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3859

SEP 17 2001

DOE-0874-01

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

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

Ms. 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 Ms. Orr:

JULY 2001 RE-INJECTION OPERATING REPORT

This letter submits the subject report for your review and approval.

The monthly reports are being submitted to the United States Environmental Protection Agency (USEPA) and Ohio Environmental Protection Agency (OEPA) Office of Federal Facilities Oversight in accordance with the Re-injection Demonstration Test Plan. The monthly reports are also being submitted to the OEPA Division of Drinking and Ground Waters Unit of Underground Injection Control (UIC) in accordance with their guidelines.

If you have questions or concerns regarding this report, please contact John Kappa at (513) 648-3149.

Sincerely,

Johnny Reising

Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Kappa

Enclosure: As Stated

cc w/enclosure:
R. J. Janke, OH/FEMP
J. Kappa, OH/FEMP
K. Nickel, OH/FEMP
T. Schneider, OEPA-Dayton (three copies of enclosure)
G. Jablonowski, USEPA-V, SRF-5J
F. Bell, ATSDR
M. Schupe, HSI GeoTrans
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AR Coordinator, Fluor Fernald Inc./MS78

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K. Chaney, EM-31/CLOV
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D. Carr, Fluor Fernald, Inc./MS2
M. Frank, Fluor Fernald, Inc./MS90
T. Hagen, Fluor Fernald, Inc./MS65-2
W. Hertel, Fluor Fernald, Inc./MS52-5
S. Hinnefeld, Fluor Fernald, Inc./MS52-2
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T. Walsh, Fluor Fernald, Inc./MS46
ECDC, Fluor Fernald, Inc./MS52-7

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MONTHLY RE-INJECTION OPERATING REPORT JULY 2001

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OVERVIEW

On September 2, 1999, DOE completed one year of active groundwater re-injection as part of a field-scale demonstration. A report detailing the demonstration was issued to the U.S. EPA and Ohio EPA on May 30, 2000.

Re-Injection at Fernald is exempted under 40 CFR 300.400(e)(1) from requiring a permit, as it is a CERCLA action. In accordance with Ohio EPA Guidelines (OEPA 1997), DOE will prepare monthly operating reports that include:

I. An analysis of the injectate
II. The volume and rate of re-injection
III. A description of any well maintenance and rehabilitation procedures conducted.

DOE will submit the monthly re-injection operating reports to the U.S. EPA, Ohio EPA Office of Federal Facilities Oversight, and the Division of Ohio EPA Drinking and Ground Waters – Underground Injection Control Unit. This report covers re-injection operations from July 1 to August 1, 2001.

Routine monitoring of the aquifer in the re-injection area is conducted as part of the groundwater remedy performance monitoring program specified in Fernald's Integrated Environmental Monitoring Plan. Results of the Integrated Environmental Monitoring Plan are reported quarterly and are available for viewing on the Fernald Website, www.fernald.gov.

ANALYSIS OF THE INJECTATE

Groundwater extracted from the Great Miami Aquifer is treated for uranium removal and is then re-injected into the Great Miami Aquifer. The groundwater is treated in the FEMP Advanced Waste Water Treatment (AWWT) Expansion Facility. The effluent from the AWWT Expansion Facility is sampled monthly for the parameters listed in Table 2-1 of the Re-Injection Demonstration Test Plan, Revision 0.

Monthly injectate grab sampling focuses on the groundwater final remediation level (FRL) constituents that have had an exceedance of their FRL in the region of the aquifer from which the groundwater is being pumped. The monthly injectate grab samples are sent to an off-site laboratory for analysis. In addition to the monthly grab sample, 24-hour composite samples are collected and analyzed at the on-site laboratory for uranium. The 24-hour composite sampler samples the combined effluent from the active

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treatment trains comprising the facility. The daily composite results are used by plant management for making process control decisions. They provide a daily evaluation of the quality of the water that is re-injected into the aquifer. Composite daily uranium results from the AWWT Expansion Facility effluent for days when re-injection occurred are shown in Figure 1.

