



Department of Energy

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AUG 20 1999

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
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DOE-1040-99

Mr. Tom Schneider, Project Manager
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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:

MAY 1999 OPERATING REPORT FOR THE RE-INJECTION DEMONSTRATION

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

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AUG 20 1999

Mr. James A. Saric
Mr. Tom Schneider
Mr. Val Orr

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

Sincerely,



Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Kappa

Enclosure

cc w/enclosure:

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MONTHLY OPERATING REPORT
RE-INJECTION DEMONSTRATION
MAY 1999

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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 May 1999. It covers operation of the Re-Injection Demonstration from May 1, 1999 through June 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 injectate samples are being sent to an off-site laboratory for analysis.

Preliminary results from the injectate sample collected in May are provided in Table 1. A review of the preliminary data from May indicates that all of the constituent concentrations are below their respective FRLs. As reported in the April Monthly Operating Report, the lead concentration of the injectate sample collected in April was four thousandths of a mg/L over the FRL for lead. Lab personnel confirmed that the lead concentration was reported correctly. The concentration reported for April was an order of magnitude higher than any lead concentration previously reported for the

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injectate, since the start of the demonstration. Therefore, the reported April lead concentration was considered suspect. The lead concentration in the May sample was back down below the FRL. The lead concentration reported for the May sample indicates that there is not an ongoing problem with lead in the injectate.

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 2 through 6.

Figure 2 illustrates the water level rise in each of the five re-injection wells from May 1, 1999 through June 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 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. All of the re-injection wells were down from May 6 to May 8 (sample numbers 741 to 746) due to a lightning strike. Re-Injection Well 8 was down from May 3 to May 6 (sample numbers 732 to 740) for rehabilitation to address well plugging.

WELL MAINTENANCE AND REHABILITATION

On May 3, 1999, Re-Injection Well 8 was shut down for rehabilitation. This is the third time that Re-Injection Well 8 has been rehabilitated to address plugging. The first rehabilitation took place from October 22 to October 29, 1998, after approximately two months of operation. The second rehabilitation took place from February 26 to March 4, 1999 after approximately four months of operation. This third rehabilitation took place from May 3 to May 6, 1999 after approximately two months of operation. The well was rehabilitated using the same procedure that had been used twice before.

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Approximately 2.0 gallons of Sodium hypochlorite were added to the well. The well screen was swabbed and surged and approximately 7,790 gallons of water were pumped from the well. The chlorine concentration of the pumped water from the well at the end of rehabilitation was 0.06 ppm. Upon return to service on May 8, 1999 (there was a two day delay in returning the well to service due to a lightning strike that affected the entire re-injection system) the water level rise in the well was approximately 7.62 feet. Following the first rehabilitation the rise was 4.02 feet, following the second rehabilitation the rise was 7.48 feet.

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 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 1998. Results of the December sampling event were reported in the January monthly report. The third round of water quality samples for the re-injection demonstration was collected in March 1999. Results of the March sampling event were reported in the April monthly report. The fourth round of sampling will be collected during the months of June through August. 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 observed over the course of the entire demonstration.

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TABLE 1

ANALYSIS OF INJECTATE PRELIMINARY RESULTS
Sample Collected May 13, 1999

Constituents ^a	Result ^b	Groundwater FRL ^c	Detection Limit	Constituent Type ^e	Basis for FRL ^f
General Chemistry		mg/L			
Nitrate	0.560 J	11.0		MP	B
Inorganics		mg/L			
Antimony	U	0.006	0.00010	N	A
Arsenic	0.0026 B	0.05		N	A
Barium	0.0529	2.0		N	A
Beryllium	U	0.004	0.00001	N	A
Cadmium	U	0.014	0.00031	N	B
Total Chromium	0.00066 B	0.022 ^d		MP	R
Cobalt	U	0.17	0.00001	N	R
Lead	0.00008 B	0.015		N	A
Manganese	0.0023 BE	0.9		N	B
Mercury	U	0.002	0.00012	MP	A
Nickel	0.0040 BE	0.1		N	A
Selenium	0.0011 B	0.05		N	A
Silver	U	0.05	0.00002	N	A
Vanadium	U	0.038	0.00073	N	R
Zinc	0.0033 B	0.021		N	B
Radionuclides		pCi/L			
Neptunium-237	U	1.0	0.0581	MP	R*
Radium-226	0.408	20.0		N	A
Strontium-90	U	8.0	0.447	MP	A
Thorium-228	U	4.0	0.103	N	R*
Thorium-232	U	1.2	0.0398	N	R*
Total Uranium	5.41	20.0		MP	A
Organics		µg/L			
Bis(2-ethylhexyl)phthalate	U	6.0	5	N	A
Carbon disulfide	U	5.5	5	N	A
1,1-Dichloroethene	U	7.0	5	N	A
1,2-Dichloroethane	U	5.0	1	MP	A
Trichloroethene	U	5.0	3	N	A

