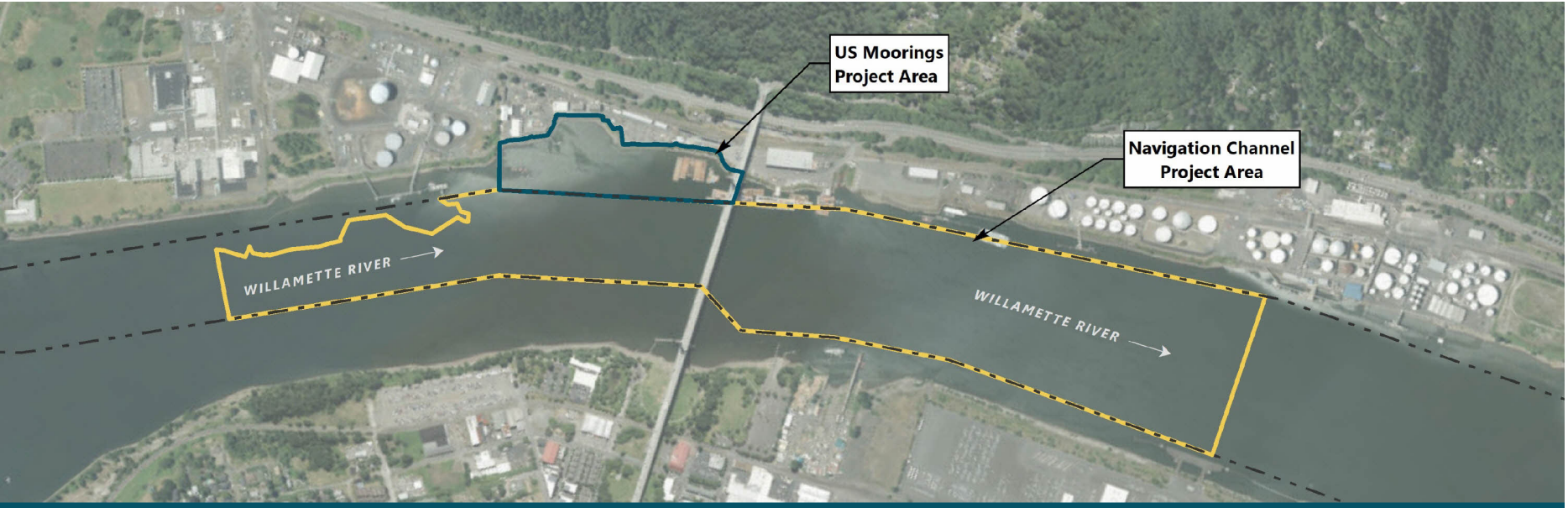


ANCHOR QEA

Navigation Channel Project Area and US Moorings Project Area – Introduction

Presented by
NW Natural and Anchor QEA

May 19, 2020

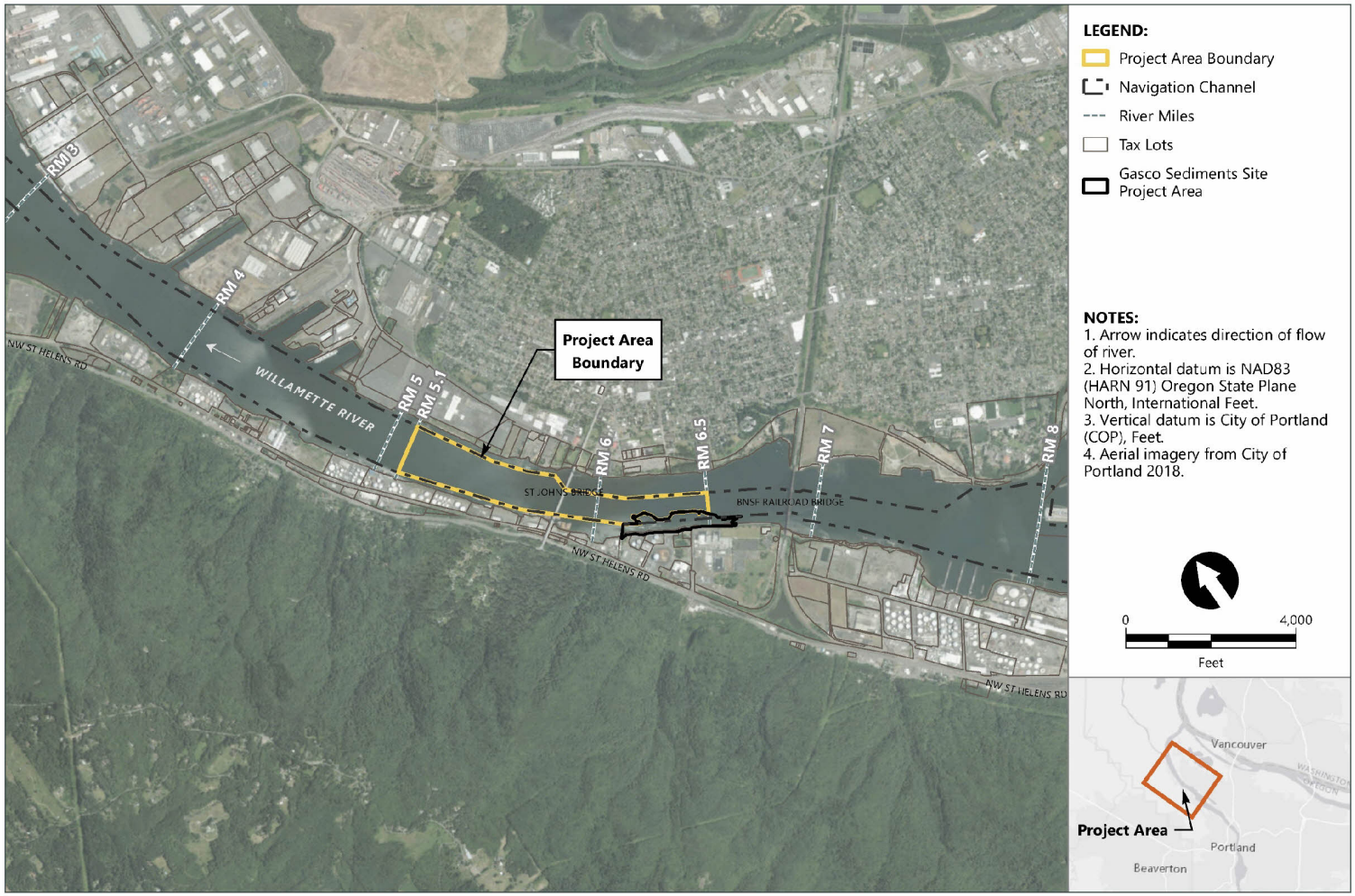
Agenda

- Introduction and Purpose
- Sufficiency Assessments – Navigation Channel and US Moorings Project Areas
- PDI Work Plan – Navigation Channel Project Area
- PDI Work Plan – US Moorings Project Area
- Path Forward and Schedule

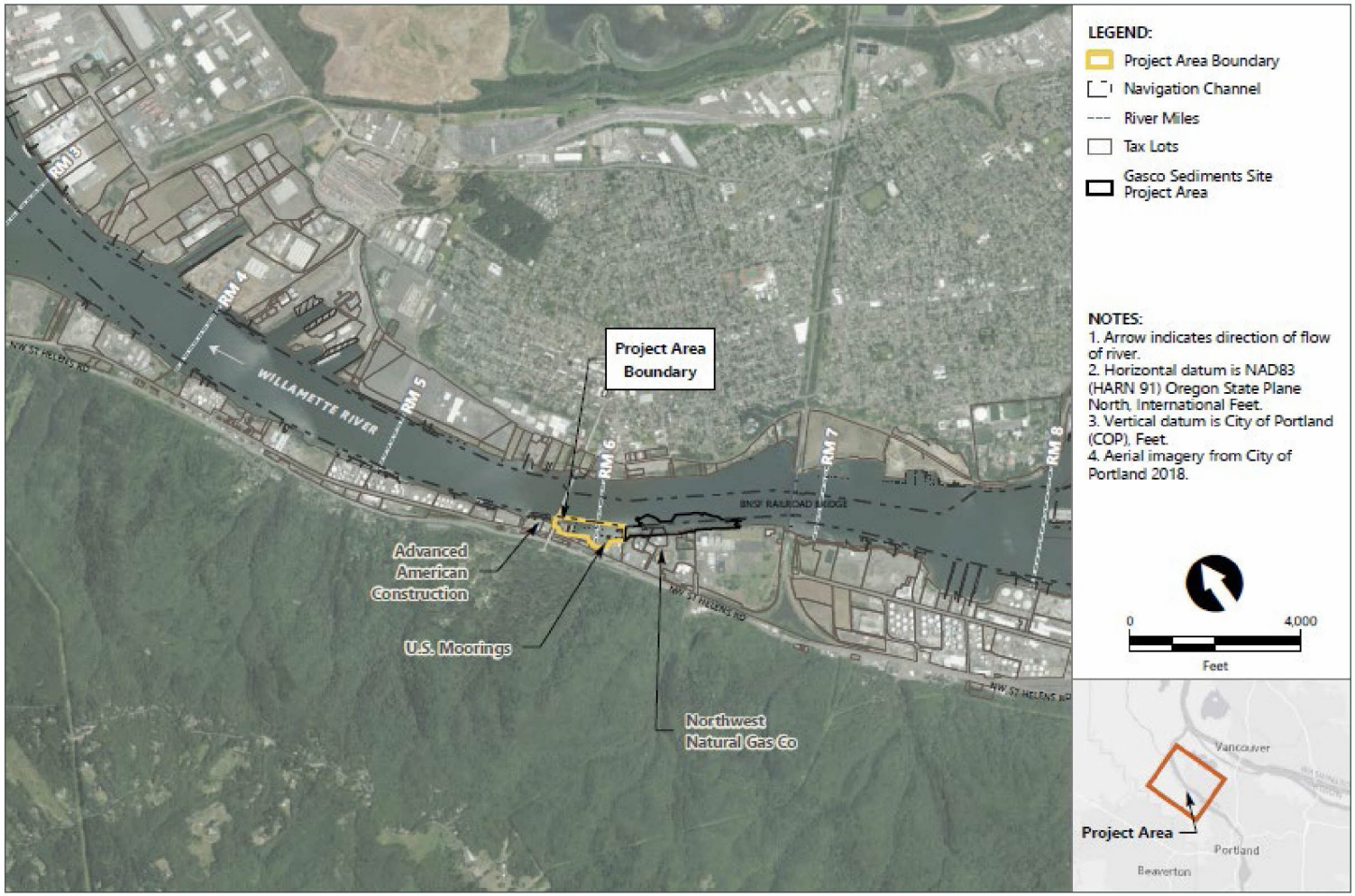
Introduction and Purpose

- NW Natural executed an *Administrative Settlement Agreement and Order on Consent for Removal Action Amendment No. 2* with EPA
- The scope of work includes completion of remedial design in the Navigation Channel and US Moorings Project Areas and the development of the following tasks:
  - Sufficiency Assessment
  - PDI Work Plan, PDI field activities, and PDI Evaluation Report
  - Basis of Design Report
  - Remedial Design Work Plan
  - Remedial Design (30%, 60%, 95%, and 100%)
- The first two elements of work required for both projects (Sufficiency Assessment and PDI Work Plans) can be performed concurrently, as described in this presentation

