

0051571

071355

Environmental  
Restoration  
Contractor

# ERC Team

## Meeting Minutes

Job No. 22192  
Written Response Required: NO  
Due Date: N/A  
Actionee: N/A  
Closes CCN: N/A  
OU: 200-ZP-1, 200-ZP-2  
TSD: N/A  
ERA: CCL4  
Subject Code: 4170, 8220, 8960

**SUBJECT** 200-ZP-1/ZP-2 UNIT MANAGERS MEETING MINUTES

**TO** Distribution

**FROM** L. C. Swanson *AS*

**DATE** July 22, 1999

### ATTENDEES

D. A. Faulk B5-01  
S. W. Petersen H0-02  
V. J. Rohay H0-19  
L. C. Swanson H9-02  
A. C. Tortoso H0-12

### DISTRIBUTION

Attendees  
R. L. Jackson H9-02  
C. Ward H9-01  
R. C. Wilson H9-02  
Administrative Record c/o H0-09  
Document and Information Services H0-09



A 200-ZP-1 and 200-ZP-2 Unit Managers Meeting was held on May 25, 1999, in conference room 2C58 at 3350 George Washington Way. The agenda is included as Attachment 1.

### 200-ZP-2 Soil Vapor Extraction System

Soil vapor extraction (SVE) to remove carbon tetrachloride from the vadose zone resumed 3/29/99 at the Z-9 site using the 14.2 m<sup>3</sup>/min SVE system. Four extraction intervals were selected initially to optimize both protection of groundwater and mass removal of contaminant. These are the same wells used for initial operations at Z-9 in July 1998. Two additional extraction intervals were added 4/15/99. In general, the initial extraction wells are nearer the carbon tetrachloride source (crib) and wells added later will expand operations away from the source.

V. J. Rohay provided a graph showing both the daily average carbon tetrachloride concentrations measured at the SVE inlet and the daily mass removed (Attachment 2). The mass removal rate increased on 4/15/99 because new wells added to the SVE system increased the soil vapor flowrate. Concentrations and flows increased on 4/21/99 after replacement of the Bruel & Kjaer (B&K) carbon tetrachloride sensor, which had been reading too low. The mass removal rate increased again on 4/26/99 because replacement of the SVE blower belt resulted in increased flowrate.

V.J. Rohay provided a graph indicating that the initial extracted carbon tetrachloride concentrations in 4/99 were slightly lower than those observed in 7/98, even when the 1999 data are corrected for the low B&K readings (Attachment 3). However, after approximately 5 weeks of SVE operations, the 1999 and 1998 concentrations were the same. These 1999 and 1998 data are for the same set of on-line wells. The Unit Managers agreed that the 1999 wells should be selected to maintain mass removal rather than to repeat the 1998 selection pattern.

V. J. Rohay provided the characterization data for individual SVE extraction wells organized by well and

H:\CECELIA\GWTASK\ROHAY\0525-min.doc

by date for 1999 (Attachment 4) and by date for 1998 (Attachment 5). Comparison of the initial 1999 concentrations to the initial 1998 concentrations at the same individual SVE extraction wells indicates that the 1999 concentrations are typically lower.

Soil vapor monitoring near the groundwater, the lower permeability silt/caliche zone, and the ground surface was conducted at both the Z-9 and Z-1A/Z-18/Z-12 sites from October 1998 through March 1999 while the soil vapor extraction system was not being operated; soil vapor monitoring is being conducted primarily at the Z-1A/Z-18/Z-12 site from April through June 1999 while the SVE system is operating at the Z-9 site. V. J. Rohay provided a table comparing the maximum concentration at each monitoring location to the maximum observed at that location during the rebound study (November 1996 through July 1997) and during fiscal year 1998 (October 1997 through September 1998) and a table of all the non-operational monitoring data for fiscal year 1999 (Attachment 6). Monthly monitoring data from July through September 1998 are included with the fiscal year 1999 data for monitoring locations at the Z-1A/18/12 site, where SVE operations were discontinued in June 1998.

S.W. Petersen provided a status of the carbon tetrachloride strategy being developed for the 200-ZP-2 and 200-ZP-1 vadose and groundwater plumes. The strategy will be provided to the U.S. Department of Energy, Richland Operations Office (RL) as a letter report and will consist of recommended steps for overcoming barriers to reaching final decisions regarding cleanup of the carbon tetrachloride plume. D. A. Faulk recommended that the strategy being linked to the carbon tetrachloride Innovative Treatment Remediation Demonstration (ITRD) process, which is receiving regulatory input, and to the 5-year review of the ZP-1 pump-and-treat remediation.

A. C. Tortoso and D. A. Faulk agreed that the carbon tetrachloride ITRD program is making good progress. The ITRD program for the Hanford carbon tetrachloride site will evaluate innovative characterization, modeling, and remediation technologies for the vadose zone and groundwater plumes.

Selected 200-ZP-2 wells are being adapted for passive soil vapor extraction as an alternative to active vapor extraction. D. A. Faulk expressed an interest in a visit to the passive extraction site after the passive systems have been installed.

J. W. Massmann, University of Washington, is conducting studies of the carbon tetrachloride migration and distribution through the Consortium for Risk Evaluation and Stakeholder Participation (CRESP) program. A. C. Tortoso and D. A. Faulk suggested that it would be useful to have Dr. Massmann visit and provide a status of his planned activities. V. J. Rohay provided copies of "Enhancements for Passive Vapor Extraction: The Hanford Study" which was published in the May-June 1999 issue of Ground Water; the work described in the paper was supported in part through CRESP and the RL Environmental Restoration Program.

