

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:

Georgia-Pacific Corporation

**AGREED ORDER FOR INTERIM
ACTION**

NO. 00TCPNR-1418

TO: Georgia-Pacific Corporation
133 Peachtree Street N.E.
P.O. Box 105605
Atlanta, Georgia 30348-5605

**I.
JURISDICTION**

This Agreed Order ("Order") is issued pursuant to the authority of
RCW 70.105D.050(1).

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II.

FINDINGS OF FACT

The Department of Ecology (hereinafter "Ecology") makes the following Findings of Fact, without admission of such facts by Georgia-Pacific Corporation (hereinafter "G-P").

1. G-P is the partial owner of aquatic bedland property known as the G-P Log Pond, (hereinafter "Log Pond") which is located on G-P's pulp and paper mill at West Laurel Street, Bellingham, Washington, 98225. The Log Pond is a sub-unit of the Whatcom Waterway Site.

2. While the Port of Bellingham also currently owns a portion of the Log Pond, G-P has entered into a separate agreement with the Port of Bellingham that assigns authority for said properties to G-P.

3. G-P has owned and operated a pulp and paper mill in Bellingham, Washington, located directly adjacent to the Log Pond since the 1960's.

4. From 1965 through 1979, G-P discharged wastewater containing mercury to the Whatcom Waterway from G-P's chlor-alkali plant located at its pulp and paper mill.

5. Pursuant to the conduct of a Remedial Investigation/Feasibility Study (RI/FS) of the Whatcom Waterway Site performed under Agreed Order Number DE 95TC-N399, sediments at the Log Pond have been determined to contain hazardous substances including mercury and phenol.

6. In order to protect human health and the environment and to prevent the release or threatened release of hazardous substances from the Log Pond, an interim action is necessary to eliminate or substantially reduce pathways for exposure to

hazardous substances.

III.

ECOLOGY DETERMINATIONS

1. The Log Pond is a facility as defined in RCW 70.105D.020(4), G-P is an "owner or operator" of that facility as defined at RCW 70.105D.020(12), and G-P is a generator as defined at RCW 70.105D.040(1)(c).
2. Mercury and phenol are the substances found at the Log Pond, a sub-unit of the Whatcom Waterway Site, and are "hazardous substances" as defined at RCW 70.105D.020(7).
3. Based on the presence of hazardous substances at the Log Pond and all factors known to the Department, there is a release or threatened release of hazardous substances from the Log Pond, as defined at RCW 70.105D.020(20).
4. By letter dated March 6, 1995, Ecology notified G-P of its status as a "potentially liable person" for the Whatcom Waterway Site under RCW 70.105D.040 after notice and opportunity for comment.
5. Pursuant to RCW 70.105D.030(1) and 70.105D.050, Ecology may require potentially liable persons to investigate or conduct remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.
6. Based on the foregoing facts, Ecology believes the interim remedial action required by this Order is in the public interest.

IV.

WORK TO BE PERFORMED

Based on the foregoing Facts and Determinations, Ecology and G-P agree that G-P will take the following interim remedial actions and that these actions be conducted in accordance with the Model Toxics Control Act (MTCA; Chapter 173-340 WAC), and the Sediment Management Standards (SMS; Chapter 173-204 WAC), unless otherwise specifically provided for herein.

1. Purpose and Scope of the Interim Remedial Work (the "Work").

The purpose of the Work will be to remediate contaminated sediments and concurrently accomplish habitat restoration in the Log Pond by capping. The need for sediment remedial action at the Log Pond is described in detail in the Draft Final Whatcom Waterway Site RI/FS, hereby incorporated into this Agreed Order by reference. Consistent with the Draft Bellingham Bay Comprehensive Strategy, the Work will implement an important first stage of an integrated baywide sediment cleanup, source control, habitat restoration, and aquatic land use plan.

Capping of the Log Pond provides an effective permanent cleanup remedy, and can concurrently provide significant habitat enhancement and restoration benefits, primarily by softening the slope and shallowing these areas to provide optimal feeding and refuge habitats and migratory corridors for salmonids and other resources. The Work would restore similar habitats that existed historically within this area of Bellingham Bay.

2. Description of the Work.

Work to be performed by G-P includes remedial design, remedial

action/construction, and operation, maintenance, and performance monitoring, as described below. The work to be performed by G-P is described in more detail in Exhibit A – Statement of Work, attached and hereby incorporated by reference as an enforceable part of this Agreed Order.

2a. Remedial Design Activities.

Remedial design activities will include the completion of planning activities and deliverables associated with preparation for implementation of the Work. G-P shall submit the Draft Final Design when the design effort is approximately 90 percent complete. The Draft Final Design shall incorporate final design data collection as described in Exhibit A. The Draft Final Design submittals shall include the following:

- Design Analysis.
- Construction Quality Assurance Plan.
- Remedial Action Health and Safety Plan specifications.
- Draft Operation, Maintenance and Monitoring Plan (OMMP).
- Plans and general specifications.
- Project schedule.

The Draft Final Design shall serve as the Final Design if Ecology has no further comments and issues the notice to proceed. Otherwise, the Final Design shall fully address all comments made to the Draft Final Design. However, the Final OMMP will not be submitted to Ecology until construction is complete, as outlined below.

As set forth in RCW 70.105D.090 and in Section V.12 below, Ecology will ensure substantive compliance of this action with the Shoreline Substantial Development and Critical Areas Ordinance normally administered by the City of Bellingham and Hydraulic

Project Approval normally administered by the Washington Department of Fish and Wildlife. G-P will obtain separate permits for this action under the Clean Water Act Section 404 (U.S. Army Corps of Engineers), including Endangered Species Act (ESA) Consultation (U.S. Fish & Wildlife Service and National Marine Fisheries Service).

2b. Remedial Action Activities.

The Work will cap and convert sediments at the Log Pond that exceed SMS criteria, along with intertidal riprap, sheet pile, bulkheads, and concrete debris areas, into a silt-sand mudflat that will comply with applicable sediment quality criteria and enhance habitat functions. The bottom (Phase I) layer of the cap will be constructed with sand, and will be placed in a manner that minimizes the potential for mixing of the cap with underlying sediments. Finer-grained native silt material will be used for the final (Phase II) cap surface, providing a base seeding of endemic Bellingham Bay benthic fauna, facilitating rapid colonization of the mudflat.

Exhibit A – Statement of Work - describes in more detail each phase of the Work.

2c. Operation, Maintenance, and Monitoring Plan.

G-P shall submit for Ecology approval a Draft OMMP as part of the Draft Final (90%) Design submittal, as described above. The Final OMMP shall be submitted to Ecology following completion of construction. The Final OMMP shall include the following elements:

- Description of normal operation and maintenance;
- Description of routine monitoring and laboratory testing, including data collection, laboratory tests, and their interpretation; and
- Corrective action to be implemented in the event that performance standards

are exceeded.

Long-term monitoring and maintenance at the Log Pond will be performed as set forth in the final Log Pond OMMP approved by Ecology.

2d. Reporting.

A cleanup report will be prepared and submitted to Ecology within 90 days after completing the construction phases of the Work. The report will describe cap placement methods, final cap surface elevations, and site observations, and will include figures, summary tables, and the OMMP for the Log Pond. Reporting requirements for OMMP elements will be as described in the final Log Pond OMMP approved by Ecology.

2e. Restrictive Covenant.

The property on which the Work is to be performed is subject to a Restrictive Covenant made pursuant to RCW 70.105D.030(l)(f) and (g) and WAC 173-340-440. The Restrictive Covenant, attached as Exhibit B, sets forth limitations, restrictions, and uses to which the Property may be put and constitute covenants to run with the land. Exhibit B is hereby incorporated by reference as an enforceable part of this Agreed Order.

V.

TERMS AND CONDITIONS OF THE ORDER

1. Definitions.

Unless otherwise specified, the definitions set forth in ch. 70.105D RCW and ch. 173-340 WAC shall control the meanings of the terms used in this Order.

2. Public Notices.

Pursuant to RCW 70.105D.030(2)(a), this Order shall be subject to concurrent public notice.

Ecology shall be responsible for providing such concurrent public notice and reserves the right to modify or withdraw any provisions of this Order should public comment disclose facts or considerations which indicate to Ecology that the Order is inadequate or improper in any respect.

3. Remedial Action Costs.

G-P shall pay costs incurred by Ecology pursuant to oversight of this Order. These costs shall include work performed by Ecology or its contractors for investigations, remedial actions, and Order preparation, oversight and administration. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). G-P shall pay the required amount within 90 days of receiving from Ecology an itemized statement of costs that includes a summary of costs incurred, an identification of involved staff, and the amount of time spent by involved staff members on the project. A general description of work performed will be provided upon request.

Itemized statements shall be prepared quarterly. Failure to pay Ecology's costs within 90 days of receipt of the itemized statement of costs will result in interest charges.

4. Designated Project Coordinators.

The project coordinator for Ecology is:

Ms. Lucille T. Pebles
Washington Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, WA 98008-5452
phone: (425) 649-7272
e-mail: lpeb461@ecy.wa.gov

The project coordinator for G-P is:

Mr. R. J. "Chip" Hilarides
Senior Environmental Engineer
Georgia-Pacific West, Inc.
P.O. Box 1236
Bellingham, WA 98227-1236
phone: (360) 647-5695
e-mail: rjhilari@gapac.com

The project coordinator(s) shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and G-P, and all documents, including reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed through the project coordinator(s). Should Ecology or G-P change project coordinator(s), written notification shall be provided to Ecology or G-P at least ten (10) calendar days prior to the change.

5. Performance.

All work performed pursuant to this Order shall be under the direction and supervision, as necessary, of a professional engineer or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. G-P shall notify Ecology as to the identity of such engineer(s) or expert(s), and of any contractors and subcontractors to be used in carrying out the terms of this Order, in advance of their involvement at the Log Pond. G-P shall provide a copy of this Order to all agents, contractors and subcontractors retained to perform work required by this Order and shall ensure that all work undertaken by such agents, contractors and subcontractors will be in compliance with this Order.

Except where necessary to abate an emergency situation, G-P shall not perform any remedial actions at the Log Pond outside that required by this Order unless Ecology concurs, in writing, with such additional remedial actions.

WAC 173-340-400(7)(b)(i) requires that "construction" performed on the Log Pond must be under the supervision of a professional engineer registered in Washington.

6. Access.

Ecology or any Ecology authorized representative shall have the authority to access the Log Pond and any associated remedial work areas at all reasonable times for the purposes of, *inter alia*: inspecting records, operation logs, and contracts related to the work being performed pursuant to this Order; reviewing the progress in carrying out the terms of this Order; conducting such tests or collecting samples as Ecology or the project coordinator may deem necessary; using a camera, sound recording, or other

documentary type equipment to record work done pursuant to this Order; and verifying the data submitted to Ecology by G-P. By signing this Agreed Order, G-P agrees that this Order constitutes reasonable notice of access, and agrees to allow access at all reasonable times for purposes of overseeing work performed under this Order. As necessary, Ecology shall allow split or replicate samples to be taken by G-P during an inspection unless doing so interferes with Ecology's sampling. G-P shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity.

