Gas Works Park
FS 139

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ATTORNEY GENERAL'S OFFICE
Ecology Div. - Lacey

July 30, 1997

VIA FEDERAL EXPRESS

Mr. Mark C. Jobson
Assistant Attorney General
629 Woodland Square Loop SE
P.O. Box 40117
Olympia, Washington 98504-0117

Re: Gas Works Park Agreed Order

Dear Mark:

Enclosed is the Agreed Order for Gas Works Park, executed by the City of Seattle and Puget Sound Energy. Following execution by the Department, please provide a photocopy to me and to Peter Hapke, the Assistant City Attorney responsible for this matter.

We look forward to continuing to work with you to move this in a positive direction.

Very truly yours,

Harry E. Grant, Jr.
of
GRAHAM & JAMES LLP/RIDDELL WILLIAMS P.S.

HEG/kh
Enclosure

Doc ID: N-52353 Ver: 1 44901-00063
7/30/97 KH

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

In the Matter of Remedial Action by:	**AGREED ORDER**
The City of Seattle Puget Sound Energy	No. DE 97TC-148

TO: The City of Seattle
Puget Sound Energy

I. Jurisdiction

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

II. Findings of Fact

Ecology makes the following Findings of Fact, without admission of any such facts by the City of Seattle, hereinafter referred to as the "City", and Puget Sound Energy, hereinafter referred to as "PSE".

1. The City of Seattle is the current owner of Gas Works Park (the "Site"), located at 2000 N. Northlake Way, Seattle, Washington. A map of the Park has been provided in Attachment "2."

2. Puget Sound Energy or its predecessors were a former owner and operator of a facility at the Site.

3. The Site is the location of a former manufactured gas plant (MGP) facility.

4. Operation of this MGP facility for 50 years (1906-1956) has left soil underlying the Site contaminated with a number of hazardous materials, including polynuclear aromatic hydrocarbons (PAHs), and volatile organic compounds ("VOCs").

5. The release of hazardous substances to soil has contaminated the shallow

ground water beneath the Site with dense non-aqueous phase liquids ("DNAPL"), PAHs and VOCs.

6. The concentrations of hazardous substances in soil and ground water at the Gas Works Park site exceed the 1 x 10^{-6} risk-based cleanup levels for human-health and the environment, as promulgated under Chapter 173-340 WAC.

III. Ecology Determinations

Ecology makes the following Determinations without any admission of liability or legal conclusion by the City and/or PSE.

1. The City is an "owner" as defined at RCW 70.105D.020(11) of a "facility" as defined in RCW 70.105D.020(4).

2. The facility is located at Gas Works Park (the "Site") and is located at 2000 N Northlake Way in Seattle, Washington.

3. PSE or its predecessors were a former owner and operator as defined at RCW 70.105D.020(11) of a "facility" as defined in RCW 70.105D.020(4).

4. The substances found at the Site as described above are "hazardous substances" as defined at RCW 70.105D.020(7).

5. Based on the presence of hazardous substances at the Site and all factors known to the Department, there is a release or threatened release of hazardous substances from the Site, as defined at RCW 70.105D.020(19).

6. By letters dated October 5, 1990 and November 29, 1990, after notice and opportunity for comment, Ecology notified the City and PSE of their status as "potentially liable persons" under RCW 70.105D.040.

7. Pursuant to RCW 70.105D.030(1) and 70.105D.050, the Department may

require potentially liable persons to investigate or conduct other remedial actions with respect to the release or threatened release of hazardous substances, whenever it believes such action to be in the public interest.

8. Based on the foregoing facts, Ecology believes the remedial action required by this Order is in the public interest.

IV. Work to be Performed

Based on the foregoing Facts and Determinations, it is hereby ordered that the City and PSE take the following remedial actions and that these actions be conducted in accordance with Chapter 173-340 WAC unless otherwise specifically provided for herein. This remedial action shall include a site feasibility study, hereinafter referred to as the "FS" and a Cleanup Action Plan, hereinafter referred to as the "CAP". A scope of work for the site FS has been provided in Attachment "1".

