

Release 591717
VCP NW1823

**PROPOSED WELL DECOMMISSIONING,
CONTAMINATED SOIL REMOVAL, AND GROUND
WATER INVESTIGATION ACTION PLAN**

**OAK HARBOR SANITATION TREATMENT PLANT
1501 SE CITY BEACH STREET
OAK HARBOR, WASHINGTON**

**FS ID: 63184452
VCP NO: NW1823**

RECEIVED
SEP 30 2008
DEPT. OF ECOLOGY

For:
Larry Michaels
Lead Wastewater Treatment Plant Operation
City of Oak Harbor
865 SE Barrington Drive
Oak Harbor, Washington 98277-4092

Prepared by:



Earthworks Environmental Inc.
2101 Young Street
Bellingham, WA 98225
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September 26, 2008





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Larry Michaels
Lead Wastewater Treatment Plant Operation
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865 SE Barrington Drive
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**Re: Proposed Well Decommissioning, Contaminated Soil Removal,
and Ground Water Investigation Action Plan**

Oak Harbor Sanitation Treatment Plant
1501 SE City Beach Street
Oak Harbor, Washington
FS ID: 63184452
VCP No: Nw1823

Dear Mr. Michaels:

We are pleased to present an action plan for soil cleanup, well decommissioning, and ground water assessment for the Oak Harbor Sanitation Treatment Plant, located at 1501 SE City Beach Street in Oak Harbor, Washington. This action plan describes the sampling and analysis details for assessing the success of the soil removal and investigation of the ground water in the vicinity of a former underground storage tank.

The goal of the cleanup and investigation activities is to achieve a "No Further Action" designation for the site from the Washington State Department of Ecology and have the site removed from Ecology's Leaking Underground Storage Tank list.

We recommend that this work plan be submitted to Department of Ecology for review. Ecology reviews proposed actions through the Voluntary Cleanup Program and will provide a formal or informal opinion that describes whether the proposed actions will be sufficient to meet the Model Toxics Control Act (cleanup) standards.

Thank you for choosing Earthworks Environmental Inc. for your environmental compliance needs. If you have any question please contact us at 360-738-6600.

Earthworks Environmental, Inc., President



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2101 Young Street
Bellingham, WA 98225
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September 26, 2008

Washington State Department of Ecology
3190 160th Avenue S.E.
Bellevue, WA 98008-5452

Attn: Dale Myers
Toxics Cleanup Program

**Re: Proposed Well Decommissioning, Contaminated Soil Removal,
and Ground Water Investigation Action Plan**

Oak Harbor Sanitation Treatment Plant
1501 SE City Beach Street
Oak Harbor, Washington
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Dear Mr. Myers:

We are pleased to present an action plan for soil cleanup, well decommissioning, and ground water assessment for the Oak Harbor Sanitation Treatment Plant, located at 1501 SE City Beach Street in Oak Harbor, Washington. This action plan describes the sampling and analysis details for assessing the success of the soil removal and investigation of the ground water in the vicinity of a former underground storage tank.

We request that this plan be reviewed and a formal opinion letter be granted. The goal for this site is to achieve a "No Further Action" designation and have the site removed from the Leaking Underground Storage Tank list.

Should you have any questions concerning this scope of work, please do not hesitate to contact us at (360) 738-6600.

A handwritten signature in dark ink that reads "Jeff Ninnemann". The signature is written in a cursive, flowing style.

Jeff Ninnemann, MS
President
Earthworks Environmental, Inc.

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	SITE DESCRIPTION.....	1
2.1	SITE BACKGROUND.....	2
2.2	GEOLOGY.....	2
2.3	HYDROGEOLOGY	3
3	DE-WATERING WELL DE-COMMISSIONING	3
4	CONTAMINATED SOIL REMOVAL	3
4.1	SOIL REMOVAL PROCESS	4
4.2	SOIL SAMPLING PROTOCOLS	4
5	GROUND WATER QUALITY INVESTIGATION	5
5.2	GROUND WATER WELL INSTALLATION	5
5.3	GROUND WATER SAMPLING PROTOCOLS	5
6	QUALITY ASSURANCE PLAN.....	6
6.2	SAMPLING QUALITY ASSURANCE	6
6.3	LABORATORY QUALITY ASSURANCE.....	7
6.4	DATA ASSESSMENT	7
7	SCHEDULE OF ACTIVITIES	7
8	INDEPENDENT REMEDIAL ACTION REPORT.....	8
9	COMMUNICATIONS	8

