

**QUARTERLY MONITORING REPORT
JANUARY 2005 SAMPLING**

**City of Patterson Wastewater Treatment Plant
Groundwater Monitoring Program**

Conducted in Accordance with
Waste Discharge Requirements Order No. 5-00-146

Prepared by:



LEE & RO, Inc.
11060 White Rock Road, Suite 100
Rancho Cordova, California 95670-6046

Prepared for:

City of Patterson
Department of Public Works
33 South Del Puerto Avenue
Patterson, CA 95363

FEBRUARY 2005

REPORT PREPARED BY:



2-14-5

Robert Owen Godwin
Registered Civil Engineer

(DATE)
California No. C48045

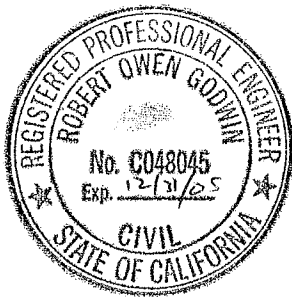


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1. INTRODUCTION

This Quarterly Groundwater Monitoring Report has been prepared in accordance with the Waste Discharge Requirements for the City of Patterson Wastewater Treatment Plant in the City of Patterson, Stanislaus County, California. The wells were installed as part of the groundwater monitoring program developed to determine if groundwater has been, or has the potential to be, adversely impacted by wastewater treatment and disposal operations. The monitoring program will include an assessment of background conditions and a determination if there has been any impact from wastewater disposal. The groundwater monitoring program consists of the construction and quarterly sampling of ten monitoring wells.

Monitoring wells MW-1 to MW-5 were constructed in March 2001. Samples have been collected on a quarterly basis since April 2001. In conjunction with the 1.25 mgd wastewater treatment plant expansion, five new monitoring wells were constructed between the months of July and August of 2004. These wells have been sampled once in October for the Quarterly Monitoring Report since being constructed.

This report presents the results of the quarterly samples collected on January 17, 2005 for all ten monitoring wells. Included in this report will be groundwater elevation summaries and contour maps.

2. GROUNDWATER MONITORING WELLS

Figure 1 shows the monitoring well locations.

All ten wells have 15 feet of screen with total depths ranging from 28 to 31.5 feet below ground surface (bgs). A summary of well characteristics is provided in **Table 1**.

The location of monitoring well MW-9 has been disputed by the neighboring landowners. The City is now reconsidering removing and relocating the well. If the well is removed, alternate locations will be proposed in the next quarterly report.

3. GROUNDWATER ELEVATIONS

Groundwater elevations measured to date are summarized in **Figure 2**.

Groundwater elevations measured in this sampling round are presented in **Table 1** and contoured on the map presented in **Figure 3**.

4. MONITORING WELL SAMPLING

The wells were purged and sampled on January 17, 2005 in accordance with the procedures specified in the workplan. Sampling was conducted by Richard Chrun of GeoAnalytical Laboratories. Purge logs are presented in **Appendix A**.

5. GROUNDWATER QUALITY RESULTS

The samples were analyzed by GeoAnalytical Laboratories, a state-certified environmental laboratory. Analytical results for the quarterly samples are summarized in **Table 2**. Laboratory reports for the January 2005 samples are presented in **Appendix B**.

