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MAR 29 1999

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-5J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

DOE-0573-99

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Mr. Val Orr
Division of Drinking and Ground Waters - UIC Unit
P.O. Box 1049
1800 Watermark Drive
Columbus, Ohio 43216-1049

Dear Mr. Saric, Mr. Schneider, and Mr. Orr:

JANUARY 1999 OPERATING REPORT FOR THE RE-INJECTION DEMONSTRATION

This correspondence submits the Re-Injection Demonstration Operation Report for the month of January 1999.

As specified in the Re-Injection Demonstration Test Plan, monthly operating reports for the re-injection demonstration are to be prepared and submitted to the U.S. Environmental Protection Agency (U.S. EPA), Ohio Environmental Protection Agency (OEPA) Office of Federal Facilities Oversight, and the OEPA Division of Drinking and Ground Waters-UIC Unit.

If you have any questions regarding this submittal, please contact John Kappa at (513) 648-3149.

Sincerely,

Johnny Reising

FEMP:Kappa

Johnny W. Reising
Fernald Remedial Action
Project Manager

Enclosure

cc w/enclosure:
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MONTHLY OPERATING REPORT
RE-INJECTION DEMONSTRATION
JANUARY 1999

OVERVIEW

The FEMP Re-Injection Demonstration began on September 2, 1998. The controlling document for the Re-Injection Demonstration is the Re-Injection Demonstration Test Plan, Rev. 0. A requirement of Section 6 of the test plan is that monthly operating reports be submitted to the U.S. EPA, Ohio EPA Office of Federal Facilities Oversight, and the Division of Ohio EPA Drinking and Ground Waters-UIC Unit. The monthly operating reports are to include the following information:

I. Analysis of the injectate
II. The volume and rate of re-injection
III. A description of any well maintenance and rehabilitation procedures which were conducted
IV. Results of groundwater monitoring at the re-injection test site.

This report serves to fulfill this commitment for the month of January 1999. It covers operation of the Re-Injection Demonstration from January 1, 1999 through February 1, 1999.

ANALYSIS OF THE INJECTATE

Groundwater which is being extracted from the Great Miami Aquifer is being treated for uranium and re-injected back into the Great Miami Aquifer. The groundwater is being treated in the FEMP Advanced Waste Water Treatment (AWWT) Expansion Facility. The effluent from the AWWT Expansion Facility is being sampled monthly for the parameters listed in Table 2.1 of the Re-Injection Demonstration Test Plan, Rev. 0. Monthly injectate sampling is focusing on the final remediation level (FRL) constituents that have had an exceedance of their FRL in the area of the aquifer from which the groundwater is being pumped.

The monthly samples are being sent to an off-site laboratory for analysis. Contracted for schedules with the off-site labs for reporting analytical results are not being met. The laboratory delay has affected FEMP reporting of the injectate sampling results.

The December report provided partial preliminary results for injectate samples collected in December. All results except those for Neptunium-237 and Strontium-90 were provided and discussed. Complete

preliminary results for the injectate sample collected in December, which include the results for Neptunian-237 and Strontium-90, are provided in Table 1 of this report. A review of the Neptunium-237 and Strontium-90 concentrations measured in the sample collected in December indicates that the concentrations of the two constituents are below their respective FRLs.

Partial preliminary results from the injectate sample collected in January are provided in Table 2. All but the radiological results are provided. Radiological results for the January injectate sample are still pending from the offsite laboratory. A review of the preliminary data from January indicates that all of the constituent concentrations are below their respective FRLs. Efforts continue to expedite the receipt of radiological results from the offsite laboratories in order to achieve a more timely reporting. The radionuclide data for January should be available for the next monthly report.

VOLUME AND RATE OF RE-INJECTION

Treated groundwater is being re-injected into the Great Miami Aquifer in five re-injection wells at a rate of 200 gallons per minute per well. Figure 1 illustrates the location of the five re-injection wells. Re-Injection Well 8 is an 8-inch diameter well. Re-Injection Well 9 is a 12-inch diameter well. The other re-injection wells are all 16-inches in diameter. The combined design re-injection rate for all five wells is 1000 gallons per minute. Operational data specific to each re-injection well are provided in Tables 3 through 7.

