WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

PERIODIC REVIEW
(DRAFT)

WHITTY'S MINI MART 2 SITE

COLVILLE, WA

EASTERN REGIONAL OFFICE

TOXICS CLEANUP PROGRAM

APRIL 2008

1.0 INTRODUCTION

The Department of Ecology (Ecology) has completed a review of post-cleanup conditions at the Whitty's Mini Mart 2 Site (Site). (Facility/Site # 766) This review included an evaluation of remedial actions and monitoring data to assure that the completed actions at the Site continue to be protective of human health and the environment.

The Cleanup Action Plan (CAP) for this Site was developed under an Agreed Order in accordance with the Model Toxics Control Act (MTCA) Chapter 70.105D Revised Code of Washington (RCW) and Chapter 173-340 Washington Administrative Code (WAC) [1996 edition]. The CAP was implemented by Federated Service Insurance Company and Mr. Carroll Whitten, the Potentially Liable Persons (PLPs), under Agreed Order No. 97TC-E101. The Agreed Order became effective on March 28, 1997.

Ecology has determined that the final cleanup action was implemented in accordance with the CAP dated March 28, 1997 and the Cleanup Action Work Plan dated May 8, 1997.

The cleanup at this Site included the excavation of petroleum contaminated soils, ground water air-sparging, and soil vapor extraction. Cleanup actions at the site resulted in residual concentrations of petroleum contamination in soil and ground water exceeding established cleanup levels for the Site. According to WAC 173-340-420 (1):

> "If the department selects or approves a cleanup action that results in hazardous substances remaining at a site at concentrations which exceed Method A or Method B cleanup levels established under WAC 173-340-700 through 173-340-760 or if conditional points of compliance have been established, the department shall review the cleanup action no less frequently than every five years after the initiation of such cleanup action to ensure that human health and the environment are being protected".

This is Ecology's first periodic review for this Site. This review covers the period from the adoption of the CAP in March 1997 through the most recent sampling event, completed in September 2007. Cleanup activities at the Site began in 1990. The cleanup actions that took place between 1990 and 1997 were evaluated during the development of the CAP and are not the focus of this review.

2.0 SUMMARY OF SITE CONDITIONS

The following includes an operational history of the Site and a summary of the completed remedial actions. Also included are a discussion of the selected cleanup levels and the points of compliance.

2.1 SITE DESCRIPTION AND HISTORY

The Whitty's Mini Mart 2 Site is located at 485 South Main Street (Hwy. 395) at the northeast corner of Main Street and Dominion Avenue in Colville, Washington, within Stevens County. (See Figure 1.) The Site is located in the southeast quarter of the northwest quarter of Section 16, Township 25 N., Range 35 E.W.M. and covers approximately 0.75 acres. This leaking Underground Storage Tank (UST) site operated as retail gasoline service station from 1977 to 1992. (UST Site ID # 7370) The business closed in 1992 and subsequently re-opened as an auto service shop. The property sold in 2007, and the Site is now being developed into commercial office space.

A small, unnamed creek flows onto the east boundary of the Site where it enters a concrete culvert. The culvert diverts the creek below ground along Dominion Avenue on the south side of the Site. Up until 1993 the creek discharged from the culvert into a natural channel, approximately 500 feet west/southwest of the Site. This creek outfall was on the property of a private residence.

Reports of gasoline contamination at the creek outfall and in a storm drain adjacent to the Site date back to 1984. The contamination was determined to be the result of a leaking fuel distribution pipe at the Site. In 1984, Whitten Oil replaced the gasoline product lines. At that time, a contractor installed a trench and sump at the west end of the Site to intercept and recover gasoline found on the shallow ground water. Three ground water monitoring wells were also installed. Water and gasoline were pumped from the sump on several occasions between 1984 and 1988.

In April 1990, the City of Colville contacted Ecology to report gasoline in the creek and stormwater drain adjacent to Whitty's and strong gasoline vapors at the Creek outfall. The City flushed several thousand gallons of water into the storm drains and the culverted portion of the creek in an effort to alleviate the immediate risk of fire or explosion. While investigating this report, Ecology measured approximately 1" of gasoline product in one of the previously installed monitoring wells. As part of an emergency response, Ecology's spill response contractor redeveloped the previously installed trench and sump, pumping out several hundred gallons of water and gasoline.

In June 1990, Ecology issued a final determination of Potentially Liable Person (PLP) status to Mr. Carroll Whitten of Whitten Oil. In August 1990, lacking any independent response to the apparent release, Ecology initiated an emergency interim action to mitigate the release of gasoline into the ground water and creek. An Ecology contractor installed interceptor trenches along with a soil-vapor extraction system adjacent to the

site. This system greatly reduced the vapors and gasoline sheen within the creek and storm water system.

In the continued absence of any independent remedial actions at the Site, Ecology retained a contractor to complete a Remedial Investigation (RI). This investigation included the drilling of numerous soil borings, the construction of ground water monitoring wells, and extensive soil and ground water sampling. The investigation also included a video inspection of the storm water drain that identified gasoline entering the system along the southwest corner of the Site. The RI report concluded that the Whitty's Mini Mart 2 UST system was the source of the recent, and possibly ongoing, release of the observed gasoline contamination.

In July 1991, Ecology issued MTCA Enforcement Order No. DE 91-E701. This order, in part, directed the PLP to conduct additional integrity tests on the UST system. The testing identified a leak in the regular-grade gasoline product line. The area along the product line was excavated and a visual inspection of the pipe noted three holes within 2" of each other and within 20 feet of the line leak documented in 1984. This investigation noted a spray of gasoline leaking from the pipe when it was pressurized to simulate normal operating conditions.

In August 1991, Ecology issued a final determination of PLP status to Federated Service Insurance Company (Federated). Federated provided pollution liability insurance for the Site. Federated was named a PLP based on the level of control they exercised at the Site.

In October 1991, Ecology issued MTCA Enforcement Order No. DE 91TC-E702 to Mr. Carroll Whitten and Federated. This Order directed the PLPs to complete a Remedial Investigation / Feasibility Study (RI/FS).

The RI/FS included sampling data from 31 soil vapor probes, 28 soil borings, a network of 17 monitoring wells, several backhoe trenches and a ground water interception trench.

The RI/FS identified ground water at approximately 4 to 6 feet below ground surface within a shallow zone of silty-sand deposits. A laterally continuous and extensive clay layer underlies this 1 to 3 foot thick water-bearing zone. The underlying clay layer is approximately 9 to 16 feet in thickness and functions as an aquitard, confining a deeper aquifer.

The 3 USTs at the site were removed in 1993 under an Ecology approved interim action. During the UST removal, accessible petroleum contaminated soils were excavated and treated off-site. This work was completed concurrent with the RI/FS. The final RI/FS Report was submitted to Ecology in June 1993.

The Feasibility Study (FS) identified the following actions as part of the preferred cleanup alternative:

- Removal of USTs and the excavation of accessible petroleum-contaminated soils.
- Expansion of the ground water interception trench along the west property boundary.
- Construction of a ground water interception trench along the south property boundary.
- Installation of soil vapor extraction piping across the site.
- Installation of a ground water air-sparge system within the trenches.
- Sampling ground water quarterly at selected compliance and performance wells.
- Sampling surface water at the creek and the storm water drain adjacent to the property.

In November 1993, Ecology issued Amendment No.1 to Order No. DE 91TC-E702. The amendment provided for the installation of a ground water air-sparge and soil vapor extraction system. It also provided for continuing the quarterly ground water monitoring. These interim actions helped in the evaluation of the cleanup strategy identified in the FS. The site work and system installation were completed in August 1994. An evaluation of the treatment system operation was completed in July 1995.

In March 1997, Ecology issued MTCA Agreed Order No. 97TC-E101 to Mr. Carroll Whitten and Federated Service Insurance. The Agreed Order incorporated the Final CAP. The Order also provided for the recording of a restrictive covenant on the property's deed.

The CAP was fully implemented in 1997 following an opportunity for public review and comment.

2.2 CLEANUP ACTION PLAN

2.2.1 Remedial Action Objectives

Remedial actions conducted under MTCA are intended to identify, eliminate and/or minimize any threat posed by hazardous substances to human health or the environment. Remedial actions include any investigative and monitoring activities regarding a release of a hazardous substance.

Remedial actions began at this Site in 1990. The CAP included a comprehensive evaluation of all previously completed cleanup activities and identified the remaining remedial action objectives as follows:

- Maintain institutional controls to prevent dermal contact with petroleum impacted soils or remove and treat these soils if adequate controls cannot be maintained.

- Demonstrate that levels of petroleum contamination in soils, including Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), are protective of ground water.

- Prevent the off-site migration of ground water contamination that exceeds those cleanup levels determined to be protective of the identified beneficial uses. The highest beneficial use of this ground water is as a source of surface water.

- Prevent direct human contact with contaminated ground water by maintaining appropriate institutional controls.

- Maintain performance monitoring to assure ground water contamination does not impact on-site or off-site surface water quality.

2.2.2 Cleanup Levels and Points of Compliance

MTCA provides a process for developing site-specific cleanup levels. This process is intended to account for the specific site conditions and the hazards associated with a particular contaminant. Through this process, cleanup levels are developed for soils, ground water and surface water, as appropriate. Part of this process also serves to establish points at which the developed cleanup levels must be reached. These points are referred to as points of compliance.

Ecology determined that the highest beneficial use of the shallow ground water at this site is as a contributing source of surface water. The RI found that the contaminated, shallow ground water is not a current or potential source of drinking water. The RI also determined that there is not significant hydraulic continuity between the impacted shallow aquifer and any deeper aquifer.

Based on the findings described above and under the provisions of WAC 173-340-720 (1)(a) and (c), it was determined that surface water cleanup levels would be appropriate for the ground water at this site.

Soil cleanup levels were derived using MTCA Method B for soils as provided for in WAC 173-340-740 (3). Cleanup levels were established for the gasoline constituents, BTEX.

Cleanup levels for Total Petroleum Hydrocarbons (TPH) could not be calculated using Method B. Method A cleanup levels were used for setting cleanup levels for TPH. Method A differentiates between TPH for gasoline, diesel, and other hydrocarbons. This site was impacted by both gasoline and diesel contamination. The selected soil cleanup levels are intended to be protective of ground water.

The CAP identified petroleum contamination, including specific gasoline constituents as chemicals of concern. The identified contaminants and associated cleanup levels:

Constituent	Cleanup Levels* Ground Water (ppb)	Soil (ppm)
BENZENE	**43**	**4.3**
TOLUENE	**17,500**	**1,750**
ETHYLBENZENE	**6,910**	**691**
XYLENES	**16,000**	**1,600**
TPH (G)	**1,000**	**100**
TPH (D)	**1,000**	**200**

* Ground water cleanup levels expressed in parts per billion (ppb)

* Soil cleanup levels expressed in parts per million (ppm)

The points of compliance at this site were selected based on criteria outlined in WAC 173-340-720 (6). For ground water cleanup, the points selected are those nearest the property boundary, nearest the unnamed creek, and nearest the storm water drain. These points also represent the area most severely impacted by petroleum contamination. The points of compliance for ground water cleanup are MW-7, MW-8 and MW-10.

