APPENDIX B

FIGURE SHOWING LOCATIONS OF STORMWATER OUTFALLS INTO SLIP 4

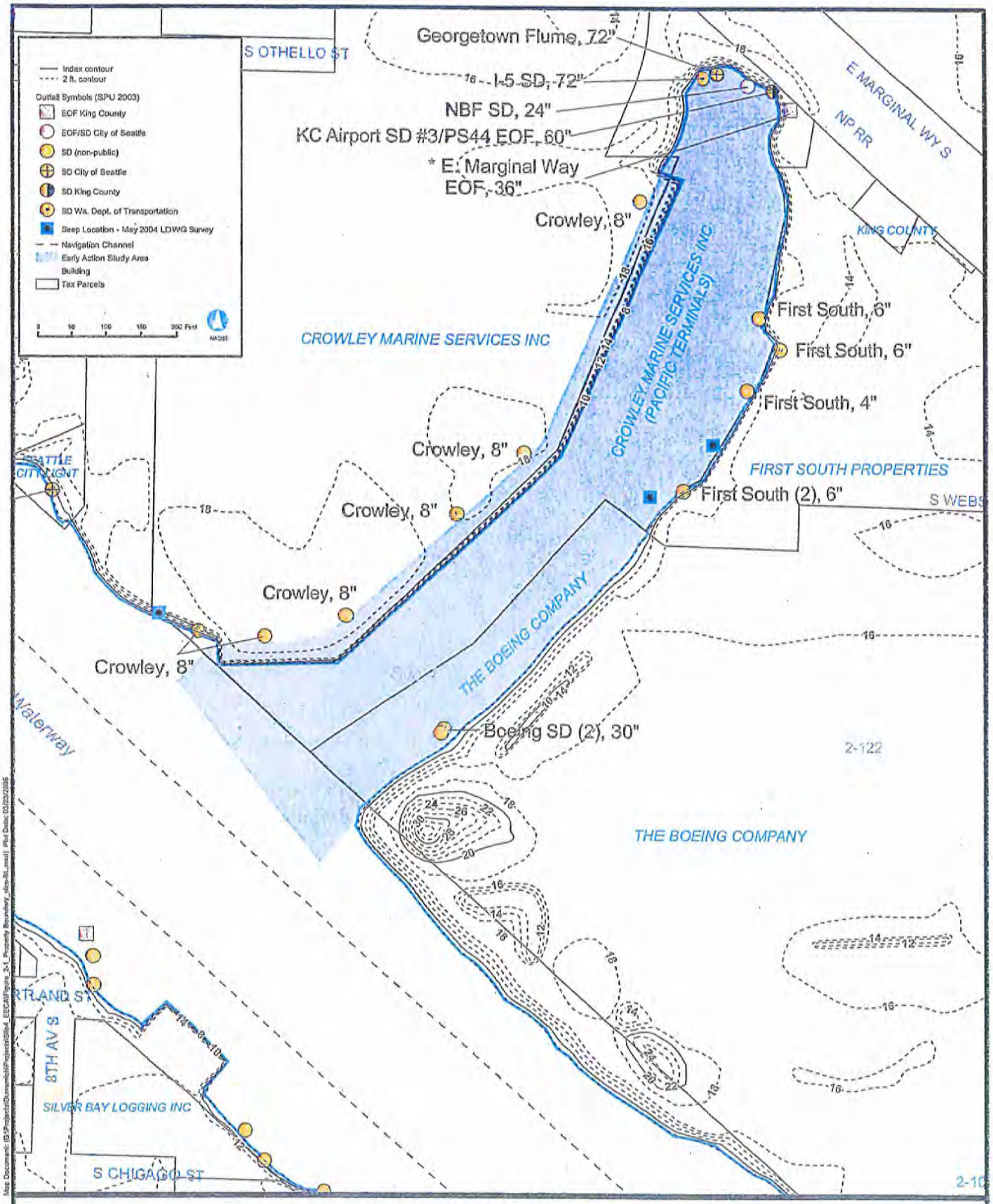


Figure 4. Slip 4 Outfalls

Adapted from: Integral 2006

* East Marginal Way EOF not observed during SPU (2003) survey; location based on King County coordinates.

Map Feature Sources: King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, and others.

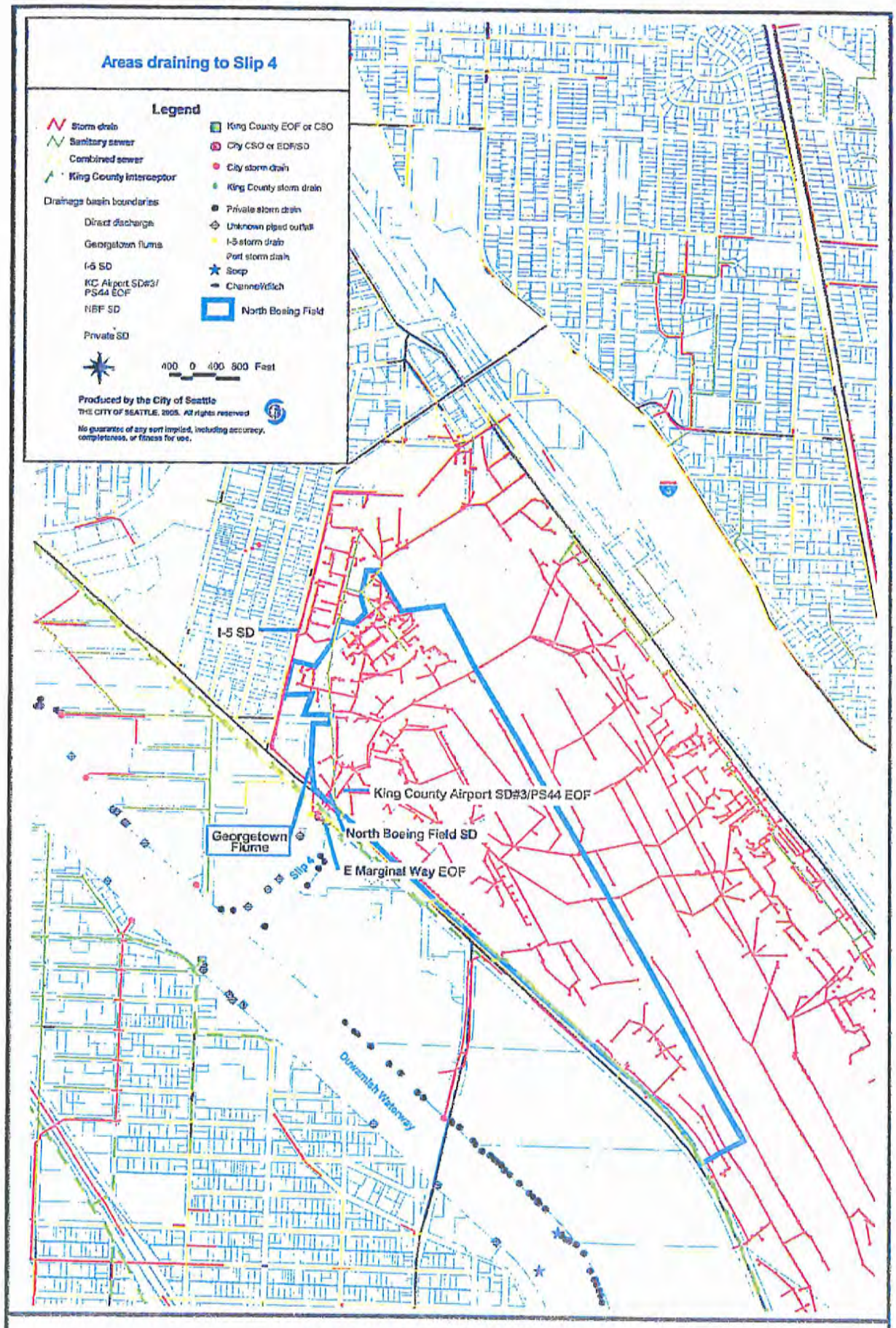
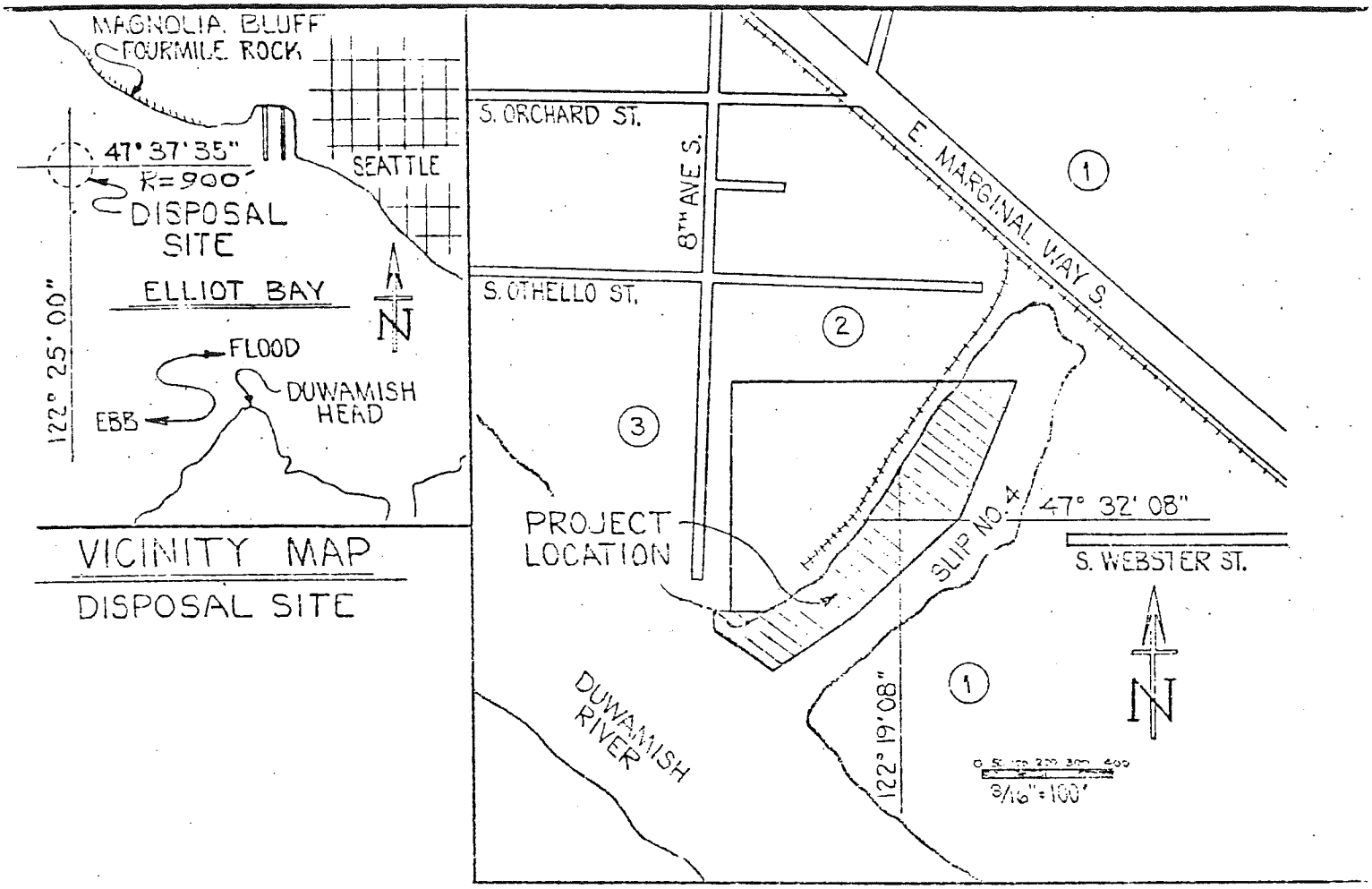


Figure 5. Slip 4 Drainage Basin
Adapted from: City of Seattle 2006

APPENDIX C

HISTORICAL DREDGING AND SEDIMENT SAMPLING INFORMATION

HISTORICAL DREDGING DOCUMENTS



VICINITY MAP
DISPOSAL SITE

VICINITY MAP
PROJECT LOCATION

NO FEDERAL PIERHEAD LINES ESTABLISHED

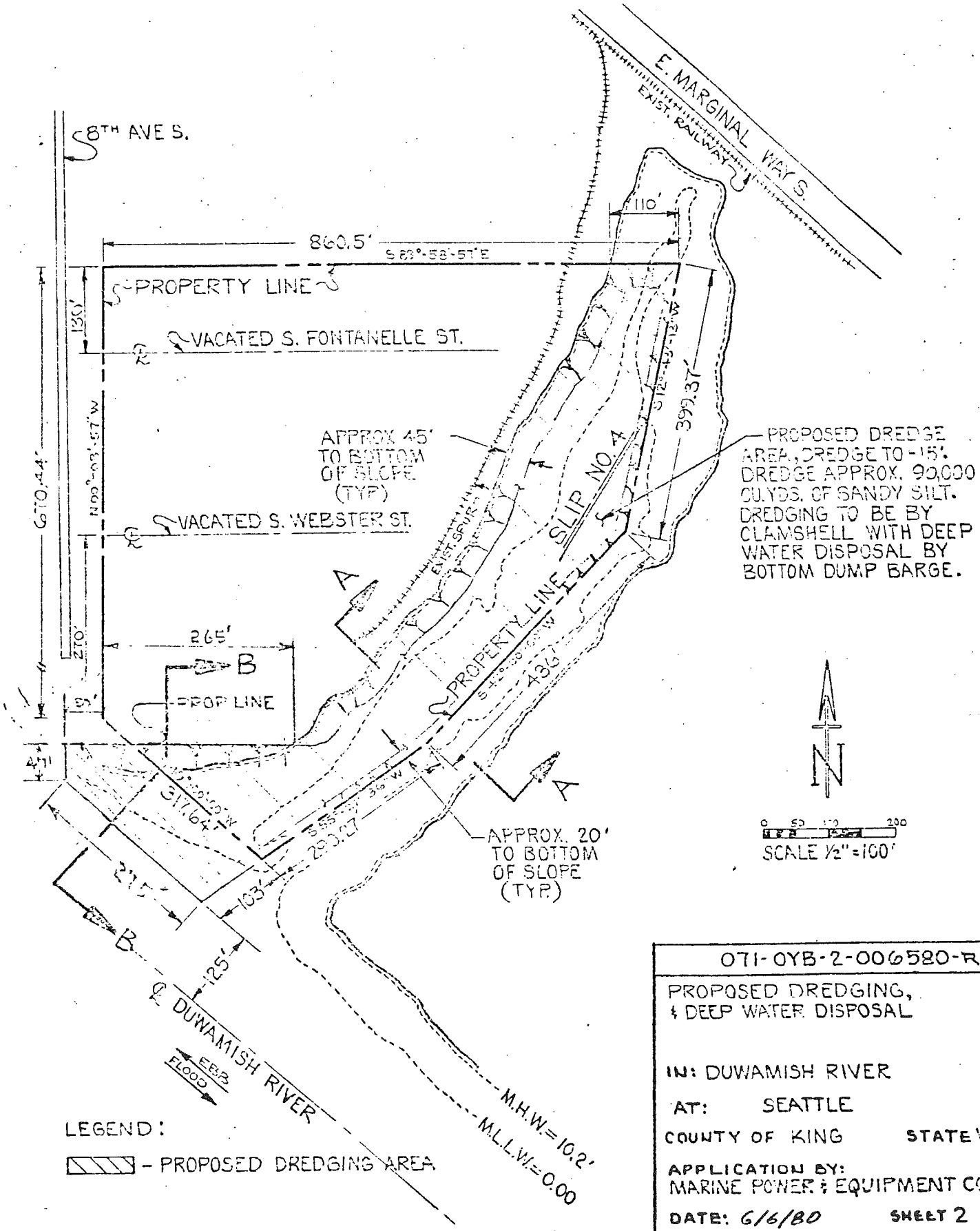
PURPOSE: TO ESTABLISH A SAFE DEPTH FOR COMMERCIAL MARINE TRAFFIC.

DATUM: M.L.L.W. = 0.00 N.O.S.

ADJACENT PROPERTY OWNERS:

1. BOEING AIRCRAFT CO., 7755 E. MARGINAL WAY S. SEATTLE, WA. 98108
2. LAYRITE CONCRETE PRODUCTS CO., 7265 E. MARGINAL WAY S. SEATTLE, WA. 98108
3. PUGET SOUND TRUCK LINES, 3720 AIRPORT WAY S. SEATTLE, WA. 98108

071-0YB-2-006580-R
PROPOSED DREDGING & DEEP WATER DISPOSAL
IN DUWAMISH RIVER
AT SEATTLE
COUNTY OF KING STATE WA.
APPLICATION BY MARINE POWER & EQUIP CO., INC.
SHEET 1 OF 4 DATE 6/6/80
REV 1 8/29/80, REV 2 [illegible]



071-0YB-2-006580-R

PROPOSED DREDGING, & DEEP WATER DISPOSAL

IN: DUWAMISH RIVER

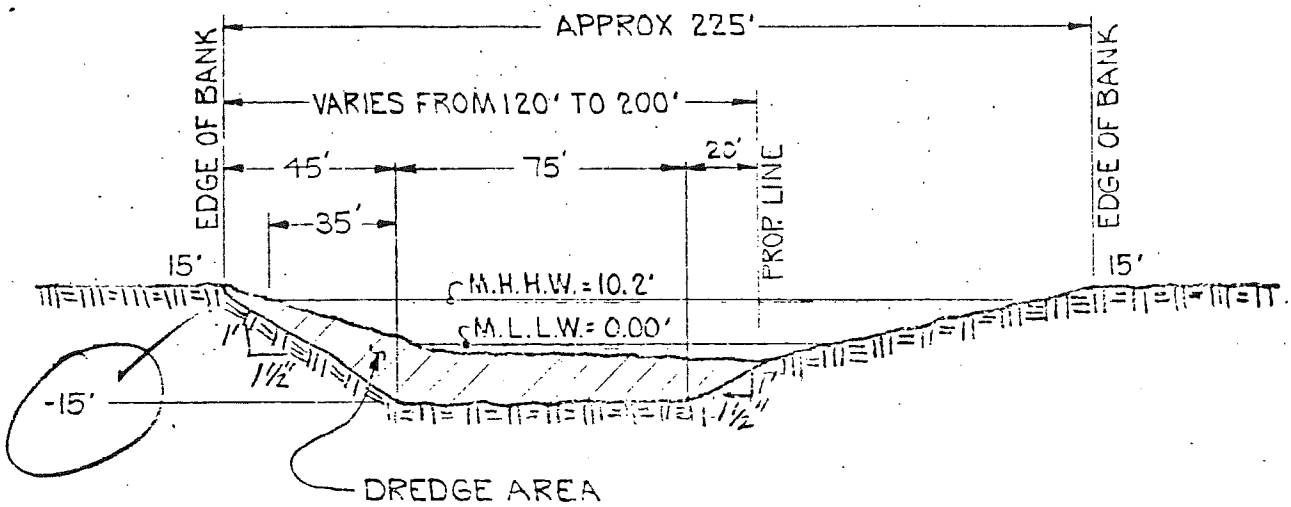
AT: SEATTLE

COUNTY OF KING STATE WA.

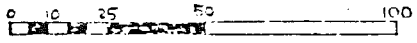
APPLICATION BY:
MARINE POWER & EQUIPMENT CO.