APPENDIX I

Figure 1 – Site Vicinity Map

Figure 2 – Aerial Photograph of Site (2006)

Figure 3 – Site Overview

Figure 4 – Photograph of Site

Figure 5 – Proposed Ground Water Well Locations

APPENDIX II

Draft Report, Sediment Sampling Results Summary, City of Oak Harbor – completed by
URS Corporation, February 9, 2008

Plan Distribution:

Dale Myers, Department of Ecology

Larry Michaels, City of Oak Harbor Waste Water Treatment Plant

Oak Harbor Sanitation Treatment Plant
**Proposed Well Decommissioning, Contaminated Soil Removal,
and Ground Water Investigation Action Plan**

1.0 INTRODUCTION

This action plan describes the environmental work to be completed at the Oak Harbor Sanitation Treatment Plant. Petroleum contaminated soil is known to be present on the site and petroleum contaminated ground water has been suspected at the site in association with a former 300-gallon diesel underground storage tank (UST).

The site is located at 1501 SE City Beach Street, within the city limits of Oak Harbor, Washington. The site is occupied by the Oak Harbor water treatment facility and is approximately 150 feet north of tidelands of Oak Harbor. The former UST site is located east of the generator building in the southeast portion of the property utilized by the waste water treatment facility.

The goal of this plan is to describe the activities that will occur on the site to assess and/or remove petroleum contamination. This plan provides details for removal of four de-watering wells, removal of soil in areas of known soil contamination, and steps needed to evaluate whether the former UST has negatively impacted the local ground water. The four de-watering wells currently located on the site were not installed to meet the minimum requirements for a resource protection well and must be decommissioned. This plan describes the proposed soil excavation area, soil sampling protocols and analyses, de-watering well decommissioning locations, and new ground water well installation locations, and ground water sampling protocols.

If the site meets appropriate soil and ground water clean up standards after these activities have been completed, a final independent remedial action report will be submitted to Ecology for review to see if the site can receive a "No Further Action" determination and be removed from the Leaking Underground Storage Tank list. If contamination is found above the appropriate clean up standards, additional clean up and/or monitoring recommendations will be made.

2.0 SITE DESCRIPTION

The City of Oak Harbor owns the subject property, which is located between downtown Oak Harbor and Oak Harbor. The land is utilized as a local city park and houses the city's waste water treatment plant. The Sanitation Treatment Plant utilizes the northeast corner of the property, along the west side of City Beach Road. The treatment plant area is occupied by one main treatment plant building, one outbuilding, one generator building, sludge ponds, numerous treatment areas, and paved parking areas. The former UST was located east of the generator building in the southeast corner of the treatment plant area.

The site is located approximately 150 feet north of Oak Harbor, approximately 10 feet above mean sea level. The location of the subject property is indicated in Figure 1 in Appendix I. An aerial photograph of the site is provided in Figure 2. The former UST site and the de-watering wells are shown in Figure 3 and a picture of the area is shown in

Figure 4 in Appendix I.

2.1 Site Background

One underground storage tank has historically been located on the site. The tank was installed in approximately 1972 and contained 300-gallons of heating oil. The tank was located adjacent to the generator building and likely was used as regular or backup fuel for the generator. The 300-gallon diesel tank was removed from the site on July 30, 1998 by Fuel Tank Installation Co, Inc. Contaminated soil ("several yards") was removed from the UST pit and placed on tarps on the property for remediation at the time of the tank removal. The soils were treated with Environmental Chemical Solutions product FM186-2. Subsequent soil samples indicated that the soil met cleanup standards and the UST pit was refilled with the soil.

The laboratory reports for soil samples collected from the vicinity of the former UST in July 1998 and July 2000 identify soils that exceed the MTCA Method A cleanup standards for diesel. The exact locations of the soil samples are unknown, but one sample that exceeded the standards was identified as being located in the northwest corner of the pit and had a concentration of 22,000 mg/kg diesel in July 2000.