1. Based upon the Scope of Work in Attachment "1", the City and PSE and their contractors shall provide a schedule for completion of the FS tasks within thirty (30) days after the effective date (defined herein in Section V.1.b. and hereinafter "Effective Date") of this Order.

2. A draft FS is to be completed and submitted for a 60 day public review and comment period within twelve (12) months after the Effective Date of this Order. A final FS is to be completed within fifteen (15) months after the Effective Date of this Order.

3. A draft CAP is to be submitted to Ecology for a 60 day public review and comment period within twelve (12) months after the Effective Date of this Order. The draft CAP shall meet the requirements of WAC 173-340-360. A final CAP is to be submitted to Ecology within fifteen (15) months after the Effective Date of this Order.

V. Terms and Conditions of Order

1. Definitions.

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

b. Effective Date. The Effective Date ("Effective Date") of this Order shall be a date after the termination date of Ecology's responsiveness period which shall follow a forty-five (45) day public notice and comment period on this Order. The Effective Date shall be written by Ecology in the blank on the final page of this Order and Ecology shall at that time promptly give written notice to the City and PSE of the Effective Date of this Order.

2. Public Notices. Pursuant to WAC 173-340-600(10)(c), there shall be at least a 30 day public comment period before this Order becomes effective. Ecology shall be responsible for providing such public notice and reserves the right to seek agreed modification or withdrawal of 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. The City and PSE shall pay to Ecology costs incurred by Ecology pursuant to this Order. Ecology costs shall include costs of direct activities and support costs of direct activities as defined in WAC 173-340-550(2). The City and PSE shall pay the required amount within 90 days of receiving from Ecology a quarterly 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. Site logs

prepared by the involved staff 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:

Name: Charles San Juan
Address: P.O. Box 47600
Olympia, WA 98054-7600
(360) 407 - 7191

The project coordinator for PSE is:

Name: Steve Secrist
Address: PUGET SOUND ENERGY
815 Mercer Street
M/S MER-04F
Seattle, WA 98109

The project coordinator for the City is:

Name: Robin V. Kordik
Address: SEATTLE PARKS AND RECREATION DEPARTMENT
2911 Second Avenue 4th Floor
Seattle, WA 98121-1079
(206) 233 - 7938

The project coordinators shall be responsible for overseeing the implementation of this Order. To the maximum extent possible, communications between Ecology and the City and/or PSE, 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 coordinators. Should Ecology, the City or PSE change project coordinators, written notification shall be provided to Ecology, the City and PSE 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, hydrogeologist, or similar expert, with appropriate training, experience and expertise in hazardous waste site investigation and cleanup. The City and PSE shall notify Ecology as to the identity of such engineer(s) or hydrogeologist(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 Site. The City and PSE 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, The City and PSE shall not perform any remedial actions at Gas Works Park outside that required by this Order unless Ecology concurs with such additional remedial actions. Such concurrence may be oral, however, in such event Ecology shall subsequently confirm its approval of such actions in writing.

In accordance with WAC 173-340-400(7)(b)(i), all "construction" performed on the Site shall be under the supervision of a professional engineer registered in Washington.

6. Access. Ecology or any Ecology authorized representative shall have the authority to enter and freely move about the Site 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 the

City or PSE. Ecology shall notify Virginia Swanson, City of Seattle, Parks and Recreation Department, Special Events Coordinator, at (206) 684-8017, prior to entering upon the Site. By signing this Agreed Order, the City agrees that this Order constitutes reasonable notice of access, and agrees to allow access to the Site at all reasonable times for purposes of overseeing work performed under this Order. Ecology shall allow split or replicate samples to be taken by the City and PSE. The City and PSE shall allow split or replicate samples to be taken by Ecology and shall provide seven (7) days notice before any sampling activity. Likewise, Ecology shall provide the City and PSE with seven (7) days notice before sampling events.