DATE: 6/6/80 SHEET 2 of 4

REV 1. 8/28/80, 30 DEC 80



SECTION A-A



SCALE: 1" = 50'-0"

071-0YB-2-006580-R

PROPOSED DREDGING &
DEEP WATER DISPOSAL

IN: DUWAMISH RIVER

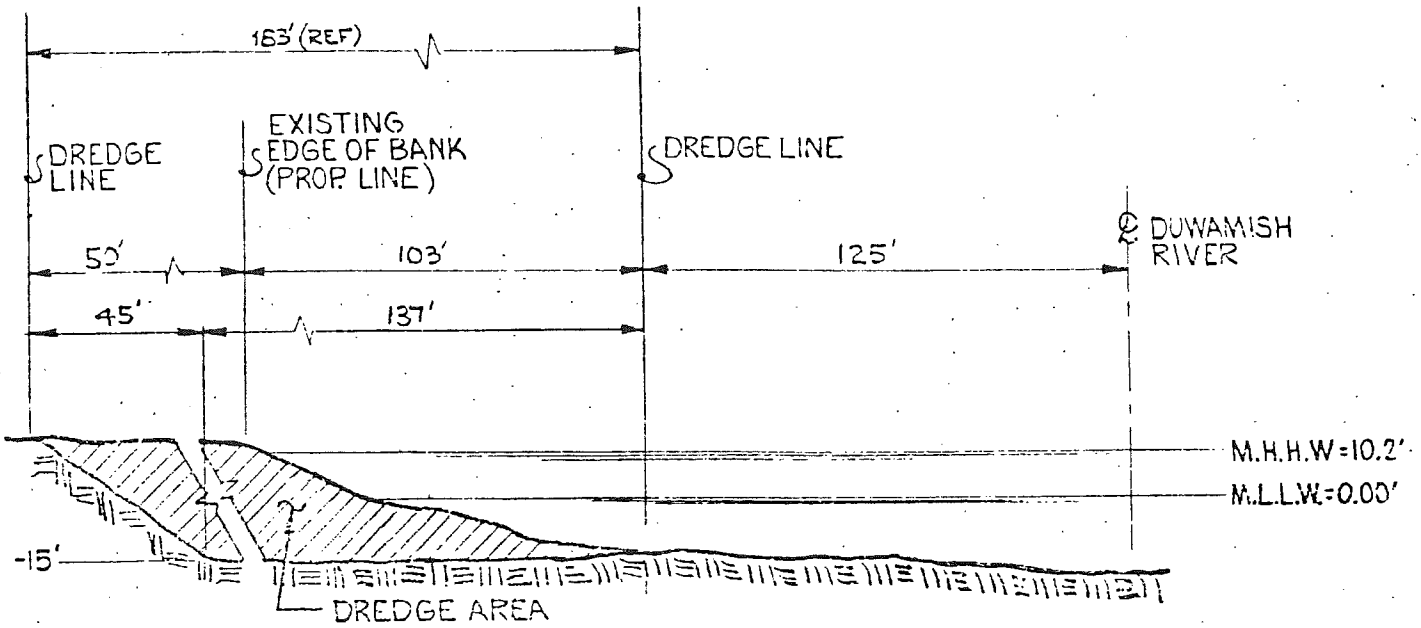
AT: SEATTLE

COUNTY OF KING STATE WA.

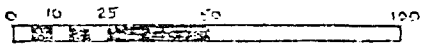
APPLICATION BY:
MARINE POWER & EQUIP. CO. INC.

DATE: 6/6/80 SHEET 3 of 4

REV 1 8/28/80, 200 YDS 50, [illegible]



SECTION B-B



SCALE: 1" = 50'-0"

071-0YB-2-006580-R

PROPOSED DREDGING
& DEEP WATER DISPOSAL

IN DUWAMISH RIVER
AT SEATTLE
COUNTY OF KING STATE WA
APPLICATION BY
MARINE POWER & EQUIP. CO. INC.
SHEET 4 OF 4 DATE 6/6/80
REV 1 8/25/80, ED DEC 80

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

NPSOP-RF

27 JAN 1981

Marine Power & Equipment Co., Inc.
[illegible]

Reference: [illegible]

Inclosed is a Department of the Army permit which authorizes performance of the work described in your referenced application.

You are cautioned that any change in the location or plans of the work will require submittal of a revised plan to this office for approval prior to accomplishment.

Your attention is drawn to conditions "o" and "n" of the permit which specify the expiration dates for both commencement and completion of the work and that you notify this office of the dates the work is started and completed.

Sincerely yours,

Gerald A Keller

GERALD A. KELLER
Chief, Regulatory Functions Branch

1 Incl
As stated
CF:
Compliance File

NPS FL
AUG 80 199

Application No. ~~071-OYB-2-006~~ J

Name of Applicant ~~Marine Power & Equipment Company~~

Effective Date 27 JAN 1981

Expiration Date (If applicable) ~~See General Condition o~~

DEPARTMENT OF THE ARMY
PERMIT

Referring to written request dated ~~1 May 1980~~ for a permit to:

(X) Perform work in or affecting navigable waters of the United States, upon the recommendation of the Chief of Engineers, pursuant to Section 10 of the Rivers and Harbors Act of March 3, 1899 (33 U.S.C. 403);

(X) Discharge dredged or fill material into waters of the United States upon the issuance of a permit from the Secretary of the Army acting through the Chief of Engineers pursuant to Section 404 of the Federal Water Pollution Control Act (86 Stat. 816, P.L. 92-500);

( ) Transport dredged material for the purpose of dumping it into ocean waters upon the issuance of a permit from the Secretary of the Army acting through the Chief of Engineers pursuant to Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (86 Stat. 1052; P.L. 92-532);

Marine Power & Equipment Company
1441 N. Northlake Way
Seattle, Washington

is hereby authorized by the Secretary of the Army:
to

dredge approximately 85,000 cubic yards of sandy silt by clamshell; dredge material to be deposited at deep water site in Elliott Bay (Provide adequate water depth for safe vessel movement)

in Duwamish River

at Seattle, Washington

in accordance with the plans and drawings attached hereto which are incorporated in and made a part of this permit (on drawings: give file number or other definite identification marks.)

071-OYB-2-006580, 4 sheets

subject to the following conditions:

I. General Conditions:

a. That all activities identified and authorized herein shall be consistent with the terms and conditions of this permit; and that any activities not specifically identified and authorized herein shall constitute a violation of the terms and conditions of this permit which may result in the modification, suspension or revocation of this permit, in whole or in part, as set forth more specifically in General Conditions j or k hereto, and in the institution of such legal proceedings as the United States Government may consider appropriate, whether or not this permit has been previously modified, suspended or revoked in whole or in part.

ENG FORM 1721 1 JUL 77 EDITION OF 1 APR 74 IS OBSOLETE. (ER 1145-2-303)

EXHIBIT 12

b. That all activities authorized herein shall, if they involve, during their construction or operation, any discharge of pollutants into waters of the United States or ocean waters, be at all times consistent with applicable water quality standards, effluent limitations and standards of performance, prohibitions, pretreatment standards and management practices established pursuant to the Federal Water Pollution Control Act of 1972 (P.L. 92-500; 86 Stat. 816), the Marine Protection, Research and Sanctuaries Act of 1972 (P.L. 92-532, 86 Stat. 1052), or pursuant to applicable State and local law.

c. That when the activity authorized herein involves a discharge during its construction or operation, of any pollutant (including dredged or fill material), into waters of the United States, the authorized activity shall, if applicable water quality standards are revised or modified during the term of this permit, be modified, if necessary, to conform with such revised or modified water quality standards within 6 months of the effective date of any revision or modification of water quality standards, or as directed by an implementat on plan contained in such revised or modified standards, or within such longer period of time as the District Engineer, in consultation with the Regional Administrator of the Environmental Protection Agency, may determine to be reasonable under the circumstances.

d. That the discharge will not destroy a threatened or endangered species as identified under the Endangered Species Act, or endanger the critical habitat of such species.

e. That the permittee agrees to make every reasonable effort to prosecute the construction or operation of the work authorized herein in a manner so as to minimize any adverse impact on fish, wildlife, and natural environmental values.

f. That the permittee agrees that he will prosecute the construction or work authorized herein in a manner so as to minimize any degradation of water quality.

g. That the permittee shall permit the District Engineer or his authorized representative(s) or designee(s) to make periodic inspections at any time deemed necessary in order to assure that the activity being performed under authority of this permit is in accordance with the terms and conditions prescribed herein.

h. That the permittee shall maintain the structure or work authorized herein in good condition and in accordance with the plans and drawings attached hereto.

i. That this permit does not convey any property rights, either in real estate or material, or any exclusive privileges; and that it does not authorize any injury to property or invasion of rights or any infringement of Federal, State, or local laws or regulations nor does it obviate the requirement to obtain State or local assent required by law for the activity authorized herein.

j. That this permit may be summarily suspended, in whole or in part, upon a finding by the District Engineer that immediate suspension of the activity authorized herein would be in the general public interest. Such suspension shall be effective upon receipt by the permittee of a written notice thereof which shall indicate (1) the extent of the suspension, (2) the reasons for this action, and (3) any corrective or preventative measures to be taken by the permittee which are deemed necessary by the District Engineer to abate imminent hazards to the general public interest. The permittee shall take immediate action to comply with the provisions of this notice. Within ten days following receipt of this notice of suspension, the permittee may request a hearing in order to present information relevant to a decision as to whether his permit should be reinstated, modified or revoked. If a hearing is requested, it shall be conducted pursuant to procedures prescribed by the Chief of Engineers. After completion of the hearing, or within a reasonable time after issuance of the suspension notice to the permittee if no hearing is requested, the permit will either be reinstated, modified or revoked.

k. That this permit may be either modified, suspended or revoked in whole or in part if the Secretary of the Army or his authorized representative determines that there has been a violation of any of the terms or conditions of this permit or that such action would otherwise be in the public interest. Any such modification, suspension, or revocation shall become effective 30 days after receipt by the permittee of written notice of such action which shall specify the facts or conduct warranting same unless (1) within the 30-day period the permittee is able to satisfactorily demonstrate that (a) the alleged violation of the terms and the conditions of this permit did not, in fact, occur or (b) the alleged violation was accidental, and the permittee has been operating in compliance with the terms and conditions of the permit and is able to provide satisfactory assurances that future operations shall be in full compliance with the terms and conditions of this permit; or (2) within the aforesaid 30-day period, the permittee requests that a public hearing be held to present oral and written evidence concerning the proposed modification, suspension or revocation. The conduct of this hearing and the procedures for making a final decision either to modify, suspend or revoke this permit in whole or in part shall be pursuant to procedures prescribed by the Chief of Engineers.

l. That in issuing this permit, the Government has relied on the information and data which the permittee has provided in connection with his permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Government may, in addition, institute appropriate legal proceedings.

m. That any modification, suspension, or revocation of this permit shall not be the basis for any claim for damages against the United States.

n. That the permittee shall notify the District Engineer at what time the activity authorized herein will be commenced, as far in advance of the time of commencement as the District Engineer may specify, and of any suspension of work, if for a period of more than one week, resumption of work and its completion.

ENVIRONMENTAL ASSESSMENT
For Work Authorized in Accordance with Section
10 of the River and Harbor Act of March 3, 1899
and Section 404 of the Clean Water Act
Described in Permit Application No. 071-OYB-2-006580
of Marine Power and Equipment Company

1. The work was coordinated with appropriate state and Federal agencies in accordance with procedures specified in 33 CFR, Parts 320-329.

2. The work is to dredge approximately 85,000 cubic yards of sandy silt by clamshell in the Duwamish River at Seattle, Washington. (Deposit dredged material at deep water site in Elliott Bay.)

3. This application has been reviewed in light of comments received from the public and agency coordination. Evaluation by this office considered relevant factors including esthetics, fish and wildlife values, flood damage prevention, land and shoreline management classifications, conservation, navigation, recreation, water supply, water quality, archeological and historic values, economics, ecological and general environmental considerations, endangered species or their critical habitat, energy needs, safety, food production, and general public welfare. This review has not identified any potentially significant adverse effects for action under the terms of the permit application.

4. The work has been considered with respect to Indian Treaty fishing rights, per the decision reached in United States v. Washington, (384 F. Supp. 312, affirmed 520 F. 2d 676, cert. denied 423 U.S. 1086), as modified in Supreme Court's decision of 2 July 1979. I have determined that the work will not significantly interfere with the Indian fishery, including Indian access to usual and accustomed fishing grounds and opportunity to fish in these areas. I have further determined that the work will not significantly interfere with salmonids, their habitat or promote adverse impacts on fishing success in these areas.

5. I have determined that performance of this work, in accordance with the conditions of the permit, will not significantly affect the quality of the human environment. Further, I have determined that the issuance of this particular permit is a Federal action not having a significant impact on the environment and thus have concluded that the preparation of a formal EIS is not required.

21 Jan 81
Date

LEON K. MORASKI
Colonel, Corps of Engineers
District Engineer

FINDINGS OF FACT

Reference: Marine Power and Equipment Company - 071-OYB-2-006580

Concerning issuance of Department of the Army Permit under Section 10 of the River and Harbor Act of March 3, 1899 (30 Stat. 1151; 33 U.S.C. 403) and Section 404 of the Clean Water Act to dredge approximately 85,000 cubic yards of sandy silt by clamshell in the Duwamish River at Seattle, Washington. (Deposit dredged material at deep water site in Elliott Bay.)

1. I have reviewed and evaluated, in light of the overall public interest, the documents and factors concerning this permit application, as well as the stated views of other interested Federal and non-Federal agencies and the concerned public, relative to the work in navigable waters of the United States.

2. All factors relevant to this work were considered in accordance with our regulations. These factors include, but are not limited to, conservation, economics, esthetics, general environmental concerns, historic values, fish and wildlife values, flood damage prevention, land use, navigation, recreation, water supply, water quality, energy needs, safety, food production and, in general, the needs and welfare of the people.

3. The following points are considered pertinent in evaluation of comments received in coordinating the public notice dated 23 June 1980 and drawing revision notice dated 23 September 1980. The revision consisted of modifying the boundary configuration of the proposed dredged area to satisfy a concern expressed by the City of Seattle. On 29 October 1980 the applicant further revised the proposed dredged area boundary configuration to insure dredging operations noninterference with an existing submarine telephone cable.

a. Federal Agencies. The National Oceanic and Atmospheric Administration, the Environmental Protection Agency (EPA) and the Department of the Interior have no objection to the work. EPA, in 10 November 1980 letter, conditioned its nonopposing position advising that the material to be dredged has high concentrations of sulfides. The conditions are:

(1) Loads of dredged material to be dumped at Four Mile Rock Disposal Site will be limited to a volume of 1,000 cubic yards.

(2) In the event of adverse impacts on fisheries resources, due to the nature of the material being dredged, dredging operations will cease and modifications in the dredging procedures to alleviate the problem will be coordinated with EPA.

The applicant, in 3 November 1980 letter to EPA, advised that the conditions outlined in the 10 November 1980 letter will be complied with. The EPA 3 November 1980 letter will be mailed to the permittee as a condition letter.

b. State and Local Agencies. The State of Washington and the City of Seattle, the local governing body, have no objections to the work. The State of Washington, in 22 December 1980 letter, conditioned its nonopposing position with the following requirements:

(1) A water quality modification be obtained from the Department of Ecology prior to commencement of work.

(2) Time Limitation: Construction may be started immediately, and shall be completed by December 31, 1981. A time extension will be considered upon reapplication. However, no dredging shall be accomplished from April 1 to June 15 of any year.

(3) A floating clamshell may be used for dredging. Each pass of the clamshell bucket shall be complete, and there is to be no stockpiling in the water.

(4) Dredging operations shall be conducted at all times in such a manner as to cause little or no disturbance or siltation to the adjacent waters.

(5) Dredged materials shall be deposited at an approved, designated Department of Natural Resources deep water disposal site.

(6) The dredged banks shall be sloped no steeper than 1.5 feet horizontal to each 1.0 foot vertical.

(7) If, at any time, there should be fish in distress, a fish kill, or water quality problems as a result of this project, the dredging operation shall be stopped immediately. The summer and fall may be critical times of low dissolved oxygen.

(8) The following is the limitation of dissolved oxygen:

Allowable dredging - 5.1mg/1 D.O. or over
Cease dredging - 5.0mg/1 D.O. or under

(9) The applicant will be informed if dissolved oxygen does below 5mg/1.

(10) No petroleum products or other deleterious materials shall be allowed to enter state waters as a result of this project.

(11) Any debris resulting from this project shall be removed from the water and disposed of or placed in such a manner to prevent its being washed back into the water by high water or wave action.

(12) Water quality is not to be degraded to the detriment of fish life as a result of this project. Compliance with the quality limits set forth in the Washington State Water Quality Regulations shall be maintained throughout the life of the project.

(13) These provisions shall be closely followed by the contract(s) and the equipment operator(s) and shall be on the job site at all times.

The State of Washington 22 December 1980 letter will be mailed to the permittee with the permit as a condition letter.

Comments of the state and local governmental agencies are predicated upon the applicant's compliance with the State Shoreline Management Act and applicable local laws, regulations and codes governing this work.

c. Treaty Indians. The Muckleshoot Indian Tribe, in 8 July 1980 letter, recommended that dredging be conducted between 15 June and 15 March of the calendar year and advised that tribal members will be fishing for salmonids at the worksite between July and January of the calendar year. The applicant, in 5 December 1980 letter to the Muckleshoot Indian Tribe, advised that the dredging is planned to be performed between 15 June and 15 March of the calendar year with the estimated performance period being during the month of January 1981. The applicant further advised the Muckleshoot Indian Tribe that the necessary precautions will be taken to insure noninterference with the Tribe's commercial fishing activities. The work has been considered with respect to the decision reached in United States v. Washington, (384 F. Supp. 312, affirmed 520 F. 2d 676, cert. denied 423 U.S. 1086), as modified in Supreme Court's decision of 2 July 1979, and it was found that the project will not adversely affect any treaty rights.

d. Individual or Organized Groups. No individual or organized groups have opposed the work. This work is considered to be in the general public interest.

e. Other Considerations: The work will have no significant adverse effect on items recorded in paragraph 2 above. Particular attention was given to the location and general design to prevent possible obstructions to navigation with respect to both the public use and the neighboring proprietors' access to the Duwamish River.

The work will provide an adequate water depth for safe vessel movement.

f. The work was evaluated in accordance with the objectives of the Environmental Protection Agency's Section 404(b) guidelines, contained in the Clean Water Act (40 CFR 230). The technical evaluation considered the following parameters: physical and chemical-biological interactive effects, water quality impacts, selection of disposal sites, and conditioning of discharges

of dredged or fill material. As a result of this evaluation, I have concluded that the discharge will not have significant adverse impacts on the aquatic environment.

4. I find that issuance of this Department of the Army Permit is predicated upon a thorough analysis of the various factors identified herein. The work is deemed to comply with state and local laws, regulations and codes. There are no identified major adverse environmental effects. The work is consonant with National policy, statutes, and administrative directives. The total public interest would best be served by the issuance of a Department of the Army permit.

21 Jan 81
Date

LEON K. MORASKI
Colonel, Corps of Engineers
District Engineer

Marine Power & Equipment
Diesel . . Marine . . . Electric

1441 North Northlake Way
Seattle, Washington 98103

MElrose 2-1441

December 11, 1980

U.S. Army
Corps of Engineers
Seattle District
P.O. Box C-3755
Seattle, Washington 98124

Attn: Regulatory Functions Branch
Joe Thomer

Re: Permit Application 071-OYB-2-006580

Dear Sir:

The original revision of the subject permit application was in response to concern expressed by Elsie Hulsizer of the City of Seattle, Department of Construction and Land Use. The original plan left a small tip of land sticking out into Slip 4 and she was concerned about erosion of that area.

I agreed to expand the dredging area to cut off that particular tip of land.

After the revision was made I realized that the newly added dredge area was in close proximity to an under water telephone cable which crosses the Duwamish River. To preclude any interference with the subject cable I elected to further revise the dredge area and provided you with the required drawings.

If you have any further questions, please call.

Very truly yours,

MARINE POWER & EQUIPMENT CO., INC.

Bruce H. Klein

RHK:sw

Seattle
Engineering Department
Arthur E. Maronek
Acting Director of Engineering
Charles Royer, Mayor

RE: 071-OYB-2-006580-R
MARINE POWER & EQUIPMENT CO.
23 SEPTEMBER 1980

NOVEMBER 20, 1980

Department of the Army
Seattle District
Corps of Engineers
P. O. Box C-3755
Seattle, Washington 98124

Gentlemen:

The City of Seattle has reviewed the subject Public Notice. Based upon comments which have been received from various City departments, we offer the following statement(s):

1. We have no objection to the proposal as described in the subject Public Notice.

2. The proposal is exempt from the permit requirements of the Shoreline Management Act under the Seattle Shoreline Master Program.

3. The proposal is consistent with the Seattle Shoreline Master Program and Substantial Development Permit No. SMA 80-45 was approved on NOVEMBER 4, 1980.