Figure 2 illustrates the water level rise in each of the five re-injection wells from January 1, 1999 through February 1, 1999, as measured by the operators at the AWWT Expansion Facility Distributed Control System (DCS). Water levels are recorded three times per day. Water levels inside of the re-injection wells are monitored as an indicator of plugging within the wells. As a well screen becomes plugged, the water level in the well rises to compensate for the greater pressure needed to maintain a constant re-injection rate.

While it is not the intent of this report to discuss operational efficiency issues, the following information is provided to aid in the interpretation of Figure 2. Re-Injection was shut down for a little over 14 days (January 8 to January 22) to facilitate the routing of the entire AWWT Phase III discharge to the Great Miami River.

WELL MAINTENANCE AND REHABILITATION

No well maintenance or rehabilitation work was required or performed on the five re-injection wells during the month of January.

GROUNDWATER MONITORING RESULTS

Water quality samples for the Re-Injection demonstration are collected quarterly and analyzed for major anions, cations, and total uranium. The first round of water quality data was collected in August of 1998, prior to the start of re-injection. Results of the August sampling event were reported in the September monthly report. The second round of water quality samples was collected in December of 1998. Preliminary results from the December samples are provided in Table 8. The next scheduled collection of water quality samples for the re-injection demonstration will take place in March of 1999. At the end of the one year Re-Injection Demonstration, the water quality data collected quarterly during the demonstration will be used to illustrate water quality conditions over the course of the demonstration.

TABLE 1

ANALYSIS OF INJECTATE PRELIMINARY RESULTS
Sample Collected December 17, 1998

Constituents[a]	Result[b]	Groundwater FRL[c]	Detection Limit	Constituent Type[e]	Basis for FRL[f]
General Chemistry		mg/L			
Nitrate	0.377	11.0		MP	B
Inorganics		mg/L			
Antimony	U	0.006	0.0039	N	A
Arsenic	U	0.05	0.0025	N	A
Barium	0.0542 B	2.0		N	A
Beryllium	U	0.004	0.0003	N	A
Cadmium	U	0.014	0.0005	N	B
Total Chromium	U	0.022[d]	0.0018	MP	R
Cobalt	U	0.17	0.0034	N	R
Lead	U	0.015	0.0016	N	A
Manganese	0.0072 B	0.9		N	B
Mercury	U	0.002	0.00010	MP	A
Nickel	U	0.1	0.0158	N	A
Selenium	0.0045 B	0.05		N	A
Silver	U	0.05	0.0025	N	A
Vanadium	0.0128 B	0.038		N	R
Zinc	0.0179	0.021		N	B
Radionuclides		pCi/L			
Neptunium-237	U	1.0	0.0	MP	R*
Radium-226	U	20.0	- 0.310	N	A
Strontium-90	U	8.0	0.121	MP	A
Thorium-228	U	4.0	0.003	N	R*
Thorium-232	U	1.2	0.003	N	R*
		µg/L			
Total Uranium	0.058 J	20.0		MP	A
Organics		µg/L			
Bis(2-ethylhexyl)phthalate	U	6.0	5	N	A
Carbon disulfide	U	5.5	1	N	A
1,1-Dichloroethene	U	7.0	1	N	A
1,2-Dichloroethane	U	5.0	1	MP	A
Trichloroethene	U	5.0	1	N	A

[a]Constituents taken from Table 2-1 of Re-Injection Demonstration Test Plan. Constituents are those previously detected in aquifer zones 2 and 4 at concentrations above their FRL.
[b]If a duplicate sample was analyzed the highest concentration between the regular sample and duplicate sample is reported.
B = Lab qualifier. Reported value was obtained from a reading that was less than the contract required detection limit but greater than or equal to the instrument detection limit.
J = Lab qualifier, means data is estimated.
U = Nondetect
[c]From Table 9-4 in OU5 ROD.
[d]FRL is for hexavalent chromium.
[e]Constituent types from Appendix A of IEMP. MP indicates that the constituent has been identified as being able to migrate to the aquifer. N indicates that the constituent has been identified as not being able to migrate to the aquifer.
[f]A - Applicable or relevant and appropriate requirement based (MCL, PMCL, etc.).
B - Based on 95th percentile background concentrations.
R - Risk-based
R* - Risk-based radionuclide cleanup levels include constituent specific 95th percentile background concentration.