7. Public Participation. Ecology shall maintain the responsibility for public participation at the site. Public participation shall be coordinated among the three parties and implemented in accordance with the public participation plan and WAC 173-340-600(8)(g).

8. Retention of Records. The City and PSE shall preserve in a readily retrievable fashion, during the pendency of this Order and for seven (7) years from the date of completion of the work performed pursuant to this Order, all records, reports, documents, and underlying data in its possession produced pursuant to this Order not otherwise protected by legal privileges. Should any portion of the work performed hereunder be undertaken through contractors or agents of the City or PSE, then the City and PSE agree to include in their contract with such contractors or agents a record retention requirement meeting the terms of this paragraph.

9. Dispute Resolution. The City and/or PSE may request Ecology to resolve disputes which may arise during the implementation of this Order. Such request shall be in writing and directed to the Ecology signatory, or his/her successor(s), to this Order. Ecology

resolution of the dispute shall be in writing and shall constitute a final administrative decision. The City and/or PSE is not relieved of any requirement of this Order during the pendency of the dispute and remains 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 Chapter 70.105D RCW. Ecology's signature on this Order in no way constitutes a general covenant not to sue or a compromise of any Ecology rights or authority. Ecology will not, however, bring an action against the City or PSE 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 the City or PSE to require those remedial actions required by this Agreed Order, provided the City and PSE comply with this Agreed Order.

Ecology reserves the right, however, to require additional remedial actions at the Site 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 Site.

In the event Ecology determines that conditions at the Site are creating or have the potential to create a danger to the health or welfare of people on the Site or in the surrounding area or to the environment, Ecology may order the City and PSE 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 Site shall be consummated by the City 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 the City may have in the site or any portions thereof, the City 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, the City shall notify Ecology of the contemplated transfer.

12. Compliance with Other Applicable Laws.

a. All actions carried out by the City and PSE pursuant to this Order shall be done in accordance with all applicable federal requirements and the substantive provisions of applicable state and local law.

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 Attachment "1" Scope of Work and are binding and enforceable requirements of the Order, however, permits need not be obtained in accordance with the requirements of RCW 70.105D.090.

The City and PSE have 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 the City or PSE determines that additional permits or approvals addressed in RCW 70.105D.090(1) would otherwise be required for the remedial action under this Order, it shall promptly notify Ecology of this determination. Ecology shall determine whether Ecology or the City/PSE shall be responsible to contact the appropriate

state and/or local agencies. If Ecology so requires, the City or PSE 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 the City or PSE and on how the City or PSE must meet those requirements. Ecology shall inform the City and PSE in writing of those requirements. Once established by Ecology, the additional requirements shall be enforceable requirements of this Order. The City and PSE shall not begin or continue the remedial action potentially subject to these additional requirements until Ecology makes its final determination but completion dates for Work to be Performed under Section IV of this Order shall be extended by the number of days required to satisfy this provision of the Order.

Ecology shall ensure that notice and opportunity 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 the City and PSE 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 but completion dates for Work to be Performed under Section IV of this Order shall be extended by the number of days required to satisfy this provision of the Order.

VI. Satisfaction of this Order

The provisions of this Order shall be deemed satisfied upon the City's and PSE's receipt of written notification from Ecology that the City and/or PSE 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 satisfied.

VII. Enforcement

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

a. The Attorney General may bring an action to enforce this Order in a court of competent jurisdiction.

b. Except as provided in Section 10 of this Order, the Attorney General may seek, by filing an action, if necessary, to recover costs incurred by Ecology for investigative and remedial actions and orders related to this Site.

c. In the event the City or PSE refuses, without sufficient cause, to comply with any term of this Order, City or PSE 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 Chapter 70.105D RCW.