Table 1

Well Construction Summary

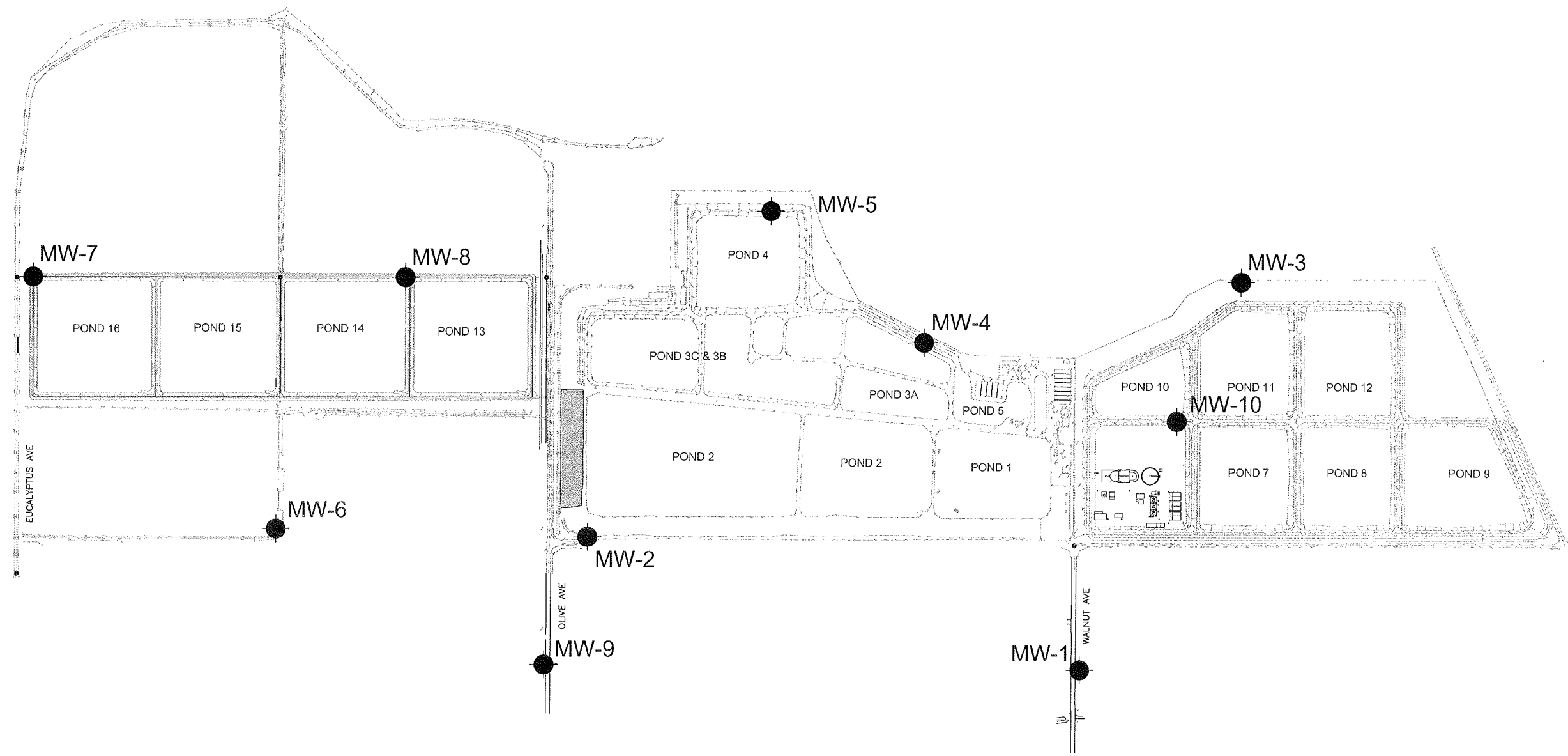
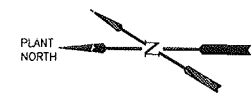
	Well Depth (ft)	Completion Type	Slab Surface Elevation	Top of Casing Elevation	Water Elevation 01/17/05 (ft msl)
MW-1	27.5	Below	55.58	54.93	37.83
MW-2	29.0	Above	57.93	59.68	37.22
MW-3	28.0	Above	52.18	53.80	37.05
MW-4	30.0	Above	56.99	58.58	37.72
MW-5	29.0	Above	53.79	55.21	37.50
MW-6	30.0	Above	51.81	55.23	36.81
MW-7	31.5	Above	54.62	58.04	37.54
MW-8	29.5	Above	55.91	59.33	37.98
MW-9	30.0	Below	53.84	53.63	37.28
MW-10	30.0	Below	58.33	58.12	37.94

Table 2
January 2005 Analytical Results

	PH	Electric Conductivity	Total Dissolved Solids	Nitrate as Nitrogen	Coliform Organisms	
	(Std. Units)	(umhos/cm)	(mg/L)	(mg/L)	Total Coliform Method 9221B,C (MPN/100ml)	Fecal Coliform Method 9221E,C (MPN/100ml)
MW-1	7.0	3020	1610	15.0	30.0	<2
MW-2	6.9	3420	1850	7.6	4.0	<2
MW-3	6.8	4920	2480	12.0	17.0	<2
MW-4	6.6	3140	1610	0.6	<2	NT
MW-5	6.3	2850	1360	1.8	4.0	<2
MW-6	6.6	2340	1110	4.2	<2	NT
MW-7	6.6	2510	1240	5.2	13.0	<2
MW-8	6.5	3730	1970	7.2	17.0	<2
MW-9	7.0	3220	1570	13.0	<2	NT
MW-10	6.6	3570	1830	9.1	<2	NT

