PORTLAND HARBOR RI/FS

# ROUND 3B
# SIDE-SCAN SONAR
# FIELD SAMPLING PLAN

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**Recommended for Inclusion in Administrative Record**

April 2008

**Prepared for:**
The Lower Willamette Group

**Prepared by:**
Anchor Environmental, L.L.C.

AE08-01

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# LIST OF ACRONYMS

| | |
|---|---|
| **AOPC** | Area of Potential Concern |
| **CTP/SVP** | Conductivity Temperature Depth/Sound Velocity Profile |
| **DGPS** | differential global positioning system |
| **EPA** | U.S. Environmental Protection Agency |
| **FSP** | Field Sampling Plan |
| **LWG** | Lower Willamette Group |
| **NAD** | North American Datum |
| **NOAA** | National Oceanographic and Atmospheric Administration |
| **NOS** | National Ocean Service |
| **PDOP** | Percent Dilution of Position |
| **POS/MV** | Position and Orientation System for Marine Vessels |
| **QA/QC** | Quality assurance/quality control |
| **RI/FS** | Remedial Investigation/Feasibility Study |
| **RM** | River Mile |

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# 1.0 INTRODUCTION

This Side-Scan Sonar Field Sampling Plan (FSP) presents the approach and procedures to implement supplemental side-scan sonar survey activities for the Remedial Investigation/ Feasibility Study (RI/FS) of the Portland Harbor Superfund Site (Site; Figure 1-1). The need for such a survey was identified in the *Comprehensive Round 2 Site Characterization Summary and Data Gaps Analysis Report* (Integral 2007).

This FSP describes the procedures to identify areas of debris and unknown submerged structures within the river. The survey will include the navigation channel as well as the slope from the river channel bottom to the water line along both shores on the day of the survey. Data collected by the proposed survey will augment information obtained in previous investigations.

## 1.1 BACKGROUND

Two rounds of data collection have taken place for the project since 2001 and a third and final data collection round is underway. In February 2007, the *Comprehensive Round 2 Site Characterization Summary and Data Gaps Analysis Report* was completed and describes findings from the first two rounds of data collection and identification of any remaining data gaps. The report identifies the lack of side-scan sonar imagery as a data gap and states that once final areas of potential concern (AOPCs) have been identified, it will be necessary to conduct a side-scan sonar survey of each of these AOPCs to determine the presence, nature, and extent of any debris in the sediment surface (e.g., submerged logs and structures) of these areas. It may be some time before final AOPCs are identified. Consequently, to keep the project on schedule, we propose in this FSP a side-scan sonar survey of the entire Portland Harbor Site.

## 1.2 SURVEY OBJECTIVES

The objectives of the side-scan survey are:

- To survey and map bottom features between river miles (RMs) 1 and 12.2 (Figure 1-1) in the Lower Willamette River, which includes approximately 2,000 feet at the mouth of the Multnomah Channel, to determine the approximate distribution of debris in the river channel and along both banks of the river to support decision making processes related to the FS.

- To conduct additional processing of side-scan sonar data collected in this survey that will allow for the generation of mosaic imagery of sediment surface textures (i.e., sands, fines, etc.) throughout the survey area.

To set the data quality objectives (DQO) to meet the above overall study objectives the steps in the EPA DQO process were followed in a focused format as follows:

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- State the Problem – The presence of debris (e.g., logs, boulders, etc.) and or submerged structures (e.g., old pilings) could impact the feasibility and cost of alternatives (e.g., dredging) evaluated in the FS. To ensure the FS can address feasibility issues, a survey of such submerged features is needed.

- Identify the Decision – Where and to what extent is debris or submerged structures present that could substantially impact the feasibility and cost of remedial alternatives? Where debris is not apparent, no additional feasibility or cost implications will be considered in the remedial alternatives. Where debris is present the general nature and extent of that debris can be factored into feasibility and cost analyses in the FS. For example, submerged log beds may first need to be removed mechanically before mechanical or hydraulic dredging could take place in such areas.

- Identify the Inputs to the Decision – Side scan sonar surveys are the quickest way to map submerged debris or similar and give sufficient information to assess the general feasibility and cost issues for an FS level evaluation (i.e., it will not provide design level information).

- Define the Boundaries of the Study – The study area has been defined by EPA for the FS. The side scan survey will cover the all areas addressed by the FS.

- Develop a Decision Rule:

  – Debris: Maximum resolution/minimum debris-size criterion: Any single piece of debris or structures greater than 0.5 m (in any dimension) would impact clean-up feasibility and cost evaluations, particularly where such debris occurs over extended areas. This size criterion reflects the dimensions of material that can be readily picked up by a mechanical dredge, removed with hydraulic dredge, and/or be capped with a reasonable depth of new material. Isolated materials less than 0.5 m (in any dimension) are not likely to greatly impact the feasibility or cost of remedial technologies.