Numerous ground water sampling events have taken place using four de-watering wells that are located through the center and adjacent to three sidewalls of the former UST pit. The wells were installed using a backhoe. Based on the improper installation of the wells, the data for the ground water wells will not be utilized for describing the current ground water conditions.

A sediment sampling investigation took place near the Oak Harbor Waste Water Treatment facility outfall (Outfall 001) in September 2006. URS Corporation collected sediment samples from seven locations and one reference point in Oak Harbor and analyzed the samples for 47 Washington Sediment Management Standards (SMS) analytes. The outfall is approximately 1,160 feet offshore and samples were collected at -15 feet mean lower low water. URS Corporation concluded that none of the SMS chemicals were detected above their respective SMS criteria and SMS chemicals do not appear to be accuulating in the sediments. A copy of the draft report of the sediment sampling investigation is provided in Appendix II.

The site was entered into Ecology's Voluntary Cleanup Program (VCP) in September 2007. All the information pertaining to the conditions of the site were submitted to Ecology through the VCP in March 2008. Ecology determined that further action was required on the site before a "no further action" letter would be granted.

2.2 Geology

Northwestern Washington has been occupied by continental glaciers at least four times during the Pleistocene Epoch (1.6 million to 10,000 years ago). During these glacial (stades) and accompanying interglacial periods (interstades), the underlying bedrock was

eroded and glacial related sediments of varying thickness were deposited over the bedrock.

The surficial deposits on the subject property and in the vicinity of the subject property were interpreted from the Geologic Map of the Oak Harbor, Crescent Harbor, and Part of the Smith Island 7.5-Minute Quadrangles, Island County, Washington (Dragovich, et al., 2005). The subject property is underlain by salt water marsh deposits (Qm). The salt water marsh deposits consist of organic rich silt and mud that commonly has layers and lenses of peat. Artificial fill material is located north of the salt water marsh deposits and beach and nearshore/tidal deposits are located south of the salt water deposits.

Our observations within the top two feet indicated that the site is underlain by sands with some gravel and shells, which are more indicative of the beach and nearshore tidal deposits.

2.3 Hydrogeology

The property is located in the Oak Harbor drainage basin at approximately 10 feet above mean sea level. Ground water levels collected from on-site wells indicate that ground water is typically between 3.5 to 5.5 feet below the surface. The groundwater generally flows toward the bay in a south to southeastern direction. The ground water is likely influence by tidal fluctuations.

3 DE-WATERING WELL DE-COMMISSIONING

Four de-watering wells currently located in the vicinity of the former underground storage tank site. The wells are located in the center of the former UST pit and along the north, east, and south sides of the former UST pit. A site map with the location of the wells is presented in Figure 3 and photograph of the wells is provided in Figure 4 of Appendix I.

The current wells were installed with a backhoe and are constructed of unconventional piping that ranges up to 18" wide and no specific knowledge of the screening depths. The unconventional construction of the wells may not reflect actual ground water conditions due to stagnation or lack of access to the top of the ground water table. Because these four ground water wells were not installed to meet the minimum requirements for a resource protection well standards, these four wells will be decommissioned.

Hayes Drilling of Bow, Washington will conduct the well decommissioning. The date of the decommissioning will be October 7th 2008.

4 CONTAMINATED SOIL REMOVAL

The goal of the contaminated soil removal is to remove any areas of residual petroleum contamination associated with the former diesel UST. The focus of the excavation will take place around the former UST site, located between the generator building and SE City

Beach Road.

4.1 Soil Removal Process

Excavation will begin in the northwest corner of the former UST site, where previous sampling indicated high levels of diesel contaminated soil. The dimensions of the final excavation will be dependent upon field observations and soil sample analyses results. Field testing of the soils for sheen, discoloration, and odor will be utilized for determining the presence of contaminated soil and identifying the direction and depth of the excavation. Contaminated soil will be temporarily stockpiled on site within a bermed area on black plastic. Dependent upon the quantity of contaminated soil, the materials will be remediated on-site or delivered to Cemex in Everett, Washington for thermal desorption.

Soil samples will be collected from the sidewalls and base of the excavation when field testing indicates that the contamination has been removed. The soil sample results will be compared to the MTCA Method A clean up standards for soil (WAC 173-340). Areas that exceed the cleanup standards will be further excavated and another round of confirmation samples will be collected.