The point of compliance for soil is the entire site.

Ground water cleanup will be considered complete following four consecutive quarters of sampling which demonstrate contaminant levels below the established cleanup levels.

2.3 SUMMARY OF CLEANUP ACTIONS

The following cleanup actions have been taken at the Site:

- Approximately 350 cubic yards of petroleum-contaminated soils were removed and treated off-site. These were soils encountered during the trench construction, the UST removal, and associated activities.

- Approximately 10,000 gallons of contaminated ground water was pumped out and treated during the decommissioning of the USTs.

- A Soil Vapor Extraction system (SVE) was installed to treat the shallow impacted soils across the Site. Lateral vapor extraction (vacuum) lines were installed across the Site with particular emphasis in the area where the UST piping had been.

- Ground water interception trenches were installed along the downgradient boundaries of the site.

- A ground water Air-Sparging (AS) system was installed to treat ground water within the trenches and at strategic points across the Site. The AS/SVE system

was operated from August 1994 to July 1995. During its time of operation, the system removed an estimated 370 pounds of petroleum hydrocarbons. The removal rate diminished with time and was approaching zero at the time it was shut down. It was determined that continued operation of the system would not be effective. A decision was made to keep the system available, but on stand-by for the duration of the cleanup. The CAP included a performance monitoring plan that identified threshold criteria for reactivating components of the AS/SVE system.

- Long-term, quarterly ground water monitoring began in 1992. The CAP as implemented in 1997 incorporated a Sampling and Analysis Plan (SAP) with ground water monitoring occurring semi-annually. Semi-annual ground water sampling events were scheduled to coincide with seasonal ground water elevation extremes.

- Institutional controls were implemented for the Site, and include the following:

  - Maintain the asphalt/concrete cap on the property to reduce the risk of exposure to contaminated soils.
  - Record a restrictive covenant on the deed of the property that conditions any site activity that may cause exposure to contaminated soils.

2.4 LONG-TERM GROUND WATER MONITORING

Ground water monitoring began in 1992. Between 1992 and 1997, 17 wells were sampled on a quarterly basis. The final CAP identified MW-7, MW-8 and MW-10 as ground water compliance wells. The Sampling and Analysis Plan (SAP) amended the sampling schedule to a semi-annual event with sampling events scheduled to coincide with the historically observed seasonal high and low ground water levels.

2.5 INSPECTION & MAINTENANCE OF ASPHALT CAP AND WELLS

Site inspections for the integrity and condition of the asphalt and concrete cap have been conducted during scheduled ground water sampling events. No repairs to the surface cap have been necessary.

In the fall of 2002, a road construction and sidewalk replacement project damaged several of the monitoring wells. MW-7, 8, 10, 11 and 12 were repaired and resurveyed in time for the scheduled sampling. MW-14 was destroyed during the construction project and could not be sampled in the fall of 2002. It was replaced and sampling resumed in spring 2003. The upper casing and collar for MW-11, located within the traffic lane on Dominion Ave., was damaged again in 2005, apparently by traffic and settling of the road surface. It was repaired and resurveyed in the spring of 2006. The scheduled sampling was not affected.

3.0 PERIODIC REVIEW

WAC 173-340-420(2) [1997] requires that:

"When evaluating whether human health and the environment are being protected, the factors the department shall consider include

(a) The effectiveness of ongoing or completed cleanup actions;
(b) New scientific information for individual hazardous substances of mixtures present at the site;
(c) New applicable state and federal laws for hazardous substances present at the site;
(d) Current and projected site uses;
(e) Availability and practicability of higher preference technologies; and
(f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.

The department shall publish a notice of all periodic reviews in the register and provide an opportunity for public comment."

This initial periodic review covers the period of semi-annual ground water monitoring from the fall 1997 through the fall 2007 sampling events. This review evaluated:

- Ground water monitoring data.
- The maintenance of institutional controls.
- Seasonal inspections of the cap.
- Integrity of the monitoring wells.
- Adequacy of the current cleanup strategy.
- Review of the applicable cleanup standards.

3.1 GROUND WATER MONITORING DATA REVIEW

During this review period, ground water samples were collected semi-annually from six monitoring wells. Each sample was analyzed for gasoline and diesel range petroleum hydrocarbons (TPH) and the gasoline constituents Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).

Analyte	Analytical Method
TPH(G)	NWTPH-Gx
TPH(D)	NWTPH-Dx
B T E X	EPA Methods 8020A/8021B

A total of 17 ground water monitoring wells were constructed during the course of investigating the contamination at this site. Three of those wells were identified as points of compliance (MW-7, MW-8 and MW-10). In addition, MW-11, MW-12 and MW-14 were selected as performance monitoring wells, intended to provide additional data to

evaluate the effectiveness of the selected cleanup strategy. Well locations are represented in Figures 2 and 3.

Contaminant levels have decreased in all monitoring wells since the beginning of this review period. Cleanup levels for BTEX were met in all monitoring wells during the September 2007 sampling event. All wells, except MW-8, were below cleanup levels for TPH (G) and TPH (D). MW-8 exceeded cleanup levels for both TPH (G) and TPH (D).

3.1.1 Contaminant Trends

MW-7 (Figures 4 through 9)

This is the Site's upgradient compliance well. Contaminant levels in MW-7 have been below cleanup levels for each of the four most recent sampling events.

MW-8 (Figures 10 & 11)

This compliance well is located closest to the storm water drain and downgradient from MW-7. TPH (G) has decreased approximately 85 % over the review period and over 98% from the highest levels measured prior to cleanup. TPH (D) has been trending downward but continues to have seasonal spikes above the cleanup level. This coincides with the low ground water elevation observed during sampling events in the fall. Diesel and gasoline were below cleanup levels for the first time during the March 2007 sampling event. These levels rebounded above cleanup levels at the time of the September 2007 sampling event. The spike in diesel range contamination was particularly notable.

This wells' proximity to the city's storm water drain may account for the seasonal jump in TPH concentrations. The well is located less than 10 feet from the storm sewer. A 1991 video survey of the storm drain noted gasoline infiltrating through a small breach in the drain in this area. Storm water discharging from this section of the drain would likely impact ground water in the immediate vicinity of MW-8.

BTEX concentrations in MW-8 have been below cleanup levels for 12 consecutive sampling events and continue to trend downward.

MW-10 (Figures 4 through 9)

This compliance well is located cross gradient and approximately 30 feet to the south of MW-8, near the southwest corner of the property. Contaminant concentrations in MW-10 have been below cleanup levels since 1998.

MW-11 (Figures 4 through 9)

This performance monitoring well is the most upgradient of the six wells. Contaminant concentrations in MW-11 have remained below cleanup levels throughout the review period of 1997 to date.

MW-12 (Figures 4 through 9)

This performance monitoring well is located downgradient from MW-11. It is the most southerly of the six wells, located on the southeast corner of Main and Dominion. Contaminant concentrations in MW-12 have been below cleanup levels for the last four sampling events.

MW-14 (Figures 4 through 9)

This performance monitoring well is the most downgradient of the six wells, located south of the Whitten Oil property on the west side of Main Street. Contaminant concentrations in MW-14 have been non-detect since 2000 and below cleanup levels throughout the review period of 1997 to date.

3.2 PERIODIC REVIEW CRITERIA

3.2.1 Effectiveness Of Cleanup Actions

- The concentrations of TPH (G) and TPH (D) in ground water have decreased since the cleanup was initiated at the Site. Cleanup levels have been met at each of the wells excepting MW-7 and MW-8.

  MW-7 has been below cleanup levels for each of the last four sampling events. MW-8 continues to be above cleanup levels, particularly during the seasonal drop in ground water elevation. This well appears to be influenced by runoff waters from the adjacent storm water drain.

- The concentrations of BTEX in ground water have decreased in each of the affected wells. Benzene levels as high as 3500 ug/L (MW-7 and MW-8) were measured prior to cleanup at the site. Contaminant concentrations have been below cleanup levels for each of the six wells throughout the review period of 1997 to date.

- The wells have been carefully maintained throughout the review period. Vehicle traffic, snow removal equipment, road construction projects, and seasonal freeze-thaw cycles have prompted repeated repair and resurvey of several of the wells.

- The concrete and asphalt cap on the site has been monitored and maintained throughout the review period.

- The recent redevelopment of the site into commercial office space is appropriate and protective of the institutional controls at the Site.

Cleanup actions at the Site have been effective. The institutional controls and ground water monitoring throughout this review period have been effective and appropriate and should continue.

3.2.2 New Scientific Information

There is no new scientific information regarding the contaminants identified at this Site.

3.2.3 New Applicable State and Federal Laws

There are no new applicable state and federal laws pertinent to the cleanup issues under review. This cleanup is governed by Chapter 173-340 WAC [1996]. This regulation was amended in 2001 and 2007.

The 2007 edition of the MTCA cleanup regulations includes the following section relevant to periodic reviews:

WAC 173-340-420. Periodic review

(2) Applicability. The department shall conduct periodic reviews of a site whenever the department conducts a cleanup action; whenever the department approves a cleanup action under an order, agreed order or consent decree; or, as resources permit, whenever the department issues a no further action opinion; and one of the following conditions exists at the site:

(a) Where an institutional control and/or financial assurance is required as part of the cleanup action;
(b) Where the cleanup is based on a practical quantitation limit as provided for under WAC 173-340-707; and
(c) Where, in the department's judgment, modifications to the default equations or assumptions using site-specific information would significantly increase the concentration of hazardous substances remaining at the site after cleanup or the uncertainty in the ecological evaluation or the reliability of the cleanup action is such that additional review is necessary to assure long-term protection of human health and the environment.

(3) General requirements. If a periodic review is required under subsection (2) of this section, a review shall be conducted by the department at least every five years after the initiation of a cleanup action. The department may require potentially liable persons to submit information required by the department to conduct a periodic review.

Specific review criteria are described under WAC 174-340-420(4). Those criteria have not changed significantly since 1996.

3.2.4 Current and Projected Site Use

The property is currently being redeveloped into commercial office space. Construction plans do not include activities that would compromise the asphalt / concrete cap or otherwise create a risk of exposure to potentially impacted soils. The existing building will be maintained and the asphalted area will be resealed and used for parking.

The remainder of the Site consists of asphalted road surfaces.

3.2.5 Availability and Practicability of Higher Preference Technologies

The cleanup at this site has included a number of aggressive cleanup actions including the removal of source material and the in-situ treatment of soils and ground water. Ground water monitoring has served to document the effectiveness of these actions and the continuing attenuation of residual contamination.