  – Sediment texture: Grain size features (e.g., the presence of gravel) can also impact the feasibility of some likely technologies (e.g., dredging). Grain size characteristics can be assessed through previously collected grain size samples as well as the sediment texture information provided by this study's technologies.

  – Scan coverage**:** Gaps in scan coverage reduce understanding of the nature and extent of debris. Presence of debris in small gaps can be predicted using conservative assumptions about the presence and variability of debris in surrounding areas. Uncertainty about debris

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presence in data gaps will increase with the size of the scan gap and the variability in debris presence in surrounding areas. Where debris is found in scattered patches, fairly complete mapping will be needed and no scan gaps greater than the minimum size criterion for debris should exist. Where debris coverage is heavy and complete, larger gaps in data may be acceptable. Real time mapping of bottom coverage will be used to assure that no gaps in coverage occur in debris maps that would lead to uncertainty about what is present in unsurveyed areas. Coverage should be the same in channel and shoreline areas. Also, if there are substantial gaps in scan coverage, this may impede the ability to map an accurate nature and extent of debris. Small gaps are tolerable given that conservative assumptions about the presence of debris based on nearby information can be made and will not likely greatly impact FS level decisions. Coverage should be the same in channel and shoreline areas.

- Specify Limits on Decision Errors – If resolution is much poorer than the 0.5 m, it may impact feasibility study decisions. As an approximate estimate, greater than plus 50% error (e.g., only objects of 0.75 m or greater can be resolved) may have some impact on feasibility study decisions. Levels below plus 50% error are therefore desirable.

  Also, to obtain scan coverage with minimal gaps, a minimum of 160 percent with sufficient trackline overlap to produce imagery at nadir where possible is desired. Again, small gaps in coverage are acceptable given the FS level analysis needed and would not be cause for re-survey.

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# 2.0 SURVEY APPROACH AND RATIONALE

This Side-Scan Sonar FSP presents the approach and procedures to implement supplemental side-scan sonar survey activities for the RI/FS of the Portland Harbor Superfund Site (Site; Figure 1-1). The need for such a survey was identified in the Comprehensive Round 2 Site Characterization Summary and Data Gaps Analysis Report (Integral 2007). Because the presence of any unknown debris or structures can substantially impact removal and/or capping in such areas, collection of this information is potentially critical to determining the effectiveness, feasibility, and costs of remedial alternatives evaluated during the FS.

This FSP describes the procedures to identify areas of debris and unknown submerged structures along the shorelines on both sides of the river. The survey will include the navigation channel, as well as the slope from the river channel bottom to the water line along both shores on the day of the survey. Data collected by the proposed survey will augment information obtained in previous investigations.

## 2.1 DATA NEEDS

Side-scan sonar technology has the ability to map the river bottom and produce imagery showing the locations and size of submerged debris, submerged structures, and bottom features such as riprap and rock that are otherwise unknown from other site investigations. Because the presence of substantial unknown debris or structures can substantially impact removal and/or capping in such areas, collection of this information is potentially critical to determining the effectiveness, feasibility, and costs of remedial alternatives for the FS. Additional processing of proposed side-scan sonar survey data will provide information within the survey area on riverbed sediment textures such as silts and sand at the time of the survey. The information obtained from the side-scan sonar survey will be used directly in the FS evaluation to assess the feasibility of capping and dredging options, both of which are affected in terms of cost, logistics, and environmental effectiveness by the presence of large amounts of debris or structures.

## 2.2 SURVEY SPATIAL EXTENT

The side-scan survey will be conducted from shoreline to shoreline between RMs 1 and 12.2 (Figure 1-1) in the Lower Willamette River, and will include approximately 2,000 feet at the mouth of the Multnomah Channel, to determine the approximate distribution of debris in the river channel and along both banks. It is anticipated that there may be areas where side-scan sonar data acquisition is limited. Likely areas include narrow areas between dock structures and the shoreline where survey tracklines are unobtainable, and in areas within sonar shadows caused by larger structures along the shoreline. However, as stated in Section 1.2, data gaps may be interpreted by the materials on either side of the data gap (e.g., bottom features in the image shadows caused by pilings along the shore).

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## 2.3 SURVEY SCHEDULE

Side-scan sonar data is best collected during high water to capture the greatest amount of data possible along the shorelines. Therefore, the survey is proposed for the spring freshet on the Columbia River, typically in late May/early June, when river stage on the Willamette River is high and flows are relatively low. The survey is expected to take from 3 to 4 days to complete, depending on whether additional time is required to survey between docks, run extra tracklines in wider areas of the river, or repeat survey tracklines where survey resolution is below required project quality assurance levels as described in Section 4.4.

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# 3.0 DATA ACQUISITION

This section describes the methods used for data acquisition. The survey vessel will move along tracklines parallel to shore between RM 1 and RM 12.2, and will include approximately 2,000 feet at the mouth of the Multnomah Channel, to obtain side-scan sonar images of the river channel and each shoreline upward to the waterline (Figure 3-1). The survey will focus on the shoreline areas because this is where submerged debris and structures will most likely exist. The river channel is not expected to have submerged structures due to maintenance dredging, and any submerged debris is much more likely to be transitory in the main channel. However, the survey will include the river channel as there may be debris in some areas away from the banks.