Navigation Channel Project Area



US Moorings Project Area



Schedule of Deliverables

Deliverable	Deadline
Draft Sufficiency Assessment Report	90 days after effective date of agreement
Final Sufficiency Assessment Report	45 days after EPA's comments on the draft Sufficiency Assessment Report
Draft PDI Work Plan	90 days after effective date of agreement
Final PDI Work Plan	45 days after EPA's comments on the draft PDI Work Plan
Draft PDI Evaluation Report	As set forth in the approved final PDI Work Plan
Final PDI Evaluation Report	As set forth in the approved final PDI Work Plan
Draft Basis of Design Report (BODR)	90 days after EPA approval of the final PDI Evaluation Report
Final BODR	45 days after EPA's comments on the draft BODR
Draft Remedial Design Work Plan (RDWP)	90 days after EPA's approval on the final BODR
Final RDWP	45 days after EPA's comments on the draft RDWP
Preliminary Remedial Design (30%)	As set forth in the approved final RDWP, work on the 30% design will begin prior to completion of the PDI reports but will not be completed until after the PDI reports are completed
Intermediate Remedial Design (60%)	As set forth in the approved final RDWP
Pre-Final Remedial Design (95%)	As set forth in the approved final RDWP
Final Remedial Design (100%)	As set forth in the approved final RDWP
Progress Reports	Quarterly

Sufficiency Assessments – Navigation Channel and US Moorings Project Areas

Sufficiency Assessment Objectives

Page 32 of Amendment No. 2 states:

> *"The objective of the Sufficiency Assessment is to evaluate upland (direct discharges, groundwater, river bank, overwater) and in-water sources of contaminants to determine whether they have been adequately investigated and sufficiently controlled or considered such that the RA can proceed. The Sufficiency Assessment will consider whether upland (direct discharges, groundwater, river bank, overwater) and in-water sources will adversely impact the short- or long-term effectiveness of the proposed RA."*

Sufficiency Assessment Content

- Will achieve the requirements set forth in Section 3.1 of Amendment No. 2
- Sediment remedy recontamination based on exceedances of Record of Decision (ROD) Table 21 remedial action levels (RAL)/principal threat waste (PTW)-highly toxic threshold exceedances
- For upland water media (groundwater, stormwater, direct discharge), recontamination potential chemicals (RPCs) will be determined by a surface sediment point-by-point and surface-weighted average concentration screening process; the screened-in RPCs will then be used for the upland water media pathway screening. RPCs will not be used to reduce the list of ROD Table 21 COCs evaluated during remedial design.
- Will evaluate both the potential for recontamination from applicable migration pathways as well as whether known sources have been adequately investigated and sufficiently controlled or considered such that RA can proceed

Sufficiency Assessment Content (cont.)

- Will consider potential impacts from the following sources:
  - In-water sources of recontamination
  - Resuspension of sediments from natural and anthropogenic activities
  - Factors that may impact sediment cap effectiveness
  - Potential future use for nearshore land and in-water uses
  - Other future conditions (e.g., seismic and climate change impacts) that may impact recontamination potential
  - Upland pathways (direct discharges, groundwater, riverbank, and overwater)

PDI Work Plan – Navigation Channel Project Area

PDI Work Plan Objectives

- Obtain data needed to fully support remedial design, performed in two phases:
  - **Phase 1:** Refine the sediment management areas (SMAs) consistent with the ROD methodologies
    - Tiered surface sediment collection around the perimeter of the footprint
    - Depth of contamination (DOC) in areas with existing subsurface exceedances
    - Contingent near-bottom surface water and benthic toxicity testing to assess ROD Remedial Action Objectives (RAOs) 3 and 5, respectively
  - **Phase 2:** Perform sampling needed to evaluate dredging and capping remedial technologies performance in the refined SMA footprint (to be described in a brief PDI Work Plan Addendum)
    - If capping is determined to be feasible, NW Natural will propose the collection of sufficient PDI data to complete the site-specific chemical isolation capping demonstration detailed in the EPA-approved *Final Pre-Remedial Design Technical Evaluations Work Plan* prepared by NW Natural dated August 2019

PDI Work Plan Objectives (cont.)

