

1R - 260

**GENERAL  
CORRESPONDENCE**

**YEAR(S):**  
2002 - 1997

12260



RECEIVED

MAR 07 2002

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

To: Bill Olson / NMOCD

From: Mike Griffin / Whole Earth Environmental, Inc.

Date: February 23, 2002

Subject: Tatum Pit Closure Project  
Your Letter February 13, 2002

Thank you for the reminder regarding our Work Plan for the Bagley Field Pit Closure Project.

Our work plan for the project is to drill a total of six additional delineation wells at the proposed locations referenced in Exhibits 1-6. The 2" wells will be drilled to a minimum depth of 15' below the upper water interface. Slotted casing will go from the bottom of the well to a distance of 10' above the water table as determined at the time of drilling. The slotted casing will be sand packed below a bentonite seal. The well bore will be grouted to surface and a locking cap installed. (Reference: Exhibit 7).

Rather than setting a separate reporting schedule for these wells, we propose to include the results of the investigation within our annual report to the OCD. We will sample each well each quarter in accordance with the sampling plan already in practice.

We will drill the wells within sixty days of your approval of this plan. If laboratory testing of the waters from any of the proposed wells reveals BTEX or chloride concentrations in excess of NMWQCC standards, we will immediately contact you.

Please don't hesitate to contact me if you've any additional questions.

  
Mike Griffin  
Whole Earth Environmental

1/13/03 - Mike Griffin  
Wells installed. Will submit  
in next annual report  
MGO



## **Exhibit Index**

- Exhibit 1** Schematic of Well Site & Proposed New Monitor Well Location Mable COM
- Exhibit 2** Schematic of Well Site & Proposed New Monitor Well Location Bell State
- Exhibit 3** Schematic of Well Site & Proposed New Monitor Well Location NBF
- Exhibit 4** Schematic of Well Site & Proposed New Monitor Well Location Sohio # 1
- Exhibit 5** Schematic of Well Site & Proposed New Monitor Well Location Sohio "A"
- Exhibit 6** Schematic of Well Site & Proposed New Monitor Well Location G.S. State
- Exhibit 7** Schematic of Typical Monitor Well Construction
- Exhibit 8** Gradient Chart
- Exhibit 9** Gradient Chart

HWY 380

BELL "A"

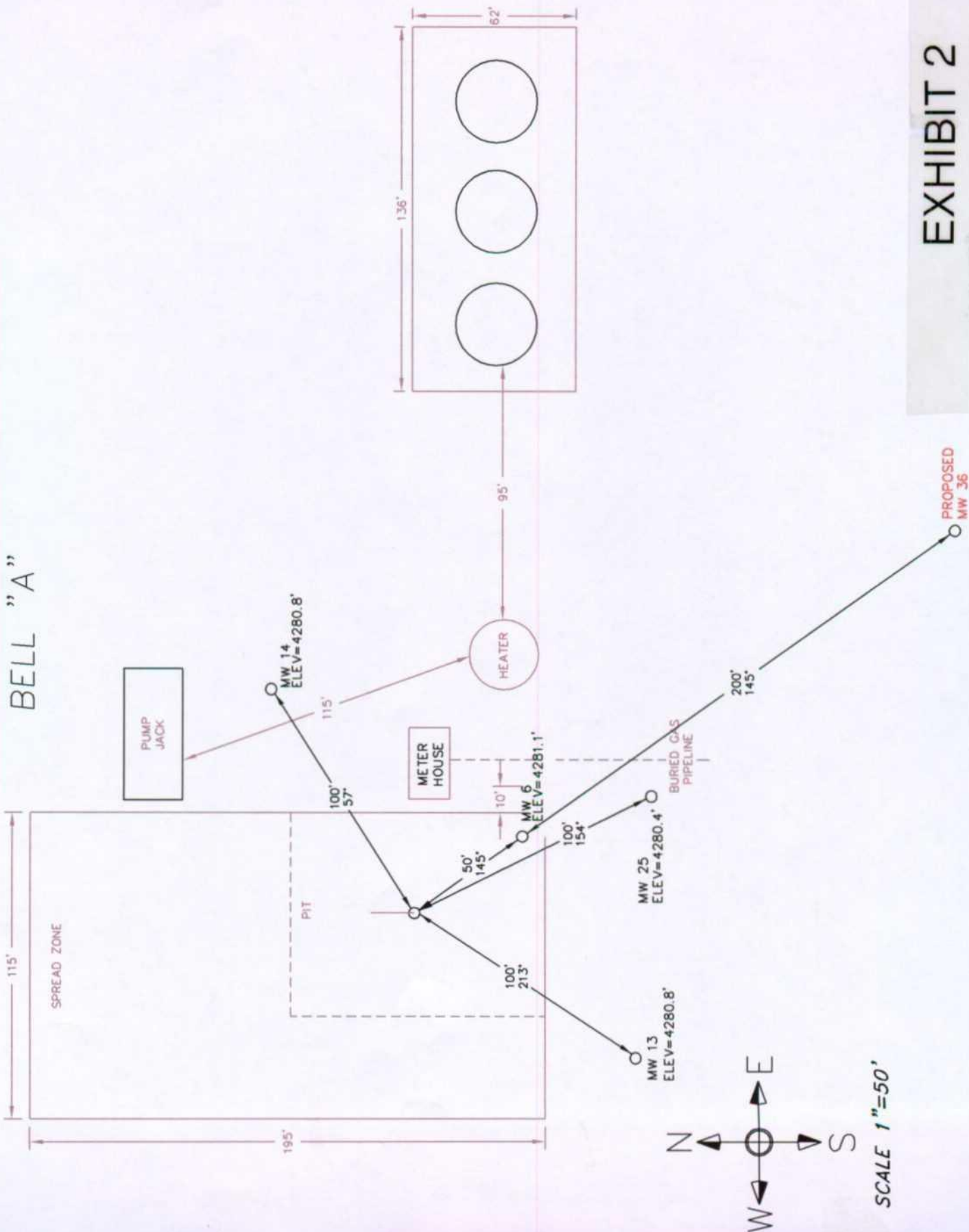


EXHIBIT 2

**Atkins Engineering  
Associates, Inc.**

2904 W. 2nd St., Roswell, NM 88202-3156

**LOG OF BORING Rice Operating MW-3**

(Page 2 of 2)

Whole Earth Environmental  
19606 San Gabriel  
Houston, TX 77084

Contact: Mike Griffin

Job#: EUNICEG.MWD.01

Date : 05-08 & 05-09-01

Drill Start : a.m.

