

OCT 19 1990

Results of Remedial Action at Whitten Oil
in Colville, Washington

Prepared for Washington Department of Ecology

Submitted by Olympus Environmental, Inc.
October 18, 1990

INTRODUCTION

This report describes actions taken by Olympus Environmental, Inc. to prevent the migration of gasoline into a storm sewer in Colville, Washington. The work was conducted at the request of the Washington Department of Ecology (DOE). The scope of services provided by Olympus are as follows.

1) Preparation for on site services. Develop remedial plan and system design. Obtain the necessary permits for street excavation, arrange for disposal of contaminated soils at a local landfill, and contract local electrician, street repair and gravel companies.

2) On site services. Excavate two trenches, one along Dominion and one along Main Street, to determine where the gasoline was entering the storm sewer and install a vapor extraction system in the trenches.

SITE CHARACTERISTICS

The site is located at Dominion and Main streets in Colville, Washington. There is a long history of gasoline migrating into the storm sewer at this location. A ground water recovery trench had been installed on the edge of Main Street in front of Whitty's Mini Mart in 1984 to recover gasoline released at the site but had not been maintained. In April 1990 gasoline was reported to be in the creek at 533 South Wynne. An inspection of the storm sewer that feeds the creek revealed gasoline in the manhole at the corner of Main and Dominion, but no gasoline was noted in the next manhole up the street at Columbia and Main or in the creek that runs into the sewer in the alley behind Whitten Oil. Based on the observations, the most likely source for the gasoline into the storm sewer was the Whitty's Mini Mart property. Therefore, Olympus was requested by the Washington Department of Ecology to install an interceptor trench to prevent migration of gasoline into the storm sewer.

REMEDIAL ACTIVITIES

Two common remedial technologies used to remove gasoline from the subsurface include "pump and treat" and vapor extraction. Pump and treat remediation involves physically pumping the gasoline from wells installed in the plume. Vapor extraction remediation relies on the natural tendency of volatile petroleum hydrocarbons to partition between the soil and the air contained within soil in the unsaturated zone. Inducing a vacuum through extraction pipes creates a subsurface pressure gradient, or air flow through the soil mass. As air flows through the soil mass, vapor contamination is removed, and liquid contamination volatilizes into the air flow. The vapors are drawn to the ground surface where they are vented to the atmosphere. Since vapor extraction has been demonstrated to be a cost effective remedial technology for volatile contaminants such as gasoline, it was chosen for the initial remedial activity.

Prior knowledge of site conditions indicated that contamination was migrating from Whitten Oil property into the storm sewer. Our vapor extraction system (VES) design was thus based on installing interceptor trenches between the source area and the storm sewer and extracting volatiles from the trenches.

Trenches were located along Main and Dominion Streets as shown on site map in Appendix A. During trenching, the trenches were extended north and east from the corner until contamination was no longer observed in the soils.

Subsurface geology and soil characteristics have been identified through examination of soils removed during the trench excavations. The subsurface is characterized by a silty clay from below the surface fill to a depth of 4 feet. A silty sand layer was encountered between 4 and 6 feet below grade. This is underlain by silty clay which extends to at least 9 feet (maximum depth of trench).

Ground water was encountered in the trenches at a depth of 6 to 8 feet below grade with a seasonal high water mark (coloration) at three feet below grade. The 30" storm sewer in Main Street is at a depth of 5 1/2 to 8 feet below grade.