TABLE 2

ANALYSIS OF INJECTATE PRELIMINARY RESULTS
Sample Collected January 27, 1999

Constituents[a]	Result[b]	Groundwater FRL[c]	Detection Limit	Constituent Type[e]	Basis for FRL[f]
General Chemistry		mg/L			
Nitrate	0.47	11.0		MP	B
Inorganics		mg/L			
Antimony	0.0031 B	0.006		N	A
Arsenic	U	0.05	0.0029	N	A
Barium	0.0511	2.0		N	A
Beryllium	U	0.004	0.0001	N	A
Cadmium	U	0.014	0.0003	N	B
Total Chromium	U	0.022[d]	0.0007	MP	R
Cobalt	U	0.17	0.001	N	R
Lead	U	0.015	0.0015	N	A
Manganese	0.00087 B	0.9		N	B
Mercury	U	0.002	0.0001	MP	A
Nickel	U	0.1	0.001	N	A
Selenium	U	0.05	0.0031	N	A
Silver	U	0.05	0.0001	N	A
Vanadium	U	0.038	0.0008	N	R
Zinc	U	0.021	0.0027	N	B
Radionuclides		pCi/L			
Neptunium-237		1.0		MP	R*
Radium-226		20.0		N	A
Strontium-90		8.0		MP	A
Thorium-228		4.0		N	R*
Thorium-232		1.2		N	R*
		µg/L			
Total Uranium		20.0		MP	A
Organics		µg/L			
Bis(2-ethylhexyl)phthalate	U	6.0	10	N	A
Carbon disulfide	U	5.5	1	N	A
1,1-Dichloroethene	U	7.0	1	N	A
1,2-Dichloroethane	U	5.0	1	MP	A
Trichloroethene	U	5.0	1	N	A

[a]Constituents taken from Table 2-1 of Re-Injection Demonstration Test Plan. Constituents are those previously detected in aquifer zones 2 and 4 at concentrations above their FRL.
[b]If a duplicate sample was analyzed the highest concentration between the regular sample and duplicate sample is reported.
B = Lab qualifier. Value was obtained from a reading that was less than the contract required detection limit but greater than or equal to the instrument detection limit.
U = Nondetect
[c]From Table 9-4 in OU5 ROD.
[d]FRL is for hexavalent chromium.
[e]Constituent types from Appendix A of IEMP. MP indicates that the constituent has been identified as being able to migrate to the aquifer. N indicates that the constituent has been identified as not being able to migrate to the aquifer.
[f]A - Applicable or relevant and appropriate requirement based (MCL, PMCL, etc.).
B - Based on 95th percentile background concentrations.
R - Risk-based
R* - Risk-based radionuclide cleanup levels include constituent specific 95th percentile background concentration.

TABLE 3

RE-INJECTION WELL 22107 (IW-8)
OPERATIONAL SUMMARY SHEET
JANUARY 1999

Reference Elevation (feet AMSL) - 539.92 (top of casing)
Northing Coordinate ('83) - 476196.22
Easting Coordinate ('83) - 1347978.25

Hours in reporting period[a] = 736.5
Hours not injecting[b] = 344
Hours injecting[c] = 392.5
Operational percent[d] = 53.3

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected[e]	Average Operating Injection Rate (gpm)[f]
9/98	8.16	206
10/98	5.78	203
11/98	8.47	196
12/98	5.76	222
1/99	5.35	227