- Perform Phase 1 under an expedited schedule (September 2020); PDI Work Plan submitted on May 15, 2020
- Full existing dataset used—no pre-sampling data replacement

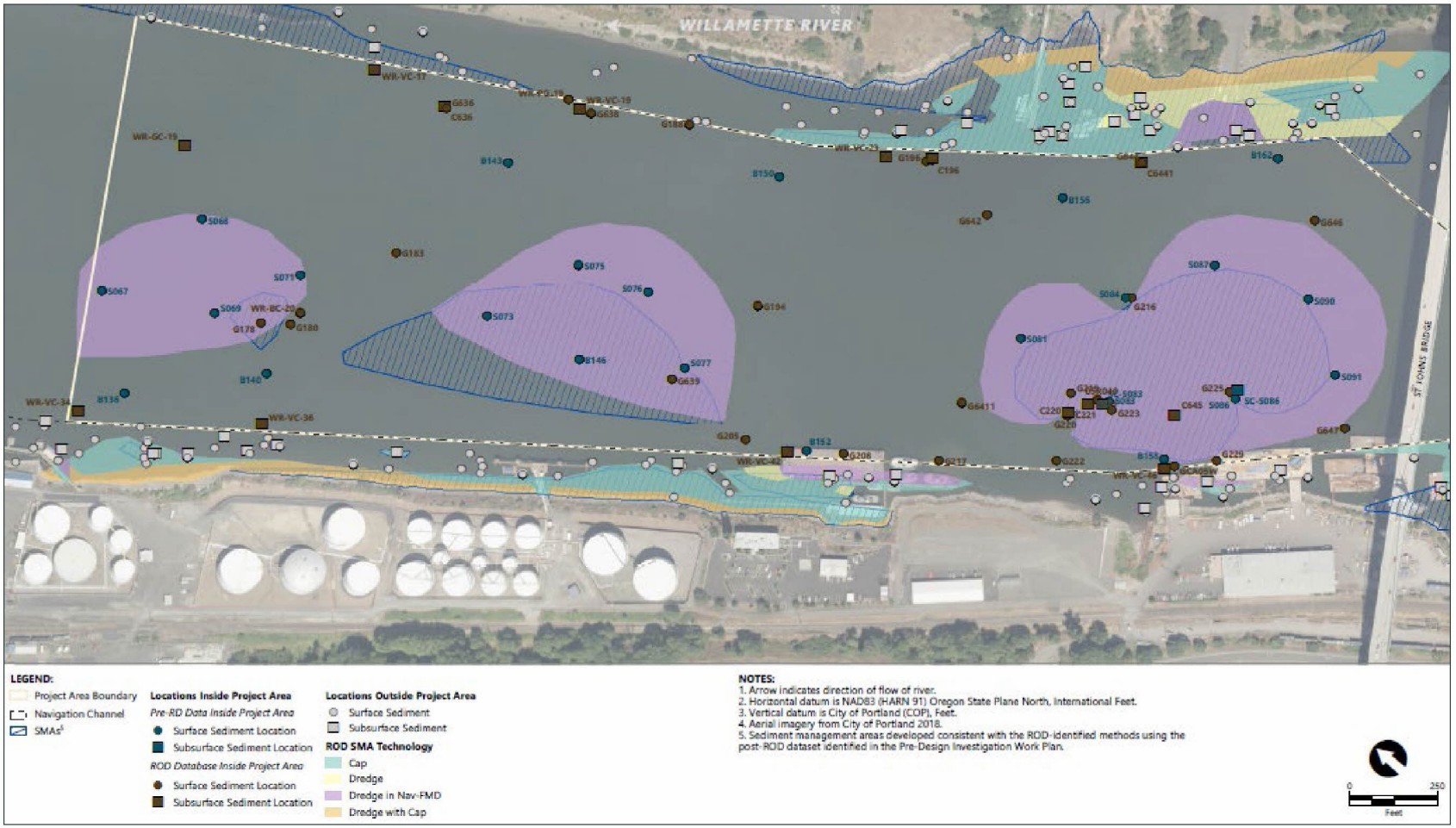
PDI Work Plan Proposed Scope of Work (Phase 1)

- SMA refinement: Three-point composite surface (0- to 1-foot) grab samples at less than 150-foot spacing with tiered analysis of chemicals containing ROD Table 21 RALs/PTW-highly toxic thresholds
  - 30 expedited surface grab samples
  - 28 contingent surface grab samples
  - 8 standard surface grab samples
- RAO 5 evaluations: Up to seven contingent bioassay surface grab samples
  - 10-day survival and biomass test using the midge *Chironomus* dilutes
  - 28-day survival and biomass test using the amphipod *Hyalella azteca*

