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INTERIM REMEDIAL MEASURES COMPLETION REPORT PASCO LANDFILL PASCO WASHINGTON

February 4, 1998
Project No. 16921

Prepared for:
Pasco Landfill PLP Group

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1 INTRODUCTION

Soil vapor extraction (SVE) and in-well air stripping systems (NoVOCs) where installed at the Pasco Landfill as part of the interim measures being implemented at the site. These systems were described in the design documents submitted to the Department of Ecology on February 4, 1997. This report satisfies the requirements of WAC 173-340-400 (7)(b)(ii) and WAC 173-340-430 (7).

2 SVE SYSTEM INSTALLATION

SVE system installation took place from March 20 through May 8, 1997. One additional vapor extraction well, VEW-04, was installed per the design document at the southeast corner of Zone A at a depth of 55.5 feet below ground surface. The well completion report is contained in Appendix A. After installation of this well, piping was installed along routes outlined in the design documents to convey extracted vapors to the equipment building. Piping consisted of four inch schedule 80 polyvinyl chloride (PVC) pipe and fittings. Twenty foot lengths of piping were solvent welded using schedule 80 PVC couplers. Details of this installation can be seen in photos 1 and 2 in Appendix B.

The majority of the piping was installed along the ground surface using pipe supports consisting of plastic pipe hangers mounted on 4 x 4 x 18 inches pieces of treated lumber. The piping from VEW-04 enters a trench on the east side of Dietrich Road, and continues underground until reaching the equipment building. VEW-01 and VMW-02D piping runs enter a trench 60 feet east of the equipment building, and continue underground until surfacing at the equipment building.

The blower, manifold, moisture separator, valves and gages are contained on a steel framed skid fabricated by Hiline Engineering of Richland, Washington. The skid mounted equipment was installed on the north side of the equipment building. Photos 4 and 5 show the layout and

position of the SVE equipment skid. The manifold is connected to the individual piping runs via hose and cam-lock connectors.

The blower outlet was attached to two 2000 pound vapor phase carbon adsorption units in series. using high temperature hose with cam-lock connectors, Photo 6.

As-built piping and instrumentation diagrams, and electrical schematics of the SVE skid mounted equipment are included with this report.

2.1 VARIATIONS FROM DESIGN

The SVE system was installed per the February 4, 1997 design document with the following exceptions,

- The blower type was changed from a rotary lobe blower to a regenerative blower. This change was made to reduce the amount of maintenance required to keep the system operational.

- Piping routes were modified somewhat to take advantage of trenching installed as part of the NoVOCs system, and to avoid a storage area used for Basin Disposal dumpsters.

It is the opinion of Steve Drumheller, PE, project engineer, the SVE system was constructed in substantial compliance with the February 4, 1996 design document for the Pasco Landfill IRM SVE system.

3 NOVOCS INSTALLATION

Installation of the NoVOCs in-well air stripping system began with the drilling of two 16-inch borings. The NoVOCs wells and monitoring piezometers were installed in these borings. The well completion diagrams are contained in Appendix A. After installation of the treatment wells was completed, Philip installed two monitoring wells to measure the treatment zone of the two-well NoVOCs system. NVM-01 was installed at the midpoint between the two NoVOCs wells, and NVM-02 was installed 45 feet from NV-01, transverse to the groundwater flow direction.

After well installation was completed air supply and vacuum return lines were installed. All NoVOCs air lines were installed below ground surface in approximately four foot deep trenches. Air and vacuum lines were composed of schedule 40 PVC, and were installed along routes as shown in Figure 1. Just before crossing the road the four-inch diameter PVC lines for NV-02 change to six-inch PVC to reduce friction losses along this longer piping run. This change is indicated on Figure 1. The well head completions are shown in Photos 7 and 8.

The blowers, manifolds, moisture separators, valves and gages are contained on a steel framed skid fabricated by Hiline Engineering of Richland, Washington. Also included on this equipment skid is the programmable logic controller (PLC) that monitors and controls both the SVE and NoVOCs equipment. The skid mounted equipment for the NoVOCs system was installed on the south side of the equipment building. Photos 9 through 12 show the layout and position of the NoVOCs equipment skid. The manifold is connected to the individual piping runs via galvanized steel piping.

Each NoVOCs well system is connected to two 1000 pound vapor phase carbon adsorption units. The carbon units are plumbed into the vacuum return lines leading from the wells to the blowers.

As-built piping and instrumentation diagrams. and electrical schematics of the NoVOCs skid mounted equipment are included with this report.

3.1 VARIATIONS FROM DESIGN

The NoVOCs in-well air stripping system was installed per the February 4, 1997 design document with the following exceptions,

- Piping routes were modified somewhat to reduce the length of piping run from NV-02 to the equipment building.

It is the opinion of Stan Peterson, project manager for EG&G Environmental (under the supervision of Tom McKeon, P.E.) that the NoVOCs system was constructed in substantial compliance with the February 4, 1997 design document for the Pasco Landfill IRM NoVOCs system.

4 SVE STARTUP

The installation of the SVE system was completed on May 7, 1997. The system was started at 11:55 AM on May 8, 1997. Representatives from the Department of Ecology were present at start up. The system was started with all control valves in the full open position. At 12:11 PM the system flows were as follows,

- VEW-01 - 206.1 scfm
- VMW-02D - 222.5 scfm
- VEW-04 - 210.4 scfm

Adjustments were made to the control valve on the piping run to VMW-02D to balance the system. At 1305 the flows were,

- VEW-01 - 210.4 scfm
- VMW-02D - 211.4 scfm
- VEW-04 - 210.7 scfm

Vacuum readings at the wells stabilized very quickly, but were lower than anticipated, based on data from the SVE pilot study. Immediately after startup, vacuum gages at all wells read 9.0 inches of water. After running for one hour at the balanced flows VEW-01 was at 10.0, VMW-02D was at 9.0 and VEW-04 was at 9.5 inches of water. During the 1995 SVE pilot study, VEW-01 produced a flow of approximately 175 scfm against a vacuum of 30 inches of water. The higher flows and lower vacuums caused some concern that there may be leaks in the system, and/or that short circuiting was occurring somewhere near the vacuum extraction wells. A check of all piping runs and manifolds did not detect leaks. Radius of influence testing was conducted to rule out any short circuiting from the surface.

Radius of influence testing was conducted by measuring the baseline vacuum/pressures at several vapor monitoring points around the site (Figure 1). Baseline measurements were taken on the mornings of May 15 and June 2 after the SVE system had been shut down for 8 hours to return the vadose zone to natural conditions. Table 1 is a summary of radius of influence testing. These data indicate that the operating SVE system is inducing greater radii of influence than was expected from the pilot test data. Based on the data collected from monitoring points VMW-01S, VMW-02S, and VMW-03S it appears that the Touchet formation is acting as an effective barrier to air flow short circuiting from the surface.

4.1 CONTAMINANT REMOVAL

Four rounds of sampling were conducted to determine contaminant removal rates for the SVE system. During the first day of startup a field photo ionization detector (PID) was used to determine the relative contaminant contribution from each leg of the system. No response was observed on the PID during the first day of operation. Samples for laboratory analysis were collected at the end of the first day from the combined air stream from the three wells and after the carbon adsorption treatment vessels. The method was changed from TO-14 to 8260. These methods differ only in the container and method of sample collection. Method TO-14 specifically requires the use of pre-evacuated passivated SUMMA canisters for the collection of vapor samples. The SVE performance monitoring samples have been collected in non-SUMMA

evacuated canisters and Tedlar® bags. This collection method allows for the detection of specific compounds being removed from the vadose zone around Zone A, as well as the detection of any particular compounds passing through the treatment system and being discharged to the atmosphere. Analytical methods for both TO-14 and 8260 use GC/MS and the same detectors.

As shown in Table 2 the initial removal rate was approximately 9 lbs./day, significantly lower than expected. After approximately two weeks of operation another round of sampling was completed. The rate had increased to approximately 11 lbs./day. After approximately one month of operation, sampling indicated a dramatic increase in contaminant removal rates to 80.5 lbs./day. The fourth sample round collected on July 7th, after 40 days of run time, analytical results indicated that the contaminant removal rate had dropped by approximately 43% to 45.8 lbs./day. Continued monthly sampling of the through December 1997 has shown a stabilization of the removal rate between 46 and 54 pounds of VOCs per day.

4.2 STARTUP PROBLEMS

The only problem encountered during the startup of the SVE system was the time required to obtain carbon changeout services in June. Philip was informed in late May that the pre-arranged vendor for carbon changeout services would no longer be operating their Tukwila Washington service center. The system was down for 16 days while arrangements were made to schedule the changeout after breakthrough was detected on the second adsorption unit. This problem has been addressed, and a more rapid response was obtained for the second changeout in early July (6 days of downtime). The contaminant removal rate has now stabilize to the point that breakthrough can be anticipated. and GAC changeout scheduled so that downtime is now about 5 hours per changeout.

5 NOVOCS STARTUP

EG&G Environmental started the in-well air stripping NoVOCs system on May 8, 1997. Air line depths for startup were placed at 5 feet below the static water level. The design depth is 15 feet

below the static water level to obtain the 250 gallon per minute design pumping rate. After approximately one hour of operation the system went through an "auto" shut down because of a high temperature alarm at the blower output. The high temperature was addressed using a variety of methods to reduce the blower output temperature, including cooling fans and evaporative coolers, and finally an in-line air to air heat exchanger. The NoVOCs system ran approximately 50% of the time at the lower pumping rate while EG&G worked to solve this problem during the three month startup period.

After installation of the heat exchanger the NoVOCs system was restarted on September 8, 1997 with the air injection line of both wells set at approximately 15 feet below the static water level. After one week of operation the NoVOCs wells stabilized at the following levels:

Well NV-01	**Well NV-02**
Pressure – 122.2 inches of water	Pressure – 114.8 inches of water
Vacuum – 39.8 inches of water	Vacuum – 25.3 inches of water
Air supply flow – 310 scfm	Air supply flow – 310 scfm
Air return flow – 370 scfm	Air return flow – 385 scfm
Depth to water in intake screen – 58.81 feet (Prior to Start 57.32 feet)	Depth to water in intake screen – 63.73 feet (Prior to Start 63.08 feet)
Depth to water in recharge screen – 47.54 feet (Bottom of recharge screen – 52.27 feet)	Depth to water in recharge screen – 54.61 feet (Bottom of recharge screen – 61.55 feet)

Since the installation of the heat exchanger the NoVOCs system has operated continuously with the exception of two days of downtime required to repair a broken airline in NV-01.

5.1 GROUNDWATER PERFORMANCE MONITORING

Groundwater samples from the IRM performance monitoring wells EE-2, EE-3, #2, MW-10S, MW-11S, MW-12S, MW-12ID, and MW-13S were collected monthly from June 1997 to September 1997. The results of this monthly sampling, and preliminary results from the

December 1997 quarterly sampling are summarized in Table 3. Analysis of this data shows that for most VOCs a downward trend has been established since the operation of the IRM began in May 1997. Concentrations of selected VOCs versus time are included as Figures 3 through 14. These figures consist of two groups, wells within the NoVOCs treatment zone and wells directly downgradient of the treatment zone. Although not in the NoVOCs treatment zone, EE-3 has been included in the treatment zone graphs as a reference. Concentrations of PCE, TCE, cis-1,2-DCE,vinyl chloride, 1,1,1-TCA and 1,1-DCE have been charted.

Treatment zone wells typically exhibit a dramatic initial drop in the concentrations of most VOCs. These concentrations then rebounded during the downtime of the NoVocs wells. After restart of the NoVOCs wells on September 8 another dramatic drop in concentrations takes place, and continues to decline in December.

An anomalous increase in the concentration of most detected VOCs was observed in MW-12S during the June 1997 sampling round. The levels of VOCs in this well returned to pre-IRM levels or lower in the subsequent July sampling round. For some, but not all VOCs, this spike in concentration was echoed in MW-10S and MW-11S farther downgradient in later sampling rounds.

Well MW-13S, located 150 feet north-northwest of the NoVocs treatment zone, has shown increased levels of most VOCs since the startup of the IRM. Because of MW-13S's distance and location with respect to the NoVOCs wells, it is not thought that they are the cause of this increase. The levels of VOCs peaked during the September 1997 sampling round. A decrease was observed in the preliminary December data, although most detected VOC concentrations ore still above pre-IRM levels. At this time the cause of the VOC concentration increases in MW-13S is not known. This well will continue to be monitored and concentration trends tracked.

It should be noted that EE-3 shows a significant decline in most VOCs since the startup of the IRM in May 1997. Total detected VOCs in EE-3 have been reduced in the last ten months from a high of 15455 ug/l in June 1997 to a low of 7367 ug/l in December 1997. Total detected VOCs

in EE-2 have been reduced in the last ten months from a high of 138 ug/l in March 1997, to a low of 0 ug/l in December 1997. In fact, only three VOCs were detected in the September 1997 groundwater sample collected from EE-2: cis-1,2-DCE at 0.6 ug/l, vinyl chloride at 0.05 ug/l and 1,1-DCE at 0.02 ug/l. Preliminary results from the December sampling round indicate that no VOCs were present above detection limits in well EE-2. If this trend in EE-3 and EE-2 continues, it will provide the best proof that the SVE system is significantly reducing transport of contaminants to ground water.

Wells downgradient of the NoVOCs treatment zone also show a downward trend in the concentration of VOCs in the groundwater. Most concentrations have been reduced by at least one half and some concentrations have been reduced by a factor of ten. Total detected VOCs in MW-10S have been reduced in the last ten months from a high of 170 ug/l in March 1997, to a low of 21.6 ug/l in December 1997. Total detected VOCs in MW-11S have been reduced in the last ten months from 93 ug/l in June 1997, to a low of 44.15 in December 1997. If this trend continues, it will show that the present SVE and NoVocs systems can effectively remediate the downgradient groundwater.

6 CONTINUED REPORTING

Performance monitoring will continue per the Performance Monitoring Plan for both the SVE and NoVOCs systems. Data collected during this monitoring will be provided in future quarterly reports according to the schedule specified in the Performance Monitoring Plan.

7 EAST LEWIS STREET CITY WATER EXTENSION

As part of the IRM undertaken at the Pasco Landfill site, users of domestic wells identified as containing water with detectable levels of volatile organic compounds (VOCs) were hooked up to the City of Pasco (City) municipal water supply. These wells were identified during sampling,

conducted in March and June of 1996, of all private wells found in that area of the City bounded by A Street to the south, Highway 12 on the east and north, and Beech Street on the west. Five wells were found to contain detectable levels of VOCs. The owners of these five wells are:

Bonnie Brae Apartments
Lester West
Ruth Rindt
Doug Brown (Hideaway Motel)
Allan Yenney

The installation of the water main extension and hookup to individual homes was completed on December 19, 1997. Bottled water supplies have been removed from all residences in the impacted area. Semi-annual sampling of the Yenny #2 well and the Rada well will be performed during the spring and fall sampling events completed as part of the ongoing post RI groundwater monitoring.

TABLES

TABLE 1

SVE RADIUS OF INFLUENCE DATA

Monitoring Point	5/15/97 Baseline Time/Vacuum (in. H2O)	5/15/97 Round 1 Time/Vacuum (in. H2O)	5/15/97 Round 2 Time/Vacuum (in. H2O)	5/15/97 Round 3 Time/Vacuum (in. H2O)	5/22/97 Round 4 Time/Vacuum (in. H2O)	5/22/97 Round 5 Time/Vacuum (in. H2O)	6/2/97 Baseline Time/Vacuum (in. H2O)	6/2/97 Round 1 Time/Vacuum (in. H2O)	6/2/97 Round 2 Time/Vacuum (in. H2O)	6/3/97 Round 3 Time/Vacuum (in. H2O)	6/3/97 Round 4 Time/Vacuum (in. H2O)	6/3/97 Round 5 Time/Vacuum (in. H2O)
VEW-01	NA	1132/-9.5	1239/-9.5	1447/-9.5	1141/-10.5	1302/-9.8	1249/+0.33	1424/-7.2	1619/-7.4	0858/-9.0	1233/-9.8	1524/-10.6
VMW-01D	0824/-0.56	1108/-1.92	1237/-2.0	1444/-1.85	1140/-2.27	1300/-1.90	1245/+0.56	1422/-0.61	1618/-0.71	0852/-2.28	1232/-2.42	1513/-3.10
VMW-01S	0823/-0.26	1108/-1.2	1234/-1.2	1444/-1.1	1139/-1.21	1259/-1.10	1247/+0.34	1423/-0.27	1617/-0.33	0852/-1.33	1230/-1.36	1512/-1.75
VEW-02	0815/-0.71	1120/-1.15	1252/-1.15	1436/-0.95	1119/-1.30	1252/-0.81	1228/+0.62	1416/-0.13	1610/-0.17	0845/-1.37	1224/-1.56	1505/-2.20
VMW-02D	NA	1126/-10.5	--	1442/-10.5	1133/-11.2	1258/-10.5	1200/+0.39	1420/-8.0	1615/-8.7	0849/-11.0	1227/-11.5	1510/-12.0
VMW-02S	0817/-0.06	1126/-0.22	--	1442/-0.2	1133/-0.21	1257/-0.20	1239/+0.08	1421/-0.08	1615/-0.08	0849/-0.27	1228/-0.33	1511/-0.37
VMW-03D	0811/-0.66	1119/-1.55	1250/-1.50	1438/-1.4	1122/-1.73	1255/-1.35	1232/+0.61	1417/-0.25	1613/-0.25	0847/-1.75	1226/-2.04	1508/-2.65
VMW-03S	0813/-0.12	1129/-0.17	1250/-0.18	1440/-0.15	1123/-0.20	1254/-0.11	1231/+0.11	1417/-0.05	1612/-0.04	0847/-0.19	1225/-0.26	1507/-0.34
VEW-03	0836/-0.66	1115/-1.25	1245/-1.29	1455/-1.12	1151/-1.41	1308/-1.07	1259/+0.69	1432/-0.08	1626/-0.11	0905/-1.60	1240/-2.77	1534/-2.27
VEW-04	NA	1114/-9.5	1243/-9.5	1453/-9.5	1149/-9.8	1306/-9.8	1257/+0.47	1429/-8.7	1624/-8.7	0903/-10.2	1237/-10.1	1531/-10.5
PH-36	0828/-0.61	1110/-1.55	1240/-1.62	1449/-1.5	1144/-1.89	1303/-1.52	1251/+0.64	1426/-0.33	1620/-0.29	0858/-1.88	1235/-2.01	1525/-2.60
PH-37	0834/-0.43	1114/>-3.0	1243/>-3.0	1453/-4.25	1149/>-3.0	--	1256/+0.62	1429/-2.98	1624/-2.92	0903/>-3.0	1237/>-3.0	1531/>-5.0
PH-38	0832/-0.26	1113/-0.79	1243/-0.82	1451/-0.80	1147/-0.93	1306/-0.72	1254/+0.29	1428/-0.21	1623/-0.19	0902/-1.16	1236/-1.18	1529/-1.50

Notes:
NA - Not Applicable
-- - Reading not taken

Table 2
SVE Total Vapor Analytical Results and Removal Rates

Compound	5/8/1997 NG/CC	5/22/1997 NG/CC	6/3/1997 NG/CC	7/7/1997 NG/CC	8/20/1997 NG/CC	9/22/1997 NG/CC	10/14/97 NG/CC	11/17/97 NG/CC	12/15/1997 NG/CC
Dichlorodifluoromethane	7.5	2.9	9.5	1.9	5.6	4	4.2	4	4.3
Chloromethane	<1	<1	<1	8.9	<1	<1	<1	<1	<1
Vinyl chloride	<1	<1	2.5	1.1	1.84	<1	1	<1	<1
Chloroethane	<1	<1	2.9	3.0	14.3	9	2.8	2.3	1.9
Trichlorofluoromethane	31	8.7	40	2.8	10.3	5.7	5.4	4	1.4
1,1-Dichloroethene	<1	3.6	11	4.5	6.6	3.9	4.1	3.2	2.5
Ethyl Ether	<5	<5	<5	<5	313	<5	<5	<5	<5
1,1,2-Trichlorotrifluoroethane	<5	<5	535	<5	<5	<5	<5	<5	<5
Acetone	<5	<5	<5	25	<5	<5	33	<5	8
Carbon disulfide	5.2	4.3	<1	3.5	<1	<1	<1	<1	<1
2-Methylpentane	<5	<5	15	9.8	14.4	<5	9.7	8.3	7.3
Methylene chloride	<5	7.6	46	73	79.7	79	87	87	100
3-Methylpentane	<5	<5	14	8.9	14.2	9.2	9.4	7.7	7.1
1,1-Dichloroethane	18	17	66	50	84.3	62	64	58	56
Methylcyclopentane	<1	5.0	20	12	21.5	14	15	12	12
cis-1,2-dichloroethene	16	23	84	62	93.2	65	70	62	60
Chloroform	2.3	2.3	7.2	4.3	12.87	9.7	9.9	8.7	7.8
1,1,1-Trichloroethane	50	39	150	120	205.4	150	160	140	130
1,2-Dichloroethane	<1	<1	1.8	2.5	3.3	3.5	3.5	4.2	4.1
Benzene	<1	<1	3.1	2.8	2.96	8.3	2.7	2.6	3.2
Trichloroethene	23	25	120	120	157.7	140	140	120	140
4-Methyl-2-pentanone (MIBK)	<5	<5	<5	7.9	<5	<5	5.2	7.2	9.8
Toluene	<2	39	180	200	266.5	220	210	200	240
Tetrachloroethene	6.1	2.8	13	8.2	16.02	15	13	11	13
Ethylbenzene	<1	4.4	19	17	24.3	22	21	18	21
m,p-Xylene	<1	11	49	44	68.8	72	55	45	55
o-Xylene	<1	1.6	11	9.6	12.2	20	12	9.4	11
Isopropylbenzene	<1	<1	1.1	<1	1.21	1.5	<1	<1	<1
n-propylbenzene	<1	<1	2.3	1.1	2.28	3.7	1.3	1.1	1.7
1,3,5-Trimethylbenzene	<1	<1	3.0	1.1	2.37	7.3	1.4	1.3	1.5
1,2,4-Trimethylbenzene	<1	<1	6.7	1.3	2.23	17	1.7	1.3	2.7
Napthalene	<5	<5	7.8	<5	<5	<5	<5	<5	<5
Total	**159.1**	**197.2**	**1420.9**	**806.2**	**1437.08**	**941.8**	**942.3**	**818.3**	**901.3**
PID Reading (ppm)	<1	<1	27.1	28.5					
Flow rate (scfm)	628.6	619.9	631.4	631.4	613	636.4	633.9	634.3	643.2
Removal Rate (lbs/day)	9.0	11.0	80.7	45.8	79.2	53.9	53.7	46.7	52.1

Note: NG/CC=ug/l
lbs./day=(X)ug/l x 28.32 x (Y)ft3/day x 0.002205 lbs/gm /1,000,000 ug/gm

Table 3
Pasco Groundwater IRM Performance Monitoring Summary

SITE	DATE	Chloromethane (ug/l)	Chloroethane (ug/l)	Trichloro fluoromethane (ug/l)	Acetone (ug/l)	Methylene chloride (ug/l)	trans-1,2-Dichloroethene (ug/l)	1,1-DCA (ug/l)	2-Butanone (ug/l)	cis-1,2-Dichloroethene (ug/l)	Chloroform (ug/l)
#2	4/16/97	<1	<4	<4	<6	1.3	0.9	280	<3	530	36
#2	6/18/97	<1	<4	<4	<6UJ	<0.9	<0.7	4.2	<3UJ	4.6	<0.6
#2	7/24/97	<1	<4	<4	<6	<0.91	<0.7	14	<3	8.8	0.9
#2	8/19/97	<1	6	10	<6	25	17	680	<3	1600	86
#2	9/25/97	<1	<4	<4	<6	3.7	<0.7	17	<3	14	1.3
#2	12/8/97	<1	<4	<4	<6		<0.7	12	<3	7.6	
EE-2	3/1/97	<1	<4	<4	<6	<0.91	<0.7	27.4	<3	30.6	0.938
EE-2	6/23/97	<1	<4	<4	<6UJ	<0.9	<0.7	0.8	<3UJ	1.3	<0.6
EE-2	7/23/97	<1	<4	<4	<6	1.6	<0.7	5.3	<3	11	<0.6
EE-2	8/19/97	<1	<4	<4	<6	<0.91	<0.7	2.2	<3	3.1	<0.6
EE-2	9/24/97	<1	<4	<4	<6	<0.91	<0.7	<0.7	<3	0.6	<0.6
EE-2	12/5/97	<1	<4	<4	<6	<0.91	<0.7	<0.7	<3	<0.4	<0.6
EE-3	3/1/97	<1	<4	<4U	3340	<6.66U	3.49	695	1130	2050	42.1
EE-3	6/23/97	<1	<4	15	4100J	13	2	830	2000J	2900	50
EE-3	7/23/97	2	6	8	1100	12	10	750	<3	2900	50
EE-3	8/19/97	<1	35	10	200	340	1.8	460	<3	1700	37
EE-3	9/24/97	<1	<4	<0.01	20	8.2	<0.7	130	<3	480	11
EE-3	12/5/97	<1	<4	<0.01	2100	2.6	1.2	330	1300	1600	15
MW-10S	3/1/97	<1	<4	<4	<6	<0.91	<0.7	36.8	<3	59.3	2.25
MW-10S	6/17/97	<1	<4	<4	<6UJ	<0.9	<0.7	22	<3UJ	37	<1.4U
MW-10S	7/23/97	<1	<4	<4	<6	<0.91	<0.7	16	<3	20	1
MW-10S	8/20/97	<1	<4	<4	<6	<0.91	<0.7	18	<3	24	0.9
MW-10S	9/24/97	<1	<4	<4	<6	<0.91	<0.7	5.7	<3	8.9	<0.6
MW-10S	12/4/97	<1	<4	<4	<6	<0.91	<0.7	4.3	<3	8.7	<0.6
MW-11S	2/27/97	<1	<4	<4	<6	<0.91	<0.7	2.44	<3	3.53	0.683
MW-11S	6/17/97	<1	<4	<4	<6UJ	<0.9	<0.7	20	<3UJ	44	<3.8U
MW-11S	7/23/97	<1	<4	<4	<6	<0.91	<0.7	21	<3	45	3.7
MW-11S	8/20/97	<1	<4	<4	<6	<0.91	<0.7	28	<3	58	3.9
MW-11S	9/24/97	<1	<4	<4	<6	<0.91	<0.7	9.5	<3	21	1.9
MW-11S	12/4/97	<1	<4	<4	<6	<0.91	<0.7	8.8	<3	19	<0.6