No monthly grab sample was collected for July 2001 due to the re-injection system being shut down starting July 15, 2001. As shown in Figure 1, the total uranium concentrations measured in the daily composite samples ranged from 7.8 to 13.9 micrograms per liter (µg/L). The FRL for uranium is 20 µg/L.

VOLUME AND RATE OF RE-INJECTION

The design re-injection set point for each of the re-injection wells is 200 gallons per minute (gpm). The combined design re-injection rate for all five wells is 1000 gpm. Figure 2 illustrates the location of the five re-injection wells; Tables 1 through 5 summarize the current calendar year's operational data by month. The tables also provide averages by year for the calendar years 1998, 1999, and 2000. Re-Injection Well 8 is 8 inches in diameter. Re-Injection Well 9 is 12 inches in diameter. The other re-injection wells are all 16 inches in diameter.

In February 2000, a new injection rate strategy was initiated to help compensate for well downtimes due to maintenance, electrical outages, etc. Injection rate set points may be temporarily increased to 220 gpm toward the end of a month and decreased to the 200 gpm rate at the start of a new month. The ability to increase re-injection rates is dependent upon the condition of the wells, availability of higher than average groundwater treatment capacity, and lower than normal uranium concentrations in the site effluent. This strategy for adjusting re-injection rate set points may continue in future months, depending on the variables noted above.

Figure 3 illustrates the water level rise in each of the operating re-injection wells from July 1 to July 15, 2001, as recorded by the operators at the AWWT Expansion Facility Distributed Control System (DCS). Water levels are recorded three times each day. Water levels inside the re-injection wells are monitored as an indicator of plugging within the wells. Given a constant re-injection rate, as a well becomes plugged, the water level in the well rises to compensate for the greater pressure needed to move the same volume of water through a smaller opening.

While it is not the intent of this report to discuss operational issues, the following information is provided to aid in the interpretation of Figures 1 and 3.

SUMMARY OF SYSTEM OUTAGES FOR THE REPORTING PERIOD

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For the month of July 2001, re-injection took place at a reduced rate due to outages of Re-Injection Wells 8, 9, 10, and 12. Re-Injection Well 11 was down from July 15 through the end of the month due to an exceedance of the internal 10 µg/L re-injection process control total uranium concentration limit in the AWWT 1800 system discharge. To ensure that no water exceeding 20 µg/L total uranium is injected, the system was shut down until one of the 1800 system ion exchange vessels could be regenerated and the combined discharge verified to be less than 10 µg/L total uranium.

SUMMARY OF WELL MAINTENANCE FOR THE REPORTING PERIOD

- Re-Injection Well 11 went offline on July 15, 2001.
- Re-Injection Wells 8, 9, 10, and 12 were offline through the end of July 2001 as presented in Tables 1, 2, 3, and 5, respectively.

NOTIFICATION OF SIGNIFICANT REDUCTION IN REINJECTION EFFICIENCY

The re-injection wells have been subject to increased residual plugging that has effectively stopped re-injection at Re-Injection Wells 8, 9, 10, and 12. The cessation of re-injection in these four wells has resulted in an overall well field reduction of 80 percent; the system has been re-injecting at 200 gpm for part of the reporting period and has thus not met the design rate of 1000 gpm for the reporting period.

While it is not within the scope of this report to detail both problem analysis and methods of solving this problem, steps currently underway include:

- DOE is continuing to evaluate the best well treatment method. A key component of the recommended treatment is a polymeric acid enhancer called NW-310. NW-310 readily biodegrades and is used to treat potable water systems. Other acids were additionally recommended and may be used pending EPA and OEPA concurrence. A letter requesting concurrence with use of these additional chemicals was submitted the week of July 9, 2001. DOE received concurrence from OEPA on July 31, 2001.
- During the week of July 13 to 20, 2001, Fluor Fernald prepared and reviewed a draft of the well rehabilitation scope of work based on recommendations made by an industry expert in the field of well rehabilitation. This plan was then provided to DOE for review during the subsequent week. The plan was scheduled to be reviewed by the industry expert for well rehabilitation in early August.
- A report is being prepared to status and update the issues associated with these re-injection wells. The report will outline the rehabilitation efforts that have taken place to date, including an analysis of the project's successes and failures.
- If the plugging of the re-injection wells proves to be non-reversible, then the FEMP will re-evaluate the re-injection program to determine whether the program still possesses significant cost savings with respect to the acceleration of the groundwater remedy.