No update was available on the high resolution seismic reflection activities being conducted by geophysicists from the University of South Carolina at the Z-9 site to look for dense non-aqueous phase liquid.

D. A. Faulk reported that the sampling and analysis plan for the 241-Z-361 Tank is in the review cycle. Preliminary results of the recent vapor sampling in the tank indicated no detection of organic compounds

and low concentrations of nitrous oxides and hydrogen. A video of the tank interior indicated that the steel liner is deteriorated and that there is a sludge layer on the bottom.

### **200-ZP-1 Pump and Treat System**

L. C. Swanson reported that the 200-ZP-1 pump-and-treat operations were shut down from 5/4/99 to 5/11/99 to flush the stripping tower with chlorine to remove algae growth.

D. A. Faulk requested that the ZP-1 project analyze the extracted groundwater for fecal coliform to determine whether the pump-and-treat operation is extracting septic water discharged from the Plutonium Finishing Plant.

L. C. Swanson summarized the recent investigation where technetium-99 was detected in the extracted groundwater at ZP-1. Concentrations detected at the post-effluent tank were 100 pCi/L, which is well below the Drinking Water Standard of 900 pCi/L. Low Level Burial Grounds waste management (i.e., RCRA monitoring) was notified that Tc-99 is in the treated groundwater being injected under the solid waste burial grounds upgradient of ZP-1 site. BHI is confident that no Tc-99 is being released to atmosphere or retained on the granular activated carbon in the treatment train based on sampling results at the vapor knockout tank. A recent Tc-99 sample collected at this location was below detection. It was recommended that the Washington State Department of Ecology (Ecology) be made aware of this situation by notifying the Ecology lead for 200 Area groundwater.

L. C. Swanson presented a table of the sampling results for Tc-99 within the ZP-1 pump-and-treat system (Attachment 7). He noted that Tc-99 concentrations are high in groundwater extracted from well 299-W15-32, which is further south from the T-TX tank farm than extraction well 299-W15-35. Because well 299-W15-35 should capture any groundwater being drawn from the T-TX tank farm area, he thought that these high concentrations might indicate an undocumented source to the east of well 299-W15-32.

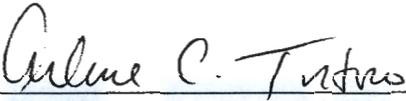
D. A. Faulk requested that any waste that is generated be handled properly and placed in waste containers in the 200-ZP-1/200-ZP-2 storage area prior to disposal at the Environmental Restoration Disposal Facility.

### **Action Items**

1. A. C. Tortoso will determine who within the DOE manages the CRESA activities.
2. A. C. Tortoso will contact Mike Waddell of the University of South Carolina for an update on the high resolution seismic work.
3. V. J. Rohay will contact Joel Massmann of the University of Washington to ask about his visiting the site to provide an update on his CRESA activities.
4. L. C. Swanson will ensure that ZP-1 pump-and-treat extracted groundwater is analyzed for coliform.
5. D. A. Faulk will send the 241-Z-361 Sampling and Analysis Plan to A. C. Tortoso.

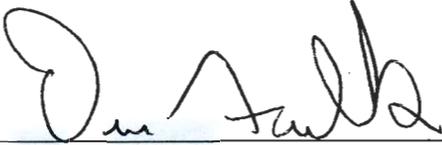
**Meeting Minutes Approval**

The undersigned indicate by their signatures that these meeting minutes reflect the actual occurrences of the above-dated Unit Managers Meeting.