4. Applicant has applied for a Shorelines Substantial Development Permit. We reserve comments on the proposal until our review of the Shorelines Permit has been completed.

5. Applicant is hereby advised that a Shorelines Substantial Development Permit is required under the Shoreline Management Act of 1971. Application forms are available from the Seattle Department of Construction and Land Use, 503 Municipal Building, Seattle, Washington, 98104. We request that the Department of the Army permit for this proposal be withheld until a Substantial Development Permit is obtained.

6. Other:

Very truly yours,

ARTHUR E. MARONEK
Acting Director of Engineering

By
R. J. ANDERSON, P. E., Manager
Court & Right of Way Division

MC:ft

cc: Dept. of Construction
and Land Use
State Dept. of Ecology

316A

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X
1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: MS 521

NOV 10 1980

District Engineer
Seattle District, C/E
ATTN: Chief, Reg. Func. Branch
P. O. Box C-3755
Seattle, Washington 98124

RE: 071-OYB-2-006580-R, Marine Power and Equipment Company, Inc., 6/23/80

Dear Sir:

We have completed our review of the above referenced permit application.

Chemical analyses indicate that the material to be dredged has relatively high concentrations of sulfides. However, our agency will have no objection to the issuance of this permit provided the proposed operations are subject to the following conditions:

1) Loads of dredged material to be dumped at 4 Mile Rock disposal site will be limited to a volume of 1,000 cubic yards,

2) In the event of adverse impacts on fisheries resources, due to the nature of the material being dredged, dredging operations will cease and modifications in the dredging procedures to alleviate the problem will be coordinated with our office.

These conditions are needed to maintain water quality and to protect the aquatic resources.

These conditions have been discussed with and agreed to by the applicant. If there are any questions concerning our review of this application please contact James Wood, of my staff, at (206) 442-1352 or FTS 399-1352.

Sincerely,

Ronald A. Lee

Ronald A. Lee, Chief 15 08:21
Dredge and Fill Permits Section

cc: USFWS - Olympia
NMFS
WDNR - Attn. Rene Herrera
WDG - Attn. Bob Zeigler
WDE
Applicant

311 C

PLICATION FOR A DEPARTMENT OF THE A . ' PERMIT
For use of this form, see EP 1145–2–1

The Department of the Army permit program is authorized by Section 10 of the River and Harbor Act of 1899, Section 404 of P. L. 92–500 and Section 103 of P. L. 92–532. These laws require permits authorizing structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided in ENG Form 4345 will be used in evaluating the application for a permit. Information in the application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary; however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and checklist) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

1. Application number (To be assigned by Corps)

071-043-2-006580

2. Date

1 MAY 1980
Day Mo. Yr.

3. For Corps use only.

4. Name and address of applicant.

Marine Power & Equipment Co.,Inc.
1441 N. Northlake Way
Seattle, Washington 98103

Telephone no. during business hours

A/C (206) 632-1441
A/C (206) 632-1447

5. Name, address and title of authorized agent.

Bruce H. Klein
Personnel Director
1441 N. Northlake Way
Seattle, Washington 98103

Telephone no. during business hours

A/C (206) 632-1441
A/C (206) 632-1447

6. Describe in detail the proposed activity, its purpose and intended use (private, public, commercial or other) including description of the type of structures, if any to be erected on fills, or pile or float–supported platforms, the type, composition and quantity of materials to be discharged or dumped and means of conveyance, and the source of discharge or fill material. If additional space is needed, use Block 14.

Dredge 85,000 cu. yards of sandy silt by clamshell and deposit at "Four Mile Rock" deep water disposal site by bottom dump barge. The purpose is to provide a safe depth for commercial marine use in Slip 4.

7. Names, addresses and telephone numbers of adjoining property owners, lessees, etc., whose property also adjoins the waterway.

1. Boeing Co. 7755 E. Marginal Way South Seattle, Washington 98108 (773-7790)
2. Layrite Concrete Products Co. 7265 E. Marginal Way S. Seattle,Wa 98108 (762-8681)
3. Puget Sound Truck Lines 3720 Airport Way South Seattle, Wa 98134 (623-1600)

8. Location where proposed activity exists or will occur.

Address:

8th Ave. South and South Fontanelle St.
Street, road or other descriptive location

Seattle
In or near city or town

King Wash. 98108
County State Zip Code

Tax Assessors Description: (If known)

Map No. Subdiv. No. Lot No.

Sec. Twp. Rge.

9. Name of waterway at location of the activity.

Duwamish River

ENG Form 4345, 1 OCT 77 Edition of 1 Apr 74 is obsolete.

Date activity is proposed to commence. As soon as permit is issued

Date activity is expected to be completed Within 5 weeks after start of project

Is any portion of the activity for which authorization is sought now complete? ☐ YES ☒ NO
If answer is "Yes" give reasons in the remark section. Month and year the activity was completed _____. Indicate the existing work on the drawings.

List all approvals or certifications required by other federal, interstate, state or local agencies for any structures, construction, discharges, deposits or other activities described in this application.

Issuing Agency	Type Approval	Identification No.	Date of Application	Date of Approval
City of Seattle	Shoreline Permit			

Has any agency denied approval for the activity described herein or for any activity directly related to the activity described herein?

☐ Yes ☒ No (If "Yes" explain in remarks)

Remarks or additional information.

Application is hereby made for a permit or permits to authorize the activities described herein. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities.

Bruce H. Klein

Signature of Applicant or Authorized Agent

Bruce H. Klein

The application must be signed by the applicant; however, it may be signed by a duly authorized agent (named in Item 5) if this form is accompanied by a statement by the applicant designating the agent and agreeing to furnish upon request, supplemental information in support of the application.

18 U. S. C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of The United States knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than five years, or both. Do not send a permit processing fee with this application. The appropriate fee will be assessed when a permit is issued.

(79)

INSPECTION RECORD

FOR

PERMITTED WORK IN NAVIGABLE WATERS
NORTH PACIFIC DIVISION, CORPS OF ENGINEERS

District Seattle

1230 pm

Permit No. 071-OYB-2-006-590

Date of Inspection 10 April 5

Permittee Marine Power & Equipment Co. Inc.

Inspector LARSON / FENSKE

Waterway Duwamish River

Type of Work Dredge

STATUS

Work Completed ✓ Yes ____ No ____ Not Sure

Estimated Percent Complete 100 % ____ Unknown

Work In Progress ____ Yes ✓ No

COMPLIANCE

Completed Entire Scope of Permitted Work ✓ Yes ____ Apparently ____ No

Standard Conditions: ✓ Yes ____ Apparently ____ No ____ Doubtful

Special Conditions: ✓ Yes ____ Apparently ____ No ____ Doubtful

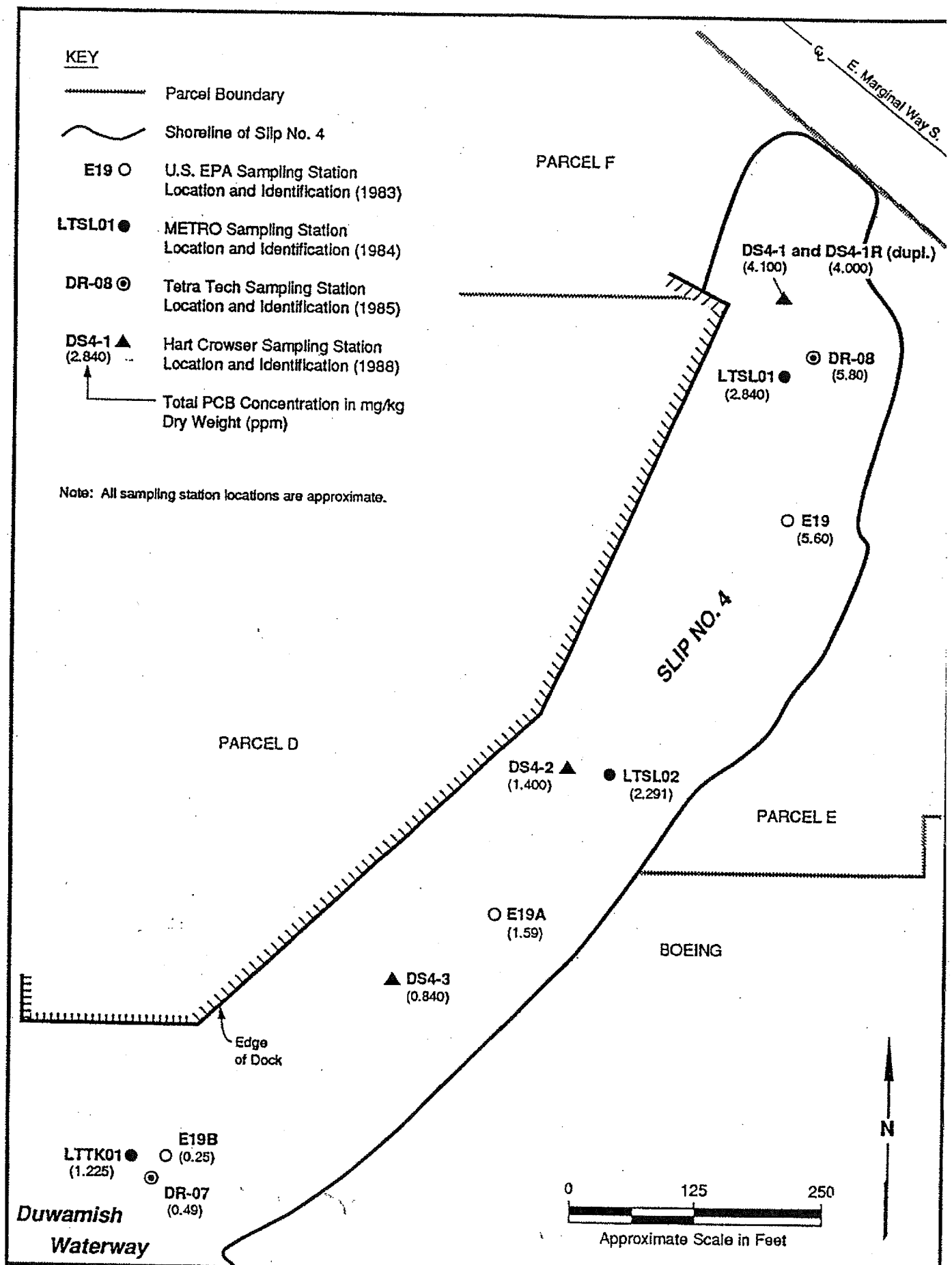
Permit Dwg: ✓ Yes ____ Apparently ____ No

Comments: WATER DEPTH WSL 26 ± 10 GAGE READING +5.8
= -15.2 ← ELEV OF BOTTOM

ERD Form 288(Rev)
May 77

610
607*

SEDIMENT SAMPLING MAPS

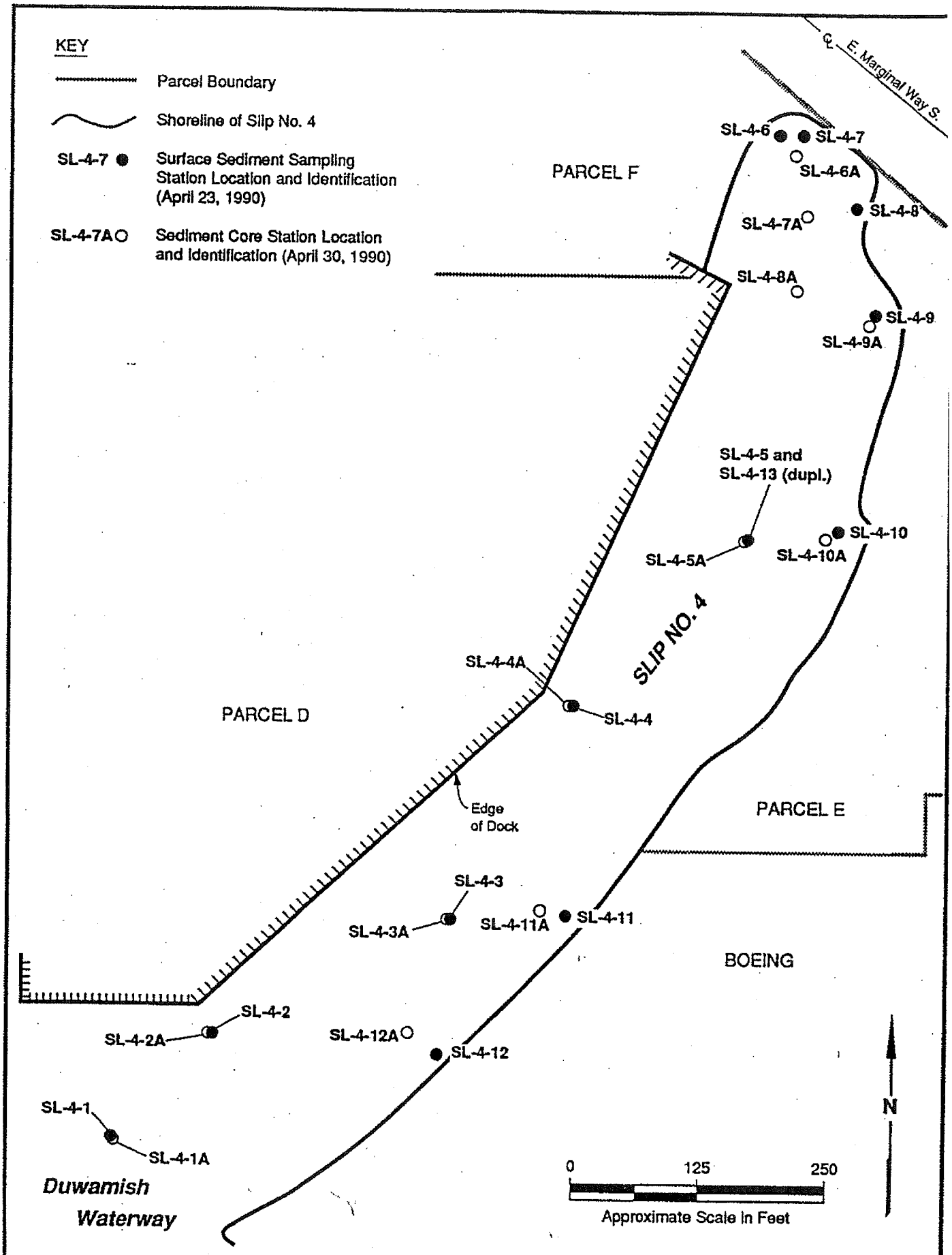


LANDAU ASSOCIATES, INC.

Concentrations of Total PCBs in Surface Sediments at Historical Stations in Slip No. 4

25-52.10 Boeing/First Interstate/Environmental Site Assessment/Final Report 6/8/90

Figure 9-3

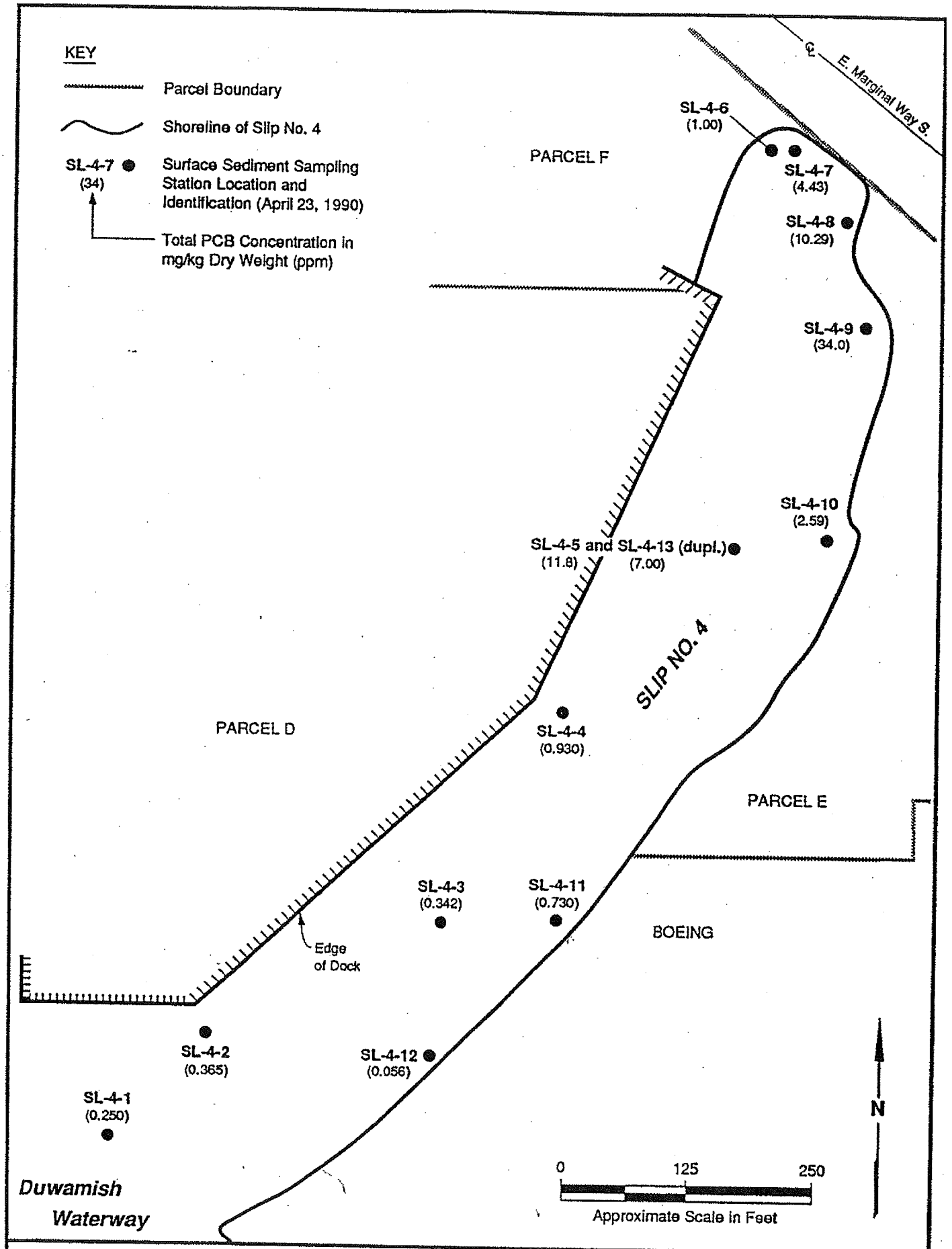


25-52.10 Boeing/First Interstate/Environmental Site Assessment/Final Report 6/8/90

LANDAU ASSOCIATES, INC.