Drill End : 12:00

Boring Location : 3¼ mi SE of Eunice & ½ mi E of Logg By

Site Location

: SE Eunice, NM

: Sec. 15, T22S, R37E

Auger Type

: Hollow Stem

: Mort Bates

Well: MW-3

Depth  
in  
Feet

GRAPHIC

USCS

Samples

DESCRIPTION

Lab

PID  
ppm-v

55

Sand w/ caliche, tan, firm, dry

60

SM

65

70

Sandstone, tan, hard, dry

75

SS

80

SP

Sand, tan, soft, moist

85

SS

Broken sandstone, tan, firm, moist

Sand, tan, soft, wet

90

SP

95

100

TD 100'  
WL 83.55'

105

110

Grout

Bentonite seal

2" PVC casing

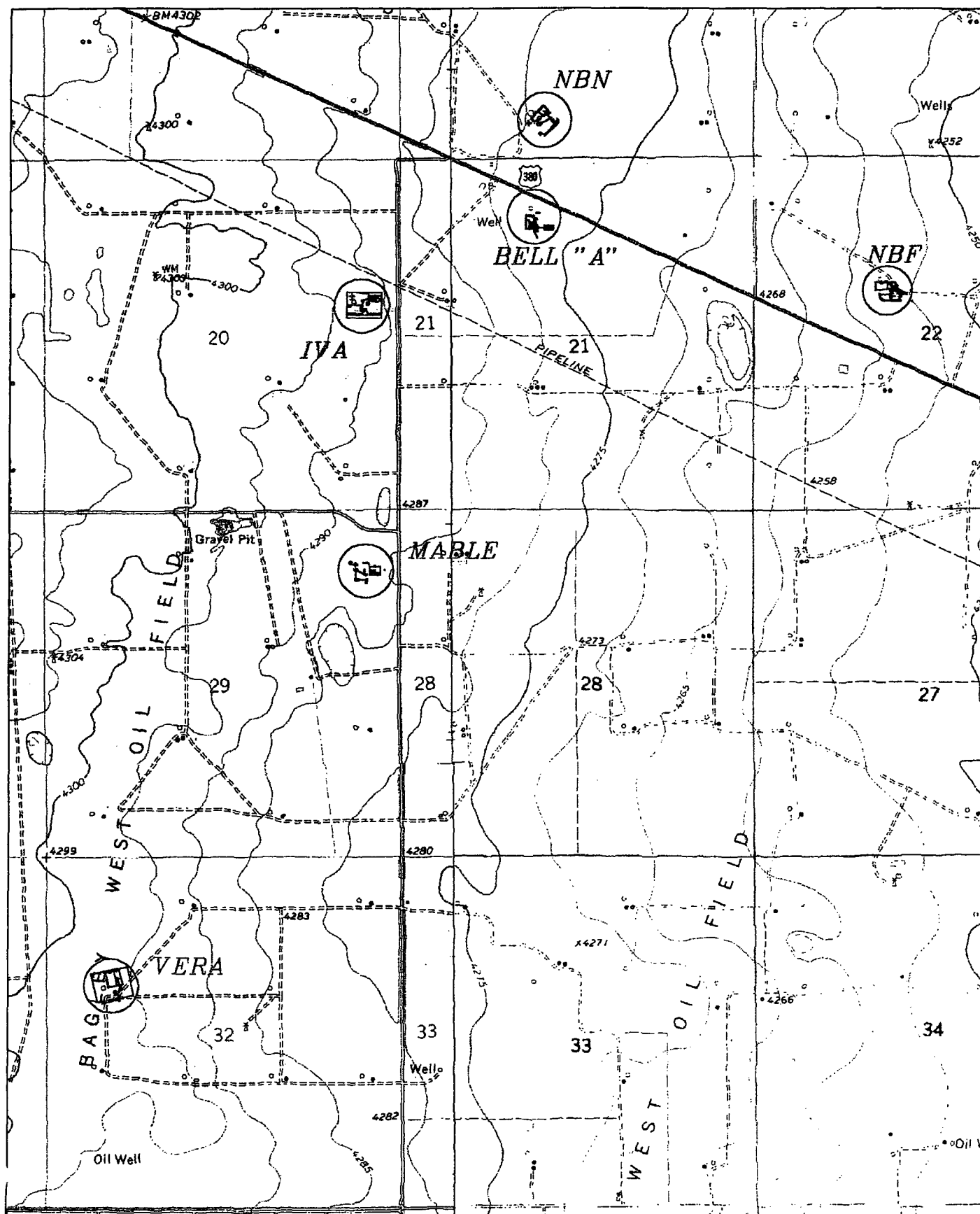
Sand pack

2" .020 slot screen

05-14-2001 C:\MTECH46\EUNICEG\MWD01\mw-3.bor

**EXHIBIT 7**

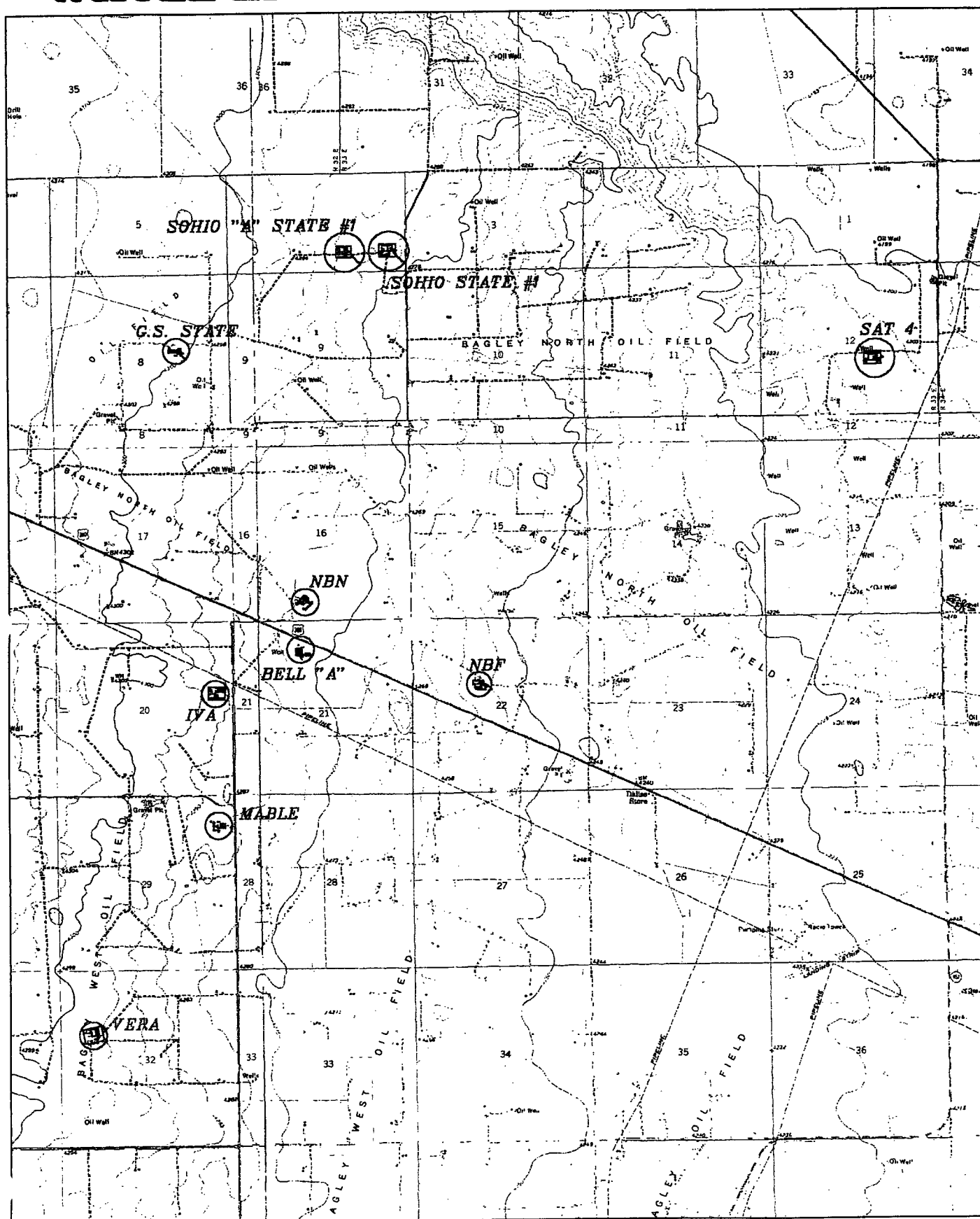
# WHOLE EARTH ENVIROMENTAL, INC.



2000 0 2000 4000

EXHIBIT 8

# WHOLE EARTH ENVIROMENTAL, INC.



4000 0 4000 8000

**EXHIBIT 9**

**BASIN SURVEYS** P.O. BOX 1786-HOBBS, NEW MEXICO

W.O. Number: 9352

Drawn By: K. GOAD

Date: 10-21-99

Disk: KJG #122 - WE9352.DWG

**Olson, William**

---

**From:** Mike @ Whole Earth [whearth@iamerica.net]  
**Sent:** Monday, November 19, 2001 6:52 AM  
**To:** Bill Olson  
**Cc:** Larry Sugano  
**Subject:** November 2nd Instruction Letter



MW # 1.xls



MW # 2.xls



MW 25.xls



MW # 24.xls

Bill:

We are in receipt of your letter of November 2nd regarding the need to establish the lateral delineation of eight sites within the Tatum Pit Closure Project.

I've researched our findings and agree that five sites do need additional information to be submitted. We've one additional year's worth of information now on its way to you that we believe will demonstrate that we've adequately identified the down-gradient spread of three of the sites described as follows:

Iva COM (Case # 1R263) The attached spread sheets for monitor wells 1 & 2 show four quarters in which the outlying wells have criteria contaminant concentrations within NMWQCC standards.

Bell State "A" (Case # 1R260) The attached spread sheet for monitor well # 25 ( the furthest from the pit center) shows nine consecutive quarters with acceptable results.

Satellite 4 (Case # 1R266) The attached spread sheet for monitor well # 25 the furthest from the pit center) shows five consecutive quarters with acceptable results. We were going to submit a final closure on this site after the January 2002 sampling round.