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Table 3
Pasco Groundwater IRM Performance Monitoring Summary

SITE	DATE	1,1,1-TCA (ug/l)	Benzene (ug/l)	1,2-DCA (ug/l)	TCE (ug/l)	1,2-Dichloro-propane (ug/l)	Dibromo-methane (ug/l)	cis-1,3-Dichloropropene (ug/l)	4-Methyl-2-pentanone (ug/l)	Toluene (ug/l)	1,1,2-TCA (ug/l)	PCE (ug/l)
#2	4/16/97	170	<0.5	19	57	<0.5	<0.9	<0.4	<2	<0.5	1.1	11
#2	6/18/97	1.1	<0.5	<0.5	<0.6	<0.5	<0.9	<0.4	<2	<0.5	<0.5	<0.5
#2	7/24/97	2.2	<0.5	0.7	1	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
#2	8/19/97	530	1	56	160	<0.5	<0.9	<0.4	<2	<0.4	1.9	21
#2	9/25/97	16	<0.5	1	<0.6	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
#2	12/8/97	23	<0.5	1	1.1	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
EE-2	3/1/97	33.1	<0.5	<0.5	36.2	<0.5	<0.9	<0.4	<2	<0.4	<0.5	7.69
EE-2	6/23/97	1.1	<0.5	<0.5	1.5	<0.5	<0.9	<0.4	<2	<0.5	<0.5	<0.5
EE-2	7/23/97	5.8	<0.5	<0.5	9.6	<0.5	<0.9	<0.4	<2	<0.4	<0.5	0.7
EE-2	8/19/97	2.5	<0.5	<0.5	3.1	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
EE-2	9/24/97	<0.7	<0.5	<0.5	<0.6	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
EE-2	12/5/97	<0.7	<0.5	<0.5	<0.6	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
EE-3	3/1/97	816	36.7	82.3	44.3	<0.5	<0.9	<0.4U	386	3150	2.77	16.8
EE-3	6/23/97	450	51	120	11	<0.5	<0.9	<0.4	1100	2300	4.8	20
EE-3	7/23/97	480	32	130	49	<0.5	<0.9	0.8	390	2500	3.4	22
EE-3	8/19/97	210	18	240	75	<0.5	<0.9	1.2	5	1300	4.4	11
EE-3	9/24/97	51	3.1	43	10	<0.5	<0.9	<0.4	<2	390	0.9	2.6
EE-3	12/5/97	170	12	170	4.1	<0.5	<0.9	<0.4	13	1300	1.9	2.5
MW-10S	3/1/97	32.3	<0.5	3	29.1	<0.5	<0.9	<0.4	<2	<0.4	<0.5	3.5
MW-10S	6/17/97	18	<0.5	1.6	13	<0.5	<0.9	<0.4	<2	<0.5	<0.5	2.5
MW-10S	7/23/97	16	<0.5	0.9	12	<0.5	<0.9	<0.4	<2	<0.4	<0.5	2.7
MW-10S	8/20/97	17	<0.5	<0.5	<0.6	1.2	13	<0.4	<2	<0.4	<0.5	2
MW-10S	9/24/97	4.9	<0.5	0.5	4.5	<0.5	<0.9	<0.4	<2	<0.4	<0.5	0.8
MW-10S	12/4/97	3.3	<0.5	0.7	3.7	<0.5	<0.9	<0.9	<2	<0.4	<0.5	0.6
MW-11S	2/27/97	2.32	<0.5	<0.5	3.01	<0.5	<0.9	<0.9	<2	<0.4	<0.5	1.52
MW-11S	6/17/97	13	<0.5	1.4	10	<0.5	<0.9	<0.4	<2	<0.5	<0.5	2.6
MW-11S	7/23/97	13	<0.5	1.5	9	<0.5	<0.9	<0.4	<2	<0.4	<0.5	2.3
MW-11S	8/20/97	16	<0.5	1.6	12	<0.5	<0.9	<0.4	<2	<0.4	<0.5	2.4
MW-11S	9/24/97	5.6	<0.5	0.7	5.8	<0.5	<0.9	<0.4	<2	<0.4	<0.5	1.1
MW-11S	12/4/97	5.7	<0.5	0.6	7.7	<0.5	<0.9	<0.4	<2	<0.4	<0.5	1.5

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Table 3
Pasco Groundwater IRM Performance Monitoring Summary

SITE	DATE	2-Hexanone (ug/l)	Chlorobenzene (ug/l)	Ethylbenzene (ug/l)	m,p-Xylene (ug/l)	o-Xylene (ug/l)	Styrene (ug/l)	1,4-Dichloro-benzene (ug/l)	1,2-Dichloro-benzene (ug/l)	Vinyl chloride (ug/l)	1,1-DCE (ug/l)
#2	4/16/97	<3	<0.5	0.6	<0.5	0.5	<0.4	<0.4	0.5	1.1	18
#2	6/18/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.02	0.11
#2	7/24/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.09	0.82
#2	8/19/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	0.5	2.3	22	92
#2	9/25/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.11	0.68
#2	12/8/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.05	0.36
EE-2	3/1/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	<0.02	2.44
EE-2	6/23/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	<0.02	0.19J
EE-2	7/23/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.05	0.43
EE-2	8/19/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	<0.02	<0.01
EE-2	9/24/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.05	0.02
EE-2	12/5/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	<0.02	<0.01
EE-3	3/1/97	4.89	1.41	372	943	315	33.1	0.56	5.84	8.03	72.2
EE-3	6/23/97	7	1.4	300	820	270	<0.4	1	12	12	65
EE-3	7/23/97	6	1.1	230	630	220	<0.4	0.7	7.4	7.6	51
EE-3	8/19/97	4	<0.5	75	210	75	<0.4	0.4	4.7	31	39
EE-3	9/24/97	<3	<0.5	22	59	18	<0.4	<0.4	0.9	1.1	3
EE-3	12/5/97	5	<0.5	85	250	84	<0.4	<0.4	<0.5	1.3	4.5
MW-10S	3/1/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.18	3.64
MW-10S	6/17/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.08J	2.2J
MW-10S	7/23/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.04	1.9
MW-10S	8/20/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.12	4
MW-10S	9/24/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.02	0.98
MW-10S	12/4/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.03	0.29
MW-11S	2/27/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	<0.02	0.52
MW-11S	6/17/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.1J	1.9J
MW-11S	7/23/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.1	2.2
MW-11S	8/20/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.38	4.5
MW-11S	9/24/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.06	1.4
MW-11S	12/4/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.05	0.78

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Table 3
Pasco Groundwater IRM Performance Monitoring Summary

SITE	DATE	Chloromethane (ug/l)	Chloroethane (ug/l)	Trichloro fluoromethane (ug/l)	Acetone (ug/l)	Methylene chloride (ug/l)	trans-1,2-Dichloroethene (ug/l)	1,1-DCA (ug/l)	2-Butanone (ug/l)	cis-1,2-Dichloroethene (ug/l)	Chloroform (ug/l)
MW-12ID	3/1/97	<1	<4	<4	<6	<0.91	<0.7	32.7	<3	56.6	1.84
MW-12ID	6/17/97	<1	<4	<4	<6UJ	<0.9	<0.7	8.5	<3UJ	11	<0.6
MW-12ID	7/23/97	<1	<4	<4	<6	<0.91	<0.7	5.9	<3	8.7	<0.6
MW-12ID	8/20/97	<1	<4	<4	<6	<0.91	<0.7	10	<3	23	0.6
MW-12ID	9/25/97	<1	<4	<4	<6	4.5	<0.7	13	<3	17	1
MW-12ID	12/4/97	<1	<4	<4	<6	<0.9	<0.7	7.3	<3	14	<0.6
MW-12S	3/1/97	<1	<4	<4	<6	<0.91	<0.7	81.7	<3	182	6.7
MW-12S	6/18/97	<1	<4	<4	<6UJ	<0.9	1.2	290	<3UJ	670J	32
MW-12S	7/23/97	<1	<4	<4	<6	<0.91	<0.7	49	<3	110	2.9
MW-12S	8/19/97	<1	<4	<4	<6	<0.91	<0.7	26	<3	54	1.9
MW-12S	9/25/97	<1	<4	<4	<6	<0.91	<0.7	23	<3	59	1.9
MW-12S	12/4/97	<1	<4	<4	<6	<0.91	<0.7	8.5	<3	20	<0.6
MW-13S	3/1/97	<1	<4	<4	<6	<0.91	<0.7	40.5	<3	57.8	9.52
MW-13S	6/17/97	<1	<4	<4	<6UJ	<0.9	<0.7	100	<3UJ	170J	23
MW-13S	7/23/97	<1	<4	<4	<6	22	<0.7	82	<3	160	22
MW-13S	8/19/97	<1	<4	<4	<6	<0.91	<0.7	27	<3	52	4.3
MW-13S	9/24/97	<1	<4	<4	<6	3.9	<0.7	120	<3	170	17
MW-13S	12/4/97	<1	<4	<4	<6	1.9	<0.7	50	<3	86	7.9
NVM-01	4/16/97	<1	<4	7	<6	3.5	1.7	790	<3	1600	70
NVM-01	6/18/97	<1	<4	<4	<6UJ	<0.9	<0.7	37	<3UJ	71J	<3.8U
NVM-01	7/24/97	<1	<4	<4	<6	<0.91	1	220	<3	540	22
NVM-01	8/19/97	<1	<4	8	<6	<0.91	1.8	540	<3	1600	25
NVM-01	9/24/97	<1	<4	5	<6	3.7	<0.7	230	<3	640	22
NVM-01	12/6/97	<1	<4	<4	<6	1.5	<0.7	6.4	<3	9.3	
NVM-02	4/16/97	<1	<4	<4	<6	<0.9	7.8	59	<3	140	8.7
NVM-02	6/18/97	<1	<4	<4	<6UJ	<0.9	<0.7	4.8	<3UJ	8.5	<0.6
NVM-02	7/24/97	<1	<4	<4	<6	<0.91	2.1	260	<3	570	47
NVM-02	8/19/97	<1	8	10	<6	360	2.1	400	<3	940	54
NVM-02	9/24/97	<1	<4	<4	<6	<0.91	<0.7	49	<3	36	3.4
NVM-02	12/6/97	<1	<4	<4	<6	<0.91	<0.7	17	<3	15	<0.6

For RCL 8260-Z

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Table 3
Pasco Groundwater IRM Performance Monitoring Summary

SITE	DATE	1,1,1-TCA (ug/l)	Benzene (ug/l)	1,2-DCA (ug/l)	TCE (ug/l)	1,2-Dichloro-propane (ug/l)	Dibromo-methane (ug/l)	cis-1,3-Dichloropropene (ug/l)	4-Methyl-2-pentanone (ug/l)	Toluene (ug/l)	1,1,2-TCA (ug/l)	PCE (ug/l)
MW-12ID	3/1/97	27.4	<0.5	2.89	22.2	<0.5	<0.9	<0.4	<2	<0.4	<0.5	2.55
MW-12ID	6/17/97	9.2	<0.5	<0.5	8.3	<0.5	<0.9	<0.4	<2	<0.5	<0.5	1.4
MW-12ID	7/23/97	6.5	<0.5	<0.5	6.1	<0.5	<0.9	<0.4	<2	<0.4	<0.5	1
MW-12ID	8/20/97	7.5	<0.5	1.3	9	<0.5	<0.9	<0.4	<2	<0.4	<0.5	0.6
MW-12ID	9/25/97	11	<0.5	1.4	4.3	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
MW-12ID	12/4/97	7.9		1.4	2.1	<0.5	<0.9	<0.4	<2	<0.4	<0.5	<0.5
MW-12S	3/1/97	66.5	<0.5	8.99	44.1	<0.5	<0.9	<0.4	<2	<0.4	<0.5	5.36
MW-12S	6/18/97	150	<0.5	40	83	<0.5	<0.9	<0.4	<2	<0.5	1.5	15
MW-12S	7/23/97	50	<0.5	6.9	14	<0.5	<0.9	<0.4	<2	<0.4	<0.5	3.3
MW-12S	8/19/97	15	<0.5	3.6	17	<0.5	<0.9	<0.4	<2	<0.4	<0.5	2.2
MW-12S	9/25/97	14	<0.5	3.1	11	<0.5	<0.9	<0.4	<2	<0.4	<0.5	1.1
MW-12S	12/4/97	5.3	<0.5	1.8	2.1	<0.5	<0.9	<0.4	<2	<0.5	<0.5	0.5
MW-13S	3/1/97	24.5	<0.5	1.02	16.4	<0.5	<0.9	<0.4	<2	<0.4	<0.5	3.93
MW-13S	6/17/97	82	0.9	2.3	76	<0.5	<0.9	<0.4	<2	<0.5	<0.5	11
MW-13S	7/23/97	51	<0.5	2.5	65	<0.5	<0.9	<0.4	<2	<0.4	<0.5	6.1
MW-13S	8/19/97	19	<0.5	1.4	24	<0.5	<0.9	<0.4	<2	<0.4	<0.5	3.2
MW-13S	9/24/97	140	<0.5	6.9	220	<0.5	<0.9	<0.4	<2	<0.4	<0.5	6.5
MW-13S	12/4/97	53	<0.5	9.3	100	<0.5	<0.9	<0.4	<2	1.3	0.5	6.2
NVM-01	4/16/97	540	12	88	140	<0.5	<0.9	<0.4	<2	130	2.9	23
NVM-01	6/18/97	32	<0.5	5.4	27	<0.5	<0.9	<0.4	<2	<0.5	<0.5	4.8
NVM-01	7/24/97	150	5.4	37	64	<0.5	<0.9	<0.4	<2	26	1.3	13
NVM-01	8/19/97	290	21	55	43	<0.5	<0.9	<0.4	<2	76	1.5	11
NVM-01	9/24/97	170	1.8	27	74	<0.5	<0.9	<0.4	<2	<0.4	0.9	9.9
NVM-01	12/6/97	7.4	<0.5	0.9	4.7	<0.5	<0.9	<0.4	<2	<0.4	<0.5	0.5
NVM-02	4/16/97	27	<0.5	8	18	<0.5	<0.9	<0.4	<2	<0.5	<0.5	2.7
NVM-02	6/18/97	1.9	<0.5	0.6	2.4	<0.5	<0.9	<0.4	<2	<0.5	<0.5	<0.5
NVM-02	7/24/97	160	3.3	25	50	<0.5	<0.9	<0.4	<2	<0.4	1.4	12
NVM-02	8/19/97	260	0.5	31	280	<0.5	<0.9	<0.4	<2	<0.4	1.1	18
NVM-02	9/24/97	48	<0.5	1.3	33	<0.5	<0.9	<0.4	<2	<0.4	<0.5	1.1
NVM-02	12/6/97	30	<0.5	0.9	25	<0.5	<0.9	<0.4	<2	<0.4	<0.5	1.1

For RCL 8260-Z

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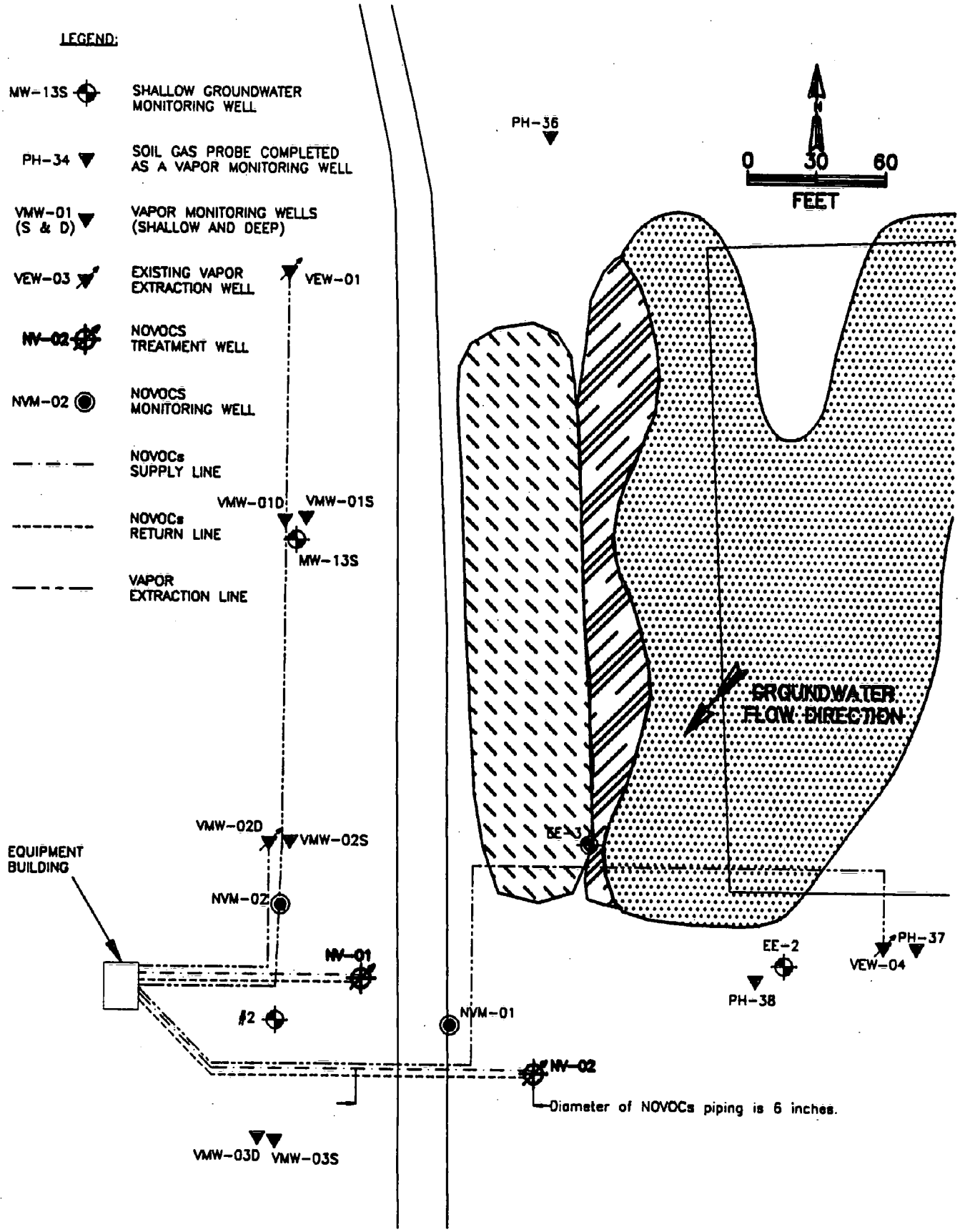
Table 3
Pasco Groundwater IRM Performance Monitoring Summary

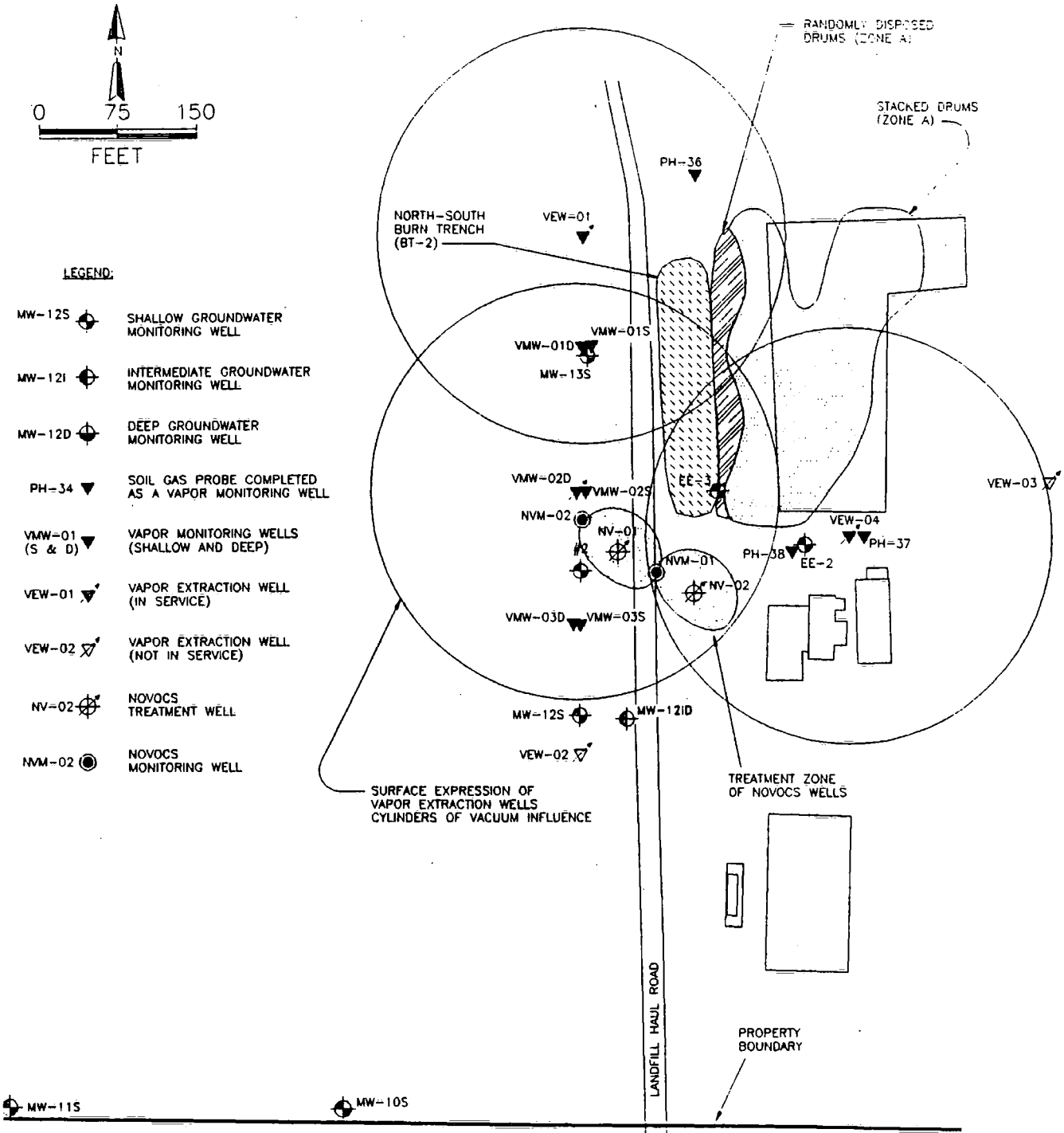
SITE	DATE	2-Hexanone (ug/l)	Chlorobenzene (ug/l)	Ethylbenzene (ug/l)	m,p-Xylene (ug/l)	o-Xylene (ug/l)	Styrene (ug/l)	1,4-Dichloro-benzene (ug/l)	1,2-Dichloro-benzene (ug/l)	Vinyl chloride (ug/l)	1,1-DCE (ug/l)
MW-12ID	3/1/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	<0.02	3.09
MW-12ID	6/17/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.04	0.77
MW-12ID	7/23/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.03	0.61
MW-12ID	8/20/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.23	0.92
MW-12ID	9/25/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.08	0.59
MW-12ID	12/4/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.04	0.26
MW-12S	3/1/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.4	7.29
MW-12S	6/18/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	1.3	27
MW-12S	7/23/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.29	6.8
MW-12S	8/19/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.23	5.3
MW-12S	9/25/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.11	1.5
MW-12S	12/4/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.06	0.44
MW-13S	3/1/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.09N	2.99
MW-13S	6/17/97	<3	<0.5	<0.5	<0.5	0.7	<0.4	<0.4	<0.5	0.56	8.3
MW-13S	7/23/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.26	4.4
MW-13S	8/19/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.42	2.3
MW-13S	9/24/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.38	2.2
MW-13S	12/4/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.17	1
NVM-01	4/16/97	<3	0.7	110	86	120	<0.4	0.4	3.2	5.9	65
NVM-01	6/18/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.13	5.9
NVM-01	7/24/97	<3	<0.5	31	50	43	<0.4	<0.4	0.9	1.5	28
NVM-01	8/19/97	<3	0.6	75	84	100	<0.4	<0.4	2.3	29	87
NVM-01	9/24/97	<3	<0.5	<0.5	<0.5	7.4	<0.4	<0.4	<0.5	1.6	21
NVM-01	12/6/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.03	0.44
NVM-02	4/16/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.25	1.8
NVM-02	6/18/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.03	0.43
NVM-02	7/24/97	<3	<0.5	<0.5	<0.5	0.9	<0.4	<0.4	1.7	1.4	25
NVM-02	8/19/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	0.7	15	51
NVM-02	9/24/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.29	2
NVM-02	12/6/97	<3	<0.5	<0.5	<0.5	<0.5	<0.4	<0.4	<0.5	0.1	0.65
For RCL 8260-Z											

December 1997 data have not undergone third party validation and are therefore preliminary.