Map Showing Slip No. 4 Shoreline and Locations of Surface Sediment and Sediment Core Stations

Figure 9-1

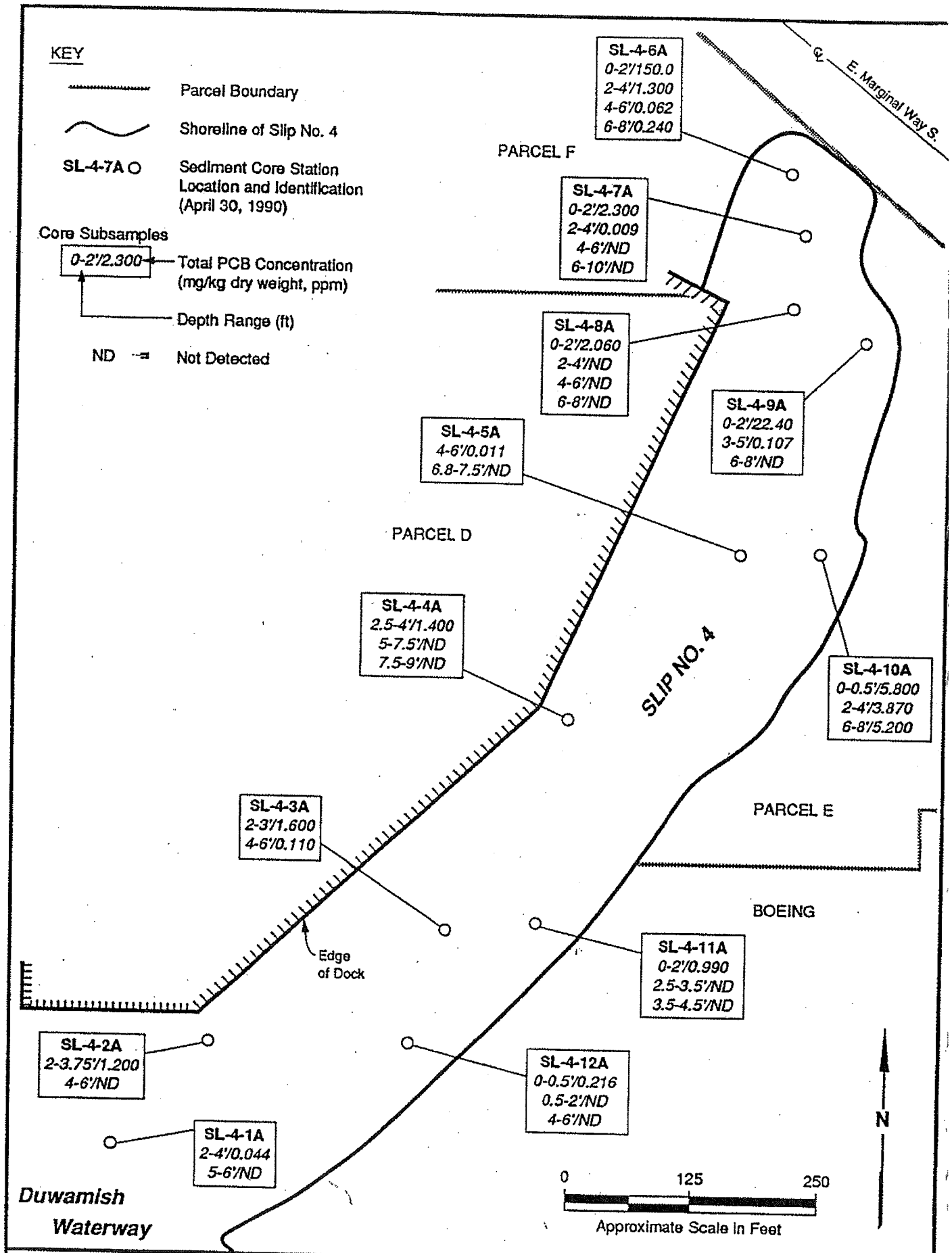


LANDAU ASSOCIATES, INC.

Surface Sediment Stations and Concentrations of Total PCBs in Slip No. 4 Surface Sediments

25-52.10 Boeing/First Interstate/Environmental Site Assessment/Final Report 6/8/90

Figure 9-2

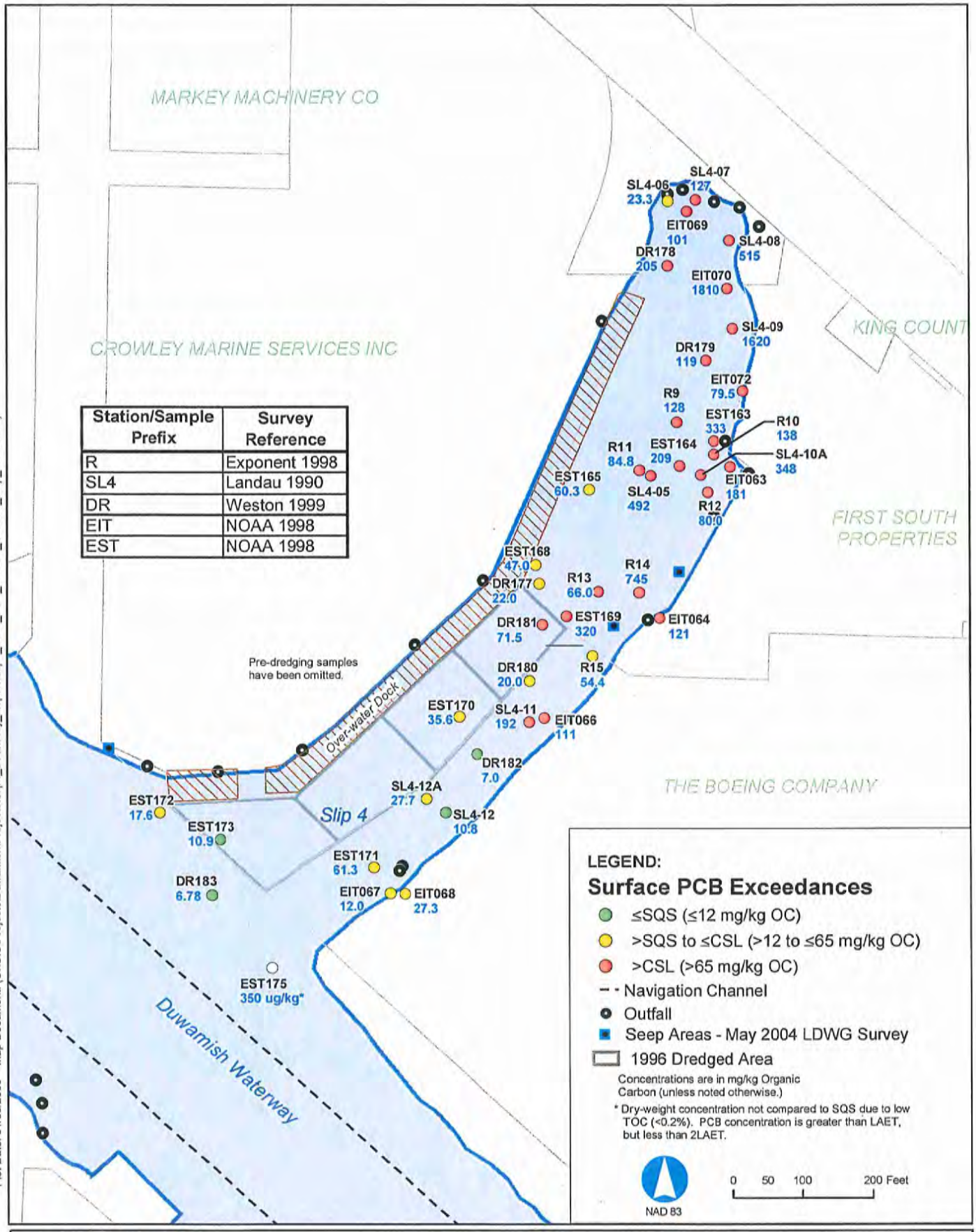


LANDAU ASSOCIATES, INC.

Sediment Core Stations and Concentrations of Total PCBs in Core Subsamples in Slip No. 4

25-62.10 Boeing/First Interstate/Environmental Site Assessment/Final Report 6/8/90

Figure 9-4



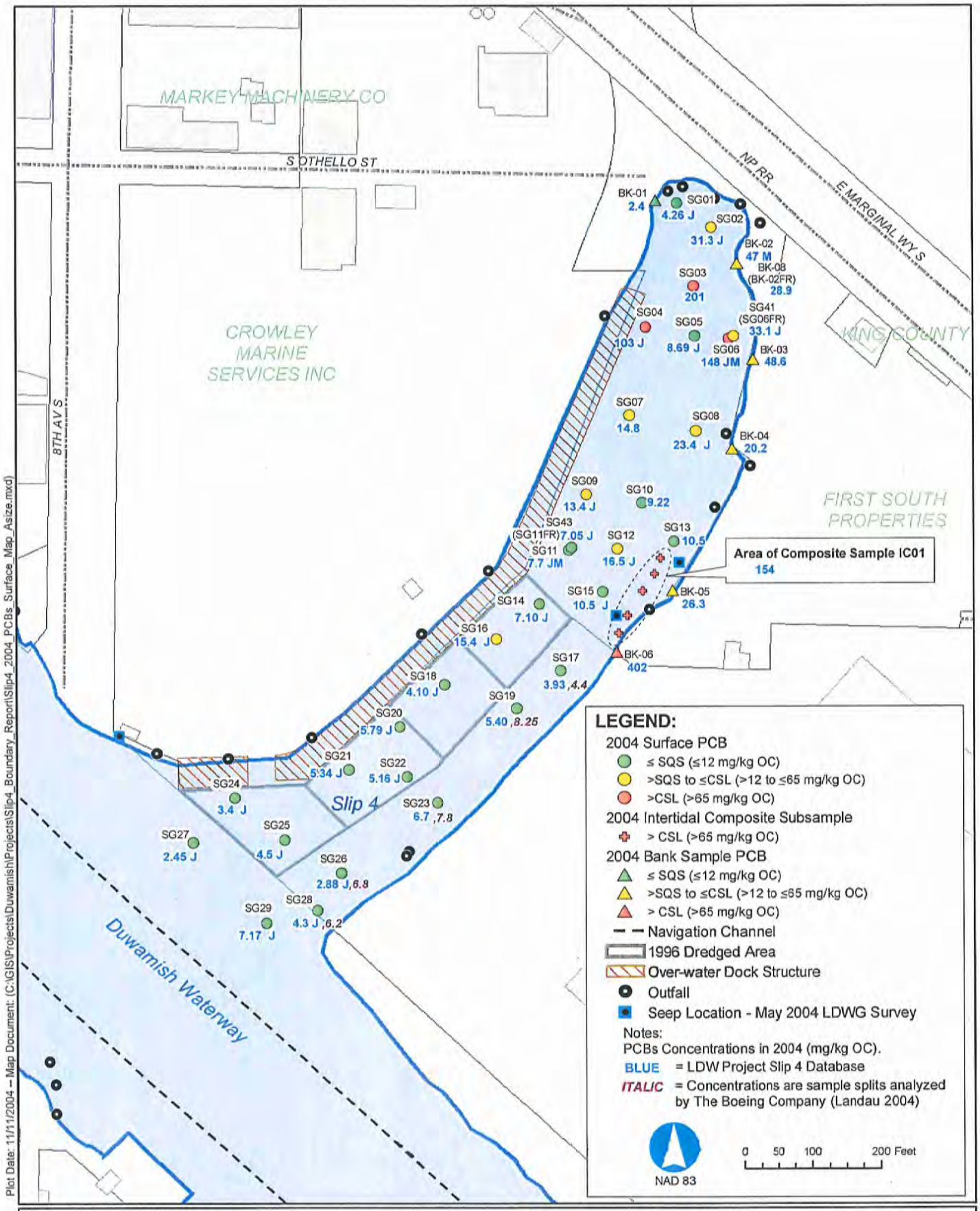
Station/Sample Prefix	Survey Reference
R	Exponent 1998
SL4	Landau 1990
DR	Weston 1999
EIT	NOAA 1998
EST	NOAA 1998

Plot Date: 01/03/2005 – Map Document: (C:\GIS\Projects\Duwamish\Projects\Slip4_Boundary_Report\Slip4_2004_PCB_Historic_Surface_Map_Asize.mxd)

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey PCB analysis results.

Figure 2.
PCB Concentrations in Surface Sediments Collected in 1990-1998.



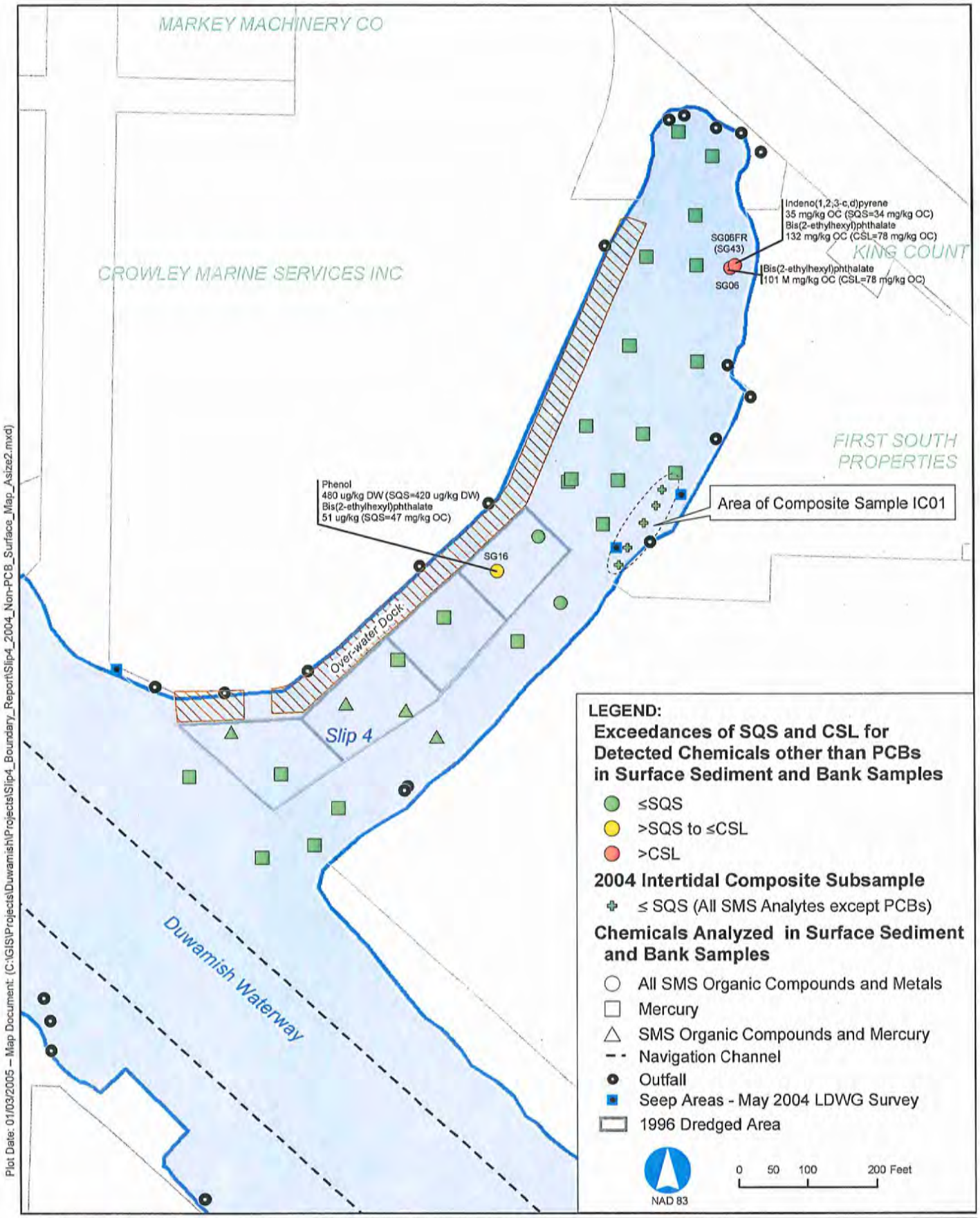
Plot Date: 11/11/2004 – Map Document: (C:\GIS\Projects\Duwamish\Projects\Slip4_Boundary_Report\Slip4_2004_PCBs_Surface_Map_Asize.mxd)

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Station locations: Lower Duwamish Project Database and 2004 Slip 4 FSP Navigation Table.

Qualifiers:
J=Estimated
M=Mean of field duplicate (i.e., split)
FR=Field replicate

Figure 3.
PCB Concentrations in Surface Sediment and Bank Samples Collected in 2004



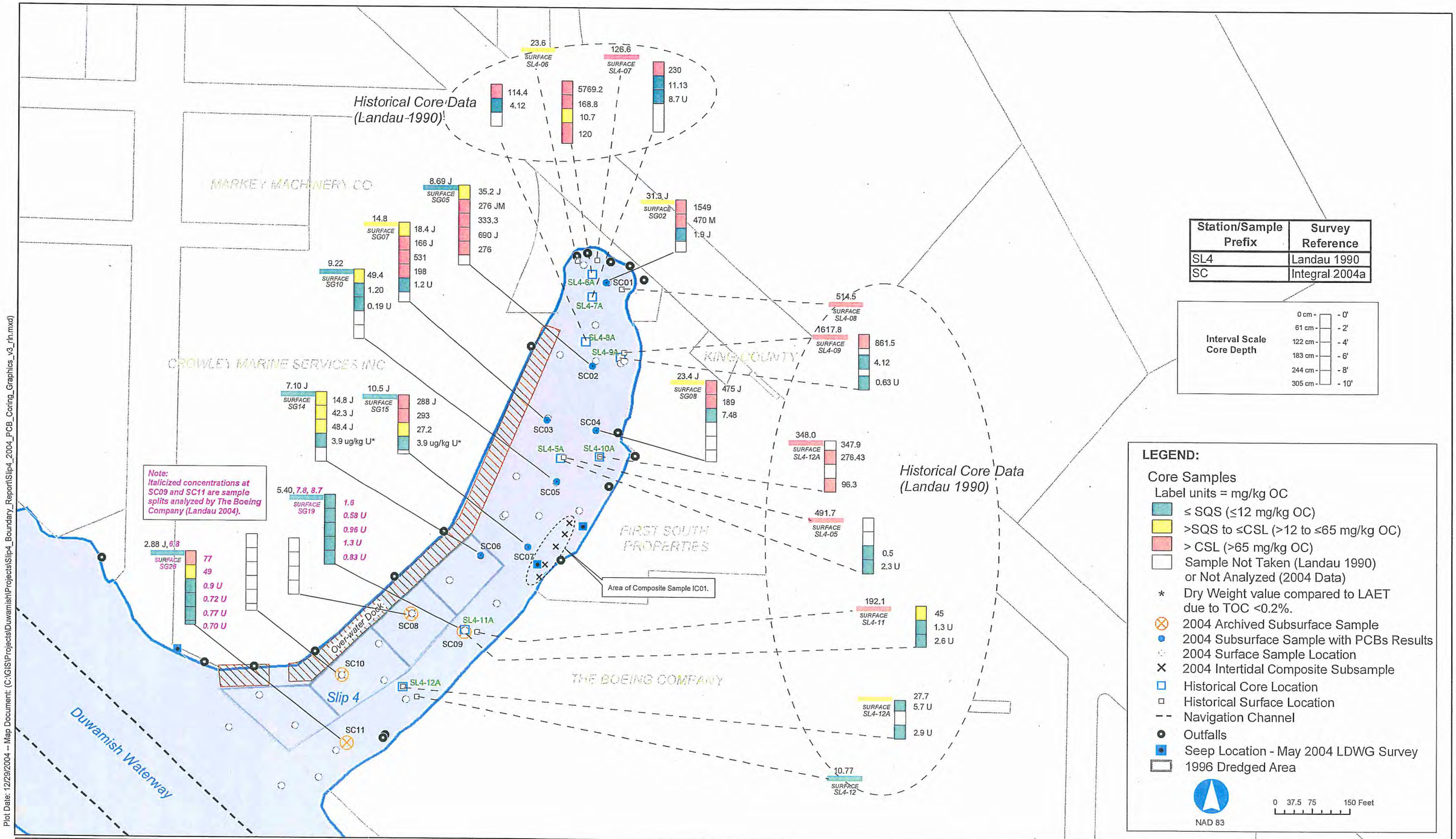
Plot Date: 01/03/2005 – Map Document: (C:\GIS\Projects\Duwamish\Projects\Slip4_Boundary_Report\Slip4_2004_Non-PCB_Surface_Map_Asize2.mxd)

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey PCB analysis results.