  
\_\_\_\_\_

Arlene C. Tortoso, Project Manager, RL

Date: 7/22/99

  
\_\_\_\_\_

Dennis A. Faulk, Project Manager, EPA

Date: 7-22-99

AGENDA  
UNIT MANAGERS MEETING  
200-ZP-1 AND 200-ZP-2  
MAY 25, 1999

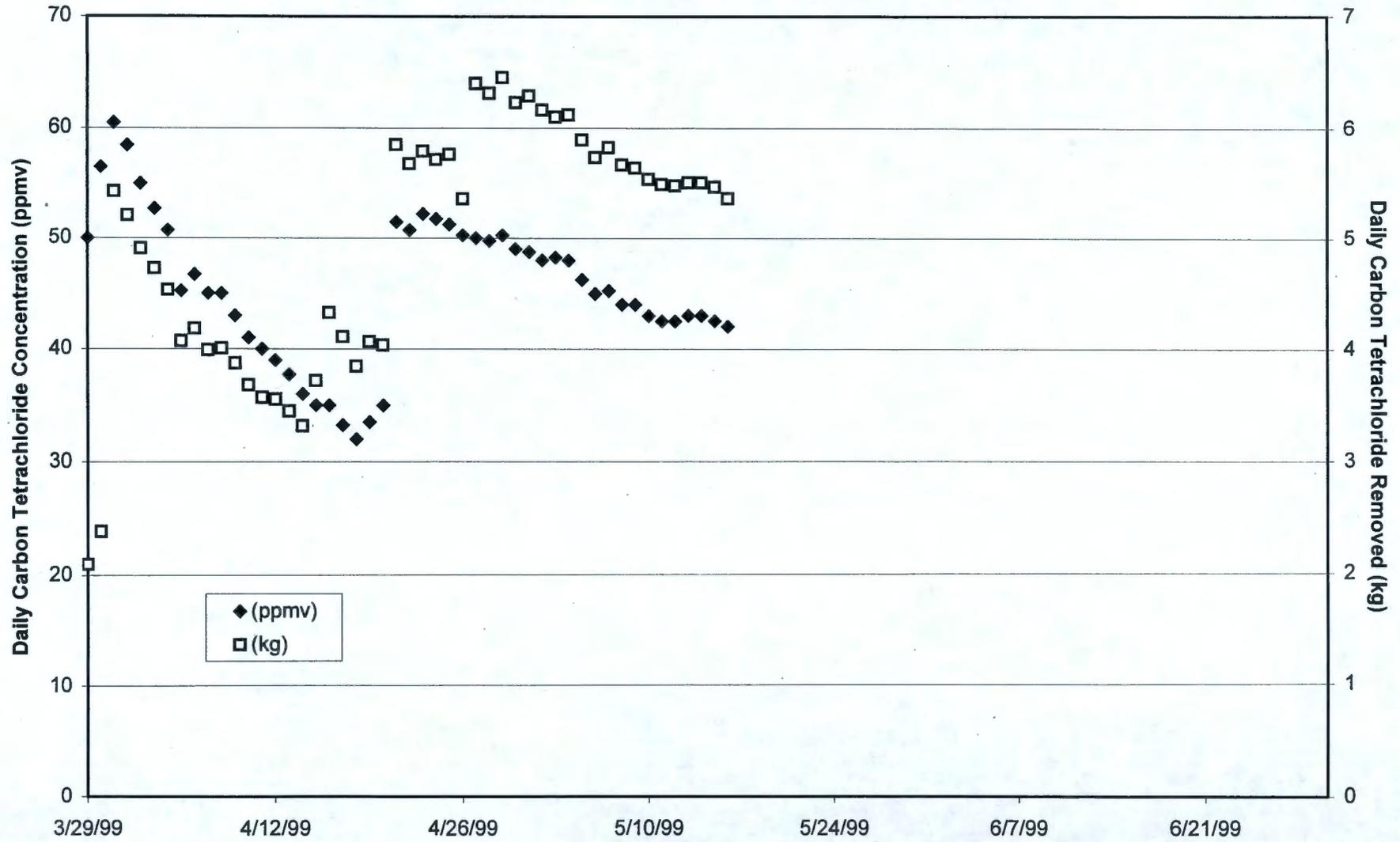
200-ZP-2 SOIL VAPOR EXTRACTION REMEDIATION

- Summary of Z-9 Operating Data
- Summary of Non-Operational Monitoring
- Passive Soil Vapor Extraction Implementation Plan
- Carbon Tetrachloride Strategy
- ITRD
- CRESP
- High Resolution Seismic Profiling

