



Derek

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TO: Scott Hooten

FROM: Derek
Joannah Tornow

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NOTES/COMMENTS:

Scott,

Draft ARCO Facility 855 Data. I am evaluating data but ground water concentrations are similar to historical data. MW-3 did have 0.02' of LPH.

Thanks,
Derek

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SPECIALTY GASES

GROUND WATER MONITORING REPORT

Atlantic Richfield Company

Annual Report for 2003

July 15, 2003

Draft

Former ARCO Facility No.: 855
Address: 4603 Ocean Beach Highway, Longview, WA
Atlantic Richfield Company
Environmental Business Manager: Scott Hooton
Consulting Co./Contact Person: Delta Environmental Consultants, Inc./Derek Tornow
Consultant Project Number: AM02-516
Primary Agency/Regulatory ID No.: Washington State Department of Ecology/

WORK PERFORMED DURING 2003:

- Delta conducted annual ground water monitoring and sampling on July 9, 2003.
- Delta prepared this annual ground water monitoring report.

Current Phase of Project:	Monitoring	(Phase I, Addtl Assmnt RAP/CAP, Remed., etc)
Frequency of Ground Water Sampling and Monitoring:	Annual	(Quarterly, etc)
Are LPH Present On-Site:	Yes	(Yes/No)
LPH Recovered this Reporting Period:	None	(Gallons)
Cumulative LPH Recovered to Date:	None	(Gallons)
Amount of Soil Removed to Date:	Unknown	(Cubic yards/tons)
Current Remediation Techniques:	Natural Attenuation	(SVES/Sparge/Pump and Treat)
Approximate Depth to Ground Water:	5.36 to 7.04	(Feet)
Ground Water Gradient:	Generally East/0.01 ft/linear ft	(Direction/Magnitude)

Attachments:

- Table 1 – Historical Water Sample Analyses
- Table 2 – Historical Water Level Elevations
- Figure 1 - Site Location Map
- Figure 2 - Inferred Water Table Contour Map – 7/9/03
- North Creek Analytical Lab Report

Draft

Table 1. Historical Water Sample Analyses
Former ARCO Facility No. 0855
4603 Ocean Beach Highway, Longview, Washington