Additional source removal, the excavation of contaminated soils, would require the demolition of all on-site structures and the asphalt cap. Although technically possible, Ecology has determined that this is not practical or necessary. Institutional controls and the current ground water monitoring program are actions that adequately protect human health and the environment.

3.2.6 Availability of Improved Analytical Techniques to Evaluate Compliance with Cleanup Levels

The analytical method currently used for ground water analysis of semi-volatile petroleum hydrocarbons as gasoline is NWTPH-Gx. Method NWTPH-Dx is used to evaluate diesel range hydrocarbons. Volatile organic compounds (VOCs), such as BTEX, are quantified using EPA Method 8021B. These analytical techniques represent the current Ecology and EPA standards.

4.0 CONCLUSIONS

- The cleanup actions implemented at the Site continue to be protective of human health and the environment.

- The March 2007 sampling event documented the attainment of cleanup levels at each of the ground water monitoring wells. However, exceedances of TPH cleanup levels recurred at MW-8 at the time of the September 2007 sampling event. Each of the other compliance and performance wells remained below cleanup levels for each of the contaminants of concern. Exceedances at MW-8 are likely the result of influences from the adjacent storm water drain. This issue will continue to be monitored and evaluated.

- Ground water monitoring has been completed according to the schedule and protocol described in the Sampling Analysis Plan.

- Residual petroleum contamination likely remains in soils at the Site. According to WAC 173-340-740(6)(d)[1996] and WAC 173-340-740(6)(f)[2007], soils exceeding the cleanup level at the Site comply with cleanup standards since the long-term integrity of the containment system is ensured, and the requirements for containment technologies have been met.

- Institutional controls have been maintained and regularly evaluated at the time of each ground water sampling event. These controls continue to be effective in protecting public health and the environment by preventing exposure to hazardous substances and maintaining the integrity of the cleanup actions.

Ecology has determined that the remedial actions taken at this site have been appropriate and effective in reducing the contamination and protecting human health and the environment.

5.0 RECOMMENDATIONS

Ground water monitoring at this Site will continue to be conducted semi-annually. Ecology will reevaluate the sampling schedule once cleanup levels have been attained.

The inspection of the cap and the integrity of each of the monitoring wells will be evaluated at the time of each sampling event. Repairs and maintenance will be made as appropriate.

The next periodic review will be conducted in 5 years and will cover the period beginning with the March 2008 sampling event.

6.0 REFERENCES

West Central Environmental Consultants, Semi-Annual Groundwater Monitoring Report for Former Whitty's Minimart, Colville, Washington, March 2000 through September 2007 [16 Reports].

Summit Envirosolutions, Semi-Annual Compliance Monitoring Report, Former Whitty's Minimart, Colville, Washington, September 1997 through September 1999 [5 Reports.]

Summit Envirosolutions, Cleanup Action Work Plan, Former Whitty's Minimart, Colville, Washington, June 1997.

Ecology, Cleanup Action Plan, Agreed Order No. 97TC-E101, Former Whitty's Minimart, February 1997.