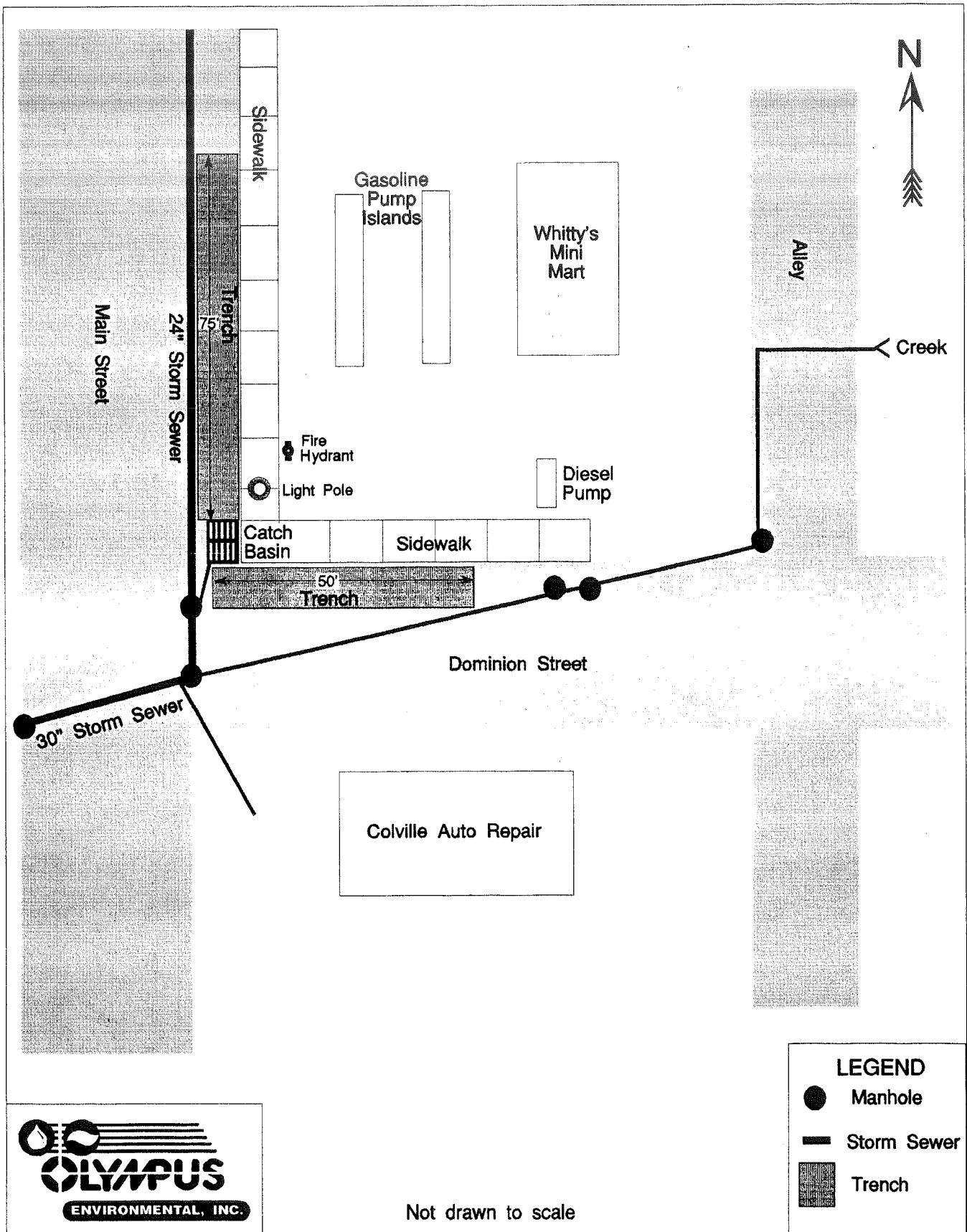
Hydrocarbon levels in the subsurface have been evaluated through visual and olfactory observations. Free product was observed flowing on the surface of the ground water in the westernmost 20 feet of the east-west trench (along Dominion). A strong product odor was noted in the silty sand layer 4 to 6 feet below grade to 40 feet east of corner. No contamination was observed in the easternmost 10 feet of the trench. The total length of the east-west trench was 50 feet.

The north-south trench was started at the catch basin at the corner of Main and Dominion. The trench that had been installed in 1984 was opened during this investigation. Water and free product (gasoline) flowed in the trench at a depth of 6 feet. Contaminated soils and free product were encountered to 66 feet north of the catch basin (approximately at north end of pump island). Contamination is present in the silty sand layer 5 to 7 feet below grade and in the silty clay beneath it. At 75 feet from the catch basin, the silt layer 8 feet below grade was saturated with water but had no gasoline odor. The total length of the north-south trench was 75 feet.