^aConstituents 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.

^bIf 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.

E = Analytical result considered estimated because of suspected matrix interference as demonstrated by non-compliant serial dilution data for associated sample.

J = Lab qualifier, data are estimated.

U = Nondetect

^cFrom Table 9-4 in OUS ROD.

^dFRL is for hexavalent chromium.

^eConstituent 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.

^fA - 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

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RE-INJECTION WELL 22107 (IW-8)
OPERATIONAL SUMMARY SHEET
MAY 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 = 743.35
Hours not injecting^b = 168.00
Hours injecting^c = 575.35
Operational percent^d = 77.4

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
2/99	7.06	196
3/99	7.34	205
4/99	7.75	197
5/99	7.46	216

^aFirst operational shift reading on 5/1/99 to operational shift reading on 6/1/99

^bDowntime. System down to facilitate maintenance on the water treatment system.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

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TABLE 3

RE-INJECTION WELL 22108 (IW-9)
OPERATIONAL SUMMARY SHEET
MAY 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 = 743.67
Hours not injecting^b = 91.00
Hours injecting^c = 652.67
Operational percent^d = 87.8
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
1/99	4.33	181
2/99	6.07	156 ^g
3/99	5.93	178 ^h
4/99	6.66	184
5/99	7.83	200

^aFirst operational shift reading on 5/1/99 to first operational shift reading on 6/1/99

^bDowntime. System down to facilitate maintenance on the water treatment system.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

^gInjection out of smaller downcomer in February. Target Injection rate of smaller downcomer is 150 gpm.

^hInjection out of smaller downcomer up until March 8. Large downcomer was used from March 11 to April 1, 1999.

TABLE 4

RE-INJECTION WELL 22109 (TW-10)
OPERATIONAL SUMMARY SHEET
MAY 1999

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

Hours in reporting period^a = 742.15
Hours not injecting^b = 43.00
Hours injecting^c = 699.15
Operational percent^d = 94.2

Target Injection Rate = 200 gpm

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
1/99	5.48	229
2/99	8.09	208
3/99	8.13	204
4/99	5.35	190
5/99	8.25	197

^aFirst operational shift reading on 5/1/99 to first operational shift reading on 6/1/99

^bDowntime. Well down during re-development. System down to facilitate maintenance on the water treatment system.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

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TABLE 5

RE-INJECTION WELL 22240 (IW-11)
OPERATIONAL SUMMARY SHEET
MAY 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 = 742.62
Hours not injecting^b = 43.00
Hours injecting^c = 699.62
Operational percent^d = 94.2

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected ^e	Average Operating Injection Rate (gpm) ^f
0/98	8.39	211
10/98	8.29	199
11/98	8.50	197
12/98	5.68	216
1/99	5.53	230
2/99	8.06	208
3/99	8.04	204
4/99	7.56	192
5/99	8.34	199

^aFirst operational shift reading on 5/1/99 to first operational shift reading on 6/1/99

^bDowntime. System down to facilitate maintenance on the water treatment system.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

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TABLE 6

RE-INJECTION WELL 22111 (TW-12)
OPERATIONAL SUMMARY SHEET
MAY 1999

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

Hours in reporting period^a = 742.62
Hours not injecting^b = 43.00
Hours injecting^c = 699.62
Operational percent^d = 94.2

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected ^e	Average Operating Injection Rate (gpm) ^f
09/98	8.12	205
10/98	8.27	201
11/98	8.53	197
12/98	5.61	219
1/99	5.08	212
2/99	8.06	208
3/99	8.13	203
4/99	7.65	195
5/99	8.27	197

^aFirst operational shift reading on 5/1/99 to first operational shift reading on 6/1/99.