We are preparing the work plan you requested and will have it out shortly after we know if these three sites must be included.

Thanks in advance,

Mike Griffin



Monitor Well # 25  
Bell State "A"  
Sampling Results

Lab. #	17265	18601	20611	22784	25170	28454	31489	36152	38926	0101098-10	101642.1
Sample Date	4/1/1999	7/14/1999	10/6/1999	1/8/2000	4/13/2000	7/20/2000	9/26/2000	1/5/2001	4/5/2001	7/7/2001	9/26/2001
Benzene	0.006	0.012	0.001	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Toluene	0.004	0.010	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.001
Ethylbenzene	0.004	0.002	0.001	0.001	0.002	0.002	0.003	0.001	0.001	0.003	0.005
m,p Xylene	0.005	0.006	0.001	0.004	0.005	0.005	0.010	0.001	0.001	0.006	0.016
o Xylene	0.004	0.004	0.001	0.002	0.002	0.002	0.004	0.001	0.001	0.002	0.006
Total Xylene	0.009	0.010	0.002	0.006	0.007	0.007	0.014	0.002	0.002	0.008	0.022
Total BTEX	0.023	0.034	0.005	0.010	0.013	0.011	0.019	0.005	0.005	0.013	0.029



**Tipperary**  
CORPORATION

633 Seventeenth Street  
Suite 1550  
Denver, Colorado 80202

November 14, 2001

VIA OVERNIGHT MAIL

Mr. William C. Olson  
New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, NM 87505

**RE: Progress Report for Year 2001  
Tatum Pit Closure Project  
Lea County, NM**

**RECEIVED**

NOV 16 2001

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

Dear Mr. Olson:

Please find enclosed additional results from our monitor wells in the subject project area. This report summarizes the results from water samples taken on January 10, April 5, July 7, and September 26, 2001. These results represent the 17 quarters of monitoring. In general, we are continuing to observe decreasing levels of BTEX in the monitor wells.

The Executive Summary section contains the following:

- Summary of results by location.
- Procedure for obtaining water samples.
- Summary of water depths in each monitor well.
- Monitor well gradient chart.
- LNAPL depth chart.
- Maps of pit reclamation locations.
- Chain of custody records and lab results of the water samples by quarter.

Detailed results are presented in tabular and graphical format for each monitor well. The monitor well data is grouped by site location in the report. We will continue to sample the project quarterly and report the results to your office on an annual basis. If you have any questions, please call me at (303) 293-9379.