M=Mean of Field Duplicate (i.e., split)
FR=Field Replicate

Figure 4.
Exceedances of SQS and CSL for Detected Chemicals other than PCBs in Surface Sediment and Bank Samples Collected in 2004



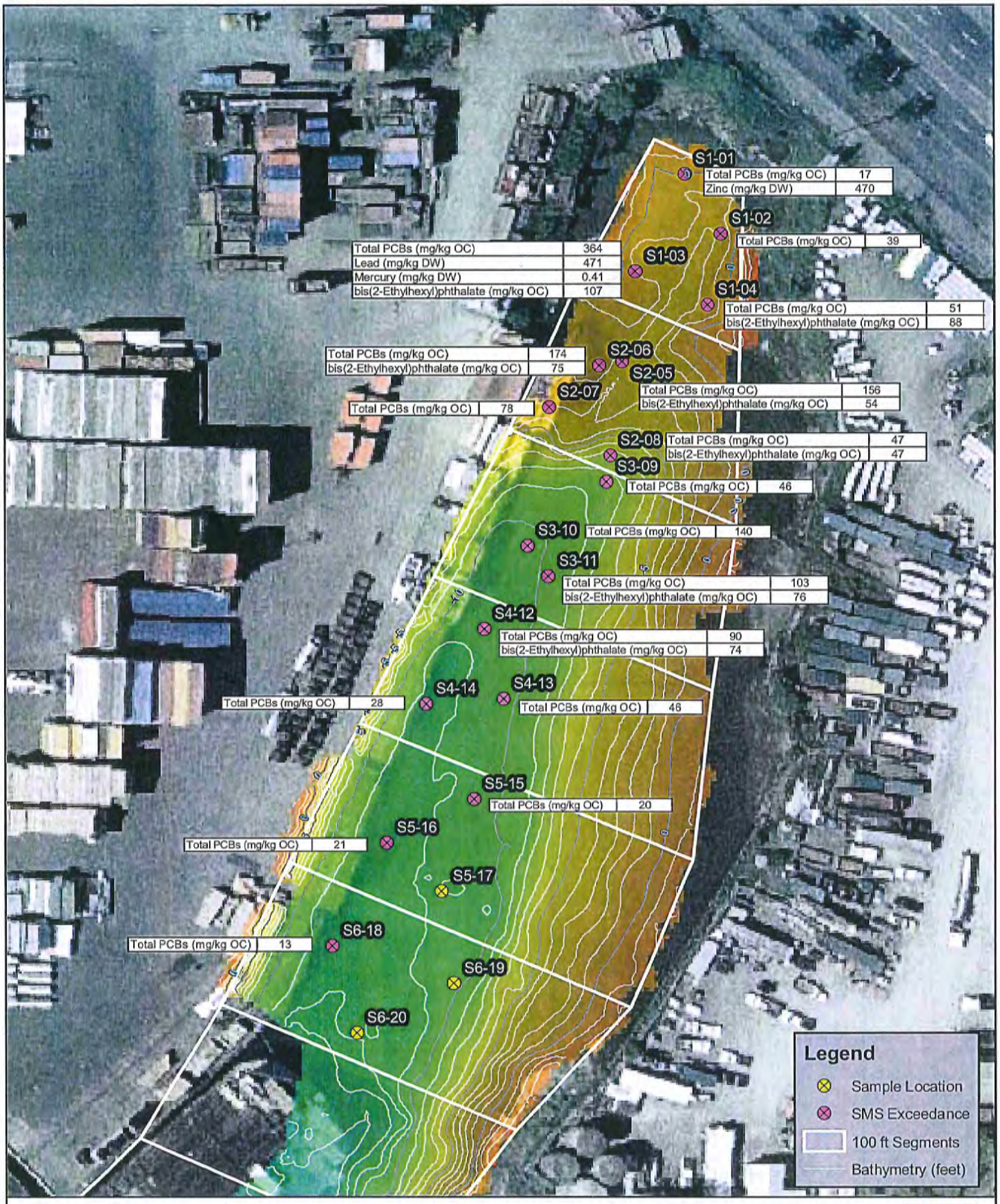
Plot Date: 12/29/2004 -- Map Document: (C:\GIS\Projects\Duwamish\Projects\Slip4_Boundary_Report\Slip4_2004_PCB_Coring_Graphics_v3_rlh.mxd)

integral consulting inc.

Map Feature Sources:
King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, David Evans, Inc., and others.
Sediment Chemistry:
Lower Duwamish Project Database and 2004 Slip 4 Survey PCB analysis results, The Boeing Company.

U=Undetected
J=Estimated
M=Mean of field duplicates (i.e., split)

Figure 5.
Historical and 2004 PCB Concentrations in Subsurface Sediments in Slip 4.



SAIC
From Science to Solutions

Figure 3. Slip 4 Surface Sediment SMS Exceedances

0 15 30 60 90 120 150 Feet

N

DEPARTMENT OF ECOLOGY
State of Washington

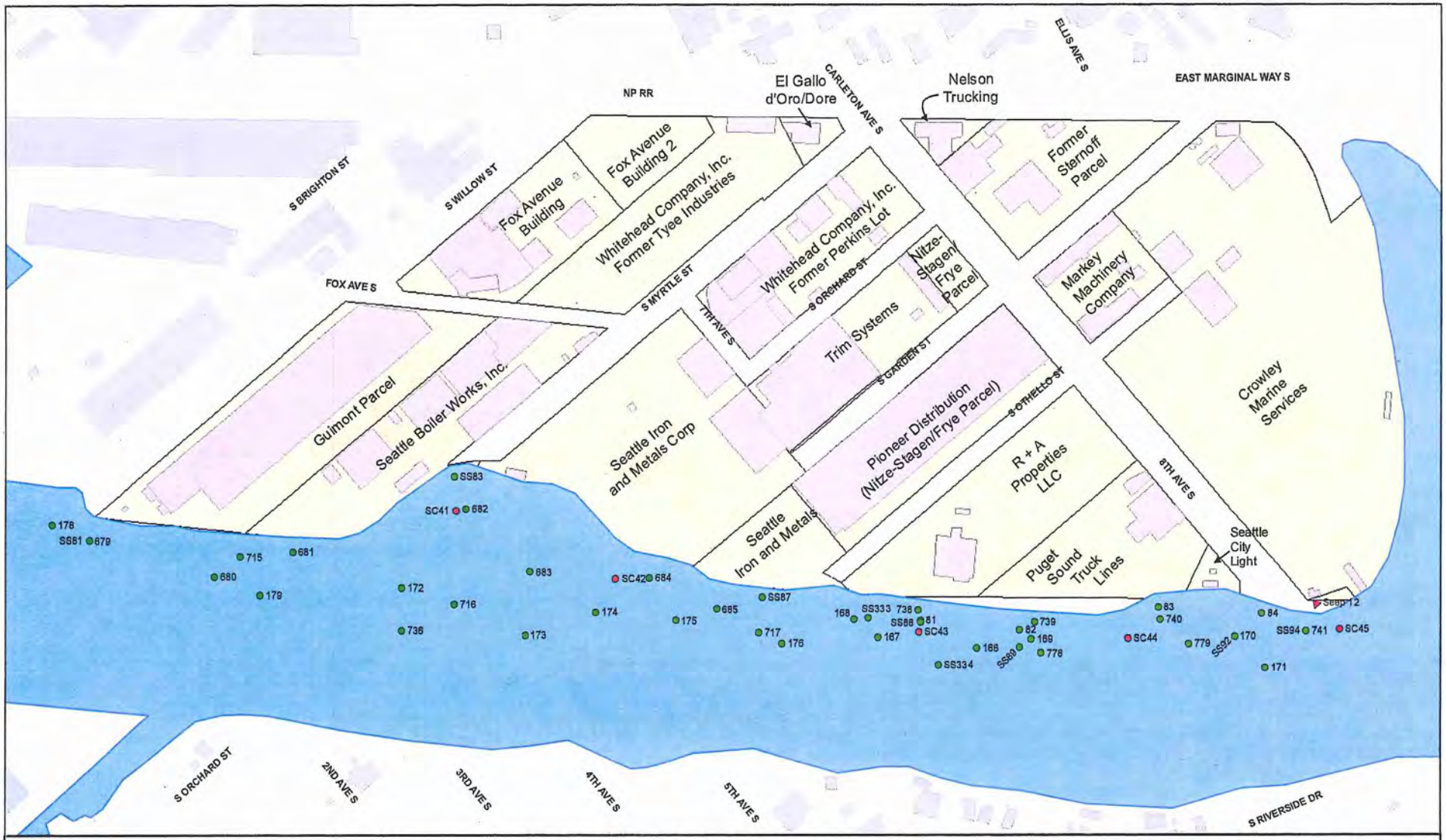


Figure 3. RM 2.3-2.8 East - Sediment and Seep Sampling Locations

SAIC
From Science to Solutions

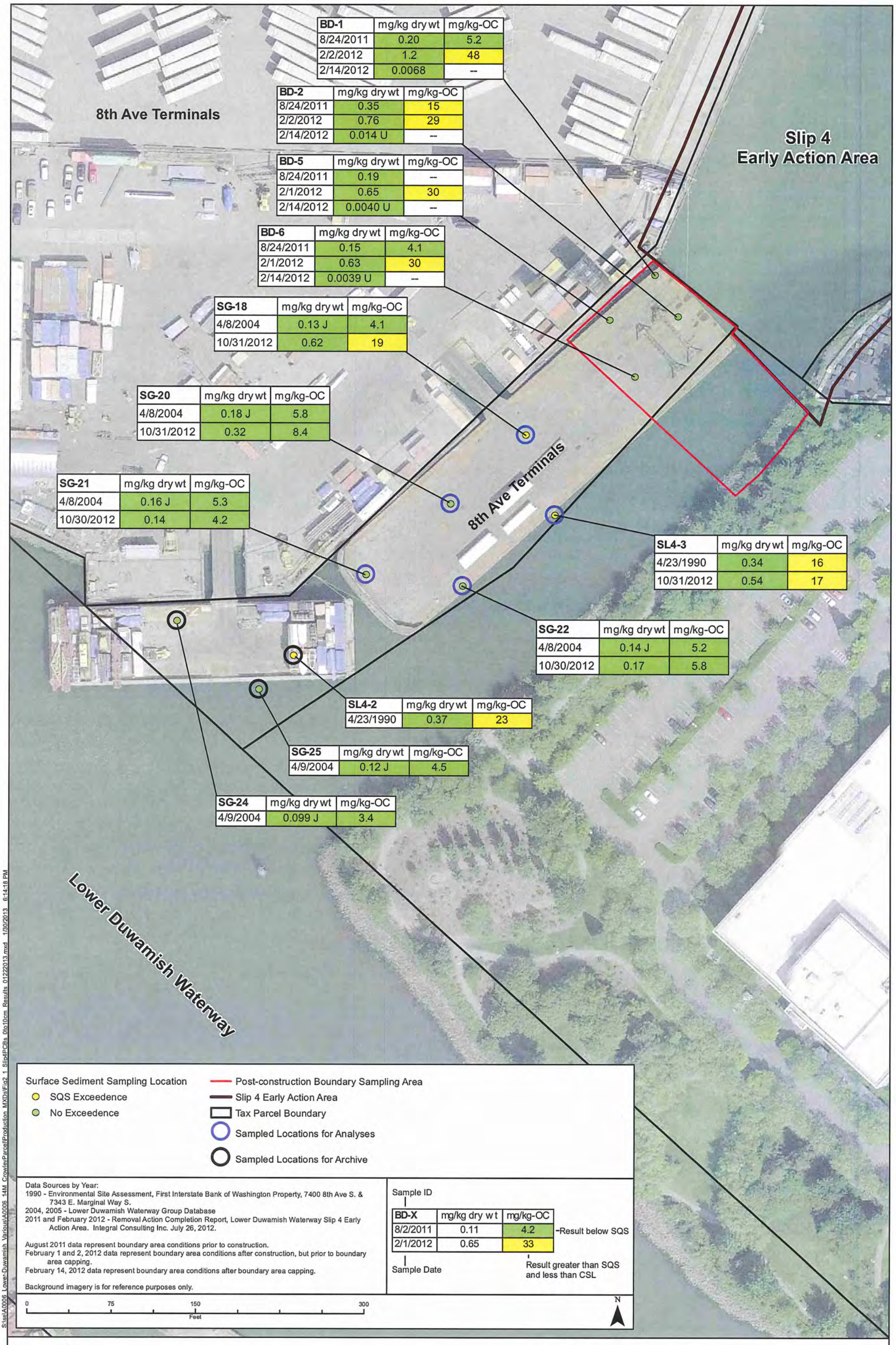
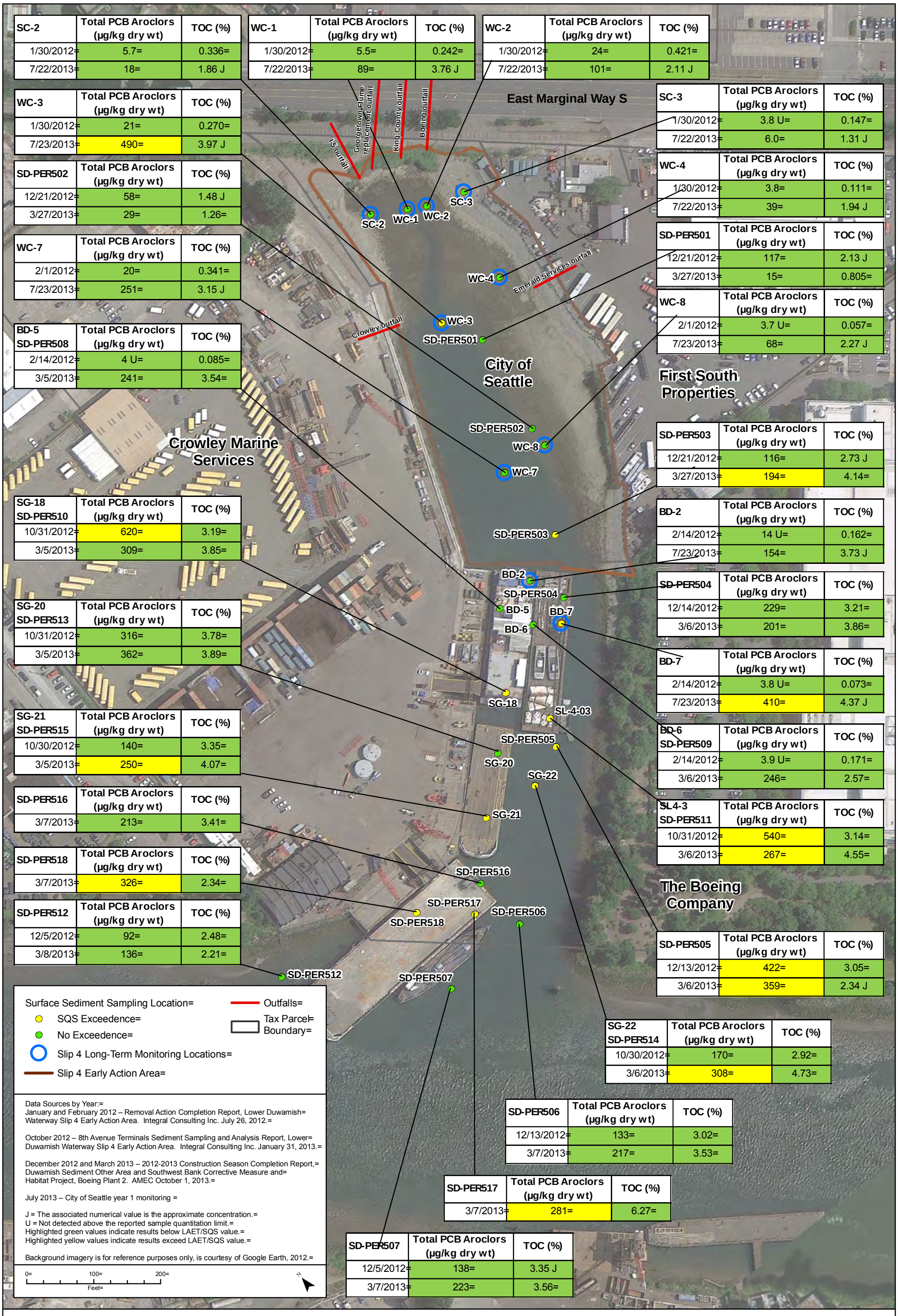


Figure 2.
2012 and Historical PCB Concentrations in Surface Sediments (0 - 10 cm) at 8th Avenue Terminals



SC-2	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
1/30/2012=	5.7=	0.336=
7/22/2013=	18=	1.86 J

WC-1	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
1/30/2012=	5.5=	0.242=
7/22/2013=	89=	3.76 J

WC-2	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
1/30/2012=	24=	0.421=
7/22/2013=	101=	2.11 J

WC-3	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
1/30/2012=	21=	0.270=
7/23/2013=	490=	3.97 J

SD-PER502	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/21/2012=	58=	1.48 J
3/27/2013=	29=	1.26=

WC-7	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
2/1/2012=	20=	0.341=
7/23/2013=	251=	3.15 J

BD-5 SD-PER508	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
2/14/2012=	4 U=	0.085=
3/5/2013=	241=	3.54=

SG-18 SD-PER510	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
10/31/2012=	620=	3.19=
3/5/2013=	309=	3.85=

SG-20 SD-PER513	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
10/31/2012=	316=	3.78=
3/5/2013=	362=	3.89=

SG-21 SD-PER515	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
10/30/2012=	140=	3.35=
3/5/2013=	250=	4.07=

SD-PER516	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
3/7/2013=	213=	3.41=

SD-PER518	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
3/7/2013=	326=	2.34=

SD-PER512	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/5/2012=	92=	2.48=
3/8/2013=	136=	2.21=

SC-3	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
1/30/2012=	3.8 U=	0.147=
7/22/2013=	6.0=	1.31 J

WC-4	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
1/30/2012=	3.8=	0.111=
7/22/2013=	39=	1.94 J

SD-PER501	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/21/2012=	117=	2.13 J
3/27/2013=	15=	0.805=

WC-8	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
2/1/2012=	3.7 U=	0.057=
7/23/2013=	68=	2.27 J

SD-PER503	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/21/2012=	116=	2.73 J
3/27/2013=	194=	4.14=

BD-2	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
2/14/2012=	14 U=	0.162=
7/23/2013=	154=	3.73 J

SD-PER504	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/14/2012=	229=	3.21=
3/6/2013=	201=	3.86=

BD-7	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
2/14/2012=	3.8 U=	0.073=
7/23/2013=	410=	4.37 J

BD-6 SD-PER509	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
2/14/2012=	3.9 U=	0.171=
3/6/2013=	246=	2.57=

SL4-3 SD-PER511	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
10/31/2012=	540=	3.14=
3/6/2013=	267=	4.55=

SD-PER505	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/13/2012=	422=	3.05=
3/6/2013=	359=	2.34 J

SG-22 SD-PER514	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
10/30/2012=	170=	2.92=
3/6/2013=	308=	4.73=

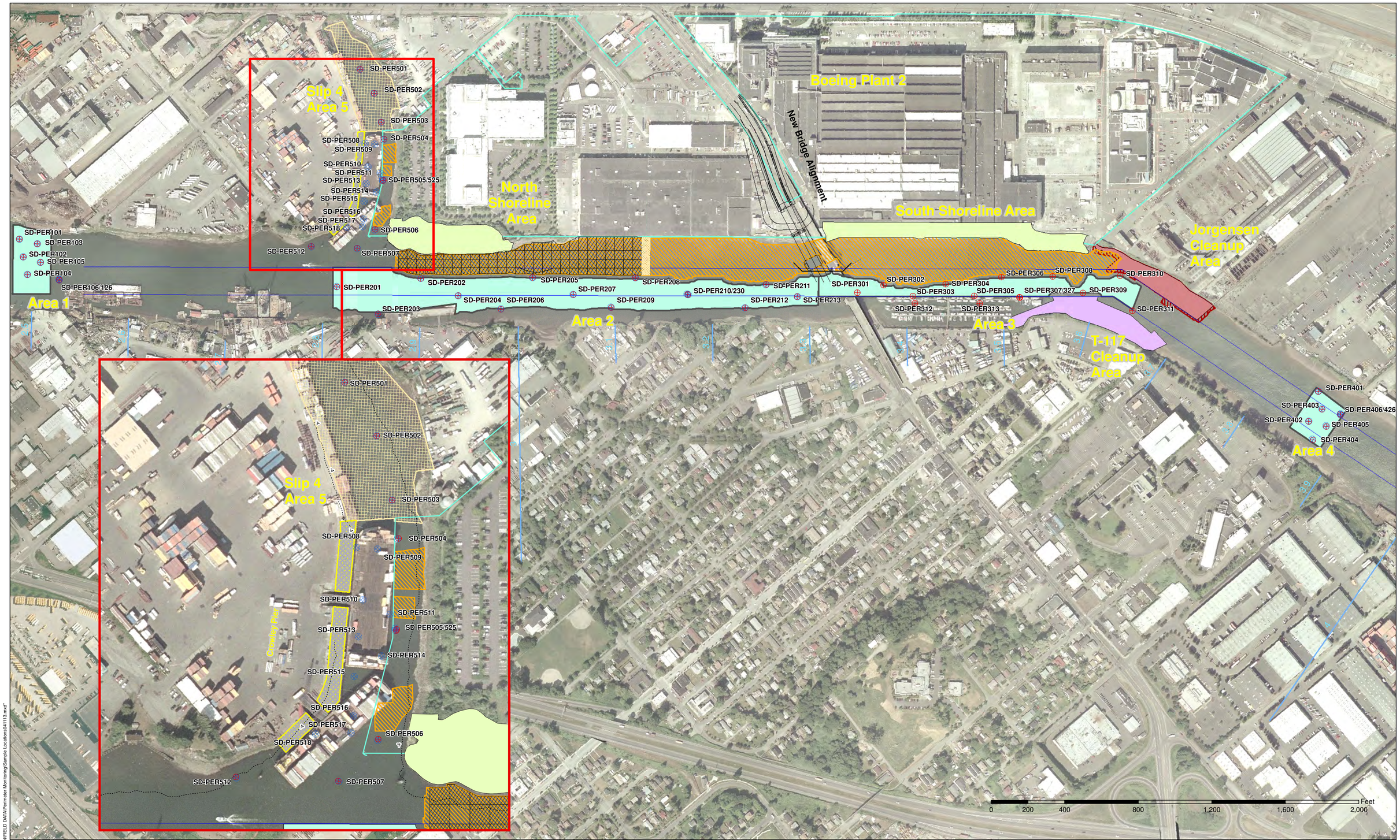
SD-PER506	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/13/2012=	133=	3.02=
3/7/2013=	217=	3.53=

SD-PER517	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
3/7/2013=	281=	6.27=

SD-PER507	Total PCB Aroclors (µg/kg dry wt)	TOC (%)
12/5/2012=	138=	3.35 J
3/7/2013=	223=	3.56=

integral consulting inc.