- If supportable, DOE will explore the possibility of new injection wells, including the possibility of a new well design to allow periodic pumping from the re-injection well at rates of 100 gpm or greater.

More information, including information beyond the temporal scope of this report (e.g., more recent than July 2001), will be presented in the weekly site conference calls as it becomes available.

TABLE 1

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RE-INJECTION WELL 22107 (IW-8)
OPERATIONAL SUMMARY SHEET
JULY 2001

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

Hours in reporting period[a] = 744.00
Hours not injecting[b] = 744.00
Hours injecting[c] = 0.00
Operational percent[d] = 0.0

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.04	207
1999	7.21	199
2000	4.26	149
1/01	0.00	0
2/01	0.00	0
3/01	0.00	0
4/01	0.00	0
5/01	0.00	0
6/01	0.00	0
7/01	0.00	0

[a]First operational shift reading on July 1, 2001 to first operational shift reading on August 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

TABLE 2

RE-INJECTION WELL 22108 (IW-9)
OPERATIONAL SUMMARY SHEET
JULY 2001

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

Hours in reporting period[a] = 744.00
Hours not injecting[b] = 744.00
Hours injecting[c] = 0.00
Operational percent[d] = 0.0

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.67	204
1999	6.64	188
2000	4.29	164
1/01	0.00	0
2/01	0.00	0
3/01	0.11	204
4/01	0.00	0
5/01	0.00	0
6/01	0.00	0
7/01	0.00	0

[a]First operational shift reading on July 1, 2001 to first operational shift reading on August 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

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TABLE 3

RE-INJECTION WELL 22109 (IW-10)
OPERATIONAL SUMMARY SHEET
JULY 2001

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

Hours in reporting period[a] = 744.00
Hours not injecting[b] = 744.00
Hours injecting[c] = 0.00
Operational percent[d] = 0.0

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.66	204
1999	7.07	196
2000	3.96	149
1/01	2.72	206
2/01	6.27	199
3/01	7.82	200
4/01	7.81	201
5/01	8.01	199
6/01	1.28	201
7/01	0.00	0

[a]First operational shift reading on July 1, 2001 to first operational shift reading on August 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

TABLE 4

RE-INJECTION WELL 22240 (IW-11)
OPERATIONAL SUMMARY SHEET
JULY 2001

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

Hours in reporting period[a] = 736.37
Hours not injecting[b] = 408.00
Hours injecting[c] = 328.37
Operational percent[d] = 44.6

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.72	206
1999	7.61	199
2000	6.38	196
1/01	5.97	200
2/01	6.26	199
3/01	7.76	196
4/01	7.68	202
5/01	8.03	201
6/01	6.61	200
7/01	3.91	198

[a]First operational shift reading on July 1, 2001 to first operational shift reading on August 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