Effective date of this Order: 8/1/97

CITY OF SEATTLE

By: _____

Its: Superintendent of Parks

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

By: _____

Its: Ecology Section Manager

PUGET SOUND ENERGY

By: _____

Its: Director Environmental Services

Doc ID: N-48852 Ver: 1 44901-00063
7/30/97 KH

ATTACHMENT 1

ATTACHMENT 1

FOCUSED FEASIBILITY STUDY AND CLEANUP ACTION PLAN WORK SCOPE GAS WORKS PARK ENVIRONMENTAL CLEANUP

PURPOSE AND GOALS

A Focused Feasibility Study (FFS) and Cleanup Action Plan (CAP) that meets the requirements of WAC 173-340 will be completed for Gas Works Park (hereafter referred to as the "site"). Work completed by Tetra Tech, HDR Engineering, the U.S. Geological Survey, and the University of Washington in the 1980s characterized soil and groundwater contamination at the site by means of surficial soil sampling, test borings, and monitoring wells, resulting in accumulation of more than 11,000 data points. The body of historical work addressed the necessary elements of a remedial investigation (RI) and selected elements of a feasibility study (FS), as described in WAC 173-340-350, State remedial investigation and feasibility study.

As the initial step to facilitate completion of the FS process, the City of Seattle Department of Parks and Recreation (SDPR) and Puget Sound Energy (PSE; formerly Washington Natural Gas) funded a study to identify potential remedial action measures for Gas Works Park, including development of life-cycle cost ranges. The resulting report, "Gas Works Park Environmental Cleanup, Phase I - Candidate Remedial Measures, July 15, 1996," included the following elements:

- *A database of historical site soil and groundwater sample information.*
- *An inventory and assessment of the existing monitoring wells at the site.*
- *A conceptual site model describing contaminant sources, migration pathways, and potential receptors.*
- *A list of candidate remedial alternatives to address soil and groundwater contamination at the site.*

- *A description of five remedial alternatives and development of life-cycle costs for each alternative.*

The Phase I screening and evaluation of potential remedial action measures was conducted to be consistent with WAC 173-340-350(6)(e), Cleanup action alternatives. This regulation allows for a phased analysis of remedial alternatives by conducting an initial screening of alternatives to reduce the number of potential remedies subject to the final detailed evaluation. Because the Phase I analysis accomplished much of the initial screening step of the FS, the Phase II analysis will be referred to as a Focused Feasibility Study (FFS). The Phase I report will be appended to the FFS report to document the initial step of the FS process.

The Phase I remedial alternatives reflect the following key considerations and goals which will guide the FFS:

1. *Total removal or treatment of all the impacted soil and groundwater beneath the park to established MTCA levels is not technically practicable. Therefore, source control measures will be combined with containment and institutional controls to protect human health and the environment.*

2. *Soil remedial action measures will be designed to address potential health risks associated with ingestion and inhalation of contaminated soil. A specific soil remedial action goal will be to eliminate the tar seeps that occur on a seasonal basis at the site.*

3. *Remedial action measures for groundwater and non-aqueous phase liquid (NAPL) will be designed to address potential ecological risks associated with subsurface discharges to Lake Union.*

4. *The City's goal is to preserve the site as a public park and preserve existing architectural features and land forms.*

Following completion of the FFS, a Cleanup Action Plan (CAP) will be prepared pursuant to WAC 173-340-360(10-12).

The work scope for completion of the FFS and CAP follows.

FOCUSED FEASIBILITY STUDY (FFS) WORK SCOPE

Task 1 - Summarize Previous Studies

Review information from the previous studies for Gas Works Park and from adjacent sites that have completed site investigations and provide a brief summary in the FFS report. Collect and summarize information on groundwater flow characteristics (including vertical flow) and subsurface stratigraphy (including the depth to the glacial till unit) as part of this review.

Task 2 - Conduct Field Investigations to Address Data Gaps

2.1 Repair and Abandon Deficient Onsite Monitoring Wells

Fit watertight caps to all monitoring wells to keep surface water from entering the wells. Replace protective valve boxes, as necessary, to prevent unauthorized access to the wells.