## 3.1 SURVEY VESSEL

The surveys will be collected using a shallow draft vessel operated by Global Remote Sensing of Seattle, Washington. The vessel is capable of towing side-scan sonar equipment from the bow at slow speeds.

## 3.2 NAVIGATION

Differential Global Positioning System (DGPS) will be used for vessel positioning. Real-time differential corrections will be obtained from the nearest Coast Guard beacon installation, improving horizontal positional accuracy to less than ± 3 meters. Survey navigation control and data acquisition will be accomplished using the HYPACK survey system integrated with the Position and Orientation System for Marine Vessels (POS/MV) inertial navigation system that has the capability to maintain position data continuity and accuracy under bridges and near large structures during times of low DGPS coverage or DGPS outages.

During the survey, the DGPS antenna will be located at the tow point of the side-scan tow cable. Layback information (position of the towfish in relation to the DGPS antennae) will be input to the navigation system to correct for the distance from the DGPS antenna and the towfish. If configurations change due to towfish depth or vessel speed, the offsets will be adjusted accordingly. Layback information is calculated automatically in the HYPACK navigation system by data received based on the length of tow cable deployed and the recorded depth from the depth sensor integrated with the data provided by the side-scan sonar device.

Position coordinates will be referenced in International feet to Oregon State Plane, Northern Zone, North American Datum (NAD) 83. Navigation quality control procedures are discussed in more detail in Section 4.

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## 3.3 SONAR EQUIPMENT

Data will be collected using a Benthos C3-D high resolution side-scan sonar device, or comparable equipment deployed off the bow of the survey vessel. A shipboard data acquisition and image processing system will be used to acquire, store, and process all side-scan sonar data. The system will also act as an interface between the navigation system and acoustic systems and provide real-time georeferencing of all data.

## 3.4 DATA COLLECTION

The side-scan sonar data will be collected at a frequency of 200 khz to achieve a very high resolution image of substrate topography. The DGPS data collected will be integrated with the sonar data to facilitate accurate georeferencing of the sonar data.

The side-scan sonar system will be operated such that it is capable of resolving an object on the riverbed that measures 0.5 meters x 0.5 meters x 0.5 meters (as determined by shadow length measurements) in the outer range limits. The system will be towed at a speed and range that allows a minimum of 3 to 4 pings per 0.5 meter of track distance. Higher resolution is possible; however, a resolution of 0.5 meters in the outer ranges was chosen because it meets the survey DQOs and it represents the minimum resolution to maintain a reasonable data file size.

Survey tracks will run parallel to the shoreline as practicable. The width of the scan swath will be less than or equal to 100-m (328 feet) on each side of the trackline (towfish) and the distance between tracklines will be adjusted to ensure sufficient overlap of swath data to ensure a minimum of 160 percent coverage of the bottom and sufficient data overlap to produce imagery at nadir. When external factors such as inclement weather or changes in the water column distort the outer portions of the range, the scan width will be reduced to maintain resolution requirements.

With a 200-meter swath, areas encompassing the navigation channel, the slope up from the navigation channel, the nearshore bench areas (present in many areas of the river), and both shorelines up to the water line on the day of the survey will be mapped with three to five passes along much of the survey area. In some cases where docks, piers, and other obstructions are encountered, an additional pass will be made between the obstruction and the shoreline if space allows. In some cases, piers and shoreline structures will prevent complete imaging of the overlap.

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# 4.0 SIDE-SCAN SURVEY DATA QUALITY ASSURANCE/QUALITY CONTROL

This section describes the specific quality assurance/quality control (QC/QC) procedures to be used in the collection of side-scan sonar data and the decision making process to determine when data acquisition does not meet project standards and when additional data acquisition is required. Standard techniques for side-scan sonar quality assurance generally follow National Ocean Service (NOS) guidance documentation (NOAA 2007) with specific project QA/QC methodology documented in this section.

## 4.1 SOUND VELOCITY

Full water depth sound velocity casts will be performed prior to and after the survey using a Seabird CTD/SVP, or equivalent velocimeter. The sound velocity profiles are required for accurate processing the side-scan sonar data to account for travel time and refraction due to changes in sound speed through the water column.

## 4.2 CONFIDENCE CHECKS

Confidence checks of data acquisition shall be performed prior to and following the survey. Confidence checks involve the collection of survey data of a known stationery object by passing the object with the sonar equipment in opposite directions. Real time data acquisition of the object is compared for both passes to assess the accuracy of layback information and latency of DGPS data inputs. Data acquired from both passes should indicate the object as being the same size and in the same location. Discrepancies in layback and latency inputs will be adjusted in the HYPAC system accordingly.