The design of the vapor extraction system took into account the seasonal fluctuation of the ground water surface elevation. Coarse, washed gravel was backfilled from the bottom of the trench at 8 to 9 feet to a depth of 3 feet below grade. 100 feet of 4" diameter .020 slot PVC perforated screen was layed horizontally in the trenches, manifolded together and connected to a 4" PVC standpipe. 60 feet of screen was used in the N-S trench and 40 feet of screen was used in the E-W trench. The perforated screens were covered with coarse, washed gravel to a depth of 2 feet below grade. 1/4" crushed gravel was backfilled to the surface and compacted. The asphalt surface was then replaced. A Coppus Portavent 3/4 horse power blower, Model PV-750, was connected to the standpipe and a 10 foot air emissions stack was attached to the light pole on the corner. A plywood security building was built to house the fan. A sample port was installed on the stack to monitor the air emissions. Operation of the blower is being monitored by the Washington DOE. Diagrams of the system design are provided in Appendix B.

APPENDIX A

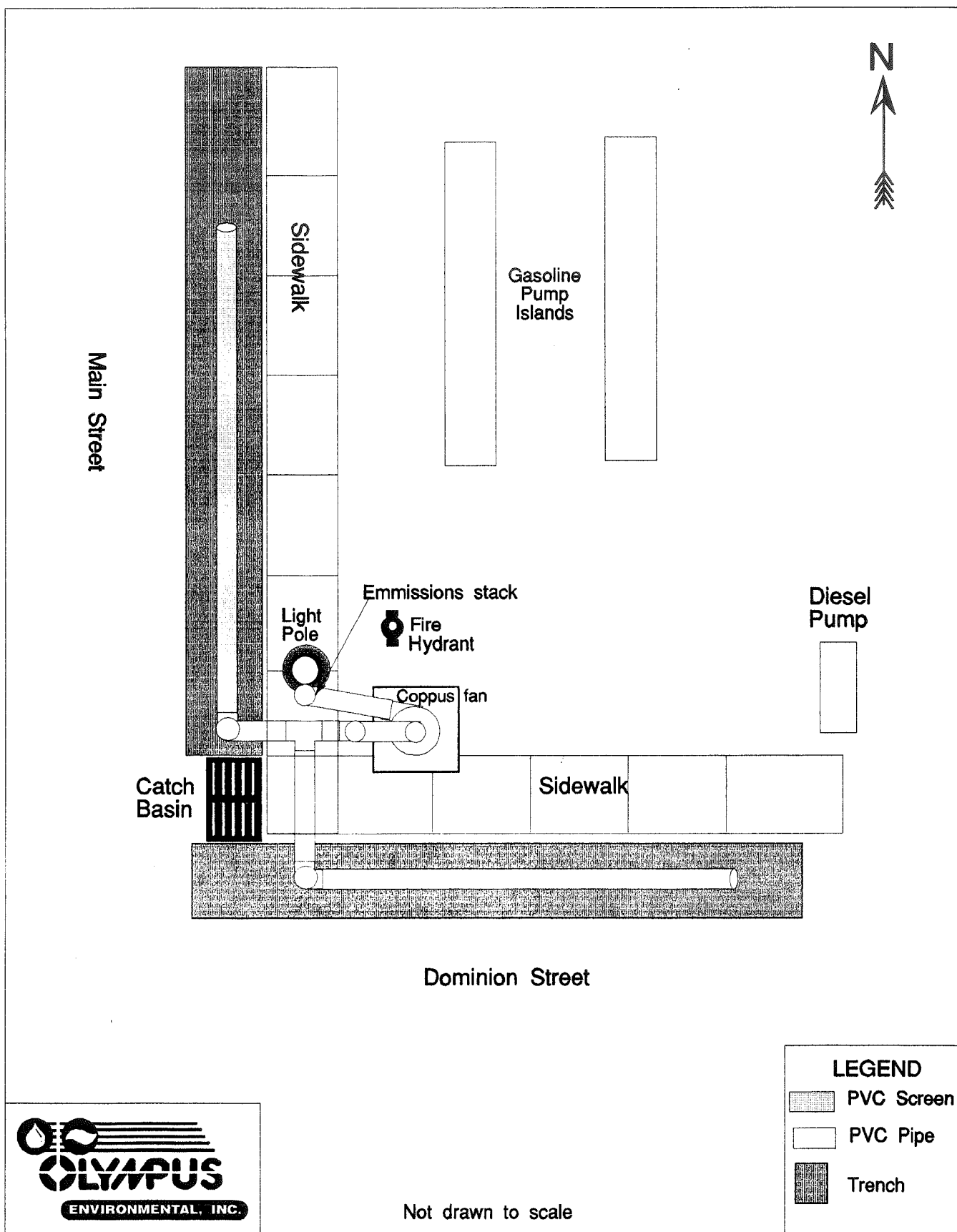
Site Map with Storm Sewer and Trench Locations