Redevelop monitoring wells to be sampled, as necessary, to clear any well screens that may have become clogged.

Prepare recommendations for abandonment of monitoring wells with construction deficiencies that: 1) compromise the collection of representative groundwater samples, or 2) present pathways for migration of contaminants. Pursuant to discussions with SDPR, PSE and Ecology, abandon wells as appropriate, in compliance with WAC 173-160.

2.2 Install a New Upgradient Monitoring Well (Optional)

Review data collected in Task 1 to determine the need for an additional upgradient monitoring well to characterize the quantity and quality of groundwater entering the Gas Works Park site. Original upgradient well MW-1 (located off site, north of Gas Works Park) was apparently destroyed by construction. Monitoring well data from adjacent sites (see Task 1) may be used in lieu of a new well.

If a new well is required, drill a borehole to the top of the glacial till unit to confirm the thickness of the uppermost groundwater zone. Complete one monitoring well within the borehole to screen the uppermost groundwater zone.

2.3 Baseline Sampling

Update the site-specific SAP and HSP prepared in Phase I to provide for collection of surface soil and groundwater samples, including addition of a QA/QC section to the SAP. The content of these plans will be consistent with WAC 173-340-350. The soil and groundwater sample results will be compared to the data previously collected at Gas Works Parks to determine if any significant changes have occurred over time.

2.3.1 Groundwater Sampling

Gauge all wells to obtain the data needed to determine groundwater elevations and to determine if NAPL is present in any of the wells. Note NAPL thickness, if present.

Sample all of the site monitoring wells (except any that contain NAPL, cannot be located, or have been destroyed) for appropriate contaminants and general water quality parameters. On the basis of NAPL measurements collected in the summer of 1996, wells to be sampled are: MW-3, MW-3D, MW-6, MW-8, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-19, MW-20, MW-21, and the new upgradient well (16 wells total). These wells and the analytical parameters proposed for each well are identified in Table 1.

Submit samples to a commercial laboratory for analysis of volatile and semivolatile organic compounds, the primary constituents of interest in the Phase I analysis and for general water quality parameters. Measure field parameters (e.g., pH, specific conductance, and temperature) during sample collection.

Validate the sample data. Enter the validated data into the site database.

2.3.2 Surface Soil Sampling

Using the previous surface soil sampling results, define sample locations corresponding across the site that correspond to areas expected to contain high, moderate and low levels of

organic contamination. Select up to 10 locations for confirmational analysis. Collect and submit samples to a commercial laboratory for analysis of volatile and/or semivolatile organic compounds (depending upon the previous results).

Validate the sample data and enter the validated data into the site database.

2.4 Assess the Source(s) of Upwelling Tar

Evaluate the occurrence and sources of upwelling tar by means of appropriate subsurface investigation techniques including test pits. This investigation will be conducted in the area of the former American Tar Company (ATCO) facility and at all other documented tar seep locations.

Estimate the quantities of tar and/or tar contaminated soil to determine the best management practices. Submit a representative tar sample for analysis of hazardous constituents (i.e., volatile and semivolatile organic compounds), sulfur and BTU content. The results of the organic compound analysis will be used to assess leaching and migration potential while the sulfur and BTU content characterization will be used to assess recycle/reuse options.

2.5 Assess Potential Contaminant Sources in the Cracking Tower Area

Determine if the cracking towers and other former above ground site MGP equipment are an on-going source of tar and other waste material. If hazardous substances are being released from the former MGP equipment, determine the appropriate remedy.

2.6 Conduct a Site-Specific Ecological Survey

Retain a biologist to survey the site for environmental receptors including plants and wildlife. Determine if any particularly sensitive species are present including threatened or endangered species.

2.7 Evaluate Groundwater-Surface Water Interface Monitoring

Evaluate the groundwater-surface water interface to assess actual discharges and to establish an appropriate point of compliance for groundwater at Gas Works Park in accordance

with WAC-340-720 (6)(d). Research techniques that will allow monitoring to be conducted as close as technically possible to the points where site groundwater discharges into surface water. Field test selected methods if appropriate.