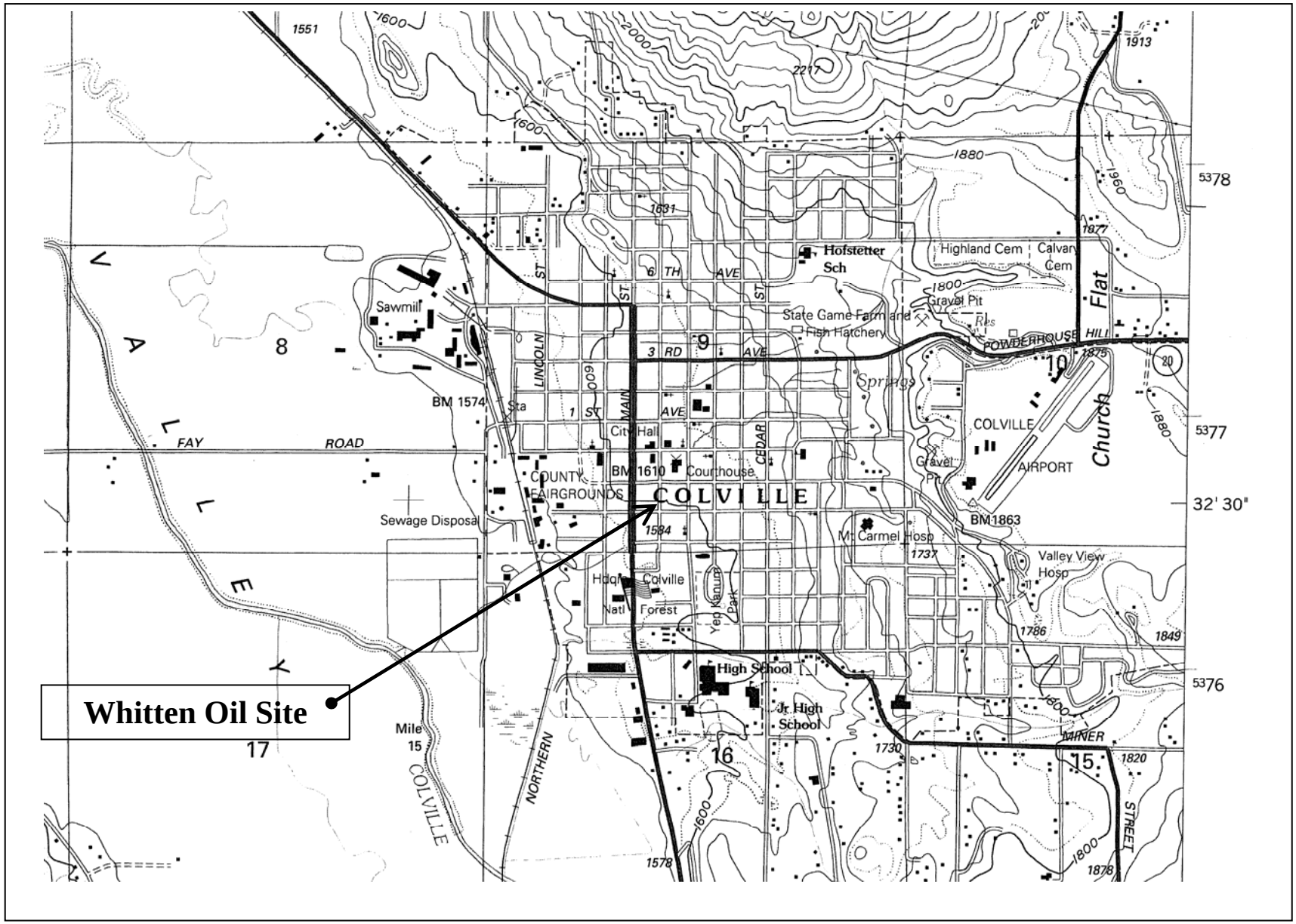
FIGURES

SITE MAPS
AND
GROUND WATER MONITORING

TABLES

GROUND WATER SAMPLING DATA

FIGURE 1


Whitten Oil Site
COLVILLE
VALLEY
FAY ROAD
Sawmill
BM 1574
Sta
1 ST
MAIN
AVE
City Hall
COUNTY FAIRGROUNDS
BM 1610
Courthouse
CEDAR
Sewage Disposal
Hofstetter Sch
6 TH AVE
3 RD AVE
State Game Farm and Fish Hatchery
Gravel Pit
Highland Cem
Calvary Cem
POWDERHOUSE HILL
Springs
COLVILLE AIRPORT
Gravel Pit
BM1863
Mt Carmel Hosp
Valley View Hosp
Church
Flat
Hdqtr Colville Natl Forest
Yeg Kanum Park
High School
Jr High School
MINER
STREET
NORTHERN
COLVILLE
Mile 15
LINCOLN
8
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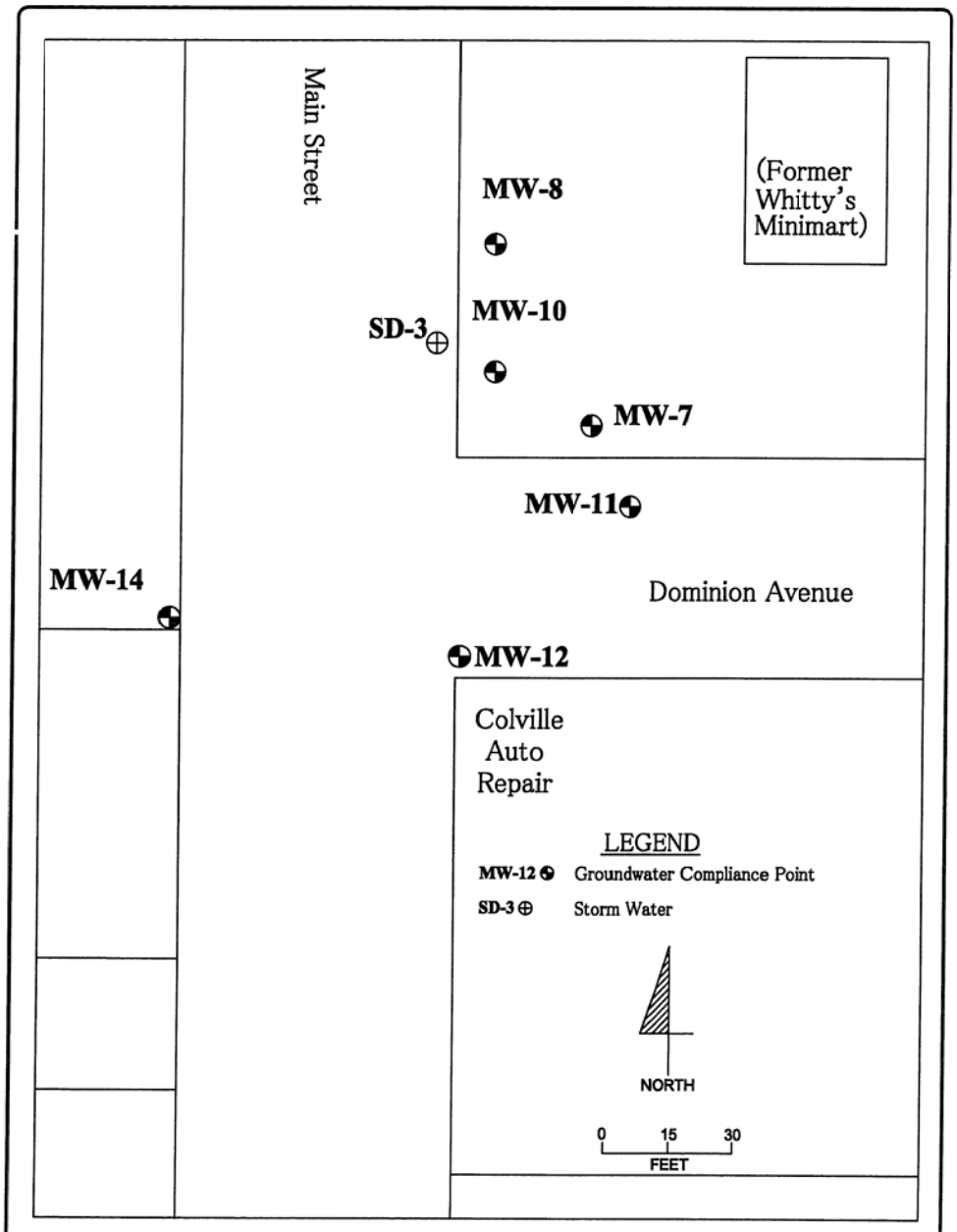
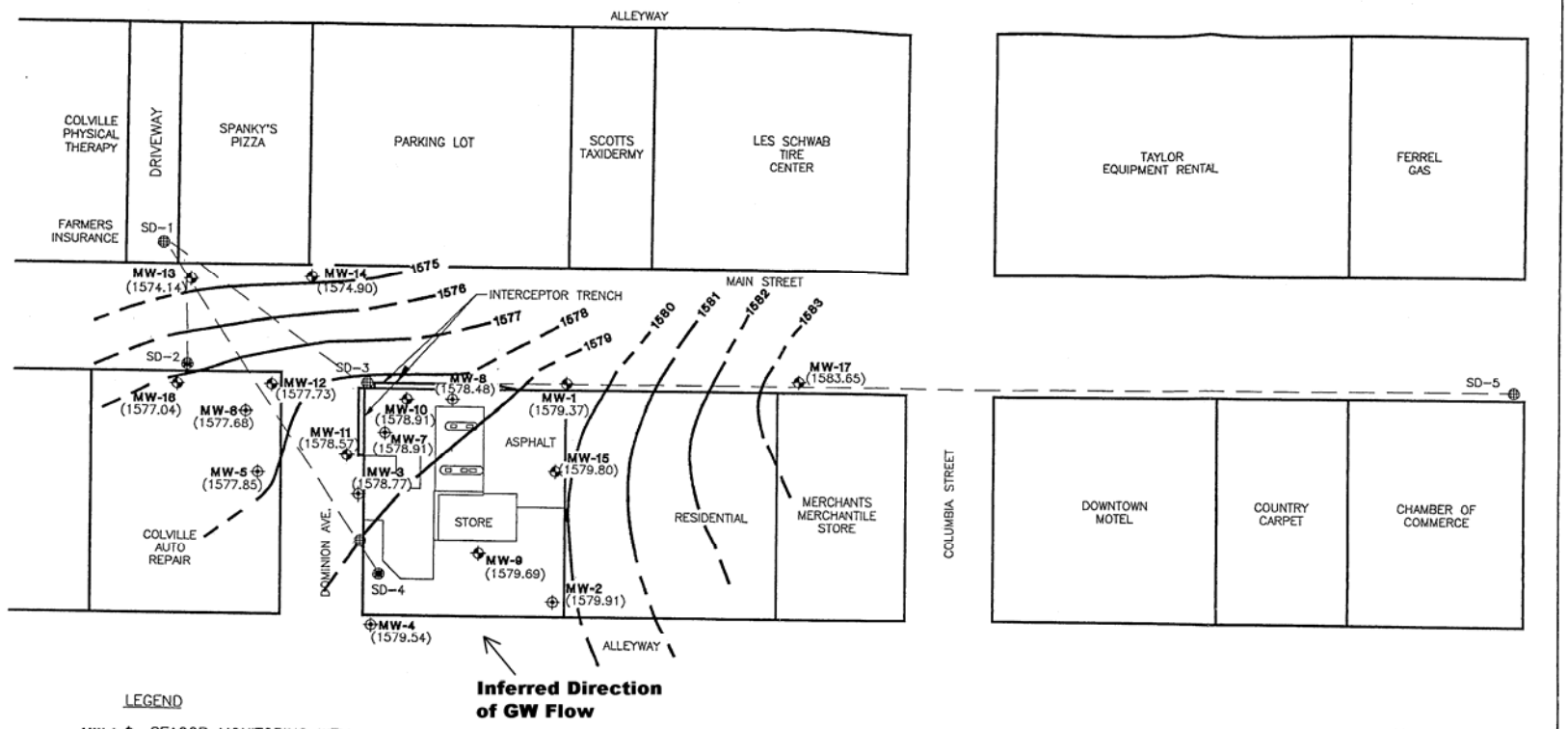
32' 30"



WCEC Environmental Consultants	CURRENT DATE: 10/31/07 FILE NAME: PROJECT NO: DRAWN BY:	**Site Details Map** Former Whitty's Minimart Colville, WA	FIGURE 2