Well Number	Sample Date	BTEX (µg/L)				VOCs (µg/L)				TPH-G (µg/L)	TPH-D (µg/L)	TPH-O (µg/L)	TOTAL LEAD (µg/L)	DISSOLVED LEAD (µg/L)
		Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	MTBE					
MW-1	03/27/00	ND	ND	ND	ND	—	—	—	—	ND	ND	ND	—	—
	05/23/00	ND	ND	ND	ND	—	—	—	—	ND	—	—	—	—
	07/20/00	ND	ND	ND	ND	—	—	—	—	ND	—	—	—	—
	10/18/00	ND	ND	1.61	ND	—	—	—	—	404	—	—	—	—
	01/18/01	ND	ND	ND	ND	ND	ND	ND	ND	95.6	—	—	—	—
	04/18/01	ND	ND	ND	ND	4.30	ND	ND	ND	386.0	—	—	—	—
	07/17/01	ND	2.63	1.46	ND	—	—	—	—	ND	—	—	—	—
	10/18/01	ND	ND	ND	ND	—	—	—	—	104	—	—	—	—
	01/16/02	ND	ND	ND	ND	—	—	—	—	<50.0	<250	<500	1.70	<1.00
	07/09/03	<0.500	<0.500	<0.500	<1.00	—	<0.010	<1.00	<1.00	<50.0	<250	<500	1.70	<1.00
MW-2	03/27/00	6.89	49.5	599	2,490	—	—	—	—	17,100	ND	ND	—	—
	05/23/00	26.2	16.2	614	1,770	—	—	—	—	13,200	—	—	—	—
	07/20/00	11.9	11.8	304	330	—	—	—	—	7,220	—	—	—	—
	10/18/00	3.67	1.23	13.9	7.55	—	—	—	—	743	—	—	—	—
	01/18/01	ND	ND	41.1	5.62	ND	ND	ND	ND	691	—	—	—	—
	04/18/01	ND	ND	8.73	ND	ND	ND	ND	ND	—	—	—	—	—
	07/17/01	ND	1.26	14	ND	—	—	—	—	430	—	—	—	—
	10/18/01	2.11	ND	3.64	ND	—	—	—	—	304	—	—	—	—
	01/16/02	1.16	0.81	37.1	6.71	—	—	—	—	370	—	—	—	—
	07/09/03	0.858	<0.500	6.43	1.28	—	<0.010	<1.00	<5.00	131	<250	<500	15.9	<1.00
MW-3	03/27/00	7,520	12,900	2,780	14,500	—	—	—	—	93,700	ND	ND	—	—
	05/23/00	4,710	8,330	2,280	11,200	—	—	—	—	65,200	—	—	—	—
	07/20/00	10,700	22,600	3,160	17,400	—	—	—	—	145,000	—	—	—	—
	10/18/00	12,900	33,000	4,890	26,700	—	—	—	—	179,000	—	—	—	—
	01/18/01	9,380	17,200	3,940	20,230	607	ND	155	ND	121,000	—	—	—	—
	04/18/01	7,700	15,300	3,430	16,990	405	ND	101	ND	—	—	—	—	—
	07/17/01	10,100	21,400	4,120	20,900	—	—	—	—	940,000	—	—	—	—
	10/18/01	7,200	19,700	3,340	17,300	—	—	—	—	138,000	—	—	—	—
	01/16/02	13,600	26,600	3,920	20,800	—	—	—	—	177,000	—	—	—	—
	07/09/03	11,800	20,100	4,560	21,200	—	<0.010	107	<20.0	124,000	3,750	623	28.5	7.98

Table 1. Historical Water Sample Analyses
Former ARCO Facility No. 0855
4603 Ocean Beach Highway, Longview, Washington

Well Number	Sample Date	BTEX (µg/L)				VOCs (µg/L)				TPH-G (µg/L)	TPH-D (µg/L)	TPH-O (µg/L)	TOTAL LEAD (µg/L)	DISSOLVED LEAD (µg/L)
		Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene	EDB	EDC	MTBE					
MW-4	11/15/00*	1,310	53.6	2,430	7,250	—	—	—	—	45,500	—	—	—	—
	01/18/01	1,130	ND	2,030	2,764	331	ND	ND	ND	29,400	—	—	—	—
	04/18/01	1,280	ND	1,700	2,591	289	ND	ND	ND	—	—	—	—	—
	07/17/01	1,610	35	2,870	1,870	—	—	—	—	34,900	—	—	—	—
	10/18/01	1,040	ND	2,300	1,320	—	—	—	—	33,000	—	—	—	—
	01/16/02	733	ND	920	948	—	—	—	—	19,300	—	—	—	—
	07/09/03	906	39.1	1,350	156	—	<0.010	<25.0	<20.0	14,100	798	<500	6.50	2.57
MW-5	11/15/00*	ND	ND	ND	ND	—	—	—	—	ND	—	—	—	—
	01/18/01	ND	ND	ND	ND	2.44	ND	ND	ND	786	—	—	—	—
	04/18/01	9.42	ND	6.76	10.1	2.42	ND	ND	ND	—	—	—	—	—
	07/17/01	1.83	1.16	1.90	3.28	—	—	—	—	694	—	—	—	—
	10/18/01	3.05	1.39	1.48	1.45	—	—	—	—	647	—	—	—	—
	01/16/02	52.3	3.82	48	24.9	—	—	—	—	2,800	—	—	—	—
	07/09/03	1.26	0.990	1.54	4.64	—	<0.010	<1.00	<5.00	615	<250	<500	5.83	<1.00
MW-6	11/15/00*	ND	ND	ND	ND	—	—	—	—	131	—	—	—	—
	01/18/01	ND	ND	ND	ND	ND	ND	ND	ND	732	—	—	—	—
	04/18/01	ND	ND	ND	ND	ND	ND	ND	ND	—	—	—	—	—
	07/17/01	ND	1.35	1.33	5.79	—	—	—	—	892	—	—	—	—
	10/18/01	ND	ND	2.60	5.48	—	—	—	—	1,000	—	—	—	—
	01/16/02	ND	0.724	1.58	2.78	—	—	—	—	810	—	—	—	—
	07/09/03	<0.500	0.529	1.15	4.84	—	<0.010	<1.00	<1.00	462	958	<500	12.1	<1.00