7. Public Participation.

Public Participation shall adhere to the Whatcom Waterway Site Public Participation Plan dated February 1996. Ecology shall maintain the responsibility for public participation and G-P shall help coordinate and implement public participation.

8. Retention of Records.

G-P shall preserve in a readily retrievable fashion, during the pendency of this Order and for ten (10) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession relevant to this Order. Should any portion of the work performed hereunder be undertaken through contractors or agents of G-P, then G-P agrees to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

9. Dispute Resolution.

G-P may request Ecology to resolve disputes that may arise during the implementation of this Order. Such request shall be in writing and directed to the

signatory, or his/her successor(s), to this Order. Ecology resolution of the dispute shall be binding and final. G-P is not relieved of any requirement of this Order during the pendency of the dispute and remain responsible for timely compliance with the terms of the Order unless otherwise provided by Ecology in writing.

10. Reservation of Rights/No Settlement.

This Agreed Order is not a settlement under ch. 70.105D RCW. Ecology's signature on this Order in no way constitutes a covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against G-P to recover remedial action costs paid to and received by Ecology under this Agreed Order. In addition, Ecology will not take additional enforcement actions against G-P to require those remedial actions required by this Agreed Order, provided G-P complies with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the Log Pond-should it deem such actions necessary.

Ecology also reserves all rights regarding the injury to, destruction of, or loss of natural resources resulting from the releases or threatened releases of hazardous substances from the Log Pond.

In the event Ecology determines that conditions at the Log Pond are creating or have the potential to create a danger to the health or welfare of the people in the surrounding area or to the environment, Ecology may order G-P to stop further implementation of this Order for such period of time as needed to abate the danger.

11. Transference of Property.

No voluntary or involuntary conveyance or relinquishment of title, easement, leasehold, or other interest in any portion of the Log Pond shall be consummated by G-P without provision for continued implementation of all requirements of this Order and implementation of any remedial actions found to be necessary as a result of this Order.

Prior to transfer of any legal or equitable interest G-P may have in the Log Pond or any portions thereof, G-P shall serve a copy of this Order upon any prospective purchaser, lessee, transferee, assignee, or other successor in such interest. At least thirty (30) days prior to finalization of any transfer, G-P shall notify Ecology of the contemplated transfer.

12. Compliance with Other Applicable Laws.

A. All actions carried out by G-P pursuant to this Order shall be done in accordance with all applicable federal, state, and local requirements, including requirements to obtain necessary permits, except as provided in paragraph B of this section.

B. Pursuant to RCW 70.105D.090(1), the substantive requirements of chapters 70.94, 70.95, 70.105, 75.20, 90.48, and 90.58 RCW and of any laws requiring or authorizing local government permits or approvals for the remedial action under this Order that are known to be applicable at the time of issuance of the Order have been included in Section IV and are binding and enforceable requirements of the Order.

G-P has a continuing obligation to determine whether additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for

the remedial action under this Order. In the event G-P determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, they shall promptly notify Ecology of this determination. Ecology shall determine whether Ecology or G-P shall be responsible to contact the appropriate state and/or local agencies. If Ecology so requires, G-P shall promptly consult with the appropriate state and/or local agencies and provide Ecology with written documentation from those agencies of the substantive requirements those agencies believe are applicable to the remedial action. Ecology shall make the final determination on the additional substantive requirements that must be met by G-P and on how G-P must meet those requirements. Ecology shall inform G-P in writing of these requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. G-P shall not begin or continue the remedial action potentially subject to the additional requirements until Ecology makes its final determination.

Ecology shall ensure that notice and opportunities for comment is provided to the public and appropriate agencies prior to establishing the substantive requirements under this section.

C. Pursuant to RCW 70.105D.090(2), in the event Ecology determines that the exemption from complying with the procedural requirements of the laws referenced in RCW 70.105D.090(1) would result in the loss of approval from a federal agency which is necessary for the State to administer any federal law, the exemption shall not apply and G-P shall comply with both the procedural and

substantive requirements of the laws referenced in RCW 70.105D.090(1), including any requirements to obtain permits.

VI.

SATISFACTION OF THIS ORDER

The provisions of this Order shall be deemed satisfied upon G-P's receipt of written notification from Ecology that G-P has completed the remedial activity required by this Order, as amended by any modifications, and that all other provisions of this Agreed Order have been complied with.

VII.

ENFORCEMENT

1. Pursuant to RCW 70.105D.050, this Order may be enforced as follows:

A. The Attorney General may bring an action to enforce this Order in a state or federal court.

B. The Attorney General may seek, by filing an action, if necessary, to recover amounts spent by Ecology for investigative and remedial actions and orders related to this Agreed Order.

C. In the event G-P refuses, without sufficient cause, to comply with any term of this Order, G-P will be liable for:

(1) up to three times the amount of any costs incurred by the state of Washington as a result of its refusal to comply; and

(2) civil penalties of up to \$25,000 per day for each day it refuses to comply.

D. This Order is not appealable to the Washington Pollution Control Hearings Board. This Order may be reviewed only as provided under Section 6 of ch. 70.105D RCW.

Effective date of this Order: October 19, 2000

GEORGIA-PACIFIC
CORPORATION

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By James W. Cunningham
James W. Cunningham

By Steven M. Alexander
Steven M. Alexander

General Manager
Georgia-Pacific West, Inc.

Section Manager
Toxics Cleanup Program
Regional Manager -Northwest
Regional Office

Date July 27, 2000

Date October 19, 2000

EXHIBIT A
STATEMENT OF WORK

EXHIBIT A - STATEMENT OF WORK

**INTERIM REMEDIAL ACTION
G-P LOG POND, WHATCOM WATERWAY SITE, BELLINGHAM, WASHINGTON**

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I. PURPOSE

The purpose of this statement of work (SOW) is to describe the work that will be conducted to implement an interim action at the G-P Log Pond, a separate and distinct sediment site unit of the Whatcom Waterway Site (see Figures 1 and 2). This Interim Action SOW for the Log Pond implements the Agreed Order entered into by Ecology and the Georgia-Pacific Corporation (G-P), to which this SOW is an Exhibit.

This SOW presents a concise narrative discussion of the action, performance standards and the work that will be performed.

II. INTRODUCTION

A. Background

The Whatcom Waterway Site (Site), located within inner Bellingham Bay, Washington consists of intertidal and subtidal aquatic lands within and adjacent to the Whatcom and I&J Street Waterways within inner Bellingham Bay, Washington (Figure 1). Figure 2 depicts property ownership and general land use within the site area.

In January 1996, G-P and the Washington State Department of Ecology (Ecology) entered into an Agreed Order to perform a Remedial Investigation/Feasibility Study (RI/FS) of the Site under the Washington State Model Toxics Control Act (MTCA; Chapter 173-340 WAC; RCW 70.105D.). The Draft Final RI/FS (Anchor Environmental and Hart Crowser 1999), which was released for public comment in July 1999, provides data, analysis, and engineering evaluations to enable Ecology to select a sediment cleanup action alternative, which is protective of human health and the environment and considers local site development plans. The public concurrently reviewed and commented on the Bellingham Bay Comprehensive Strategy Draft Environmental Impact Statement (DEIS; Ecology 1999), which examined integrating cleanup of the Site with source control, habitat restoration, and land use objectives. The Bellingham Bay Comprehensive Strategy EIS serves as the State Environmental Policy Act review for the Site. The public comment period for both the Draft Final RI/FS and DEIS documents closed in September 1999; final versions of these documents are expected to be issued in August 2000.

The G-P Log Pond is a sub-unit of the Whatcom Waterway Site and is addressed in the Draft Final RI/FS. In terms of environmental review, the Department of Ecology has issued a Determination of Non-Significance (DNS) under the State Environmental Policy Act for the proposed Log Pond actions. The DNS is currently under review by the public.

B. Rationale for the Log Pond Interim Remedial Action

As described in the following paragraphs, the purpose of the proposed Interim Remedial Action at the Log Pond is to remediate contaminated sediments, restore habitat and beneficially reuse clean dredge materials.

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The Draft Final RI/FS explains that the G-P Log Pond, relative to the whole Whatcom Waterway Site, contains the highest sediment concentrations of mercury, as well as elevated levels of phenols and woody material. The proposed interim action will achieve cleanup standards through capping these sediments, reducing the threat to human health and the environment by eliminating exposure pathways. Containment of the Log Pond sediments is consistent with the remedial alternatives evaluated for the Whatcom Waterway Site in both the DEIS and the Draft Final RI/FS.

The draft Bellingham Bay Comprehensive Strategy identifies the G-P Log Pond as an important estuarine habitat restoration area due to its proximity to the mouth of Whatcom Creek. The proposed cap will be designed to provide significant habitat benefits, primarily by flattening steep slopes and increasing subtidal and intertidal elevations to provide improved feeding and refuge habitats and migratory corridors for salmonids and other biota. The Log Pond interim remedial action will restore habitats that existed historically within this area of Bellingham Bay.

The proposed Log Pond interim remedial action also capitalizes on the opportunity to beneficially reuse clean maintenance dredging sediments from both the Swinomish Channel, located in LaConner and Squalicum Waterway, located in Bellingham. In the absence of this project, clean sediments dredged as a result of separate U.S. Army Corps of Engineers maintenance of these federal channels would be disposed (without beneficial reuse) at the PSDDA open-water disposal site in Rosario Sound. The proposed project will allow for the beneficial reuse of all of the Swinomish Channel dredged materials, along with a portion of the Squalicum Waterway dredged materials, thus significantly reducing the amount of material that would otherwise be placed at open-water, unconfined disposal sites. The proposed project schedule has been developed with the U.S. Army Corps of Engineers to ensure effective coordination of these efforts.

III. EXISTING CONDITIONS

A. Characterization of the G-P Log Pond Site

The Log Pond was established as a separate and distinct site sediment unit in the RI/FS. Figure 3 depicts existing RI/FS sampling locations and bathymetry. A summary of the RI/FS site characterization is provided below:

- **Shoreline and bathymetry.** The current shoreline of the Log Pond is comprised largely of sheet pile, wooden bulkheads, riprap, and concrete debris down to an elevation of approximately -5 feet MLLW. Mudline elevations within the Log Pond range from -5 to -15 feet MLLW, averaging -10 feet MLLW.
- **Land ownership and use.** G-P and the Port of Bellingham currently own the Log Pond property fee simple. The Log Pond is located within the middle of a well-established heavy industrial land use area with a Maritime shoreline designation. The area is currently used for transient moorage of boats and log rafts. Existing structures within the area include pilings, dolphins, log

booms, and floating docks (Figure 3). The action will result in removal of most of these structures, as well as substantially shallower elevations that are well suited for intertidal habitat. The action will eliminate limited existing log rafting, small boat moorage, and occasional ship berthing that occurs within this area by the Port and G-P.