TABLE 5

RE-INJECTION WELL 22111 (IW-12) OPERATIONAL SUMMARY SHEET JULY 2001

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

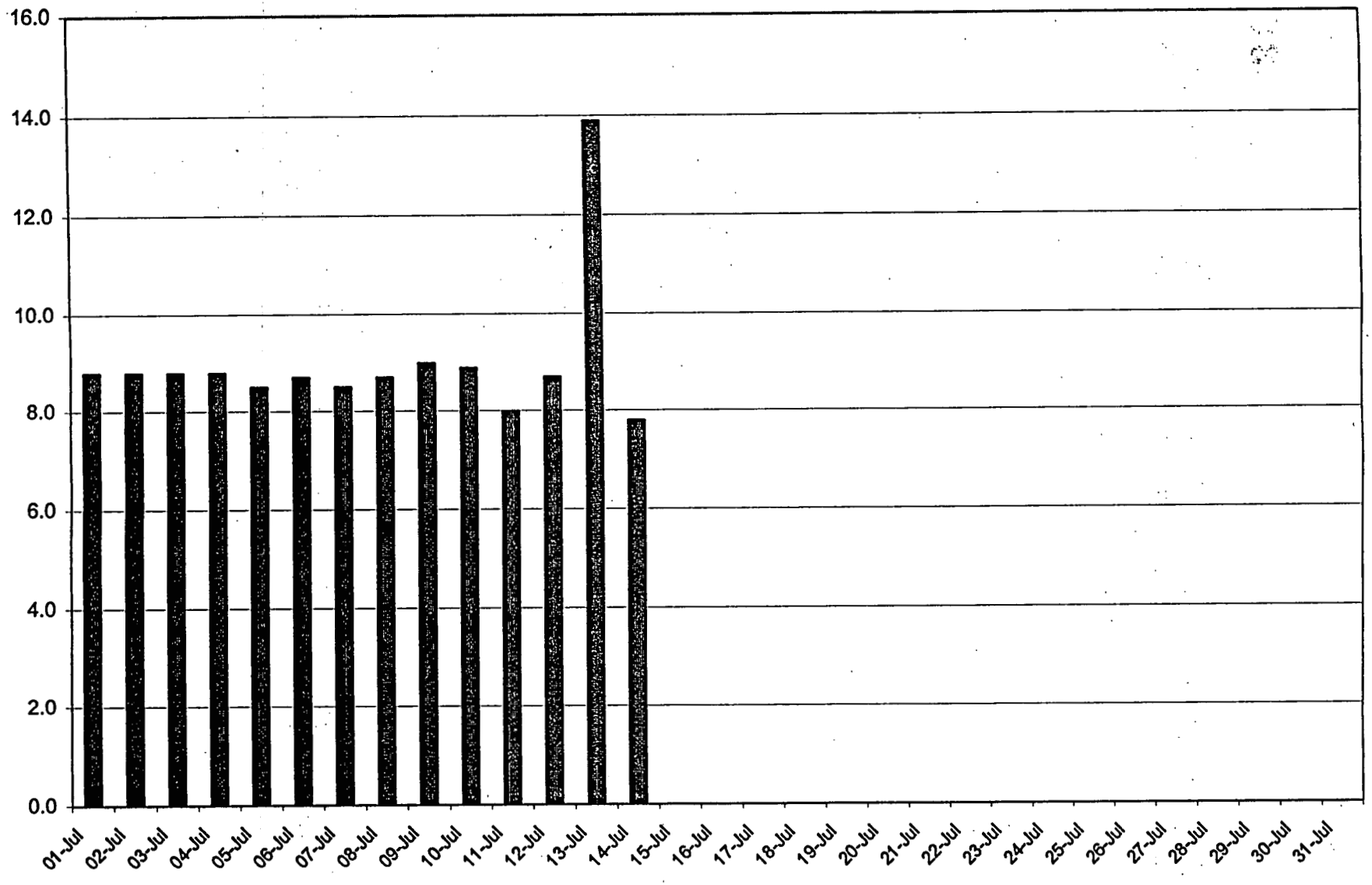
Hours in reporting period[a] = 744.00
Hours not injecting[b] = 744.00
Hours injecting[c] = 0.00
Operational percent[d] = 0.0

Target Injection Rate = 200 gpm

Monthly Measurements		
Month[e]	Million Gallons Injected[f]	Average Operating Injection Rate (gpm)[g]
1998	7.63	206
1999	7.55	198
2000	6.05	180
1/01	0.00	0
2/01	0.00	0
3/01	0.00	0
4/01	0.00	0
5/01	0.00	0
6/01	0.00	0
7/01	0.00	0

[a]First operational shift reading on July 1, 2001 to first operational shift reading on August 1, 2001.
[b]Downtime as noted in the text.
[c]Hours in reporting period - Hours not injecting
[d](Hours injecting/Hours in reporting period) x 100
[e]Average for calendar years 1998, 1999, and 2000
[f]Summation of daily totalizer differences
[g]Gallons Injected/(Hours Injecting x 60)

Figure 1
AWWT Expansion 1800 System Effluent Total Uranium Concentration (µg/L)
on Days when Re-Injection Occurred



Note: Down times are discussed in the text.