The excavation will be backfilled with clean pit run materials after confirmation sampling results indicate that all soils meet the cleanup standards.

4.2 Soil Sampling Protocols

A minimum of four soil samples will be collected from the base and sidewalls of the soil excavation area. The exact number of samples and the sample locations will be determined by a third party environmental professional on-site to oversee the excavation. The intent of the sampling is to provide qualitative data to confirm that the excavation removed all accessible contaminated soil. If excavation is limited due to the presence of utility lines, buildings, ground water or other obstructions, samples will be collected to identify the contaminate concentrations in the residual soils.

Representatives of Earthworks Environmental, or other qualified third party environmental professional, will collect the soil samples. Samples will be collected in laboratory provided containers and immediately placed into an ice cooler. One four-ounce soil jar will be filled at each sampling location. Each sample jar will be labeled with their appropriate sample names.

The samples will be kept in the ice cooler until delivery to CCI Analytical Laboratories in Everett, Washington for analysis. Delivery of the samples will take place within 2 days of sample collection. This delivery schedule will meet or exceed all hold times for laboratory samples. CCI Analytical Laboratories will receive information about the incoming samples through a completed chain-of-custody form. This form will describe the sample names, times and date of sample collection, and the analyses to be performed on each sample. The chain-of-custody form will be signed by both parties to represent the transfer of the samples.

Oak Harbor Sanitation Treatment Plant
**Proposed Well Decommissioning, Contaminated Soil Removal,
and Ground Water Investigation Action Plan**

All samples will be analyzed for diesel and oil range petroleum products using NWTPH-DX methodology.

Detailed notes and photographs will be taken to document the site investigation. Notes will include data about the soil profile, soil characteristics, and soil conditions, particularly any discolorations, texture differences, or observed contamination, sample locations and depths, and any other site specific information.

5 GROUND WATER QUALITY INVESTIGATION

The former diesel UST at the Oak Harbor Sanitation Treatment Plant is suspected of having impacted the ground water with petroleum products. The purpose of this investigation is to install permanent ground water monitoring wells and conduct a ground water sampling event to determine whether the water has been negatively impacted.

5.2 Ground Water Well Installation

Three ground water wells will be installed in the vicinity of the former UST. The proposed well locations are indicated on Figure 5. The well locations were determined to identify the water quality in the vicinity and takes into account potential fluctuations in ground water flow direction and depth due to tidal influences. The number and location of the wells may vary depending on soil excavation and testing results.

The wells will be installed by a licensed well driller with the State of Washington. The wells will meet the minimum requirements for resource well protection construction standards and will be registered with the Department of Ecology for receipt of an individual well identification. Each monitoring well will be constructed of two-inch PVC pipe to a depth of approximately 10 feet. The wells will be screened between 2 and 7 feet using factory screens. The well casing will be completed with clean sand filter pack and sealed with bentonite clay.

The wells will be developed by an environmental professional prior to collected ground water samples. Well development will be completed by surging with a bailer. The well will be developed until the organic, silt, and clay materials have been cleared from the water column.

5.3 Ground Water Sampling Protocols

One ground water sample will be collected from each ground water monitoring well location. This ground water sampling event will determine whether the ground water has been impacted by the former UST. If the water samples meet the ground water clean-up standards no further testing will be completed. However, if contaminated ground water is discovered additional sampling events will take place until four consecutive quarterly sampling events meet the clean-up standards.

Oak Harbor Sanitation Treatment Plant
**Proposed Well Decommissioning, Contaminated Soil Removal,
and Ground Water Investigation Action Plan**

Samples will be collected by representatives of Earthworks Environmental, or other qualified third party environmental professional.

Each well will be purged prior to sample collection until temperature, pH, and conductivity stabilize. Samples will be collected into 1-liter amber glass jars using low flow sampling techniques. Due to the shallow water table beneath the subject property, the low flow samples will likely be collected using a peristaltic pump with disposable tubing.

Samples will be collected in laboratory provided containers and immediately placed into an ice cooler. Each sample jar will be labeled with their appropriate sample names.