## 4.3 TRACKLINE SPACING

Project specific trackline spacing requires a minimum of 160 percent coverage of the bottom to ensure data collection at nadir where possible. Real time mapping outputs in the HYPACK system allows for a real time check of total area coverage so that areas of incomplete coverage can be re-surveyed by making additional survey passes. Generally, at the end of each survey day, a coverage map is generated by the contractor so that areas of incomplete coverage can be assessed and re-surveyed in subsequent survey days.

## 4.4 TRACKLINE RANGE RESOLUTION

During the survey, the survey technician has the ability to assess, on a real time basis, data quality by observing the signal to noise ratio and observable distortion at the outer limits of the survey trackline. Ensonification rates (pings per meter distance) based on settings in the

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HYPACK data acquisition system will be monitored during the survey to ensure that appropriate range setting are correct for the highest resolution at the outer ranges of each trackline. Vessel speed is monitored through the HYPACK survey acquisition system and modifications can be made on board to assure the most accurate survey data.

## 4.5 RE-SURVEY DECISION MAKING PROCESS

The decision to re-survey an area is based on the factors:

- Coverage – If, during real time coverage mapping or at the end of the day, coverage mapping reveals that a survey segment has less than a minimum of 160 percent areal coverage, the area will be re-surveyed to complete coverage.
- Range distortion – When outer trackline range distortions caused by excessive heave, pitch, and roll (signal noise) of the vessel are observed, tracklines will be re-surveyed. The determination that the resolution at the outer range of the tracklines is within project specification relies heavily on the experience of the operator. In real time, the operator is observing the quality of the data and will determine when re-survey is advised.
- Signal to noise ratio – When the signal to noise ratio recorded in the HYPACK data acquisition equipment indicates poor data quality, tracklines will be re-surveyed. A signal to noise ratio of 5 dB or greater is required. The signal must be at least 1.5 times the noise signal for adequate resolution. Greater ratios will require re-surveying. Signal to noise data is recorded in the HYPACK acquisition for real time observations and the operator will determine when re-survey is advised.
- Positional integrity – Differential positioning integrity shall be maintained to a PDOP of more than 3.0. Survey tracklines where PDOP increases above 3.0 or differential coverage is interrupted and the inertial navigation system is unreliable, the survey trackline portion will be re-surveyed.

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# 5.0 DATA COMPILATION AND REPORTING

Data analysis will be conducted using the digital data obtained in the field. Because the data will be available almost immediately after the field cruise, the field sampling and data reports will be combined into one data report. Within 90 days of the completion of the field work, Anchor will provide a data report to EPA that will include:

- A brief narrative of the field activities that includes the survey dates, identification of the equipment used, methodology, any problems encountered during the survey, quality control procedures used, quality control results, and any field cruise information relevant to the interpretation of the data.
- Compilation of any annotations or observations by field technicians and any other information that is relevant to the interpretation of the mosaics.
- Figures showing the survey transect lines and percent coverage.
- Figures showing the synthesized mosaic images of the side-scan sonar data. Hard copy mosaics with 1 inch to 100 feet scale will identify rocks, logs, piling, submerged structures, debris, riprap, etc. Data acquisition will account for a mosaic deliverable resolution of at least 25 cm but not more than 10 cm.
- Figures showing sediment surface textures (i.e., sands, fines, etc.) throughout the survey area.
- Brief text interpretation of images to identify areas of substantial submerged debris or structures.
- A CD containing an electronic file of the synthesized mosaic images.

The data report will not discuss the potential implications of any found debris or structures for the FS. Use and interpretation of this information for evaluation of cleanup alternatives will be contained within the project FS.

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# 6.0 REFERENCES

Integral. 2007. Portland Harbor RI/FS. Comprehensive Round 2 Site Characterization Summary and Data Gaps analysis Report. Prepared for the Lower Willamette Group, Portland, Oregon. Anchor Environmental LLC, Seattle, Washington. February 21, 2007.

NOAA. 2007. NOS Hydrographic Surveys Specifications and Deliverables. U.S. Department of Commerce, National Oceanographic and Atmospheric Administration. April, 2007