Figure 5-3.
Total PCB and TOC Concentrations for All Slip 4 Sediment=
Samples Collected in 2012 and 2013=
Slip 4 Early Action Area=
Long-Term Monitoring Data Report - Year 1 (2013)=



Legend

- Boeing Limits of Dredging
- Crowley Pier
- Jorgensen Cleanup Area
- Jorgensen Limits of Dredging
- T-117 Cleanup Area
- Slip 4 Cap Area
- Dredged Units
- Initial Backfill
- Perimeter Monitoring Areas
- Boeing Plant 2 Parcel
- Navigation Channel Boundary

Pre-construction Samples (December 2012)
SD-PER106/126 (Field Duplicate)

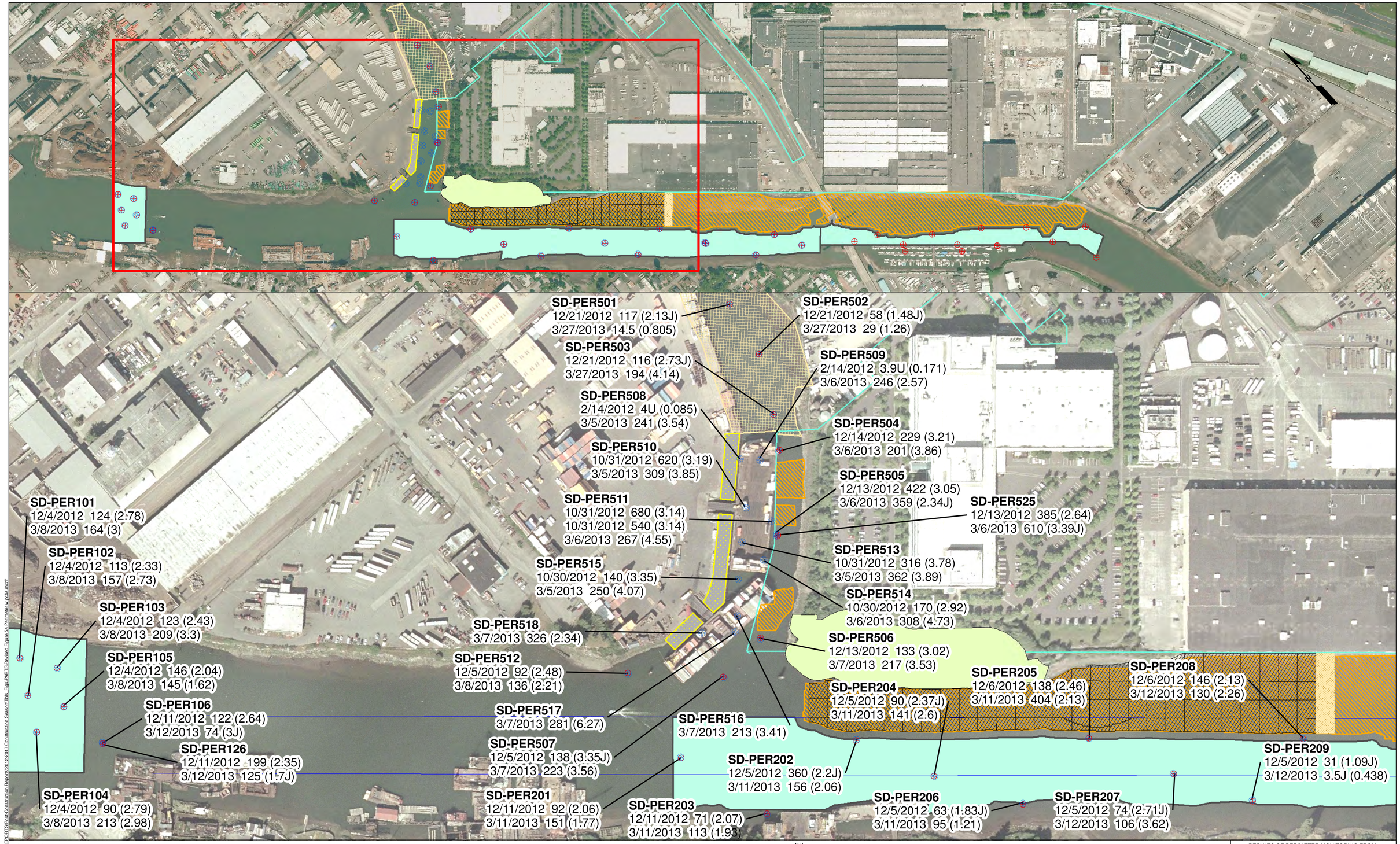
End of Season 1 (March 2013)
SD-PER508

Note:
Markers are positioned at average location based on three grab samples for all locations except SD-PER501, SD-PER502, and SD-PER503. Samples collected on Slip 4 cap (SD-PER501, SD-PER502, and SD-PER503) were sampled using hand cores and divers. Symbol placed at approximate sample location.

PERIMETER MONITORING SAMPLE LOCATIONS
2012-2013 CONSTRUCTION SEASON
2012-2013 Construction Season Completion Report
Duwamish Sediment Other Area and Southwest
Bank Corrective Measure and Habitat Project,
Boeing Plant 2, Seattle/Tukwila, Washington

By: RHG	Date5/7/2013	Project No. 0131320080
		Figure 4

File path: P:\BOEING\DESIGN\FIELD DATA\Perimeter Monitoring\Sample Locations\041113.mxd



Legend

- Boeing Limits of Dredging
- Jorgensen Limits of Dredging
- Dredged Units
- Boeing Plant 2 Parcel
- Crowley Pier
- T-117 Cleanup Area
- Initial Backfill
- Navigation Channel Boundary
- Jorgensen Cleanup Area
- Slip 4 Cap Area
- Perimeter Monitoring Areas

Pre-construction Samples (December 2012)

End of Season 1 (March 2013)

Location ID SD-PER508
Sample Dates 12/8/2012 179 (2.83) — TOC %
3/17/2013 156 (2.18) — Total PCBs ppb dw

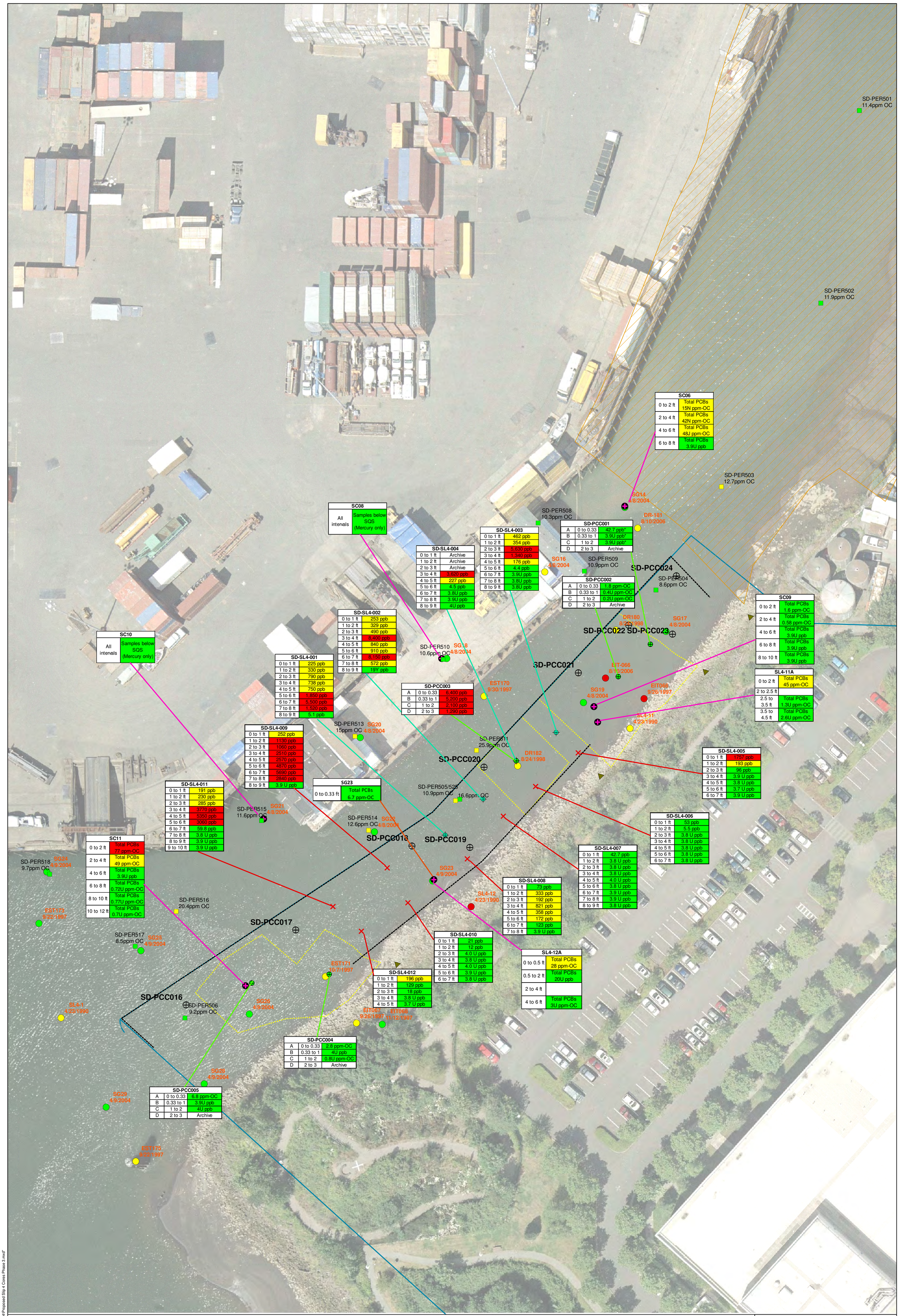
NA = Not Available

Note:
Markers are positioned at average location based on three grab samples for all locations except SD-PER501, SD-PER502, and SD-PER503. Samples collected on Slip 4 cap (SD-PER501, SD-PER502, and SD-PER503) were sampled using hand cores and divers. Symbol placed at approximate sample location.

RESULTS OF PERIMETER MONITORING FROM
2012-2013 CONSTRUCTION SEASON
2012-2013 Construction Season Completion Report
Duwamish Sediment Other Area and Southwest
Bank Corrective Measure and Habitat Project,
Boeing Plant 2, Seattle/Tukwila, Washington

By: RHG	Date 9/18/2013	Project No. 0131320080
		Figure 5a

File path=P:\BOEING\DESIGN\REPORTS\Post-Construction Reports\2012-2013 Construction Season\This_Fig\PARTS\Revised Figure 5a Perimeter w pcbs.mxd



SC06	
0 to 2 ft	Total PCBs 15N ppm-OC
2 to 4 ft	Total PCBs 42N ppm-OC
4 to 6 ft	Total PCBs 48J ppm-OC
6 to 8 ft	Total PCBs 3.9U ppb

SC08	
All intervals	Samples below SQS (Mercury only)

SC10	
All intervals	Samples below SQS (Mercury only)

SD-PCC001		
A	0 to 0.33	42.7 ppb*
B	0.33 to 1	3.9U ppb*
C	1 to 2	3.9U ppb*
D	2 to 3	Archive

SD-PCC002		
A	0 to 0.33	1.8 ppm-OC
B	0.33 to 1	0.4U ppm-OC
C	1 to 2	0.2U ppm-OC
D	2 to 3	Archive

SD-PCC003		
A	0 to 0.33	6,400 ppb
B	0.33 to 1	5,200 ppb
C	1 to 2	2,100 ppb
D	2 to 3	1,290 ppb

SD-PCC004		
A	0 to 0.33	2.8 ppm-OC
B	0.33 to 1	4U ppb
C	1 to 2	0.8U ppm-OC
D	2 to 3	Archive

SD-PCC005		
A	0 to 0.33	6.8 ppm-OC
B	0.33 to 1	3.9U ppb
C	1 to 2	4U ppb
D	2 to 3	Archive

SD-SL4-003	
0 to 1 ft	462 ppb
1 to 2 ft	354 ppb
2 to 3 ft	5,630 ppb
3 to 4 ft	1,340 ppb
4 to 5 ft	176 ppb
5 to 6 ft	4.4 ppb
6 to 7 ft	3.9U ppb
7 to 8 ft	3.8U ppb
8 to 9 ft	3.8U ppb

SD-SL4-004	
0 to 1 ft	Archive
1 to 2 ft	Archive
2 to 3 ft	Archive
3 to 4 ft	3,620 ppb
4 to 5 ft	227 ppb
5 to 6 ft	4.5 ppb
6 to 7 ft	3.8U ppb
7 to 8 ft	3.9U ppb
8 to 9 ft	4U ppb

SD-SL4-002	
0 to 1 ft	253 ppb
1 to 2 ft	329 ppb
2 to 3 ft	490 ppb
3 to 4 ft	8,400 ppb
4 to 5 ft	840 ppb
5 to 6 ft	910 ppb
6 to 7 ft	8,150 ppb
7 to 8 ft	572 ppb
8 to 9 ft	19Y ppb

SD-SL4-001	
0 to 1 ft	225 ppb
1 to 2 ft	330 ppb
2 to 3 ft	790 ppb
3 to 4 ft	738 ppb
4 to 5 ft	750 ppb
5 to 6 ft	1,850 ppb
6 to 7 ft	5,500 ppb
7 to 8 ft	1,520 ppb
8 to 9 ft	5.1 ppb

SD-SL4-009	
0 to 1 ft	252 ppb
1 to 2 ft	1130 ppb
2 to 3 ft	1060 ppb
3 to 4 ft	2510 ppb
4 to 5 ft	2570 ppb
5 to 6 ft	4870 ppb
6 to 7 ft	5690 ppb
7 to 8 ft	2840 ppb
8 to 9 ft	3.9 U ppb

SD-SL4-011	
0 to 1 ft	191 ppb
1 to 2 ft	230 ppb
2 to 3 ft	285 ppb
3 to 4 ft	3770 ppb
4 to 5 ft	5350 ppb
5 to 6 ft	3060 ppb
6 to 7 ft	59.8 ppb
7 to 8 ft	3.8 U ppb
8 to 9 ft	3.9 U ppb
9 to 10 ft	3.9 U ppb

SG23	
0 to 0.33 ft	Total PCBs 6.7 ppm-OC

SC09	
0 to 2 ft	Total PCBs 1.6 ppm-OC
2 to 4 ft	Total PCBs 0.58 ppm-OC
4 to 6 ft	Total PCBs 3.9U ppb
6 to 8 ft	Total PCBs 3.9U ppb
8 to 10 ft	Total PCBs 3.9U ppb

SL4-11A	
0 to 2 ft	Total PCBs 45 ppm-OC
2 to 2.5 ft	
2.5 to 3.5 ft	Total PCBs 1.3U ppm-OC
3.5 to 4.5 ft	Total PCBs 2.6U ppm-OC

SD-SL4-005	
0 to 1 ft	1757 ppb
1 to 2 ft	193 ppb
2 to 3 ft	96 ppb
3 to 4 ft	3.9 U ppb
4 to 5 ft	3.8 U ppb
5 to 6 ft	3.7 U ppb
6 to 7 ft	3.9 U ppb

SD-SL4-006	
0 to 1 ft	53 ppb
1 to 2 ft	5.5 ppb
2 to 3 ft	3.8 U ppb
3 to 4 ft	3.8 U ppb
4 to 5 ft	3.8 U ppb
5 to 6 ft	3.8 U ppb
6 to 7 ft	3.8 U ppb

SD-SL4-007	
0 to 1 ft	42.7 ppb
1 to 2 ft	3.8 U ppb
2 to 3 ft	3.8 U ppb
3 to 4 ft	3.8 U ppb
4 to 5 ft	4.0 U ppb
5 to 6 ft	3.8 U ppb
6 to 7 ft	3.9 U ppb
7 to 8 ft	3.9 U ppb
8 to 9 ft	3.8 U ppb

SD-SL4-008	
0 to 1 ft	73 ppb
1 to 2 ft	333 ppb
2 to 3 ft	192 ppb
3 to 4 ft	821 ppb
4 to 5 ft	358 ppb
5 to 6 ft	172 ppb
6 to 7 ft	123 ppb
7 to 8 ft	3.9 U ppb

SD-SL4-010	
0 to 1 ft	21 ppb
1 to 2 ft	12 ppb
2 to 3 ft	4.0 U ppb
3 to 4 ft	3.8 U ppb
4 to 5 ft	4.0 U ppb
5 to 6 ft	3.9 U ppb
6 to 7 ft	3.8 U ppb

SD-SL4-012	
0 to 1 ft	196 ppb
1 to 2 ft	129 ppb
2 to 3 ft	18 ppb
3 to 4 ft	3.8 U ppb
4 to 5 ft	3.7 U ppb

SL4-12A	
0 to 0.5 ft	Total PCBs 28 ppm-OC
0.5 to 2 ft	Total PCBs 20U ppb
2 to 4 ft	
4 to 6 ft	Total PCBs 3U ppm-OC

SC11	
0 to 2 ft	Total PCBs 77 ppm-OC
2 to 4 ft	Total PCBs 49 ppm-OC
4 to 6 ft	Total PCBs 3.9U ppb
6 to 8 ft	Total PCBs 0.72U ppm-OC
8 to 10 ft	Total PCBs 0.77U ppm-OC
10 to 12 ft	Total PCBs 0.7U ppm-OC

Proposed Additional Confirmation Cores
Phase 2 Slip 4 Core Locations (Jan 2015)
Phase 1 Slip 4 Core Locations (Dec 2014)
Historic Core Locations
Historic Surface Grab Locations
Perimeter Monitoring Locations (Sept 2014)
Historic Outfalls
Slip 4 Cap
Sheetpile

Total PCB (ppb DW or ppm OC)
<130 ppb DW or <12 ppm OC
≥130 ppb DW or ≥12 ppm OC and <1,000 ppb DW or <65 ppm OC
≥1,000 ppb DW or ≥65 ppm OC