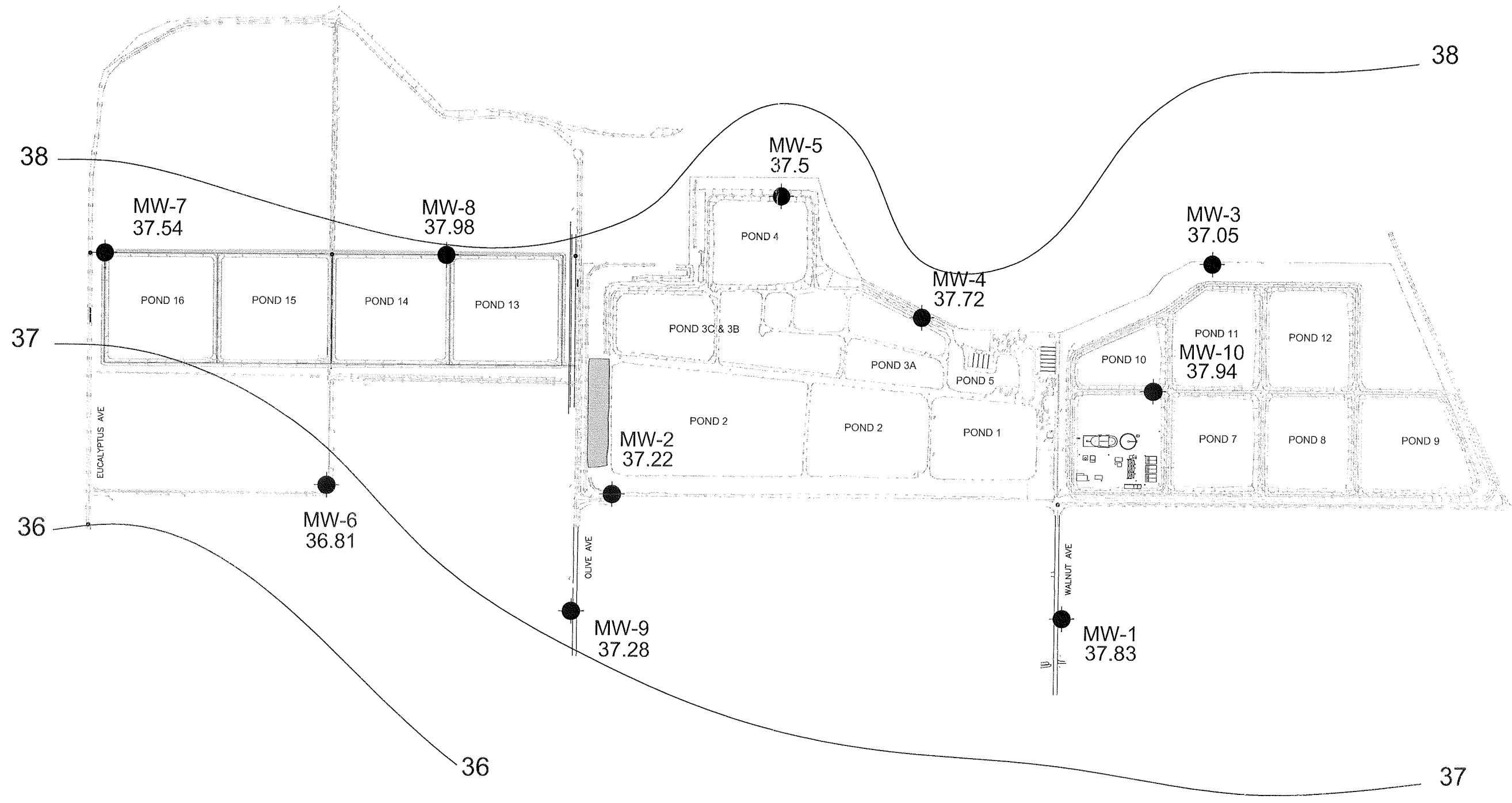
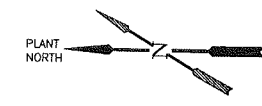
ND = Not Detected

NT = Not Tested



CITY OF PATTERSON
WASTEWATER TREATMENT PLANT
14901 POPLAR AVENUE

FIGURE 1
MONITORING WELL LOCATION MAP
SCALE 1" = 600'



APPENDIX A PURGE LOGS

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # R017-04

Date: 1/21/05

City of Patterson
33 S. Del Puerto
Patterson CA 95363

Project: Quarterly Monitoring Wells


Date Rec'd: 1/17/05
Date Started: 1/17/05
Date Completed: 1/21/05

PO#


Date Sampled: 1/17/05
Time: 10:42 am
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	RL	Method	Analyte	Results	Units
MW - 1	R300477	NA	150.1	pH	7.0	Std. Units
		1.0	120.1	Specific Conductance (EC)	3020	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1610	mg/L
		0.25	300.0	Nitrate as N	15	mg/L
MW - 2	R300478	NA	150.1	pH	6.9	Std. Units
		1.0	120.1	Specific Conductance (EC)	3420	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1850	mg/L
		0.25	300.0	Nitrate as N	7.6	mg/L
MW - 3	R300479	NA	150.1	pH	6.8	Std. Units
		1.0	120.1	Specific Conductance (EC)	4920	µmhos/cm
		10	160.1	TDS (Filterable Residue)	2480	mg/L
		0.25	300.0	Nitrate as N	12	mg/L
MW - 4	R300480	NA	150.1	pH	6.6	Std. Units
		1.0	120.1	Specific Conductance (EC)	3140	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1610	mg/L
		0.25	300.0	Nitrate as N		mg/L
MW - 5	R300481	NA	150.1	pH	6.3	Std. Units
		1.0	120.1	Specific Conductance (EC)	2850	µmhos/cm
		10	160.1	TDS (Filterable Residue)	1360	mg/L
		0.25	300.0	Nitrate as N	1.8	mg/L

RECEIVED
JAN 31 2005
BY:


Rohit Bombaywala
Inorganic Supervisor

Certification # 2585


Donna Keller
Laboratory Director

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

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City of Patterson
33 S. Del Puerto
Patterson CA 95363


Project: Quarterly Monitoring Wells

Date Rec'd: 1/17/05
Date Started: 1/17/05
Date Completed: 1/21/05


PO#

Date Sampled: 1/17/05
Time: 11:46 am
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	RL	Method	Analyte	Results	Units
MW - 6	R300482	NA	150.1	pH	6.6	Std. Units
		1.0	120.1	Specific Conductance (EC)	2340	μ mhos/cm
		10	160.1	TDS (Filterable Residue)	1110	mg/L
		0.25	300.0	Nitrate as N	4.2	mg/L
MW - 7	R300483	NA	150.1	pH	6.6	Std. Units
		1.0	120.1	Specific Conductance (EC)	2510	μ mhos/cm
		10	160.1	TDS (Filterable Residue)	1240	mg/L
		0.25	300.0	Nitrate as N	5.2	mg/L
MW - 8	R300484	NA	150.1	pH	6.5	Std. Units
		1.0	120.1	Specific Conductance (EC)	3730	μ mhos/cm
		10	160.1	TDS (Filterable Residue)	1970	mg/L
		0.25	300.0	Nitrate as N	7.2	mg/L
MW - 9	R300485	NA	150.1	pH	7.0	Std. Units
		1.0	120.1	Specific Conductance (EC)	3220	μ mhos/cm
		10	160.1	TDS (Filterable Residue)	1570	mg/L
		0.25	300.0	Nitrate as N	13	mg/L
TW - 10	R300486	NA	150.1	pH	6.6	Std. Units
		1.0	120.1	Specific Conductance (EC)	3570	μ mhos/cm
		10	160.1	TDS (Filterable Residue)	1830	mg/L
		0.25	300.0	Nitrate as N	9.1	mg/L