[a]First operational shift reading on 01/01/99 to first operational shift reading on 02/01/99
[b]Downtime. System was off to facilitate the routing of AWWT-Phase III discharge to the Great Miami River.
[c]Hours in reporting period -Hours not injecting
[d](Hours injecting / Hours in reporting period) x 100
[e]Summation of daily totalizer differences
[f]Million Gallons Injected / (Hours Injecting x 60)

TABLE 4

RE-INJECTION WELL 22108 (IW-9)
OPERATIONAL SUMMARY SHEET
JANUARY 1999

Reference Elevation (feet AMSL) - 578.025 (top of casing)
Northing Coordinate ('83) - 476255.74
Easting Coordinate ('83) - 1348384.49

Hours in reporting period[a] = 743.45
Hours not injecting[b] = 344
Hours injecting[c] = 399.45
Operational percent[d] = 53.7

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected[e]	Average Operating Injection Rate (gpm)[f]
9/98	8.17	206
10/98	8.30	201
11/98	8.53	197
12/98	5.66	214
01/99	4.33	181

[a]First operational shift reading on 01/01/99 to first operational shift reading on 02/01/99
[b]Downtime. System was off to facilitate the routing of AWWT-Phase III discharge to the Great Miami River.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting / Hours in reporting period) x 100
[e]Summation of daily totalizer differences
[f]Million Gallons Injected / (Hours Injecting x 60)

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TABLE 5

RE-INJECTION WELL 22109 (IW-10)
OPERATIONAL SUMMARY SHEET
JANUARY 1999

Reference Elevation (feet AMSL) - 576.92 (top of casing)
Northing Coordinate ('83) - 476175.65
Easting Coordinate ('83) - 1348860.53

Hours in reporting period[a] = 743.45 Target Injection Rate = 200 gpm
Hours not injecting[b] = 344
Hours injecting[c] = 399.45
Operational percent[d] = 53.7

Monthly Measurements		
Month	Million Gallons Injected[e]	Average Operating Injection Rate (gpm)[f]
9/98	8.13	205
10/98	8.28	200
11/98	8.50	196
12/98	5.72	217
01/99	5.48	229

[a]First operational shift reading on 01/01/99 to first operational shift reading on 02/01/99
[b]Downtime. System was off to facilitate the routing of AWWT-Phase III discharge to the Great Miami River.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting / Hours in reporting period) x 100
[e]Summation of daily totalizer differences
[f]Million Gallons Injected / (Hours Injecting x 60)

TABLE 6

RE-INJECTION WELL 22240 (IW-11)
OPERATIONAL SUMMARY SHEET
JANUARY 1999

Reference Elevation (feet AMSL) - 577.14 (top of casing)
Northing Coordinate ('83) - 476422.82
Easting Coordinate ('83) - 1349386.92

Hours in reporting period[a] = 744.03
Hours not injecting[b] = 344
Hours injecting[c] = 400.03
Operational percent[d] = 53.8

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected[e]	Average Operating Injection Rate (gpm)[f]
9/98	8.39	211
10/98	8.29	199
11/98	8.50	197
12/98	5.68	216
01/99	5.53	230

[a]First operational shift reading on 01/01/99 to first operational shift reading on 02/01/99
[b]Downtime. System was off to facilitate the routing of AWWT-Phase III discharge to the Great Miami River.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting / Hours in reporting period) x 100
[e]Summation of daily totalizer differences
[f]Million Gallons Injected / (Hours Injecting x 60)

TABLE 7

RE-INJECTION WELL 22111 (IW-12)
OPERATIONAL SUMMARY SHEET
JANUARY 1999

Reference Elevation (feet AMSL) - 583.01 (top of casing)
Northing Coordinate ('83) - 476518.64
Easting Coordinate ('83) - 1350105.39

Hours in reporting period[a] = 744.15
Hours not injecting[b] = 344
Hours injecting[c] = 400.15
Operational percent[d] = 53.8

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected[e]	Average Operating Injection Rate (gpm)[f]
9/98	8.12	205
10/98	8.27	201
11/98	8.53	197
12/98	5.61	219
01/99	5.08	212