Table 1. Historical Water Sample Analyses
Former ARCO Facility No. 0855
4603 Ocean Beach Highway, Longview, Washington

Well Number	Sample Date	BTEX (µg/L)			Total Xylenes	VOCs (µg/L)				TPH-G (µg/L)	TPH-D (µg/L)	TPH-O (µg/L)	TOTAL LEAD (µg/L)	DISSOLVED LEAD (µg/L)
		Benzene	Toluene	Ethylbenzene		Naphthalene	EDB	EDC	MTBE					
MW-7	11/15/00 ^a	ND	ND	ND	1.35	—	—	—	—	113	—	—	—	—
	01/18/01	ND	ND	ND	ND	ND	ND	ND	ND	242	—	—	—	—
	04/18/01	ND	ND	ND	ND	ND	ND	ND	ND	—	—	—	—	—
	07/17/01	ND	ND	ND	ND	—	—	—	—	275	—	—	—	—
	10/18/01	ND	ND	ND	ND	—	—	—	—	286	—	—	—	—
	01/16/02	ND	ND	ND	ND	—	—	—	—	362	—	—	—	—
	07/09/03	<0.500	<0.500	<0.500	1.48	—	<0.010	<1.00	<1.00	232	2,050	<500	4.34	<1.00

ND or < = Less than laboratory method reporting limit (MRL).

— = Not sampled or not available.

Benzene, toluene, ethylbenzene, and total xylenes (BTEX) analysis by EPA Method 8021B.

VOCs analyzed by EPA Method 8062B.

EDB = 1,2-dibromoethane and EDC = 1,2-dichloroethane.

EDB by EPA Method 8011.

Total petroleum hydrocarbons-gasoline range (TPH-G) analysis by Method NWTPH-Gx.

TPH-diesel range (TPH-D) and TPH-oil range (TPH-O) analysis by Method NWTPH-Dx.

Total and dissolved lead by EPA Method 6020.

^a Monitoring wells MW-4 through MW-7 were installed on October 24 and sampled on November 15, 2000.

Note: Results in micrograms per liter (µg/L), or approximately parts per billion (ppb).

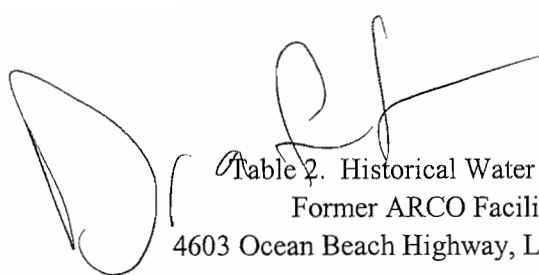
Data prior to 7/9/03 provided by Secor International, Inc.