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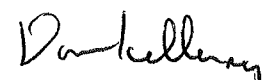
PO#

Date Sampled: 1/17/05
Time: 1:10 pm
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	RL	Method	Analyte	Results	Units
Mitigation Well	R300487	NA	150.1	pH	6.6	Std. Units
		1.0	120.1	Specific Conductance (EC)	3340	μ mhos/cm
		10	160.1	TDS (Filterable Residue)	1520	mg/L
		0.25	300.0	Nitrate as N	4.1	mg/L


Rohit Bombaywala
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CERTIFICATE OF ANALYSIS

Report # R017-04

Date: 1/24/05

City of Patterson
33 S. Del Puerto
Patterson CA 95363

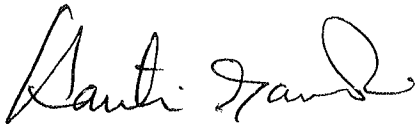
Project: Quarterly Monitoring Wells

Date Rec'd: 1/17/05
Date Started: 1/17/05
Date Completed: 1/21/05

PO#

Date Sampled: 1/17/05
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	Time	RL	Method	Analyte	Results	Units
MW - 1	R300477	10:42 am	2	9221B,C	Total Coliform	30	MPN/100ml
			2	9221E,C	Fecal Coliform	<2	MPN/100ml
MW - 2	R300478	12:59 pm	2	9221B,C	Total Coliform	4	MPN/100ml
			2	9221E,C	Fecal Coliform	<2	MPN/100ml
MW - 3	R300479	2:27 pm	2	9221B,C	Total Coliform	17	MPN/100ml
			2	9221E,C	Fecal Coliform	<2	MPN/100ml
MW - 4	R300480	1:59 pm	2	9221B,C	Total Coliform	<2	MPN/100ml
MW - 5	R300481	1:32 pm	2	9221B,C	Total Coliform	4	MPN/100ml
			2	9221E,C	Fecal Coliform	<2	MPN/100ml
MW - 6	R300482	11:46 am	2	9221B,C	Total Coliform	<2	MPN/100ml
MW - 7	R300483	12:05 pm	2	9221B,C	Total Coliform	13	MPN/100ml
			2	9221E,C	Fecal Coliform	<2	MPN/100ml
MW - 8	R300484	12:17 pm	2	9221B,C	Total Coliform	17	MPN/100ml
			2	9221E,C	Fecal Coliform	<2	MPN/100ml
MW - 9	R300485	12:35 pm	2	9221B,C	Total Coliform	<2	MPN/100ml
MW - 10	R300486	2:48 pm	2	9221B,C	Total Coliform	<2	MPN/100ml



Kanti Gandhi
Chemist



Donna Keller
Laboratory Director

Certification # 2585

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

Report# R017-04

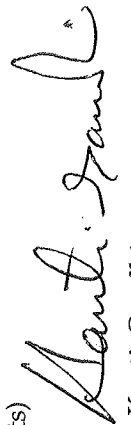
QC REPORT


City of Patterson
33 S. Del Puerto
Patterson

CA 95363

Analyte	Method	Batch #	Dates Analyzed	Orig.	Dupl.	MS %Rec	MSD %Rec	RPD	LCS %Rec	Blank	Comments
Total Coliform	9221B,C	B0023	01/17/05-01/21/05	Absent	Absent			0.0		Absent	

* LCS/LCSD (see comments)


Kanti Gandhi
Chemist


Donna Keller
Laboratory Director

Certification # 2585

GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue Modesto, CA 95351 Phone (209) 572-0900 Fax (209) 572-0916

CERTIFICATE OF ANALYSIS

Report # R017-04

Date: 1/24/05

City of Patterson
33 S. Del Puerto
Patterson CA 95363

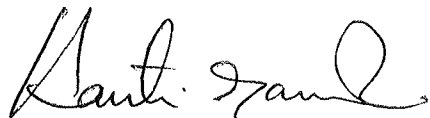
Project: Quarterly Monitoring Wells

Date Rec'd: 1/17/05
Date Started: 1/17/05
Date Completed: 1/21/05

PO#

Date Sampled: 1/17/05
Sampler: R. Chrun (Geo)

Sample ID	Lab ID	Time	RL	Method	Analyte	Results	Units
Mitigation Well	R300487	1:10 pm	2	9221B,C	Total Coliform	<2	MPN/100ml



Kanti Gandhi
Chemist

Certification # 2585



Donna Keller
Laboratory Director

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Report# R017-04


QC REPORT

City of Patterson
33 S. Del Puerto
Patterson


CA 95363

Analyte	Method	Batch #	Dates Analyzed	Orig.	Dupl.	MS %Rec	MSD %Rec	RPD	LCS %Rec	Blank	Comments
pH	150.1	IO0358	1/17/05	7.0	7.0			0.0		NA	
Specific Conductance (EC)	120.1	IO0346	1/19/05	97	97			0.0		ND	
TDS (Filterable Residue)	160.1	IO0344	1/18/05	1610	1600			0.6		ND	
Nitrate as N	300.0	IO0349	01/18/05			91.8	92.8 *	1.1		ND	Sample analyte concentration too high to spike.