Task 3 - Complete Data Analysis to Refine Understanding of Current Site Conditions

3.1 Confirm Contaminant Sources

Use the data collected in Tasks 1 and 2 to refine the description of contaminant source areas that was presented in the Phase I report. For purposes of the FFS, source areas will be defined to include areas of NAPL occurrence (either a measurable accumulation within a well or as evidenced by soil or groundwater quality data) and areas with accumulations of mobile tar. Maps and cross-sections will be prepared as appropriate to depict the defined source areas.

3.2 Confirm Migration Pathways

3.2.1 Assess Leaching Rates of the Site Waste Material

Use published data (supplemented by laboratory tests, if necessary) to assess the potential for contaminants in on-site soils and waste material to leach under the influence of precipitation or groundwater contact.

3.2.2 Assess Surface Water Infiltration and Groundwater Flow

Estimate surface water infiltration using the Hydrologic Evaluation of Landfill Performance (HELP) model.

Develop an updated estimate of groundwater discharge from beneath the site to Lake Union, using recent groundwater level data and slug test data from past Tetra Tech and HDR reports.

Develop a water balance for the site using results of the HELP modeling, updated groundwater discharge estimates, and historical site data.

Develop an updated estimate of contaminant loading from groundwater beneath the site to Lake Union, using the most recent groundwater flow and groundwater quality data. Simple analytical models such as those presented in "Tier 2 RBCA Spreadsheet System" (Groundwater Services, Inc., 1995) and "CDIFF", a U.S. EPA model for near shore environments (Yearsley, 1991) may be used as part of this analysis.

3.3 Confirm Receptors

Use the ecological survey data and data collected as part of previous studies to confirm the potential receptors identified in the Phase I report. Work with Ecology to identify the nature of the fishery resource in Lake Union.

Task 4 - Establish Remedial Action Objectives

Reexamine the key considerations and goals presented in the introduction to this scope and revise as appropriate.

Use the data collected in Task 3 to update the conceptual site model that was presented in the Phase I report. Review the updated model and the new site data to define the primary source(s) of risk associated with the site. Establish remedial action objectives that will ensure that those risks are reduced to acceptable levels.

List MTCA Method B cleanup levels for each compound of concern in soil and groundwater. Since groundwater in the uppermost saturated zone beneath the site is not now and will not likely ever be a drinking water supply, Method B surface water cleanup levels will apply to groundwater. Use the Method B cleanup levels to define areas of the site where compliance monitoring, containment and/or institutional controls are appropriate (WAC 173-340-700(2)(c)). As noted in the introductory section of this scope, using removal and/or treatment actions to meet MTCA cleanup levels throughout the entire site is not technically practicable. As appropriate, action levels will be defined to identify source areas where removal and/or treatment will be evaluated.

Identify applicable state and federal laws and provide a brief description of the applicable requirements.

Tabulate each remedial action objective and describe how "success" will be measured (e.g., by meeting a performance standard or reaching an appropriate action level).

Task 5 - Develop Final Remedial Action Alternatives

5.1 Technology Update and Evaluation

Summarize and update the initial technology screening and evaluation documented in the Gas Works Park Environmental Cleanup, Phase I - Candidate Remedial Measures report dated July 15, 1996. Consider the following:

- *The hierarchy of technology preferences defined in WAC 173-340-360(4).*
- *Technology reviews and research sponsored by the Electric Power Research Institute (EPRI) and the Gas Research Institute (GRI).*
- *EPA's response strategy for soil cleanup actions at manufactured gas plant (MGP) sites and remedial activities at other regional MGP (or similar) sites.*
- *EPA's Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration (OSWER Directive 9234.2-25)*
- *Information provided by Ecology related to the potential to reuse and recycle MGP-impacted soil. Specifically, the FFS will explore the possibility of reusing impacted soil from Gas Works Park at coal-powered boilers within the area.*