Draft

Table 2. Historical Water Level Elevations
Former ARCO Facility No. 0855
4603 Ocean Beach Highway, Longview, Washington

Well Number/ TOC Elevation ^a (feet)	Date Measured	Static Water Level (feet BTOC) ^b	Liquid Phase Hydrocarbon Thickness (feet)	Ground Water Elevation (feet) ^c	Change in Water Level Elevation (feet)
MW-1 8.34	03/27/00	4.36	0.00	3.98	— ^a
	05/23/00	5.20	0.00	3.14	-0.84
	07/20/00	5.55	0.00	2.79	-0.35
	10/18/00	5.41	0.00	2.93	0.14
	01/18/01	4.81	0.00	3.53	0.60
	04/18/01	4.58	0.00	3.76	0.23
	07/17/01	5.54	0.00	2.80	-0.96
	10/18/01	5.26	0.00	3.08	0.28
	01/16/02	4.45	0.00	3.89	0.81
	07/09/03	5.80	0.00	2.54	-1.35
MW-2 8.76	03/27/00	3.61	0.00	5.15	—
	05/23/00	4.64	0.00	4.12	-1.03
	07/20/00	5.06	0.00	3.70	-0.42
	10/18/00	5.19	0.00	3.57	-0.13
	01/18/01	3.96	0.00	4.80	1.23
	04/18/01	3.83	0.00	4.93	0.13
	07/17/01	5.08	0.00	3.68	-1.25
	10/18/01	4.83	0.00	3.93	0.25
	01/16/02	3.71	0.00	5.05	1.12
	07/09/03	5.36	0.00	3.40	-1.65
MW-3 8.78	03/27/00	5.61	0.00	3.17	—
	05/23/00	6.46	0.00	2.32	-0.85
	07/20/00	7.05	0.00	1.73	-0.59
	10/18/00	6.84	0.00	1.94	0.21
	01/18/01	6.37	0.00	2.41	0.47
	04/18/01	5.46	0.00	3.32	0.91
	07/17/01	6.93	0.00	1.85	-1.47
	10/18/01	6.47	0.00	2.31	0.46
	01/16/02	4.83	0.00	3.95	1.64
	07/09/03	6.72	0.02	2.08	-1.87
MW-4 8.78	11/15/00 ^c	6.88	0.00	1.90	—
	01/18/01	6.78	0.00	2.00	0.10
	04/18/01	6.90	0.00	1.88	-0.12
	07/17/01	7.50	0.00	1.28	-0.60
	10/18/01	6.92	0.00	1.86	0.58
	01/16/02	6.15	0.00	2.63	0.77
	07/09/03	7.04	0.00	1.74	-0.89

Draft


 Table 2. Historical Water Level Elevations
 Former ARCO Facility No. 0855
 4603 Ocean Beach Highway, Longview, Washington

Well Number/ TOC Elevation ^a (feet)	Date Measured	Static Water Level (feet BTOC) ^b	Liquid Phase Hydrocarbon Thickness (feet)	Ground Water Elevation (feet) ^c	Change in Water Level Elevation (feet)
MW-5 8.78	11/15/00 ^e	6.54	0.00	2.24	—
	01/18/01	6.07	0.00	2.71	0.47
	04/18/01	5.46	0.00	3.32	0.61
	07/17/01	6.79	0.00	1.99	-1.33
	10/18/01	6.50	0.00	2.28	0.29
	01/16/02	5.49	0.00	3.29	1.01
	07/09/03	6.86	0.00	1.92	-1.37
MW-6 8.21	11/15/00 ^e	6.15	0.00	2.06	—
	01/18/01	5.85	0.00	2.36	0.30
	04/18/01	5.70	0.00	2.51	0.15
	07/17/01	6.02	0.00	2.19	-0.32
	10/18/01	6.03	0.00	2.18	-0.01
	01/16/02	5.80	0.00	2.41	0.23
	07/09/03	6.16	0.00	2.05	-0.36
MW-7 8.45	11/15/00 ^e	6.52	0.00	1.93	—
	01/18/01	6.24	0.00	2.21	0.28
	04/18/01	5.98	0.00	2.47	0.26
	07/17/01	6.44	0.00	2.01	-0.46
	10/18/01	6.39	0.00	2.06	0.05
	01/16/02	6.31	0.00	2.14	0.08
	07/09/03	7.00	0.00	1.45	-0.69

a Top of casing (TOC) elevations, NAVD, 1988

b Measurements in feet below top of well casing.

c Elevation relative to mean sea level. Static water level corrected if liquid phase hydrocarbons (LPH) is present; corrected water level elevation = TOC - Static Water Level + (LPH x 0.80).

d — = Data not applicable or not measured.

e Monitoring wells MW-4 through MW-7 were installed on October 24 and measured on November 15, 2000.