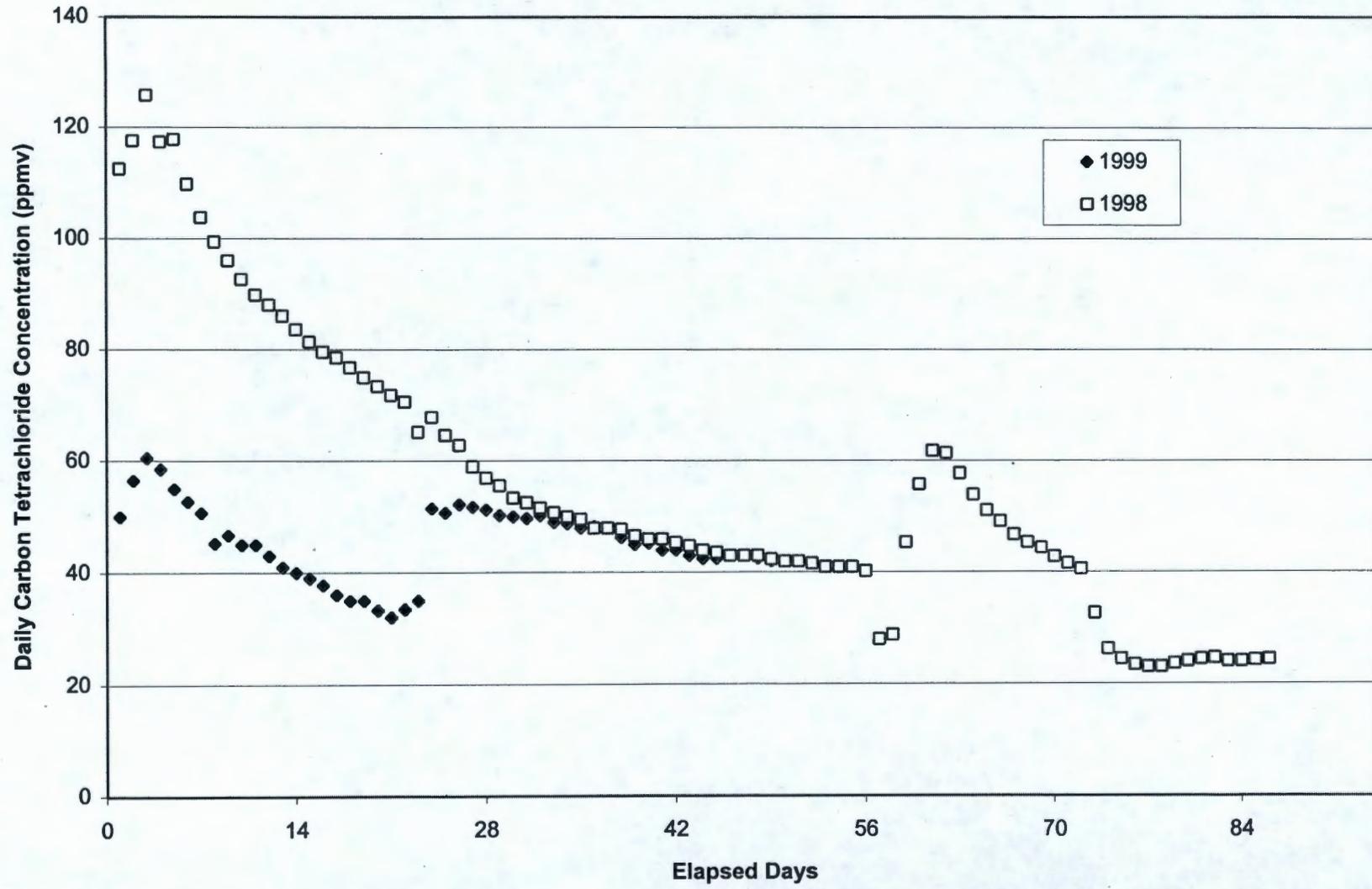
200-ZP-1 PUMP-AND-TREAT REMEDIATION

- Status of Pump-and-Treat Operations

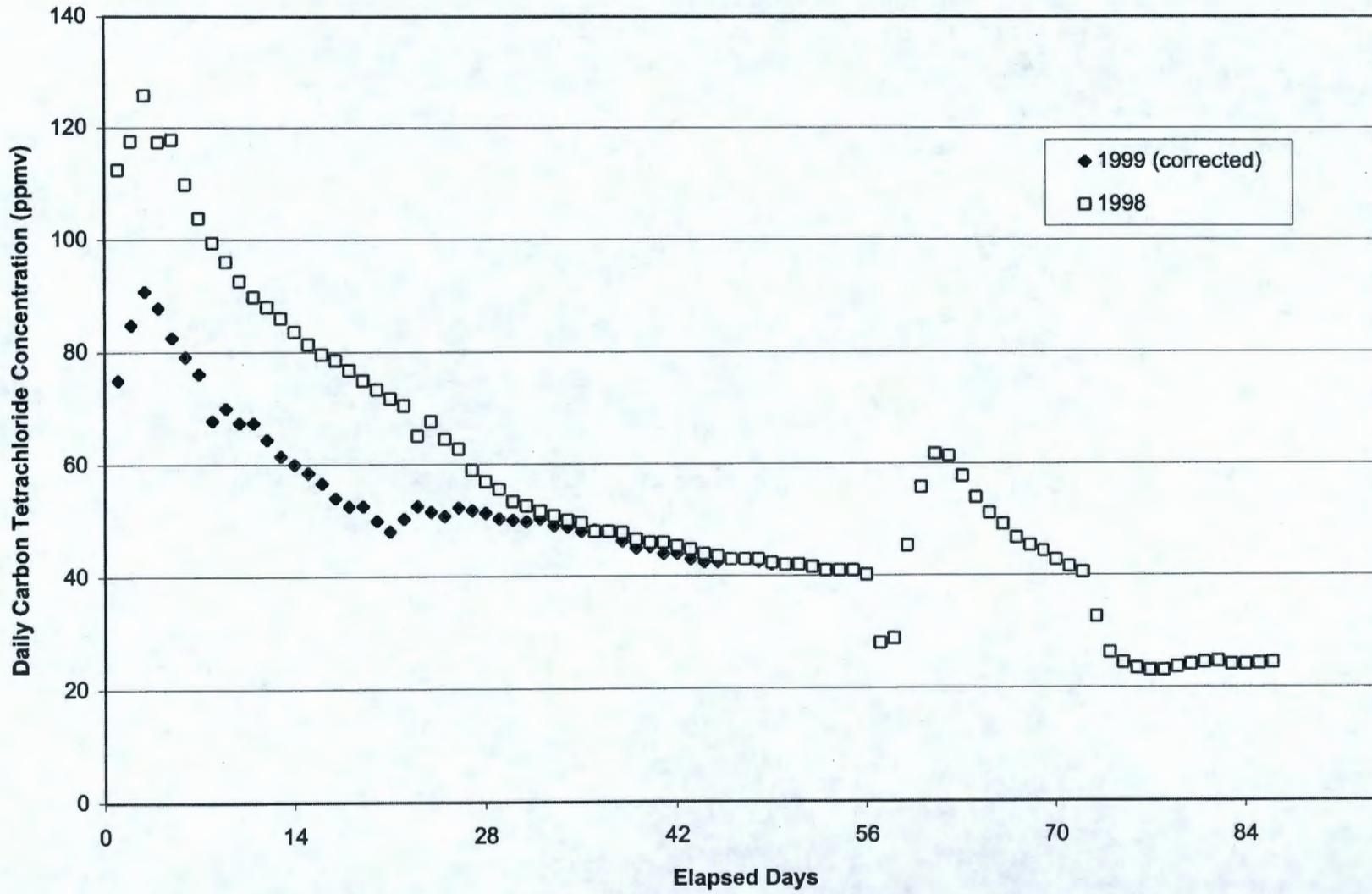
Z-9



Z-9



Z-9



Z-9		Well	SVE			CCI4			
Well/Interval	Date	Vacuum	Vacuum	Flow	CCI4	Flux	CHCl3	CH2Cl2	MEK
		(in. w.c.)	(in. w.c.)	(ft3/min)	(ppmv)	(kg/day)	(ppmv)	(ppmv)	(ppmv)
W15-6L	4/15/99	60	70	119	12	0.399	0	0	0
W15-6L	4/21/99	47	55	99	22.6	0.626	0	5.61	0
W15-6L	4/28/99	60	75	115	22	0.707	0	4.65	0
W15-6L	5/3/99	60	72	111	22.3	0.692	1.37	3.91	0
W15-6L	5/10/99	55	72	99	21.8	0.603	0	5.23	0
W15-6L	5/17/99	58	74	103	22.4	0.645	0	6.17	0
W15-9L	3/30/99	94	85	91	15.5	0.394	0	0	0
W15-9L	4/5/99	95	90	83	16.1	0.374	0	NA	NA
W15-9L	4/12/99	90	86	87	17.7	0.431	0	0	0
W15-9L	4/21/99	76	55	69	19.9	0.384	0	4.11	0
W15-9L	4/28/99	99	75	83	17.3	0.402	0	2.8	0
W15-9L	5/3/99	97	72	75	22	0.461	1.16	2.68	0
W15-9L	5/10/99	96	72	83	17.5	0.406	0	3.62	0
W15-9L	5/17/99	91	74	61	17.8	0.304	0	4.2	0
W15-9U	3/30/99	96	85	87	34.8	0.847	0	0	0
W15-9U	4/5/99	100	90	75	17.5	0.367	0	NA	NA
W15-9U	4/12/99	95	86	75	11.2	0.235	0	0	0
W15-9U	4/21/99	76	55	63	14.1	0.248	0	2.66	0
W15-9U	4/28/99	99	75	75	12.8	0.268	0	1.16	0
W15-9U	5/3/99	100	71	59	15.3	0.252	1.29	1.91	0
W15-9U	5/10/99	95	72	71	11.8	0.234	1.25	1.49	0
W15-9U	5/17/99	96	74	63	11.5	0.203	0	2.67	0
W15-82	3/30/99	82	82	63	167	2.942	1.41	0	0
W15-82	4/5/99	86	86	79	136	3.004	0	NA	NA
W15-82	4/12/99	85	90	71	118	2.343	2.05	0	0
W15-82	4/21/99	55	55	60	119	1.997	0	0	0
W15-82	4/28/99	72	75	60	102	1.711	0	0	0
W15-82	5/3/99	69	70	55	95.4	1.467	1.09	0	0
W15-82	5/10/99	70	72	58	91.1	1.477	0	0	0
W15-82	5/17/99	68	72	59	86.6	1.429	0	0	0
W15-86	4/15/99	55	60	135	3.96	0.149	1.37	0	0
W15-86	4/21/99	60	55	120	64.3	2.158	0	4.43	0
W15-86	4/28/99	80	75	160	59.3	2.653	0	3.19	0
W15-86	5/3/99	80	72	169	54.7	2.585	0	3.4	0
W15-86	5/10/99	80	72	170	48.5	2.306	0	3.19	0
W15-86	5/17/99	77	75	170	46.4	2.206	0	5.86	0
W15-217	3/30/99	75	84	142	116	4.606	1.1	0	0
W15-217	4/5/99	73	90	146	82	3.348	0	NA	NA
W15-217	4/12/99	70	86	154	65.6	2.825	1.25	0	1.42
W15-217	4/21/99	60	55	135	65.2	2.461	0	5.83	0
W15-217	4/28/99	75	75	178	47	2.339	0	4.5	0
W15-217	5/3/99	74	72	172	51.4	2.472	0	5.32	0
W15-217	5/10/99	74	72	173	48.5	2.346	0	5.76	0