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# Figures

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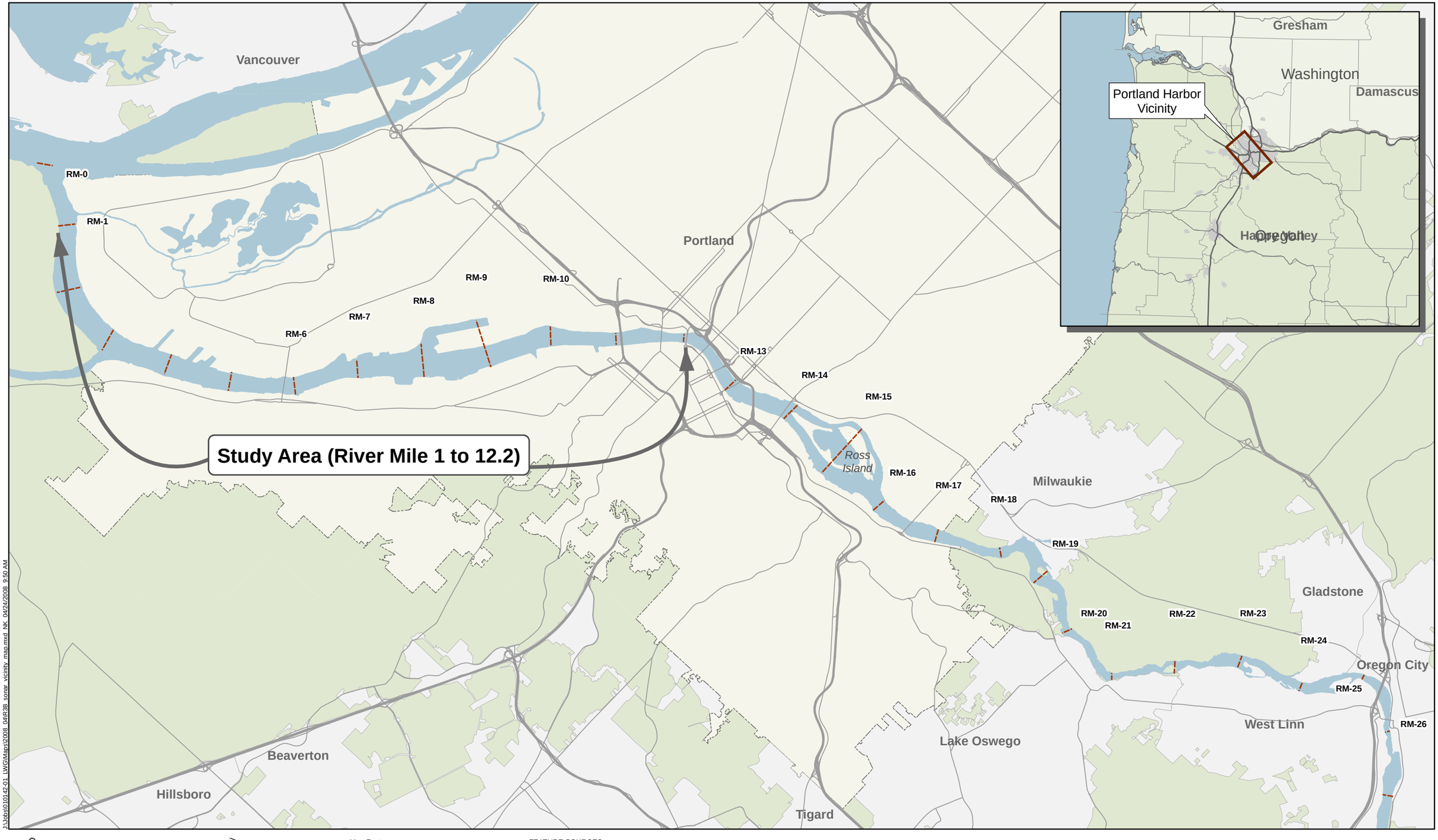


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ANCHOR ENVIRONMENTAL, L.L.C.

LWG LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

**Figure 1-1**
Portland Harbor RI/FS
Round 3B Sampling - Side Scan Survey FSP
Site and Vicinity Map

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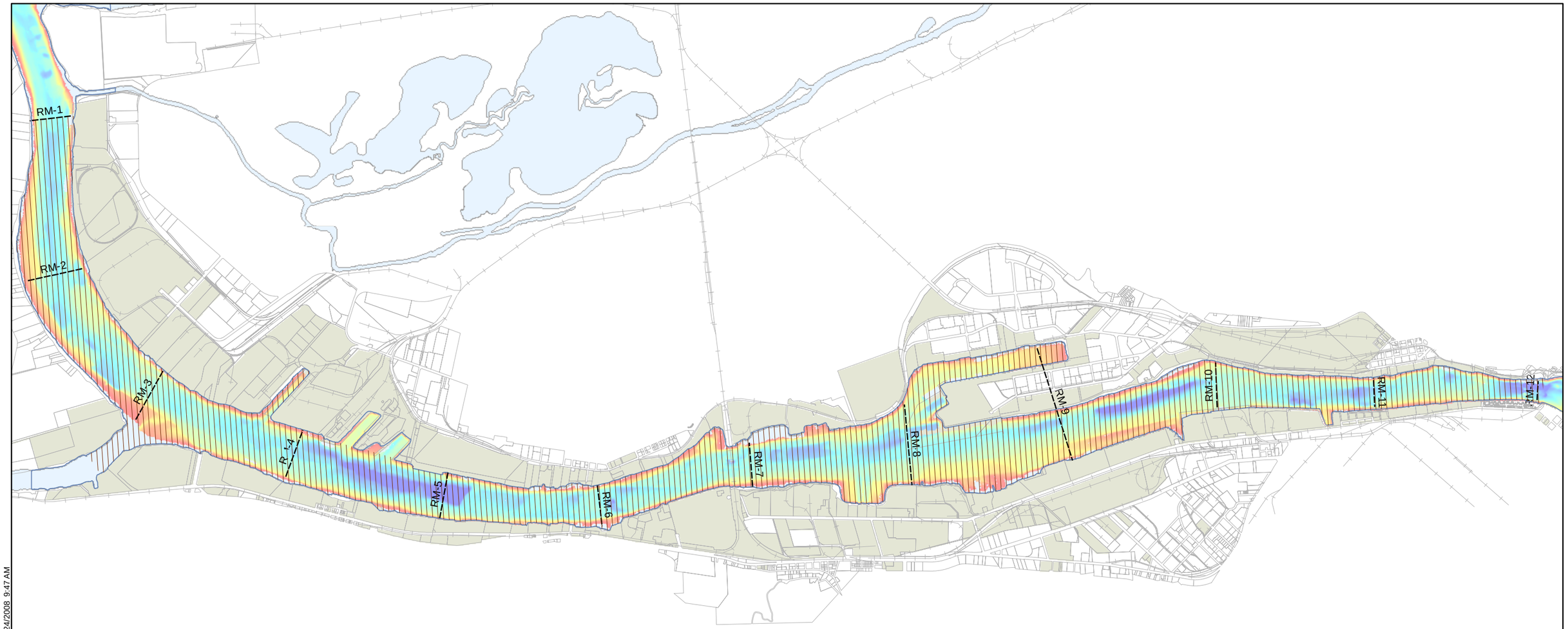