Data prior to 7/9/03 provided by Secor International, Inc.





GENERAL NOTES:
 BASE MAP FROM U.S.G.S.
 COAL CREEK, WA.-OR.
 7.5 MINUTE TOPOGRAPHIC
 PROVISIONAL EDITION 1985
 AND KELSO, WA.-OR.
 7.5 MINUTE TOPOGRAPHIC
 DATED 1990



QUADRANGLE LOCATION



FIGURE 1
 SITE LOCATION MAP

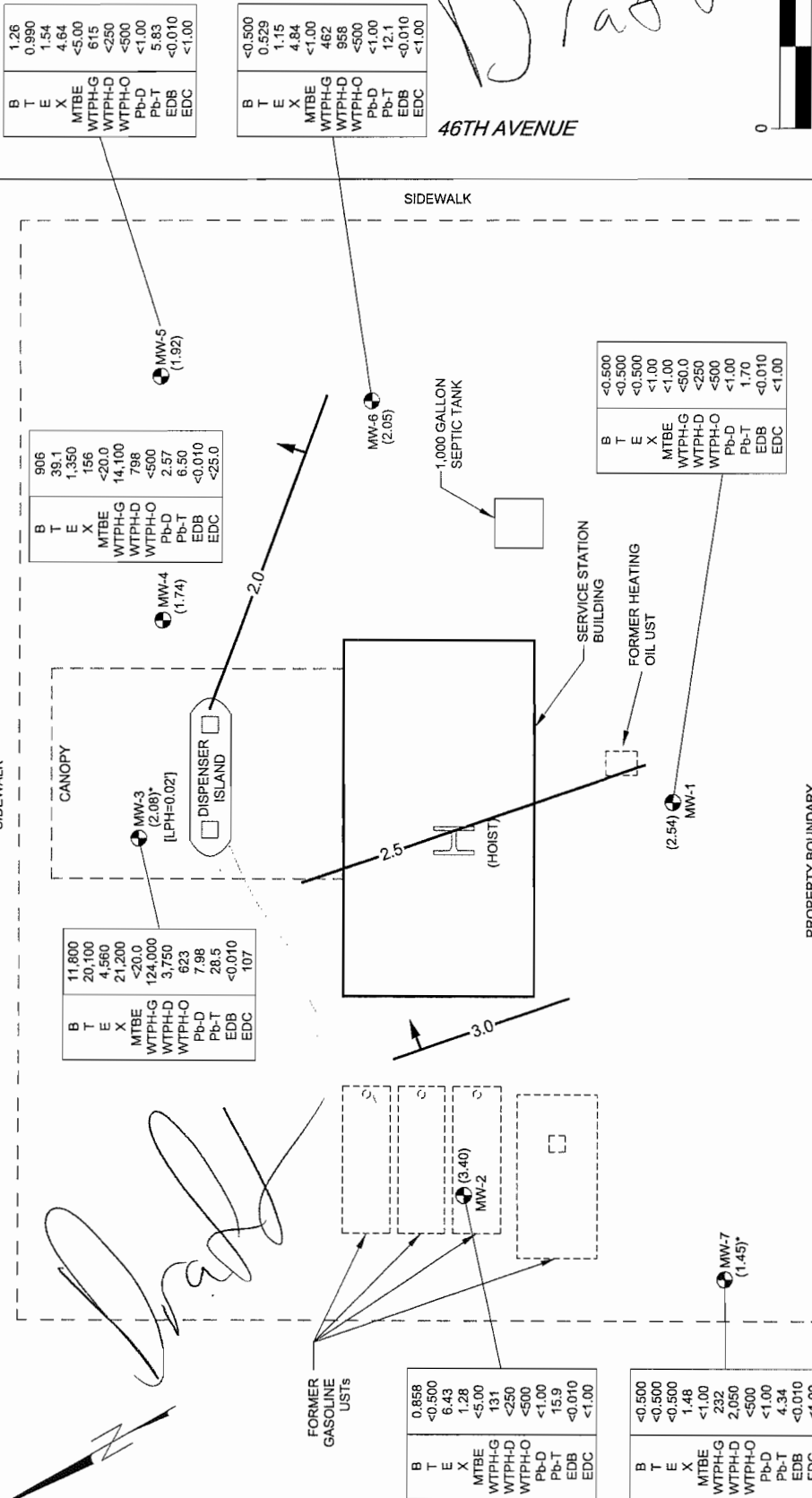
FORMER ARCO FACILITY NO. 0855
 4603 OCEAN BEACH HIGHWAY
 LONGVIEW, WA.