W15-217	5/17/99	76	75	178	45.7	2.275	0	6.78	0

Z-9 Well/Interval	Date	Well	SVE			CCI4				
		Vacuum (in. w.c.)	Vacuum (in. w.c.)	Flow (ft3/min)	CCI4 (ppmv)	Flux (kg/day)	CHCl3 (ppmv)	CH2Cl2 (ppmv)	MEK (ppmv)	
W15-9L	3/30/99	94	85	91	15.5	0.394	0	0	0	
W15-9U	3/30/99	96	85	87	34.8	0.847	0	0	0	
W15-82	3/30/99	82	82	63	167	2.942	1.41	0	0	
W15-217	3/30/99	75	84	142	116	4.606	1.1	0	0	
W15-9L	4/5/99	95	90	83	16.1	0.374	0	NA	NA	
W15-9U	4/5/99	100	90	75	17.5	0.367	0	NA	NA	
W15-82	4/5/99	86	86	79	136	3.004	0	NA	NA	
W15-217	4/5/99	73	90	146	82	3.348	0	NA	NA	
W15-9L	4/12/99	90	86	87	17.7	0.431	0	0	0	
W15-9U	4/12/99	95	86	75	11.2	0.235	0	0	0	
W15-82	4/12/99	85	90	71	118	2.343	2.05	0	0	
W15-217	4/12/99	70	86	154	65.6	2.825	1.25	0	1.42	
W15-6L	4/15/99	60	70	119	12	0.399	0	0	0	
W15-86	4/15/99	55	60	135	3.96	0.149	1.37	0	0	
	4/20/99	B&K reading low, changed out								
W15-9L	4/21/99	76	55	69	19.9	0.384	0	4.11	0	
W15-9U	4/21/99	76	55	63	14.1	0.248	0	2.66	0	
W15-82	4/21/99	55	55	60	119	1.997	0	0	0	
W15-217	4/21/99	60	55	135	65.2	2.461	0	5.83	0	
W15-6L	4/21/99	47	55	99	22.6	0.626	0	5.61	0	
W15-86	4/21/99	60	55	120	64.3	2.158	0	4.43	0	
W15-9L	4/28/99	99	75	83	17.3	0.402	0	2.8	0	
W15-9U	4/28/99	99	75	75	12.8	0.268	0	1.16	0	
W15-82	4/28/99	72	75	60	102	1.711	0	0	0	
W15-217	4/28/99	75	75	178	47	2.339	0	4.5	0	
W15-6L	4/28/99	60	75	115	22	0.707	0	4.65	0	
W15-86	4/28/99	80	75	160	59.3	2.653	0	3.19	0	
W15-9L	5/3/99	97	72	75	22	0.461	1.16	2.68	0	
W15-9U	5/3/99	100	71	59	15.3	0.252	1.29	1.91	0	
W15-82	5/3/99	69	70	55	95.4	1.467	1.09	0	0	
W15-217	5/3/99	74	72	172	51.4	2.472	0	5.32	0	
W15-6L	5/3/99	60	72	111	22.3	0.692	1.37	3.91	0	
W15-86	5/3/99	80	72	169	54.7	2.585	0	3.4	0	
W15-9L	5/10/99	96	72	83	17.5	0.406	0	3.62	0	
W15-9U	5/10/99	95	72	71	11.8	0.234	1.25	1.49	0	
W15-82	5/10/99	70	72	58	91.1	1.477	0	0	0	
W15-217	5/10/99	74	72	173	48.5	2.346	0	5.76	0	
W15-6L	5/10/99	55	72	99	21.8	0.603	0	5.23	0	
W15-86	5/10/99	80	72	170	48.5	2.306	0	3.19	0	
W15-9L	5/17/99	91	74	61	17.8	0.304	0	4.2	0	
W15-9U	5/17/99	96	74	63	11.5	0.203	0	2.67	0	
W15-82	5/17/99	68	72	59	86.6	1.429	0	0	0	
W15-217	5/17/99	76	75	178	45.7	2.275	0	6.78	0	
W15-6L	5/17/99	58	74	103	22.4	0.645	0	6.17	0	
W15-86	5/17/99	77	75	170	46.4	2.206	0	5.86	0	