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ANCHOR ENVIRONMENTAL, L.L.C.

LWG LOWER WILLAMETTE GROUP

0 900 1,800 2,700 3,600 Feet

Map Features:
- Waterfront Taxlots
- Waterfront Ownership
- River miles
- Proposed Side Scan Survey Location

**2004 Bathymetry**
High : 10.4101
Low : -90.584

FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS
Streams, Water Bodies: Metro RLIS.
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

**Figure 3-1**
Portland Harbor RI/FS
Round 3B Sampling - Side Scan Survey FSP
Transect Locations

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# Appendix A

# Administrative Record

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**
**OREGON OPERATIONS OFFICE**
805 SW Broadway, Suite 500
Portland, Oregon 97205

March 13, 2008

Mr. Jim McKenna
Port of Portland & Co-Chairman, Lower Willamette Group
121 NW Everett
Portland, Oregon 97209

Mr. Robert Wyatt
Northwest Natural & Co-Chairman, Lower Willamette Group
220 Northwest Second Avenue
Portland, Oregon 97209

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240
Round 3B Side-Scan Sonar Field Sampling Plan

Dear Messrs. Wyatt and McKenna:

EPA has reviewed the Round 3B Side-Scan Sonar Field Sampling Plan (Side-Scan Sonar FSP) dated January 2008, which was prepared by Anchor Environmental, L.L.C. for the Lower Willamette Group (LWG). The Side-Scan Sonar FSP presents the LWG's approach and procedures to implement supplemental side-scan sonar survey activities for the RI/FS. EPA's comments on the Side-Scan Sonar FSP are attached.

The Side-Scan Sonar FSP notes that the objective of the side-scan survey is to map bottom features between river mile (RM) 2 and 11 to determine the approximate distribution of debris in the river channel and along both banks of the river to support decision making processes related to the FS. As noted in our comments, the upriver boundary proposed by the LWG for the survey should be modified to include the area between RM 11 and RM 12.2. EPA also believes that the Side Scan Sonar FSP contains insufficient detail to provide assurance that the proposed survey will achieve the stated objective, as well as a lack of other specific objectives. It is our understanding that the LWG has initiated the bid process and will be providing additional detail based on vendor proposals that may address some of our concerns.

Please provide a revised Side-Scan Sonar FSP within 30 days of receipt of these comments. If you have any questions, please contact Chip Humphrey at (503) 326-2678 or Eric Blischke (503) 326-4006. All legal inquiries should be directed to Lori Cora at (206) 553-1115.

Sincerely,

Chip Humphrey
Eric Blischke
Remedial Project Managers

cc: Greg Ulirsch, ATSDR
Rob Neely, NOAA
Ted Buerger, US Fish and Wildlife Service
Preston Sleeger, Department of Interior
Jim Anderson, DEQ
Kurt Burkholder, Oregon DOJ
David Farrer, Oregon Environmental Health Assessment Program
Rick Keppler, Oregon Department of Fish and Wildlife
Michael Karnosh, Confederated Tribes of Grand Ronde
Tom Downey, Confederated Tribes of Siletz
Audie Huber, Confederated Tribes of Umatilla
Brian Cunninghame, Confederated Tribes of Warm Springs
Erin Madden, Nez Perce Tribe
Rose Longoria, Confederated Tribes of Yakama Nation

EPA Comments on Side-Scan Sonar Field Sampling Plan
March 13, 2008

## General

The Round 3B Side-Scan Sonar Field Sampling Plan (Side-Scan FSP) is very general and does not follow the DQO process. The Side-Scan FSP does not include a goals section, data quality objectives (DQOs) designed to achieve the the goals or performance measures to show the goals have been achieved. For example, what resolution is required, and where, is it the same every where? Is the percent coverage and overlap acceptable? Is 90% coverage (+/- 10%) acceptable?