PROJECT NO.	DRAWN BY
-	M.L. 8/30/02
FILE NO.	PREPARED BY
0855 Topo	K.R.
REVISION NO.	REVIEWED BY
1	



OCEAN BEACH HWY.

SIDEWALK



LEGEND:

● MW-1 MONITORING WELL LOCATION

(2.54) GROUND WATER ELEVATION IN FEET RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM

— 2.5 — INFERRED WATER TABLE CONTOUR IN FEET RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM

→ INFERRED GROUND WATER FLOW DIRECTION

LPH LIQUID PHASE HYDROCARBONS

* GROUND WATER ELEVATION FOR WELL MW-3 & MW-7 NOT USED FOR CONTOUR CONSTRUCTION

NOTE: SECOR PREVIOUSLY DID NOT USE GROUND WATER ELEVATION DATA FOR MW-7 TO CONSTRUCT CONTOURS

GROUND WATER DATA

BENZENE IN MICROGRAMS PER LITER (ug/L)
TOLUENE IN ug/L
ETHYLBENZENE IN ug/L
XYLENES IN ug/L
METHYL TERT-BUTYL ETHER IN ug/L
TPH AS GASOLINE IN ug/L
TPH AS DIESEL IN ug/L
TPH AS OIL IN ug/L
DISSOLVED LEAD IN ug/L
TOTAL LEAD IN ug/L
1,2-DIBROMOETHANE IN ug/L
1,2-DICHLOROETHANE IN ug/L

B	<0.500
T	<0.500
E	<0.500
X	<1.00
MTBE	<1.00
WTPH-G	<50.0
WTPH-D	<250
WTPH-O	<500
Pb-D	<1.00
Pb-T	1.70
EDB	<0.010
EDC	<1.00

FIGURE 2

INFERRED WATER TABLE CONTOUR MAP

7/9/03

FORMER ARCO FACILITY NO. 0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WA.

PROJECT NO.	DRAWN BY
0855-M02	M.L. 7/16/03
FILE NO.	PREPARED BY
0855M02B	K.R.
REVISION NO.	REVIEWED BY
1	





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Jensen
Jensen Tomorrow
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NOTES/COMMENTS:

Scott,

Draft ARCO Facility 855 Data. I am evaluating data but ground water concentrations are similar to historical data, MW-3 did have 0.02' of LPH.
Thanks,
Derek