[a]First operational shift reading on 01/01/99 to first operational shift reading on 02/01/99
[b]Downtime. System was off to facilitate the routing of AWWT-Phase III discharge to the Great Miami River.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting / Hours in reporting period) x 100
[e]Summation of daily totalizer differences
[f]Million Gallons Injected / (Hours Injecting x 60)

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TABLE 8

PRELIMINARY GROUNDWATER MONITORING RESULTS
SAMPLES COLLECTED IN DECEMBER 1998 FOR THE RE-INJECTION DEMONSTRATION

Constituent		Well 2015 12/30/98	Well 2017 12/30/98	Well 2060 12/30/98	Well 2070 12/29/98	Well 2106 12/30/98	Well 2166 12/31/98	Well 2398 12/29/98	Well 2434 12/29/98	Well 3015 12/30/98	Well 3069 12/29/98	Well 3106 12/30/98	Well 3070 12/29/98	Rinsate 12/29/98	FB 12/29/98	Well 3398 12/29/98
aluminum	mg/L	0.036	0.021	0.038	0.0705	0.0264U	0.027	0.164	0.053	0.028	0.019	0.130	0.128	0.025	0.0264U	0.0264U
calcium	mg/L	87.330	162.1	62.15	109.0	93.0	113.3	81.2	87.66	80.93	100.5	92.5	96.0	5.590	1.27	89.1
iron	mg/L	0.090	0.047	1.80	3.35	0.237	0.077	1.380	0.209	1.48	0.224	0.115	4.250	0.041	0.287	1.35
magnesium	mg/L	21.4	31.9	18.2	29.4	22.0	28.2	22.7	22.6	19.2	24.0	22.8	23.0	0.979	0.316	21.9
manganese	mg/L	0.0088	0.0037	0.078	0.264	0.0037	0.0065	0.0322	0.019	0.267	0.016	0.0329	0.325	0.0017	0.0009	0.294
potassium	mg/L	3.350	3.0	3.6	4.040	3.46	3.42	3.74	3.010	3.4	3.28	3.56	2.82	0.184	0.324U	2.940
silicon	mg/L	3.270	5.370	1.26	3.9	2.78	4.43	3.96	3.580	3.49	4.1	4.06	4.38	0.309	0.038U	3.880
sodium	mg/L	15.9	16.2	13.9	16.9	17.0	15.6	33.7	17.4	15.8	15.2	17.9	11.9	0.756	0.979	12.0
ammonia	mg/L	0.10U	0.10U	0.24	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.12	0.10U	0.10U	0.10U
nitrate-nitrogen	mg/L	1.1	0.9	0.1U	0.1U	0.7	1.7	0.8	0.9	0.1U	2.1	0.8	0.1U	0.1U	6.2	0.1U
uranium	ug/L	129	3.3	8.4	0.9	33.0	69	26	1.1	1.6	209	1.3	0.3	0.0U	0.0U	0.7
alkalinity	mg/L	250.0	320.0	220.0	260.0	240.0	280.0	290.0	230.0	230.0	250.0	230.0	250.0	1.0U	1.0U	250.0
chloride	mg/L	30.0	44.0	28.0	70.0	34.0	32.0	60.0	32.0	24.0	34.0	32.0	36.0	1.0U	1.0U	32.0
fluoride	mg/L	0.39	0.16	0.44	0.13	0.26	0.15	0.13	0.22	0.15	0.17	0.13	0.14	0.1U	0.1U	0.14
sulfate	mg/L	65.7	179.4	55.5	79.9	84.0	112.0	59.3	70.2	55.4	63.8	97.0	76.0	1.0U	1.0U	70.5
TDS	mg/L	508	811	296	495	459	509	449	370	421	432	481	413	83.0	2.0	390
TSS	mg/L	3.6	2U	18.8	7.0	3.6	2U	2.4	3.2	7.2	2U	3.6	20.0	3.2	2U	5.2
phosphate(total)	mg/L	0.1U	0.1U	0.1U	0.1U	*	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
bicarbonate	mg/L	250	310.0	225.0	250.0	230.0	280.0	245.0	235.0	240.0	250.0	255.0	290.0	1.0U	1.0U	255.0
carbonate	mg/L	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U