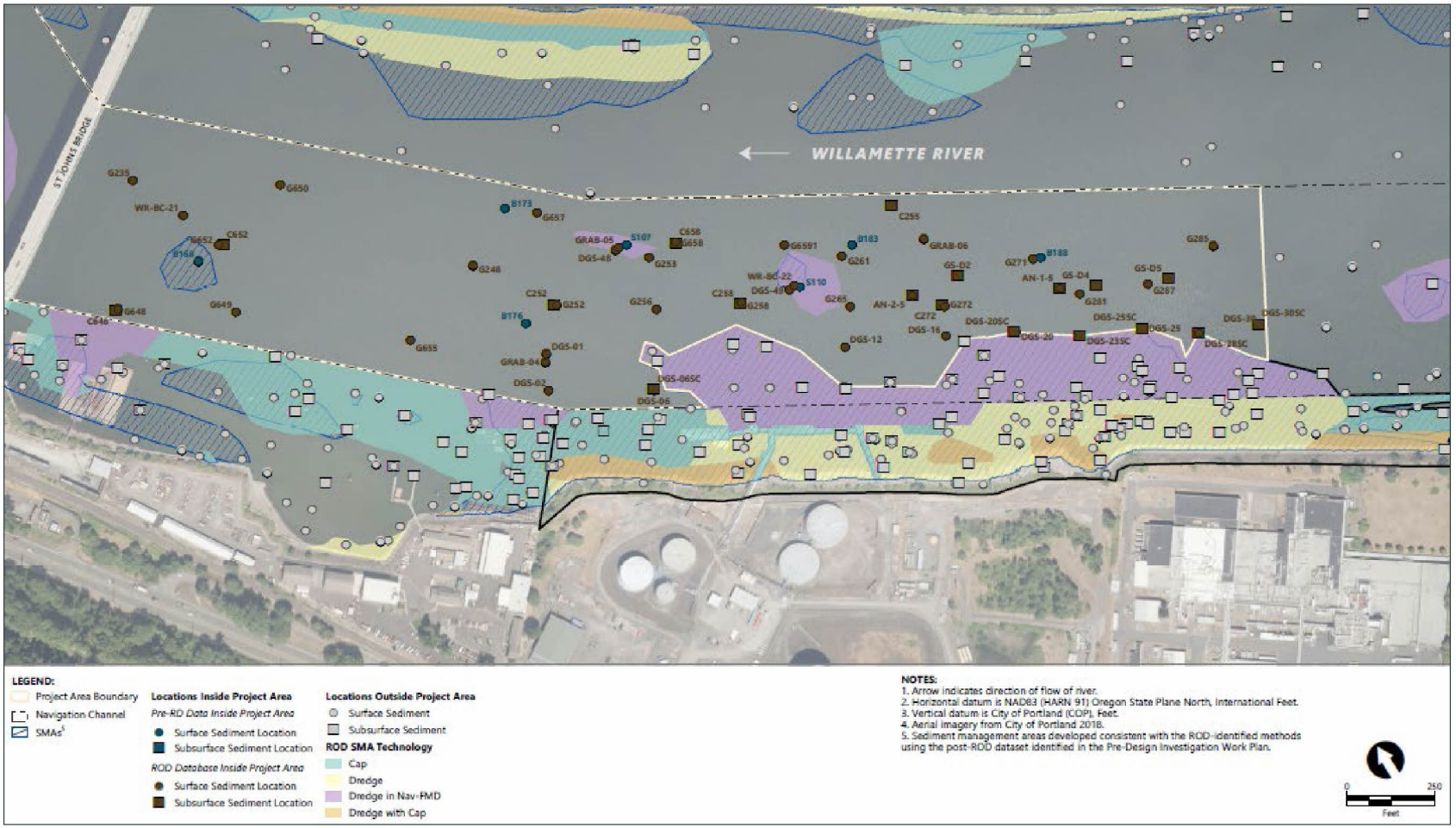
PDI Work Plan Proposed Scope of Work (Phase 1) (cont.)

- **RAO 3 evaluations:** Up to seven contingent near-bottom surface water samples (co-located with bioassay surface grab locations) with analysis of chemicals containing ROD Table 17 surface water cleanup levels (CULs)
- **DOC evaluations:** Two DOC sediment cores (20-foot cores) with analysis of chemicals containing ROD Table 21 RALs/PTW-highly toxic thresholds