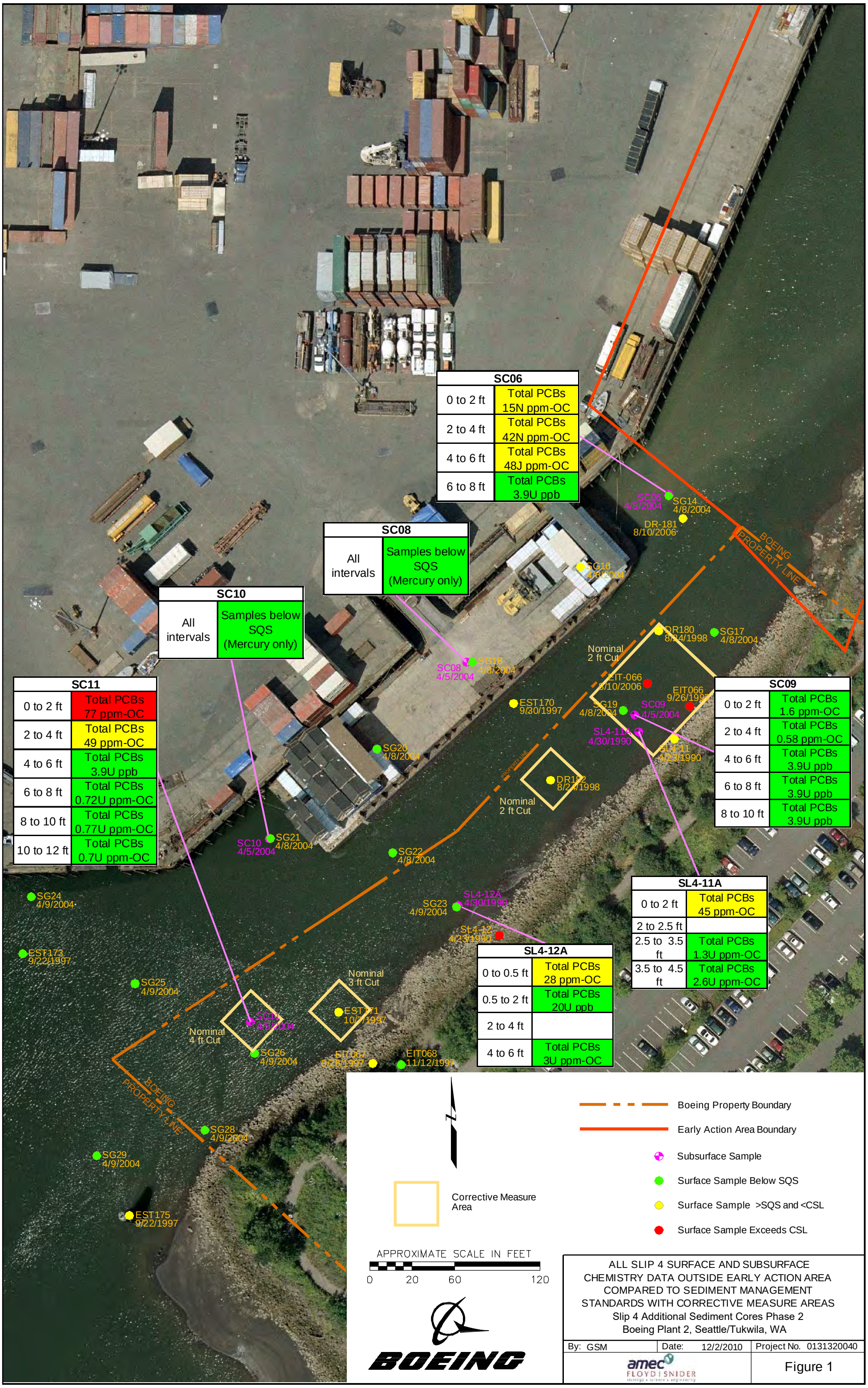
BOEING

SLIP 4 CORE LOCATIONS
Additional Slip 4 Confirmation Cores
Phase 3
Boeing Plant 2
Seattle/Tukwila, WA

By: RHG | Date: 1/30/2015 | Project No. 0131320090

Figure 1

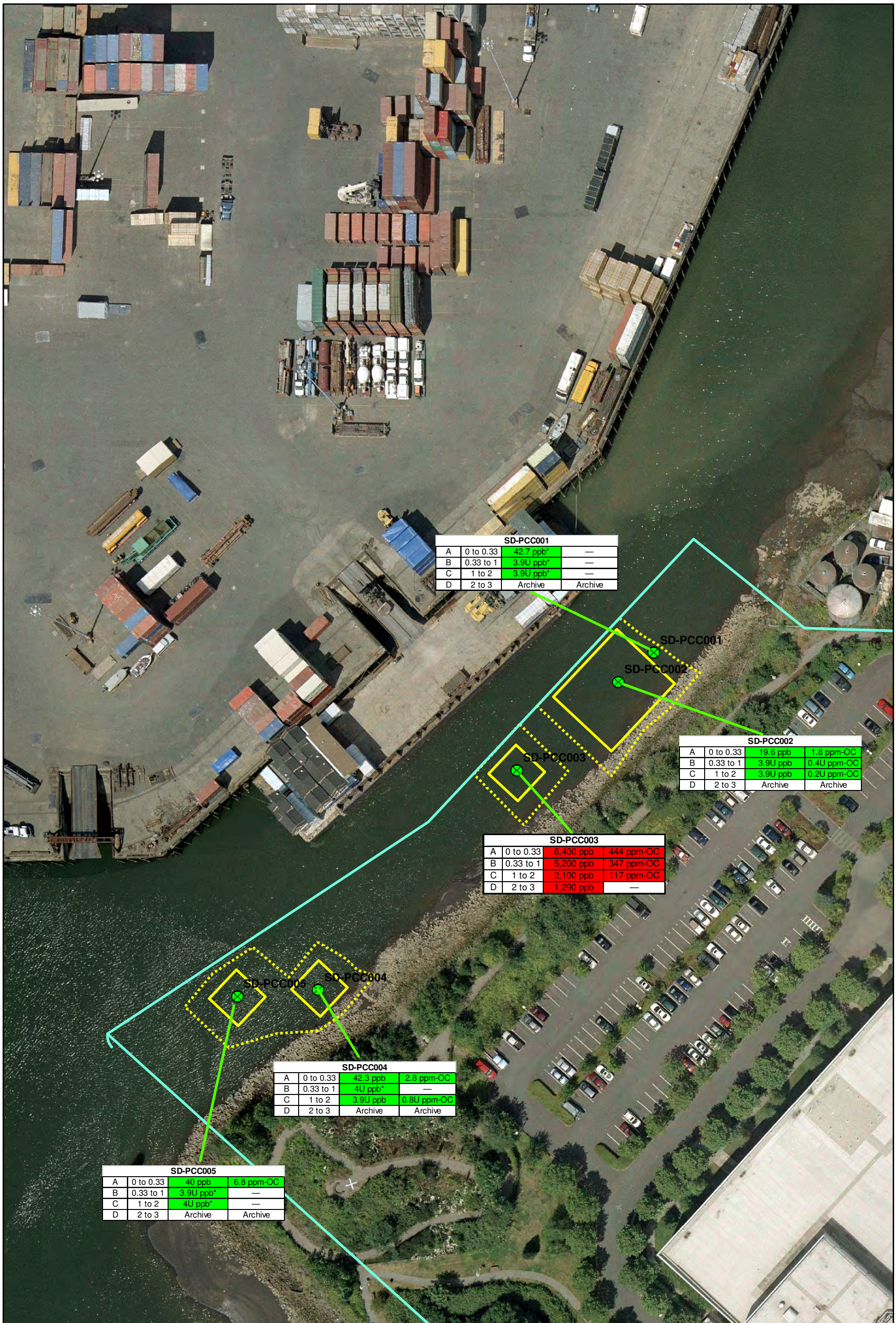
"P:\BOEING\DESIGN\DATA\Slip 4\Proposed Slip 4 Cores Phase 3.mxd"



ALL SLIP 4 SURFACE AND SUBSURFACE CHEMISTRY DATA OUTSIDE EARLY ACTION AREA COMPARED TO SEDIMENT MANAGEMENT STANDARDS WITH CORRECTIVE MEASURE AREAS
Slip 4 Additional Sediment Cores Phase 2
Boeing Plant 2, Seattle/Tukwila, WA

By: GSM	Date: 12/2/2010	Project No. 0131320040
amec FLOYD | SNIDER		Figure 1

Plot Date: 12/02/10 - 3:43pm, Plotted by: gary.maxwell
Drawing Path: P:\BOEING\SLIP 4\Sediment Characterization\CAD\, Drawing Name: SLIP4-Alternatives Evaluation Fig 5-6-7.dwg



SD-PCC001			
A	0 to 0.33	42.7 ppb*	—
B	0.33 to 1	3.9U ppb*	—
C	1 to 2	3.9U ppb*	—
D	2 to 3	Archive	Archive

SD-PCC002			
A	0 to 0.33	19.6 ppb	1.8 ppm-OC
B	0.33 to 1	3.9U ppb	0.4U ppm-OC
C	1 to 2	3.9U ppb	0.2U ppm-OC
D	2 to 3	Archive	Archive

SD-PCC003			
A	0 to 0.33	6,400 ppb	444 ppm-OC
B	0.33 to 1	5,200 ppb	347 ppm-OC
C	1 to 2	2,100 ppb	117 ppm-OC
D	2 to 3	1,290 ppb	—

SD-PCC004			
A	0 to 0.33	42.3 ppb	2.8 ppm-OC
B	0.33 to 1	4U ppb*	—
C	1 to 2	3.9U ppb	0.8U ppm-OC
D	2 to 3	Archive	Archive

SD-PCC005			
A	0 to 0.33	40 ppb	6.8 ppm-OC
B	0.33 to 1	3.9U ppb*	—
C	1 to 2	4U ppb*	—
D	2 to 3	Archive	Archive

Legend

⊗ Post-construction Core Location

SD-PCC004			
A	0 to 0.33	42.3 ppb	2.8 ppm-OC
B	0.33 to 1	4U ppb*	—
C	1 to 2	3.9U ppb	0.8U ppm-OC
D	2 to 3	Archive	Archive
Segment	Interval	Total PCBs (ppb dw)	Total PCBs (ppm OC)

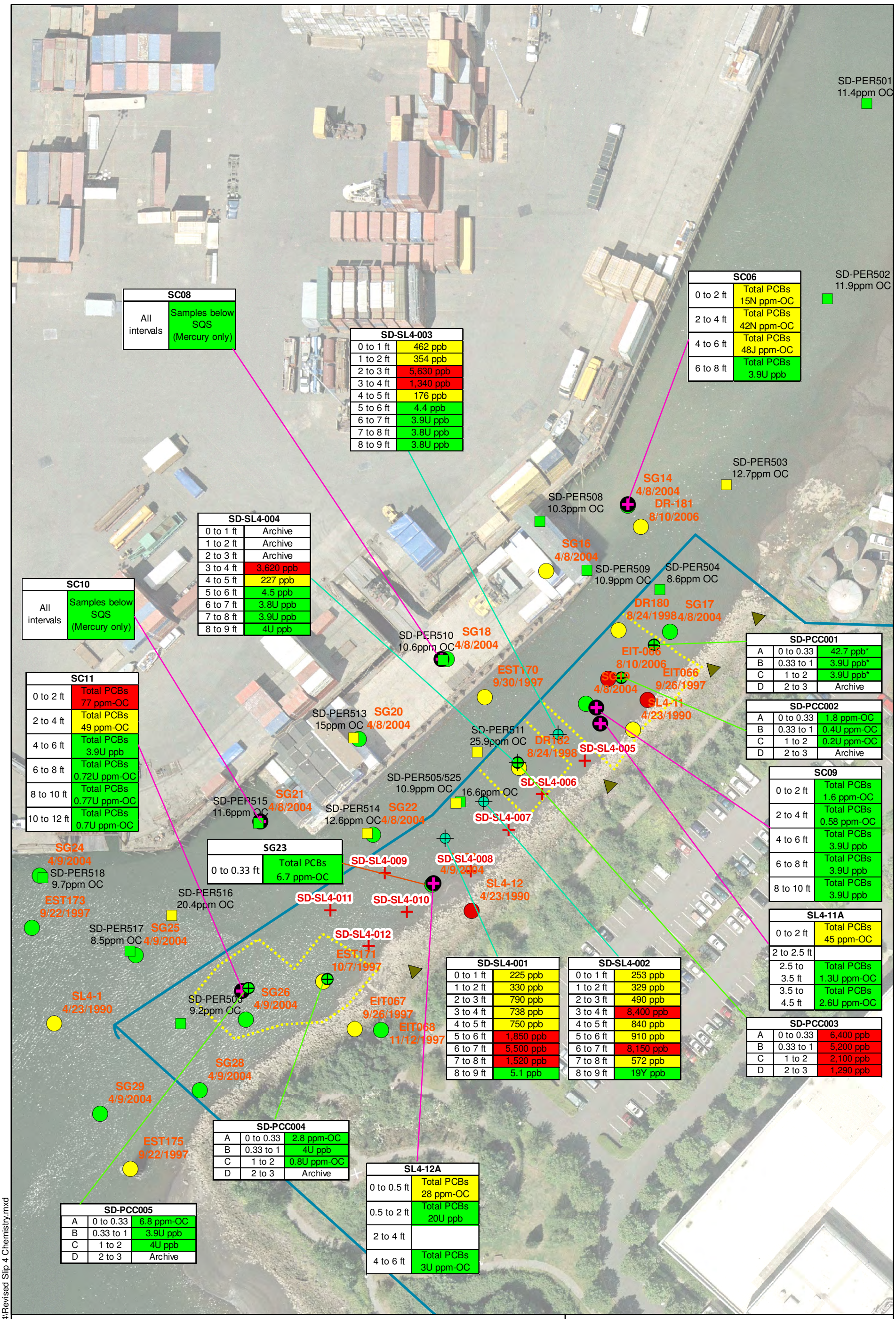
Notes:
* = Total organic carbon less than 0.5 %, OC normalized value not calculated.
U = undetected at the reporting limit
Gray cells indicate sample requested but not received

BOEING

RESULTS OF POST-CONSTRUCTION CORES
COLLECTED IN SLIP 4
Slip 4 Additional Sediment Cores
Phase 2
Boeing Plant 2,
Seattle/Tukwila, WA

By: RHG | Date: 1/13/2015 | Project No. 0131320090

Figure 2



SC08	
All intervals	Samples below SQS (Mercury only)

SD-SL4-003	
0 to 1 ft	462 ppb
1 to 2 ft	354 ppb
2 to 3 ft	5,630 ppb
3 to 4 ft	1,340 ppb
4 to 5 ft	176 ppb
5 to 6 ft	4.4 ppb
6 to 7 ft	3.9U ppb
7 to 8 ft	3.8U ppb
8 to 9 ft	3.8U ppb

SC06	
0 to 2 ft	Total PCBs 15N ppm-OC
2 to 4 ft	Total PCBs 42N ppm-OC
4 to 6 ft	Total PCBs 48J ppm-OC
6 to 8 ft	Total PCBs 3.9U ppb

SD-SL4-004	
0 to 1 ft	Archive
1 to 2 ft	Archive
2 to 3 ft	Archive
3 to 4 ft	3,620 ppb
4 to 5 ft	227 ppb
5 to 6 ft	4.5 ppb
6 to 7 ft	3.8U ppb
7 to 8 ft	3.9U ppb
8 to 9 ft	4U ppb

SC10	
All intervals	Samples below SQS (Mercury only)

SC11	
0 to 2 ft	Total PCBs 77 ppm-OC
2 to 4 ft	Total PCBs 49 ppm-OC
4 to 6 ft	Total PCBs 3.9U ppb
6 to 8 ft	Total PCBs 0.72U ppm-OC
8 to 10 ft	Total PCBs 0.77U ppm-OC
10 to 12 ft	Total PCBs 0.7U ppm-OC

SG23	
0 to 0.33 ft	Total PCBs 6.7 ppm-OC

SD-PCC001		
A	0 to 0.33	42.7 ppb*
B	0.33 to 1	3.9U ppb*
C	1 to 2	3.9U ppb*
D	2 to 3	Archive

SD-PCC002		
A	0 to 0.33	1.8 ppm-OC
B	0.33 to 1	0.4U ppm-OC
C	1 to 2	0.2U ppm-OC
D	2 to 3	Archive

SC09	
0 to 2 ft	Total PCBs 1.6 ppm-OC
2 to 4 ft	Total PCBs 0.58 ppm-OC
4 to 6 ft	Total PCBs 3.9U ppb
6 to 8 ft	Total PCBs 3.9U ppb
8 to 10 ft	Total PCBs 3.9U ppb

SL4-11A	
0 to 2 ft	Total PCBs 45 ppm-OC
2 to 2.5 ft	
2.5 to 3.5 ft	Total PCBs 1.3U ppm-OC
3.5 to 4.5 ft	Total PCBs 2.6U ppm-OC

SD-SL4-001	
0 to 1 ft	225 ppb
1 to 2 ft	330 ppb
2 to 3 ft	790 ppb
3 to 4 ft	738 ppb
4 to 5 ft	750 ppb
5 to 6 ft	1,850 ppb
6 to 7 ft	5,500 ppb
7 to 8 ft	1,520 ppb
8 to 9 ft	5.1 ppb

SD-SL4-002	
0 to 1 ft	253 ppb
1 to 2 ft	329 ppb
2 to 3 ft	490 ppb
3 to 4 ft	8,400 ppb
4 to 5 ft	840 ppb
5 to 6 ft	910 ppb
6 to 7 ft	8,150 ppb
7 to 8 ft	572 ppb
8 to 9 ft	19Y ppb

SD-PCC003		
A	0 to 0.33	6,400 ppb
B	0.33 to 1	5,200 ppb
C	1 to 2	2,100 ppb
D	2 to 3	1,290 ppb

SD-PCC004		
A	0 to 0.33	2.8 ppm-OC
B	0.33 to 1	4U ppb
C	1 to 2	0.8U ppm-OC
D	2 to 3	Archive

SL4-12A	
0 to 0.5 ft	Total PCBs 28 ppm-OC
0.5 to 2 ft	Total PCBs 20U ppb
2 to 4 ft	
4 to 6 ft	Total PCBs 3U ppm-OC

SD-PCC005		
A	0 to 0.33	6.8 ppm-OC
B	0.33 to 1	3.9U ppb
C	1 to 2	4U ppb
D	2 to 3	Archive

- Additional Slip 4 Core Locations (Jan 2015)
- Additional Slip 4 Core Locations (Dec 2014)
- Historic Core Locations
- Historic Surface Grab Locations
- Perimeter Monitoring Locations (Sept 2014)
- Historic outfalls

Total PCB (ppb DW or ppm OC)

- <130 ppb DW or <12 ppm OC
- ≥130 ppb DW or ≥12 ppm OC and <1,000 ppb DW or <65 ppm OC
- ≥1,000 ppb DW or ≥65 ppm OC

PROPOSED SLIP 4 CORE LOCATIONS
Slip 4 Additional Sediment Cores
Phase 2
Boeing Plant 2
Seattle/Tukwila, WA

By: RHG | Date: 1/13/2015 | Project No. 0131320090

Figure 3

P:\BOEING\DESIGN\DATA\Slip 4\Revised Slip 4 Chemistry.mxd

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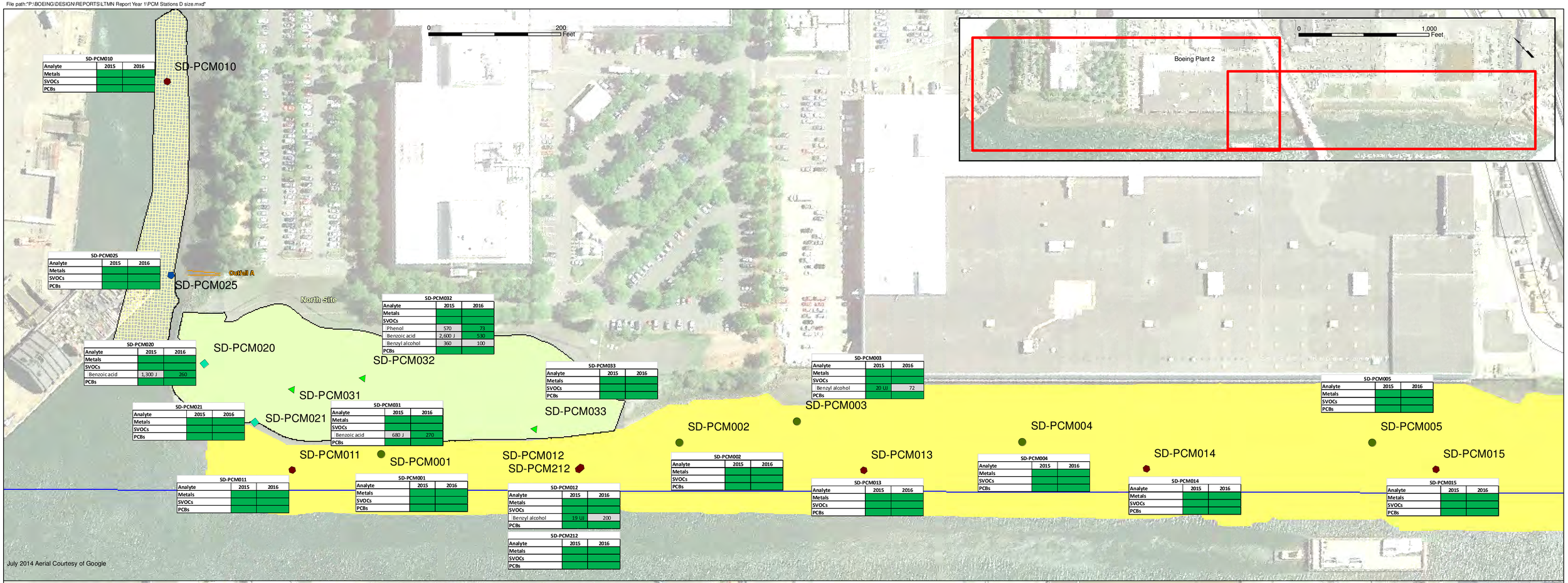