^bDowntime. System down to facilitate maintenance on the water treatment system.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

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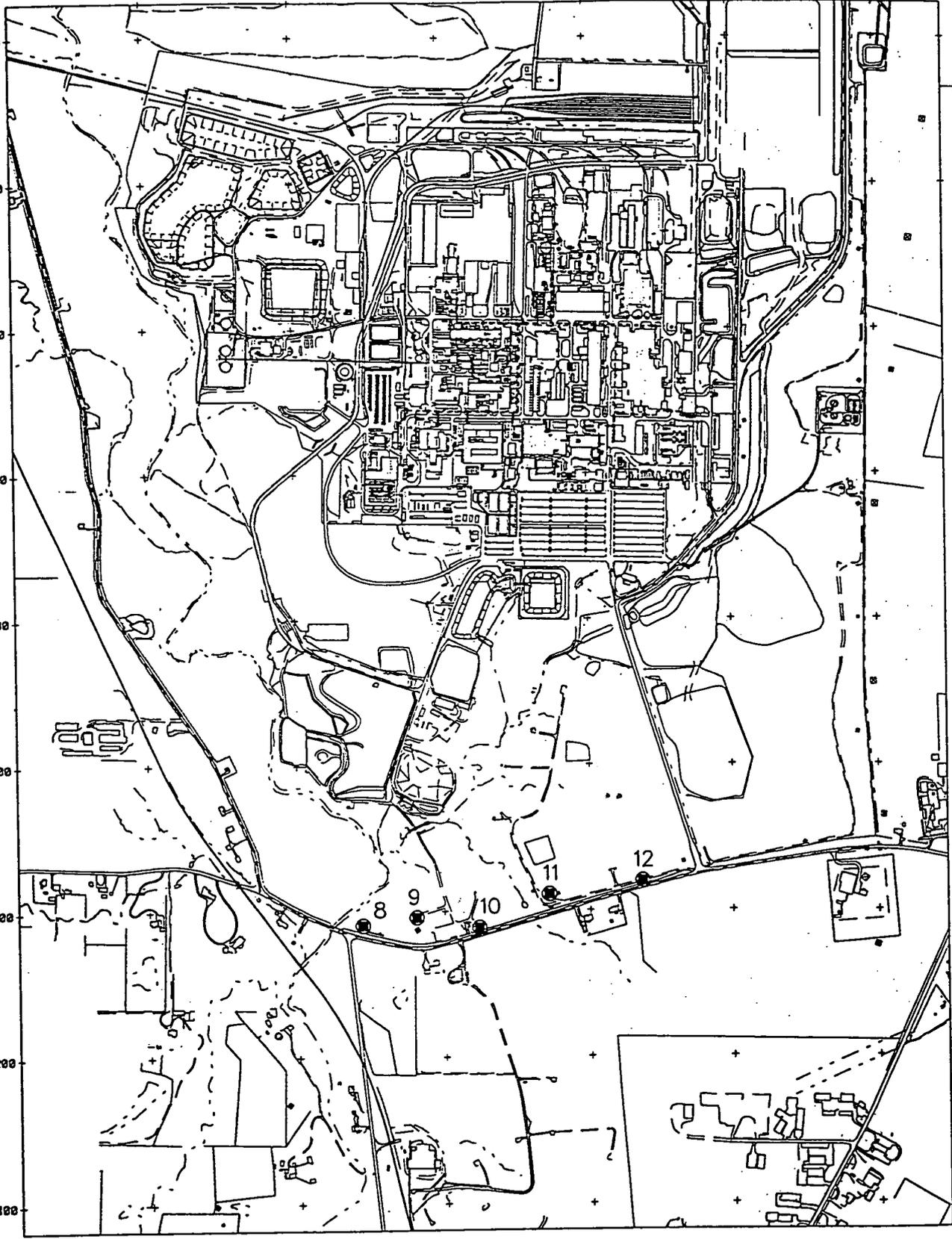
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STATE PLANAR COORDINATE SYSTEM 1983

26-APR-1999

1346400 1347500 1348600 1349700 1350800 1351900

482900
481800
480700
479600
478500
477400
476300
475200
474100



LEGEND:

- FEMP BOUNDARY
- RE-INJECTION WELL

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SCALE

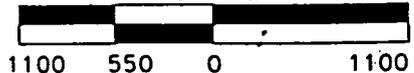
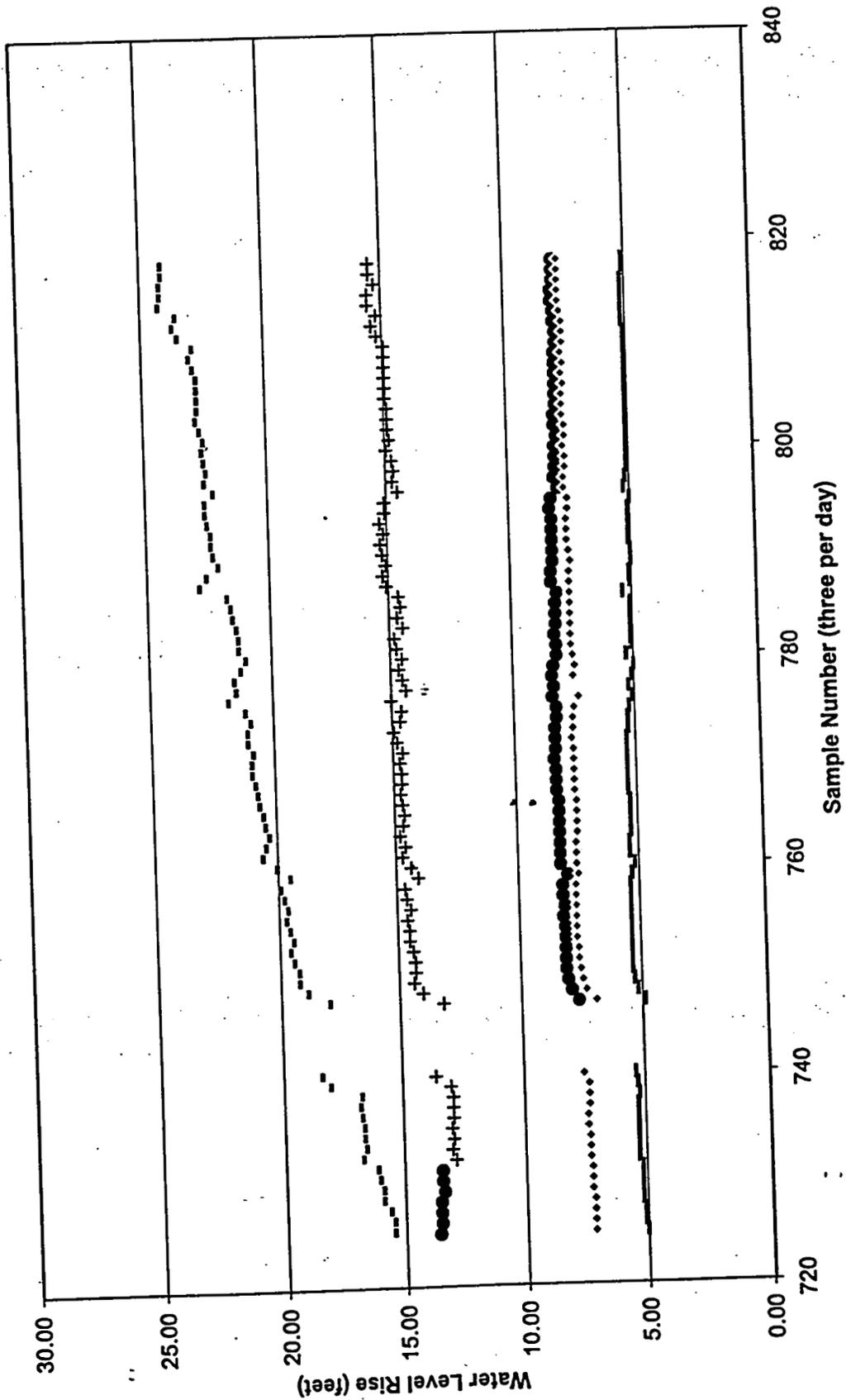


FIGURE 1. LOCATION OF RE-INJECTION WELLS

Figure 2
 Re-Injection Wells, Water Level Rise
 First Shift May 1, 1999 to First Shift June 1, 1999



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