FIGURES



PHILIP ENVIRONMENTAL	TITLE: Soil Vapor Extraction and NoVOCs System Configuration Pasco Landfill IRM	DWN: bw	DES.: pifirm02	PROJECT NO.: 624419
		CHKD:	APPD:	FIGURE NO.: 1
		DATE: 07/18/97	REV.: 1	



NOTE:

VAPOR EXTRACTION CYLINDERS OF VACUUM INFLUENCE CENTERED ON VEW-01, VMW-02D, VEW-04.

ZONE OF INFLUENCE OF NOVOCS EXTRACTION WELLS CENTERED ON NV-01 AND NV-02.

PHILIP ENVIRONMENTAL	TITLE: Soil Vapor Extraction and NoVOCs System Configuration Pasco Landfill Phase II RI/FS	DWN: bw DES.: PL2GIRM4 CHKD: APPD:	PROJECT NO.: 16921 FIGURE NO.: 2

Figure 3
PCE in Treatment Zone Wells

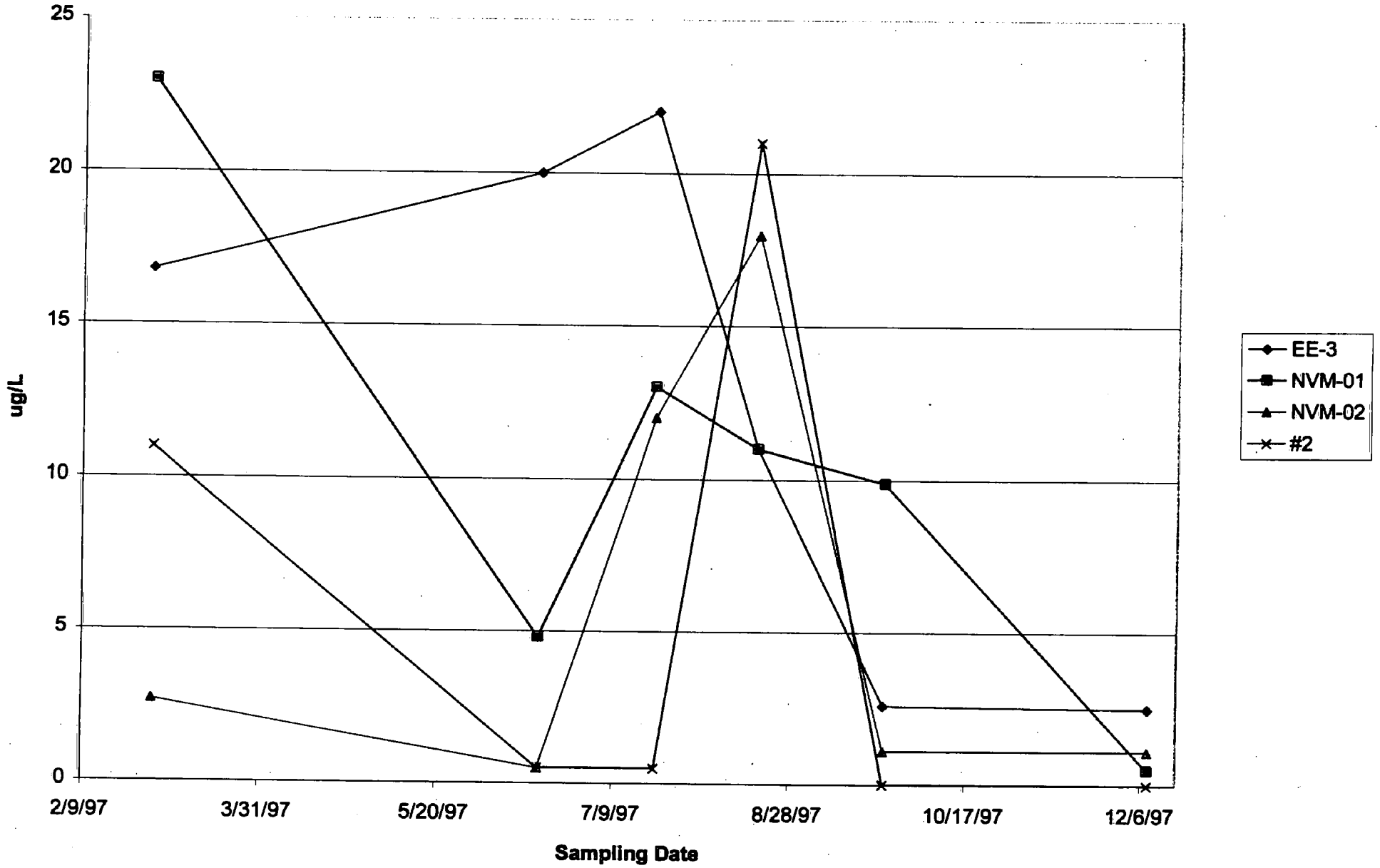


Figure 4
PCE in Downgradient Wells

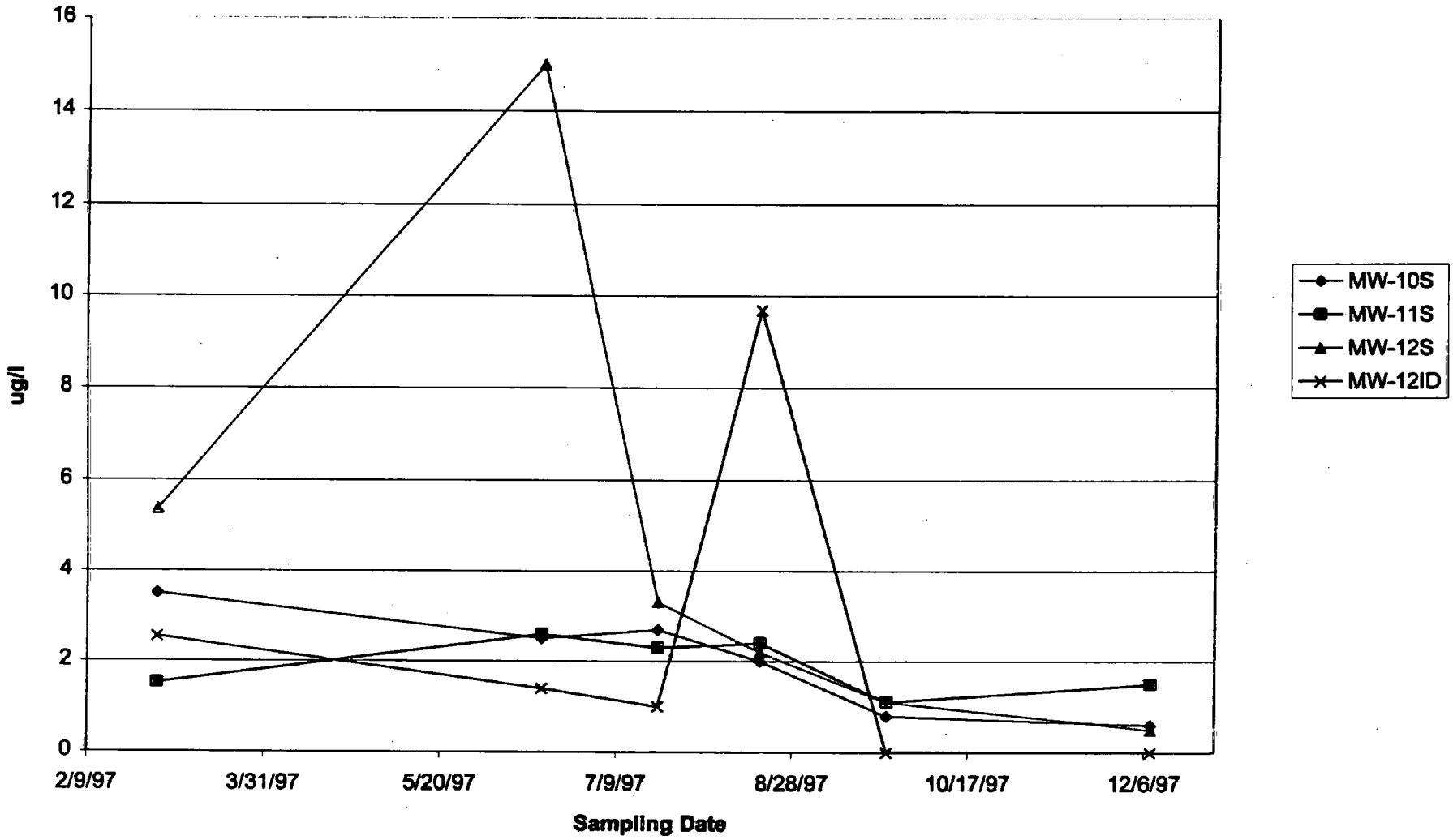


Figure 5
TCE in Treatment Zone Wells

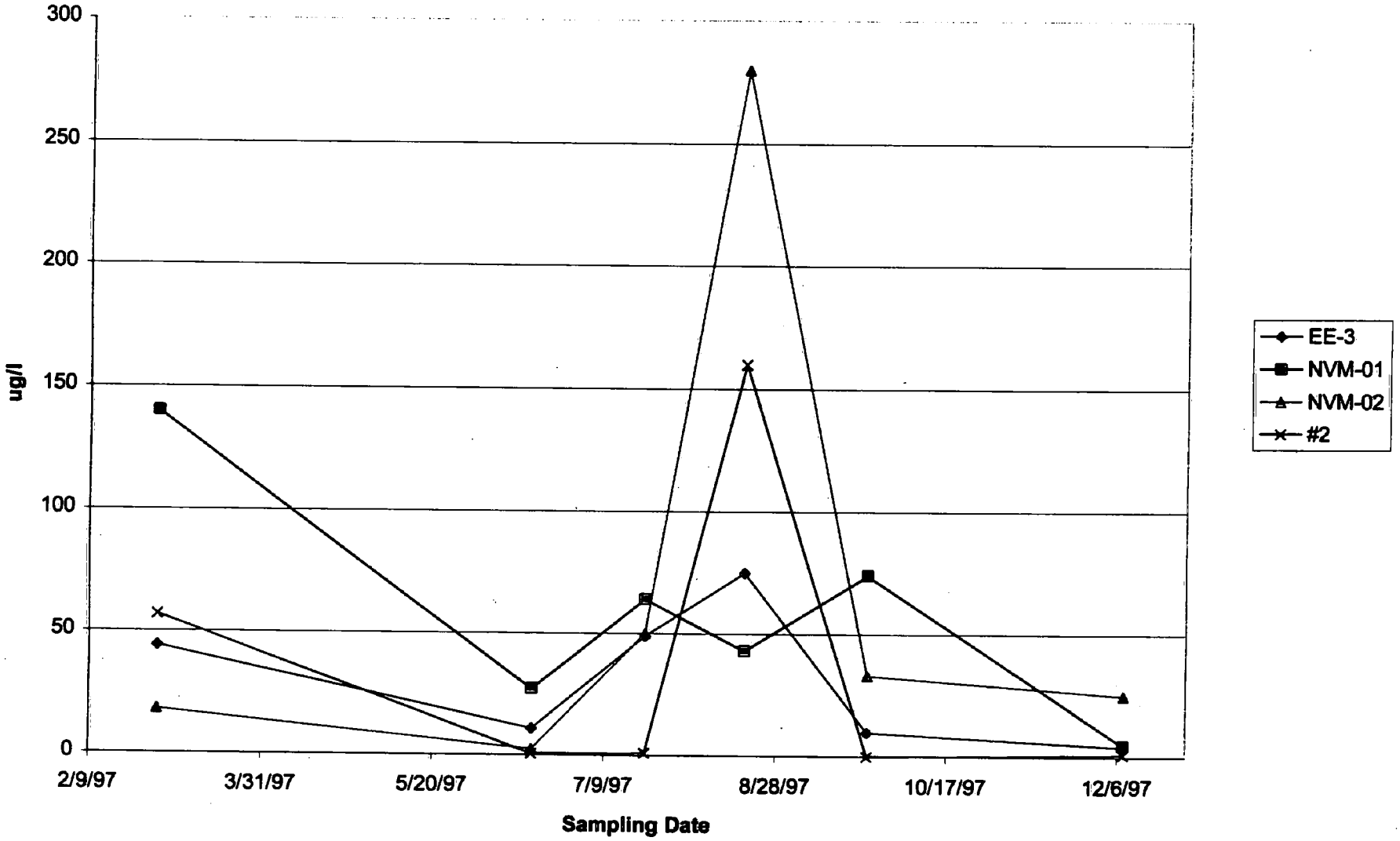