Site Map showing location of trenches and storm sewers.

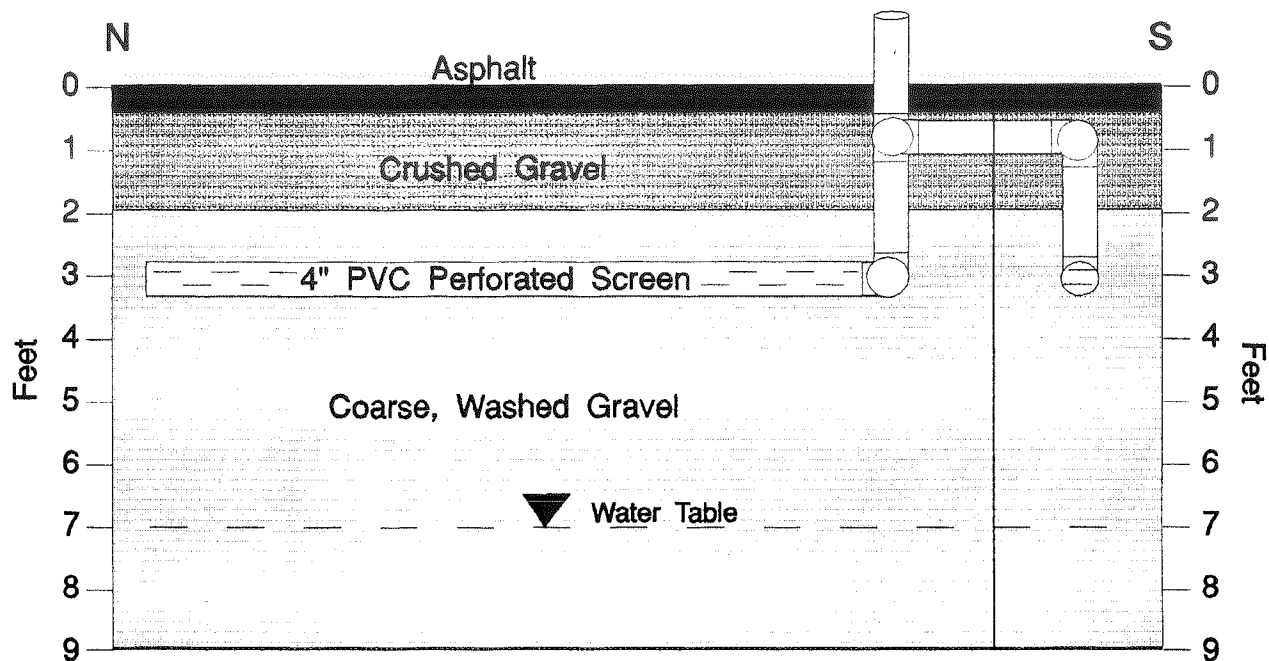
APPENDIX B

Diagrams of Vapor Extraction System Design

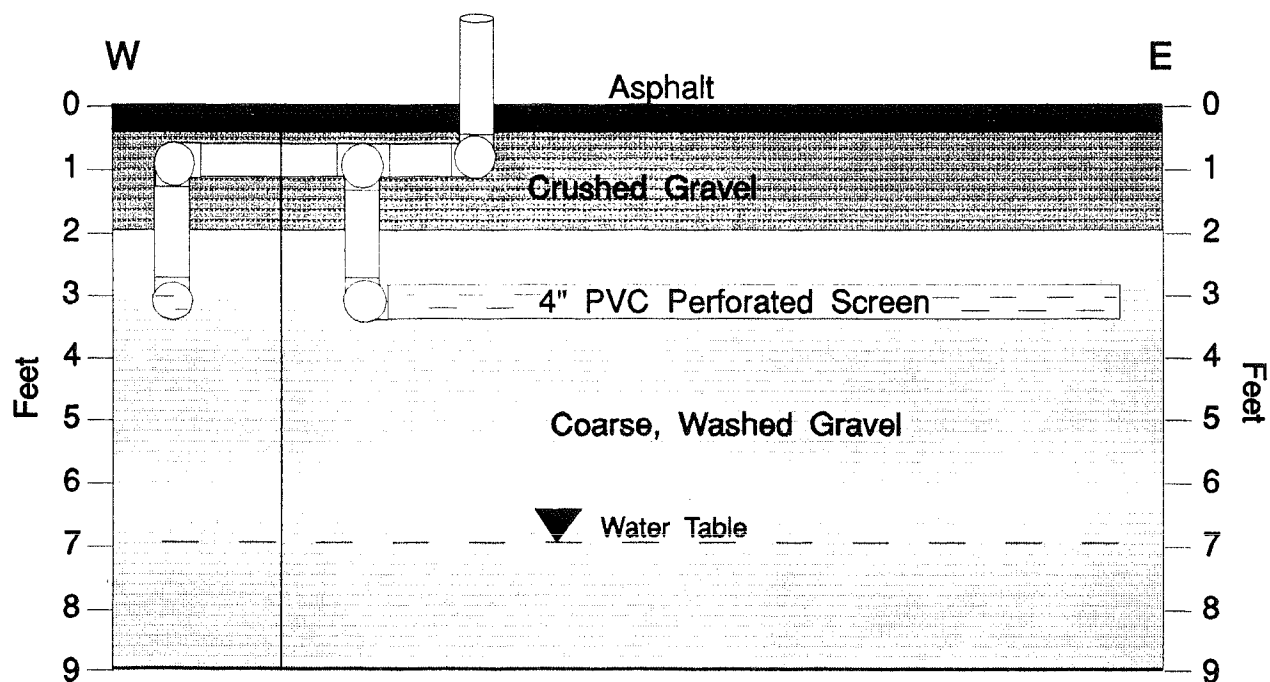


Sketch Map of vapor extraction ststem

North-South Cross-Section



East-West Cross-Section



Cross-section diagrams of vapor extraction trenches



SEP 17 1990

September 14, 1990

Mr. Mike Boatsman
State of Washington
Department of Ecology
N. 4601 Monroe, Suite 100
Spokane, WA. 99205

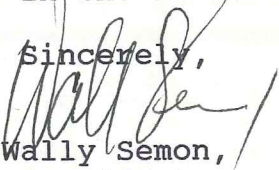
Re: Colville, WA.
W.O. #90-3041 Phase 1

Dear Mr. Boatsman:

On July 18, 1990 Olympus responded to a gasoline leak from an U.S.T. in Colville, WA. The gasoline has migrated to a underground creek that passes nearby the suspected leaking U.S.T. The quantity of fuel in the creek is minimal but creates an explosive atmosphere from time to time in the underground culvert and the nearby Douglas residence where the creek resurfaces. In 1984 soil exploration was retained by Whitten Oil to investigate a line leak. During this investigation, Soil Exploration installed an interceptor trench to prevent the migration of the gasoline and a recovery receptacle.

Upon arrival, Olympus personnel reviewed the site history with you. It was determined that the recovery receptacle had become ineffective due to sand and silt plugging the slots of the receptacle. At this time the only effective action that Olympus could perform was to flush and hand wash the slots and pump on the recovery receptacle to allow the groundwater and fuel to move toward the recovery receptacle. This was completed successfully and Olympus departed the site.

If you have any questions or comments, please do not hesitate to contact me. Olympus Environmental appreciates the opportunity to assist the Department of Ecology in their environmental concerns and looks forward to continuing in the future.

Sincerely,

Wally Semon,
President

file.90-3041

Environmental & Hazardous Waste Services

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