FIGURE 3



SECOR International Incorporated

DWN
APPR
DATE 11/29/94
JOB#

GROUNDWATER CONTOUR MAP
NOVEMBER 17, 1994
WHITTY'S MINIMART
COLVILLE, WASHINGTON

FIGURE 4

WHITTEN OIL
Total Petroleum Hydrocarbons - Gasoline

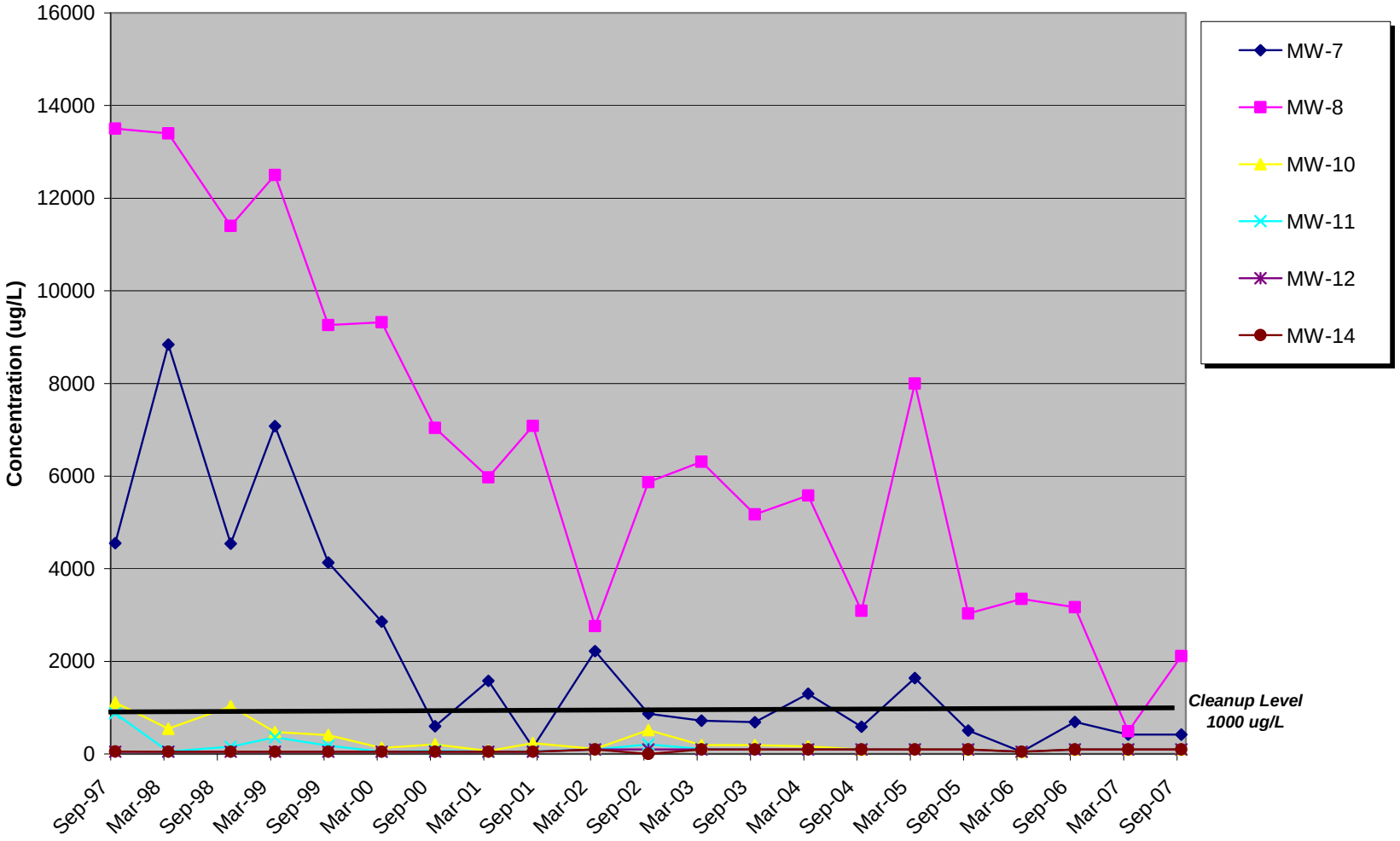


FIGURE 4

WHITTEN OIL
Total Petroleum Hydrocarbons - Gasoline

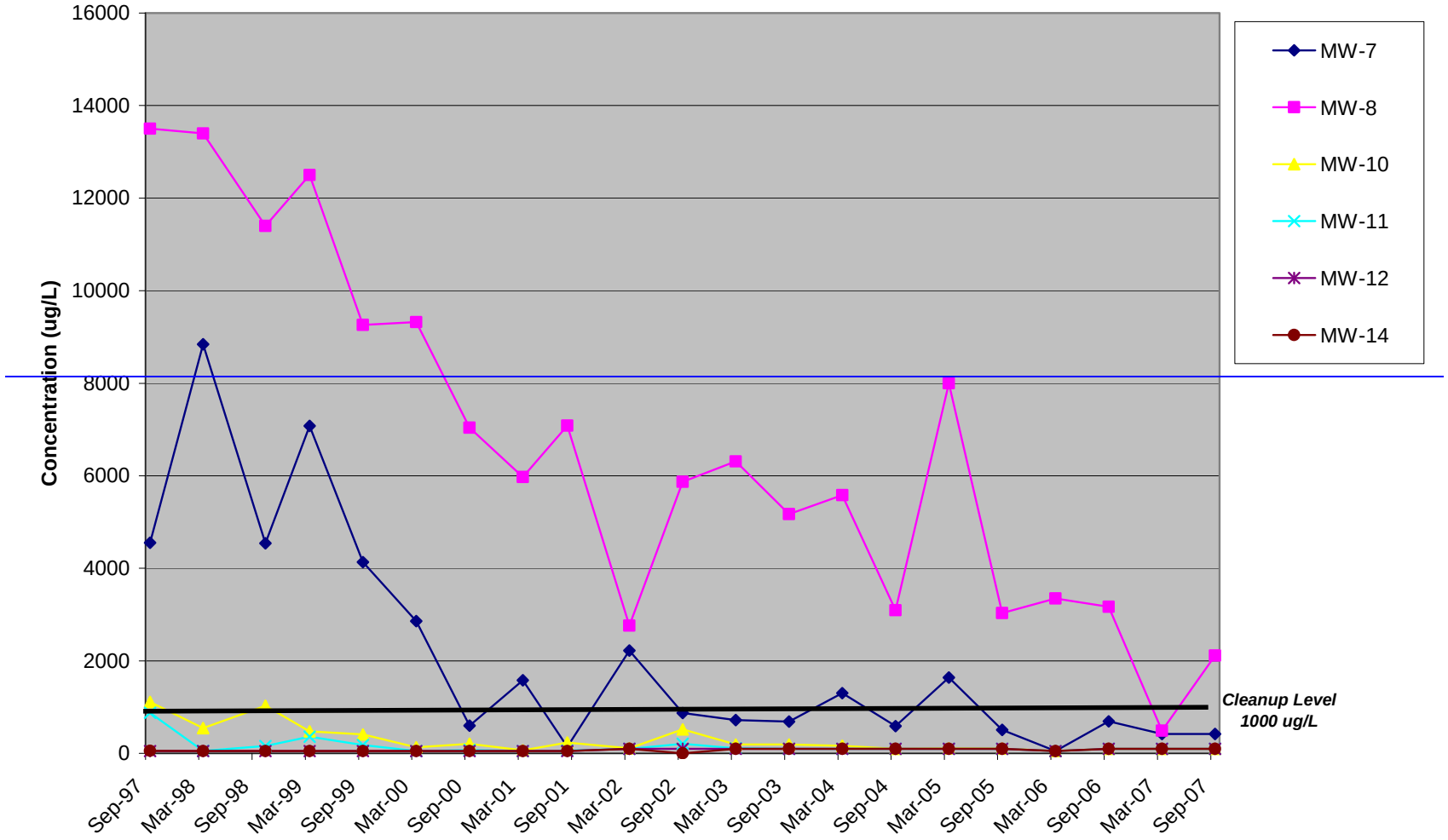


FIGURE 5

WHITTEN OIL
Total Petroleum Hydrocarbons - Diesel

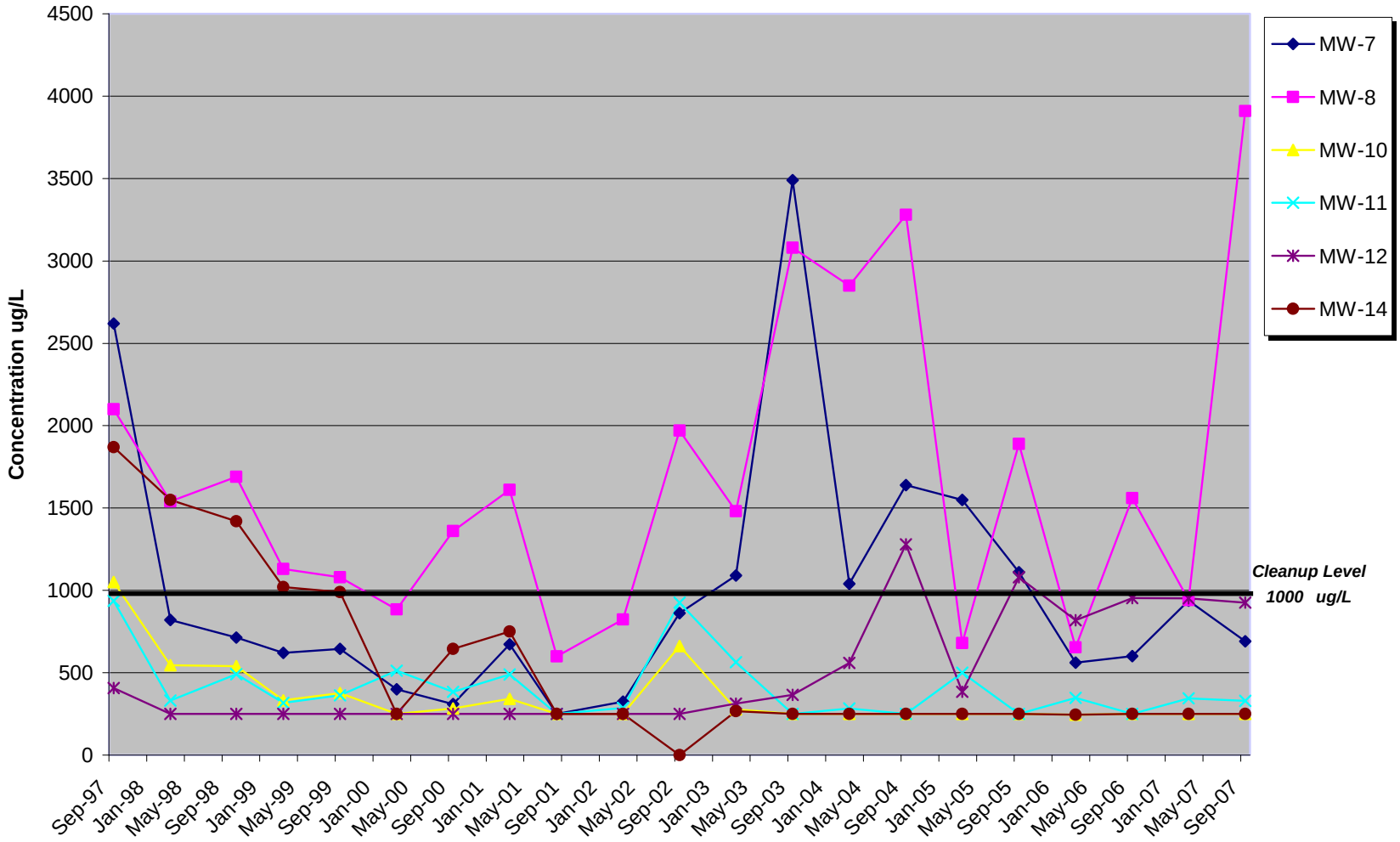


FIGURE 6

Whitten Oil
Benzene Concentrations

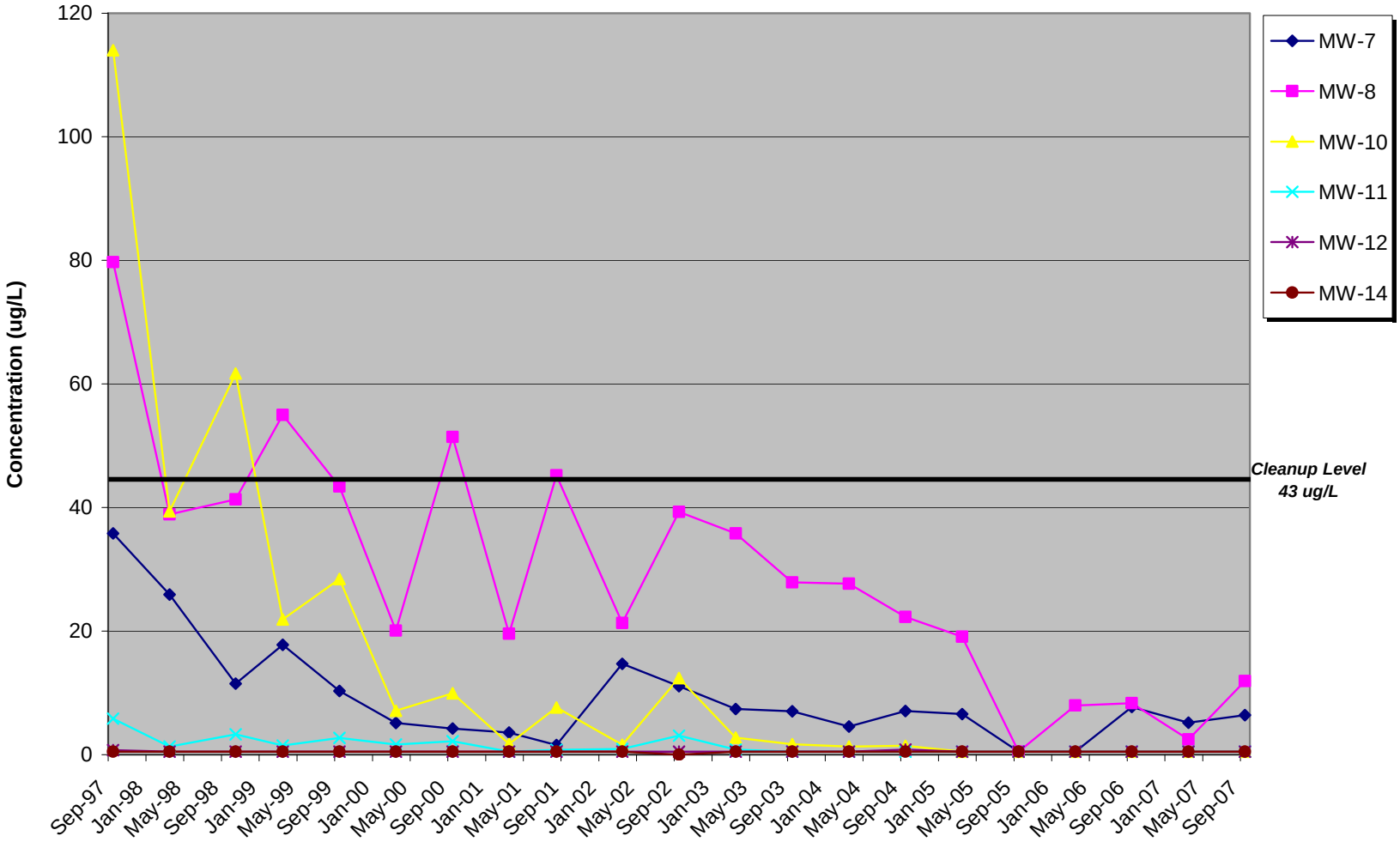


FIGURE 7

WHITTEN OIL
Toluene Concentrations

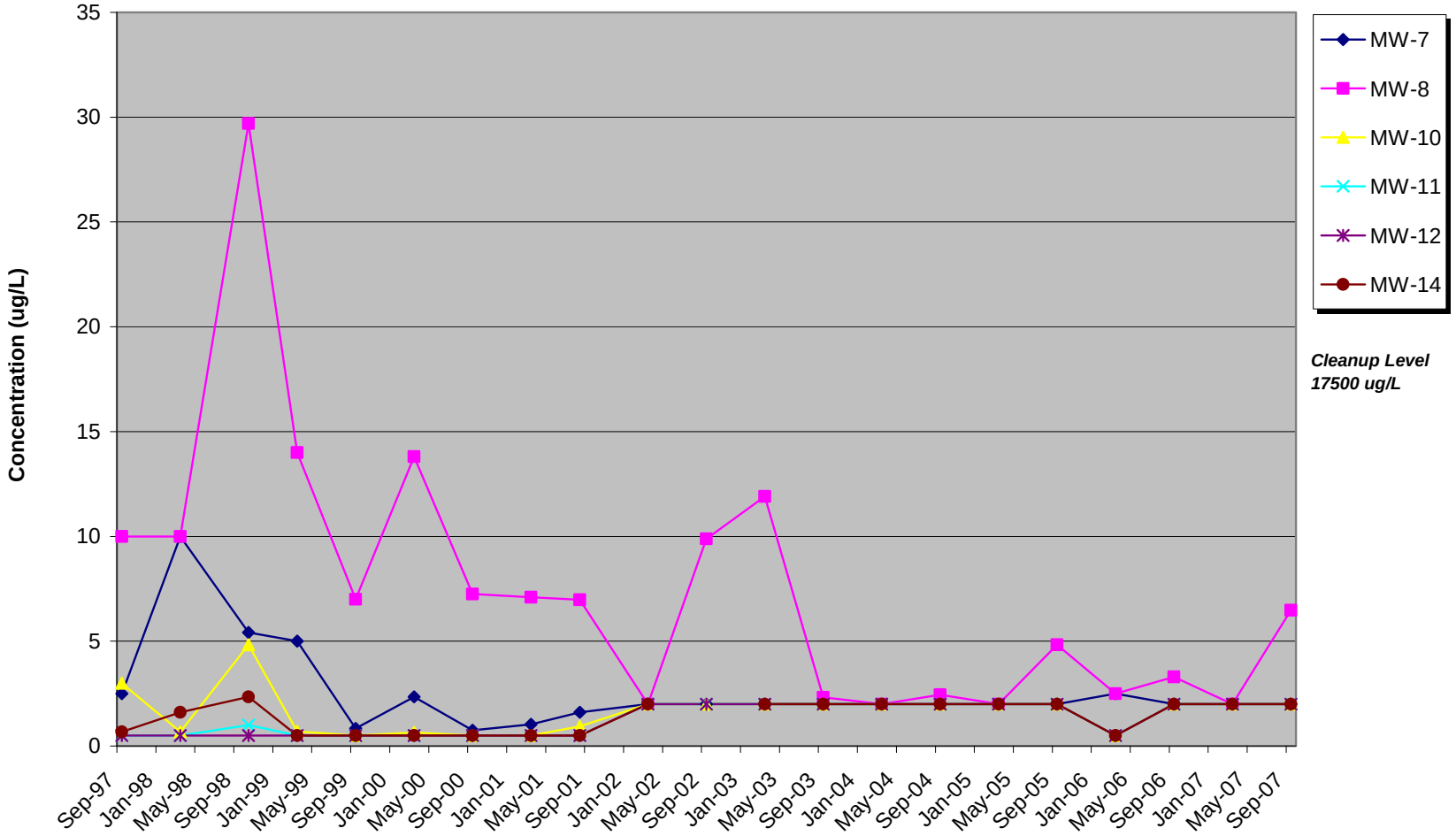


FIGURE 8

WHITTEN OIL
Ethylbenzene Concentrations

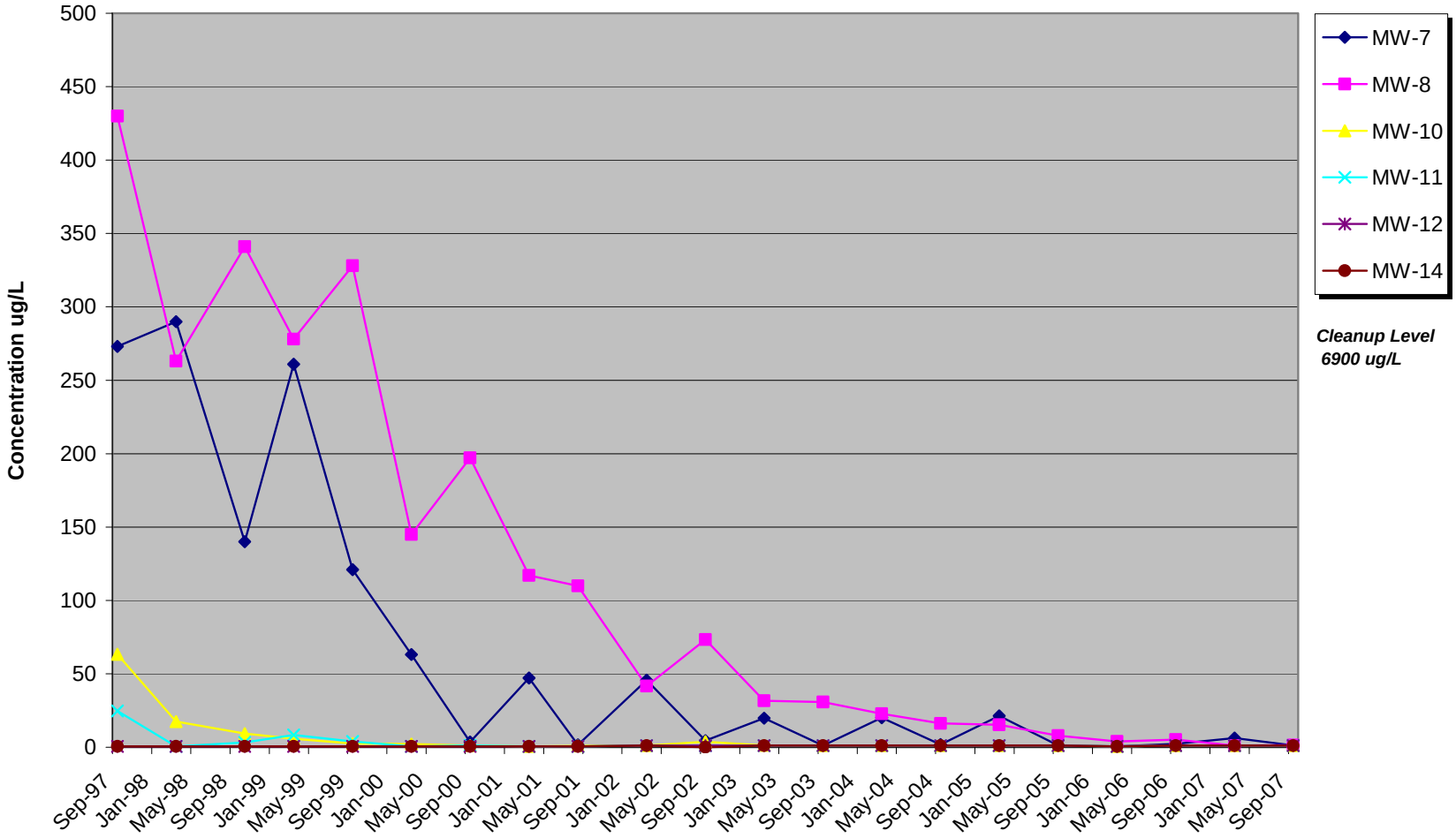


FIGURE 9

WHITTEN OIL
Xylenes Concentrations

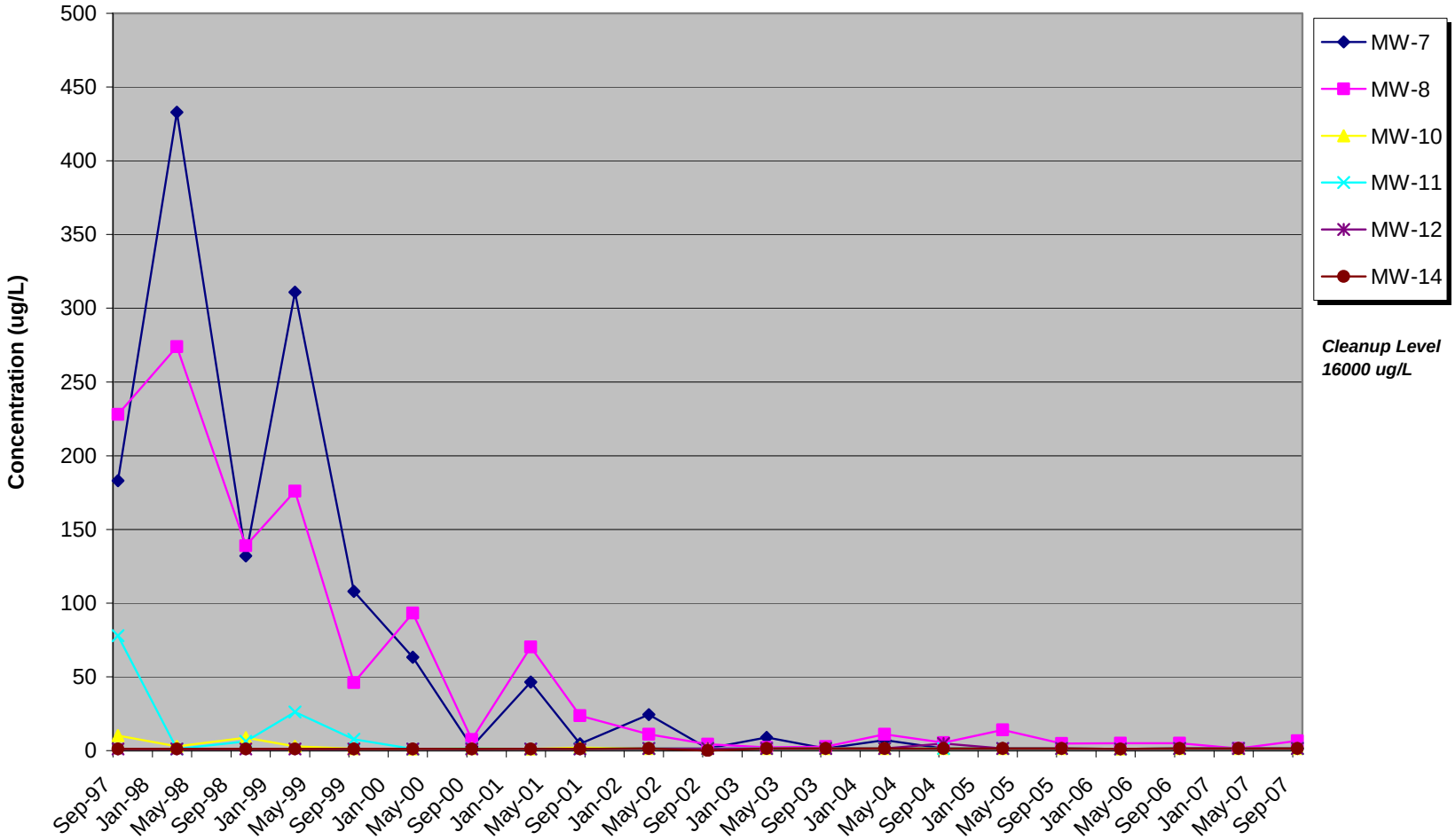


FIGURE 10

WHITTEN OIL