- **Currents/wave action.** The majority of the Log Pond is isolated from currents and wave action. However, portions are exposed to Bellingham Bay to the west.
- **Subsurface geotechnical characteristics.** Subsurface conditions within the Log Pond consist of 5 to 10 feet of very soft recent deposits over 10 to 30 feet of fluvial medium dense non-silty to silty, sand (Figure 4). Below this layer is a glacial marine outwash deposit of stiff silty clay.

B. Characterization of Log Pond Sediments

Physical and chemical characteristics of the sediments within the Log Pond are summarized in the RI/FS. The sediments to be capped have the following general characteristics:

- **Physical.** Surface sediments within the Log Pond consist primarily of sandy to very sandy silt with varying amounts of clay. Near the shorelines the sediment gradation changes to a slightly clayey, silty sand with varying amounts of gravel. Sediments consisting of greater than 50 percent shell fragments were observed near the northeast end of the Log Pond. The solids content of the sediments ranges from 25 to 40 percent, averaging approximately 30 to 35 percent. Total organic carbon (TOC) concentrations in the Log Pond area range from 2.7 to 15 percent, averaging approximately 6 to 10 percent. Surface and subsurface sediments within the Log Pond contain various remnant woody materials from historical log rafting, log haul-out, and other operations. In April 2000, 13 field vane shear tests were completed on surface sediments within the Log Pond to better understand the material's strength. Measured shear strengths ranged from 0.04 to 0.18 tons per square foot (tsf), classifying the material as very soft to soft organic silt/clay.
- **Biological/Chemical.** Accumulated soft sediments in the Log Pond contain the highest mercury levels in Bellingham Bay, with surface sediment concentrations ranging from 1 to 12 milligrams per kilogram (mg/kg); subsurface concentrations (approximately 6 feet below the mudline) range up to approximately 100 mg/kg (Anchor Environmental and Hart Crowser 1999). For comparison, the current SMS sediment quality standard (SQS) for mercury is 0.41 mg/kg. Sediments in the Log Pond also contain greater than 50 percent wood material by volume, and contain concentrations of phenol that exceed SQS criteria. Biological testing performed in the Log Pond vicinity has confirmed that such sediments may adversely affect the

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production of benthic infauna. Mercury present in surface sediments in the Log Pond also has the potential to bioaccumulate in fish and shellfish tissues.

C. Capping Material Characteristics

Two potential capping materials sources have been identified:

- **Swinomish Dredge Material.** Approximately 30,000 to 35,000 cubic yards (CY) of navigational dredge material are scheduled to be removed this summer from the Swinomish Channel near La Conner (see Figure 1). The material typically has less than 4 percent fines and 1 to 8 percent gravel. An August 1, 1994 Memorandum for Record (Corps 1994) determined that the material is suitable for unconfined open-water disposal at a PSDDA dispersive or non-dispersive site. Since chemical concentrations are also below SQS criteria, the material is suitable for beneficial reuse.
- **Squalicum Dredge Material.** Approximately 150,000 CY of navigational dredge material is scheduled to be removed this fall from the Squalicum Creek Waterway channel in Bellingham (See Figure 1). The material typically has greater than 90 percent fines, though portions of the Channel contain greater amounts of sand. An April 7, 1995 Memorandum for Record (Corps 1995) determined that the material is suitable for unconfined open water disposal at either the PSDDA Bellingham Bay nondispersive site or the PSDDA Rosario Strait dispersive site. Further PSDDA characterization is ongoing by the Corps. Only those materials that are determined by the DMMO to be suitable for disposal at both PSDDA dispersive and non-dispersive sites, and which also contain chemical concentrations below SQS criteria, will be beneficial reused within the Log Pond.

IV. DESCRIPTION OF THE INTERIM REMEDIAL ACTION

The Interim Remedial Action at the G-P Log Pond will remediate contaminated sediments and restore nearshore intertidal habitat. This will be accomplished through capping existing sediments with clean materials dredged from nearby areas in Puget Sound. The capping will occur over two phases, and the specifics are described below.

A. Overview of the Action

The Log Pond Interim Action will convert 1.5 acres of deep subtidal, 2.5 acres of shallow subtidal mudflat/debris, and 1.2 acres of intertidal riprap (along with sheet pile, bulkheads, and concrete debris), all of which is contaminated at levels above SQS criteria, into 4.2 acres of clean, low intertidal, silt-sand and 1.0 acres of shallow subtidal habitat. The bottom (Phase I) layer of the cap will be constructed with sand, and will be placed in a manner that minimizes the potential for mixing of the cap with underlying sediments. Finer-grained native silt material will be used for the final (Phase II) cap surface, providing a base seeding of endemic Bellingham Bay benthic fauna, facilitating rapid colonization of the mudflat.

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Figures 3 and 4 present the preliminary plan and cross-section, respectively, for the cap/habitat restoration design. The cap will be constructed to a minimum thickness of three feet throughout the 5.2-acre area, tapering out beyond this boundary. The mudflat surface will be constructed to elevations ranging from approximately -4 to +4 feet MLLW, as depicted on the attached plans. The slope of the mudflat surface will not exceed roughly 10 horizontal to 1 vertical (10H:1V), and in most areas will be flatter than 20H:1V. The cap will consist of 3 feet (roughly 30,000 to 35,000 CY) of beneficially reused sand material dredged from the Swinomish Channel and placed in the Log Pond during Phase I operations. Another 25,000 CY of beneficially reused Squalicum Waterway dredge material placed during Phase II will provide the final cap surface. The Squalicum dredge material will be placed to the grades shown on Figures 3 and 4. The combined thickness of the Phase I and II cap will average between 5 and 10 feet. Final design calculations may result in minor modifications of the cap design (e.g., to ensure minimal risk to adjacent structures).

B. Construction Approach

The preliminary design of the Log Pond Interim Action was developed based on past construction experience with similar capping projects, discussions with contractors specific to this project, and review of relevant guidance (e.g., Palermo, M., Maynard, S., Miller, J., and Reible, D. 1998. "Guidance for In-Situ Subaqueous Capping of Contaminated Sediments," EPA 905-B96-004). The final design will incorporate the results of additional sampling, analysis, and engineering calculations, and may be slightly modified from the design depicted on Figures 3 and 4. In addition, the contractor will be allowed to make minor modifications to this approach, provided that substantive elements of the design are not compromised.

Phase I – Site Preparation & Capping with Swinomish Materials

A.H. Powers of Seattle has been selected as the contractor to perform the Phase I operations. They are currently under contract with the U.S. Army Corps of Engineers to perform maintenance dredging of the Swinomish federal navigation channel, beginning on or after July 16, 2000 and completing dredging by September 30, 2000.

G-P will contract separately with A.H. Powers to perform Phase I operations at the Log Pond. These tasks will include the following:

- Existing piling, dolphins, log booms, and floating docks within the Log Pond will be removed. Piles will be broken off within approximately 1 foot of the pre-capping mudline elevation. The piles, as well as other structures, will be transferred to adjacent uplands owned by G-P, where they will be recycled or disposed of at appropriate upland sites. Pile and associated structure removal will occur over a period of approximately 15 days at the start of this project.
- Sand dredged from the Swinomish Channel will be delivered by barge to the Log Pond. The Puget Sound Dredge Disposal Office (DMMO) has determined that all of the Swinomish Channel maintenance dredge materials are suitable

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for unconfined, open-water disposal or beneficial reuse. The material will be delivered to the Log Pond site using 1,000 to 2,000 CY dump scows and flat scows.

- A skiff will be used to maneuver the derrick and scows within the Log Pond. Because of the potential for propeller wash impacts, tug use will be limited within the Log Pond.
- A derrick will be used to unload sand material from the scows. A 10 CY cable arm bucket will be used to offload the material, transferring 5 to 10 CY of material within each bucket.
- The cable arm bucket will be lowered to just above the water line, where the bucket will be opened slowly, concurrent with swinging the derrick from side to side. This slow release of capping material will allow the material to gently flow through the water column. Because of the low percentage of fines (less than 4%) in the Swinomish Waterway dredge material, the material is predicted to settle freely and evenly onto the Log Pond sediment surface. Turbidity is predicted to be maintained below state water quality standards, even at locations proximal to the bucket discharge (see Appendix C of the Biological Assessment prepared for this project; Anchor 2000).
- The sand material will be placed in three, 1-foot-thick layers. A waiting time of at least 2 days between successive layers will occur to allow the surface sediments to gain strength, thus minimizing the potential for mixing of the cap with underlying sediments. The contractor will monitor cap thickness during and immediately following construction.
- The contractor is expected to place between 800 and 1,000 CY per day, working 10-hour days. A total of approximately 30,000 to 35,000 CY of Swinomish Channel dredge material will be placed in the Log Pond. Thus, the total duration of the Phase I capping project is approximately 30 to 45 days.

Phase II – Mudflat Development Using Squalicum Materials

The U.S. Army Corps of Engineers is scheduled to perform maintenance dredging of the Squalicum Waterway navigation channel in Bellingham over the period October through December 2000. Although the Squalicum Waterway maintenance dredging is anticipated to remove approximately 150,000 CY of material from the federal channel, only 25,000 CY of this material is needed for Phase II construction of the Log Pond cap/restoration action.

The placement techniques for the Phase II material will be similar to that used during Phase I. That is, the contractor would use a clamshell bucket to offload the material. The main difference is that the Squalicum Waterway material has a higher fines content, so the material will not flow as freely from the bucket. However, the 3-

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foot-thick Phase I sand cap layer will provide sufficient protection from mixing with underlying contaminated sediments. Phase II operations are summarized as follows:

- Fine-grained substrate from the Squalicum Waterway will be used for the final surface within the Log Pond area, providing the desired mudflat habitat function that existed historically within this area of Bellingham Bay. Only those materials deemed suitable for unconfined, open-water disposal or beneficial reuse will be used to develop the Log Pond mudflat habitat.
- Similar to the Phase I capping procedure described above, Phase II Squalicum Waterway sediments will be placed within the Log Pond using a nominal 10 CY clamshell bucket. With this procedure, turbidity should be maintained below thresholds of potential concern for salmonids, also complying with applicable state surface water turbidity standards (see Biological Assessment prepared for this project; Anchor 2000).
- The mudflat surface will be constructed to elevations ranging from approximately -4 to +4 feet MLLW, as depicted on the attached plans. The slope of the mudflat surface will not exceed roughly 10H:1V, and in most areas will be flatter than 20H:1V. The contractor will monitor cap thickness and slopes during and immediately following construction.
- The contractor is expected to place approximately 800 to 1,000 CY per day, working 10-hour days. A total of approximately 25,000 CY of Squalicum Waterway dredge material will be placed in the Log Pond. Thus, the total duration of the Phase II mudflat development project is approximately 25 to 30 days.