* LCS/LCSD (see comments)


Rohit Bombaywala
Inorganic Supervisor

Certification # 2585


Donna Keller
Laboratory Director

Report # R017-04

Field Log / Groundwater Sampling Form

Date 1/17/0

Client City of Patterson

Well Name MW-1

Project Name Quarterly Monitoring Wells

Well Type: Monitor Extraction Other

Consultant _____

Proj. Manager Richard Chrun

Sampler Rich Chrun

PURGING

Purge Method

- Bailer - Type _____
- Pump - Type 2"
- Other _____

Purge Volume

- Well Casing Diameter
- 2 - inch
 - 4 - inch
 - other _____
- Well Volume Purged
- 3 volumes
 - 4 volumes
 - other _____

Multiplier

I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 27.50

Depth to Water 17.10

Water Column Length 10.40

10.40 x 0.6527 x 3 = 20.36
 Water column length Multiplier No. Volumes CALCULATED Purge Vol.

20.36 / 2.5 = 8.14
 Purge Vol / Purge Rate TOTAL PURGE TIME

8.14 / 3 = 2.71
 Total Purge Time # Volumes PURGE TIME/VOL.

Actual Values	
Purge Time / Vol.	<u>3</u>
No. Volumes	<u>3</u>
Total Purge Time	<u>9</u>
Purge Rate	<u>2.5</u>
Actual Purge Vol.	<u>22.5</u>

GROUNDWATER/PURGE WATER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. <input checked="" type="checkbox"/> deg C <input type="checkbox"/> deg F	ID	ORP	Color / Odor
Start	<u>10:33</u>	-	-	-	-	-	-	-
Vol 1	<u>10:36</u>	<u>7.5</u>	<u>7.17</u>	<u>2.45ms</u>	<u>19.7</u>			<u>clear/none</u>
Vol 2	<u>10:39</u>	<u>15</u>	<u>7.32</u>	<u>2.42ms</u>	<u>20.9</u>			"
Vol 3	<u>10:42</u>	<u>22.5</u>	<u>7.27</u>	<u>2.41ms</u>	<u>20.3</u>			"
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal

- Drummed onsite
- Onsite Treatment System
- Other _____

COMMENTS/purge: _____

WELL SAMPLING

Sampling Method

- Bailer - Type _____
- Pump - Type _____
- Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
<u>10:42Am</u>	<u>MW-1</u>	<input checked="" type="checkbox"/>				<u>Pl Litre</u>	<u>1</u>	<u>4°C</u>
						<u>100ml sterile</u>	<u>1</u>	<u>4°C</u>

COMMENTS/sampling: _____

Client City of Patterson
 Project Name Quarterly Monitoring Wells
 Consultant _____
 Proj. Manager Richard Chron

Well Name MW-2
 Well Type: Monitor Extraction Other _____
 Sampler Rich Chron

WELL LOG

Purge Method
 Bailer - Type _____
 Pump - Type 2"
 Other _____

Purge Volume
 Well Casing Diameter _____ Well Volume Purged
 2 - inch 3 volumes
 4 - inch 4 volumes
 other _____ other _____

Multiplier	
Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 31.40
 Depth to Water 22.46
 Water Column Length 8.94

8.94 x 0.6527 x 3 = 17.50
 Water column length Multiplier No. Volumes CALCULATED Purge Vol.

17.50 / 2.5 = 7.00
 Purge Vol / Purge Rate TOTAL PURGE TIME

7.00 / 3 = 2.33
 Total Purge Time # Volumes PURGE TIME/VOL.

Actual Values	
Purge Time / Vol.	<u>3</u>
X No. Volumes	<u>3</u>
= Total Purge Time	<u>9</u>
X Purge Rate	<u>2.5</u>
= Actual Purge Vol.	<u>22.50</u>

GROUNDWATER PARAMETER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp.		ID	ORP	Color / Odor
					<input type="checkbox"/> deg C	<input type="checkbox"/> deg F			
Start	12:50	-	-	-	-	-	-	-	-
Vol 1	12:53	7.5	7.21	2.78ms	17.9				turbid/none
Vol 2	12:56	15	7.07	2.80ms	19.0				"
Vol 3	12:59	22.50	7.23	2.94ms	17.4				"
Vol 4									
Vol 5									

Meter Type IQ Scientific Purge Water Storage / Disposal
 Drummed onsite
 Onsite Treatment System
 Other _____

COMMENTS/purge: _____

WELL SAMPLING

Sampling Method
 Bailer - Type _____
 Pump - Type _____
 Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
12:59 pm	MW-2	✓				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____

Report # R017-04

Field Log / Groundwater Sampling Form

Date 1/17/0

Client City of Patterson

Well Name MW-3

Project Name Quarterly Monitoring Wells

Well Type: Monitor Extraction Other

Consultant _____

Proj. Manager Richard Chrun

Sampler Rich Chrun

WELL PURGING

Purge Method

- Bailer - Type _____
- Pump - Type 2"
- Other _____

Multiplier

I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Purge Volume

Well Casing Diameter

- 2 - inch
- 4 - inch
- other _____

Well Volume Purged

- 3 volumes
- 4 volumes
- other _____

Total Well Depth 31.00

Depth to Water 16.75

Water Column Length 14.25

14.25 X 0.6527 X 3 = 27.90
 Water column length Multiplier No. Volumes CALCULATED Purge Vol.

27.90 / 2.5 = 11.16
 Purge Vol / Purge Rate TOTAL PURGE TIME

11.16 / 3 = 3.72
 Total Purge Time # Volumes PURGE TIME/VOL.