Constituent		3398-D 12/29/98	Well 4398 12/31/98	Well 22299 12/29/98	22299-D 12/29/98	Wel 22300 12/30/98	Well 22301 12/29/98	Wel 22302 12/30/98	Well 22303 12/31/98	Well 32304 12/31/98	Well 32305 12/29/98	Well 32306 12/29/98	Well 32307 12/30/98	FB 12/30/98	FB 12/31/98	RIN 12/31/98
aluminum	mg/L	0.0883	0.0264U	0.028	0.060	0.032	0.034	0.414	0.118	0.063	0.059	0.041	0.042	0.014	0.025	0.0098U
calcium	mg/L	84.8	107.0	93.1	88.56	96.89	84.640	101.1	94.1	102.3	94.99	99.12	97.71	0.369	3.3	1.1
iron	mg/L	1.46	1.44	0.17	0.106	0.189	0.890	0.756	8.99	0.264	0.545	1.29	1.42	0.078	0.039	0.043
magnesium	mg/L	21.0	26.4	23.7	23.2	24.1	23.2	23.4	23.1	22.3	22.0	23.0	23.3	0.075	0.870	0.282
manganese	mg/L	0.278	0.454	0.0091	0.0033	0.0068	0.013	0.048	0.0123	0.520	0.017	0.302	0.32	0.0019	0.0019	0.0041
potassium	mg/L	2.85	1.38	3.2	3.2	3.19	3.17	3.04	3.37	3.59	3.77	3.930	3.38	0.041	0.114	0.052
silicon	mg/L	3.71	5.78	3.94	3.89	3.99	3.76	4.17	4.04	4.10	3.750	3.590	3.56	0.038U	0.103	0.038U
sodium	mg/L	11.6	9.52	16.5	16.1	16.1	15.9	15.4	16.4	17.2	16.6	16.8	16.1	0.274	0.670	0.396
ammonia	mg/L	0.10U	0.14	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U	0.10U
nitrate-nitrogen	mg/L	0.1U	0.1U	0.7	0.7	6.3	0.7	0.7	0.8	0.1U	1.2	0.1U	0.1U	0.1U	9.5	0.1U
uranium	ug/L	0.6	0.1	0.3	0.3	0.9	3.4	0.7	0.8	3.1	0.4	2.3	17	0.0U	0.0U	0.0U
alkalinity	mg/L	255.0	250.0	250.0	240.0	230.0	255.0	240.0	230.0	250.0	240.0	250.0	230.0	1.0U	1.0U	1.0U
chloride	mg/L	32.0	32.0	36.0	30.0	32.0	32.0	32.0	28.0	32.0	32.0	32.0	32.0	1.0U	1.0U	1.0U
fluoride	mg/L	0.13	0.14	0.23	0.24	0.24	0.24	0.25	0.31	0.12	0.15	0.13	0.13	0.1U	0.1U	0.1U
sulfate	mg/L	64.4	126.5	77.2	83.7	74.3	72.6	78.0	85.5	87.5	65.9	96.1	89.2	1.0U	1.0U	1.0U
TDS	mg/L	376	502	411	422	395	410	430	423	465	388	454	453	58.0	19.0	1.0
TSS	mg/L	4.0	5.6	2U	3.6	2.0	2U	114.4	23.0	2U	2U	7.2	32.0	2U	2U	2U
phosphate(total)	mg/L	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U	0.1U
bicarbonate	mg/L	250.0	245.0	245.0	240.0	230.0	250.0	240.0	230.0	245.0	240.0	250.0	230.0	1.0U	1.0U	1.0U
carbonate	mg/L	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U	1.0U

* Sample was misplaced and not delivered to lab within holdtime.
FB = field blank