TPH - GASOLINE
MW-8

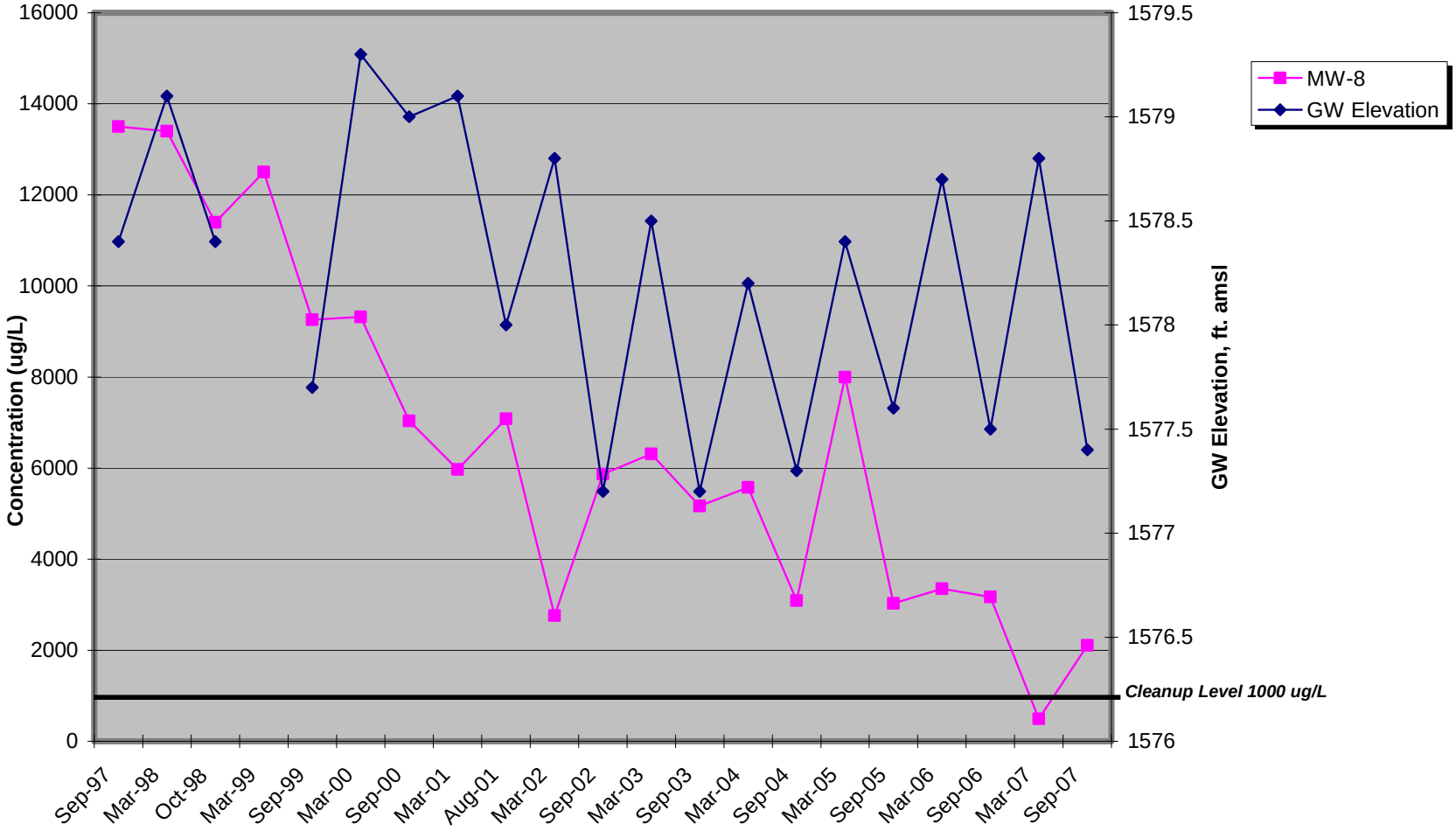


FIGURE 11

WHITTEN OIL
TPH - DIESEL
MW-8

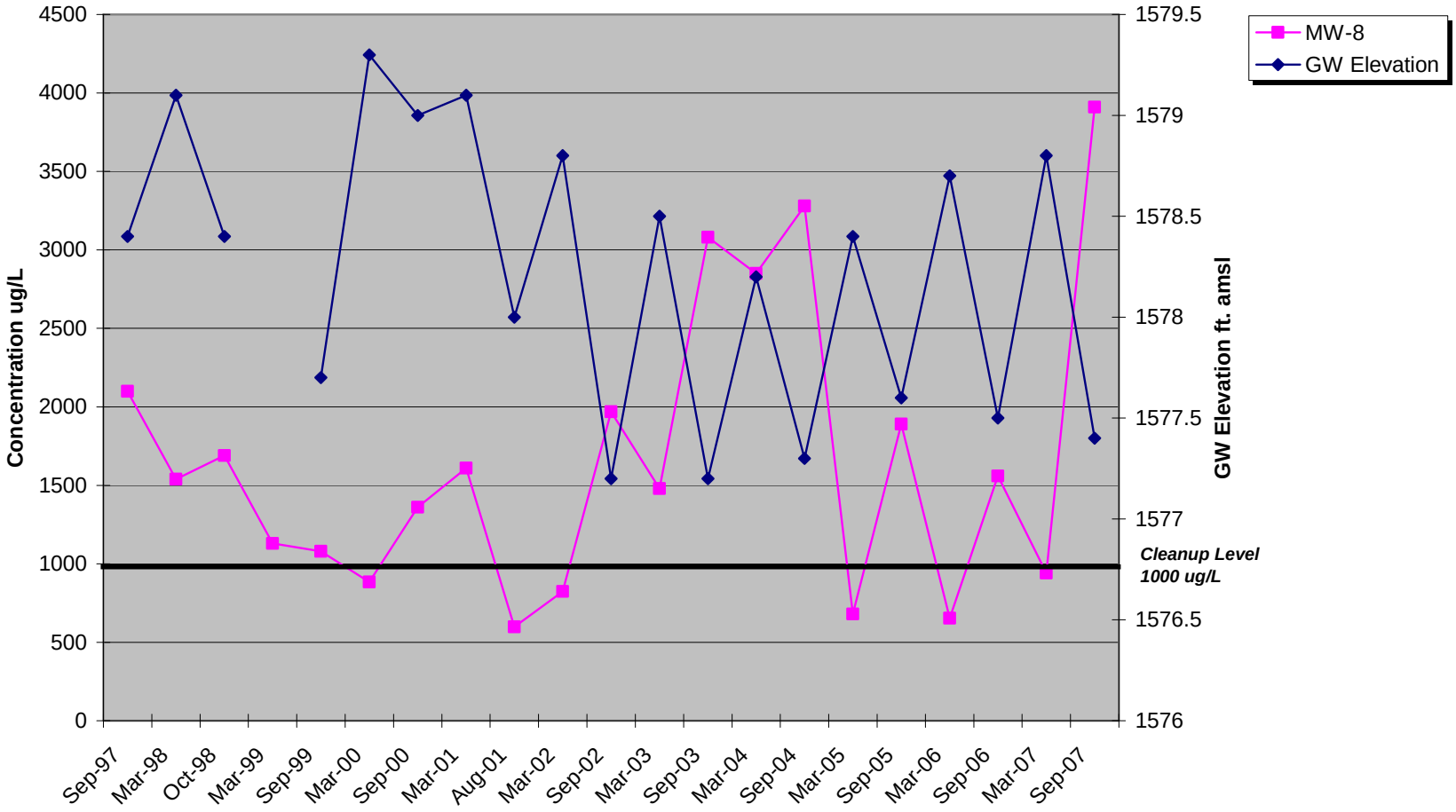


TABLE 2

Cumulative Groundwater Analytical Results
Former Whitty's Minimart, Colville, WA

Monitor Well	Sample Date	WTPH-Gas (µg/L)	WTPH-Diesel (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW-7							
	06/05/92	42000	14000	3500	3500	1500	8400
	09/23/92	39000	3300	2600	1400	1300	7600
	12/15/92	14000	3600	600	540	520	3100
	03/10/93	43000	3300	740	1700	1600	9300
	06/17/93	57000	3500	570	700	1800	11000
	08/26/93	27000	1900	320	210	890	4000
	03/19/94	37000	1600	280	380	1200	6300
	08/04/94	22000	1200	110	37	1100	4100
	11/18/94	13000	2300	65	ND	410	2200
	02/22/95	29000	2500	85	8109	9.6	2000
	05/23/95	21000	2900	95	0.5	720	16000
	08/23/95	10000	960	80	4.3	410	650
	09/16/97	4550	2620	35.8	<2.5	273	183