Actual Values

Purge Time / Vol.	<u>4</u>
No. Volumes	<u>3</u>
Total Purge Time	<u>12</u>
Purge Rate	<u>2.5</u>
Actual Purge Vol.	<u>30</u>

GROUNDWATER PARAMETER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. <input checked="" type="checkbox"/> deg C <input type="checkbox"/> deg F	ID	CRP	Color / Odor
Start	2:15	-	-	-	-	-	-	-
Vol 1	2:19	10	7.06	3.50ms	18.5			Clear / none
Vol 2	2:23	20	7.09	3.51ms	18.8			"
Vol 3	2:27	30	7.11	3.52ms	19.3			"
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal

- Drummed onsite
- Onsite Treatment System
- Other _____

COMMENTS/purge: _____

WELL SAMPLING

Sampling Method

- Bailer - Type _____
- Pump - Type _____
- Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
2:27pm	MW-3	✓				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____

Report # R017-04 Field Log / Groundwater Sampling Form Date 1/17/0
 Client City of Patterson Well Name MW-4
 Project Name Quarterly Monitoring Wells Well Type: Monitor Extraction Other _____
 Consultant _____
 Proj. Manager Richard Chrun Sampler Rich Chrun

Well Purge

Purge Method
 Bailer - Type _____
 Pump - Type 2"
 Other _____

Purge Volume
 Well Casing Diameter _____ Well Volume Purged _____
 2 - inch 3 volumes
 4 - inch 4 volumes
 other _____ other _____

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 31.00
 Depth to Water 20.86
 Water Column Length 10.14

10.14 x 0.6527 x 3 = 19.85
 Water column length Multiplier No. Volumes CALCULATED Purge Vol.

19.85 / 2.5 = 7.94
 Purge Vol / Purge Rate TOTAL PURGE TIME
7.94 / 3 = 2.64
 Total Purge Time # Volumes PURGE TIME/VOL.

Actual Values

Purge Time / Vol. 3
 X
 No. Volumes 3
 =
 Total Purge Time 9
 X
 Purge Rate 2.5
 =
 Actual Purge Vol. 22.5

GROUNDWATER PARAWATER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. <input checked="" type="checkbox"/> deg C <input type="checkbox"/> deg F	ID	ORP	Color / Odor
Start	1:50	-	-	-	-	-	-	-
Vol 1	1:53	7.5	7.01	2.33ms	18.7			Clear / none
Vol 2	1:56	15	6.83	2.30ms	19.1			"
Vol 3	1:59	22.5	6.80	2.35ms	19.2			"
Vol 4								
Vol 5								

Meter Type IQ Scientific Purge Water Storage / Disposal
 Drummed onsite
 Onsite Treatment System
 Other _____

COMMENTS/purge: _____

Well Sampling

Sampling Method
 Bailer - Type _____
 Pump - Type _____
 Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
1:59pm	MW-4	✓				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____

Report # R07-04 Field Log / Groundwater Sampling Form Date 1/17/0

Client City of Patterson
 Project Name Quarterly Monitoring Wells
 Consultant _____
 Proj. Manager Richard Chrun

Well Name MW-5
 Well Type: Monitor Extraction Other _____
 Sampler Rich Chrun

WELL PURGE

Purge Method
 Bailer - Type _____
 Pump - Type 2"
 Other _____

Purge Volume
 Well Casing Diameter _____ Well Volume Purged _____
 2 - inch 3 volumes
 4 - inch 4 volumes
 other _____ other _____

Multiplier	
Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 31.00
 Depth to Water 17.71
 Water Column Length 13.29

13.29 x 0.6527 x 3 = 26.02
 Water column length Multiplier No. Volumes CALCULATED Purge Vol.

26.02 / 2.5 = 10.40
 Purge Vol / Purge Rate TOTAL PURGE TIME

10.40 / 3 = 3.46
 Total Purge Time # Volumes PURGE TIME/VOL.

Actual Values	
Purge Time /Vol.	<u>4</u>
X No. Volumes	<u>3</u>
= Total Purge Time	<u>12</u>
X Purge Rate	<u>2.5</u>
= Actual Purge Vol.	<u>30</u>

GROUNDWATER / PUMP WATER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. <input checked="" type="checkbox"/> deg C <input type="checkbox"/> deg F	ID	ORP	Color / Odor
Start	1:20	-	-	-	-	-	-	-
Vol 1	1:24	10	6.62	220ms	18.1			clear / none
Vol 2	1:28	20	6.59	213ms	18.6			"
Vol 3	1:32	30	6.58	220ms	18.9			"
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal
 Drummed onsite
 Onsite Treatment System
 Other _____

COMMENTS/purge: _____

SAMPLING

Sampling Method
 Bailer - Type _____
 Pump - Type _____
 Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
1:32pm	MW-5	✓				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____

Report # R017-04

Field Log / Groundwater Sampling Form

Date 1/17/0

Client City of Patterson

Well Name MW-6

Project Name Quarterly Monitoring Wells

Well Type: Monitor Extraction Other

Consultant _____

Proj. Manager Richard Chrun

Sampler Rich Chrun

PURGE VOLUME CALCULATION

Purge Method

- Bailer - Type _____
 Pump - Type 2"
 Other _____

Purge Volume

- Well Casing Diameter _____ Well Volume Purged _____
 2 - inch 3 volumes
 4 - inch 4 volumes
 other _____ other _____

Multiplier

Well Casing I.D. (in.)	Gal/Ft.
<u>2.0</u>	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 29.20

Depth to Water 18.42

Water Column Length 10.78

$10.78 \times \frac{0.1632}{0.6527} \times 3 = 5.27$
 Water column length Multiplier No. Volumes = CALCULATED Purge Vol.