Z-9 Well/Interval	Date	Well	SVE		CCI4	CCI4			
		Vacuum (in. w.c.)	Vacuum (in. w.c.)	Flow (ft3/min)	CCI4 (ppmv)	Flux (kg/day)	CHCl3 (ppmv)	CH2Cl2 (ppmv)	MEK (ppmv)
W15-9L	7/10/98	78	88	82	16.7	0.383	2.48	0	0
W15-9U	7/10/98	80	88	71	29.6	0.588	1.93	0	0
W15-82	7/10/98	70	88	75	196	4.111	3.46	11	0
W15-217	7/10/98	60	88	156	135	5.889	2.74	5.84	0
W15-6L	7/30/98	38	89	75	17.6	0.369	1.66	1.78	0
W15-9L	7/30/98	78	89	59	19.3	0.318	1.67	0.998	0.53
W15-9U	7/30/98	74	89	71	33.5	0.665	1.85	0	0.508
W15-82	7/30/98	50	90	55	153	2.353	4.41	0.012	0.059
W15-86	7/30/98	52	89	146	107	4.368	2.17	0	0
W15-217	7/30/98	50	89	142	50.4	2.001	1.79	1.11	0.197
W15-218U	7/30/98	48	89	83	5.69	0.132	1.12	0	0.197
W15-6L	8/25/98	42	91	102	18.1	0.516	0.869	1.16	0
W15-9L	8/25/98	71	91	69	15	0.289	1.46	0	0
W15-9U	8/25/98	78	91	63	16.3	0.287	1.42	0	0
W15-82	8/25/98	51	91	58	89.9	1.458	2.07	0.003	0
W15-86	8/25/98	56	91	152	37.2	1.581	1.47	0	0
W15-217	8/25/98	42	91	99	5.9	0.163	1.43	0.001	0
W15-6L	9/3/98	18	56	55	18.1	0.278	1.82	1.39	0
W15-9L	9/3/98	40	56	47	15.3	0.201	1.3	0	0
W15-82	9/3/98	25	56	27	70	0.528	2.35	0	0
W15-84	9/3/98	12	56	150	15.2	0.638	1.01	0.792	0.004
W15-86	9/3/98	30	56	11	1.5	0.005	0.165	0	0.116
W15-95	9/3/98	22	56	178	6.92	0.344	1.15	0	0.035
W15-219L	9/3/98	19	56	35	18.3	0.179	1.27	1.04	0.063
W15-6L	9/14/98	18	57	59	17	0.280	0.801	1.47	0
W15-9L	9/14/98	40	57	51	13.4	0.191	1.27	0	0
W15-82	9/14/98	26	57	31	40.7	0.353	1.73	0	0
W15-84	9/14/98	17	57	162	13.3	0.602	1.9	0	0
W15-86	9/14/98	33	57	9	0.054	0.000	0.638	0	0
W15-95	9/14/98	26	57	170	0.418	0.020	1.27	0	0
W15-219L	9/14/98	19	57	35	16.8	0.164	1.39	1.54	0
W15-6L	9/22/98	12	46	47	14.5	0.191	1.44	1.62	0
W15-9L	9/22/98	22	46	31	9.37	0.081	1.08	0	0
W15-82	9/22/98	16	46	19	41.4	0.220	1.81	0.002	0
W15-84	9/22/98	13	46	146	12.8	0.523	0.731	1.42	0.177
W15-85	9/22/98	16	46	77	1.08	0.023	1.09	0	0.048
W15-216L	9/22/98	19	46	39	5.31	0.058	1.01	0	0
W15-216U	9/22/98	13	46	96	6.46	0.173	1.16	0	0
W15-219L	9/22/98	12	46	35	12.4	0.121	0.756	1.5	0.21
W15-220L	9/22/98	10	46	39	9.69	0.106	0.888	0	0.084
W15-6L	9/30/98	10	42	51	17.9	0.255	0.648	2.11	0
W15-9L	9/30/98	22	42	31	12.1	0.105	1.39	0	0
W15-82	9/30/98	15	42	19	56.7	0.301	1.31	0	0
W15-84	9/30/98	9	42	150	39	1.636	1.48	5.07	0
W15-85	9/30/98	13	42	122	0.783	0.027	1.36	0	0
W15-216L	9/30/98	18	42	39	5.71	0.062	0.165	0	0.047
W15-216U	9/30/98	12	42	98	4.78	0.131	0.568	0	0
W15-219L	9/30/98	11	42	35	12.6	0.123	0.848	0.801	0
W15-220L	9/30/98	10	42	39	10.2	0.111	0.873	0	0