5.2 Propose Remedial Action Alternatives

Reexamine the following remedial action alternatives from the Phase I screening effort, along with the no action and the total cleanup alternatives, and propose to either retain, modify, or eliminate each alternative:

1. *No action.*

2. *Hot spot removal, surficial cover with geotextile barrier and institutional controls.*

3. *Hot spot removal, low-permeability cap using geomembrane infiltration barrier, geonet drainage system, and institutional controls.*

4. *Hot spot removal, upgradient cutoff wall, surficial cover or cap, and institutional controls.*

5. *Hot spot removal, downgradient funnel and gate with integral treatment components, surficial cover or cap, and institutional controls.*

6. *Hot spot removal, groundwater biodegradation, surficial cover or cap, and institutional controls.*

7. *Total source removal (not technically practicable based on the current site data).*

Other alternatives may also be developed, depending upon the findings of the previous tasks. Use the data obtained in Tasks 1 through 3 to complete the following specific technical analyses:

- *Review the site drainage patterns and assess cap and cover design for Gas Works Park. Determine if a cap can be designed to prevent upwelling of tar, with or without some tar removal.*

- *Determine the appropriateness and extent of hot spot removal considering the containment efficiency provided by the cap and cover options.*

- *Determine the site improvements or requirements that would be needed for adequate maintenance of a cap or cover (e.g., irrigation/sprinkling systems, drainage and erosion control).*

- *Determine the need for physical barriers that contain contaminants and/or divert groundwater to achieve remedial goals at the site. If it is determined that such barriers are necessary, assess the type(s), length, depth, and placement of such physical barriers.*

- *Determine if groundwater pumping is needed, particularly in support of other remedial measures such as physical barriers. If groundwater pumping is necessary, assess options for discharge*

of pumped groundwater, including recirculation and discharge to the sanitary sewer system. Simple analytical models of groundwater flow may be applied to this task, as appropriate.

Task 6 - Evaluate Remedial Action Alternatives

Define the criteria that will be used to evaluate each remedial action alternative for Gas Works Park. Consider the remedial action objectives identified in Task 4, the "other requirements" defined in WAC 173-340-360, the City's goal of park preservation, and any initial public input that may have been received during the FFS process. Document other future land use plans, if any, and determine if those uses would be compatible with any of the proposed remedies. Update and revise the Phase I life-cycle cost estimates as appropriate.

Evaluate each alternative in terms of its ability to satisfy each of the selected evaluation criteria. Complete a comparative analysis in which the alternatives are compared to see which has a greater ability to meet each evaluation criterion. Use summary tables and matrices to compare and rank the remedial action alternatives.

Task 7 - Prepare a Focused Feasibility Study Report

Prepare an FFS report to document the methods and results of each of the previous six tasks. Include a description of the recommended remedial action alternative and the rationale for that recommendation in the FFS report.

Prepare or attach the following appendices for the FFS report: the Phase I Candidate Remedial Measures report; the methods and results of the groundwater sampling event; the methods and results of the ecological survey; and other relevant technical information.

CLEANUP ACTION PLAN (CAP) WORK SCOPE

Task 1 - Prepare a Draft CAP

Prepare a draft CAP that is consistent with the requirements of WAC 173-340-360(10). Develop the CAP from the data, findings, and conclusions developed during Phase I and II of this project. Identify the substantive requirements of applicable permits and ensure that those requirements are met by the CAP.