Figure 6
TCE in Downgradient Wells

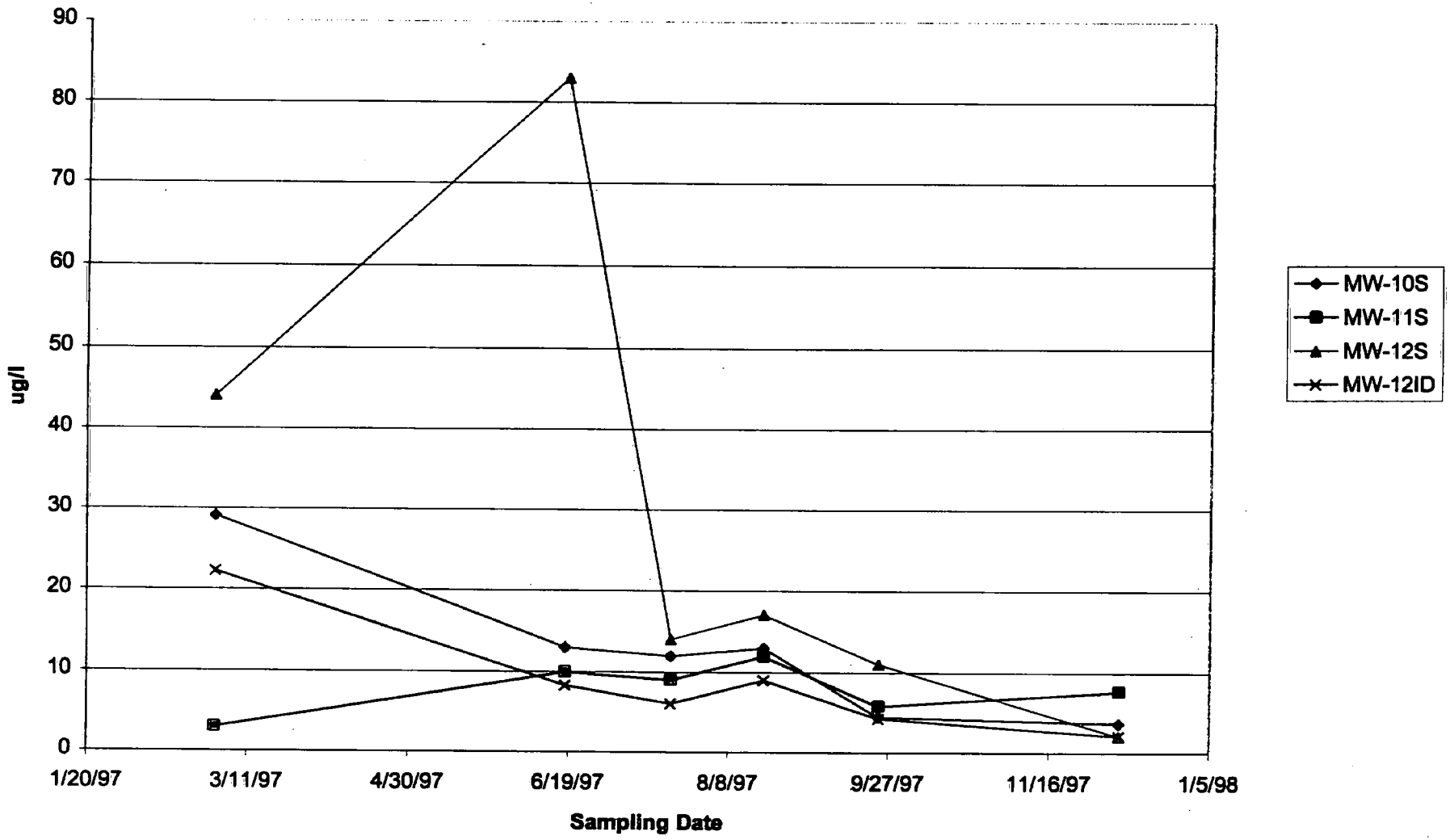


Figure 7
cis-1,2-DCE in Treatment Zone Wells

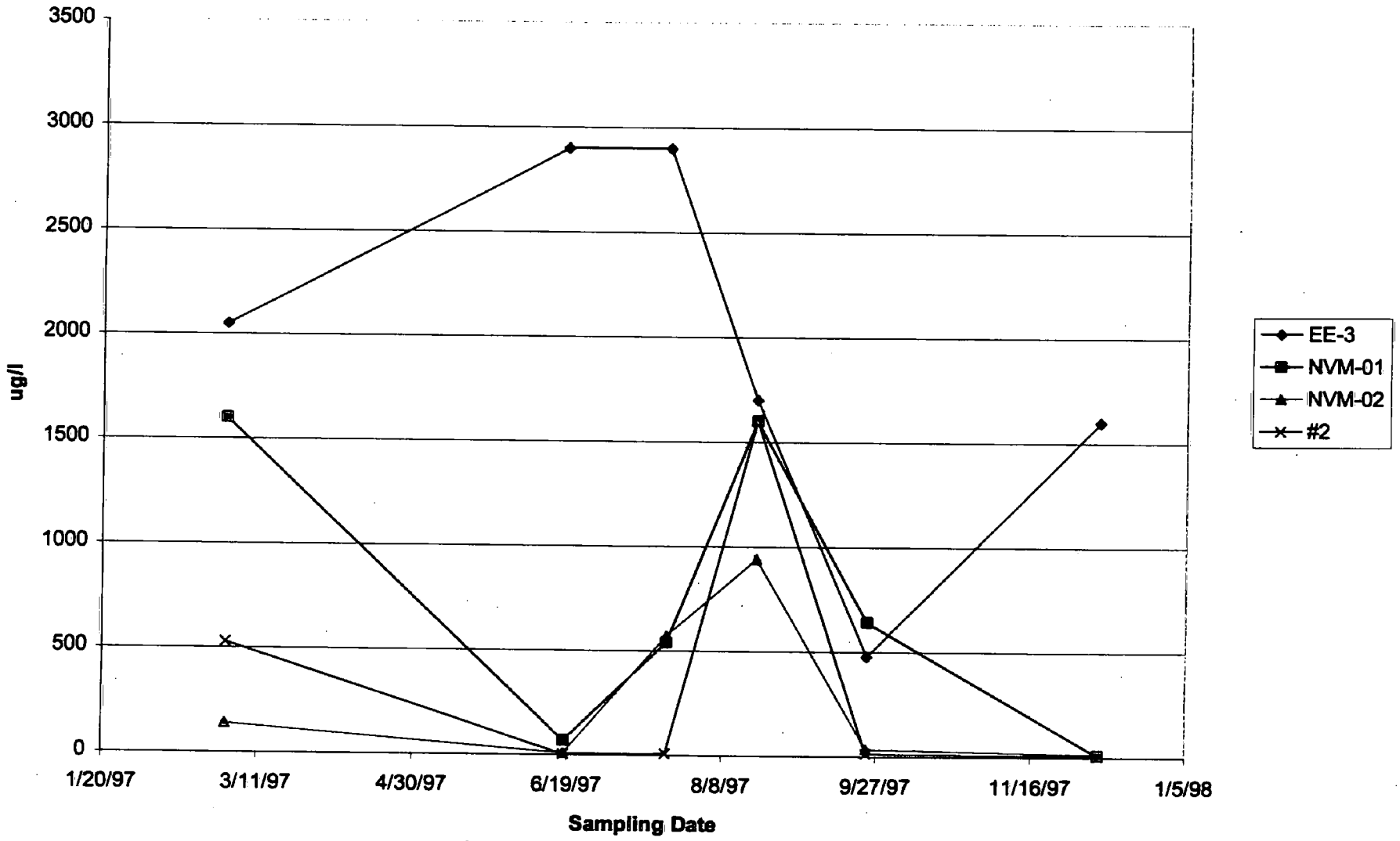


Figure 8
cis-1,2-DCE in Downgradient Wells

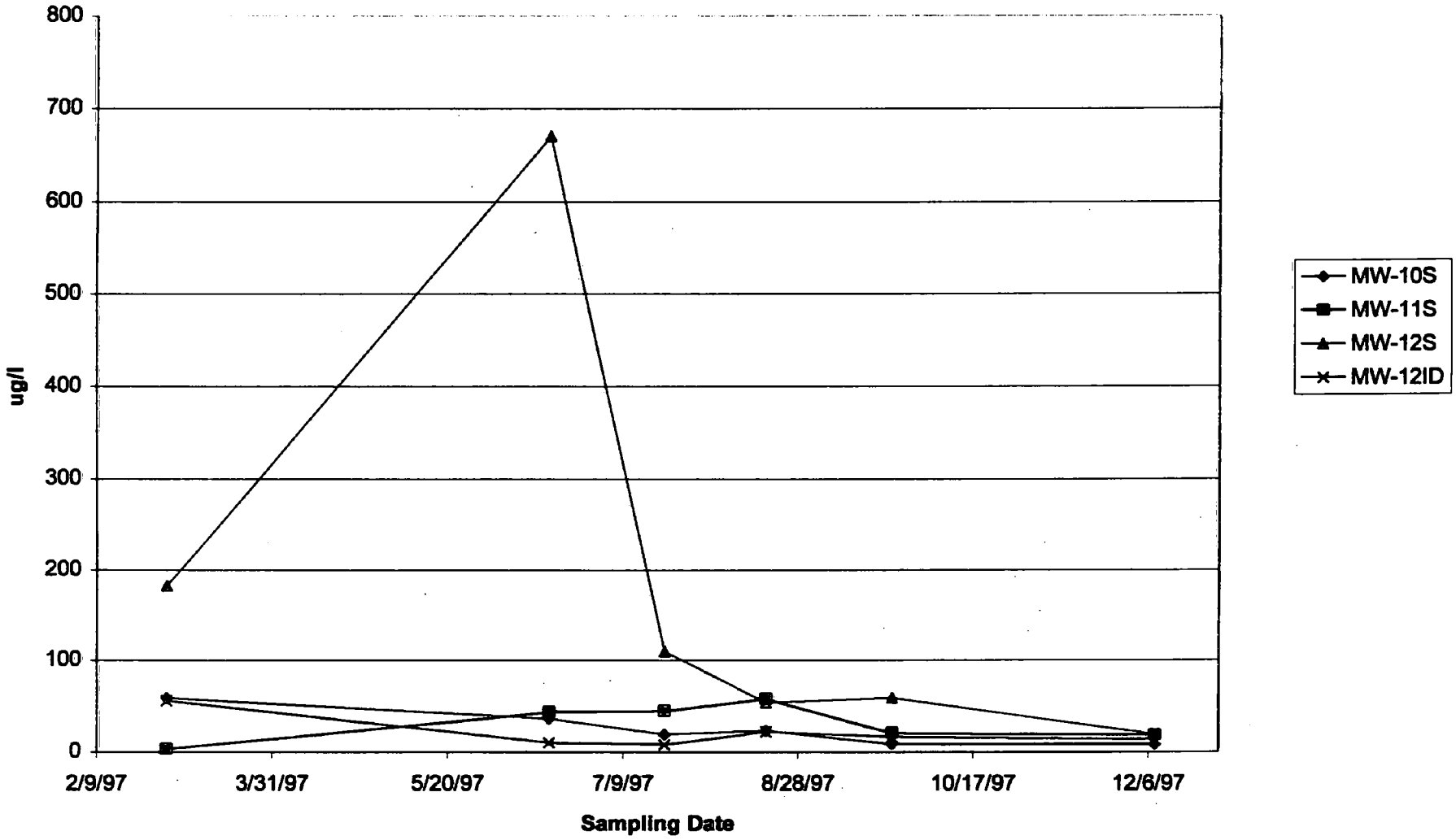


Figure 9
Vinyl Chloride in Treatment Zone Wells

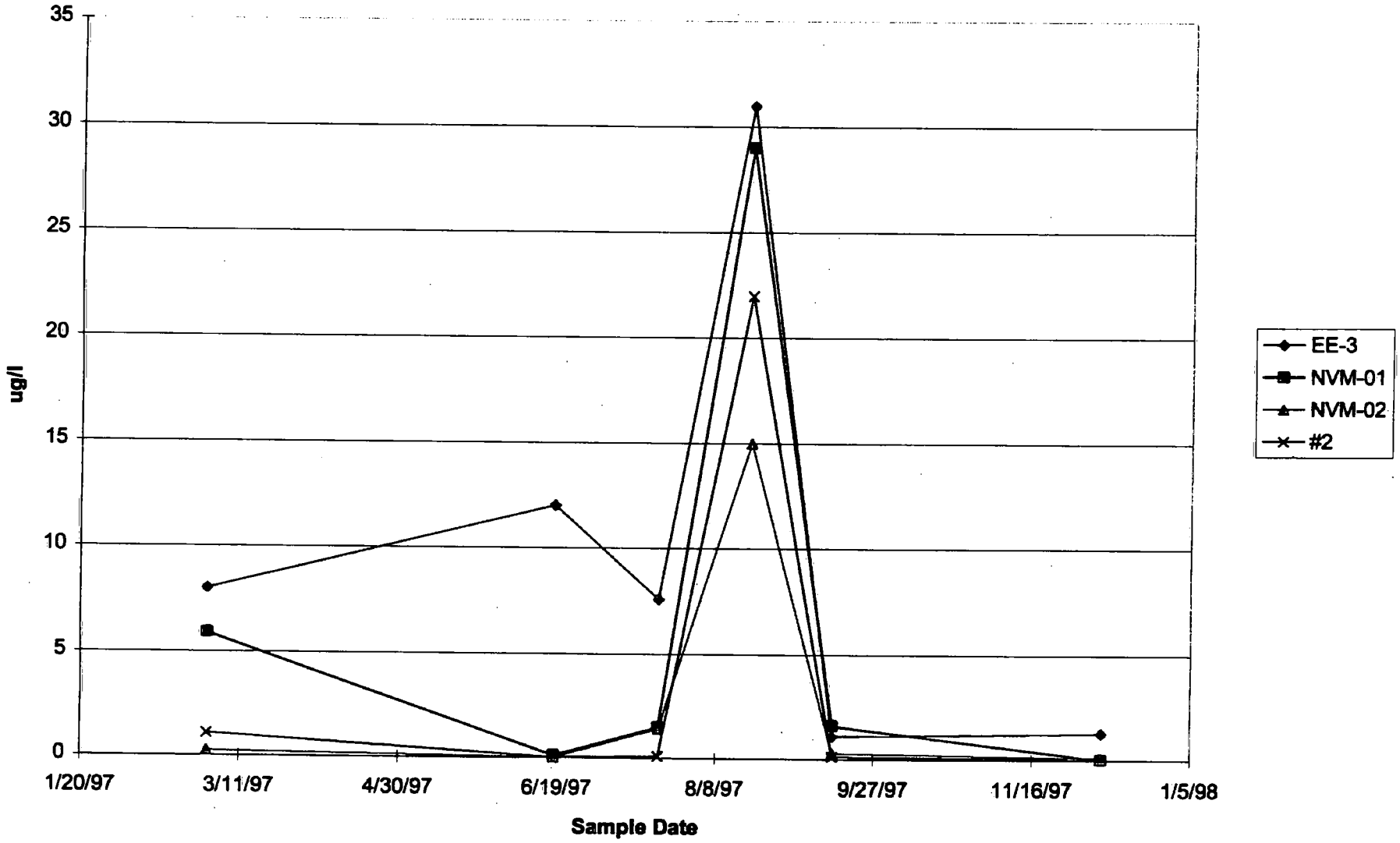


Figure 10
Vinyl Chloride in Downgradient Wells

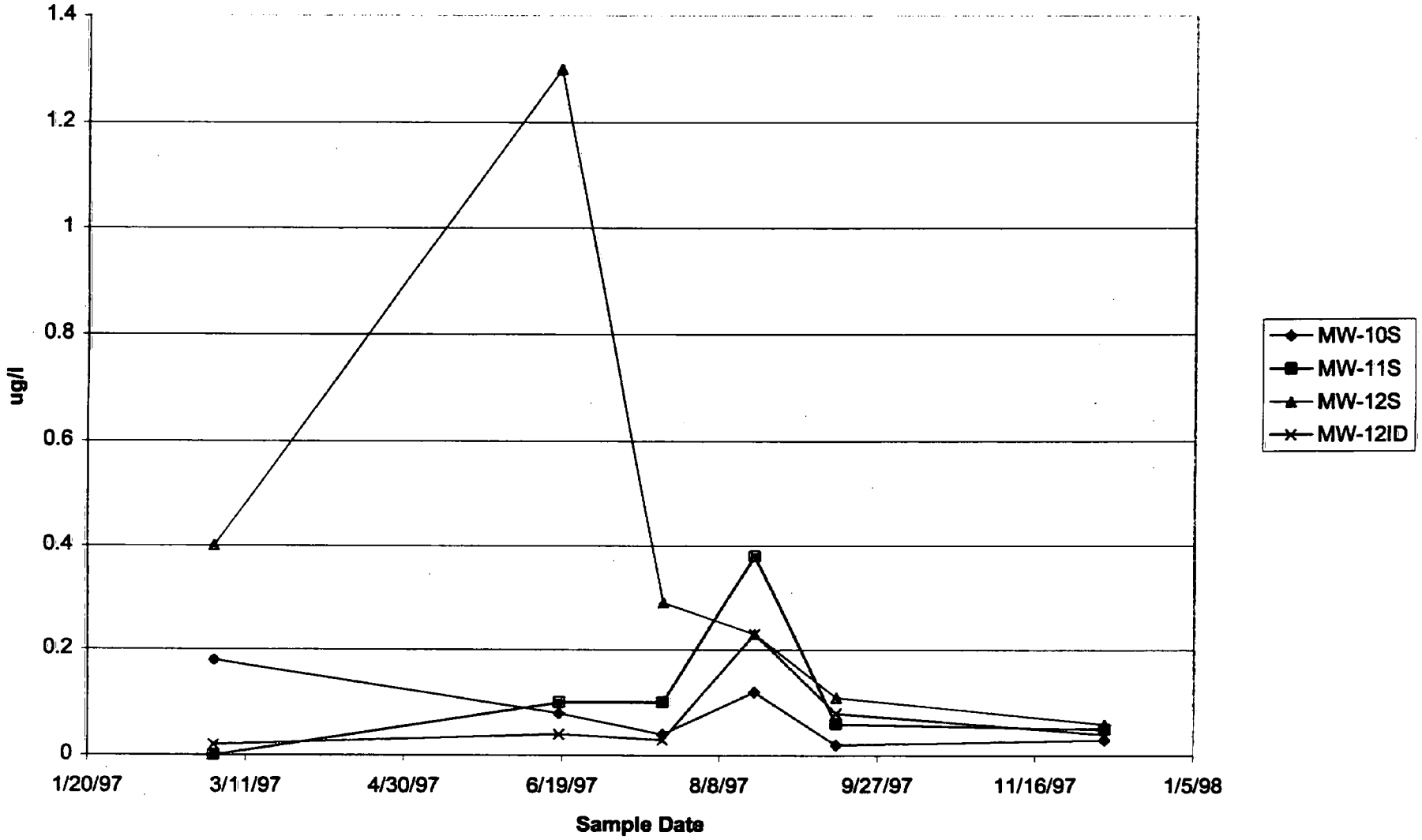


Figure 11
1,1-DCE in Treatment Zone Wells

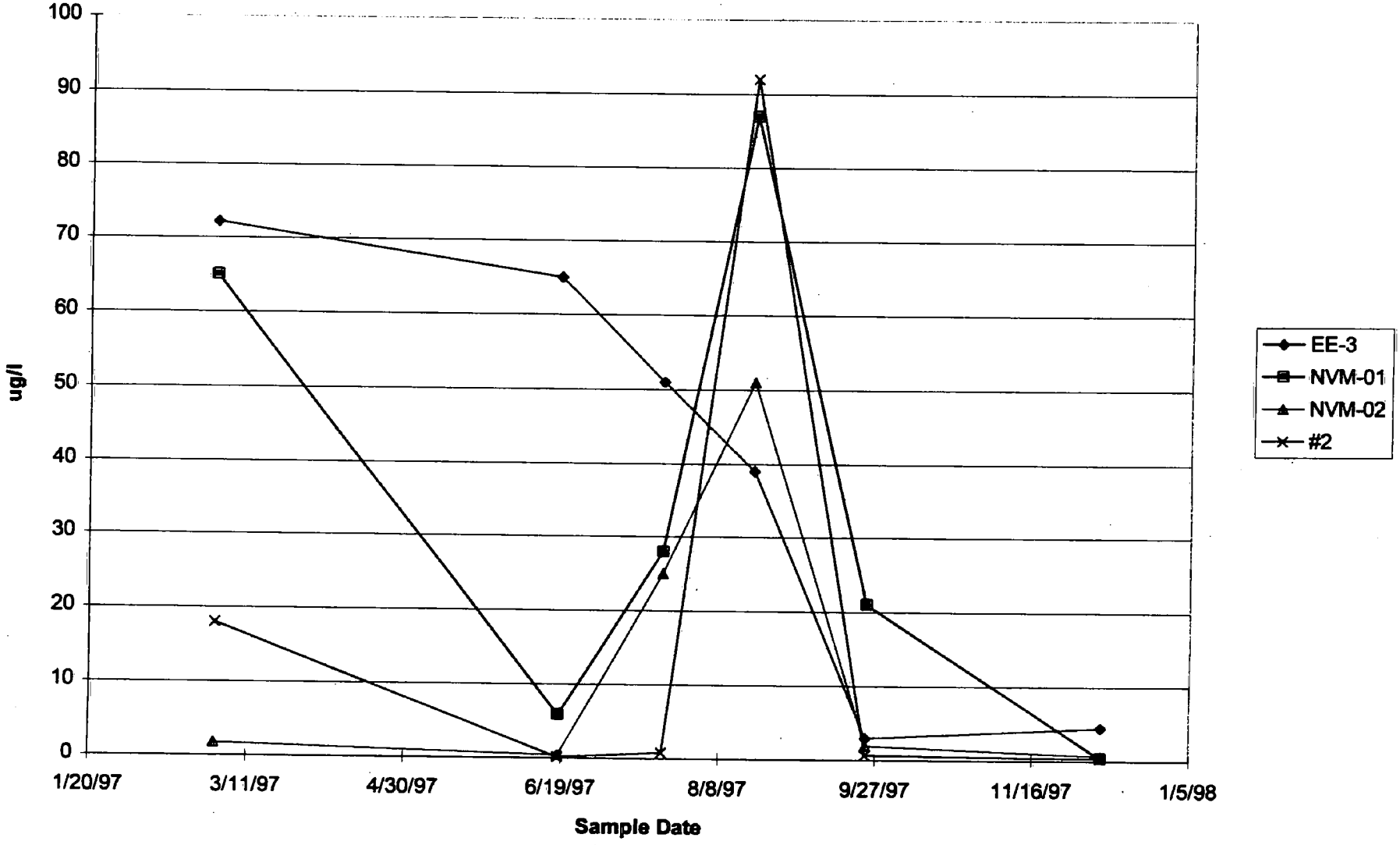


Figure 12
1,1-DCE in Downgradiant Wells

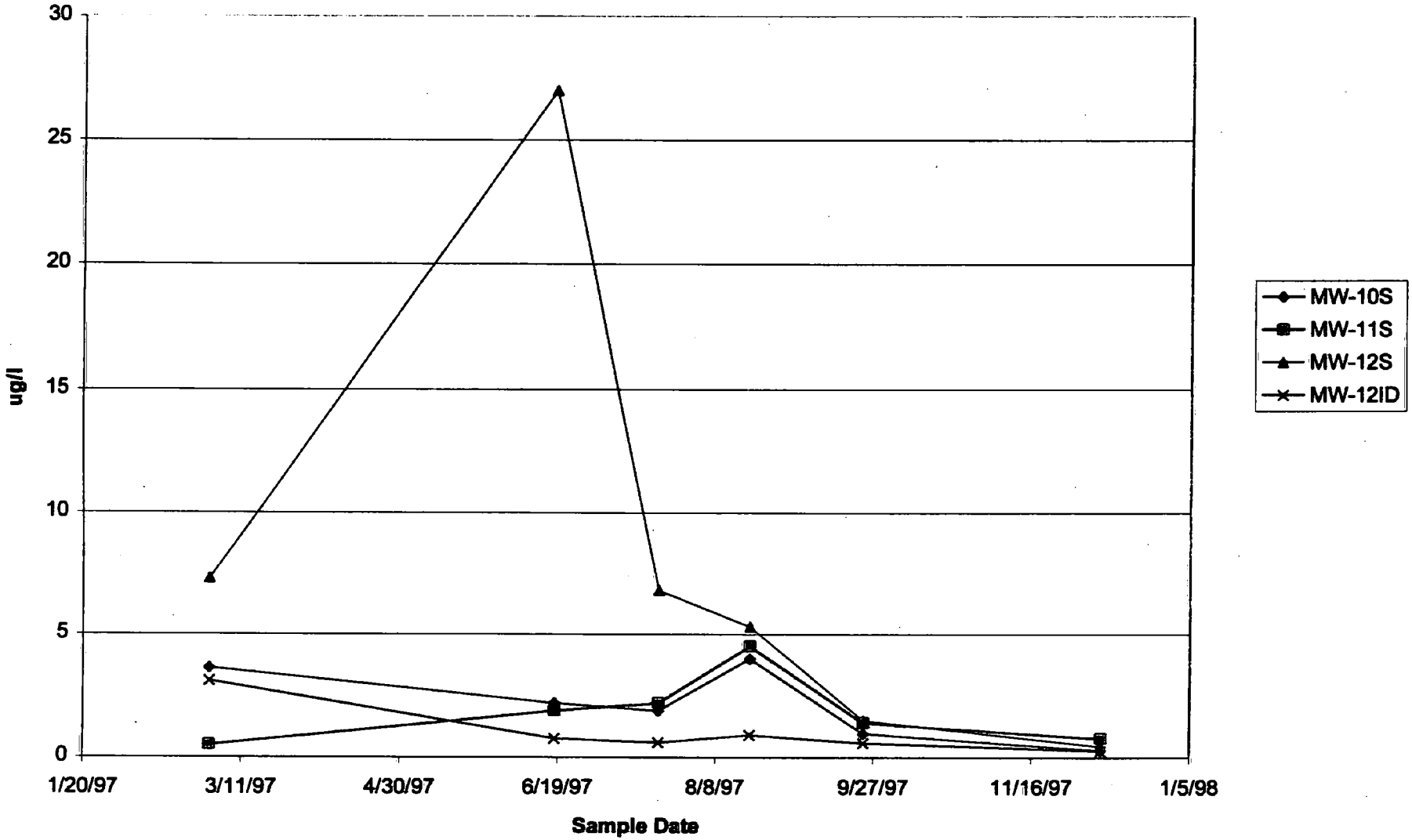


Figure 13
1,1,1-TCA in Treatment Zone Wells

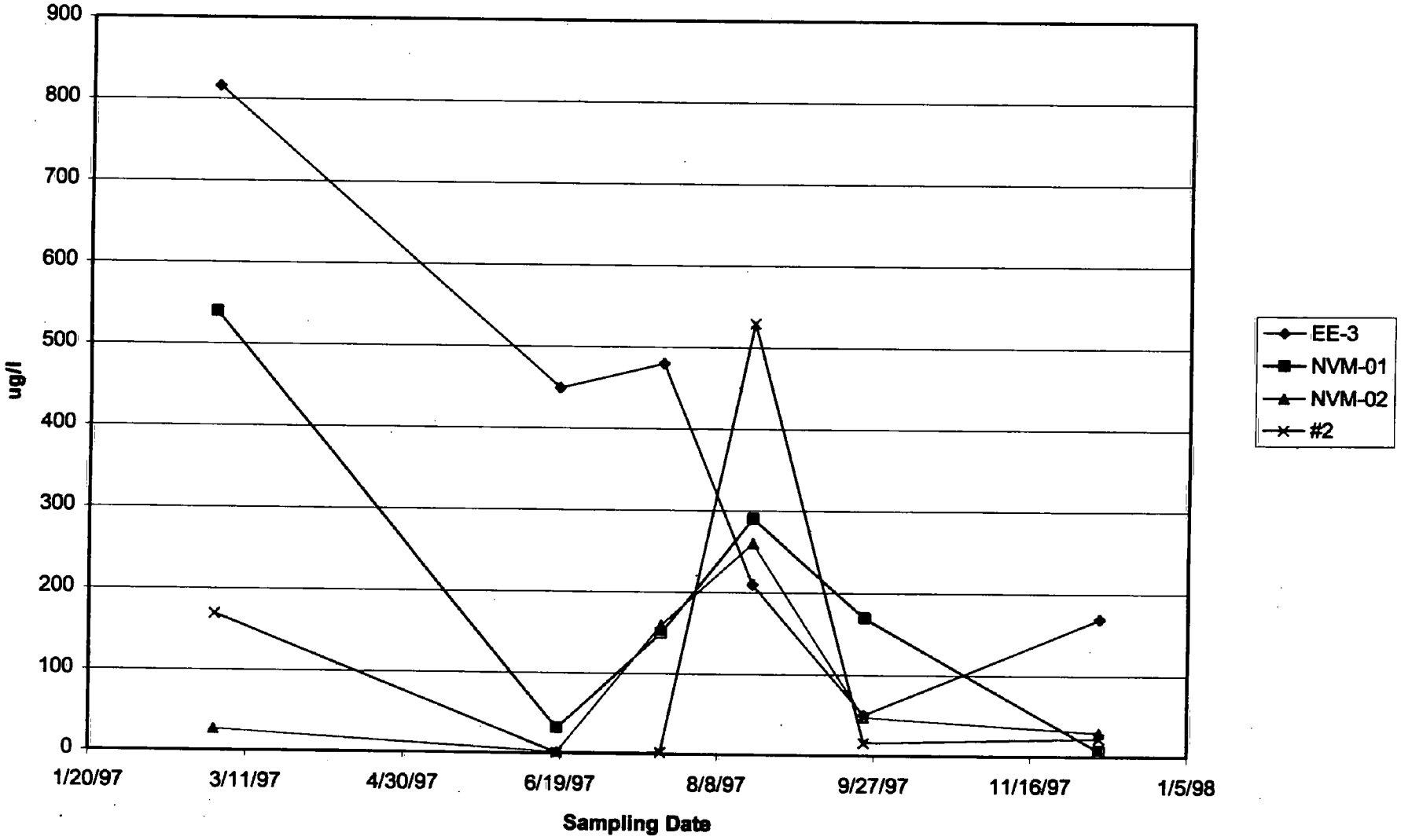
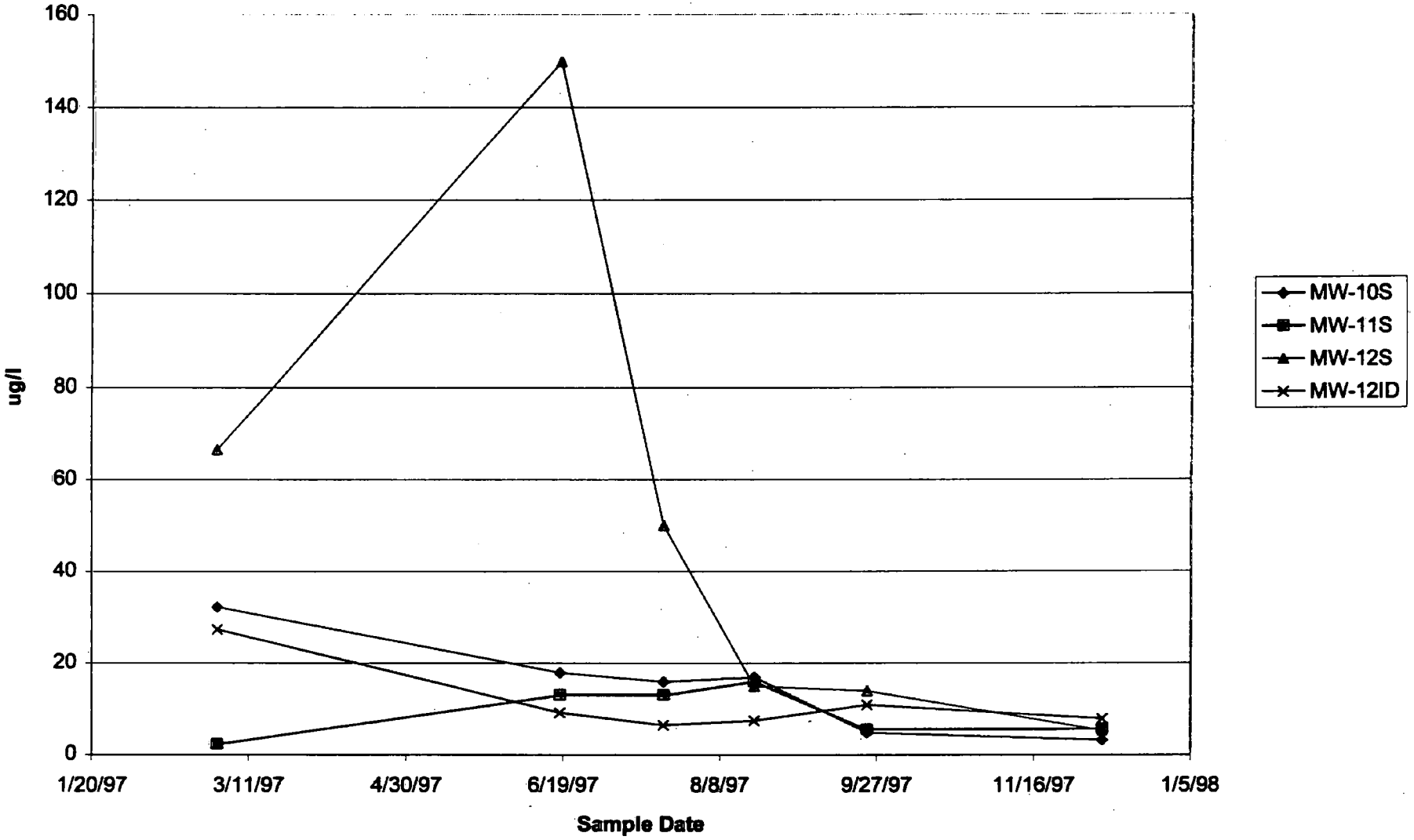
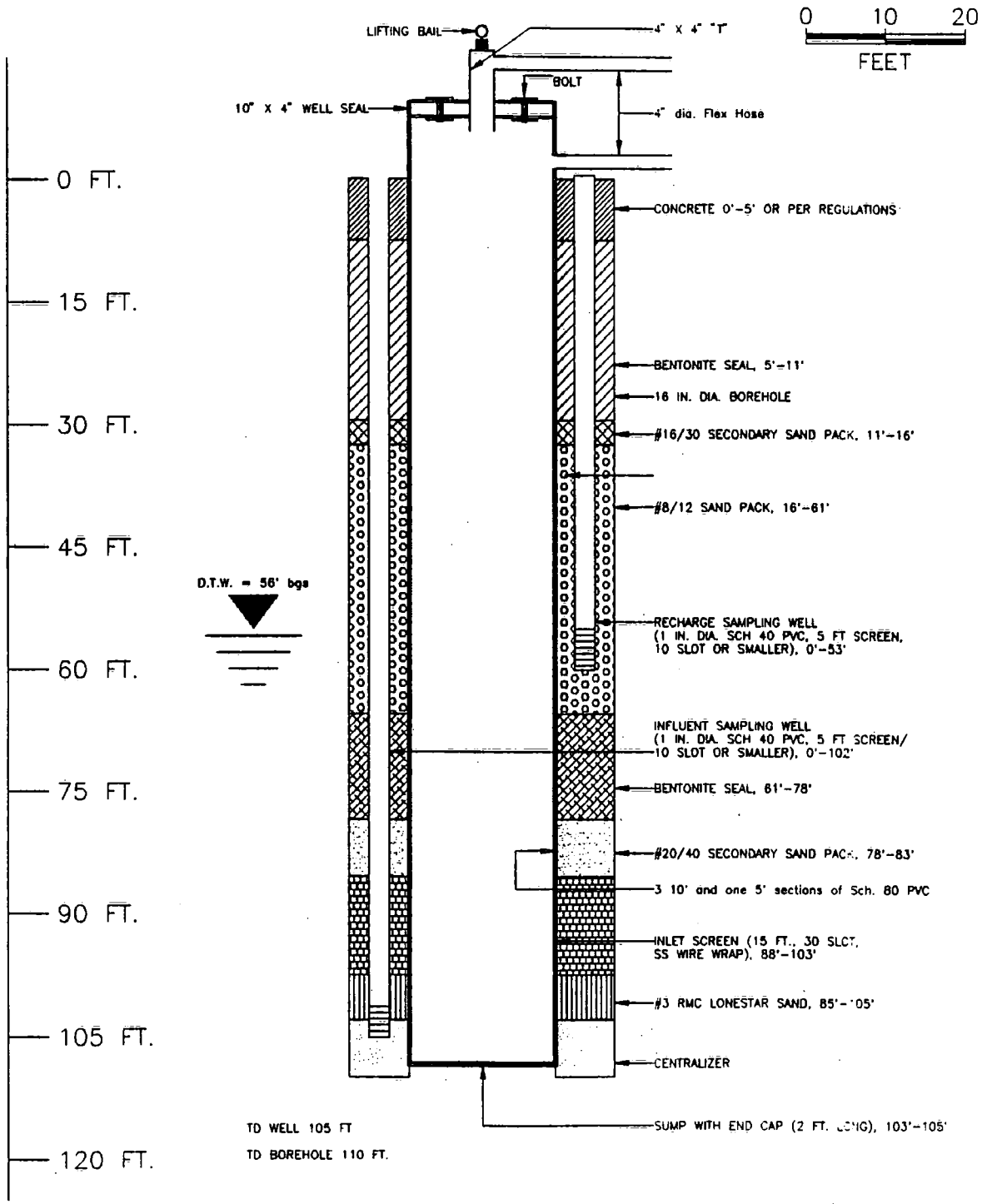