C. Institutional Controls

Since the proposed Log Pond interim action will leave residual concentrations of contamination above cleanup standards in-place under an engineered cap, measures must be undertaken to limit or prohibit activities that may interfere with the integrity of the cap. Administratively, a restrictive covenant will be placed on the property as described in Exhibit B to this agreed order. Physical measures may also be taken, such as signage and installation of a log boom to limit access. The Operations, Maintenance and Monitoring Plan (OMMP), to be developed, will describe the specific actions that will be taken to ensure integrity of the cap.

V. PERFORMANCE STANDARDS

The Interim Remedial Action must meet the requirements of MTCA. These requirements are described below.

A. Sediment Management Standards

The State of Washington Sediment Management Standards (SMS; WAC 173-204) establish numerical limits for chemical constituents and biological effects limits in

sediments that are protective of human health and the environment. SMS requirements are implemented under the MTCA law (Chapter 70.105D RCW) and Cleanup Regulations (WAC 173-340). The performance standards to be used to verify that construction of the remedial action is complete are the numerical sediment quality standards (SQS) chemical and biological effects criteria summarized in Table 1.

B. Surface Water Quality Standards

Construction

Section 401 of the Clean Water Act (CWA) requires that capping operations shall not violate applicable effluent or water quality standards. This determination allows for the designation of mixing zones within which standards may be exceeded, but beyond which applicable standards must be met. Applicable water quality standards are listed in Table 2. These standards are consistent with the following related requirements:

- Section 304 of the CWA (33 U.S.C. §1314), which requires EPA to publish Water Quality Criteria for the protection of human health and aquatic life; and
- Sections 301, 302, and 303 of the CWA (33 U.S.C. §1311, 1312, and 1313), and 40 CFR Part 131, which require states to develop Water Quality Standards. Washington Water Quality Standards are promulgated under the Washington Water Pollution Control Act (Chapter 90.48 Revised Code of Washington [RCW]; Chapter 173-201A WAC).

Washington State surface water quality standards for parameters such as turbidity/total suspended solids (TSS) have been established to protect sensitive habitat, other characteristic uses of the water body, and to provide for ecosystem and human health protection (Chapter 173-201A-030). For Class A marine waters such as Bellingham Bay, including the Log Pond, the applicable turbidity standard is as follows:

"Turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU."

During the months of July through December when construction is anticipated, background turbidity in the vicinity of the Log Pond is typically less than 50 NTU. Further, during this time of year, a water column turbidity of 5 NTU is roughly equivalent to a TSS concentration of 5 mg/L; TSS concentrations typically range from 2 to 30 mg/L in local surface waters (Anchor Environmental and Hart Crowser 1999). Thus, the turbidity/TSS standard for this action can be defined as a 5 NTU turbidity increase or a TSS increase of approximately 5 mg/L. As set forth in Chapter 173-201A-110(3):

"The turbidity criteria established under WAC 173-201A-030 shall be modified to allow a temporary mixing zone during and immediately after necessary in-water or shoreline construction activities that result in disturbance of in-place sediments... A temporary turbidity mixing zone shall be as follows:

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"...the point of compliance shall be a radius of 150 feet from activity causing the turbidity exceedance."

Therefore, during construction, turbidity/TSS standards must be met at a point 150 feet from the location of capping material release into the Log Pond. As described in Appendix C of the Biological Assessment prepared for this project (Anchor 2000), peak TSS concentration increases predicted at the 150-foot mixing zone boundary during project capping operations are anticipated to be well below 5 mg/L. Thus, no exceedance of the state surface water quality turbidity standard is anticipated as a result of the proposed action. Water quality monitoring will be completed during the capping operations to verify that TSS concentrations, turbidity, and dissolved oxygen are maintained within water quality criteria (Table 2).

G-P will obtain separate permits for this action under the Clean Water Act Section 404 (U.S. Army Corps of Engineers), including Endangered Species Act (ESA) Consultation (U.S. Fish & Wildlife Service and National Marine Fisheries Service).

As set forth in RCW 70.105D.090, Ecology will ensure substantive compliance of this action with the Shoreline Substantial Development and Critical Areas Ordinance normally administered by the City of Bellingham and Hydraulic Project Approval normally administered by the Washington Department of Fish and Wildlife.

Long-term Operation, Maintenance and Performance Monitoring

Performance standards to be used to verify long-term protection provided by the remedial action include both sediment and water quality criteria summarized in Tables 1 and 2, respectively. Sediment quality criteria are applicable within the biologically active zone, generally defined in Bellingham Bay as the top 12-centimeters of surface sediment (Anchor Environmental and Hart Crowser 1999). Surface water quality criteria are applicable at the point where groundwater discharges into surface water. Long-term monitoring activities will be described in more detail in the Operations, Maintenance and Monitoring Plan (OMMP; see below).

C. Other Requirements

Other requirements will be evaluated to ensure that cleanup of the Site is in substantial compliance with applicable or relevant and appropriate laws and regulations. The requirements to be evaluated include:

- Endangered Species Act (ESA; 16 USC 1536 (a) – (d); 50 CFR Part 402). Grants authority to and imposes requirements upon Federal agencies regarding endangered or threatened species of fish, wildlife, or plants ("listed species") and habitat of such species that has been designated as critical.
- Rivers and Harbors Act of 1899 (Section 10; 42 U.S.C. Section 6901 *et seq.*). Establishes permit requirements for any activity that will obstruct or alter a navigable waterway.

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- Washington Hydraulics Code (Chapter 75.20 RCW; Chapter 220-100 WAC). Sets requirements for performing work that would use, divert, obstruct, or change the natural flow or bed of any salt or fresh waters.
- Washington Department of Fisheries Habitat Management Policy (POL-410). Sets forth a policy of no net loss of productive capacity of the habitat of food and shellfish resources.
- U. S. Fish and Wildlife Mitigation Policy (46 FR 7644). Establishes guidance to protect and conserve fish and wildlife resources.
- Clean Air Act (42 U.S.C. Section 7401; 40 CFR Part 50). Establishes ambient air quality standards for chemicals and particulates.
- Coastal Zone Management Act (16 USC 1451 et seq.; 15 CFR 923). Requires federal agencies to act consistently with state and local shoreline regulations.
- Washington State Confined Disposal Facility Standards. Establishes procedures to develop and evaluate sediment confinement designs. Relevant and appropriate seismic design guidelines are described in American Society of Civil Engineer's Technical Council on Lifeline Earthquake Engineering Monograph No. 12, "Seismic Guidelines for Ports", March 1998.

VI. WORK TO BE PERFORMED

Work to be performed includes remedial design, remedial action/construction, and operation, maintenance, and performance monitoring, as described below.

A. Remedial Design Activities

Remedial design activities will include the completion of all planning activities and deliverables associated with preparation for implementation of the remedy. The remedial design will develop a technical package (or packages) that includes detailed descriptions and supporting engineering data/calculations justifying the basis for design, methods for placement of capping materials, construction monitoring, and long-term monitoring.

G-P shall submit the Draft Final (90%) Design when the design effort is approximately 90 percent complete. The Draft Final Design submittals shall include the following:

- **Engineering Justification**, providing a concise narrative discussion of performance standards and the remedy design, and how the remedy meets standard professional engineering practices. The following design issues will be addressed in detail:
 - Upland source control;

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- Recontamination from existing and future activities;
 - Cap stability/constructability;
 - Cap-induced settlement; and
 - Long-term cap integrity.
- **Construction Quality Assurance Plan (CQAP)**, including cleanup verification methods and methods for determining compliance with performance standards.
 - **Health and Safety Plan (HSP)**, including specifications for use by a remedial action contractor to develop a Remedial Action Health and Safety Plan.
 - **Draft Operation, Maintenance and Monitoring Plan (OMMP)**, including Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP), or amendments to the existing Whatcom Waterway RI/FS SAP and QAPP, to evaluate the success of the remedial action, including capping and habitat restoration elements.
 - **Plans and Specifications**, conforming to standard engineering practice.
 - **Project Schedule** for construction, identifying timing for initiation and completion of all critical path tasks, and the contracting strategy.

The Draft Final Design shall serve as the Final Design if Ecology has no further comments and issues the notice to proceed. Otherwise, the Final Design shall fully address all comments made to the Draft Final Design. However, the Final OMMP will not be submitted to Ecology until construction is complete, as outlined below.

B. Remedial Action Activities

As described in Section II above, the Log Pond interim remedial action will cap and convert sediments that exceed SQS criteria, along with intertidal riprap, sheet pile, bulkheads, and concrete debris areas, into a silt-sand mudflat that will comply with applicable sediment quality criteria and enhance habitat functions. The bottom (Phase I) layer of the cap will be constructed with sand, and will be placed in a manner that minimizes the potential for mixing of the cap with underlying sediments. Finer-grained native silt material will be used for the final (Phase II) cap surface, providing a base seeding of endemic Bellingham Bay benthic fauna, facilitating rapid colonization of the mudflat. All construction actions will conform to the approved Final Design.

1. Final Inspection

After G-P makes a preliminary determination that construction is complete, Ecology shall be notified for the purposes of conducting a final inspection. The inspection is to determine whether the project is complete and consistent with the Final Design. Any outstanding construction items discovered during the inspection shall be identified and noted. The Final Inspection Report, in the form of a punch list, shall

outline any outstanding construction items, actions required to resolve items, and completion dates for these items, if applicable.

2. Cleanup Report

After the final inspection is performed, G-P will submit a cleanup report including as-built drawings of the interim remedial action and construction quality assurance data collected during construction.

C. Operation, Maintenance, and Monitoring Plan

G-P shall submit for Ecology approval a Draft OMMP as part of the Draft Final (90%) Design submittal, as described above. The Final OMMP shall be submitted to Ecology following the final construction inspection, also outlined above, and along with the Cleanup Report. The Final OMMP shall include the following elements:

1. Description of Normal Operation and Maintenance

- Description of tasks and schedules for operation and maintenance.

2. Description of Routine Monitoring and Laboratory Testing

- Description of monitoring tasks, including data collection, laboratory tests, and their interpretation (including SAP, QAPP, and HSP);
- Schedule of monitoring frequency and procedures for a petition to Ecology to reduce the frequency of or discontinue monitoring; and
- Description of verification sampling procedures if performance standards are exceeded in routine monitoring.

3. Corrective Action

- Description of corrective action if performance standards are exceeded; and
- Schedule for implementing these corrective actions.

4. Records and Reporting Mechanisms Required

- Laboratory records and reports to Ecology. All sediment data will be provided to Ecology in SEDQUAL format. Other data will be provided in EIM format.