$\frac{5.27}{2.5} = 2.11$
 Purge Vol / Purge Rate = TOTAL PURGE TIME

$\frac{2.11}{3} = 0.70$
 Total Purge Time / # Volumes = PURGE TIME/VOL.

Actual Values	
Purge Time / Vol.	
No. Volumes	<u>3</u>
Total Purge Time	<u>3</u>
Purge Rate	<u>2.5</u>
Actual Purge Vol.	<u>7.5</u>

GROUNDWATER PARAMETER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp.		ID	ORP	Color / Odor
					<input checked="" type="checkbox"/> deg C	<input type="checkbox"/> deg F			
Start	11:43	-	-	-	-	-	-	-	-
Vol 1	11:44	2.5	7.34	1726µs	18.4				turbid/none
Vol 2	11:45	5.0	7.43	1674µs	19.2				"
Vol 3	11:46	7.5	7.46	1702µs	19.0				"
Vol 4									
Vol 5									

Meter Type IQ Scientific

Purge Water Storage / Disposal

- Drummed onsite
 Onsite Treatment System
 Other _____

COMMENTS/purge: _____

SAMPLING METHOD

- Bailer - Type _____
 Pump - Type _____
 Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
11:46am	MW-6	<input checked="" type="checkbox"/>				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____

Report # R017-04

Field Log / Groundwater Sampling Form

Date 1/17/0

Client City of Patterson

Well Name MW-7

Project Name Quarterly Monitoring Wells

Well Type: Monitor Extraction Other

Consultant _____

Proj. Manager Richard Chrun

Sampler Rich Chrun

WELL PURGE

Purge Method

- Bailer - Type _____
- Pump - Type 2"
- Other _____

Purge Volume

- Well Casing Diameter _____ Well Volume Purged
- 2 - inch
 - 4 - inch
 - other _____
 - 3 volumes
 - 4 volumes
 - other _____

Multiplier

I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 31.00

Depth to Water 20.50

Water Column Length 10.50

$$\frac{10.50}{10.50} \times \frac{1032}{0.6527} \times 3 = 5.14$$

Water column length Multiplier No. Volumes CALCULATED Purge Vol.

$$\frac{5.14}{2.5} = 2.05$$

Purge Vol / Purge Rate TOTAL PURGE TIME

$$\frac{2.05}{3} = 0.68$$

Total Purge Time # Volumes PURGE TIME/VOL.

Actual Values

Purge Time / Vol.	<u>1</u>
No. Volumes	<u>3</u>
Total Purge Time	<u>3</u>
Purge Rate	<u>2.5</u>
Actual Purge Vol.	<u>7.5</u>

GROUNDWATER PARAVANER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. <input checked="" type="checkbox"/> deg C <input type="checkbox"/> deg F	ID	ORP	Color / Odor
Start	12:07	-	-	-	-	-	-	-
Vol 1	12:03	2.5	7.47	2.33ms	17.7			turbid / none
Vol 2	12:04	5.0	7.13	1.97ms	18.4			
Vol 3	12:05	7.5	7.10	1869µs	19.1			
Vol 4								
Vol 5								

Meter Type IQ Scientific

Purge Water Storage / Disposal

- Drummed onsite
- Onsite Treatment System
- Other _____

COMMENTS/purge: _____

SAMPLING

Sampling Method

- Bailer - Type _____
- Pump - Type _____
- Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
12:05	MW-7	✓				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____

Report # R617-04

Field Log / Groundwater Sampling Form

Date 1/17/0

Client City of Patterson

Well Name MW-8

Project Name Quarterly Monitoring Wells

Well Type: Monitor Extraction Other

Consultant _____

Proj. Manager Richard Chron

Sampler Rich Chron

WELL PURGING

Purge Method

- Bailer - Type _____
- Pump - Type 2"
- Other _____

Purge Volume

- Well Casing Diameter _____ Well Volume Purged
- 2 - inch
 - 4 - inch
 - other _____
 - 3 volumes
 - 4 volumes
 - other _____

Multiplier

I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 30.70

Depth to Water 21.35

Water Column Length 9.35

$9.35 \times \frac{0.1632}{0.6527} \times 3 = 4.57$

Water column length Multiplier No. Volumes = CALCULATED. Purge Vol.

$4.57 / 2.5 = 1.83$

Purge Vol / Purge Rate = TOTAL PURGE TIME

$1.83 / 3 = 0.61$

Total Purge Time / # Volumes = PURGE TIME/VOL.