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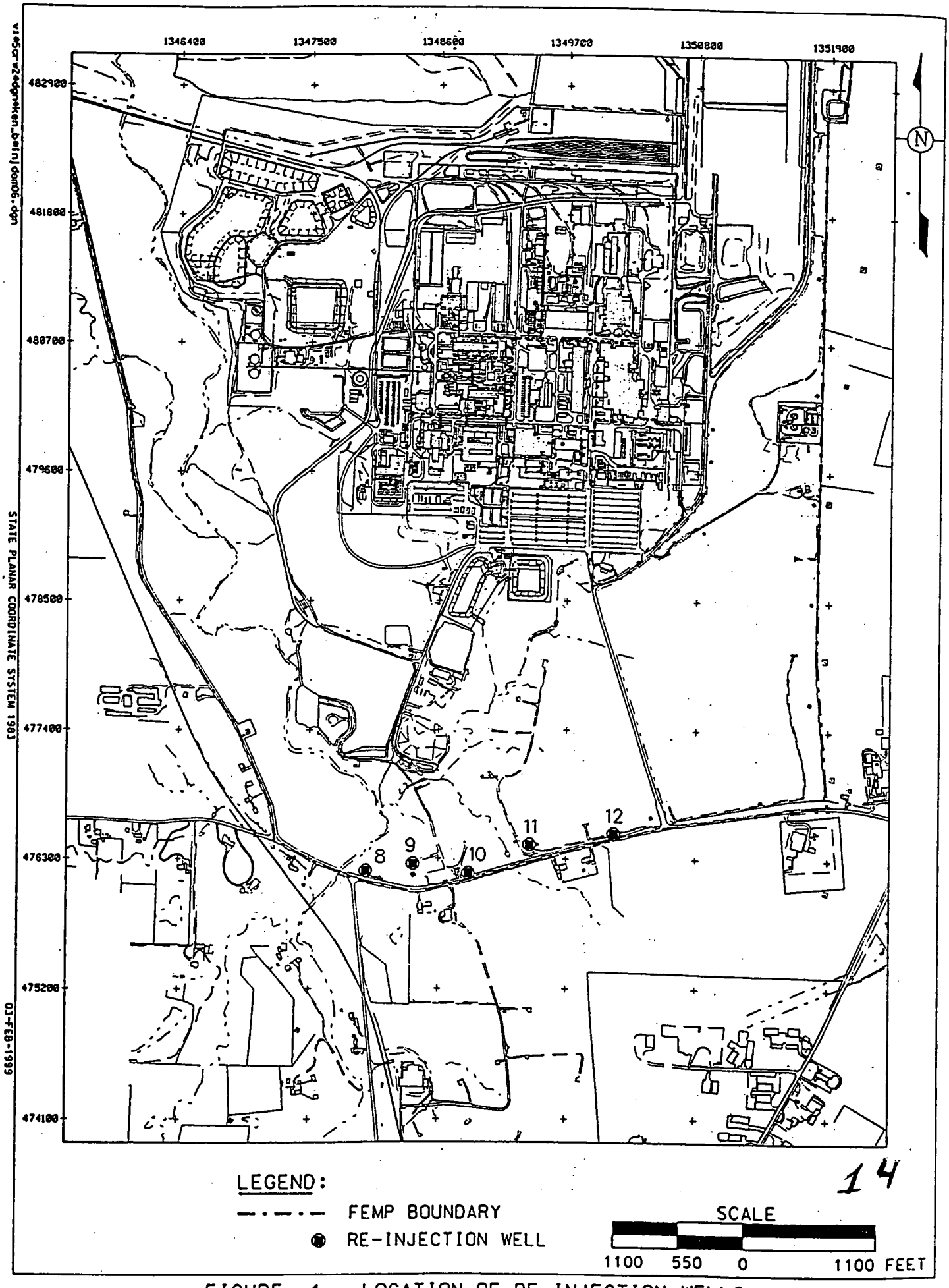

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FIGURE 1. LOCATION OF RE-INJECTION WELLS

Figure 2
Re-Injection Wells, Water Level Rise
First Shift Jan. 01, 1999 to First Shift Feb. 01, 1999