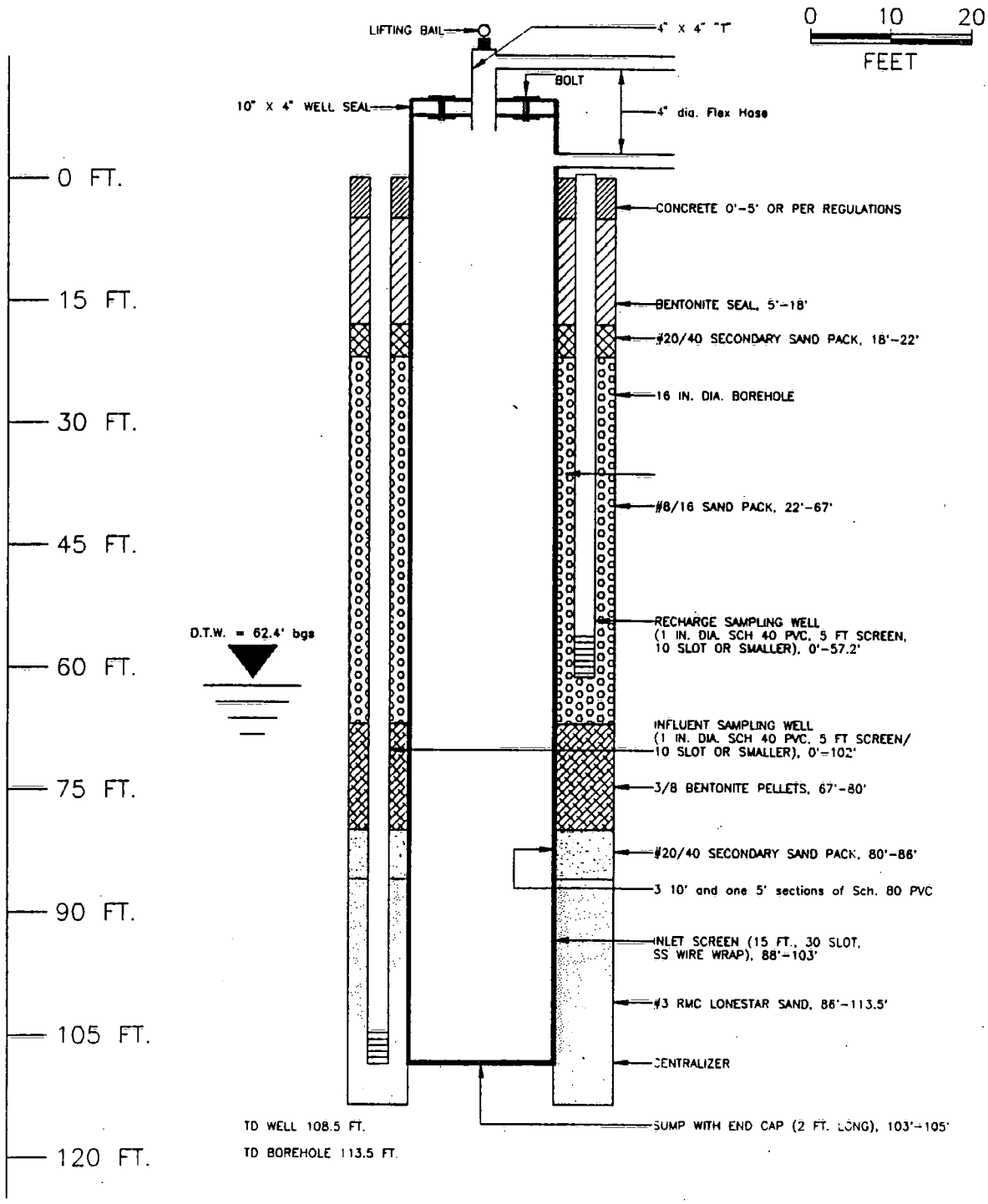
Figure 14
1,1,1-TCA in Downgradient Wells



APPENDIX A
WELL COMPLETION REPORTS



PHILIP ENVIRONMENTAL	TITLE: NV-1 Construction Diagram Pasco Landfill IRM	DWN: bw	DES.: plfirmCE	PROJECT NO.: 624419
		CHKD:	APPD:	FIGURE NO.: A-1
		DATE		



PHILIP ENVIRONMENTAL	TITLE: NV-2 Construction Diagram Pasco Landfill IRM	DW.: bw / DES.: plfirm	PROJECT NO.: 624419
		CHK'D: / APPD:	FIGURE NO.: A-2
		DATE: / REV.:	

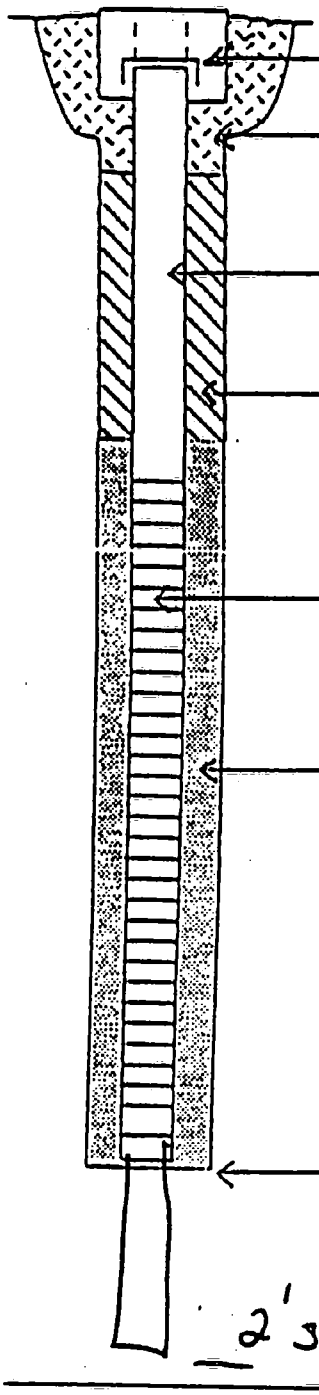
RESOURCE PROTECTION WELL REPORT

START CARD NO. R28332

PROJECT NAME: PASCO LANDFILL
WELL IDENTIFICATION NO. ACQ 844 /NVW-01
DRILLING METHOD: HSA
DRILLER: Rodney LaBrosse
FIRM: Cascade Drilling, Inc.
SIGNATURE: Rodney LaBrosse
CONSULTING FIRM: Philip Environmental
REPRESENTATIVE: D. Robbins / L. LaRosa

COUNTY: FRANKLIN
LOCATION: NE ¼ NE ¼ Sec 28 Twn 9N R 30E
STREET ADDRESS OF WELL: Pasco Landfill 307 W. Court Pasco WA
WATER LEVEL ELEVATION: 57.5
GROUND SURFACE ELEVATION: N/A
INSTALLED: 3-26-97
DEVELOPED: no

7130

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1/ft PVC BLANK 2 "x65.5' BACKFILL 2 ft. 0 TYPE: Bentonite slurry 46 TO 51 chip STAINLESS STEEL PVC SCREEN 2 "x 10' SLOT SIZE: 010 GRAVEL PACK 51 ft. 0 MATERIAL: 10/20 silica WELL DEPTH 67.5 " 2' sump	0 - 30 ft. brown fine sand 30 - 50 ft. black sands 50 - 67.5 ft. black sands & cobbles

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/09)

RESOURCE PROTECTION WELL REPORT

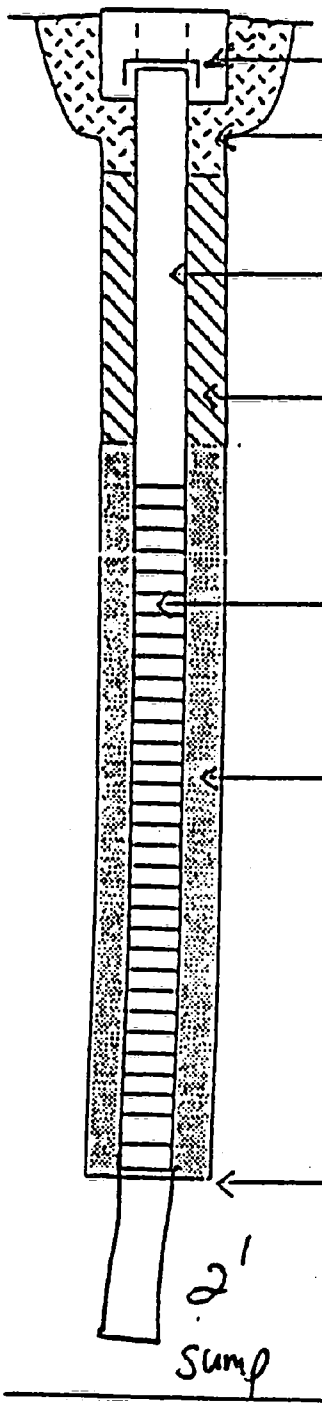
START CARD NO. R28332

PROJECT NAME: PASCO LANDFILL
WELL IDENTIFICATION NO. ACQ 846 / NVW 082
DRILLING METHOD: HSA
DRILLER: Rodney LaBrosse
FIRM: Cascade Drilling, Inc.
SIGNATURE: Rodney LaBrosse
CONSULTING FIRM: Philip Environmental
REPRESENTATIVE: D. Robbins / L. LaRosa

COUNTY: FRANKLIN
LOCATION: NE ¼ NE ¼ Sec 28 Twn 9N R 30E
STREET ADDRESS OF WELL: Pasco Landfill 307 West Court Pasco WA
WATER LEVEL ELEVATION: 60.5
GROUND SURFACE ELEVATION: N/A
INSTALLED: 3-27-97
DEVELOPED: N/A

7130

AS-BUILT	WELL DATA	FORMATION DESCRIPTION



WELL COVER

CONCRETE SURFACE SEAL
DEPTH = 1/ft

PVC BLANK 2 "x 58.5'

BACKFILL 2 ft. 0
TYPE: Bentonite slurry

PVC SCREEN 2 "x '
SLOT SIZE: 010

GRAVEL PACK TO 54 ft. 0
MATERIAL: 10/20

WELL DEPTH 70.5 "

0 - 30 ft.
brown silty sands

30 - 52 ft.
black sands

52 - 70.5 ft.
black sands & cobbles

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/00)

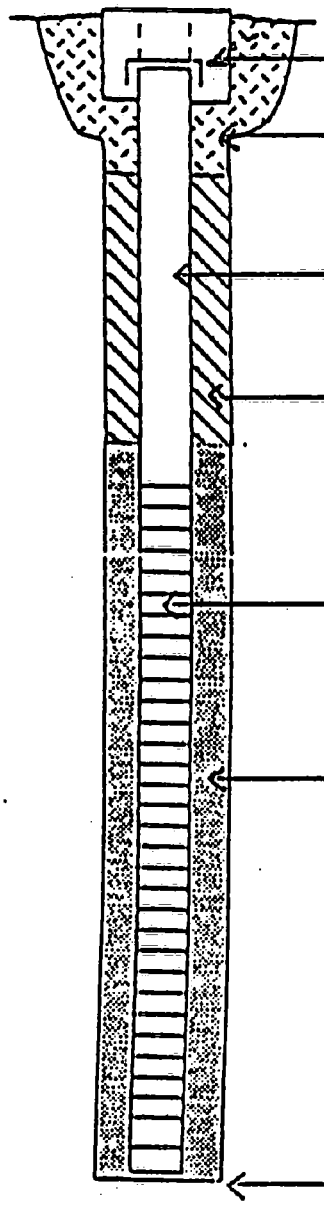
RESOURCE PROTECTION WELL REPORT

START CARD NO. R28332

PROJECT NAME: PASCO LANDFILL
WELL IDENTIFICATION NO. ACQ 945 VEW 04
DRILLING METHOD: HSA
DRILLER: Rodney LaBrosse
FIRM: Cascade Drilling, Inc.
SIGNATURE: Rodney LaBrosse
CONSULTING FIRM: Philip Environmental
REPRESENTATIVE: D. Robbins / L. LaRosa

COUNTY: FRANKLIN
LOCATION: NE ¼ NE ¼ Sec 28 Twn 9N R 30E
STREET ADDRESS OF WELL: Pasco Landfill
307 West Court Pasco WA
WATER LEVEL ELEVATION: N/A VAPOR WELL
GROUND SURFACE ELEVATION: N/A
INSTALLED: 3-26-87
DEVELOPED: N/A

VEW 04 7130

AS-BUILT	WELL DATA	FORMATION DESCRIPTION
	WELL COVER CONCRETE SURFACE SEAL DEPTH = 1/ft PVC BLANK 4" x 40 BACKFILL 2 ft. 0 TYPE: Bentonite slurry PVC SCREEN 4" x 15' SLOT SIZE: 010 GRAVEL PACK To 36 ft. 0 MATERIAL: 10/20 WELL DEPTH 55.5"	0 - 36 ft. brown sandy 36 55 ft. black sands - ft.

SCALE: 1" = _____ PAGE _____ OF _____

ECY 050-12 (Rev. 11/09)

APPENDIX B
PHOTOS

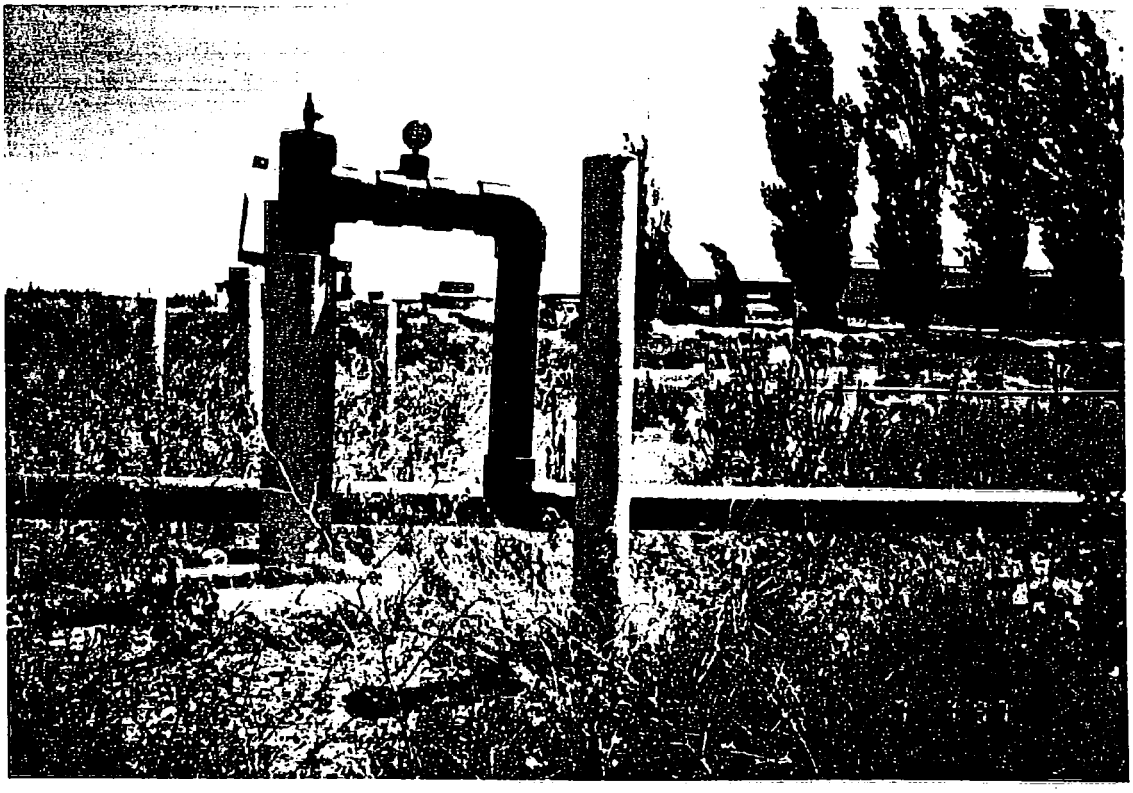


PHOTO # 1
TYPICAL WELL HEAD COMPLETION
(VMW-02D)

PHOTO # 2
PIPE SUPPORT DETAIL

PHOTO # 3
PIPE RUN
(VEW-04)