The samples will be kept in the ice cooler until delivery to CCI Analytical Laboratories in Everett, Washington for analysis. Delivery of the samples will take place within 2 days of sample collection. This delivery schedule will meet or exceed all hold times for laboratory samples. CCI Analytical Laboratories will receive information about the incoming samples through a completed chain-of-custody form. This form will describe the sample names, times and date of sample collection, and the analyses to be performed on each sample. The chain-of-custody form will be signed by both parties to represent the transfer of the samples.

All samples will be analyzed for diesel and oil range petroleum products using NWTPH-DX methodology.

Detailed notes and photographs will be taken to document the ground water sampling event. Notes will include data about the depth of the water, water characteristics, and any other pertinent information.

6 QUALITY ASSURANCE PLAN

The purpose of a quality assurance plan is to make sure that the proper type and quality of data are collected throughout the investigation. Some of the information recommended in *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies* (Publication 04-03-030, Department of Ecology, July 2004) has been incorporated into this sampling and analysis plan. However, due to the relatively small scope of this project, small sampling area, and limited number of individuals involved in the investigation, many of the formalities recommended in the guidelines were deemed unnecessary.

6.2 Sampling Quality Assurance

In order to reduce errors during sample collection and transport, the following quality assurance measures will be enacted:

- Sampling equipment will be cleaned with alconox between each sampling

Oak Harbor Sanitation Treatment Plant
**Proposed Well Decommissioning, Contaminated Soil Removal,
and Ground Water Investigation Action Plan**

- location and triple rinsed in order to reduce cross-contamination
- New personal protection equipment (ie gloves) will be used for each sampling location to reduce cross-contamination
- New sampling tubing will be used at each ground water sample location and any water parameter field equipment will be cleaned and triple rinsed between sampling locations
- Samples will be immediately placed in laboratory supplied sampling containers and then placed on ice until delivery to the laboratory
- One blind duplicate sample will be collected from the soil excavation area and will be analyzed for diesel and oil range petroleum products
- One blind duplicate sample will be collected from one of the ground water wells and analyzed for diesel and oil range petroleum products

6.3 Laboratory Quality Assurance

CCI Analytical Laboratory will be responsible for the analytical assessment of the samples. CCI Analytical Laboratory is an accredited laboratory with Department of Ecology. The laboratory will complete the following quality assurance procedures:

- All analyses will be completed by CCI Analytical Laboratory
- Standard quality assurance/quality control measures will be used by the laboratory. Laboratory control limits have been created by CCI Analytical for each soil analysis and is described in a document entitled *CCI Laboratories QC Sample Control Limits, Soil Matrix, Rev 3/12/07*. CCI Laboratory quality control limits will also be utilized for water samples. The control limits determined and documented by the laboratory will be our basis for conformance for quality control.

6.4 Data Assessment

The laboratory data will be assessed upon receipt. The laboratory report will be assessed for completeness and the data will be verified to make sure that the laboratory quality control measures were within acceptable deviations. If the quality control assessment does not fall within the acceptable deviations, professional judgement and rationale will be provided for why the information was used or not.

The results will also be checked to verify that all of the detection limits reported by the laboratory are at or below the MTCA Method A clean up standards.

7 SCHEDULE OF ACTIVITIES

The ground water well decommissioning has been scheduled with Hayes Drilling of Bow, Washington. The decommissioning of the wells will take one day. The date will be October 7th, 2008.

Oak Harbor Sanitation Treatment Plant
**Proposed Well Decommissioning, Contaminated Soil Removal,
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The contaminated soil excavation and soil sampling will take place following the well decommissioning.

The ground water well installation and ground water sampling event will follow the contaminated soil removal.

8 INDEPENDENT REMEDIAL ACTION REPORT

Once the activities in this report have been completed, an independent remedial action report will be prepared and submitted to Ecology for review. The report will summarize all the remedial and investigation activities including thorough written description of the activities, maps, and photographs. The report will describe whether further investigation or clean up is needed.