If the channel sides require more coverage than the channel bottom it should be stated in the goals and the DQOs should reflect the difference. There is no discussion on completeness.

It is our understanding that the LWG is providing this general FSP to side-scan sonar contractors, and the contractors would then provide more specifics on their approach. The plan as written does not have details that would provide a basis for assuring the success of the survey, including the required experience levels for conducting these surveys, the side-scan tool model name and number with a cut sheet that describes the tool's resolution to show it can achieve the 1 m resolution desired, etc.

## Specific Comments

1.2 - Survey Scope and Objectives. The Side-Scan Sonar FSP states that "additional data processing will allow the generation of mosaic imagery of sediment surface textures", but does not state whether obtaining data that can provide imagery of sediment textures is an objective.

The upper boundary of the side-scan survey should be revised to RM 12.2, instead of RM 11. This should be reflected in the Figures as well.

2.1 - Survey vessel transects. Please describe ***on vessel/during mobilization*** quality assurance (QA) techniques on the sonar images to ensure transects are appropriately spaced. Please also list QA requirements for excessive wave action to resurvey a transect (ie. an excessive wake will cause excessive noise, blurring or obscuring a target picture). These QA procedures will ensure adequate data collection while in the field to avoid the need for remobilization.

2.2 - Navigation. The HYPACK surveying software package allows custom vessel information to be input to correct for the distance from the DGPS antenna and the towfish. Please make this adjustment and reflect this accordingly in the Side-Scan Sonar FSP to ensure accurate data for object reacquisition (the Side-Scan Sonar FSP indicates the antenna will be at the towfish towpoint, which if uncorrected introduces error in the amount of the tow cable distance into the GIS layers). Please note in the Side-Scan Sonar FSP that if the vessel or configuration changes, this offset will be adjusted accordingly.

2.3 - Sonar equipment. Please specify the sonar equipment to be used.

2.4 - Data acquisition. The Side-Scan Sonar FSP states "The side-scan sonar system shall be towed such that it is capable of detecting an object on the river bed that measures 1m at a minimum in the outer range limits." Please specify if this means one meter in any direction, one meter square, or a cubic meter object for clarity. In addition, further discussion should be provided to justify the 1 meter size specification. For example, is a 1 meter size specification adequate for equipment evaluation in the feasibility study or is this a limit of the technology? The document should also describe and justify the depth to which the side scan sonar can identify objects. Again, is the depth specification adequate for equipment evaluation in the FS or is this a limit of the technology?

The Side-Scan Sonar FSP also states "The survey is expected to take from 3 to 5 days to complete depending on the additional time required to survey between docks where possible, extra track lines in wider areas of the river, and unexpected circumstances." This sentence should be modified to include "repeat track lines where unacceptable levels of [prop, wave, etc] noise occur" or similar such language.

4.0 References. Please reference QA documentation for standard techniques for side-scan and decision rules on when data should be discarded and retaken.

## Rebecca Goldberg

**From:** Humphrey.Chip@epamail.epa.gov
**Sent:** Monday, March 31, 2008 5:03 PM
**To:** Carl Stivers; Valerie Oster
**Cc:** A Gladstone; A Seger; Andy Davis; B Ferguson; Brigitte ; C Reive; C Powers; Carl Stivers; David Ashton; D Sanders; D Deetz Silva; D Vallance; D Livesay; Blischke.Eric@epamail.epa.gov; F Wolf; Garrick Jauregui; Gerald George; Drew Gilpin; G Koschal; J Benedict; Jan Betz; John Gootherts; Jim McKenna; J Kincaid; John Ashworth; James Peale; J Snyder; Julie Wilson; Kim Stafford; kparrett@gsiwatersolutions.com; Keith Pine; K Koehl; Loren Dunn; L Paretchan; M Chandler; Mark Leece; M Miller; Mark Lewis; Mark Schneider; Nanci Klinger; Patty Dost (Schwabe); Rick Applegate; Bob Wyatt; Robert Truedinger; R Gresh; S Gardner; S Brown; Sean Gormley; S David; Stuart Dearden; Soniya Ziegler; Terry Lauck; T Gold; T McCue; Valerie Oster; William Earle; Bill Joyce
**Subject:** Re: FW: Side Scan Sonar Revised FSP Extension

**Follow Up Flag:** Follow up
**Flag Status:** Yellow

Carl,

Your request, on behalf of the LWG, for a 2 week extension to April 28, 2008 for submittal the revised Side Scan Sonar FSP is acceptable to EPA. We understand that this extension is not expected to impact the project schedule.

We appreciate your attention to this - please call if you have any questions.