VII. SCHEDULE FOR SUBMISSION & APPROVAL OF MAJOR DELIVERABLES

To support overall coordination and schedule objectives of this project, Ecology will endeavor to perform review of deliverables as quickly as practicable. The schedule for submission of deliverables described in this SOW is presented below:

Submission	Due Date
1. Draft Final Design (90 percent)	May 26, 2000
2. Final Design (100 percent)	Fourteen (14) days after receipt of Ecology's

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- | | |
|---------------------------------------|--|
| | comments on the Draft Final Design |
| 3. Completion of Construction | As approved by Ecology in Final Design schedule |
| 4. Final Inspection | Thirty (30) days after completion of construction |
| 5. Final Inspection Report | Thirty (30) days after completion of final inspection |
| 6. Cleanup Report and Final OMMP | One hundred twenty (120) days after completion of construction |
| 7. Long-Term Monitoring and Reporting | As approved by Ecology in Final OMMP |

VIII. REFERENCES

Anchor Environmental, 2000. Biological Assessment: Combined Remedial Action and Habitat Enhancement for the Georgia-Pacific Log Pond, Whatcom Waterway, Bellingham. Report prepared by Anchor Environmental, LLC for Georgia-Pacific West, Inc. March 20, 2000.

Anchor Environmental and Hart Crowser, 1999. Draft Final Remedial Investigation/Feasibility Study. Report prepared by Anchor Environmental, LLC and Hart Crowser, Inc. for Georgia-Pacific West, Inc. July 15, 1999.

Corps, 1994. Memorandum for Record: Determination of the Suitability of Dredged Material Tested Under PSDDA Evaluation Procedures for the U.S. Army Corps of Engineers Maintenance Dredging of the Swinomish Channel for Disposal at the PSDDA Rosario Strait Open Water Disposal Site. Puget Sound Dredged Disposal Analysis Agencies. August 1, 1994.

Corps, 1995. Memorandum for Record: Determination on the Suitability of Dredged Material Tested Under PSDDA Guidelines for in Bellingham Harbor Maintenance Dredging at Squalicum Creek Waterway for Placement at Either the Bellingham Bay Nondispersive or the Rosario Strait Dispersive Open Water Sites. Puget Sound Dredged Disposal Analysis Agencies. April 7, 1995.

Ecology, 1999. Bellingham Bay Comprehensive Strategy: Draft Environmental Impact Statement. Report prepared by Anchor Environmental, LLC and associated firms for Washington Department of Ecology. July 1999.

Table 1 - Applicable Surface Sediment Quality Criteria
Log Pond Interim Action, Bellingham Bay

PARAMETER ⁽¹⁾	Sediment Quality Standard (SQS)	Minimum Sediment Cleanup Level (MCUL)
Metals (mg/kg dry weight):		
Cadmium	5.1	6.7
Mercury	0.41	0.59
Zinc	410	960
Phenols (µg/kg dry weight):		
Phenol	420	1,200
2-Methylphenol	63	63
4-Methylphenol	670	670
2,4-Dimethylphenol	29	29
Pentachlorophenol	360	690
Benzyl Alcohol	57	73
Benzoic Acid	650	650
Polynuclear Aromatic Hydrocarbons (mg/kg OC):		
Naphthalene	99	170
Acenaphthylene	66	66
Acenaphthene	16	57
Flourene	23	79
Phenanthrene	100	480
Anthracene	220	1,200
2-Methylnaphthalene	38	64
Total LPAHs ⁽²⁾	370	780
Fluoranthene	160	1,200
Pyrene	1,000	1,400
Benzo(a)anthracene	110	270
Chrysene	110	460
Total benzofluoranthenes ⁽³⁾	230	450
Benzo(a)pyrene	99	210
Indeno(1,2,3-cd)pyrene	34	88
Dibenzo(a,h)anthracene	12	33
Benzo(g,h,i)perylene	31	78
Total HPAHs ⁽⁴⁾	960	5,300
Phthalates (mg/kg OC):		
Dimethylphthalate	53	53
Diethylphthalate	61	110
Di-n-Butylphthalate	220	1,700
Butylbenzylphthalate	5	64
Bis(2-ethylhexyl)phthalate	47	78
Di-n-Octyl phthalate	58	4,500
Miscellaneous Extractable Compounds (mg/kg OC):		
1,2-Dichlorobenzene	2.3	2.3
1,3-Dichlorobenzene	na	na
1,4-Dichlorobenzene	3.1	9.0
1,2,4-Trichlorobenzene	0.8	1.8
Hexachlorobenzene	0.38	2.3
Dibenzofuran	15	58

**Table 1 - Applicable Surface Sediment Quality Criteria
Log Pond Interim Action, Bellingham Bay**

PARAMETER ⁽¹⁾	Sediment Quality Standard (SQS)	Minimum Sediment Cleanup Level (MCUL)
Confirmatory Biological Testing Determinations (optional):		
Overall Interpretation	The SQS is exceeded when any one of the confirmatory marine sediment biological tests of WAC 173-204-315(1) demonstrates the following results:	The MCUL is exceeded when any two of the biological tests exceed the SQS biological criteria, or one of the following test determinations is made:
Amphipod Toxicity Bioassay	The test sediment has a lower (statistically significant, t-test, p=0.05) mean survival than the reference sediment, and the test sediment mean survival is less than 75 percent, on an absolute basis.	The test sediment has a lower (statistically significant, t-test, p=0.05) mean survival than the reference sediment, and the test sediment mean survival is 30 percent lower than a value represented by the reference sediment mean mortality plus thirty percent.
Larval Toxicity/Abnormality Bioassay	The test sediment has a mean survivorship of normal larvae that is less (statistically significant, t-test, p=0.10) than the mean normal survivorship in the reference sediment, and the test sediment mean normal survivorship is less than 85 percent of the mean normal survivorship in the reference sediment (i.e., the test sediment has a mean combined abnormality and mortality that is greater than 15 percent relative to time-final in the reference sediment).	The test sediment has a mean survivorship of normal larvae that is less (statistically significant, t-test, p=0.10) than the mean normal survivorship in the reference sediment, and the test sediment mean normal survivorship is less than 70 percent of the mean normal survivorship in the reference sediment (i.e., the test sediment has a mean combined abnormality and mortality that is greater than 30 percent relative to time-final in the reference sediment).
Juvenile Polychaete Growth Bioassay	The test sediment has a mean individual growth rate of less than 70 percent of the reference sediment mean individual growth rate and the test sediment mean individual growth rate is statistically different (t-test, p=0.05) from the reference sediment mean individual growth rate.	The test sediment has a mean individual growth rate of less than 50 percent of the reference sediment mean individual growth rate and the test sediment mean individual growth rate is statistically different (t-test, p=0.05) from the reference sediment mean individual growth rate.

NOTES:

- (1) Including all analytes detected above SQS criteria in surface or subsurface sediments at the Whatcom Waterway Site (Anchor Environmental and Hart Crowser 1999).
- (2) Total LPAHs represents the sum of detected naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.
- (3) Total benzofluoranthenes represent the sum of the concentrations of the b, j, and k isomers.
- (4) Total HPAHs represents the sum of detected fluoranthene, pyrene, benzo(a)anthracene, chrysene, total benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

**Table 2 - Applicable Surface Water Quality Criteria
Log Pond Interim Action, Bellingham Bay**

PARAMETER ⁽¹⁾	Chronic Criterion ⁽³⁾	Acute Criterion ⁽⁴⁾
Conventionals⁽²⁾:		
Dissolved Oxygen (mg/L)	6.0 or < 0.2 change	N/A
Turbidity (NTU)	< 5 NTU or 10% change	N/A
Metals (µg/L):		
Mercury (total)	0.025	1.8

NOTES:

- (1) Including all chemicals of concern identified in source areas within or adjacent to the Log Pond (Anchor Environmental and Hart Crowser 1999).
- (2) Water quality standards for these parameters are set forth in WAC 173-201A-030(2)
- (3) 48-hour average concentration
- (4) 1-hour average concentration