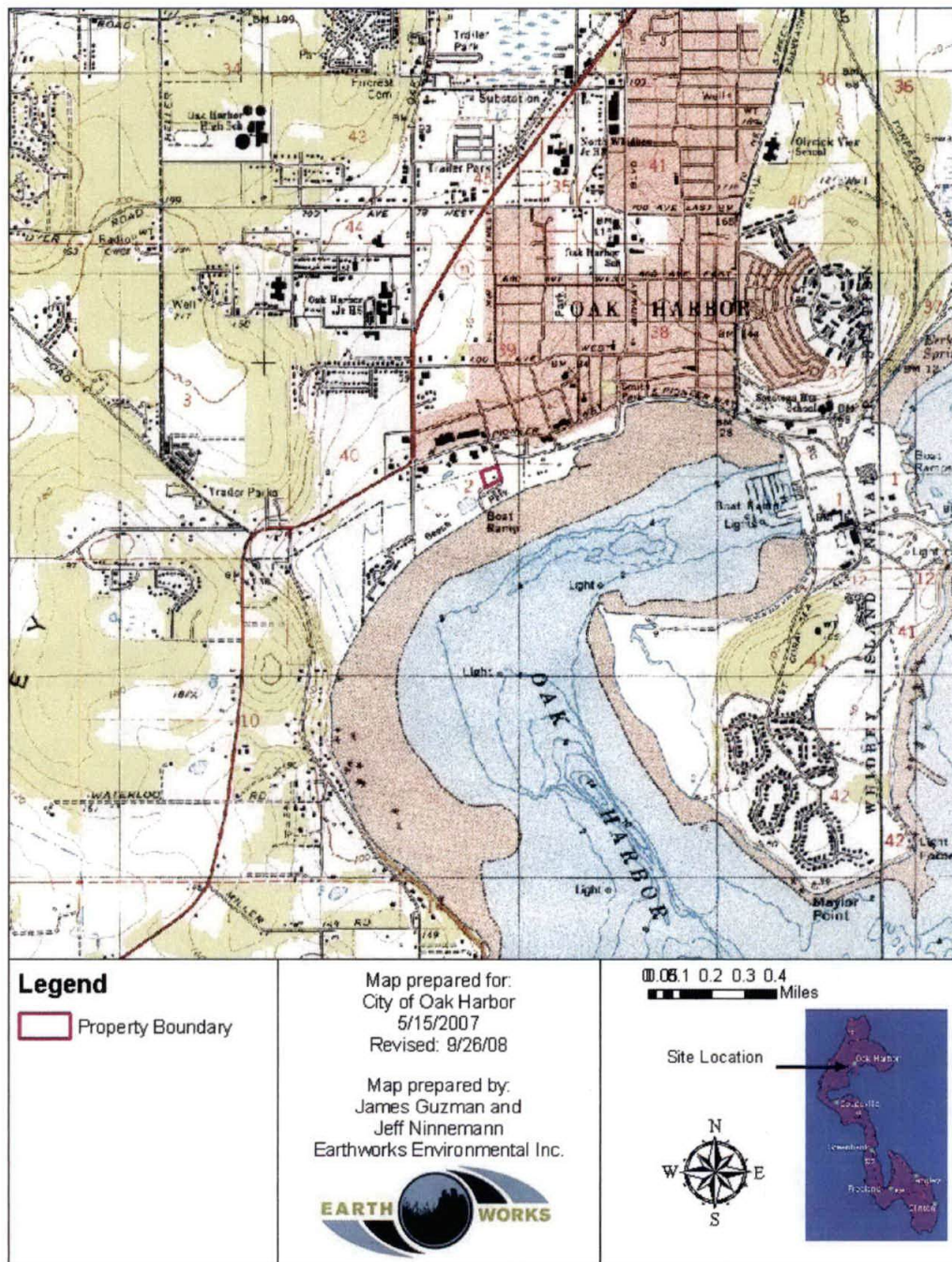
If no contamination is discovered above the MTCA clean up standards, the report will be submitted to Ecology through the Voluntary Cleanup Program in order to obtain a "No Further Action" letter. If contamination is discovered, remedial actions or monitoring will be recommended with their estimated costs.

9 COMMUNICATIONS

As part of the oversight of this cleanup and investigation, Earthworks will be in contact with Ecology and the property representatives. Any changes that deviate from this overall action plan will be discussed and cleared with the property representatives and Ecology, if necessary.