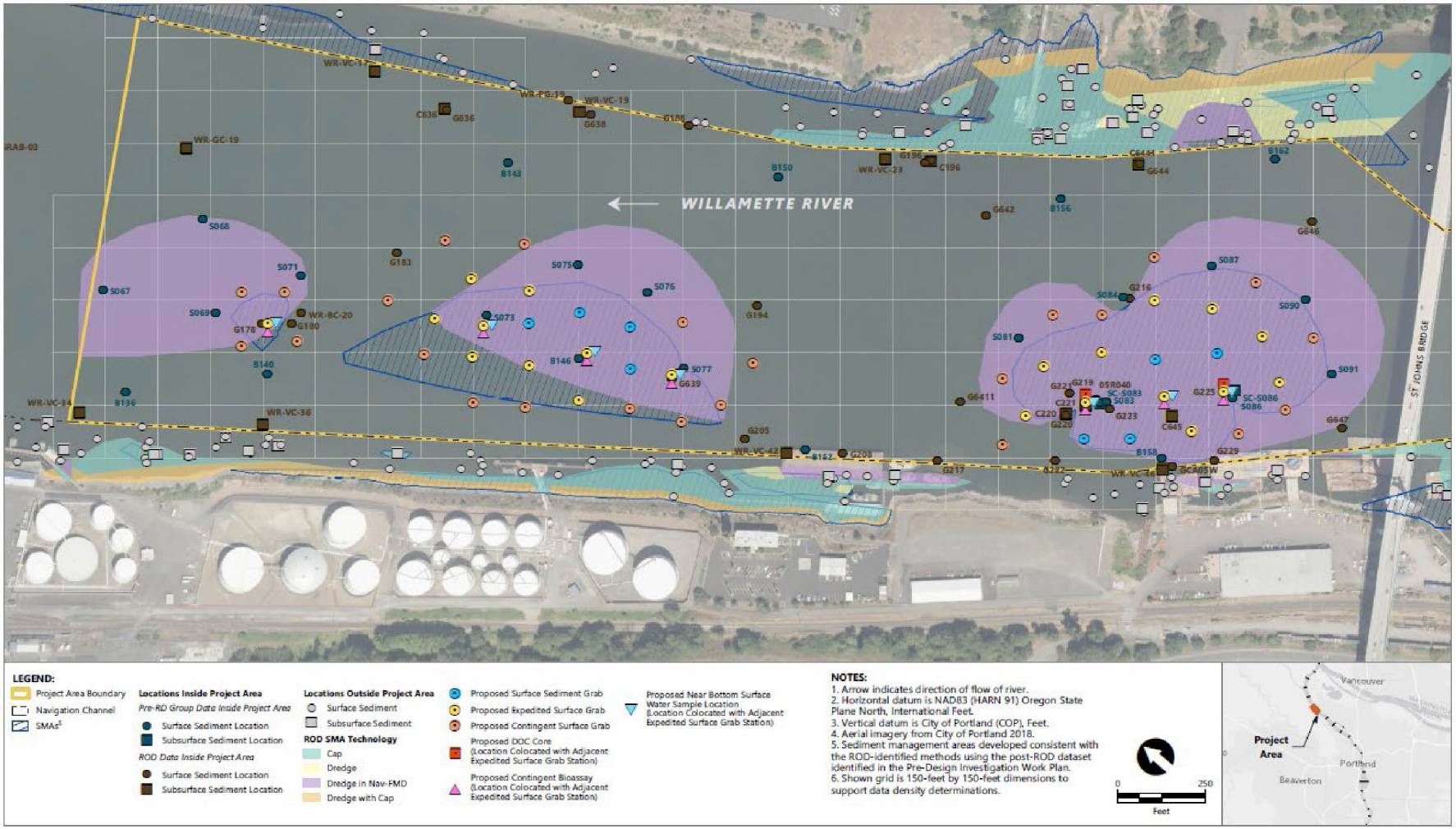
PDI Work Plan – Existing Data



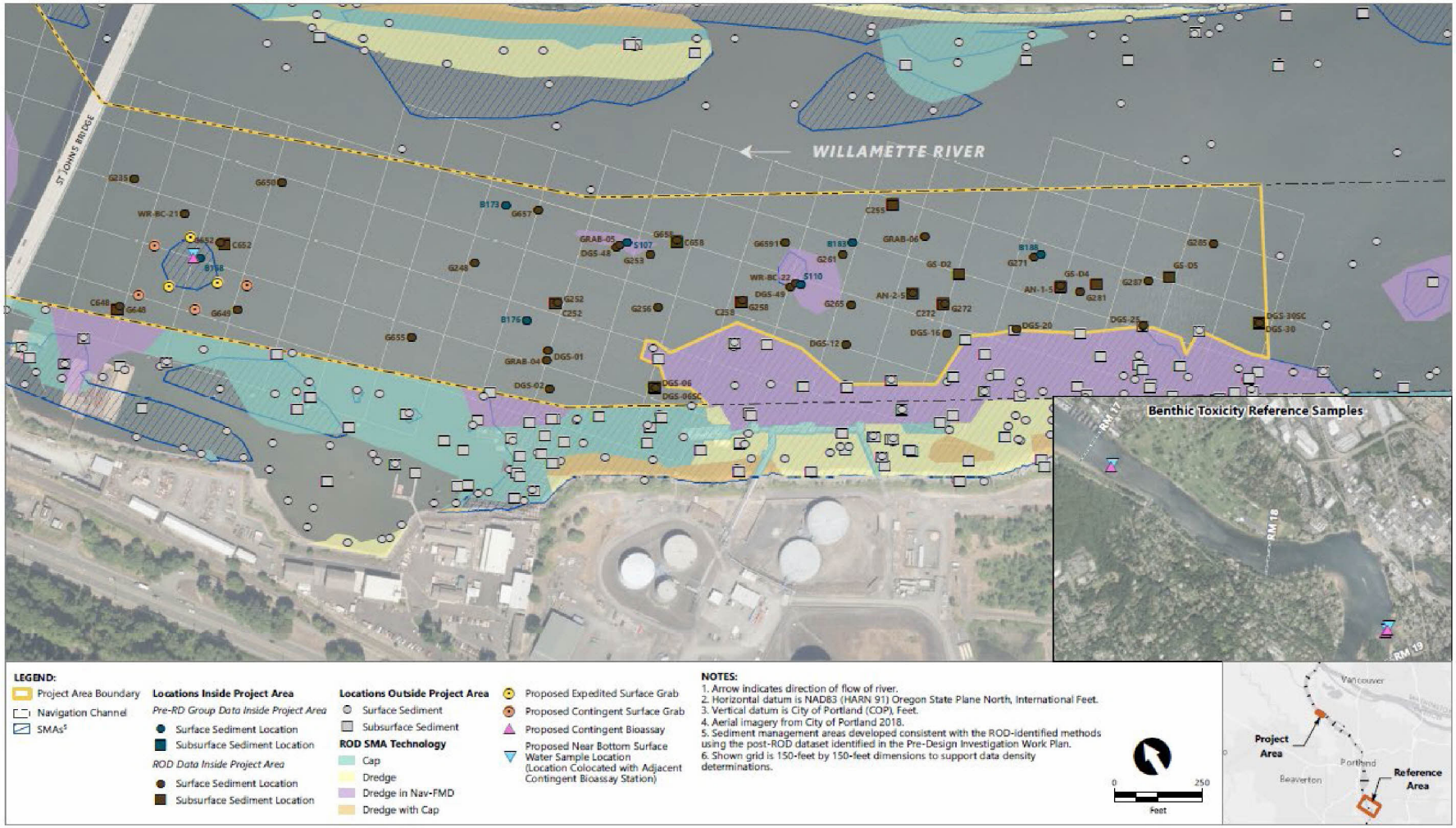
PDI Work Plan – Existing Data (cont.)



PDI Work Plan – Proposed Data Collection



PDI Work Plan – Proposed Data Collection (cont.)