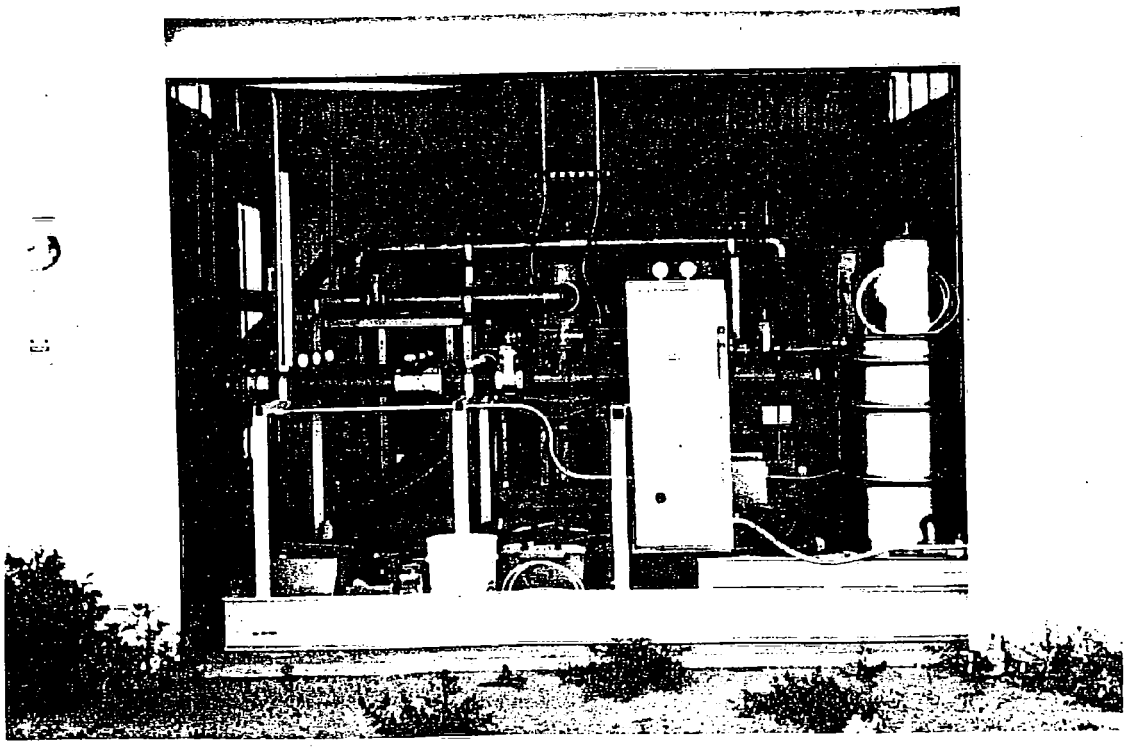


PHOTO # 4
SVE EQUIPMENT SKID

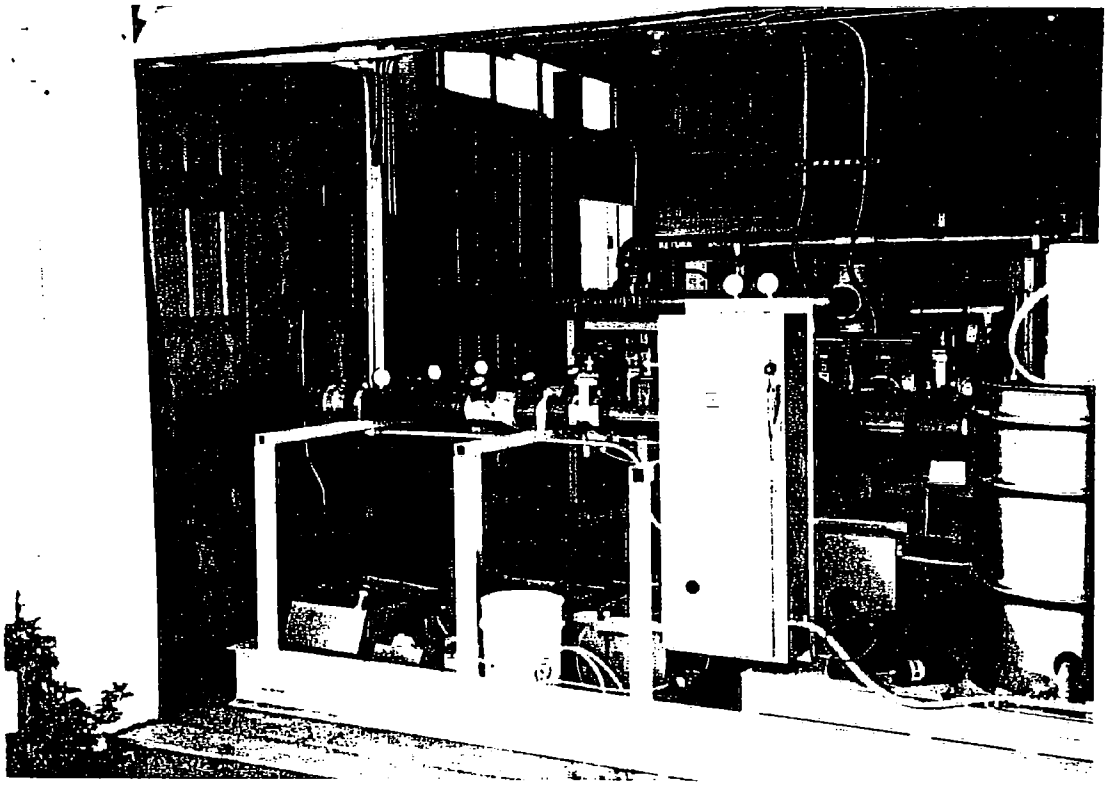


PHOTO # 5
SVE EQUIPMENT SKID

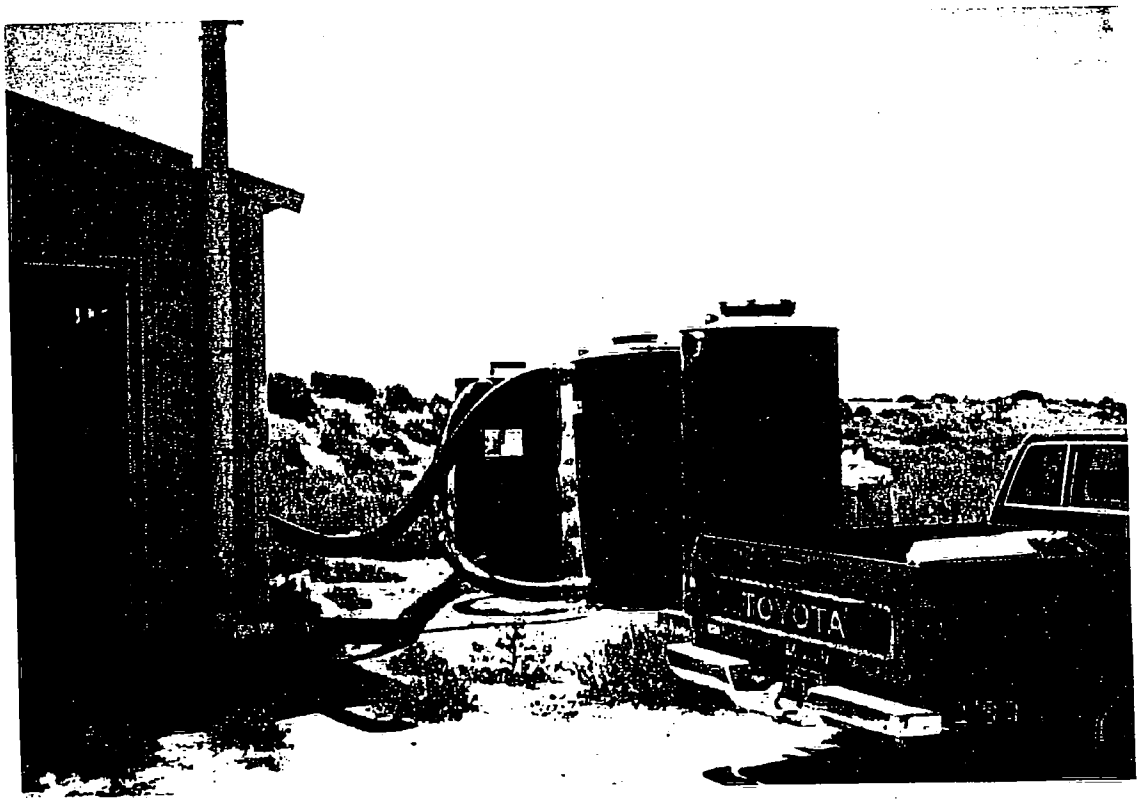


PHOTO # 6
SVE CARBON TREATMENT UNITS

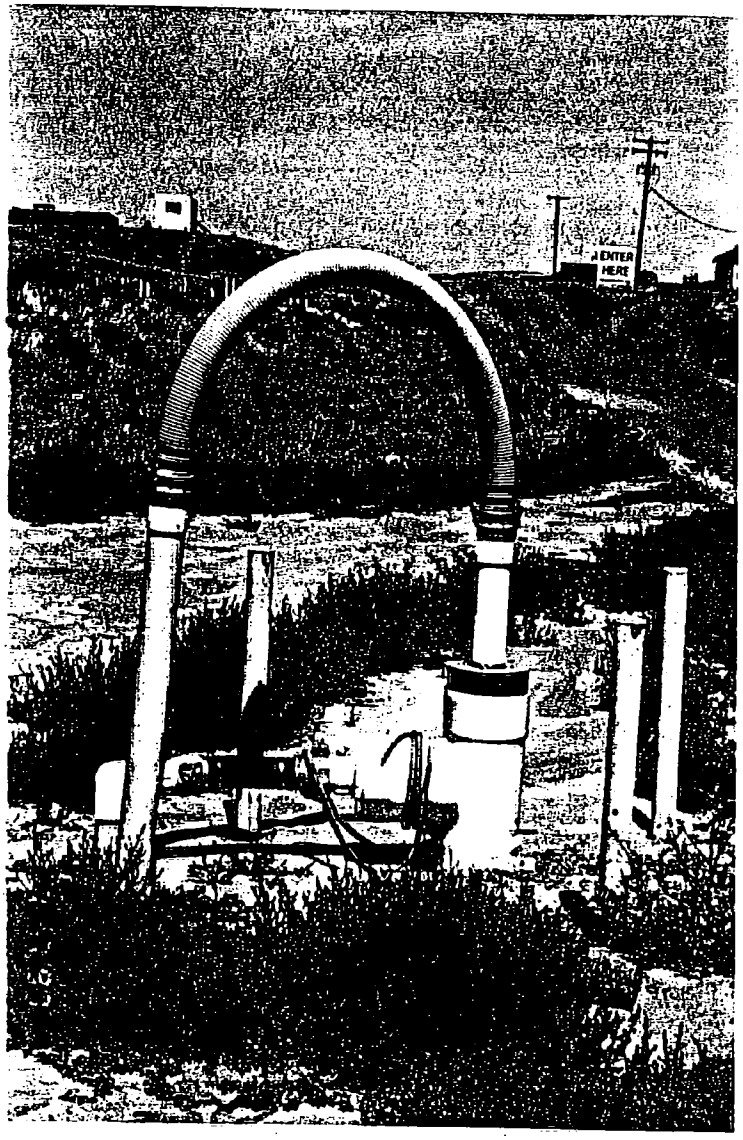
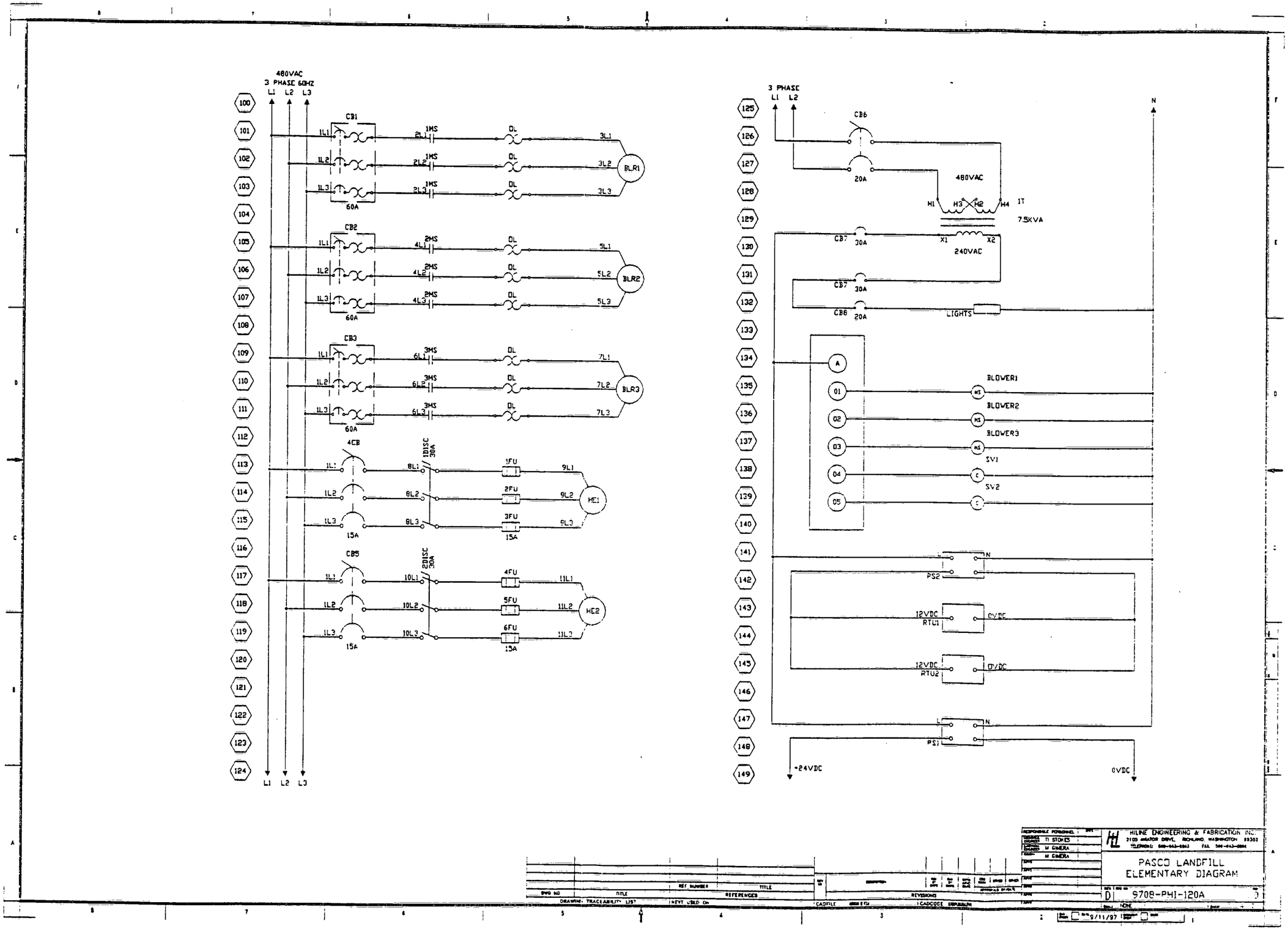


PHOTO # 7
WELL HEAD COMPLETION
(NV-01)

PHOTO # 8
WELLHEAD COMPLETION
(NV-02)

AS-BUILT DIAGRAMS

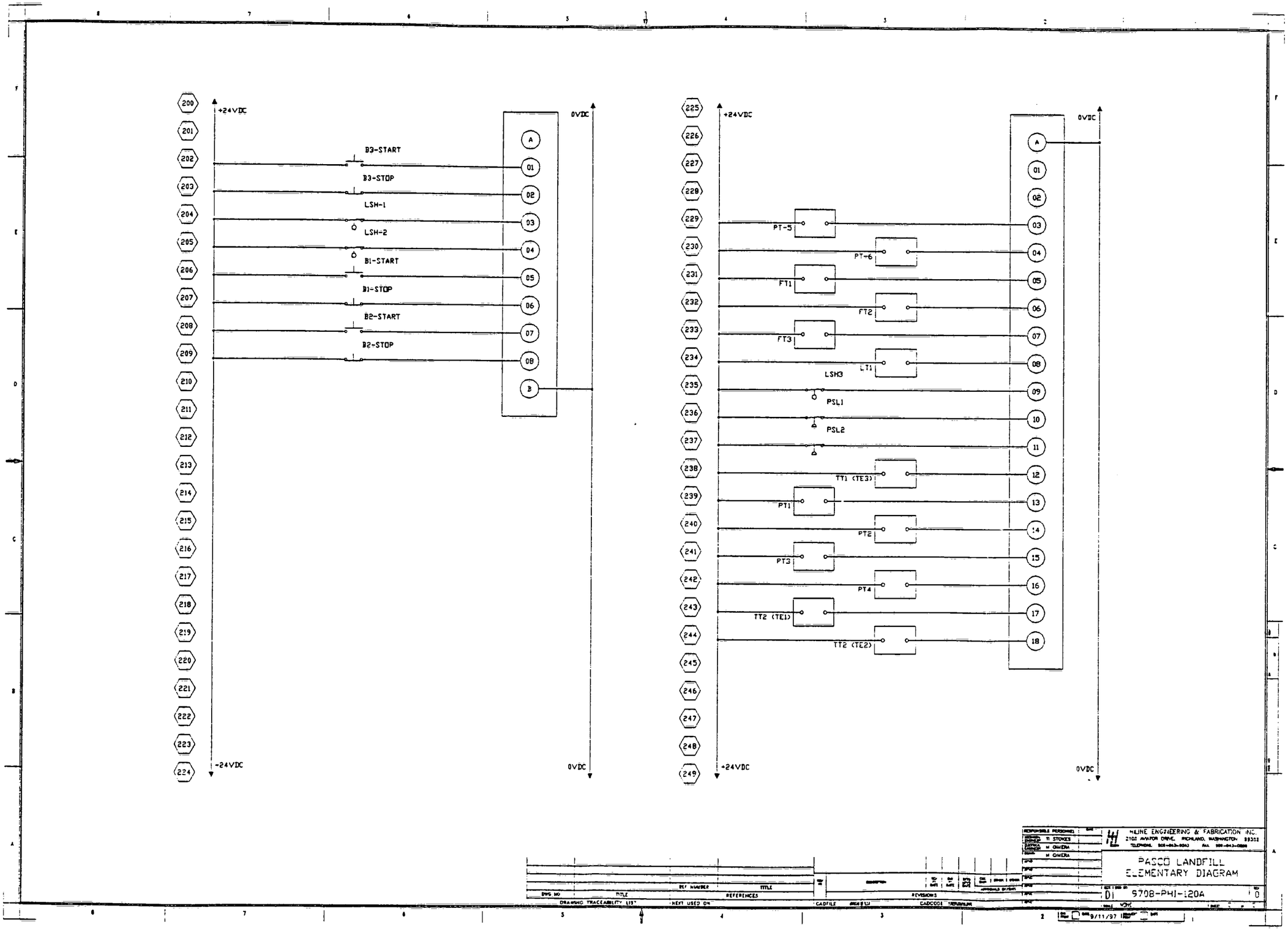


HILINE ENGINEERING & FABRICATION INC.
2105 AVIATOR DRIVE, RICHLAND, WASHINGTON 99352
TELEPHONE: 509-943-6843 FAX: 509-943-0884

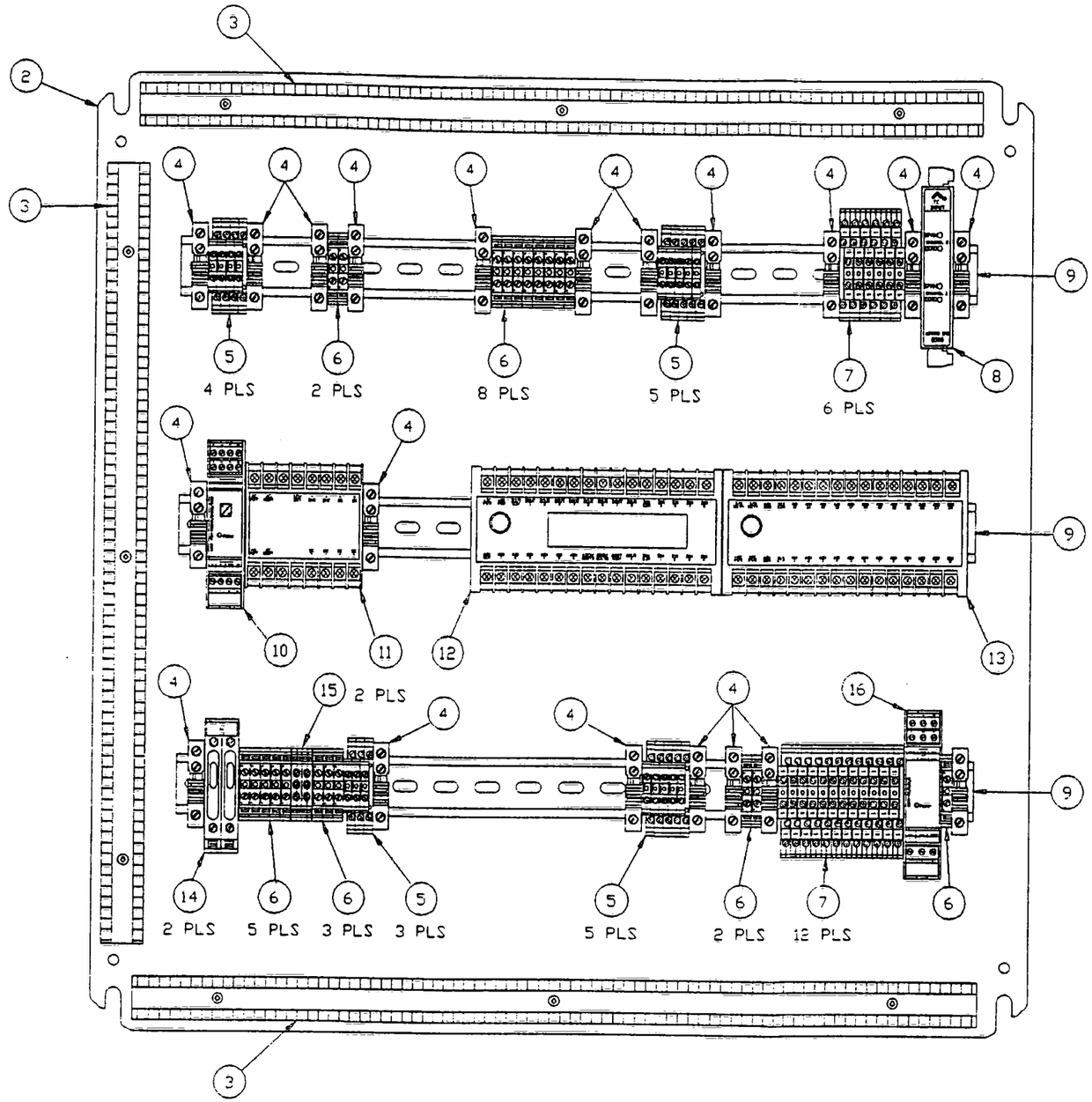
PASCO LANDFILL
ELEMENTARY DIAGRAM

D 9708-PHI-120A 0

9/11/97



+24VDC
0VDC
-24VDC
B3-START
B3-STOP
LSH-1
LSH-2
B1-START
B1-STOP
B2-START
B2-STOP
PT-5
PT-6
FT1
FT2
FT3
LT1
LSH3
PSL1
PSL2
TT1 (TE3)
PT1
PT2
PT3
PT4
TT2 (TE1)
TT2 (TE2)
HILINE ENGINEERING & FABRICATION INC.
2102 AVIATOR DRIVE, RICHLAND, WASHINGTON 99352
TELEPHONE
TI STOKES
M OMERA
PASCO LANDFILL
ELEMENTARY DIAGRAM
D1 9708-PHI-120A
0
9/11/97



1 CONTROL PANEL
CAD SCALE: 1 TO 1 PLOTTED SCALE: NONE

PARTS/MATERIAL LIST

QTY REQD	REFERENCE DESIGNATOR	PART/DASH NUMBER	NOMENCLATURE/DESCRIPTION	MATERIAL/REFERENCE	SHEET	ITEM NO
			CONTROL PANEL			1
1		C-P2424	BACK PANEL	HOFFMAN		2
AR		SLHDIXIV	WIRE DUCT, 1" W x 1" H	TYTON		3
20		EU/K	END CLAMP	PHOENIX CONTACT		4
17		UKK3	DOUBLE LEVEL TERMINAL BLOCK	PHOENIX CONTACT		5
21		UK5	TERMINAL BLOCK	PHOENIX CONTACT		6
18		SLKK5	DOUBLE TB W/ GROUND FOOT	PHOENIX CONTACT		7
1	TT1	9520	TC SIGNAL CONDITIONER	ACTION INSTRUMENTS		8
AR		NS 35/7.5	DIN RAIL	PHOENIX CONTACT		9
1	PS1	MCR-PS-120AC	POWER SUPPLY, 24 VDC	PHOENIX CONTACT		10
1	PS2	ICL-4001	POWER SUPPLY, 12 VDC	INDUSTRIAL CONTROL LINKS		11
1	RTU1	ICL-4215	RTU CONTROLLER	INDUSTRIAL CONTROL LINKS		12
1	RTU2	ICL-4030	RTU EXPANSION UNIT	INDUSTRIAL CONTROL LINKS		13
2		UK 6.3-HESI	FUSE HOLDER	PHOENIX CONTACT		14
2		USLKG 5	GROUND TERMINAL BLOCK	PHOENIX CONTACT		15
1	TT2	MCR-TE/J/K/I	TC SIGNAL CONDITIONER	PHOENIX CONTACT		16

GENERAL NOTES

1. INSTRUMENTATION DRAWINGS ARE IN ACCORDANCE WITH ISA-S5.1-1984

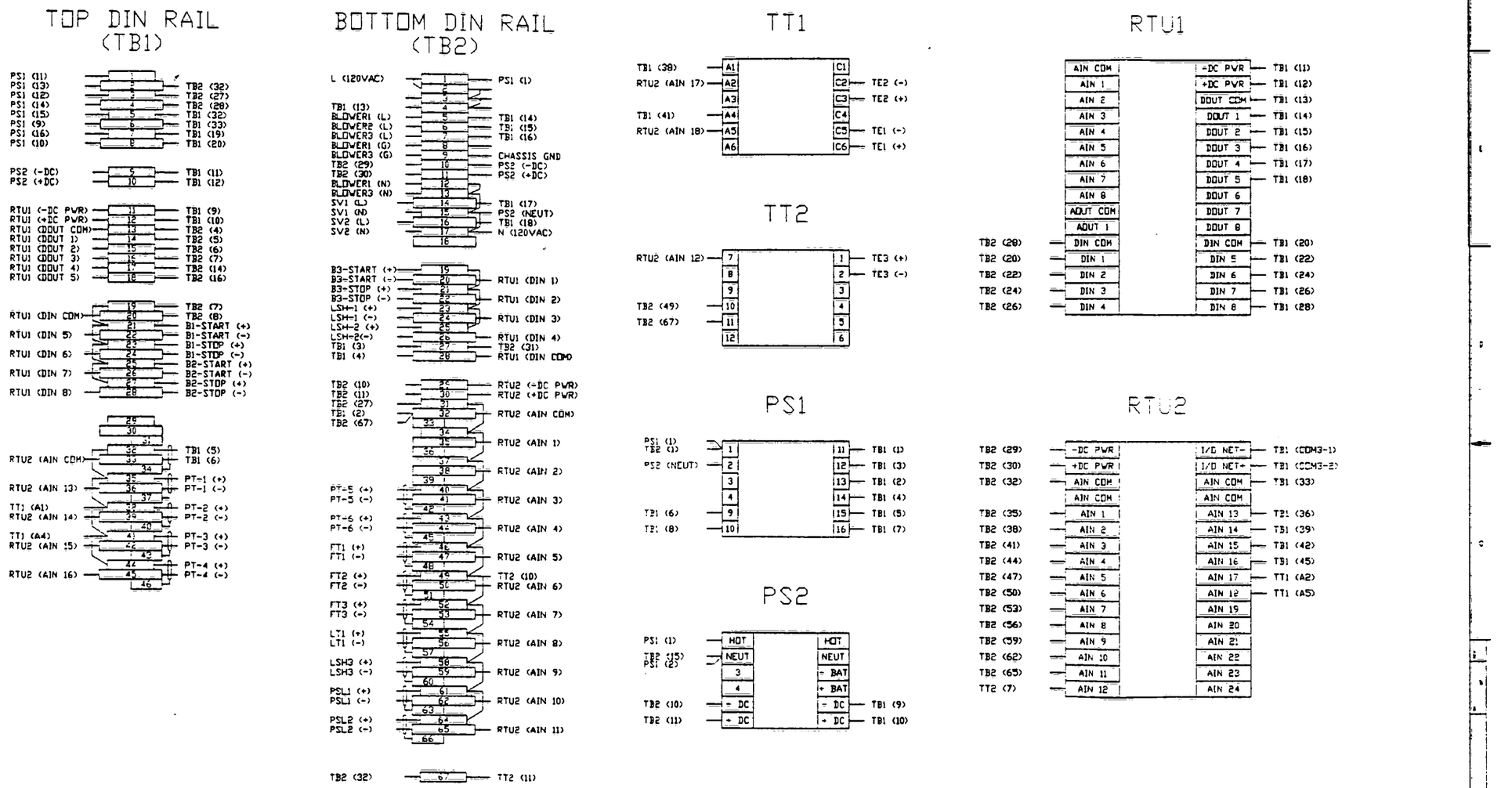
HILINE ENGINEERING & FABRICATION INC.
2105 AVIATOR DRIVE, RICHLAND, WASHINGTON 99352
TELEPHONE: 509-943-0043 FAX 509-943-0209