	03/23/98	8840	820	25.8	<10	290	433
	10/10/98	4540	714	11.5	5.41	140	132
	03/27/99	7077	621	17.8	<5	261	311
	09/28/99	4130	645	10.3	0.843	121	108
	03/17/00	2860	399	5.15	<2.35	63.1	63.4
	09/21/00	597	309	4.25	<0.75	3.53	2.72
	03/15/01	1580	673	3.57	<1.03	47.2	46.5
	08/27/01	143	<250	1.56	1.61	1.62	4.71
	03/22/02	2220	325	14.7	<2	45.7	24.4
	09/11/02	872	861	11.1	<2	4.5	<1.5
	03/05/03	720	1090	7.38	<2	19.8	8.89
	09/02/03	684	3490	7.04	<2	<1	<1.5
	03/09/04	1300	1040	4.57	<2	20.1	7.06
	09/02/04	589	1640	7.05	<2	1.78	<1.5
	03/09/05	1640	1550	6.56	<2	21.3	<1.5
	09/06/05	505	1110	<0.5	<2	1.31	<1.5
	03/20/06	<50	561	<0.5	<0.5	<0.5	<1
	09/13/06	694	601	7.72	<2	2.24	<1.5
	03/09/07	420	938	5.17	<2	6.16	<1.5
	09/24/07	420	691	6.42	<2	1.22	<1.5
Clean Up Level		1000	1000	43	17500	6900	16000

(ND) Not detected above the method detection limit.

(-) Not analyzed.