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PDI Work Plan – US Moorings Project Area

PDI Work Plan Objectives

- Obtain data needed to fully support remedial design, performed in two phases:
  - **Phase 1:** Perform surface and subsurface sediment sampling to refine the SMA and obtain initial design-level data to evaluate dredging and capping remedial technologies throughout the refined SMA
  - **Phase 2:** Based on the Phase 1 findings, perform additional sampling to evaluate dredge barge dewatering, dredge material disposal characterization, and advective flux in capping areas; this work would be described in a brief PDI Work Plan Addendum
    - If capping is determined to be feasible, NW Natural will propose the collection of sufficient PDI data to complete the site-specific chemical isolation capping demonstration detailed in the EPA-approved *Final Pre-Remedial Design Technical Evaluations Work Plan* prepared by NW Natural dated August 2019

PDI Work Plan Objectives (cont.)

- Perform Phase 1 under an expedited schedule (September 2020); PDI Work Plan will be submitted ahead of the submittal deadline (mid-May 2020)
- Full existing dataset used—no pre-sampling data replacement

PDI Work Plan Proposed Scope of Work (Phase 1)

- **SMA refinement:** Three-point composite surface (0- to 1-foot) grab samples at less than 150-foot spacing with analysis of chemicals containing ROD Table 21 RALs/PTW-highly toxic thresholds
  - 53 expedited surface grab samples
  - 8 contingent surface grab samples
- **Dredging evaluation:** 16-foot (nearshore) and 20-foot (offshore) cores at less than 150-foot spacing with analysis of chemicals containing ROD Table 21 RALs/PTW thresholds
  - 51 standard and 8 contingent DOC cores
  - Analysis of up to seven consecutive 1-foot depth intervals initiating 1 foot above the visually contaminated depth of impact
  - DOC defined as upper sampling depth that contains 2 consecutive feet of no RAL/PTW exceedances

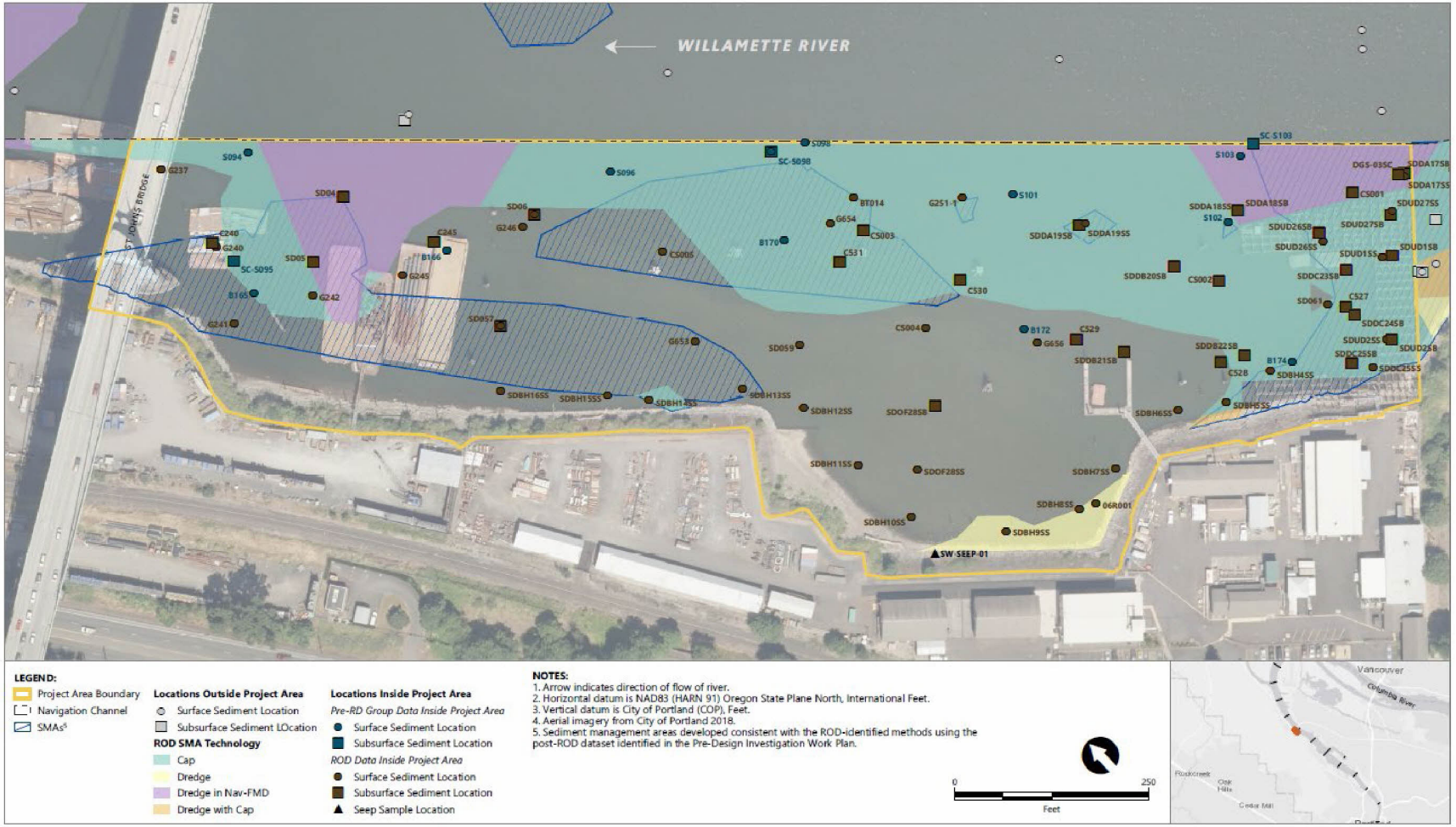
PDI Work Plan Proposed Scope of Work (Phase 1) (cont.)