Comparison of Maximum Carbon Tetrachloride Rebound Concentrations  
Monitored at 200-ZP-2 Soil Vapor Extraction Sites  
FY 1997 - FY 1999

200-ZP-2				November 1996 -		October 1997 -		July 1998 -	
Location				July 1997		September 1998		April 1999	
(Well or Probe)	Site	Zone	Maximum Rebound	months*	Maximum Rebound	months*	Maximum Rebound	months*	
/feet bgs			Carbon Tetrachloride	of	Carbon Tetrachloride	of	Carbon Tetrachloride	of	
			(ppmv)	rebound	(ppmv)	rebound	(ppmv)	rebound	
79-03/ 5 ft	Z-18	1	0	8	0	3	0	10	
79-06/ 5 ft	Z-1A	1	not measured		not measured		1.2	10	
79-11/ 5 ft	Z-1A	1	0	8	0	6	2.9	10	
86-06/ 5 ft	Z-9	1	1.3	8	0	9	1.9	6	
87-05/ 5 ft	Z-1A	1	not measured		0	3	1.0	10	
87-09/ 5 ft	Z-1A	1	not measured		1.5	3	2.6	10	
95-11/ 5 ft	Z-9	1	0	8	2.1	9	2.5	6	
95-12/ 5 ft	Z-9	1	1.1	8	1.5	9	1.3	6	
CPT-13A/ 9 ft	Z-1A	2	not measured		0	6	0	10	
CPT-16/ 10 ft	Z-9	2	not measured		0	9	1.5	6	
CPT-17/ 10 ft	Z-9	2	not measured		4.2	9	5.1	6	
CPT-18/ 15 ft	Z-9	2	not measured		6.5	9	5.0	6	
CPT-31/25 ft	Z-1A	2	not measured		0	6	0	10	
CPT-32/ 25 ft	Z-1A	2	not measured		9.1	6	10.0	10	
CPT-30/ 28 ft	Z-18	2	not measured		not measured		3.2	10	
CPT-7A/ 32 ft	Z-1A	2	not measured		2.3	6	5.4	10	
CPT-1A/ 35 ft	Z-18	2	2.0	8	1.4	3	2.8	10	
CPT-33/ 40 ft	Z-1A	2	not measured		2.0	3	2.3	10	
CPT-34/ 40 ft	Z-18	2	2.3	8	not measured		1.3	10	
CPT-30/ 68 ft	Z-18	2	1.7	8	not measured		3.0	10	
CPT-13A/ 70 ft	Z-1A	2	5.2	8	not measured		5.3	10	
CPT-31/ 76 ft	Z-1A	2	4.0	8	not measured		4.2	10	
CPT-33/ 80 ft	Z-1A	2	5.8	8	not measured		7.6	10	
W15-82/ 82 ft	Z-9	2	28.9	8	5.5	9	46.4	6	
W15-95/ 82 ft	Z-9	2	not measured		15.3	9	39.4	6	
CPT-21A/ 86 ft	Z-9	2	221	8	206	9	148	7	
CPT-34/ 86 ft	Z-18	2	36.3	8	5.9	3	0	10	
CPT-28/ 87 ft	Z-9	2	280	8	230	9	203	7	
CPT-1A/ 91 ft	Z-18	2	3.9	8	not measured		4.2	10	
CPT-4A/ 91 ft	Z-1A	2	not measured		7.7	3	10.9	10	
CPT-9A/ 91 ft	Z-9	2	103	8	34.5	9	39.8	7	
W18-252SST/ 100 ft	Z-1A	2	38.2	8	17.8	3	24.0	9	
W18-152/ 113 ft	Z-12	2	46.8	8	11.1	3	33.3	10	
W15-217/ 115 ft	Z-9	3	797	8	630	9	561	6	
CPT-24/ 118 ft	Z-9	3	44.6	8	37.7	9	37.3	6	
W18-158L/ 123 ft	Z-1A	3	not measured		143	3	492	10	
W18-167/ 123 ft	Z-1A	3	323	8	79.7	3	228	10	
W18-249/ 134 ft	Z-18	3	206	8	20.4	3	215	10	
W18-248/ 136 ft	Z-1A	3	288	8	86.3	3	162	10	
W15-6L/ 189 ft	Z-9	6	22.6	8	17.8	9	1.3	6	
W15-9L/ 189 ft	Z-9	6	18.3	8	15.0	9	14.9	6	
W18-7/ 200 ft	Z-1A	6	28.5	8	17.3	3	29.0	9	
W18-6L/ 208 ft	Z-1A	6	36	8	31.3	6	14.5	9	
W18-12/ 210 ft	Z-18	6	not measured		3.8	3	18.5	9	

\* - based on location (Z-1A/18/12 or Z-9) of monitoring point; specific points may be beyond SVE zone of influence during particular operating configurations

- Z-18 and Z-12 wells off-line Oct 96 - Apr 98

- CPT-1A, CPT-9A, and possibly CPT-7A appeared to be beyond SVE zone of influence in Oct 96 based on differential pressure (BHI-01105, p. 6-1)

