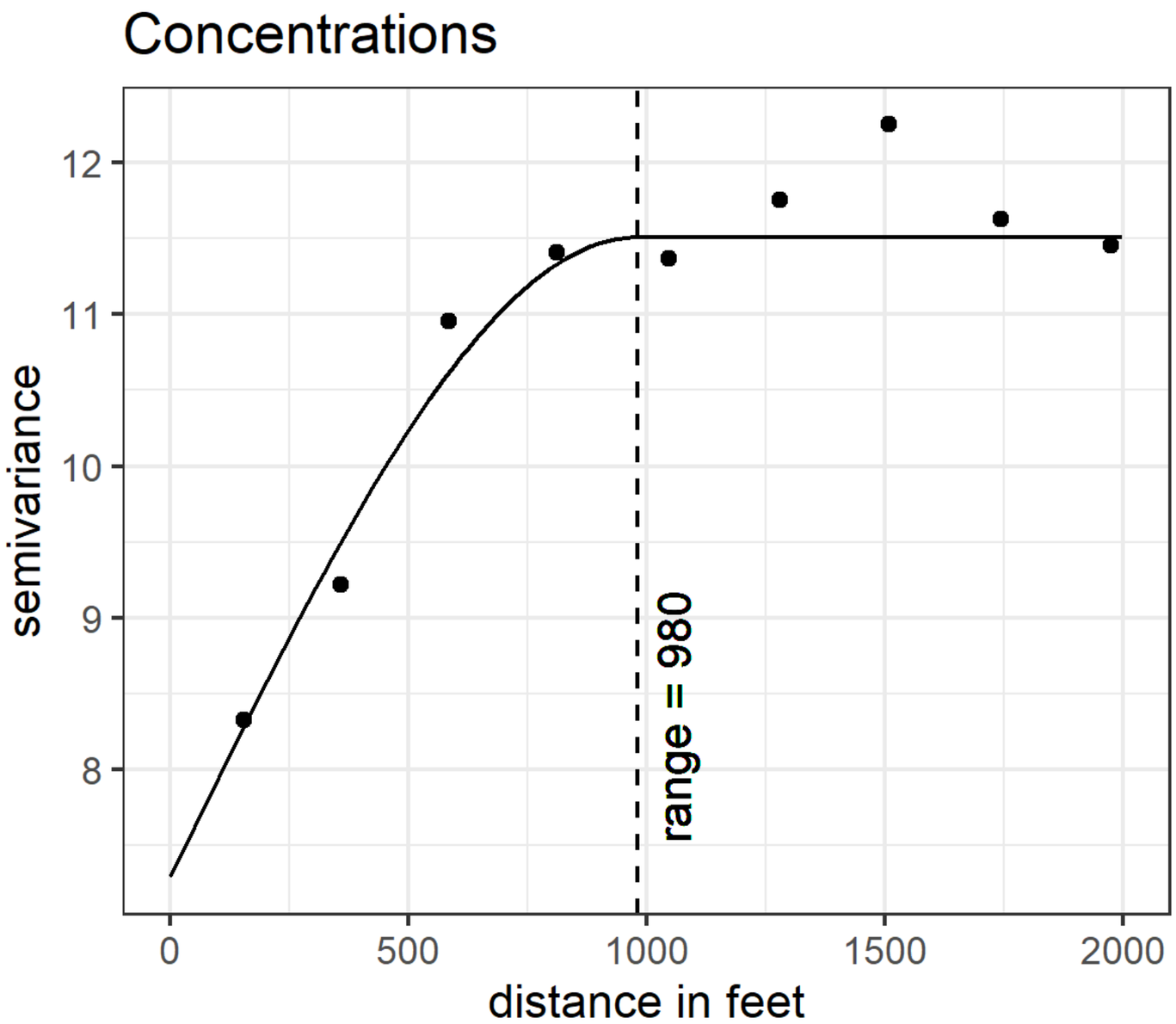
1. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
2. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-2

PCB Aroclors Semi-variogram, Surface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



Notes:

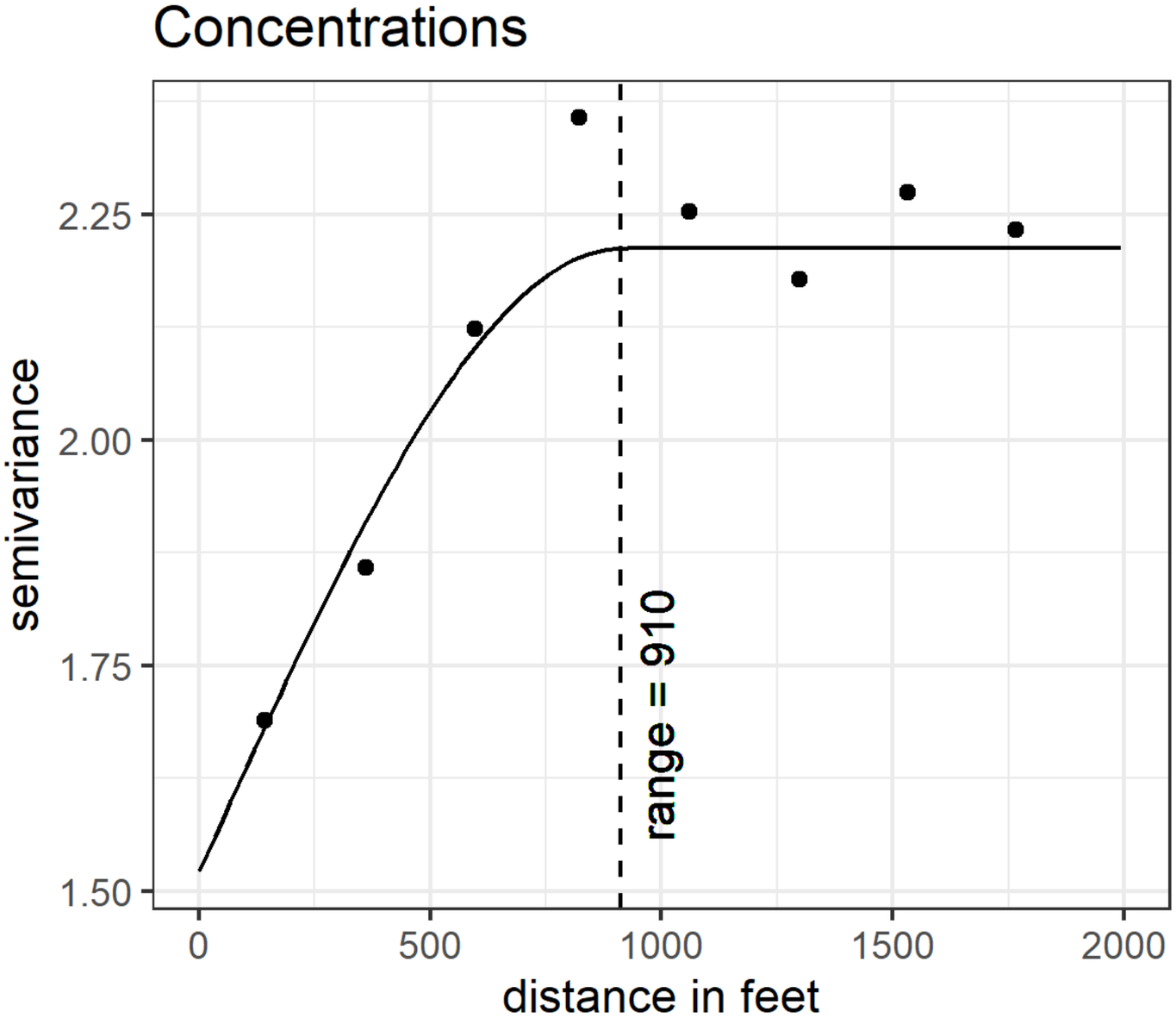
1. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
2. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-3

PCB Congeners Semi-variogram, Surface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



Notes:

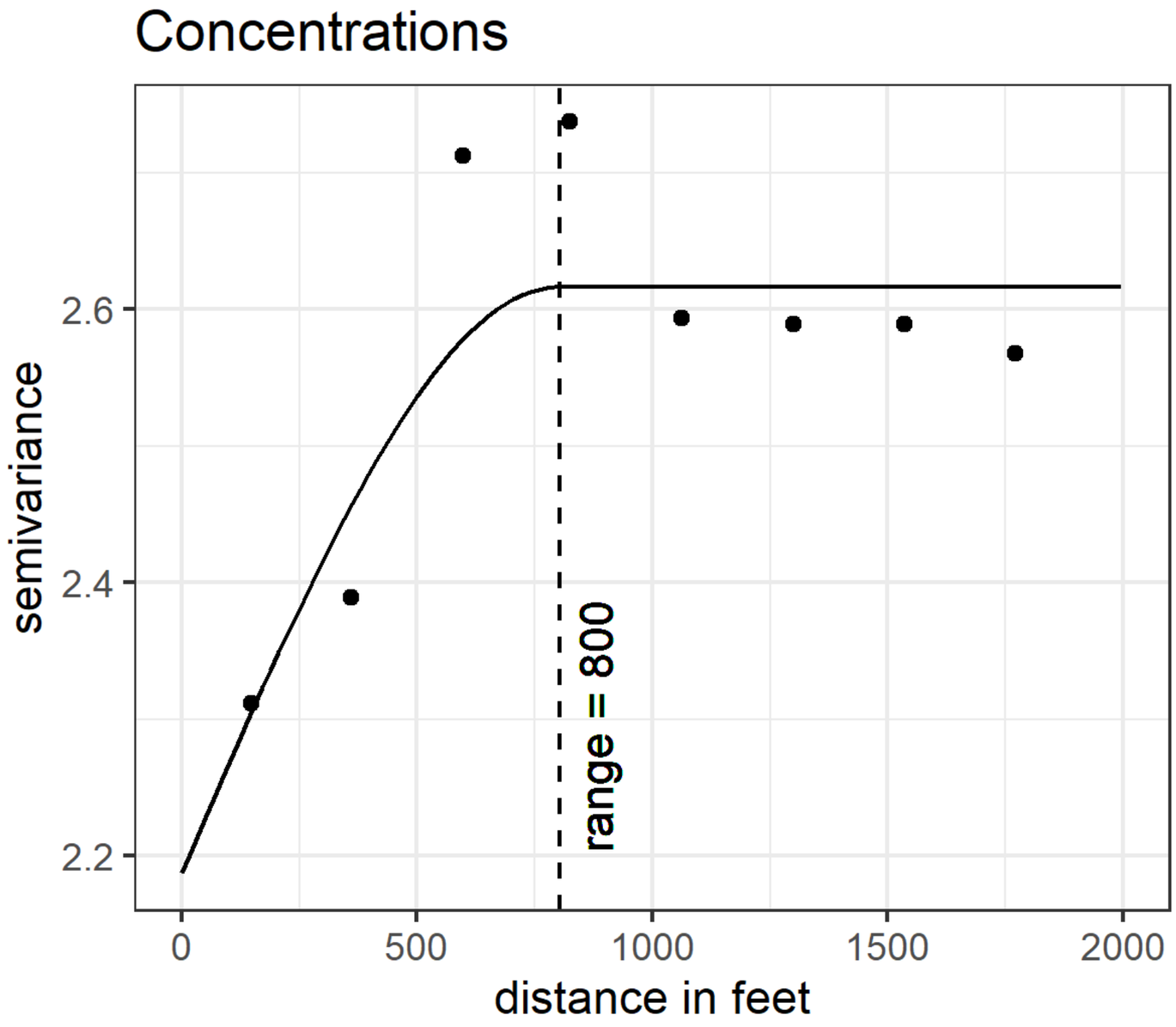
1. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
2. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-4

DDx Semi-variogram, Surface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



Notes:

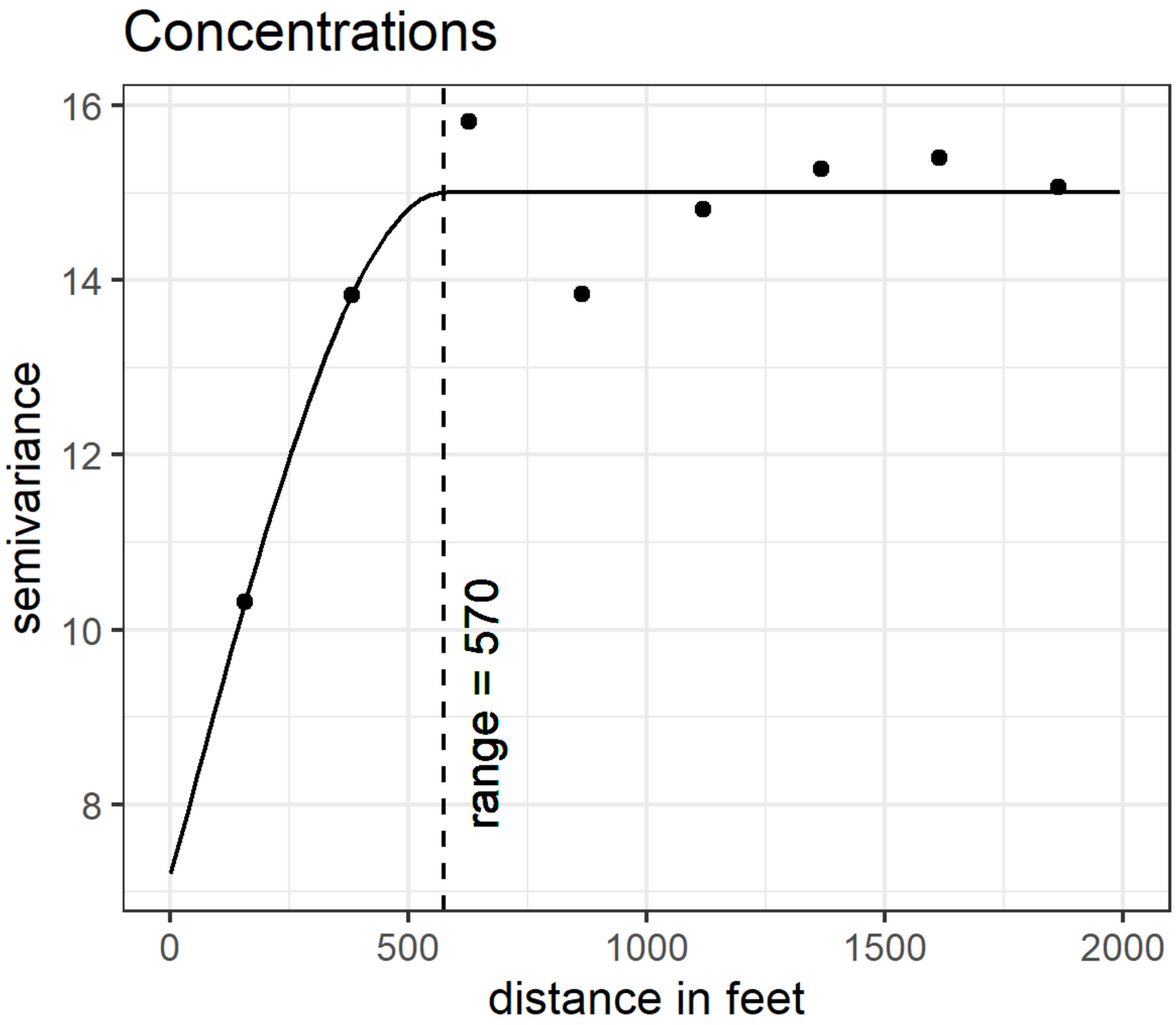
1. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
2. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-5

Total PAHs Semi-variogram, Surface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



Notes:

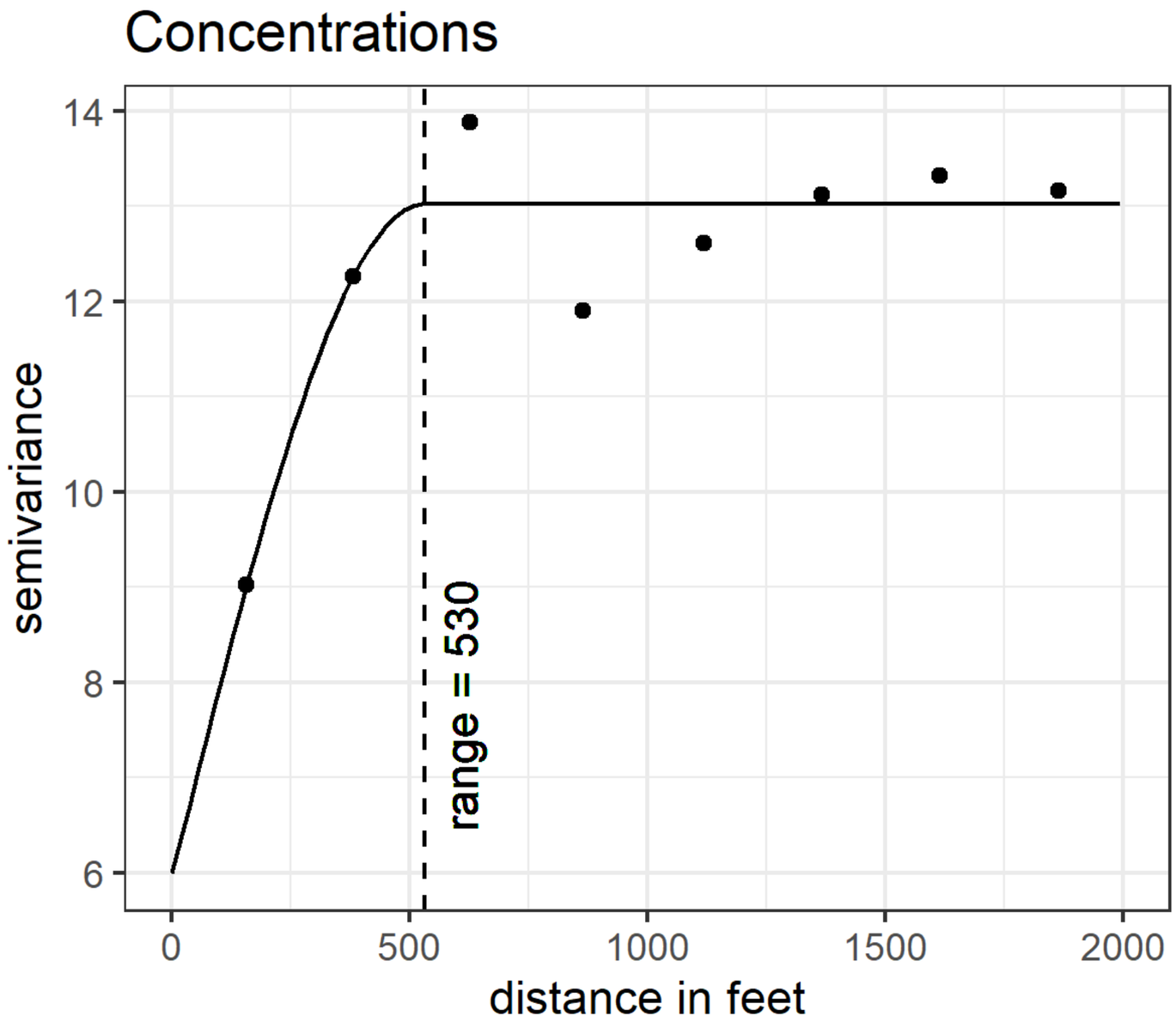
1. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
2. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-6

PeCDD Semi-variogram, Surface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



Notes:

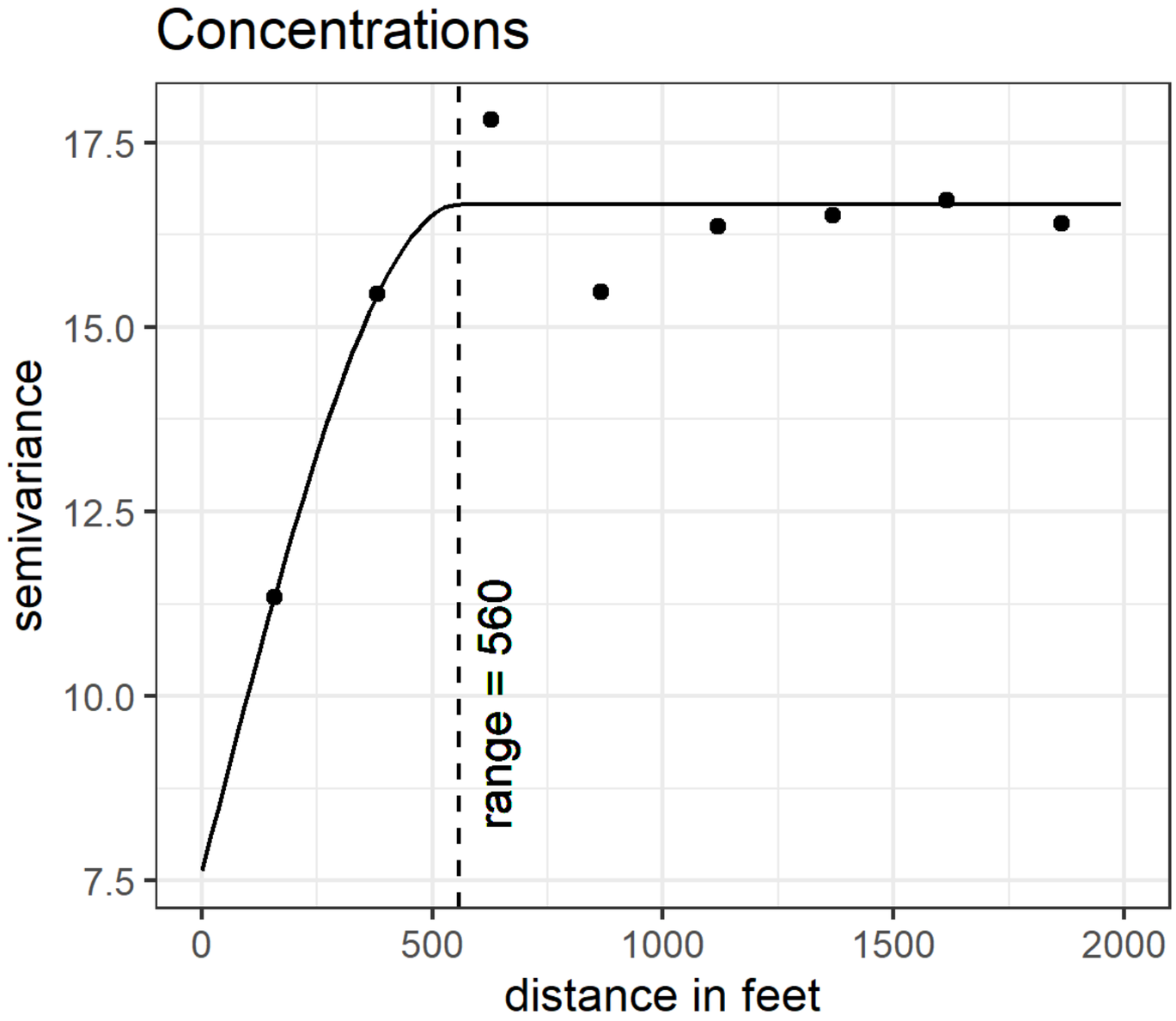
1. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
2. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-7

TCDD Semi-variogram, Surface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
MOTT MACDONALD
BRIDGEWATER GROUP



Notes:

1. The semi-variogram analysis includes the sediment chemistry datasets identified in Section 2 of the Contaminated Sediment 3D Extent Technical Memorandum.
2. The semi-variogram analysis was conducted in R using the gstat package. The variogram was fit automatically using a spherical model.

Figure A-8

PeCDF Semi-variogram, Surface Sediment

Prepared on: 9/11/2024
Contaminated Sediment 3D Extent
Swan Island Basin

PACIFIC groundwater GROUP
HGL
M MOTT MACDONALD
BRIDGEWATER GROUP

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