Very truly yours,

Larry G. Sugano  
Vice President - Engineering

cc: NMOCD Hobbs Office

Enclosures



# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**GARY E. JOHNSON**

Governor

**Jennifer A. Salisbury**

Cabinet Secretary

**Lori Wrotenbery**

Director

**Oil Conservation Division**

November 2, 2001

**CERTIFIED MAIL**

**RETURN RECEIPT NO. 5357-8024**

Mr. Larry Sugano  
Tipperary Corporation  
633 Seventeenth St., Suite 1550  
Denver, Colorado 80202

**RE: TATUM PIT CLOSURE PROJECT  
LEA COUNTY, NEW MEXICO**

Dear Mr. Sugano:

The New Mexico Oil Conservation Division (OCD) has completed a review of Tipperary Corporation's (TC) April 19, 2001 correspondence, December 7, 2000 "PROGRESS REPORT FOR YEAR 2000, TATUM PIT CLOSURE PROJECT, LEA COUNTY, NEW MEXICO" and November 29, 1999 "JULY 1999 PROGRESS REPORT, OCTOBER 1999 PROGRESS REPORT, TATUM PIT CLOSURE PROJECT, LEA COUNTY, NEW MEXICO". These documents contains the results of monitoring of ground water contamination related to the closure of unlined pits west of Tatum, New Mexico during the prior 2 years.

The remediation and monitoring actions conducted to date are satisfactory. However, a review of the monitoring data shows that the downgradient extent of ground water contamination at the following sites has not been determined:

- Bell State "A" (Case #1R260)
- Gulf State #1 (Case #1R262)
- Iva Com #1 (Case #1R263)
- Mabel Com #1 (Case #1R264)
- Satellite #4 (Case #1R266)
- Sohio State #1 (Case # 1R267)
- Sohio State "A" (Case #1R268)
- State NBF #1 (Case #1R269)

Larry G. Sugano  
November 2, 2001  
Page 2

Therefore, the OCD requires that TC submit a work plan to complete the investigation of the extent of contamination at these sites. The work plan shall be submitted to the OCD Santa Fe Office by December 7, 2001 with copy provided to the OCD Hobbs District Office and shall include:

1. A contoured ground water potentiometric map of each site showing proposed monitor well locations and the location of the former pit, excavated areas, existing monitor wells and other relevant site information.
2. Proposed monitor well construction details.
3. A proposed ground water sampling plan.
4. A schedule for implementation of the plan and submission of an investigation report.

If you have any questions, please call me at (505) 476-3491.

Sincerely,



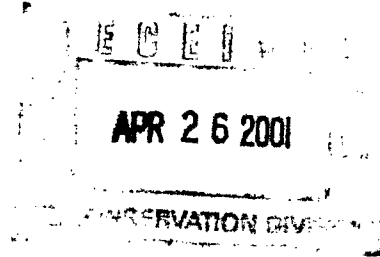
William C. Olson  
Hydrologist  
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office  
Mike Griffin, Whole Earth Environmental, Inc.



Whole Earth Environmental, Inc.

19606 San Gabriel, Houston, Texas 77084  
281/492-7077 • Fax: 281/646-8996



April 19, 2001

New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Sante Fe, NM 87505

Attn: Bill Olson

Dear Bill:

We are in receipt of your letter dated March 15, 2001 concerning the Tatum pit closure project and have prepared the following response:

**Request # 1**

A review of the OCD's files shows that TC has never responded to the OCD's August 6, 1999 correspondence requiring information related to the remediation and monitoring of contaminated ground water at TC's Tatum Pit closure sites.

**Response**

Tipperary Corporation did indeed respond to your request and sent copies to both Sante Fe and Hobbs in October, 1999. We duplicated the Hobbs office copy yesterday and re-sent it to you via UPS.

**Request # 2**

The report does not contain a water potentiometric map for each sampling event at each site which shows the location of the pit and excavated areas, the surveyed locations of all monitor wells and recovery wells and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient created using the water table elevation in each monitoring well.

**Response**

Though the requested information is contained within the afore mentioned report, we are including it once again in this transmittal.

**Request # 3**

The report does not contain information on the quarterly volume of ground water and product recovered at each site nor the total volume recovered at each site to date.

**Response**

As stated in our October 1999 response, our collection and disposal system does not allow us to accurately measure either the total volume of water produced by the windmills or the oil / water ratio. We propose to install flow meters between the collection tanks and the downstream check valves leading into the Burro Pipeline disposal system at each location so as to capture total fluid volumes. We



further propose to collect samples directly from the lines coming from the windmills into a large graduated cylinder in order to determine the oil / water ratios. These results will be collected quarterly and reported annually.

**Request # 4**

The report does not contain information on the free product thickness in all wells containing products.

**Response**

We've not been asked to provide such information in the past. We do however plan to provide you with the information in the future and have resultantly purchased a new Waterra ultrasonic oil / water LNAPL / DNAPL interface meter expressly for this purpose.

Thank you again for your interest in this project. We will continue to strive to provide you with accurate information for your future evaluations.

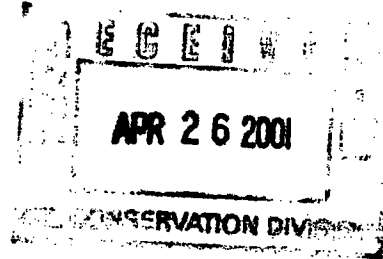
Warmest regards,

Mike Griffin  
President

Whole Earth Environmental, Inc.



Whole Earth Environmental, Inc.  
19606 San Gabriel, Houston, Texas 77084  
281/492-7077 • Fax: 281/646-8996



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Warmest regards,

Mike Griffin  
President

Whole Earth Environmental, Inc.