Task 2 - SEPA Compliance

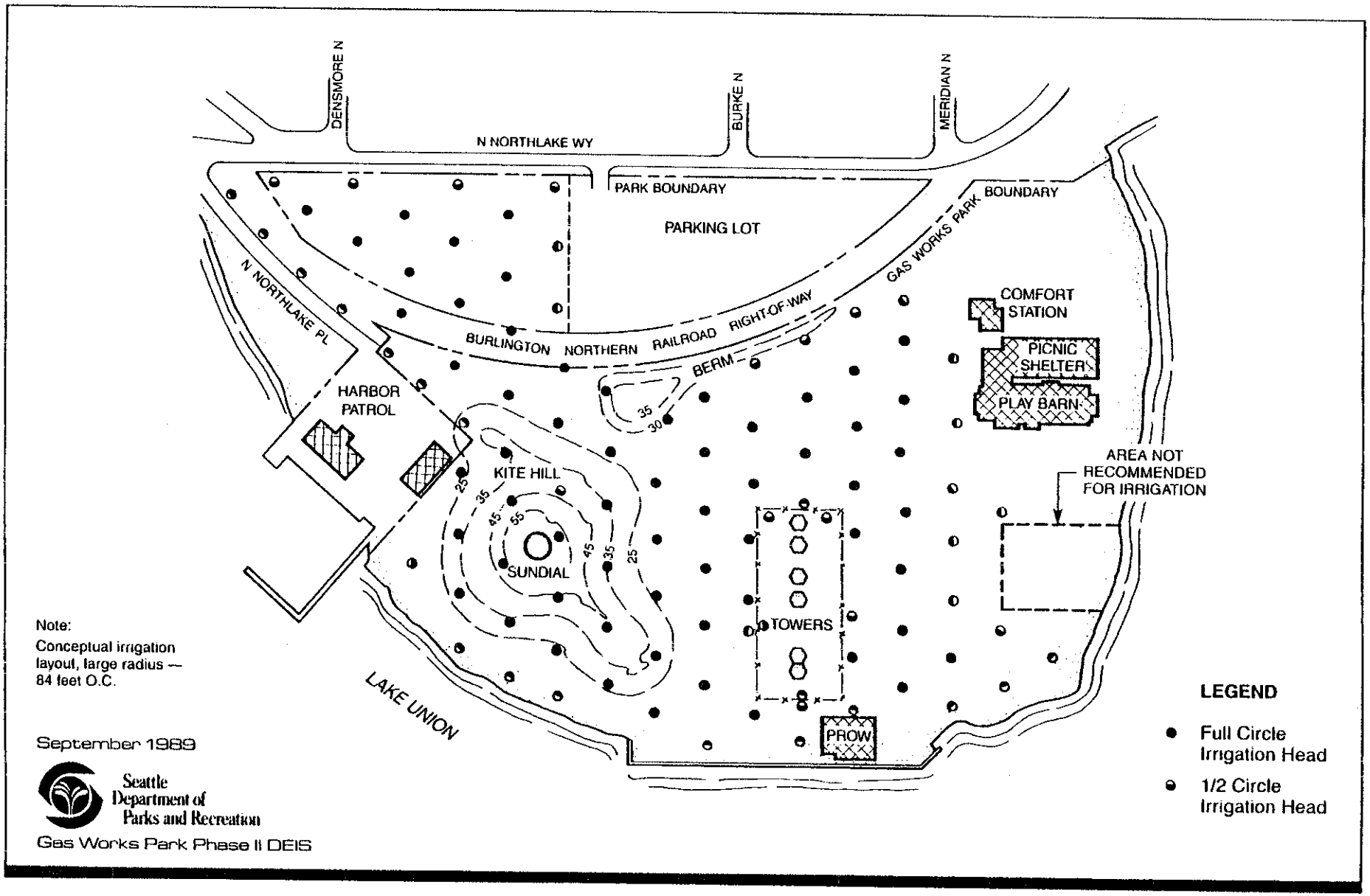
Perform the appropriate SEPA compliance activities to meet State law and City ordinance requirements.

Task 3 - Prepare a Final CAP

Support Ecology in the preparation of a responsiveness summary to public comment, as necessary. Prepare a final CAP pursuant to completion of the public comment process.

ATTACHMENT 2

(Map)



ATTACHMENT 2. SITE PLAN