- CPT-9A, CPT-21A, CPT-28 beyond SVE zone of influence in May 96 based on CCl<sub>4</sub> concentrations and airflow modeling based on measured vacuums (BHI-01105, p. 6-1)

Carbon Tetrachloride Rebound Concentrations  
Monitored at 200-ZP-2 Soil Vapor Extraction Sites  
July 1998 - April 1999

200-ZP-2										
Location	Zone	8/14/98	9/29/98	11/5/98	12/1/98	12/31/98	1/26/99	2/23/99	3/22/99	4/26/99
(Well or Probe)		(a)							3/23/99	
/feet bgs		CCI4	CCI4	CCI4	CCI4	CCI4	CCI4	CCI4	CCI4	CCI4
		(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)	(ppmv)
79-03/ 5 ft	1									0
79-06/ 5 ft	1			0	0	0	0	1.2	0	0
79-11/ 5 ft	1	0	0	2.8	0	2.9	1.9	1.6	2.5	1.5
86-06/ 5 ft	1			---- (b)	0	0	0	1.5	1.9	
87-05/ 5 ft	1									1.0
87-09/ 5 ft	1	0	1.5	0	0	1.1	0	0	1.2	2.6
95-11/ 5 ft	1			0	0	1.5	2.5	---- (f)	---- (g)	
95-12/ 5 ft	1			1.2	0	1.2	1.3	1.2	---- (g)	
CPT-13A/ 9 ft	2									0
CPT-16/ 10 ft	2			1.5	0	0	0	1.0	0	
CPT-17/ 10 ft	2			3.2	1.7	3.2	3.7	3.4	5.1	
CPT-18/ 15 ft	2			0	0	5.0	4.5	4.6	3.3	
CPT-31/25 ft	2									0
CPT-32/ 25 ft	2	0	0	1.0	2.1	5.2	7.0	7.4	8.3	10.0
CPT-30/ 28 ft	2			0	0	0	0	0	0	3.2
CPT-7A/ 32 ft	2	1.4	1.7	1.7	2.4	2.6	5.4	3.5	3.5	3.2
CPT-1A/ 35 ft	2									2.8
CPT-33/ 40 ft	2									2.3
CPT-34/ 40 ft	2									1.3
CPT-30/ 68 ft	2									3.0
CPT-13A/ 70 ft	2									5.3
CPT-31/76 ft	2									4.2
CPT-33/ 80 ft	2									7.6
W15-82/ 82 ft	2			46.4	19.2	23.1	22.1(e)	24.6	18.5	
W15-95/ 82 ft	2			39.4	25.4	37.3	28.1	30.6	27.1	
CPT-21A/ 86 ft	2			126	74.6	140	148	142	119	90.9
CPT-34/ 86 ft (j)	2									0
CPT-28/ 87 ft	2			184	65.2	203	170	156	176	98.6
CPT-1A/ 91 ft	2									4.2
CPT-4A/ 91 ft	2									10.9
CPT-9A/ 91 ft	2			39.0	38.6	12.4	39.8	32.2	37.7	37.5
W18-252SST/ 100 ft	2	8.9	17.8	18.2	13.3	22.7	10.7	24.0	23.2	
W18-152/ 113 ft	2	11.1	0	27.9	3.4	25.2	31.7	33.3	3.3	4.7
W15-217/ 115 ft	3			---- (c)	26.8	339	348(e)	418	561	
CPT-24/ 118 ft	3			37.1	37.3	33.5	20.9	21.3	25.6	
W18-158L/ 123 ft	3	---- (d)	143	172	172	---- (d)	267	288	399	492
W18-167/ 123 ft	3	---- (d)	79.7	127	205	---- (d)	228	218	195	211
W18-249/ 134 ft	3	---- (c)	20.4	215	23.3	208	188	139	76.9	81.1
W18-248/ 136 ft	3	7.1	86.3	93.5	98.0	138	136	148	144	162
W15-6L/ 189 ft	6			---- (c)	0	1.3	1.1	1.2	0 (h)	
W15-9L/ 189 ft	6			---- (c)	14.6	14.9	14.1	14.9	---- (c)	
W18-7/ 200 ft	6	0	17.3	22.5	21.8	26.7	26.4	28.4	29.0	
W18-6L/ 208 ft	6	4.3	14.5	---- (c)						
W18-12/ 210 ft	6	1.2	3.8	7.5	12.0	13.6	12.2	18.5	15.9	
(a) sampled 8/14/98; analyzed 8/15/98										
(b) probe 86-07R destroyed; substitute probe 86-06 after 11/98										
(c) not in service										
(d) access to Z-1A unavailable (no key)										
(e) opened for vertical velocity profiling 1/6/99-1/19/99										
(f) probe 95-11 clogged; substitute probe 94-02 after 2/99										
(g) probe 95-11 clogged, probe 94-02 could not be located; probe 95-12 destroyed										
(h) W15-6L tubing discovered on 3/23 to be separated at first splice (~ 50 ft of tubing in well); time of separation unknown.										
(j) sample very difficult to pull. Approximately 1/8 L purge and sample.										

**Technetium-99 Sample Results- 200-ZP1**

Extraction Well 299-W15-33	47 pCi/L
Extraction Well 299-W15-34	73 pCi/L
Extraction Well 299-W15-35	200 pCi/L; 196 pCi/L
Extraction Well 299-W15-32	286 pCi/L
Extraction Well 299-W15-36	43 pCi/L
Extraction Well 299-W15-37	20 pCi/L
Knockout Tank Water	Less than detect
Post Effluent Tank	100 pCi/L
Process Filters	Less than detect; Some natural uranium and thorium-228