99-2940-90

TABLE 2 Continued (Page 2 of 6 Pages)

Cumulative Groundwater Analytical Results

Former Whitty's Minimart, Colville, WA

Monitor Well	Sample Date	WTPH-Gas (µg/L)	WTPH-Diesel (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW-8							
	06/05/92	100000	19000	3500	19000	2600	19000
	09/23/92	130000	2400	3100	17000	2600	19000
	12/15/92	96000	3200	1100	8700	2600	18000
	03/10/93	160000	2900	910	8900	3200	22000
	06/17/93	70000	3700	460	3900	2100	13000
	09/16/97	13500	2100	79.7	<10	430	228
	03/23/98	13400	1540	38.9	<10	263	274
	10/10/98	11400	1690	41.3	29.7	341	139
	03/27/99	12500	1130	55	<14	278	176
	09/28/99	9260	1080	43.4	<7	328	46.1
	03/17/00	9320	885	20.1	<13.8	145	93.2
	09/21/00	7040	1360	51.4	<7.25	197	<7.5
	03/15/01	5970	1610	19.6	<7.1	117	70.3
	08/27/01	7080	599	45.2	6.98	110	23.7
	03/22/02	2760	824	21.3	<2	41.7	11
	09/11/02	5870	1970	39.3	9.88	73.3	4.33
	03/05/03	6310	1480	35.8	11.9	31.7	2.07
	09/02/03	5170	3080	27.9	2.32	30.8	2.67
	03/09/04	5580	2850	27.7	<2	22.7	11
	09/02/04	3090	3280	22.3	2.44	16.2	5.4
	03/09/05	8000	680	19.1	<2	15.3	14
	09/06/05	3030	1890	<0.5	4.83	7.83	4.77
	03/20/06	3350	654	7.96	<2.5	3.89	<5
	09/13/06	3170	1560	8.34	3.3	5.24	4.94
	03/09/07	492	941	2.48	<2	<1	<1.5
	09/24/07	2110	3910	11.9	6.47	1.48	6.66
Clean Up Level		1000	1000	43	17500	6900	16000

(ND) Not detected above the method detection limit.

(-) Not analyzed.

TABLE 2 Continued (Page 3 of 6 Pages)

Cumulative Groundwater Analytical Results

Former Whitty's Minimart, Colville, WA

Monitor Well	Sample Date	WTPH-Gas (µg/L)	WTPH-Diesel (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW-10							
	06/05/92	6500	1500	870	1100	75	950
	09/23/92	3500	790	900	72	160	340
	12/15/92	16000	5700	2100	1700	390	2100
	03/10/93	31000	8100	2600	4400	680	4900
	06/17/93	22000	6000	2500	5600	1100	8800
	08/26/93	26000	3400	1400	2800	500	3000
	03/19/94	33000	2200	1800	3000	850	5100
	08/04/94	34000	2700	1600	1400	1500	6900
	11/18/94	12000	1800	640	150	370	2400
	02/22/95	7100	2200	320	180	36	800
	05/23/95	4500	2100	300	7.5	200	340
	08/23/95	2400	750	270	3.8	130	71
	09/16/97	1110	1050	114	3	63.3	10.2
	03/23/98	544	546	39.4	0.68	17.5	2.91
	10/10/98	1030	540	61.7	4.83	9.17	8.72
	03/27/99	473	333	21.9	<0.7	5.67	2.83
	09/28/99	410	377	28.4	<0.5	2.53	1.25
	03/17/00	128	<250	7.09	<0.65	2.1	<1
	09/21/00	205	284	9.92	<0.5	1.13	1.37
	03/15/01	63.6	341	1.74	<0.5	<0.5	<1
	08/27/01	232	<250	7.63	0.937	0.961	2.02
	03/22/02	110	<250	1.6	<2	<1	<1.5
	09/11/02	519	662	12.4	<2	3.69	<1.5
	03/05/03	189	278	2.76	<2	1.25	<1.5
	09/02/03	188	<250	1.67	<2	<1	<1.5
	03/09/04	164	<250	1.31	<2	<1	<1.5
	09/02/04	<100	<250	1.45	<2	<1	<1.5
	03/09/05	107	<250	<0.5	<2	<1	<1.5
	09/06/05	104	<250	<0.5	<2	<1	<1.5
	03/20/06	<50	<245	<0.5	<0.5	<0.5	<1
	09/13/06	<100	<250	<0.5	<2	<1	<1.5
	03/09/07	<100	<250	<0.5	<2	<1	<1.5
	09/24/07	<100	<250	<0.5	<2	<1	<1.5
Clean Up Level		1000	1000	43	17500	6900	16000

(ND) Not detected above the method detection limit.

(-) Not analyzed.

TABLE 2 Continued (Page 4 of 6 Pages)

Cumulative Groundwater Analytical Results

Former Whitty's Minimart, Colville, WA

Monitor Well	Sample Date	WTPH-Gas (µg/L)	WTPH-Diesel (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW-11							
	06/05/92	2500	950	150	36	77	580
	09/23/92	11000	610	110	3.9	52	38
	12/15/92	12000	3900	470	50	340	2300
	03/10/93	8000	1400	200	46	170	890
	06/17/93	14000	2400	510	75	420	2500
	08/26/93	950	940	130	5.3	23	100
	03/19/94	3300	1000	90	8.7	110	460
	11/18/94	12000	5500	120	ND	59	2200
	02/22/95	7300	2100	34	4	150	730
	05/23/95	6100	2200	37	2.9	130	590
	08/23/95	1300	1100	16	0.68	24	87
	09/16/97	877	936	5.84	<0.5	24.7	77.9
	03/23/98	52.8	331	1.32	<0.5	0.544	<1
	10/10/98	158	491	3.29	<1	3.29	6.2
	03/27/99	360	317	1.48	<0.5	8.3	26.1
	09/28/99	177	363	2.7	<0.5	3.99	7.58
	03/17/00	<50	513	1.65	<0.5	0.537	<1
	09/21/00	69.7	385	2.18	<0.5	1.16	1.4
	03/15/01	<50	489	<0.5	<0.5	<0.5	<1
	08/27/01	61.5	<250	0.763	<0.5	<0.5	1.28
	03/22/02	<100	286	0.946	<2	<1	<1.5
	09/11/02	206	925	3.07	<2	<1	<1.5
	03/05/03	107	564	0.834	<2	<1	<1.5
	09/02/03	<100	<250	<0.5	<2	<1	<1.5
	03/09/04	<100	284	<0.5	<2	<1	<1.5
	09/02/04	<100	<250	<0.5	<2	<1	<1.5
	03/09/05	<100	<500	<0.5	<2	<1	<1.5
	09/06/05	<100	<250	<0.5	<2	<1	<1.5
	03/20/06	<50	347	<0.5	<0.5	<0.5	<1
	09/13/06	<100	<250	<0.5	<2	<1	<1.5
	03/09/07	<100	344	<0.5	<2	<1	<1.5
	09/24/07	<100	329	<0.5	<2	<1	<1.5
Clean Up Level		1000	1000	43	17500	6900	16000

(ND) Not detected above the method detection limit.

(-) Not analyzed.

99-2940-90

TABLE 2 Continued (Page 5 of 6 Pages)

Cumulative Groundwater Analytical Results

Former Whitty's Minimart, Colville, WA

Monitor Well	Sample Date	WTPH-Gas (µg/L)	WTPH-Diesel (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW-12							
	06/05/92	300	ND	41	12	7.9	60
	09/23/92	ND	ND	28	ND	0.72	ND
	12/15/92	400	2900	50	14	21	67
	03/10/93	ND	300	1.3	1.5	1.5	4.8
	06/17/93	1900	360	220	70	80	330
	08/26/93	130	ND	52	2.5	6.9	18
	03/19/94	110	ND	32	4.5	5	15
	08/04/94	89	430	30	0.57	3.7	2.8
	11/18/94	610	520	70	2	30	100
	02/22/95	80	ND	12	1.9	0.54	4.6
	05/23/95	100	480	21	0.98	4.5	13
	08/23/95	ND	ND	11	ND	ND	ND
	09/16/97	<50	407	0.719	<0.5	<0.5	<1
	03/23/98	<50	<250	<0.5	<0.5	<0.5	<1
	10/10/98	<50	<250	<0.5	<0.5	<0.5	<1
	03/27/99	<50	<250	<0.5	<0.5	<0.5	<1
	09/28/99	<50	<250	<0.5	<0.5	<0.5	<1
	03/17/00	<50	<250	<0.5	<0.5	<0.5	<1
	09/21/00	<50	<250	<0.5	<0.5	<0.5	<1
	03/15/01	<50	<250	<0.5	<0.5	<0.5	<1
	08/27/01	<50	<250	<0.5	<0.5	<0.5	<1
	03/22/02	<100	<250	<0.5	<2	<1	<1.5
	09/11/02	<100	<250	<0.5	<2	<1	<1.5
	03/05/03	<100	312	<0.5	<2	<1	<1.5
	09/02/03	<100	366	<0.5	<2	<1	<1.5
	03/09/04	<100	560	<0.5	<2	<1	<1.5
	09/02/04	<100	1280	0.834	<2	<1	4.74
	03/09/05	<100	385	<0.5	<2	<1	<1.5
	09/06/05	<100	1080	<0.5	<2	<1	<1.5
	03/20/06	<50	819	<0.5	<0.5	<0.5	<1
	09/13/06	<100	953	<0.5	<2	<1	<1.5
	03/09/07	<100	951	<0.5	<2	<1	<1.5
	09/24/07	<100	926	<0.5	<2	<1	<1.5
Clean Up Level		1000	1000	43	17500	6900	16000

(ND) Not detected above the method detection limit.

(-) Not analyzed.

99-2940-90

TABLE 2

Continued (Page 6 of 6 Pages)

Cumulative Groundwater Analytical Results
Former Whitty's Minimart, Colville, WA

Monitor Well	Sample Date	WTPH-Gas (µg/L)	WTPH-Diesel (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)
MW-14							
	06/05/92	ND	ND	ND	ND	ND	ND
	09/23/92	ND	ND	ND	ND	ND	ND
	12/15/92	ND	1600	ND	ND	ND	ND
	03/10/93	ND	530	ND	ND	ND	ND
	06/17/93	ND	ND	4.2	ND	7.3	ND
	09/16/97	55.2	1870	<0.5	0.678	0.565	<1
	03/23/98	<50	1550	<0.5	1.61	<0.5	<1
	10/10/98	<50	1420	<0.5	2.35	<0.5	<1
	03/27/99	<50	1020	<0.5	<0.5	<0.5	<1
	09/28/99	<50	989	<0.5	<0.5	<0.5	<1
	03/17/00	<50	<250	<0.5	<0.5	<0.5	<1
	09/21/00	<50	645	<0.5	<0.5	<0.5	<1
	03/15/01	<50	751	<0.5	<0.5	<0.5	<1
	08/27/01	<50	<250	<0.5	<0.5	<0.5	<1
	03/22/02	<100	<250	<0.5	<2	<1	<1.5
	03/05/03	<100	267	<0.5	<2	<1	<1.5
	09/02/03	<100	<250	<0.5	<2	<1	<1.5
	03/09/04	<100	<250	<0.5	<2	<1	<1.5
	09/02/04	<100	<250	<0.5	<2	<1	<1.5
	03/09/05	<100	<250	<0.5	<2	<1	<1.5
	09/06/05	<100	<250	<0.5	<2	<1	<1.5
	03/20/06	<50	<245	<0.5	<0.5	<0.5	<1
	09/13/06	<100	<250	<0.5	<2	<1	<1.5
	03/09/07	<100	<250	<0.5	<2	<1	<1.5
	09/24/07	<100	<250	<0.5	<2	<1	<1.5
Clean Up Level		1000	1000	43	17500	6900	16000

(ND) Not detected above the method detection limit.

(-) Not analyzed.