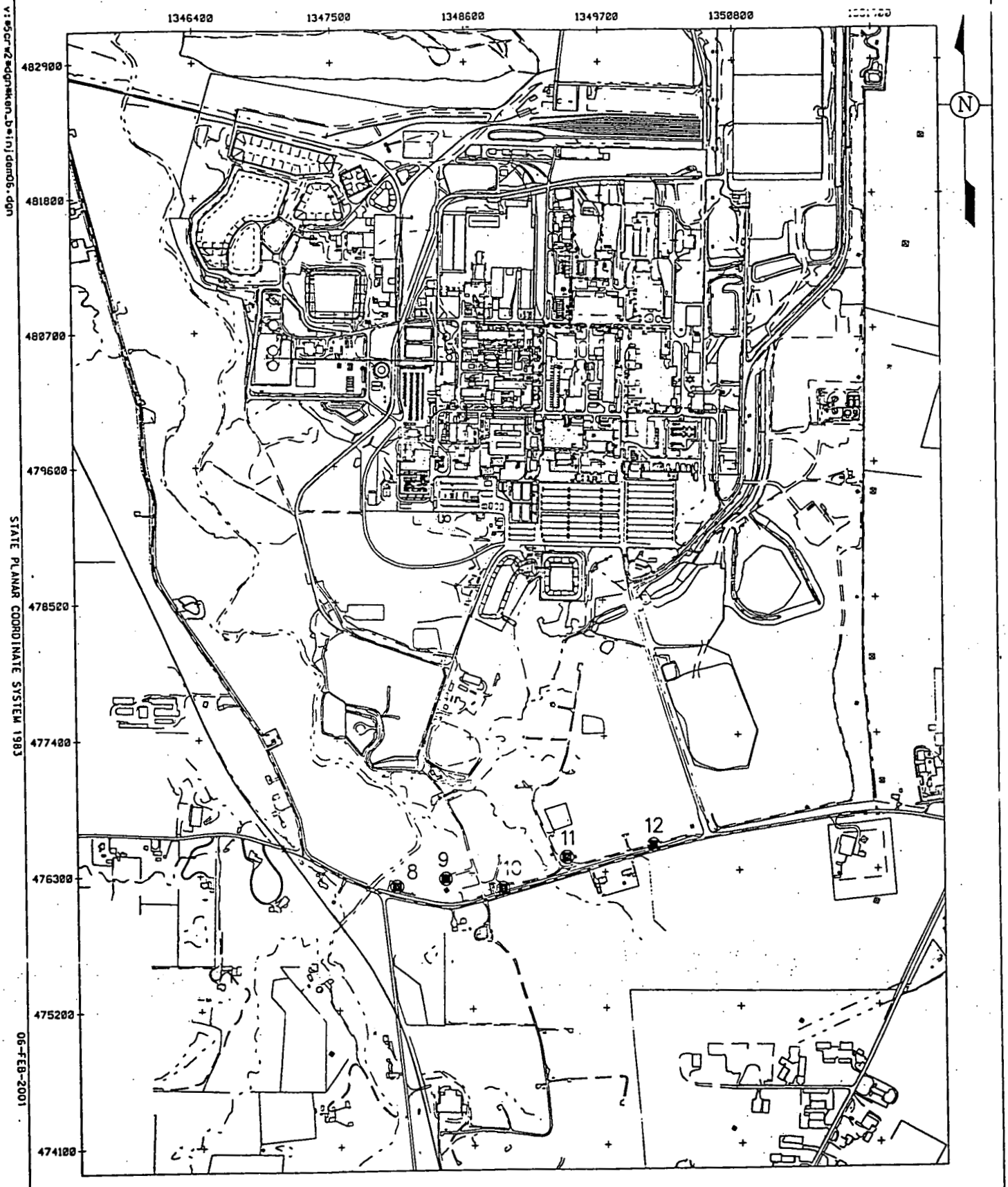
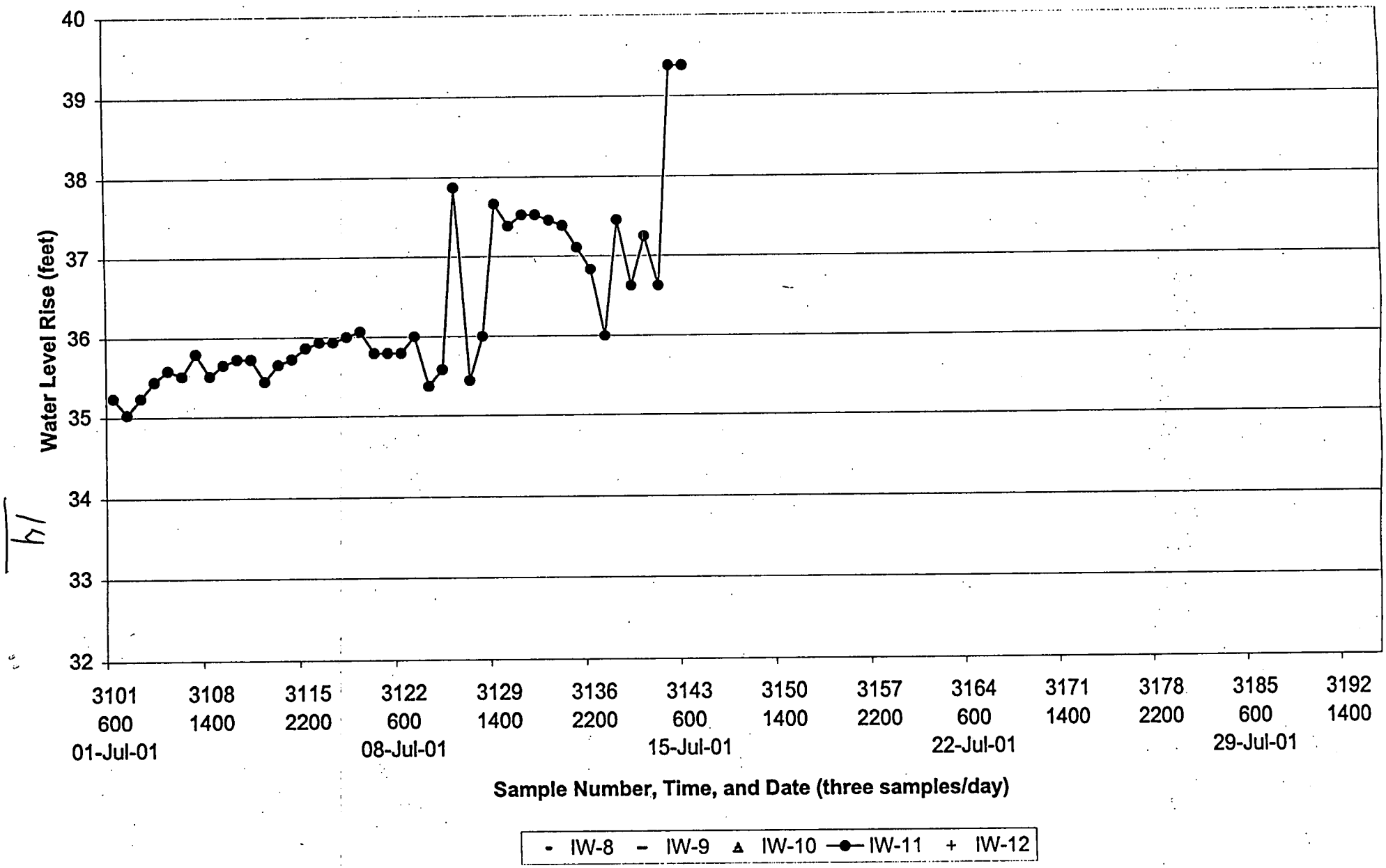


FIGURE 2. LOCATION OF RE-INJECTION WELLS

Figure 3
Re-Injection Wells, Water Level Rise
First Shift on July 1, 2001 (Sample Number 3100) to First Shift on August 1, 2001 (Sample Number 3194)



0107Inj-tab.xls Chart2 08/28/2001 11:01 AM