SD-PCM010		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM025		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM032		
Analyte	2015	2016
Metals		
SVOCs		
Phenol	570	73
Benzoic acid	2,600 J	530
Benzyl alcohol	360	100
PCBs		

SD-PCM020		
Analyte	2015	2016
Metals		
SVOCs		
Benzoic acid	1,300 J	260
PCBs		

SD-PCM033		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM003		
Analyte	2015	2016
Metals		
SVOCs		
Benzyl alcohol	20 UJ	72
PCBs		

SD-PCM005		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM021		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM031		
Analyte	2015	2016
Metals		
SVOCs		
Benzoic acid	680 J	270
PCBs		

SD-PCM002		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM004		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM011		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM001		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

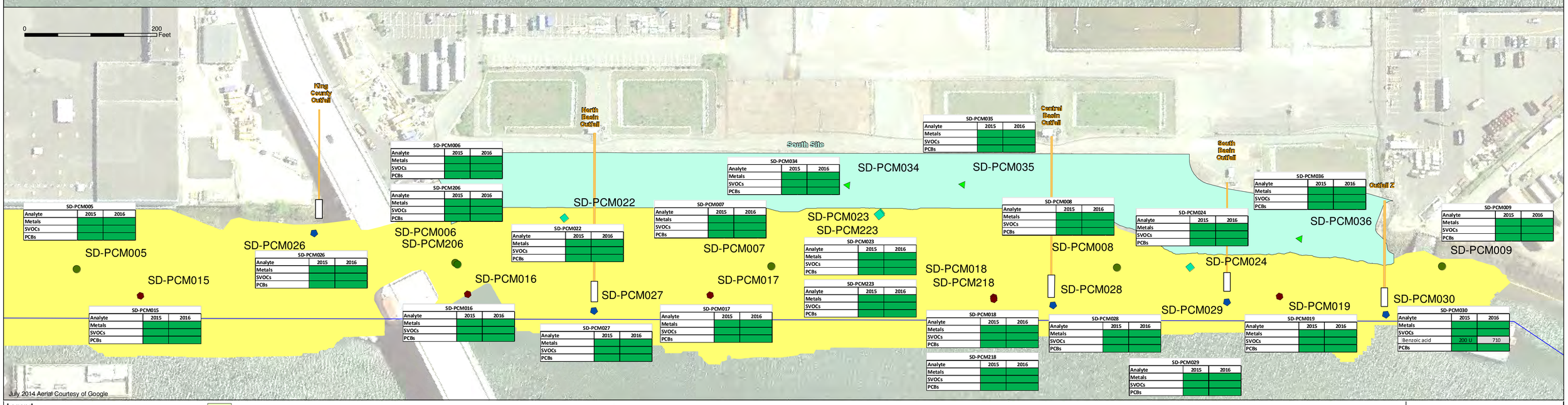
SD-PCM012		
Analyte	2015	2016
Metals		
SVOCs		
Benzyl alcohol	19 UJ	200
PCBs		

SD-PCM013		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM014		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM015		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM212		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		



SD-PCM005		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM006		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM206		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM026		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM022		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM034		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM035		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM036		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM009		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM007		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM023		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM223		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM008		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM024		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM015		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM016		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM027		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM017		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM018		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM218		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM028		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM029		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM019		
Analyte	2015	2016
Metals		
SVOCs		
PCBs		

SD-PCM030		
Analyte	2015	2016
Metals		
SVOCs		
Benzoic acid	200 U	710
PCBs		

Legend

- Shoreline Area Samples (at approximately +7 ft MLLW)
- Shoreline Area Samples (at approximately +4 ft MLLW)
- Sampling Locations (above -5 ft MLLW and below + 4 ft MLLW)
- Sampling Location (below -5 ft MLLW)
- Outfall Sample Locations
- North Site
- South Site
- Slip 4 Approximate Dredge Area
- DSOA Limits of Dredging

SMS COC Groups

SD-PCM030		
Analyte	2015	2016
Metals		
SVOCs		
Benzoic acid	200 U	710
PCBs		

Sampling Location

_SMS Analyte That Exceeds SMS Criteria

Notes:
Sediment concentrations for Sediment Management Standards (SMS) chemicals of concern (COC) are compared to the SMS dry weight equivalent sediment criteria (Sediment Quality Standard [SQS] and Cleanup Screening Level [CSL] criteria). If all of the SMS COCs within a group are below the SQS then the cell is colored green. If one or more analytes exceed the SQS (or CSL) then the analyte is listed with the results from each year and the cells are color coded gray to indicate the value exceeds one or more of the SMS criterion.

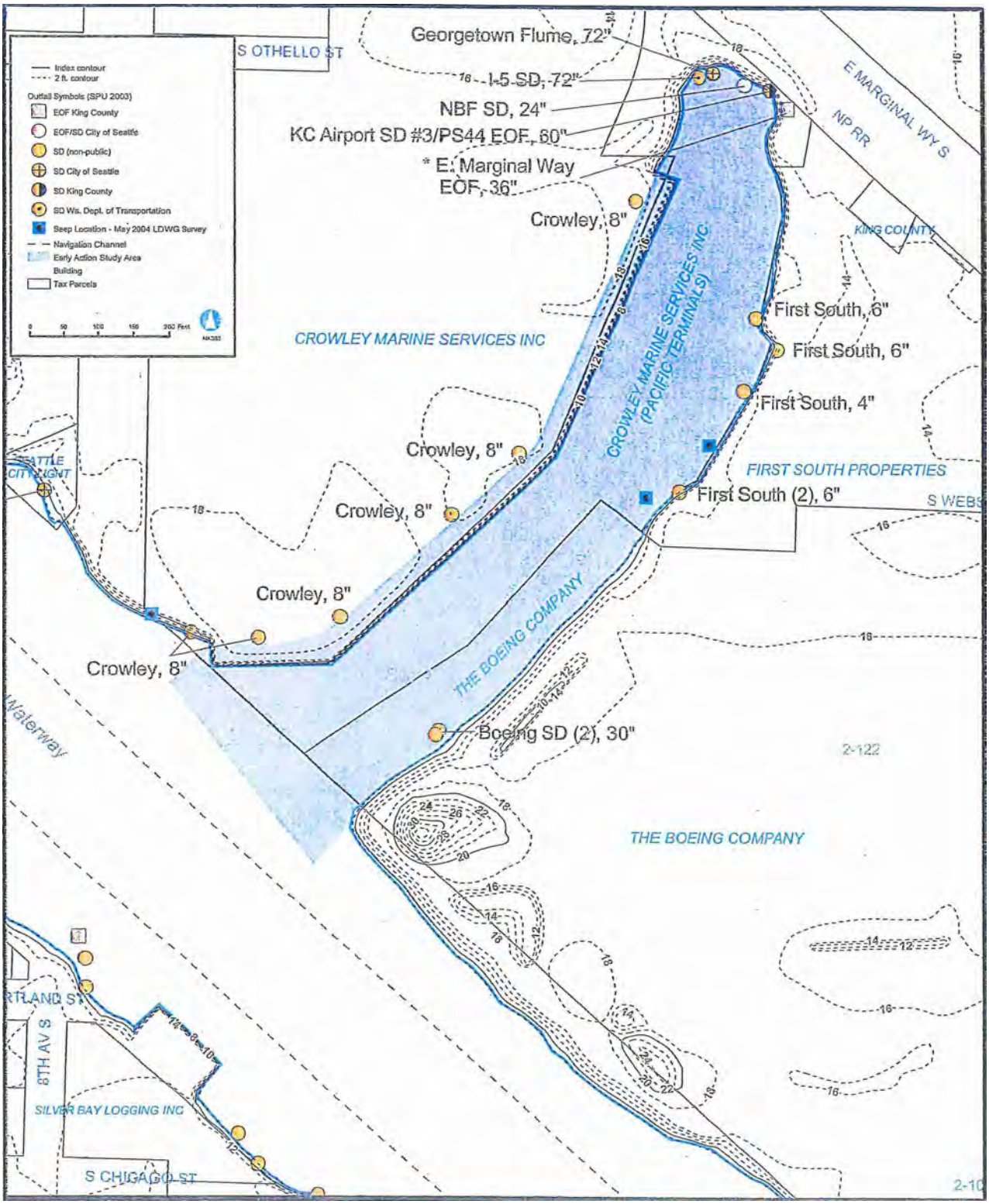
POST-CONSTRUCTION SURFACE MONITORING
SAMPLING RESULTS 2015 AND 2016
Duwamish Sediment Other Area and Southwest
Bank Corrective Measure and Habitat Project,
Boeing Plant 2, Seattle/Tukwila, Washington

BOEING

By: RHG | Date: 6/1/2016 | Project No. 0131320100

Figure 1

FIGURES



Adapted from: Integral 2006

* East Marginal Way EOF not observed during SPU (2003) survey; location based on King County coordinates.

Map Feature Sources: King County GIS, Seattle Public Utilities, USACE, Ecology, Windward Environmental, and others.

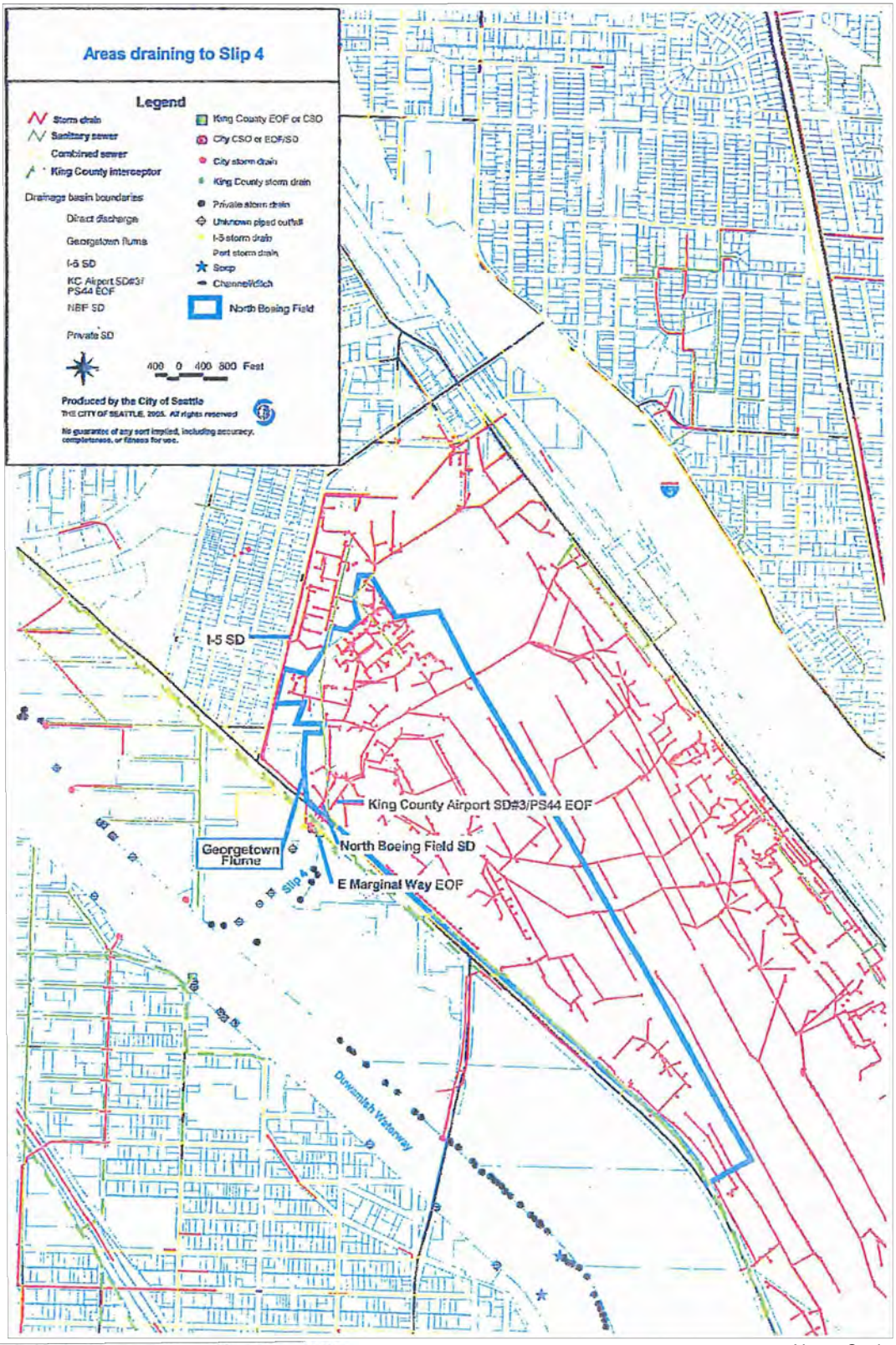
Not to Scale

SOURCE: Drawing prepared from SLR 2014

Aug 09, 2016 9:55am hhayward T:\CAD\Projects\1044-Denovo Constructors Misc Services_Remedial Investigation Report\1044-RP-004 (Slip 4 Drainage Areas).dwg B-1

ANCHOR QEA

Figure B-1
Slip 4 Outfalls
Draft Remedial Investigation Report
8th Avenue Terminals, Inc. Site



Adapted from: City of Seattle 2006

Not to Scale

SOURCE: Drawing prepared from SLR 2014

Aug 09, 2016 9:55am hhayward T:\CAD\Projects\1044-Denovo Constructors Misc Services_Remedial Investigation Report\1044-RP-004 (Slip 4 Drainage Areas).dwg B-2

ANCHOR QEA

Figure B-2
Areas Draining to Slip 4
Draft Remedial Investigation Report
8th Avenue Terminals, Inc. Site

TABLE

Table C-1
Historical Sediment Sampling Summary

Report Title	Reference	Sample Date(s)	Surface Sediment Samples		Subsurface Sediment Samples		Intertidal Sediment Samples	
			Sample Count	Chemical Testing	Sample Count	Chemical Testing	Sample Count	Chemical Testing
Environmental Site Assessment, First Interstate Bank of Washington Property	EPA, Metro, PTI, Tetra Tech, and Hart Crowser data cited in Landau 1990	1983-1988	11	PCBs	--	--	--	--
1981 Dredging								
Environmental Site Assessment, First Interstate Bank of Washington Property	Landau 1990	1990	12	PCBs, SVOCs, metals	12[a] (up to 10 feet)	PCBs, SVOCs, metals	--	--
Data Report, Proposed Dredging of Slip No. 4, Duwamish River	PTI 1996	1994-1995	8	PCBs, SVOCs, metals	4[b] (DMMU)	PCBs, SVOCs, VOCs, and metals	--	--
1996 Dredging								
Lower Duwamish Waterway Slip 4 Early Action Area: Revised Draft Technical Memorandum on Proposed Boundary of the Removal Action	Integral 2005 (identifies data from Exponent 1998, Landau 1990, Weston 1999, and NOAA 1998)	1998-1999	29	NA	--	--	--	--
Lower Duwamish Waterway Slip 4 Early Action Area: Cruise and Data Report	2004	2004	29	PCBs, metals	11 collected, 9 analyzed (up to 12 feet deep)	PCBs, metals	1	--
Lower Duwamish Waterway Remedial Investigation. Data report: Subsurface sediment sampling for chemical analyses.	Windward and RETEC 2007	2007	1	--	1 (up to 4 feet deep)	--	--	--
North Boeing Field/Georgetown Steam Plant Site Remedial Investigation/Feasibility Study, Slip 4 Sediment Recontamination Modeling Report	SAIC 2010	2010	20	PCBs, metals, SVOCs, D/F	--	--	--	--
Lower Duwamish Waterway Slip 4 Early Action Area: Draft Removal Action Completion Report	Integral 2012	2011 (prior to EAA)	4	PCBs	--	--	--	--
October 2011 to February 2012 - City of Seattle Property EAA								
Lower Duwamish Waterway Slip 4 Early Action Area: Draft Removal Action Completion Report	Integral 2012	2011 (post EAA)	4	PCBs	--	--	--	--
February 2012 placement of 9 inch waterway cap material over the boundary area								
Lower Duwamish Waterway Slip 4 Early Action Area: Draft Removal Action Completion Report	Integral 2012	2012 (post cap)	4	PCBs	--	--	--	--
Slip 4 Early Action Area, 8th Avenue Terminals Sediment Sampling and Analysis Report	Integral 2013	2012	8 collected, 5 analyzed	PCBs	--	--	--	--
2012-2013 Construction Season Report, Duwamish Sediment Other Area and Southwest Bank, Corrective Measure and Habitat Project	AMEC 2013	2012-2013	*see AMEC 2014*	--	--	--	--	--
Slip 4 Early Action Area, Long-Term Monitoring Data Report, Year 1 (2013)	Integral 2014	2012-2013	10 (2 rounds of sampling complete)	PCBs, Metals, SVOCs	--	--	--	--
2012-2014 Construction Season Report, Duwamish Sediment Other Area and Southwest Bank, Corrective Measure and Habitat Project	AMEC 2014	2012-2014	18 (3 rounds of sampling complete)	PCBs	--	--	--	--
December 2014 and March 2015 - Boeing Slip 4 Dredging								
Slip 4 Additional Sediment Cores, Phase 2, Boeing Plant 2	AMEC 2015	December 2014	--	--	5 (up to 3 feet deep)	PCBs	--	--
Slip 4 Additional Sediment Cores, Phase 2, Boeing Plant 2	AMEC 2015	December 2014	--	--	4 (up to 9 feet deep)	PCBs	--	--
Slip 4 Additional Sediment Cores, Phase 2, Boeing Plant 2	AMEC 2015	January 2015	--	--	8 (up to 10 feet deep)	PCBs	--	--
Boeing Plant 2 DSOA Corrective Measure and Habitat Project Work Plan for Slip 4 - Post-Construction Surface Sediment Monitoring - Year 1	AMEC 2016	March 2016	2 (0 to 0.33 feet below mudline)	Metals, PAHs, SVOCs, PCBs	--	--	--	--

Notes:
[a] Most of the core locations, including the 4 cores within or adjacent to the Site were co-located with the surface samples. Cores were up to 10 feet deep.
[b] Two cores collected and composited from each of 4 DMMUs
AMEC = AMEC Environment & Infrastructure, Inc.
DMMU = Dredged Material Management Unit
DOF = Dalton, Olmsted & Fuglevand, Inc.
DSOA = Duwamish Sediment Other Area
EAA = Early Action Area
EPA = U.S Environmental Protection Agency
Metro = Municipality of Metropolitan Seattle
NOAA = National Oceanic and Atmospheric Administration
PAH = polycyclic aromatic hydrocarbon
PCB = polychlorinated biphneyl
PTI = PTI Environmental Services
SAIC = Science Application International Corporation
SVOC = semivolatile organic compound
VOC = volatile organic compound