## COORDINATE FILE : TIPARARY.CRD

## P COORDINATES

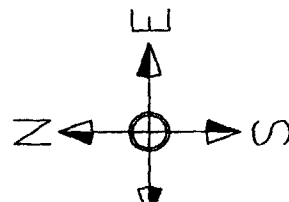
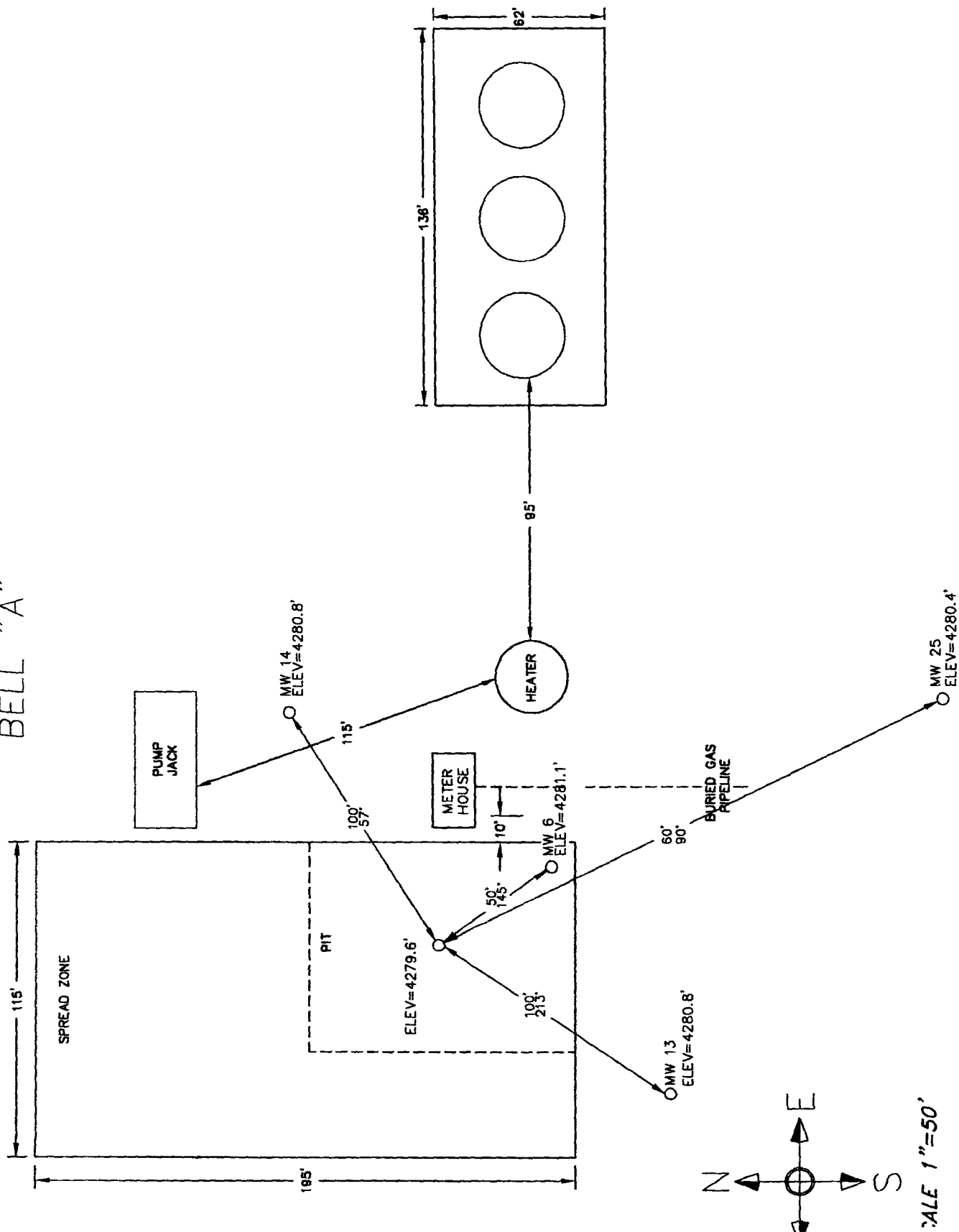
	PT#	NORTH	EAST	ELEV
SOHIO A STATE 1 PIT	253	870084.293	760084.206	4286.84
SOHIO A STATE 1 MW11	254	869981.125	760134.902	4285.88
SOHIO A STATE 1 MW19	255	869974.033	760205.397	4285.97
SOHIO A STATE 1 MW28	256	869892.771	760255.240	4285.61
SOHIO A STATE 1 MW31	257	869667.200	760452.460	4283.54
SOHIO STATE 1 PIT	258	870105.632	761381.498	4285.42
SOHIO STATE 1 MW10	259	870027.049	761459.334	4283.63
SOHIO STATE 1 MW17	260	869969.168	761443.837	4283.31
SOHIO STATE 1 MW18	261	870017.865	761533.683	4283.59
SOHIO STATE 1 MW28	262	869892.594	761534.416	4283.21
SOHIO STATE 1 MW30	263	869677.360	761728.469	4281.13
VERA 1 PIT	264	846366.089	752525.766	4289.49
VERA #1 MW5	265	846217.026	752582.067	4298.90
STATE NBF 1 PIT	266	856893.939	764024.682	4266.86
STATE NBF 1 MW8	267	856806.388	764165.403	4259.41
STATE NBF 1 MW15	268	856747.667	764157.788	4259.68
STATE NBF 1 MW16	269	856774.041	764241.604	4259.06
STATE NBF 1 MW26	270	856658.728	764331.675	4258.04
BELL A 1 PIT	271	857796.692	758625.535	4279.64
BELL A 1 MW6	272	857857.556	758583.503	4281.12
BELL A 1 MW13	273	857754.617	758597.054	4280.84
BELL A 1 MW14	274	857821.944	758664.690	4280.80
BELL A 1 MW25	275	857614.080	758714.518	4280.37
GS STATE 1 SOURCE	276	867037.530	755087.975	4307.00
GS STATE 1 MW21	277	866953.249	755213.712	4303.08
GS STATE 1 MW22	278	866905.186	755154.733	4302.77
GS STATE 1 MW29	279	866798.038	755260.271	4303.20
GS STATE 1 MW?	280	867001.862	755131.639	4303.27
MABEL COM 1 SOURCE	281	852659.555	756329.277	4290.55
MABEL COM 1 MW3	282	852517.536	756370.356	4287.22
MABEL COM 1 MW4	283	852592.288	756473.774	4287.46
STATE NBN 1 PIT	284	859499.318	758793.854	4282.45
STATE NBN 1 MW7	285	859397.517	758825.203	4281.59
SATELLITE 4 MW9	286	866587.512	775890.421	4208.66
SATELLITE 4 MW23	287	866507.846	775901.105	4209.03
SATELLITE 4 MW24	288	866562.481	775964.699	4208.64
IVA COM 1 SOURCE	289	856721.216	756252.189	4298.42
IVA COM 1 MW1	290	856654.035	756344.507	4292.10
IVA COM 1 MW2	291	856695.146	756388.036	4291.93

HORIZONTAL DATUM NAD 83

VERTICAL DATUM NAVD 88

HWY 380

BELL "A"



SCALE 1"=50'