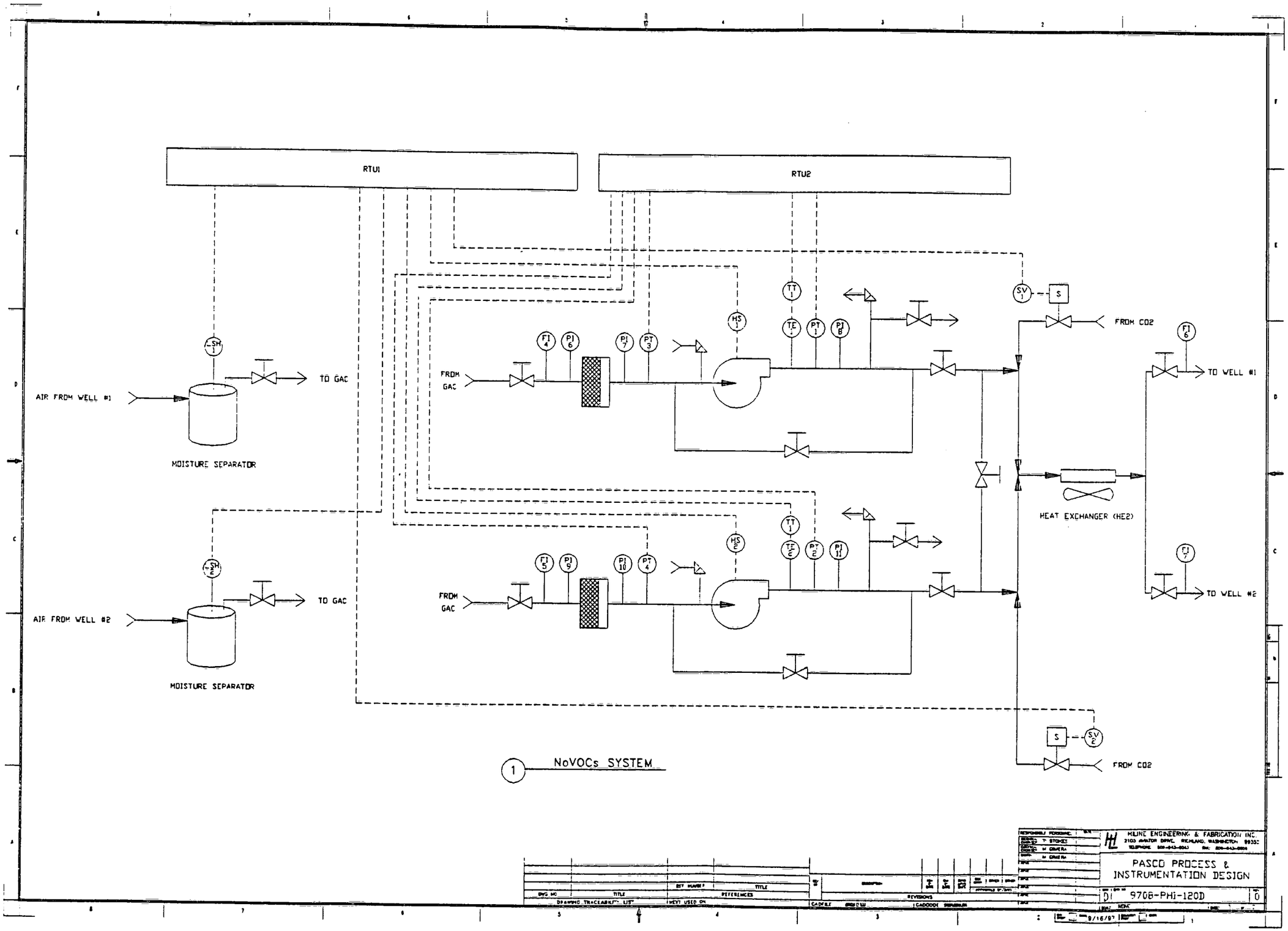
PASCO LANDFILL
CONTROL PANEL LAYOUT

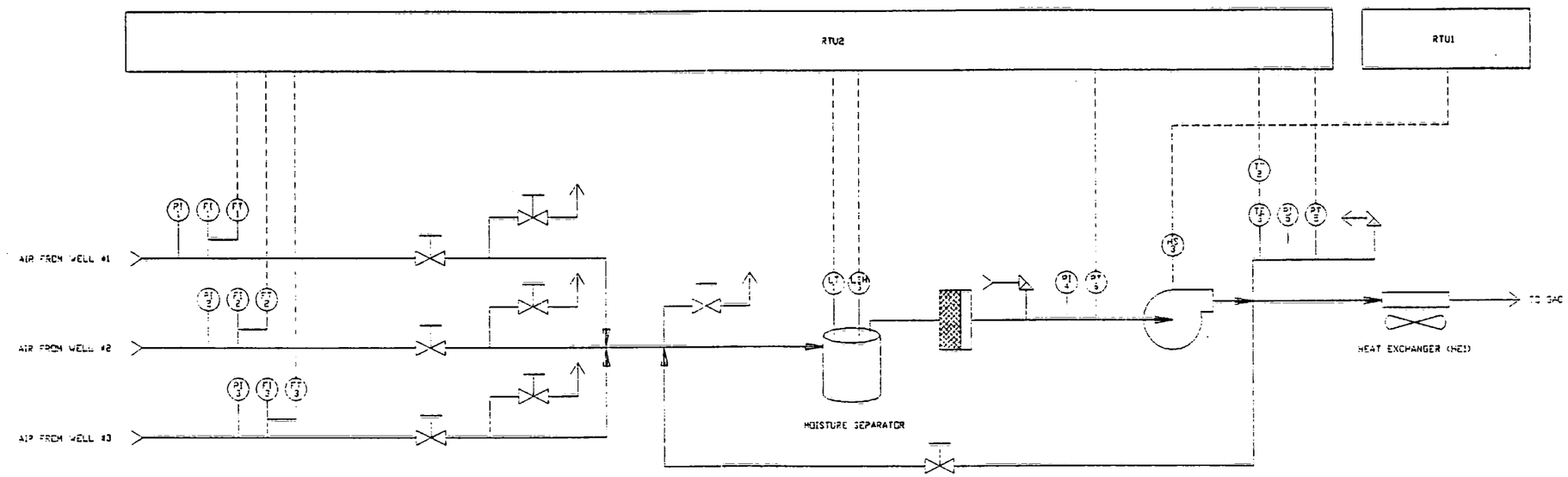
D 9708-PHI-120B 0

SCALE NONE

9/11/97


TOP DIN RAIL
(TB1)
PS1 (11) 1 TB2 (32)
PS1 (12) 2 TB2 (27)
PS1 (14) 3 TB2 (28)
PS1 (15) 4 TB1 (32)
PS1 (9) 5 TB1 (33)
PS1 (16) 6 TB1 (19)
PS1 (10) 7 TB1 (20)
PS2 (-DC) 8 TB1 (11)
PS2 (+DC) 9 TB1 (12)
RTU1 (-DC PWR) 10 TB1 (9)
RTU1 (+DC PWR) 11 TB1 (10)
RTU1 (DOUT COM) 12 TB2 (4)
RTU1 (DOUT 1) 13 TB2 (5)
RTU1 (DOUT 2) 14 TB2 (6)
RTU1 (DOUT 3) 15 TB2 (7)
RTU1 (DOUT 4) 16 TB2 (14)
RTU1 (DOUT 5) 17 TB2 (16)
RTU1 (DIN COM) 18 TB2 (7)
19 TB2 (8)
RTU1 (DIN 5) 20 B1-START (+)
21 B1-START (-)
RTU1 (DIN 6) 22 B1-STOP (+)
23 B1-STOP (-)
RTU1 (DIN 7) 24 B2-START (+)
25 B2-START (-)
RTU1 (DIN 8) 26 B2-STOP (+)
27 B2-STOP (-)
28
29
30
RTU2 (AIN COM) 31 TB1 (5)
32 TB1 (6)
RTU2 (AIN 13) 33 PT-1 (+)
34 PT-1 (-)
TT1 (A1) 35 PT-2 (+)
RTU2 (AIN 14) 36 PT-2 (-)
TT1 (A4) 37 PT-3 (+)
RTU2 (AIN 15) 38 PT-3 (-)
39
RTU2 (AIN 16) 40 PT-4 (+)
41 PT-4 (-)
42
BOTTOM DIN RAIL
(TB2)
L (120VAC) 1 PS1 (1)
2
3
TB1 (13) 4
BLOWER1 (L) 5 TB1 (14)
BLOWER2 (L) 6 TB1 (15)
BLOWER3 (L) 7 TB1 (16)
BLOWER1 (G) 8
BLOWER3 (G) 9 CHASSIS GND
TB2 (29) 10 PS2 (-DC)
TB2 (30) 11 PS2 (+DC)
BLOWER1 (N) 12
BLOWER3 (N) 13
SV1 (L) 14 TB1 (17)
SV1 (N) 15 PS2 (NEUT)
SV2 (L) 16 TB1 (18)
SV2 (N) 17 N (120VAC)
18
B3-START (+) 19
B3-START (-) 20 RTU1 (DIN 1)
B3-STOP (+) 21
B3-STOP (-) 22 RTU1 (DIN 2)
LSH-1 (+) 23
LSH-1 (-) 24 RTU1 (DIN 3)
LSH-2 (+) 25
LSH-2(-) 26 RTU1 (DIN 4)
TB1 (3) 27 TB2 (31)
TB1 (4) 28 RTU1 (DIN COM)
TB2 (10) 29 RTU2 (-DC PWR)
TB2 (11) 30 RTU2 (+DC PWR)
TB2 (27) 31
TB1 (2) 32 RTU2 (AIN COM)
TB2 (67) 33
34
35 RTU2 (AIN 1)
36
37
38 RTU2 (AIN 2)
39
PT-5 (+) 40
PT-5 (-) 41 RTU2 (AIN 3)
42
PT-6 (+) 43
PT-6 (-) 44 RTU2 (AIN 4)
45
FT1 (+) 46
FT1 (-) 47 RTU2 (AIN 5)
48
FT2 (+) 49 TT2 (10)
FT2 (-) 50 RTU2 (AIN 6)
51
FT3 (+) 52
FT3 (-) 53 RTU2 (AIN 7)
54
LT1 (+) 55
LT1 (-) 56 RTU2 (AIN 8)
57
LSH3 (+) 58
LSH3 (-) 59 RTU2 (AIN 9)
60
PSL1 (+) 61
PSL1 (-) 62 RTU2 (AIN 10)
63
PSL2 (+) 64
PSL2 (-) 65 RTU2 (AIN 11)
66
TB2 (32) 67 TT2 (11)
TT1
TB1 (38) A1 C1
RTU2 (AIN 17) A2 C2 TE2 (-)
A3 C3 TE2 (+)
TB1 (41) A4 C4
RTU2 (AIN 18) A5 C5 TE1 (-)
A6 C6 TE1 (+)
TT2
RTU2 (AIN 12) 7 1 TE3 (+)
8 2 TE3 (-)
9 3
TB2 (49) 10 4
TB2 (67) 11 5
12 6
PS1
PS1 (1) TB2 (1) 1 11 TB1 (1)
PS2 (NEUT) 2 12 TB1 (3)
3 13 TB1 (2)
4 14 TB1 (4)
TB1 (6) 9 15 TB1 (5)
TB1 (8) 10 16 TB1 (7)
PS2
PS1 (1) HOT HOT
TB2 (15) PS1 (2) NEUT NEUT
3 - BAT
4 + BAT
TB2 (10) - DC - DC TB1 (9)
TB2 (11) + DC + DC TB1 (10)
RTU1
AIN COM -DC PWR TB1 (11)
AIN 1 +DC PWR TB1 (12)
AIN 2 DOUT COM TB1 (13)
AIN 3 DOUT 1 TB1 (14)
AIN 4 DOUT 2 TB1 (15)
AIN 5 DOUT 3 TB1 (16)
AIN 6 DOUT 4 TB1 (17)
AIN 7 DOUT 5 TB1 (18)
AIN 8 DOUT 6
ADUT COM DOUT 7
ADUT 1 DOUT 8
TB2 (28) DIN COM DIN COM TB1 (20)
TB2 (20) DIN 1 DIN 5 TB1 (22)
TB2 (22) DIN 2 DIN 6 TB1 (24)
TB2 (24) DIN 3 DIN 7 TB1 (26)
TB2 (26) DIN 4 DIN 8 TB1 (28)
RTU2
TB2 (29) -DC PWR I/O NET- TB1 (COM3-1)
TB2 (30) +DC PWR I/O NET+ TB1 (COM3-2)
TB2 (32) AIN COM AIN COM TB1 (33)
AIN COM AIN COM
TB2 (35) AIN 1 AIN 13 TB1 (36)
TB2 (38) AIN 2 AIN 14 TB1 (39)
TB2 (41) AIN 3 AIN 15 TB1 (42)
TB2 (44) AIN 4 AIN 16 TB1 (45)
TB2 (47) AIN 5 AIN 17 TT1 (A2)
TB2 (50) AIN 6 AIN 18 TT1 (A5)
TB2 (53) AIN 7 AIN 19
TB2 (56) AIN 8 AIN 20
TB2 (59) AIN 9 AIN 21
TB2 (62) AIN 10 AIN 22
TB2 (65) AIN 11 AIN 23
TT2 (7) AIN 12 AIN 24
HILINE ENGINEERING & FABRICATION INC.
2106 AVIATOR DRIVE, RICHLAND, WASHINGTON 99352
TELEPHONE: 509-943-8043 FAX 509-943-0889
RESPONSIBLE PERSONNEL
DRAWN T1 STOKES
ENGINEER M SMORA
MANAGER M SMORA
PASCO LANDFILL
CONNECTION DIAGRAM
D 9708-PHI-120C 0
SCALE NONE
9/11/97
REF NUMBER
TITLE
REFERENCES
REVISIONS
DWG NO
TITLE
DRAWING TRACEABILITY LIST
NEXT USED ON
CADFILE
CADCODE


RTU1
RTU2
AIR FROM WELL #1
TO GAC
MOISTURE SEPARATOR
FROM GAC
FROM CO2
TO WELL #1
HEAT EXCHANGER (HE2)
AIR FROM WELL #2
TO GAC
MOISTURE SEPARATOR
FROM GAC
TO WELL #2
FROM CO2
1 NoVOCs SYSTEM
HILINE ENGINEERING & FABRICATION INC.
PASCO PROCESS & INSTRUMENTATION DESIGN
9708-PHI-120D
0



2 SOIL VAPOR EXTRACTION SYSTEM

HAINE ENGINEERING & FABRICATION INC.
2103 AVIATOR DRIVE, RICHLAND, WASHINGTON 99352

PASCO PROCESS & INSTRUMENTATION DESIGN

01 9708-PHI-120D 0

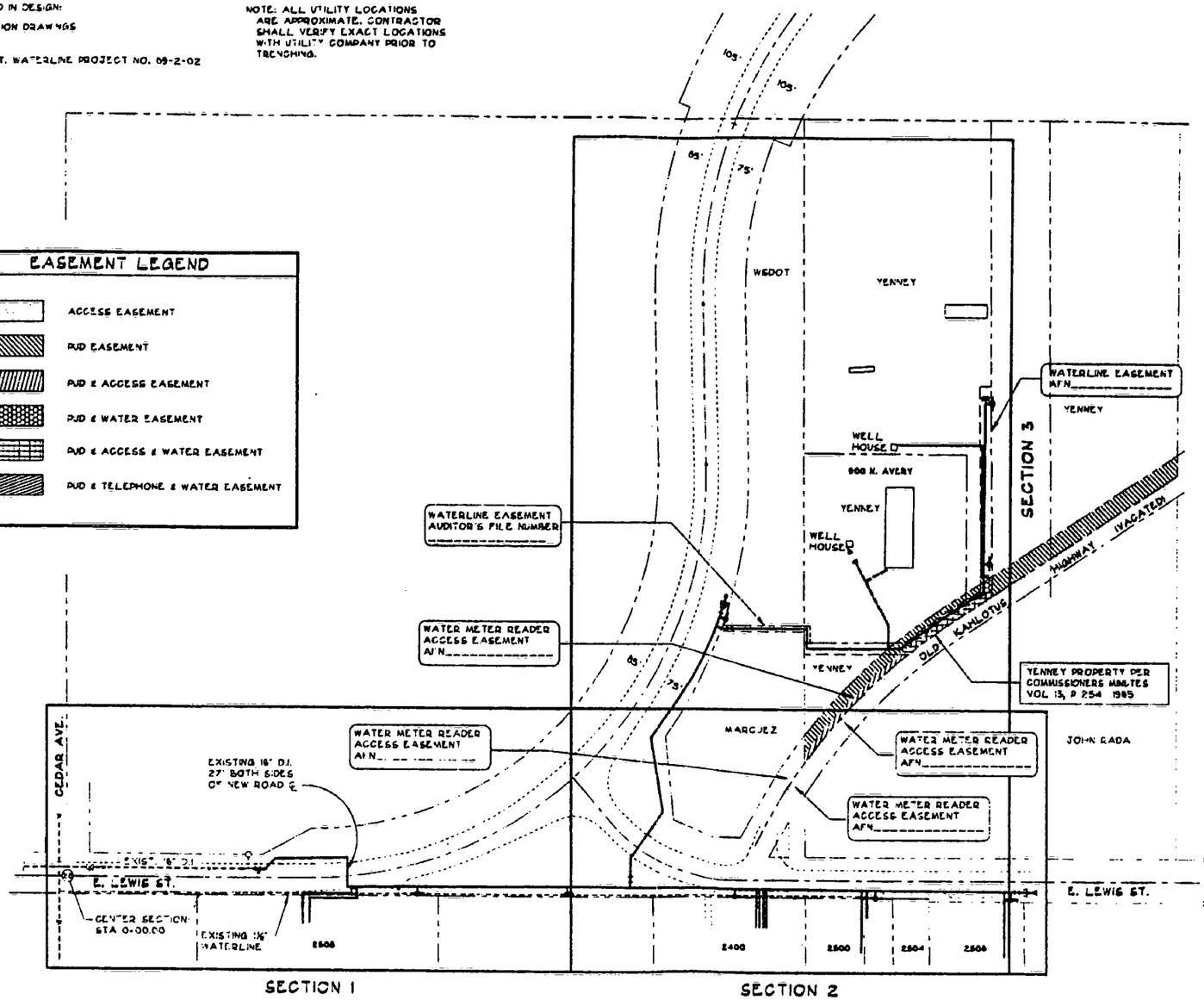
7/16/97

E. LEWIS ST. WATER MAIN EXTENSION

CALL BEFORE YOU DIG: 1-800-424-5555

REFERENCE DRAWINGS USED IN DESIGN:
WSDOT PK LINE CONSTRUCTION DRAWINGS
SHORT PLAT 81-1
ASSESSORS MAPS
CITY OF PASCO E. LEWIS ST. WATERLINE PROJECT NO. 89-2-02

NOTE: ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH UTILITY COMPANY PRIOR TO TRENCHING.

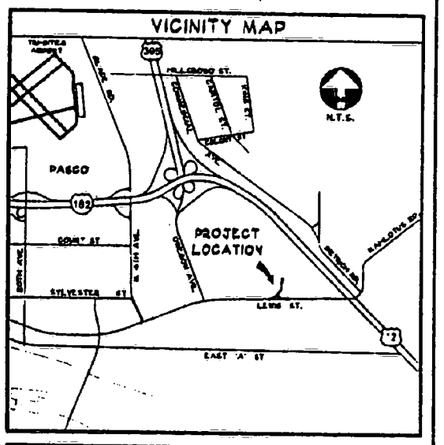


N

PLAN SCALE
FULL SIZE SCALE (36"x24"): 1"=100'
REDUCED SCALE (11"x17"): NONE

N ½ SE ¼ & S ½ NE ¼ SEC. 28
T. 9 N., R. 30 E., W.M.

VICINITY MAP



LEGEND

DESCRIPTION	EXIST.	PROP.
GROUND WATER WELLS	●	
WATER MAIN		
WATER SERVICE LINE		
FIRE HYDRANT (3 PORT)		
BLOW OFF		
WATER METER		
GATE VALVE		
BUTTERFLY VALVE		
PROPERTY LINE		
RIGHT OF WAY		
EDGE OF PAVEMENT		
EXISTING SEWER LINES		
DRAINFIELDS		
FENCE LINES		
OVERHEAD POWER		
UNDERGROUND POWER		
UNDERGROUND PHONE		
UNDERGROUND TV/CABLE		
WELL		
PRESSURE TANK		
PRESSURE REDUCER		
REDUCED PRESSURE BACKFLOW ASSEMBLY		
DOUBLE CHECK VALVE ASSEMBLY		

DRAWING LIST

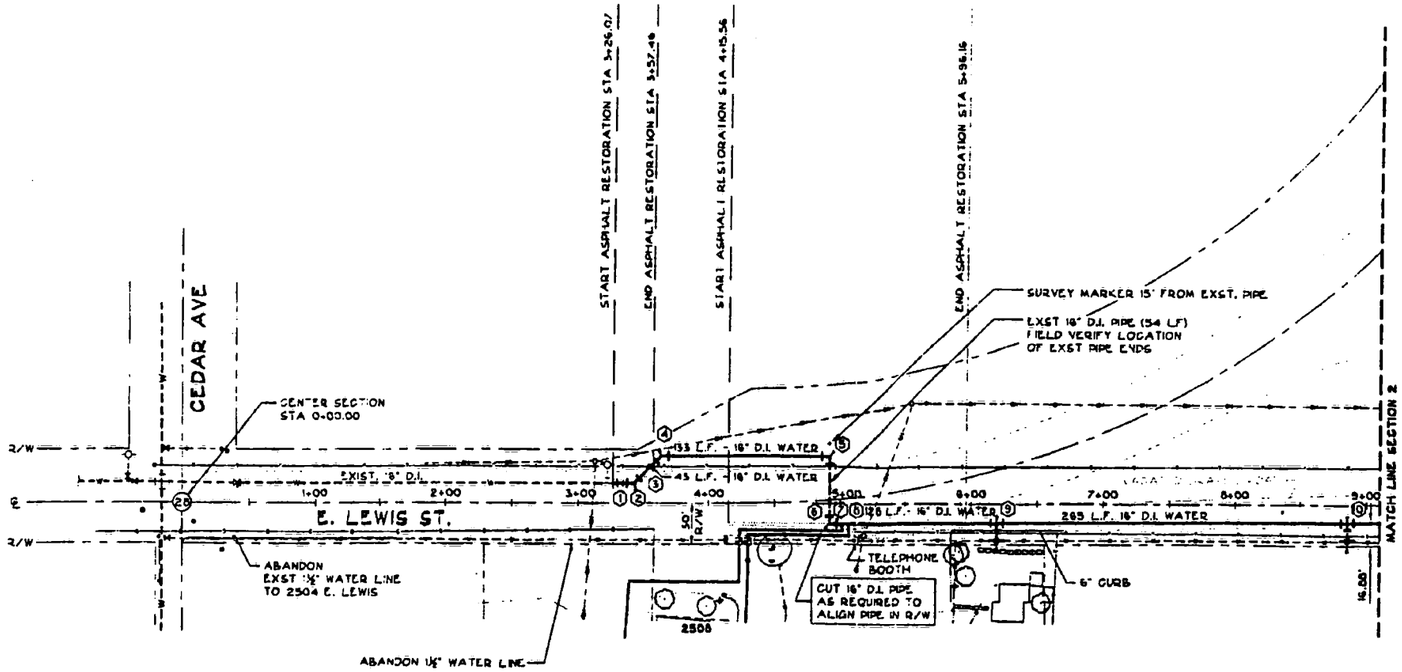
1. E. LEWIS WATER MAIN EXTENSION, OVERALL PLAN
2. E. LEWIS WATER MAIN EXTENSION, SECTIONS 1 & 2
3. E. LEWIS WATER MAIN EXTENSION, SECTION 3, 900 N. AVERY
4. PRIVATE WATER LINE SERVICE, 2508 E. LEWIS ST
5. PRIVATE WATER LINE SERVICE, 2400 E. LEWIS ST
6. PRIVATE WATER LINE SERVICE, 2500, 2504, 2506 E. LEWIS ST

CITY ENGINEER: _____ DATE: _____

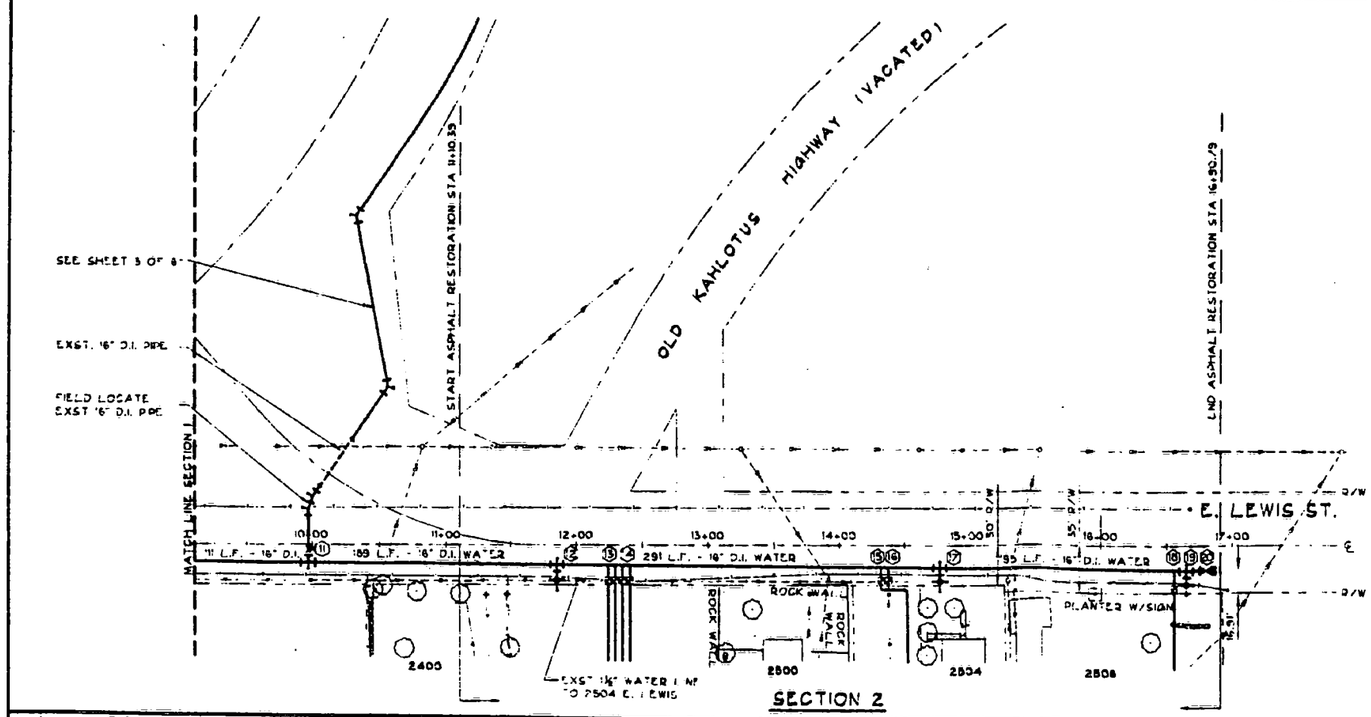
RECORD DRAWING: _____ DATE: _____

NOTE: RECORD DRAWING INFORMATION PROVIDED BY CONTRACTOR (SHARP AND PRESZLER CONSTRUCTION COMPANY, INC.).

HARMS & ASSOCIATES 1632 W. SYLVESTER PASCO, WASHINGTON 99301 PHONE (509) 547-2679 FAX (509) 547-3767	H. LIGHTHOUSE T. BRECHSEL	COVER 8-12-97 AS NOTED	PHILIP ENVIRONMENTAL SERVICES GROUP P.O. BOX 3552 SEATTLE, WA 98124 955 POWELL AVENUE S.W. RENTON, WA 98055	E. LEWIS ST. WATER MAIN EXTENSION OVERALL PLAN



SECTION 1



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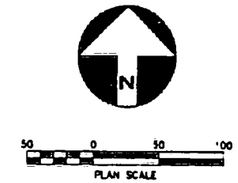


CALL BEFORE YOU DIG: 1-800-424-5555

NOTE: ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH UTILITY COMPANY PRIOR TO TRENCHING.

WATER FITTING SCHEDULE

1. STA 3+25 - 14.92' L
   1-16" SOLID SLEEVE MJ
2. STA 3+32 - 14.92' L
   1-16" BUTTERFLY VALVE MJxMJ
3. STA 3+43 - 14.92' L
   1-16"x45° BEND MJxMJ
   THRUST BLOCK 15 S.F.
4. STA 3+56 32.5' L
   1-16"x45° BEND MJxMJ
   THRUST BLOCK 15 S.F.
5. STA 4+93 - 35' L (STA 4+99) △1
   1-16"x90° ELBOW MJxMJ
   THRUST BLOCK 22 S.F.
6. STA 4+93 - 14.90' R (STA 4+99) △1
   1-16"x90° ELBOW MJxMJ
   THRUST BLOCK 22 S.F.
7. STA 5+00 - 14.90' R
   1-1½" SERVICE TAP
   STA 4+34 - 28' R
   1-1½" METER
8. STA 5+01 - 14.90' R
   1-¾" SERVICE TAP
   STA 4+35 - 28' R
   1-¾" METER
9. STA 6+20 - 14.35' R
   1-16"x16"x6" TEE MJxMJxFL
   THRUST BLOCK 4 S.F.
   1-6" GATE VALVE - FLxMJ
   FIRE HYDRANT ASSEMBLY, SEE CITY STD. 2-05
10. STA 6+85 - 13.23' R
    1-16"x16"x6" TEE MJxMJxFL
    THRUST BLOCK 4 S.F.
    1-6" GATE VALVE - FLxMJ
    FIRE HYDRANT ASSEMBLY, SEE CITY STD. 2-05
11. STA 9+96.58 - 13.68' R (STA 10+2.58) △1
    1-16"x16"x12" TEE MJxMJxFL
    THRUST BLOCK 12 S.F.
    1-12" BUTTERFLY VALVE FLxMJ
12. STA 11+85 - 14.92' R
    1-16"x16"x6" TEE MJxMJxFL
    THRUST BLOCK 4 S.F.
    1-6" GATE VALVE FLxMJ
    FIRE HYDRANT ASSEMBLY, SEE CITY STD. 2-05
13. STA 12+32 - 15.23' R
    1-1" SERVICE TAP
    1-1" METER
    1-2" RPBA
14. STA 12+53 - 15.23' R
    3-¾" SERVICE TAP
    3-¾" METER
15. STA 14+32 - 16.93' R
    1-1" SERVICE TAP
    1-1" METER
16. STA 14+36 - 16.57' R
    1-¾" SERVICE TAP
    EXST METER ¾" PRV △1
17. STA 14+76 - 16.62' R
    1-16"x16"x6" MJxMJxFL
    THRUST BLOCK 4 S.F.
    1-6" GATE VALVE FLxMJ
    FIRE HYDRANT ASSEMBLY, SEE CITY STD. 2-05
18. STA 16+55 - 18.00' R
    1-1" SERVICE TAP
    1-1" METER
19. STA 16+65 - 18.05' R
    1-16"x16"x6" TEE MJxMJxFL
    THRUST BLOCK 4 S.F.
    1-6" GATE VALVE FLxMJ
    FIRE HYDRANT ASSEMBLY, SEE CITY STD. 2-05
20. STA 16+70 - 18.05' R
    SADDLE THRUST BLOCK, 22 S.F.
    SEE CITY STANDARD 2-12
    STA 16+75 - 18.05' R
    1-16" BUTTERFLY VALVE MJxMJ
    1-6" END CAP

FIELD VERIFY LOCATION, DEPTH, & MATERIAL TYPE OF EXISTING WATER MAIN PRIOR TO CONSTRUCTION.