Oak Harbor Sanitation Treatment Plant
Proposed Well Decommissioning, Contaminated Soil Removal,
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Figure 1. Site vicinity map



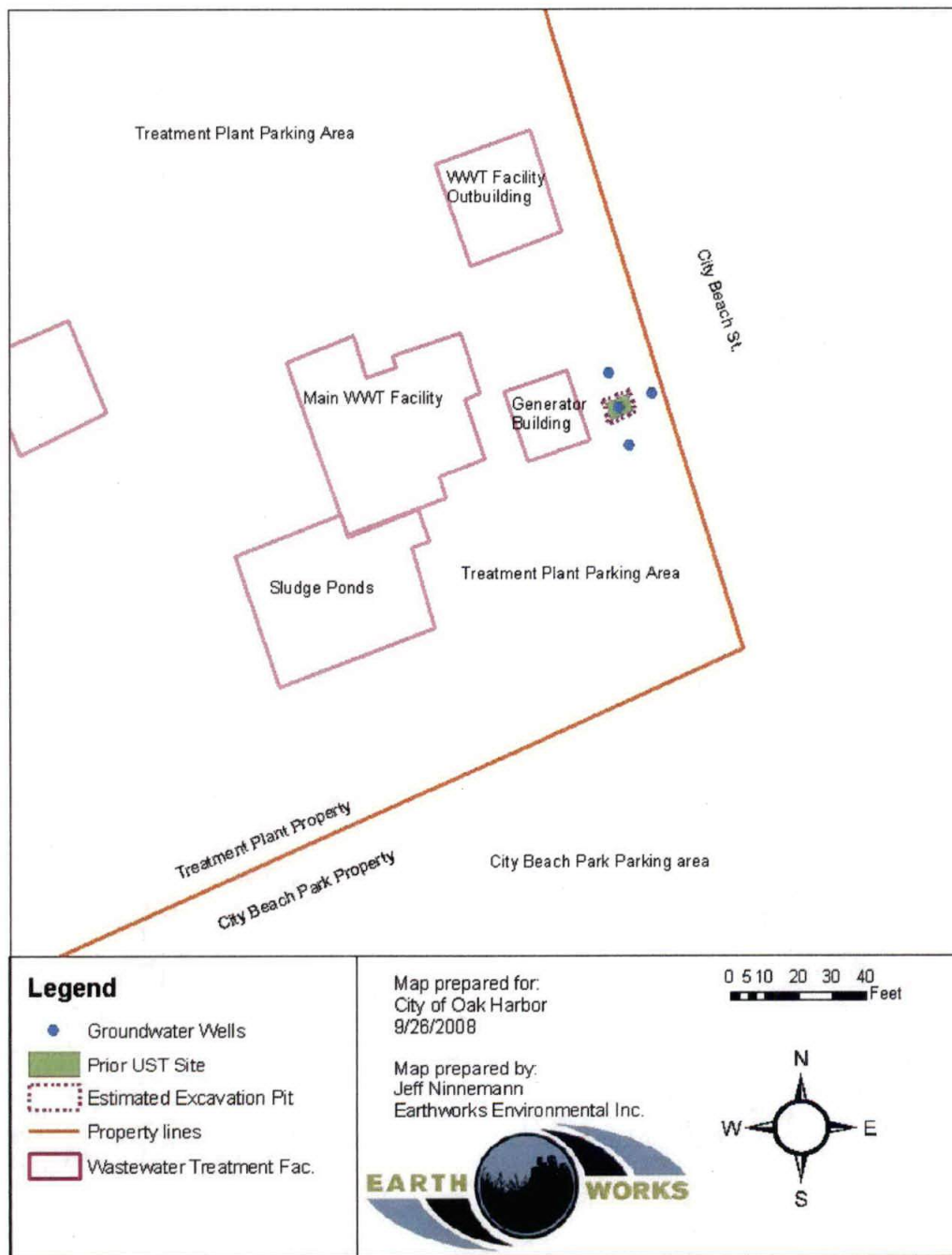
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**Proposed Well Decommissioning, Contaminated Soil Removal,
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Figure 2. Aerial photograph of site and vicinity (2006)



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 and Ground Water Investigation Action Plan**

Figure 3. Site Overview



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**Proposed Well Decommissioning, Contaminated Soil Removal,
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Figure 4. Site photograph of tank removal area and wells



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**Proposed Well Decommissioning, Contaminated Soil Removal,
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Figure 5. Proposed ground water well locations