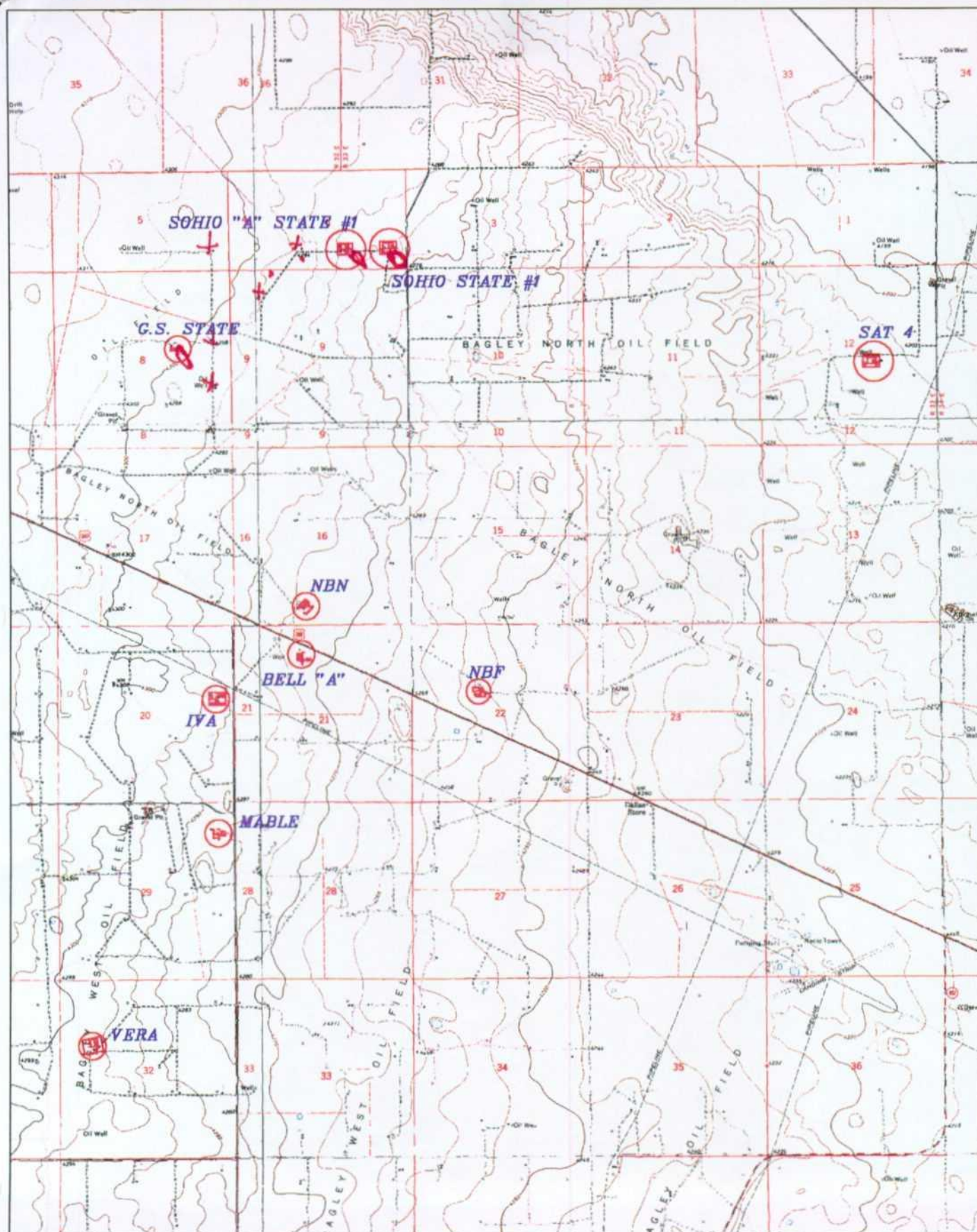
**Tipperary Corporation**  
**Tatum Pit Closure Project**  
**Monitor Well Water Elevation Table**

Well Name	Monitor Well No.	Surface Elevation	Date Well Drilled	Water Depth @ Drill Date	Water Elevation @ 8/9/99	Water Depth @ 10/21/99	Water Elev. @ 10/21/99	Depth Change Aug. / Oct. '99	Distance to Pit Center (ft)	Gradient (PL / PL)	Gradient (PL / 100 PL)
Iva	1	4,298.42	Aug-97	52.0	4,246.42	51.75	4,240.35	2.92	115	0.080174	8.02
	2	4,292.10	Aug-97	54.9	4,237.20	48.83	4,243.27	2.33	140	0.063500	5.35
	3	4,291.93	Aug-97	53.0	4,238.93	49.17	4,242.76				
Mable	Recovery Well	4,290.55	Aug-97	52.0	4,238.55	48.75	4,238.47	3.75	148	0.022500	2.25
	3	4,287.22	Aug-97	52.0	4,235.22	48.58	4,238.88	3.17	160	0.019313	1.93
	4	4,287.46	Aug-97	52.0	4,235.46	48.50	4,237.40				
Vera	Pit Center	4,292.98			4,289.50	61.50	4,237.40		159	-0.037233	-3.72
	5	4,288.90	Aug-97	63.0	4,235.90						
Bell	Pit Center	4,263.09			4,279.60	42.13	4,238.99	0.88	93	0.021183	2.12
	6	4,281.12	Aug-97	51.0	4,230.12	40.83	4,240.01	2.83	51	0.044118	4.41
	13	4,280.84	Oct-97	47.8	4,233.04	43.50	4,237.80	0.50	47	0.046723	4.67
	14	4,280.80	Oct-97	48.3	4,232.50	43.50	4,236.87	0.00	154	0.017662	1.77
NBN	25	4,280.37	Mar-99	47.4	4,232.97	43.50	4,236.87				
	25	4,280.37	Mar-99	47.4	4,232.97	43.50	4,236.87				
	Pit Center	4,282.45			4,282.45						
NBF	7	4,281.59	Aug-97	50.0	4,231.59	43.50	4,238.09		107	0.008037	0.80
	Pit Center	4,266.86			4,266.86						
	8	4,259.41	Aug-97	48.0	4,211.41	35.75	4,223.66	0.00	165	0.045152	4.52
	15	4,259.68	Oct-97	47.0	4,212.68	34.75	4,224.93	2.26	198	0.036263	3.63
	16	4,259.06	Oct-97	47.1	4,211.96	36.00	4,223.06	0.10	247	0.031579	3.16
	26	4,258.04	Mar-99	43.0	4,215.04	34.75	4,223.29	-0.15	387	0.022791	2.28
Sohio # 1	Pit Center	4,285.42			4,285.42						
	10	4,283.63	Aug-97	50.0	4,233.63	44.50	4,239.13	0.40	110	0.016273	1.63
	17	4,283.31	Oct-97	48.4	4,233.91	44.00	4,238.51	0.50	262	0.008053	0.81
	18	4,283.59	Oct-97	48.6	4,234.99	43.75	4,239.84	0.35	176	0.010386	1.04
	28	4,283.21	Mar-99	46.3	4,236.96	35.00	4,248.21	9.15	552	0.004004	0.40
	30	4,281.13	Aug-99	45.3	4,235.82	45.31	4,235.82	-1.21	776	0.005528	0.55
Sohio "A"	Pit Center	4,266.84			4,266.84						
	11	4,285.88	Aug-97	50.0	4,235.88	38.25	4,247.63	0.25	115	0.008348	0.83
	19	4,285.97	Sep-97	48.7	4,237.27	32.50	4,253.47	2.65	164	0.005305	0.53
	20	4,285.96	Sep-97	48.5	4,236.46	38.00	4,247.96	0.66	151	0.005828	0.58
	27	4,285.61	Mar-99	40.0	4,245.61	36.83	4,248.78	1.37	264	0.004659	0.47
	31	4,283.54	Aug-99	37.5	4,246.09	37.45	4,246.09	1.45	624	0.005288	0.53
G.S. State	Source Well	4,307.00	Sep-97	48.0	4,259.00						
	12	4,303.27	Aug-97	48.0	4,256.27	42.75	4,260.52	0.15	52	0.071731	7.17
	21	4,303.08	Oct-97	48.0	4,255.08	43.25	4,259.83	0.41	151	0.025960	2.60
	22	4,302.77	Oct-97	47.5	4,255.27	43.50	4,259.27	0.40	148	0.025203	2.52
	29	4,303.20	Mar-99	48.1	4,254.14	44.00	4,259.20	0.25	256	0.016475	1.65
Sat. # 4	Pit Center	4,211.46			4,208.00						
	9	4,208.66	Aug-97	31.0	4,177.66	26.17	4,182.49	0.58	80	0.035375	3.54
	23	4,209.03	Oct-97	28.0	4,181.03	26.25	4,182.78	0.30	158	0.015570	1.56
	24	4,205.64	Oct-97	28.9	4,179.74	26.08	4,182.56	0.37	150	0.019000	1.90