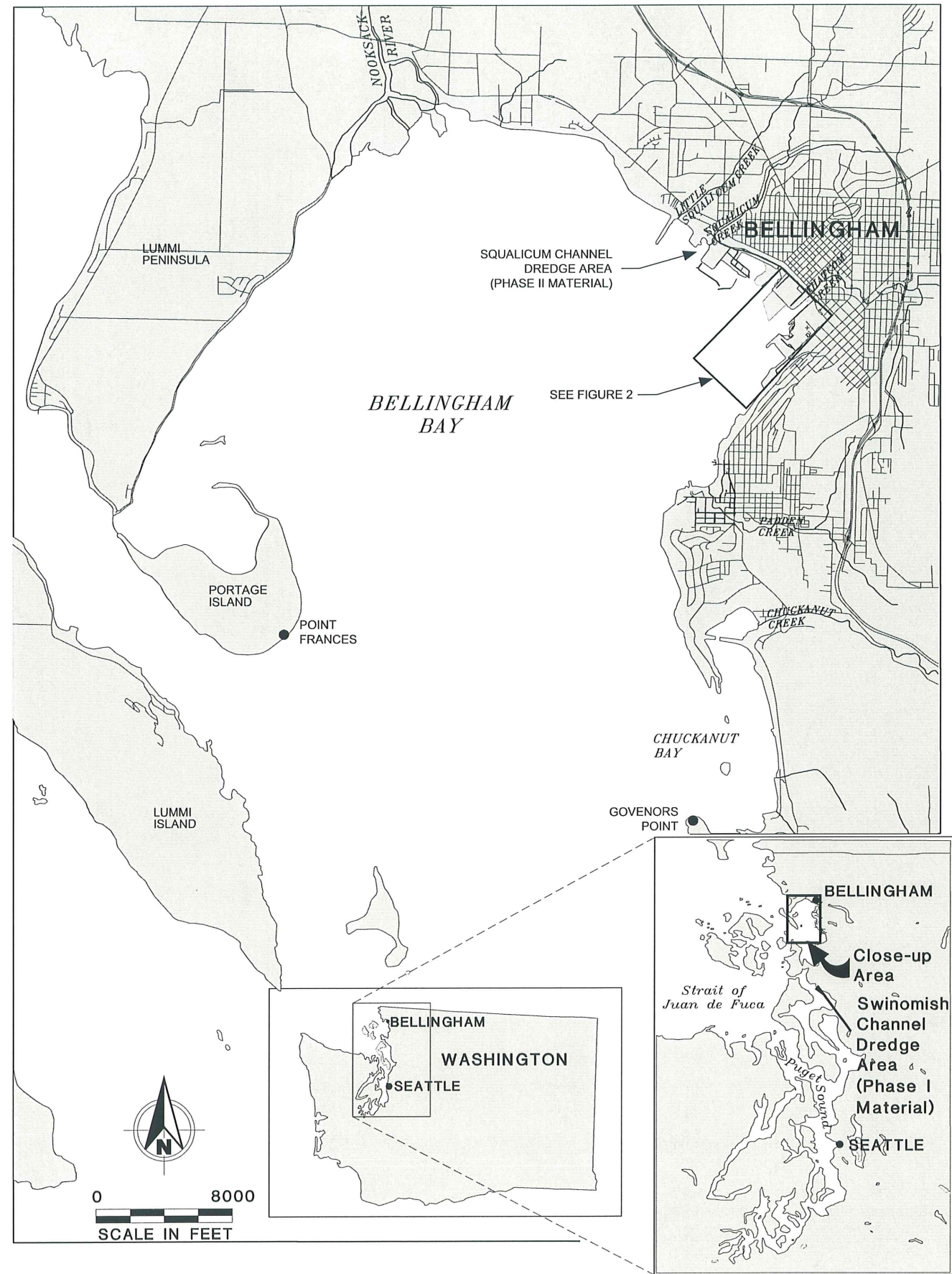


Figure 1
Vicinity Map
 Whatcom Waterway Area

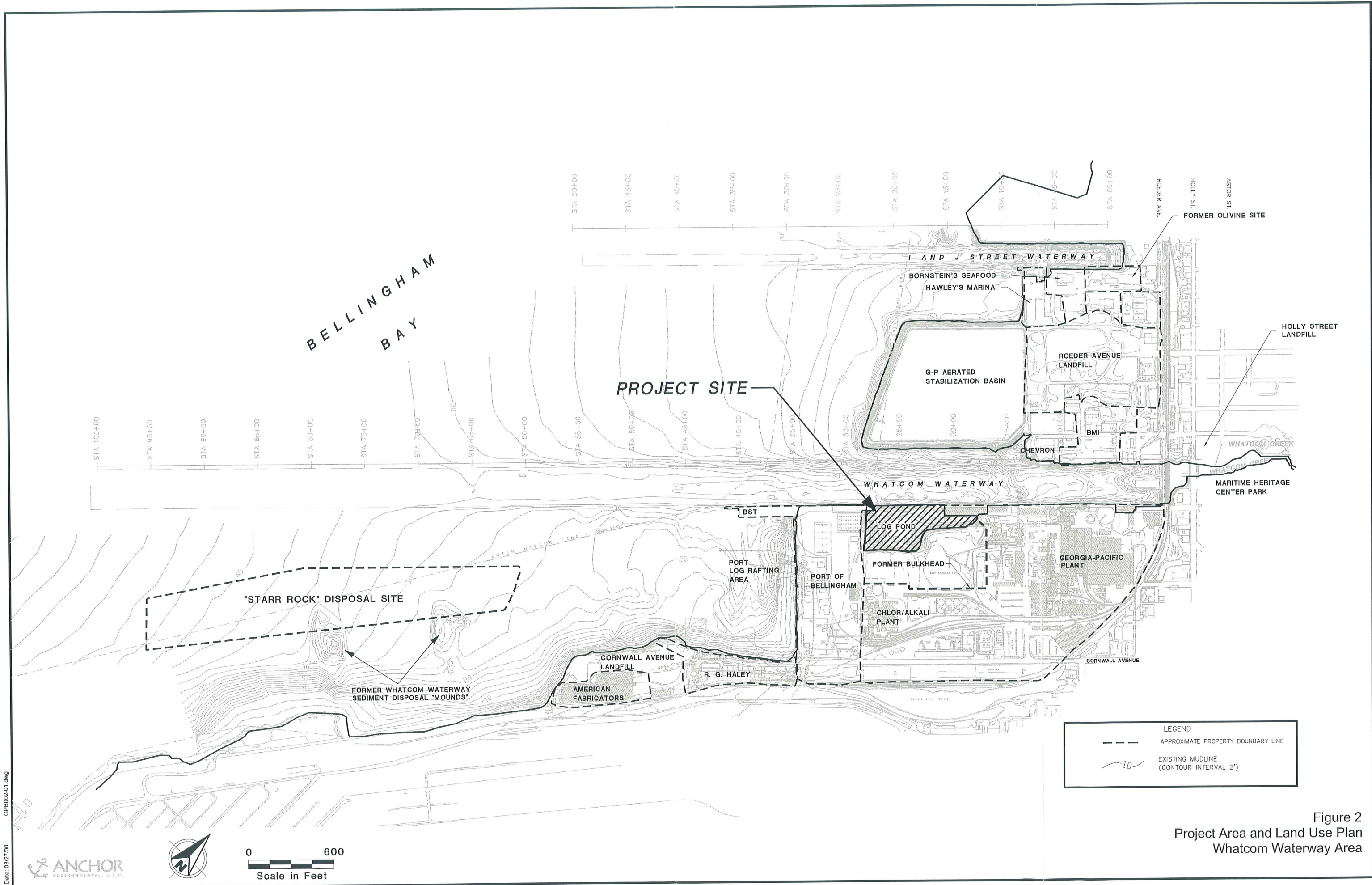
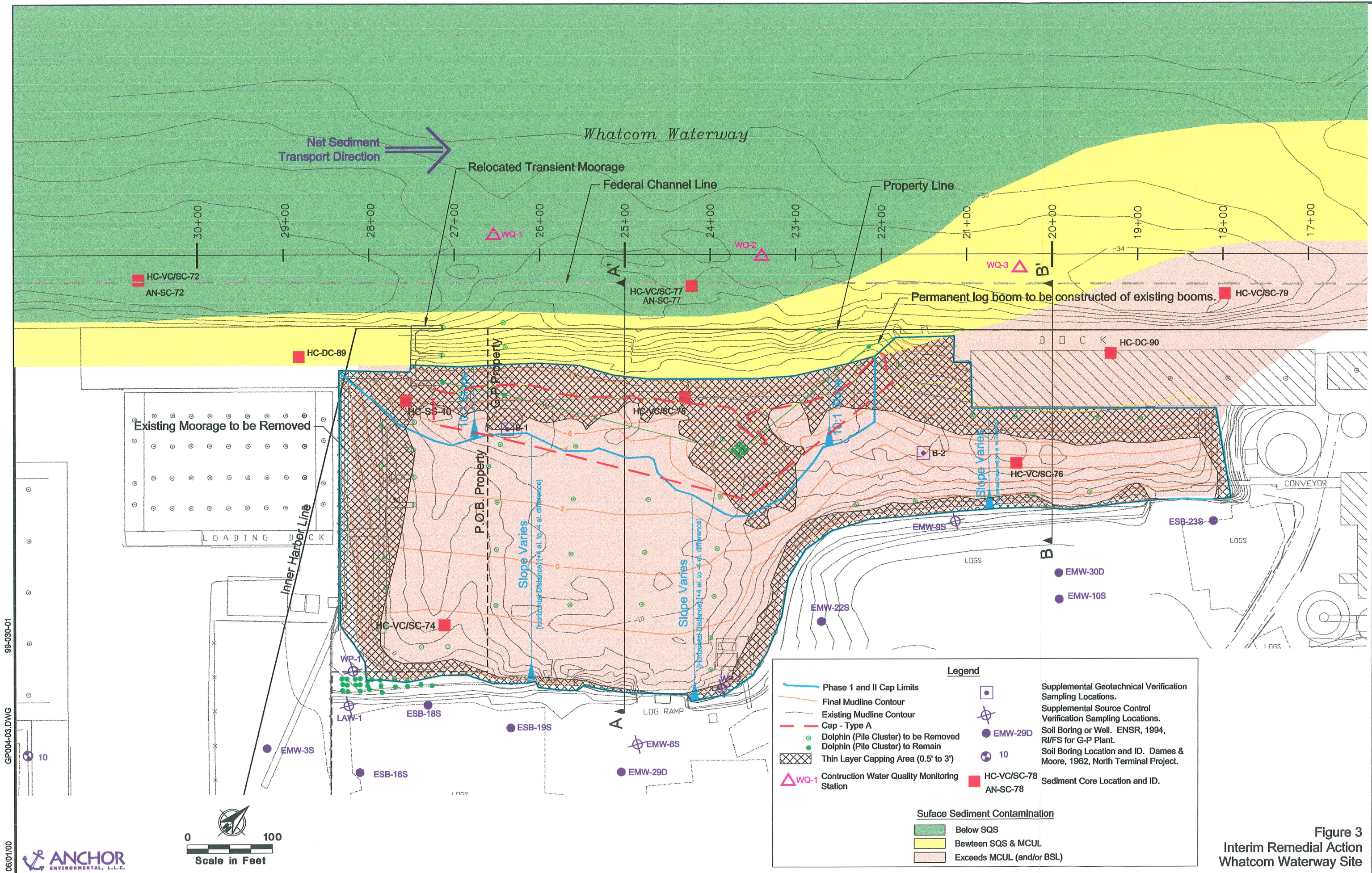