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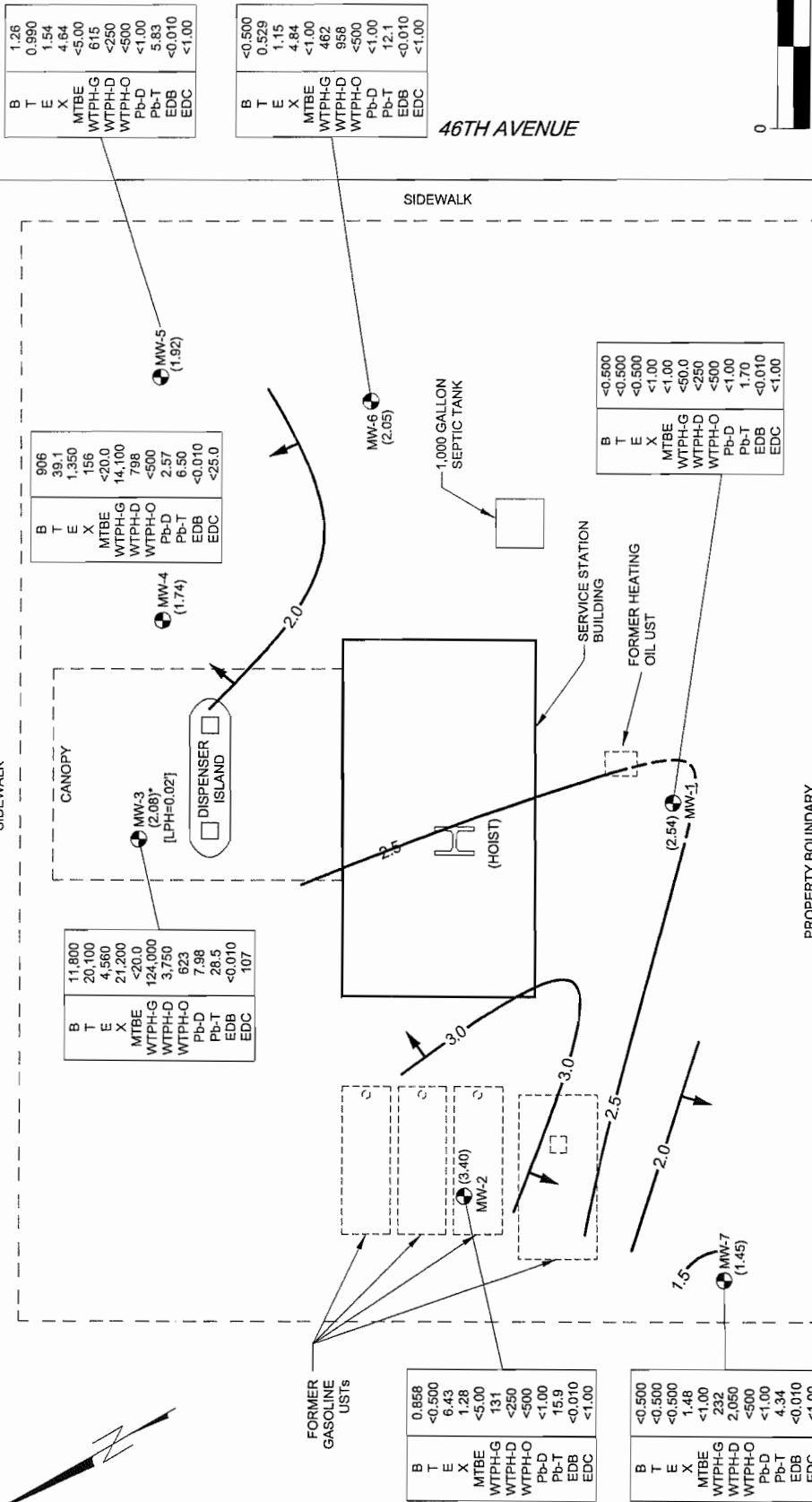


FIGURE 2
INFERRED WATER TABLE CONTOUR MAP
7/9/03
FORMER ARCO FACILITY NO. 0855
4603 OCEAN BEACH HIGHWAY
LONGVIEW, WA.

PROJECT NO.	DRAWN BY
0855-M02	M.L. 7/16/03
FILE NO.	PREPARED BY
0855M02B	K.R.
REVISION NO.	REVIEWED BY
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