Note: Vera, Bell and Satellite 4 had significant subsidence within the pit area.  
The red elevations include an added 3.49' (Ave. of seven other sites)  
Correct elevations noted in column 6.



# WHOLE EARTH ENVIROMENTAL, INC.



4000 0 4000 8000

BASIN SURVEYS P.O. BOX 1786-HOBBS, NEW MEXICO

W.O. Number: 9352

Drawn By: K. GOAD

Date: 10-21-99

Disk: KJG #122 - WE9352.DWG



# NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

**GARY E. JOHNSON**

Governor

**Jennifer A. Salisbury**

Cabinet Secretary

**Lori Wrotenbery**

Director

**Oil Conservation Division**

March 15, 2001

**CERTIFIED MAIL**

**RETURN RECEIPT NO. 5051-4218**

Mr. Larry Sugano  
Tipperary Corporation  
633 Seventeenth St., Suite 1550  
Denver, Colorado 80202

**RE: TATUM PIT CLOSURE PROJECT  
LEA COUNTY, NEW MEXICO**

Dear Mr. Sugano:

The New Mexico Oil Conservation Division (OCD) has reviewed Tipperary Corporation's (TC) December 7, 2000 "PROGRESS REPORT FOR YEAR 2000, TATUM PIT CLOSURE PROJECT, LEA COUNTY, NEW MEXICO". This document contains TC's annual report on the results of monitoring of ground water contamination related to the closure of 8 unlined pits west of Tatum, New Mexico.

The OCD has the following comments and requests for information regarding the above-referenced document:

1. A review of the OCD's files shows that TC has never responded to the OCD's August 6, 1999 correspondence requiring information related to the remediation and monitoring of contaminated ground water at TC's Tatum Pit closure sites. Please provide this information.
2. The report does not contain a water table potentiometric map for each sampling event at each site which shows the location of the pit and excavated areas, the surveyed locations of all monitor wells and recovery wells and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient created using the water table elevation in each monitor well. This information has been required in prior correspondence and must be submitted with the annual reports in order to be able to evaluate the effectiveness of the monitoring system. Please provide this information.

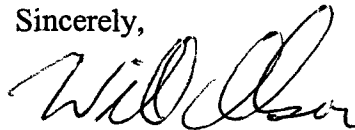
Larry G. Sugano  
March 15, 2001  
Page 2

3. The report does not contain information on the quarterly volume of ground water and product recovered at each site nor the total volume recovered at each site to date. This information has been required in prior correspondence and must be included in the annual reports in order to evaluate the effectiveness of the remediation system. Please provide this information.
4. The report does not contain information on the free product thickness in all wells containing products. Please provide this information such that the OCD can evaluate the effectiveness of the remediation system. In addition please provide this information in all future annual reports.

The above required information shall be submitted to the OCD Santa Fe Office by April 15, 2001 with a copy provided to the OCD Hobbs District Office.

If you have any questions, please call me at (505) 476-3491.

Sincerely,



William C. Olson  
Hydrologist  
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office  
Mike Griffin, Whole Earth Environmental, Inc.

Mr. Larry G. Sugano  
August 6, 1999  
Page 2

4. An explanation of the use of drill cuttings as backfill in the annular space above the bentonite plug in each newly constructed monitor well . This is a direct violation of the OCD's January 15, 1999 conditions of approval which required that the remainder of the annular space be grouted to the surface with cement containing 3-5% bentonite. As a result the monitor wells as constructed by TC are potentially direct conduits to ground water.
5. The monitor well development procedures and volumes for each monitor well.
6. The volume of ground water and product recovered to date at all sites with fluid recovery as required in the OCD's January 15, 1999 conditions of approval.
7. A completed OCD pit closure and remediation report form for each site requested for closure. Each form will contain a discussion and the results of all soil and ground water site closure activities including all soil analytical data from the excavations and the backfilled materials as well as figures showing all sample locations.

The above required information shall be submitted to the OCD Santa Fe Office by October 4, 1999 with a copy provided to the OCD Hobbs District Office. Submission of this information will allow the OCD to complete a review of TC's closure requests and proposed ground water sampling plan modifications.

If you have any questions or comments, please call me at (505) 827-7154.

Sincerely,



William C. Olson  
Hydrologist  
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office  
Mike Matush, NM State Land Office  
Mike Griffin, Whole Earth Environmental, Inc.