RECORD DRAWING MJ 12/11/97

HARMS & ASSOCIATES
1632 W. SYLVESTER PASCO, WASHINGTON 99301
PHONE (509) 547-2675 FAX (509) 547-3767

DRAWN H. SHTHOUSE	FILE NAME DESIGN-1
CHECKED T. DRECHSEL	DATE 8-12-97
CHECKED	SCALE AS SHOWN

PHILIP ENVIRONMENTAL SERVICES GROUP
P.O. BOX 3552 SEATTLE, WA 98124
955 POWELL AVENUE S.W. RENTON, WA 98055

E. LEWIS ST. WATERLINE EXTENSION SECTIONS 1 & 2, E. LEWIS ST.

PASCO, WA

JOB NO. 96-156.1

SHEET 2 OF 8

CALL BEFORE YOU DIG: 1-800-424-5555

NOTE: ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH UTILITY COMPANY PRIOR TO TRENCHING.

PLAN SCALE

FULL SIZE SCALE (36"x24"): 1"=50'
REDUCED SCALE (11"x17"): NONE

150' 278' 57'

1½" PRV 1" DCVA

200 LF ASPHALT REPAIR

30 LF 6" D.I. (FOR FUTURE USE BY RADA)

353 L.F. - 12" D.I. WATER

30' R FIRETRUCK TURN AROUND

SHOP (2)

20' EASEMENT BY YENNEY

15' MIN

10' MIN

230 LF 1½" GALV. WATER PVC

20' EASEMENT BY YENNEY

SEWAGE DRAINFIELD (PER OWNER)

SEPTIC TANK (PER OWNER)

FIELD LOCATE EXST PVC PIPE

RADA

EXST 2" PVC

2" GATE VALVE

1½" GATE VALVE

1½" PVC

WELL HOUSE

EXST 2" PVC

YENNEY

NOTE: NO METALLIC PIPE FOUND BY LOCATER BURIED PVC WATER ASSUMED

FIELD LOCATE EXISTING PVC PIPE

RADA

150 L.F. 1½" GALV. WATER PVC

WELL HOUSE

MH TRAILER

CORRECT #2

SHOP (1)

EXST PVC WATER SERVICE (PER OWNER)

YENNEY

YARD HYDRANT ¾" PVC

1½" PVC

RPBA 1" DCVA 1½" PRV

WELL HOUSE

INCORRECT #1

20' EASEMENT BY YENNEY

YENNEY

N 0°17'04" W

REMOVE AND REPLACE FENCING AS REQUIRED TO INSTALL WATER LINE

30 L.F. - 12" D.I. WATER

WSDOT

10' EASEMENT BY MARQUEZ

5' MIN

MARQUEZ

NOTE: FIELD SURVEY DATA REQUIRED FOR WATER LINE AS INSTALLED INCLUDING ANGLE POINTS.

7' MIN

140 L.F. 12" D.I. WATER

221 L.F. - 12" D.I. WATER

C1

L4

FIELD VERIFY LOCATION OF EXST PIPE END

180 L.F. 12" D.I. WATER

L3

L2

NOTE: NO EASEMENT REQUIRED IF R/W OWNED BY CITY OF PASCO. AS OF 8/12/97, WSDOT HAS NOT YET TRANSFERRED R/W TO CITY OF PASCO. AN EASEMENT IS REQUIRED FROM WSDOT TO PLACE THE WATERLINE AS SHOWN.

~~1-12"x22½° BEND MJxMJ THRUST BLOCK 4 S.F.~~
~~1-12"x12"x12" TEE MJxMJxMJ THRUST BLOCK 12 S.F.~~

MARKER FOR END OF 6" D.A PIPE

250 L.F. 12" D.I.

EXST 8" D.I. CROSSING

44 L.F. 12" D.I. WATER

35' R/W

30' R/W

R/W

CL

2506

2504

2500

2400

18" D.I. WATER

EXST 1½" WATER LINE TO 2504 E. LEWIS

E. LEWIS ST.

16" D.I. WATER

SEE SHEET 2 OF 6 FOR E. LEWIS ST. WATER MAIN DESIGN

EXST 1½" WATER LINE TO 2504 E. LEWIS

WATER FITTING SCHEDULE (CONTINUED)

(31) 1-12" BUTTERFLY VALVE

(32) 1-12"x22½° BEND MJxMJ
THRUST BLOCK 4 S.F.
~~1-12"x11¼° BEND MJxMJ~~
THRUST BLOCK 2 S.F.
1-12"x16" REDUCER
CONNECT TO EXISTING PIPE

(33) 1-16"x12" REDUCER
CONTINUE FROM EXISTING PIPE

(34) 1-12"x45° BEND MJxMJ
THRUST BLOCK 9 S.F.

(35) 1-12"x45° BEND MJxMJ
THRUST BLOCK 9 S.F.

(36) 1-12"x12"x12" TEE MJxMJxFL
THRUST BLOCK 12 S.F.
1-12"x22½° BEND MJxMJ
THRUST BLOCK 4 S.F.

(37) 1-12"x12"x6" TEE MJxMJxFL
THRUST BLOCK 4 S.F.
1-6" GATE VALVE FLxMJ
FIRE HYDRANT ASSEMBLY
SEE CITY STD. 2-05

(38) 1-12" BUTTERFLY VALVE FLxMJ
1-12" END CAP
SADDLE THRUST BLOCK 12 S.F.
SEE CITY STD. 2-12

(39) 1-12" BUTTERFLY VALVE MJxMJ

(40) 1-12"x90° BEND MJxMJ
THRUST BLOCK 12 S.F.

(41) 1-12"x90° BEND MJxMJ
THRUST BLOCK 12 S.F.

(42) 1-1" SERVICE TAP
1-1" METER

(43) 1-12"x22½° BEND MJxMJ
THRUST BLOCK 4 S.F.
1-12"x11¼° BEND MJxMJ
THRUST BLOCK 2 S.F.

(44) 1-12"x12"x6" TEE
1-6" GATE VALVE

(45) ~~1-12"x11¼° BEND MJxMJ~~
1-12"x22½° BEND MJxMJ
THRUST BLOCK 4 S.F.
1-12"x12"x12" TEE MJxMJxMJ
THRUST BLOCK 12 S.F.

(46) 1-1" SERVICE TAP
1-1" METER

(47) 1-12"x12"x6" TEE MJxMJxFL
THRUST BLOCK 4 S.F.
1-6" GATE VALVE FLxMJ
FIRE HYDRANT ASSEMBLY
SEE CITY STD. 2-05

(48) 1-12"x12"x6" TEE MJxMJxFL
THRUST BLOCK 4 S.F.
1-6" GATE VALVE FLxMJ
FIRE HYDRANT ASSEMBLY
SEE CITY STD. 2-05

(49) 1-12" END CAP
SADDLE THRUST BLOCK
SEE CITY STD. 2-12

WATER MAIN ALIGNMENT

LINE	DIRECTION	DISTANCE
L1	N 00°00'00" W	44.00'
L2	N 34°27'29" E	105.00'
L3	N 10°32'19" W	150.00'
L4	N 34°27'41" E	75.00

CURVE	R	L	T	Δ
C1	800.00'	148.15	73.44	15°37'22"
C2	800.00'	30.00'	15.00'	02°15'53"

1	RECORD DRAWING	MLC 12/16/97

HARMS & ASSOCIATES
1632 W. SYLVESTER PASCO, WASHINGTON 99301
PHONE (509) 547-2879 FAX (509) 547-3787

DESIGNED: M. LIGHTHOUSE
FILE NAME: DESIGN-2
DRAWN: T. CHLOUSE
DATE: 8-12-97
DRAWING: SCALE: AS SHOWN

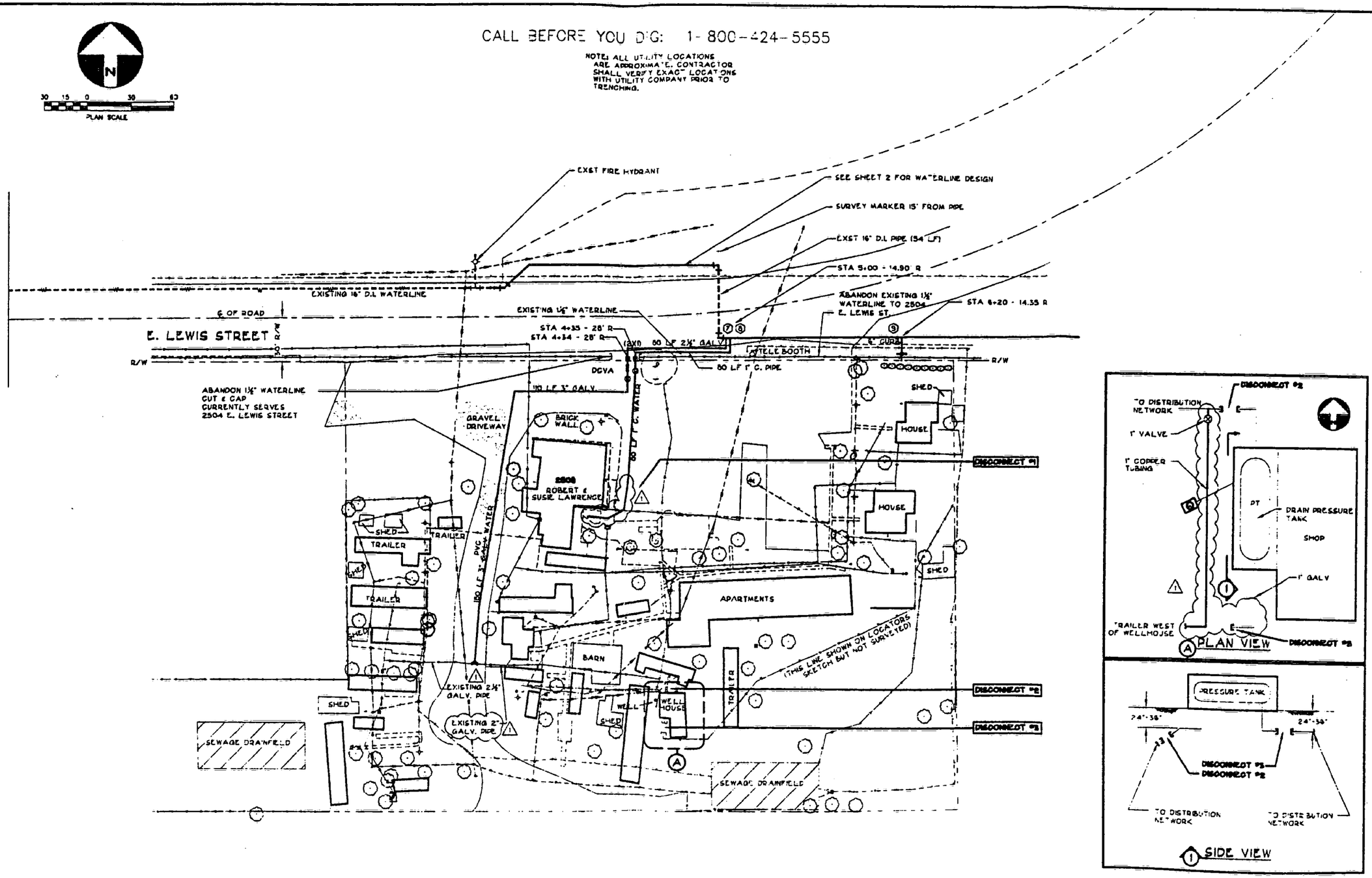
CLIENT: PHILIP ENVIRONMENTAL SERVICES GROUP
P.O. BOX 3857 SEATTLE, WA 98124
955 POWELL AVENUE S.W. RENTON, WA 98055

PROJECT TITLE: E. LEWIS ST. WATERLINE EXTENSION
SECTION 3, 900 N. AVERY
PASCO, WA

PROJ. NO. 96-156
SHEET 3 OF 6

CALL BEFORE YOU DIG: 1-800-424-5555

NOTE: ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH UTILITY COMPANY PRIOR TO TRENCHING.



RECORD DRAWING MLG 12/31/97

HARMS & ASSOCIATES
1632 W. SYLVESTER PASCO, WASHINGTON 99301
PHONE (509) 547-2679 FAX (509) 547-3767

DESIGNED H. LIGHTHOUSE | FILE NAME PARCEL
DRAWN T. DRECHSEL | DATE 8-12-97
CHECKED | SCALE AS SHOWN

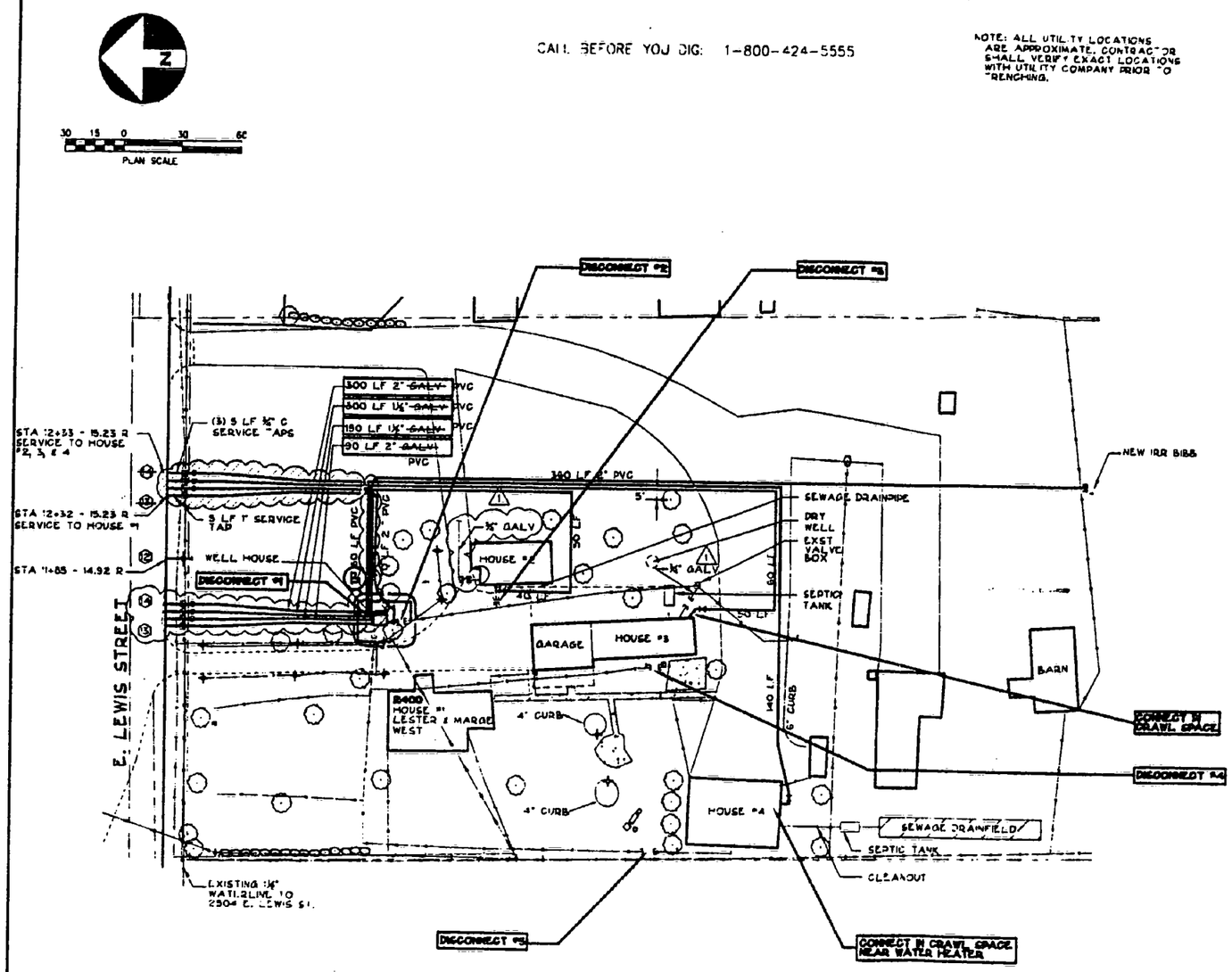
CLIENT PHILIP ENVIRONMENTAL SERVICES GROUP
P.O. BOX 3552 SEATTLE, WA 98124
955 POWELL AVENUE S.W. RENTON, WA 98055

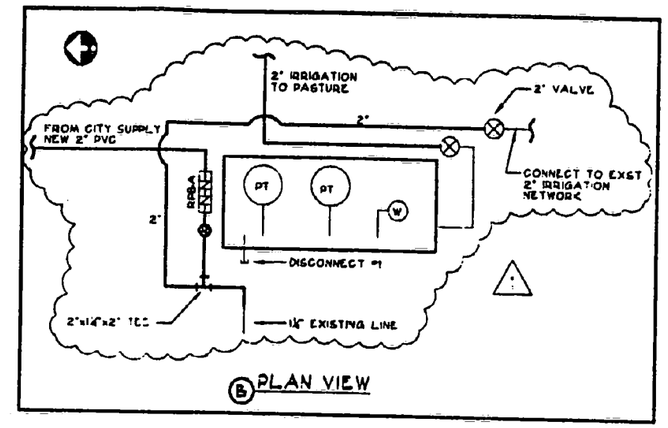
DRAWING NAME PRIVATE WATERLINE SERVICE
2508 E. LEWIS ST.
PASCO, WA

HARMS JOB NO. 96-1561
SHEET 4 OF 6

CALL BEFORE YOU DIG: 1-800-424-5555

NOTE: ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH UTILITY COMPANY PRIOR TO TRENCHING.





(B) PLAN VIEW

RECORD DRAWING	MFC 12/31/97	HARMS & ASSOCIATES 1632 W. SYLVESTER PASCO, WASHINGTON 99301 PHONE (509) 547-2679 FAX (509) 547-3767	DESIGNED: H. LIGHTHOUSE DRAWN: J. DRECHSEL CHECKED:	FILE NAME: PARCEL2 DATE: 8-12-97 SCALE: AS SHOWN	PHILIP ENVIRONMENTAL SERVICES GROUP P.O. BOX 3552 SEATTLE, WA 98124 955 POWELL AVENUE S.W. RENTON, WA 98055

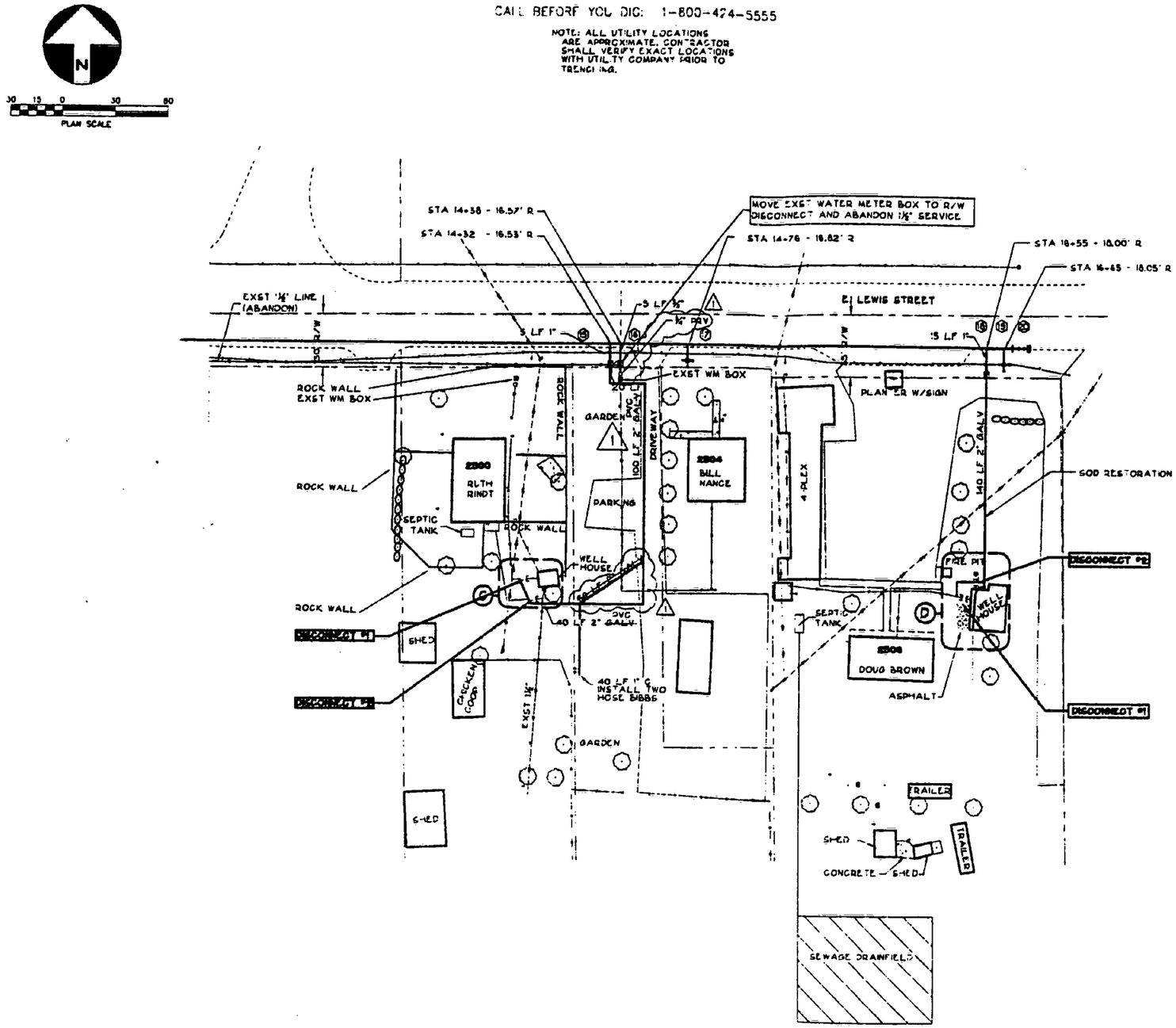
PRIVATE WATERLINE SERVICE
2400 E. LEWIS ST.
PASCO, WA

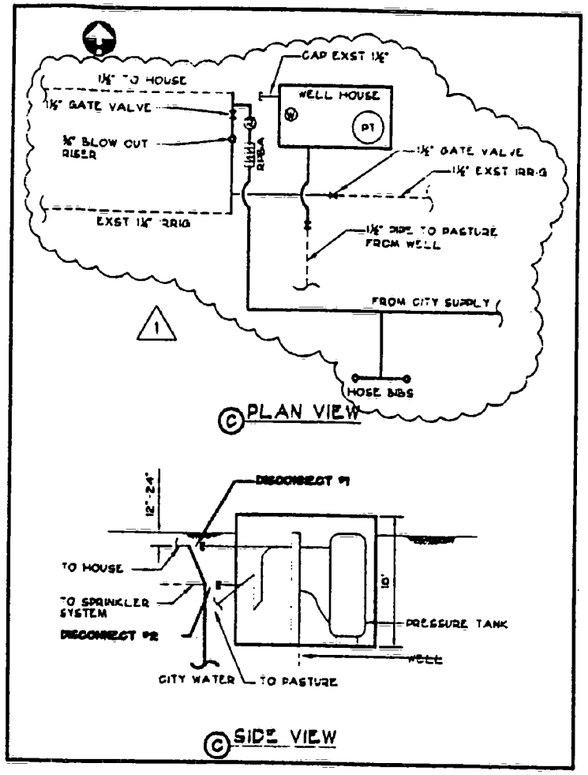
PROJ. NO. 96-156

SHEET 5 OF 6

CALL BEFORE YOU DIG: 1-800-424-5555

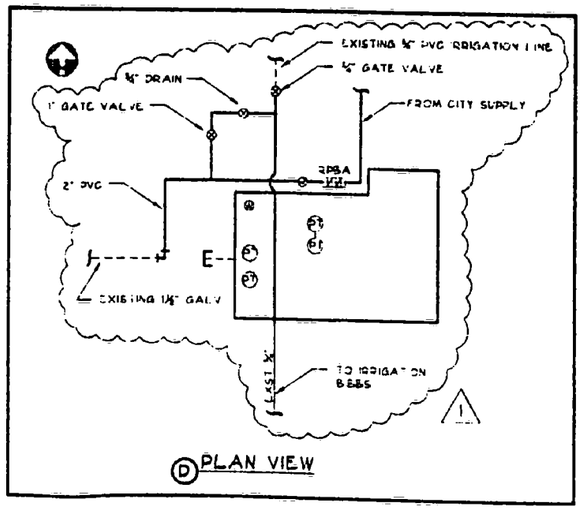
NOTE: ALL UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS WITH UTILITY COMPANY PRIOR TO TRENCHING.





© PLAN VIEW

© SIDE VIEW



Ⓓ PLAN VIEW

1	RECORD DRAWING	MLC 12/31/97	HARMS & ASSOCIATES 1632 W. SYLVESTER PASCO, WASHINGTON 99301 PHONE (509) 547-2679 FAX (509) 547-3767	H. LIGHTHOUSE / PARCEL 3 J. DRECHSEL / 8-12-97 AS SHOWN	PHILIP ENVIRONMENTAL SERVICES GROUP P.O. BOX 3552 SEATTLE, WA 98124 955 POWELL AVENUE S.W. RENTON, WA 98055	PRIVATE WATERLINE SERVICE 2500, 2504, 2506 E. LEWIS ST. PASCO, WA

98-156.1

SHEET 6 OF 6