Figure 2
Project Area and Land Use Plan
Whatcom Waterway Area



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GP004-03.DWG

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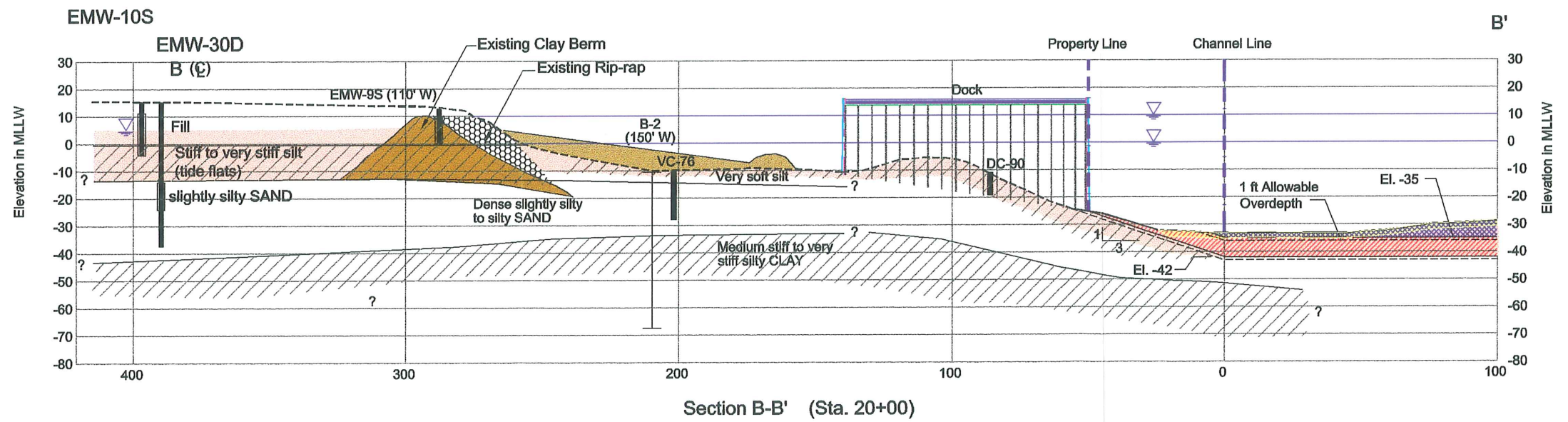
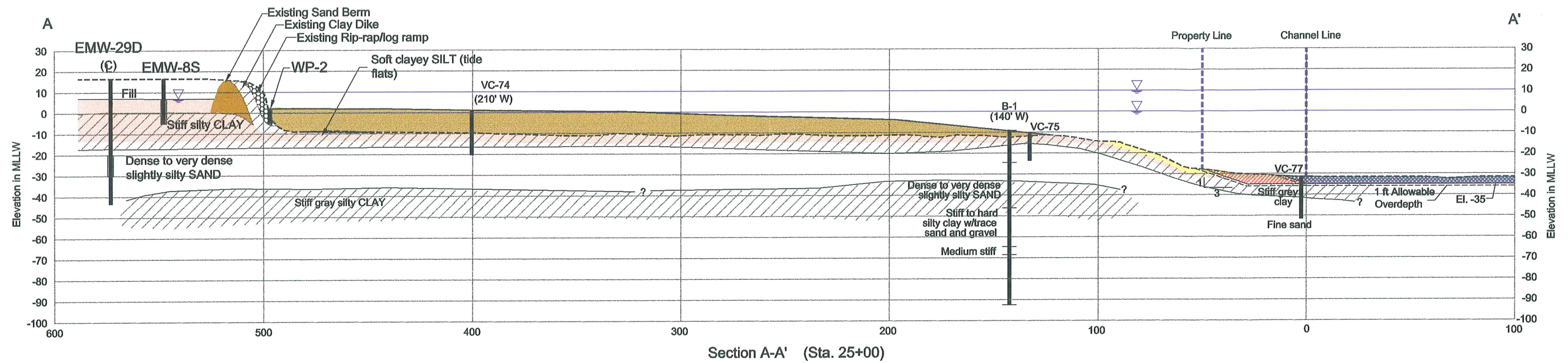
Legend

- Phase 1 and II Cap Limits
- Final Mudline Contour
- Existing Mudline Contour
- Cap - Type A
- Dolphin (Pile Cluster) to be Removed
- Dolphin (Pile Cluster) to Remain
- Thin Layer Capping Area (0.5' to 3')
- △ WQ-1 Construction Water Quality Monitoring Station
- Supplemental Geotechnical Verification Sampling Locations.
- ⊕ Supplemental Source Control Verification Sampling Locations.
- Soil Boring or Well. ENSR, 1994, RI/FS for G-P Plant.
- ⊕ 10 Soil Boring Location and ID. Dames & Moore, 1962, North Terminal Project.
- HC-VC/SC-78 AN-SC-78 Sediment Core Location and ID.

Surface Sediment Contamination

- Below SQS
- Between SQS & MCUL
- Exceeds MCUL (and/or BSL)

Figure 3
Interim Remedial Action
Whatcom Waterway Site



Legend

- Existing Mudline
- Exceeds MCUL (and/or BSL)
- SQS to MCUL
- BELOW SQS
- Extent of Log Pond Cleanup/Habitat Cap
- Maximum Future Removal Alt.
- Minimum Future Removal Alt.
- Low Permeability Clay and/or Silt Unit

Note: Station offsets are from the Federal Channel Line.

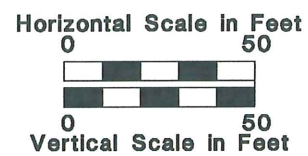


Figure 4
Cross Section A-A' and B-B'
G-P Log Pond

EXHIBIT B
RESTRICTIVE COVENANT

EXHIBIT B - RESTRICTIVE COVENANT

Georgia-Pacific Corporation

This Declaration of Restrictive Covenant is made pursuant to RCW 70.105D.030(l)(f) and (g) and WAC 173-340-440 by the Georgia-Pacific Corporation [G-P], its successors and assigns.

An Interim Remedial Action (hereafter "Remedial Action") is to be conducted on the Property that is the subject of this Restrictive Covenant. The Remedial Action is described in the Agreed Order for Interim Action at the G-P Log Pond. The Log Pond is a sub-unit of the Whatcom Waterway Site. This document is an Exhibit to that Agreed Order entered into between the State of Washington Department of Ecology and G-P, No. 00TCPNR-1418.

This Restrictive Covenant is required because residual concentrations of mercury, phenolic compounds, and woody material above State of Washington Sediment Management Standards (SMS; Chapter 173-204 WAC) criteria will remain in sediments beneath an engineered cap at the G-P Log Pond after completion of the Remedial Action.

The undersigned, G-P, is the fee owner of Log Pond (hereafter "Property") which is located in the County of Whatcom, State of Washington, that is subject to this Restrictive Covenant. The Property is legally described in Attachment A of this Restrictive Covenant and made a part hereof by reference.

G-P makes the following declaration as to limitations, restrictions, and uses to which the Property may be put and specifies that such declarations shall constitute covenants to run with the land, as provided by law and shall be binding on all parties and all persons claiming under them, including all current and future owners of any portion of or interest in the Property (hereafter "Owner").

Section 1. The Property shall be used only for those defined in and allowed under the City of Bellingham's zoning and Shoreline Management regulations codified in the City of Bellingham as of the date of this Restrictive Covenant.

Section 2.

- a. As of the date the Agreed Order was entered, the Property contains surface sediment concentrations of mercury ranging from 1 to 12 milligrams per kilogram. The Property also contains phenol concentrations ranging from 960 to 1,800 micrograms per kilogram and greater than 50 percent wood material by volume. These areas are shown on the enclosed map (Attachment B). The Owner shall not alter or modify the cap or existing structure(s) in any manner that may result in the release or exposure to the environment of the contaminated sediment or create a new exposure pathway without prior written approval from Ecology, which approval will not be unreasonably withheld.
- b. The Owner shall not conduct any activity at or adjacent to the Property that may result in a release of hazardous substances to the Property without prior written approval from Ecology, which approval will not be unreasonably withheld.

Section 3. The Owner must give thirty (30) day advance written notice to Ecology prior to transfer of any interest in the Property. No conveyance of title, easement, lease or other interest in the Property shall be consummated by the Owner without adequate and complete provision for continued monitoring, operation, and maintenance of the Remedial Action.

Section 4. The Owner must restrict leases to uses and activities consistent with the Restrictive Covenant and notify all lessees of the restrictions on the use of the Property.

Section 5. The Owner must notify and obtain approval from Ecology prior to any use of the Property that is inconsistent with the terms of this Restrictive Covenant. Ecology may approve any inconsistent use only after public notice and comment. Approval by Ecology pursuant to Section 5 shall not be unreasonably withheld.

Section 6. The Owner shall allow authorized representatives of Ecology the right to enter the Property at reasonable times for the purpose of evaluating the Remedial Action; to take samples, to inspect Remedial Actions conducted at the Property, and to inspect records that are related to the Remedial Action. Ecology will provide G-P advance notice of its entry onto the Site when feasible. Ecology shall adhere to applicable Health and Safety Plans to be developed.

Section 7. The Owner reserves the right under WAC 173-340-440 to record an instrument that provides that this Restrictive Covenant shall no longer limit use of the Property or be of any further force or effect. However, such an instrument may be recorded only if Ecology, after public notice and opportunity for comment, concurs, which concurrence shall not be unreasonably withheld.

DATED: July 27, 2000

By James W. Cunningham

James W. Cunningham
General Manager
Georgia-Pacific West, Inc.

STATE OF WASHINGTON)
) ss.
COUNTY OF WHATCOM)

On this 27th day of JULY, 2000, before me personally appeared JAMES W. CUNNINGHAM, to me known to be the GENERAL MANAGER of GEORGIA-PACIFIC WEST, the corporation that executed the within and foregoing instrument, and acknowledged said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that was authorized to execute the said instrument, and that the seal affixed, if any, is the corporate seal of said corporation.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal the day and year first above written.

D. Scott Moses
(Signature)

D. SCOTT MOSES
(Please print name legibly)

NOTARY PUBLIC in and for the State
of Washington, residing at
BELLINGHAM

My commission expires: 7-01-04

ATTACHMENT A

PACIFIC SURVEYING &
ENGINEERING SERVICES, INC.

ENGINEERING
SURVEYING
PLANNING
CONSULTING



1812 CORNWALL AVENUE
BELLINGHAM, WA 98225
360/671-7387
FAX: 360/671-4685
E-MAIL: pse@psurvey.com

DESCRIPTION
OF
LOG POND REMEDIATION AREA

THAT PORTION OF BLOCKS 182 THROUGH 184, WHATCOM COUNTY TIDELAND APPRAISERS MAP OF NEW WHATCOM TIDELANDS, STATE OF WASHINGTON, ACCORDING TO THE PLAT THEREOF, RECORDED IN VOLUME 4 OF PLATS, PAGE 31, RECORDS OF WHATCOM COUNTY, WASHINGTON, TOGETHER WITH VACATED ROADS ABUTTING, ALL BEING SITUATED IN SECTIONS 25 AND 36, TOWNSHIP 38 NORTH, RANGE 3 EAST, WILLAMETTE MERIDIAN, CITY OF BELLINGHAM, WHATCOM COUNTY WASHINGTON, BEING DESCRIBED AS FOLLOWS:

COMMENCING AT THE INTERSECTION OF THE INNER HARBOR LINE WITH THE SOUTHEASTERLY LINE OF WHATCOM CREEK WATERWAY, AS DEPICTED ON THE STATE OF WASHINGTON COMMISSIONER OF PUBLIC LANDS 1971 SUPPLEMENTAL MAP OF BELLINGHAM HARBOR; THENCE ALONG SAID INNER HARBOR LINE, SOUTH 30°44'14" EAST, 89.09 FEET TO THE INTERSECTION WITH THE NORTHWESTERLY LINE OF SAID BLOCK 184 AND THE *POINT OF BEGINNING*; THENCE CONTINUING ALONG SAID INNER HARBOR LINE, SOUTH 30°44'14" EAST, 41.98 FEET TO THE INTERSECTION WITH THE SOUTHWESTERLY LINE OF SAID BLOCK 184; THENCE ALONG SAID SOUTHWESTERLY LINE AND EXTENSION THEREOF, SOUTH 44°17'42" EAST, 308.00 FEET TO THE INTERSECTION WITH THE APPARENT HIGH WATER LINE, SAID HIGH WATER LINE BEING WITHIN THE VACATED RIGHT OF WAY OF ARMY STREET, AS VACATED UNDER CITY OF BELLINGHAM ORDINANCE NUMBER 7480; THENCE FOLLOWING SAID APPARENT HIGH WATER LINE THE FOLLOWING COURSES AND DISTANCES:

NORTH 44°31'46" EAST, 203.74 FEET; THENCE
NORTH 41°47'35" EAST, 68.29 FEET; THENCE
NORTH 55°19'41" EAST, 88.55 FEET; THENCE
NORTH 49°17'14" EAST, 63.03 FEET; THENCE
NORTH 29°03'10" EAST, 104.09 FEET; THENCE
NORTH 23°03'54" WEST, 136.12 FEET; THENCE
NORTH 07°28'11" EAST, 55.40 FEET; THENCE
NORTH 38°44'46" EAST, 97.62 FEET; THENCE
NORTH 42°35'05" EAST, 176.17 FEET; THENCE
NORTH 47°46'19" EAST, 70.97 FEET; THENCE
NORTH 36°26'42" WEST, 30.74 FEET; THENCE
NORTH 38°47'43" EAST, 21.12 FEET; THENCE
NORTH 09°15'06" EAST, 70.27 FEET; THENCE
NORTH 44°17'33" WEST, 73.26 FEET TO THE INTERSECTION WITH THE SOUTHEASTERLY MARGIN OF VACATED CENTRAL AVENUE, AS VACATED UNDER CITY OF BELLINGHAM ORDINANCE NUMBER 3006;

THENCE ALONG SAID SOUTHEASTERLY MARGIN, SOUTH 45°45'08" WEST, 1030.15 FEET
TO THE POINT OF BEGINNING.