Chip Humphrey
EPA
(503) 3326-2678

"Valerie Oster" <voster@anchorenv.com>
03/31/2008 08:33 AM

To: Eric Blischke/R10/USEPA/US@EPA, Chip Humphrey/R10/USEPA/US@EPA
cc: "Carl Stivers" <cstivers@anchorenv.com>, "Keith Pine" <kpine@anchorenv.com>, "A Gladstone" <agladstone@davisrothwell.com>, "A Seger" <andrea.seger@portofportland.com>, "Andy Davis" <andy@geomega.com>, "B Ferguson" <bob.ferguson@slli.net>, "Bill Joyce" <wjoyce@sjzlaw.com>, "Bob

Wyatt" <rjw@nwnatural.com>, "Brigitte " <brigitte@geomega.com>, "C Powers" <ckp@aterwynne.com>, "C Reive" <chris.reive@jordanschrader.com>, "D Ashton" <david.ashton@portofportland.com>, "D Deetz Silva" <DeetzD@osm.com>, "D Livesay" <dlivesay@groundwatersolutions.com>, "D Sanders" <dawns@bes.ci.portland.or.us>, "D Vallance" <derrick.d.vallance@conocophillips.com>, "Drew Gilpin" <gilpinA@osm.com>, "F Wolf" <frederick.wolf@total.com>, "G Koschal" <gkoschal@redhillsenv.com>, "Garrick Jauregui" <garrick@chevron.com>, "Gerald George" <gerald.george@pillsburylaw.com>, "J Benedict" <jbenedic@chbh.com>, "J Betz" <jbetz@ci.portland.or.us>, "J Kincaid" <jkincaid@chbh.com>, "J McKenna" <jim.mckenna@portofportland.com>, "J Snyder" <jpsnyder@stoel.com>, "James Peale" <jpeale@mfainc.org>, "John Ashworth" <john.ashworth@bullivant.com>, "John Gootherts" <jGootherts@schwabe.com>, "Julie Wilson" <jwilson@enviroissues.com>, "K Koehl" <krista.koehl@portofportland.com>, "Kim Stafford" <kims@tonkon.com>, <kparrett@gsiwatersolutions.com>, "L Paretchan" <Lparetchan@perkinscoie.com>, "Loren Dunn" <ldunn@riddellwilliams.com>, "M Chandler" <markchandler@tocholdings.com>, "M Miller" <Max@tonkon.com>, "Mark Leece" <mark.leece@ch2m.com>, "Mark Lewis" <mlewis@newfields.com>, "Mark Schneider" <mwschneider@perkinscoie.com>, "Nanci Klinger" <nklinger@ci.portland.or.us>, "Patty Dost" <pdost@schwabe.com>, "R Applegate" <ricka@bes.ci.portland.or.us>, "R Gresh" <roger.gresh@amec.com>, "Robert Truedinger" <robb.truedinger@gmail.com>, "S Brown" <sbrown@bridgeh2o.com>, "S David"

<sheila.david@portofportland.com>
, "S Gardner"
<sarag@bes.ci.portland.or.us>,
"Sean Gormley"
<sean.gormley@amec.com>, "Soniya
Ziegler" <sziegler@chevron.com>,
"Stuart Dearden"
<stuart.dearden@sanofi-aventis.co
m>, "T Gold" <tgold@sjzlaw.com>,
"T McCue"
<tom.mccue@siltronic.com>, "Terry
Lauck"
<terry.s.lauck@conocophillips.com
>, "valerie"
<voster@anchorenv.com>, "William
Earle" <WEARLE@davisrothwell.com>
Subject
FW: Side Scan Sonar Revised FSP
Extension

Chip, Eric,

Please see request below for your consideration.
thanks
Valerie

Valerie Thompson Oster
Anchor Environmental, L.L.C
6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Phone: 503-670-1108 x19
Cell: 503-577-0254
Fax: 503-670-1128

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From: Carl Stivers
Sent: Monday, March 31, 2008 9:22 AM
To: Valerie Oster
Subject: Side Scan Sonar Revised FSP Extension

Valerie – Please pass on to EPA with a copy to the LWG. Thanks.

Carl

Chip and Eric -

On behalf of the LWG, I would like to request a 2 week extension (to April 28) on EPA's official deadline for the revised Side Scan Sonar FSP due April 14. I indicated to EPA at the last FS meeting that we could not address EPA's request for detailed methods and QA/QC related to equipment used until we selected a contractor and their equipment was known. For thoroughness, the contractor selection included evaluation of an additional contractor that came late into the evaluation process.
The LWG selection of a contractor did not occur until last Wednesday week, which does not give us quite enough time to work with the contractor on the necessary revisions. Regardless, we don't see this impacting the project schedule or our ability to get into the field around June or so, given that EPA's review of the revisions should be pretty simple at this point.

Thanks much.

Carl

Carl Stivers
Anchor Environmental, L.L.C.
23 South Wenatchee Avenue, Suite 120
Wenatchee, WA 98801
Phone: 509-888-2070
Fax: 509-888-2211
cstivers@anchorenv.com
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