- **Capping demonstration:** 20-foot cores at less than 150-foot spacing with analysis of chemicals containing ROD Table 17 groundwater CULs
  - 51 standard and 8 contingent cores
  - Analysis of consecutive 2-foot composite intervals over the entire length of recovered sediment
  - Physical testing: total organic carbon, total solids, moisture content, specific gravity, grain size, and Atterberg Limits

PDI Work Plan Proposed Scope of Work (Phase 1) (cont.)

- **Riverbank remedy evaluation:** Three-point composite riverbank surface (0- to 1-foot) grab samples and top of riverbank angled borings at less than 150-foot spacing
  - 13 surface grab samples of erodible riverbank soils (where present)
  - Bulk soil/sediment samples from 0 to 10 feet, 10 to 20 feet, and 20 feet to top of toe of riverbank core elevation—collected using sonic drilling methods
  - Analyze for chemicals containing ROD Table 21 RALs and PTW-highly toxic thresholds and ROD Table 17 riverbank soil/sediment CULs

PDI Work Plan – Existing Data



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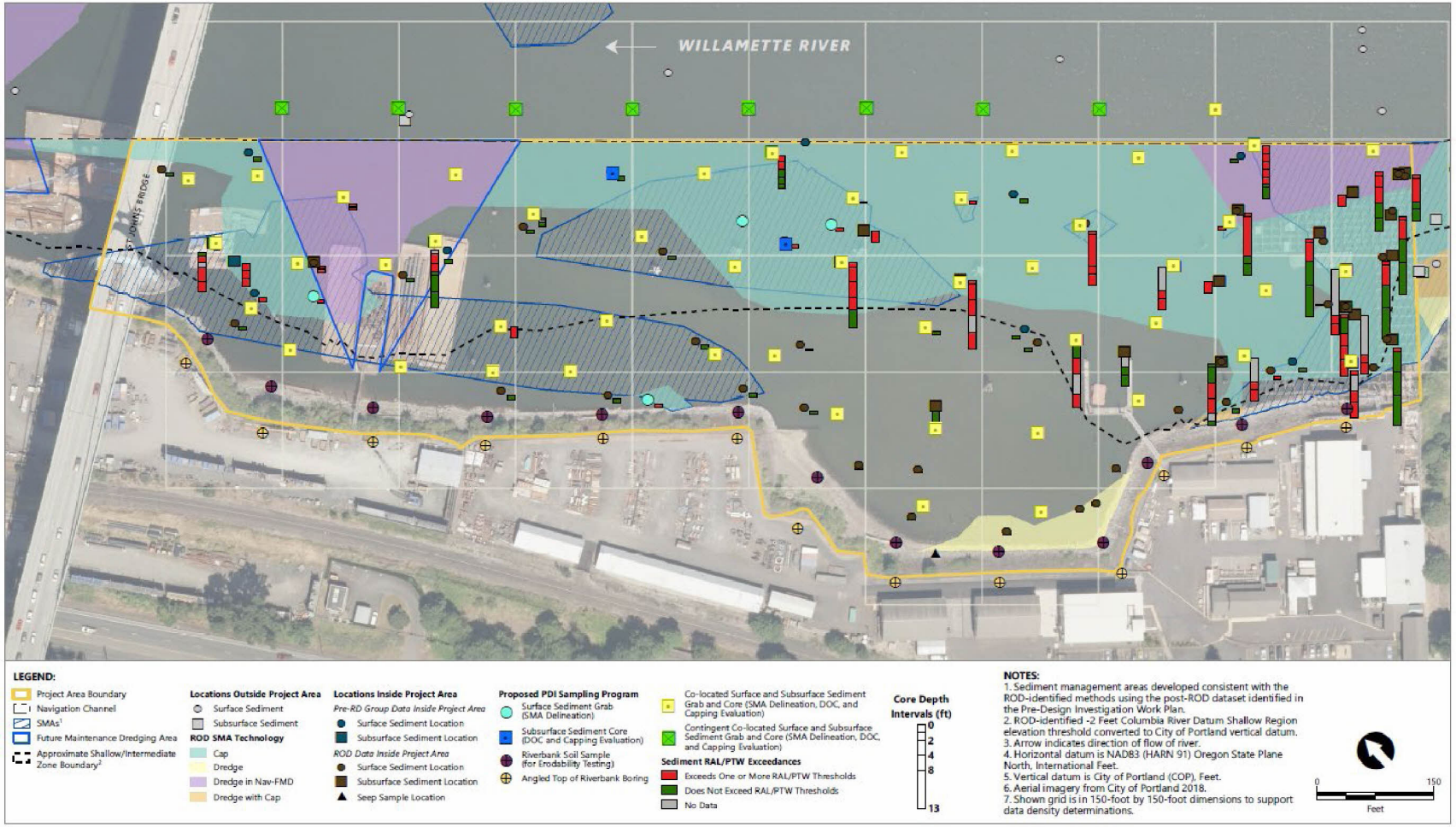
PDI Work Plan – Proposed Data Collection



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Path Forward and Schedule

- NW Natural proposes the following staggered submittal timelines for each document to minimize overlapping reviews
  - Navigation Channel PDI Work Plan: May 15, 2020
  - Navigation Channel Sufficiency Assessment: first week in June
  - US Moorings PDI Work Plan: second week in June
  - US Moorings Sufficiency Assessment: third week in June

Questions/Discussion