CONTAINING 6.029 ACRES, MORE OR LESS.

SITUATE IN CITY OF BELLINGHAM, WHATCOM COUNTY, STATE OF WASHINGTON.





PACIFIC SURVEY AND ENGINEERING INC.
www.psesurvey.com psee@psurvey.com

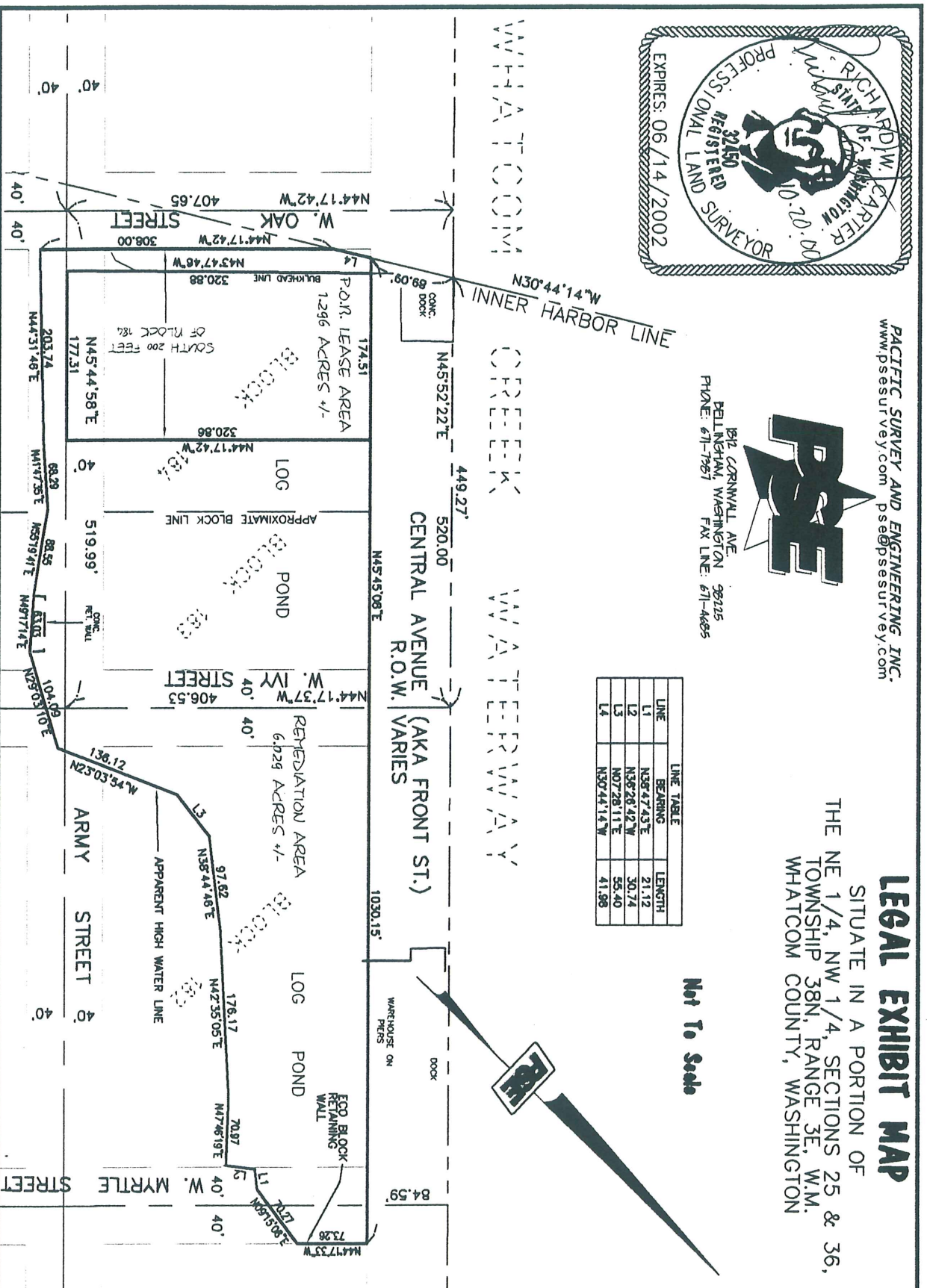


1912 CORNWALL AVE.
BELLINGHAM, WASHINGTON 98225
PHONE: 671-7967 FAX LINE: 671-4695

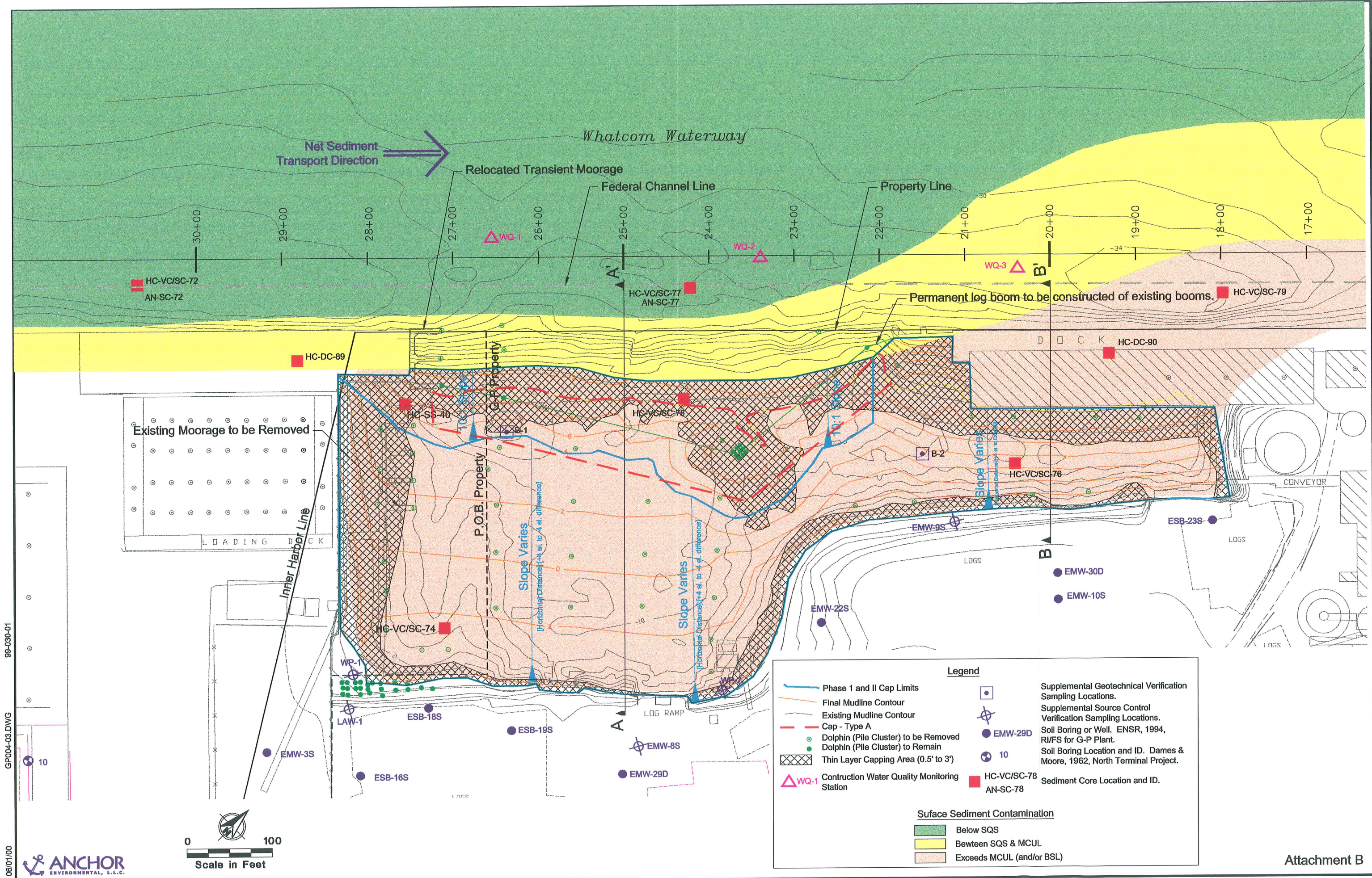
LINE	BEARINGS	LENGTH
L1	N36°47'43"E	21.12
L2	N36°28'42"W	30.74
L3	N07°28'11"E	55.40
L4	N30°44'14"W	41.98

LEGAL EXHIBIT MAP
SITUATE IN A PORTION OF
THE NE 1/4, NW 1/4, SECTIONS 25 & 36,
TOWNSHIP 38N, RANGE 3E, W.M.
WHATCOM COUNTY, WASHINGTON

Not To Scale



ATTACHMENT B



99-030-01

GP004-03.DWG

06/01/00



Legend

- Phase 1 and II Cap Limits
- Final Mudline Contour
- Existing Mudline Contour
- Cap - Type A
- Dolphin (Pile Cluster) to be Removed
- Dolphin (Pile Cluster) to Remain
- Thin Layer Capping Area (0.5' to 3')
- Construction Water Quality Monitoring Station
- Supplemental Geotechnical Verification Sampling Locations.
- Supplemental Source Control Verification Sampling Locations.
- Soil Boring or Well. ENSR, 1994, RI/FS for G-P Plant.
- Soil Boring Location and ID. Dames & Moore, 1962, North Terminal Project.
- Sediment Core Location and ID.

Surface Sediment Contamination

- Below SQS
- Between SQS & MCUL
- Exceeds MCUL (and/or BSL)