Actual Values	
Purge Time /Vol.	
No. Volumes	<u>3</u>
Total Purge Time	<u>3</u>
Purge Rate	<u>2.5</u>
Actual Purge Vol.	<u>7.5</u>

GROUNDWATER PARAMETER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp.		ID	ORP	Color / Odor
					<input checked="" type="checkbox"/> deg C	<input type="checkbox"/> deg F			
Start	12:14	-	-	-	-	-	-	-	-
Vol 1	12:15	2.5	6.99	2.87ms	16.3				turbid / none
Vol 2	12:16	5.0	6.89	7.76ms	18.4				"
Vol 3	12:17	7.5	6.86	2.83ms	17.9				"
Vol 4									
Vol 5									

Meter Type IQ Scientific

Purge Water Storage / Disposal

- Drummed onsite
- Onsite Treatment System
- Other _____

COMMENTS/purge: _____

SAMPLING

Sampling Method

- Bailer - Type _____
- Pump - Type _____
- Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
12:17 pm	MW-8	<input checked="" type="checkbox"/>				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____

Client City of Patterson
 Project Name Quarterly Monitoring Wells
 Consultant _____
 Proj. Manager Richard Chron

Well Name MW-9
 Well Type: Monitor Extraction Other _____
 Sampler Rich Chron

PURGING

Purge Method
 Bailer - Type _____
 Pump - Type 2"
 Other _____

Purge Volume
 Well Casing Diameter _____ Well Volume Purged
 2 - inch 3 volumes
 4 - inch 4 volumes
 other _____ other _____

Multiplier	
Well Casing I.D. (in.)	Gal/Ft.
2.0	0.1632
4.0	0.6527
6.0	1.4686

Total Well Depth 30.70
 Depth to Water 16.35
 Water Column Length 14.35

14.35 x 0.6527 x 3 = 7.02
 Water column length Multiplier No. Volumes CALCULATED. Purge Vol.

7.02 / 2.5 = 2.81
 Purge Vol / Purge Rate TOTAL PURGE TIME

2.81 / 3 = 0.93
 Total Purge Time # Volumes PURGE TIME/VOL.

Actual Values	
Purge Time /Vol.	<u>1</u>
No. Volumes	<u>3</u>
Total Purge Time	<u>3</u>
Purge Rate	<u>2.5</u>
Actual Purge Vol.	<u>7.5</u>

GROUNDWATER/PARAWATER MEASUREMENTS

	Time	Gallons	pH	Conductivity µmhos/cm	Temp. <input checked="" type="checkbox"/> deg C <input type="checkbox"/> deg F	ID	ORP	Color / Odor
Start	12:32	-	-	-	-	-	-	-
Vol 1	12:33	2.5	7.42	2.49ms	15.7			Brown / none
Vol 2	12:34	5.0	7.17	1163µs	17.0			
Vol 3	12:35	7.5	7.12	1124µs	17.1			
Vol 4								
Vol 5								

Meter Type IQ Scientific Purge Water Storage / Disposal
 Drummed onsite
 Onsite Treatment System
 Other _____

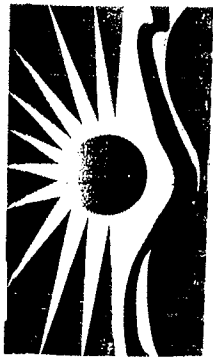
COMMENTS/purge: _____

SAMPLING

Sampling Method
 Bailer - Type _____
 Pump - Type _____
 Other _____

Time	Sample ID	Org	Dup	Split	Blank	Container Type	Number of Containers	Preservative
12:35	MW-9	✓				Pl Litre	1	4°C
						100ml sterile	1	4°C

COMMENTS/sampling: _____



GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue
Modesto, CA 95351

Phone: (209) 572-0900
Fax: (209) 572-0916

Lab Report # RD17-04
Regulatory Yes No CC: Yes No
Regulator: _____

Client: City of Patterson
Address: 33 S. Del Puerto
City: Patterson, CA Zip: _____

Phone: (209) 897-8886
Fax: (209) 897-8993
Original To: Joel Cockrell
C.C To: Bob Goodwin*

CHAIN OF CUSTODY
 EDF EDT
 FIELD LOGS

Sampled By	Date	Time	Sample type		Sample ID	Container		No. Of Containers	ANALYSIS			Remarks	Lab Use Only
			Grab	Comp		Type	Size		PH	EC	TDS		
	1-17-05	10:42 am	X		MW-1	P	1 Litre (cont)	2	X	X	X		R300477
		12:59 pm			MW-2			2	X	X	X		R300478
		2:27 pm			MW-3			2	X	X	X		R300479
		1:59 pm			MW-4			2	X	X	X		R300480
		1:32 pm			MW-5			2	X	X	X		R300481
		11:40 am			MW-6			2	X	X	X		R300482
		12:05 pm			MW-7			2	X	X	X		R300483
		12:17 pm			MW-8			2	X	X	X		R300484
		12:35 pm			MW-9			2	X	X	X		R300485
		2:48 pm			MW-10			2	X	X	X		R300486
		1:10 pm			Mitigation Well			2	X	X	X		R300487

Remarks: _____

* Fax a copy to Bob Goodwin of Lee & Po. @ 916-631-0292

Relinquished by (Signature) Richard Chua Date 1-17-05 Time _____

Relinquished by (Signature) _____ Date _____ Time _____

Received by (Signature) _____ Date 1-17-05 Time 3:30 pm

Received by (Signature) _____ Date _____ Time _____

Bailers: _____ 55 Gallon Drums _____

Turnaround Time: Standard Silver Rush Gold Rush Platinum Rush

Pump Truck _____ Time 1 day Mileage 37 mi.

Approved By: _____

Matrix: HCL NaOH Na₂S₂O₃ HNO₃ H₂O₂ Other

Drinking Water (DW) Waste Water (WW) Hazardous Waste (Water) (S) Soil/Solid