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

August 6, 1999

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. Z-274-520-689**

Mr. Larry G. Sugano  
Tipperary Corporation  
633 Seventeenth St., Suite 1550  
Denver, Colorado 80202

**RE: TATUM PIT CLOSURES**

Dear Mr. Sugano:

The New Mexico Oil Conservation Division (OCD) has reviewed Tipperary Corporation's (TC) April 27, 1999 "APRIL 1999 PROGRESS REPORT, TATUM PIT CLOSURE PROJECT, LEA COUNTY, NEW MEXICO". This document contains the results of TC's monitoring of ground water contamination related to the closure of 10 unlined pits west of Tatum, New Mexico. The document also requests final closure of the remedial actions related to unlined pits at the State NBN #1 and Vera #1 sites and proposes modifications to the ground water sampling program.

In order to complete a review of the above referenced closure requests and sampling modifications, the OCD requires that TC submit the following information, with all maps, tables and data segregated into separate case files for each site:

1. A water table potentiometric map for each site which shows the location of the pit and excavated areas, the surveyed locations of all monitor wells and recovery wells and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient created using the water table elevation in each monitor well. On March 29, 1999, the OCD required that TC submit this information. The above referenced document states that TC was preparing the maps. To date the OCD has not received this required information.
2. Tables of water table elevations in each monitor well during each sampling event. The document discusses seasonal fluctuations in the water table as responsible for increases in contaminant concentrations in ground water. However, the supporting water table elevation vs. time data for each monitor well is not provided.
3. Tables of all past and present water quality sampling results for each ground water monitoring and recovery well as required in the OCD's January 15, 1999 conditions of approval. The document only contains analytical data for ground water monitoring wells that are currently being sampled.





**NEW MEXICO ENERGY, MINERALS  
& NATURAL RESOURCES DEPARTMENT**

OIL CONSERVATION DIVISION  
2040 South Pacheco Street  
Santa Fe, New Mexico 87606  
(505) 827-7131

March 29, 1999

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. Z-274-520-638**

Mr. Larry Sugano  
Tipperary Corporation  
633 Seventeenth St., Suite 1550  
Denver, Colorado 80202

**RE: TATUM PIT CLOSURES**

Dear Mr. Sugano:


The New Mexico Oil Conservation Division (OCD) has reviewed Tipperary Corporation's (TC) February 16, 1999 "January 1999 PROGRESS REPORT, TATUM PIT CLOSURE PROJECT, LEA COUNTY, NEW MEXICO". This document contains the results of TC's monitoring of ground water contamination related to the closure of 10 unlined pits west of Tatum, New Mexico and requests final closure of the remedial actions related to unlined pits at the Iva Com #1, Mable Com #1, State NBN #1 and Vera #1 sites. The document also requests an extension of the deadline for submission of a report on ground water investigations from April 1 to May 1, 1999.

The above referenced deadline extension request is approved.

In order to complete a review of the above referenced closure requests, the OCD requires that TC submit a water table potentiometric map for each of the 10 sites which shows the location of the pit and excavated areas, the surveyed locations of all monitor wells and recovery wells and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient created using the water table elevation in each monitor well.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

  
William C. Olson  
Hydrologist  
Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office  
Mike Matush, NM State Land Office  
Mike Griffin, Whole Earth Environmental, Inc.



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

January 15, 1999

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. Z-274-520-592**

Mr. Larry Sugano  
Tipperary Corporation  
633 Seventeenth St., Suite 1550  
Denver, Colorado 80202

**RE: TATUM PIT CLOSURES  
LEA COUNTY, NEW MEXICO**

Dear Mr. Sugano:

The New Mexico Oil Conservation Division (OCD) has reviewed Tipperary Corporation's (TC) September 8, 1998 "WORK PLAN & 6/98 PROGRESS REPORT, TATUM PIT CLOSURE PROJECT, LEA COUNTY, NEW MEXICO". This document contains the results of TC's monitoring of ground water contamination related to the closure of 10 unlined pits west of Tatum, New Mexico. The document also contains TC's work plan for additional investigations through installation of monitor wells and ground water sampling.

The above referenced work plan is approved with the following conditions:

1. A sufficient number of monitor wells will be installed to determine the downgradient and lateral extent of ground water contamination at each site with either downgradient monitor wells which show ground water contamination in excess of standards or with evidence of contaminants migrating as a slug through the monitoring system.
2. Each monitor well will be constructed and completed as follows:
  - a. A minimum of 15 feet of well screen will be installed with 5 feet of well screen placed above the water table and 10 feet of well screen placed below the water table.
  - b. An appropriately sized gravel pack will be set in the annulus around the well screen from the bottom of the hole to 2-3 feet above the top of the well screen.

- c. A 2-3 foot bentonite plug will be placed above the gravel pack.
  - d. The remainder of the hole will be grouted to the surface with cement containing 3-5% bentonite.
  - e. A concrete pad and locking well cover will be placed at the surface.
  - f. The well will be developed after construction using EPA approved procedures.
3. No less than 48 hours after the wells are developed, ground water from all monitor wells at each site will be purged, sampled and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX) major cations and anions, total dissolved solids (TDS), and New Mexico Water Quality Control Commission (WQCC) metals using EPA approved methods and quality assurance/quality control (QA/QC).
4. All wastes generated during the investigation will be disposed of at an OCD approved facility.
5. TC will submit a report on the investigations to the OCD by April 1, 1999. The report will be submitted to the OCD Santa Fe Office with a copy provided to the OCD Hobbs District Office. The report will present the investigation work for each site as a separate case report. Each case report will contain the following information:
- a. A description of the investigation activities which occurred including conclusions and recommendations.
  - b. A geologic/lithologic log and well completion diagram for each monitor well.
  - c. A water table map showing the location of the pit, monitor wells, recovery wells and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient created using the water table elevation from each monitor well.
  - d. Summary tables of all past and present ground water quality sampling results and copies of all recent laboratory analytical data sheets and associated QA/QC data.
  - e. If ground water recovery is occurring at the site, the volume of ground water and volume of product recovered to date.
  - f. The disposition of all wastes generated.

Mr. Larry G. Sugano

January 15, 1999

Page 3

Please be advised that OCD approval does not limit TC to the proposed work if the plan fails to adequately determine the extent of contamination or if contamination exists which is outside the scope of the plan. In addition, OCD approval does not relieve TC of responsibility for compliance with any other federal, state or local laws and regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,



William C. Olson

Hydrologist

Environmental Bureau

xc: Chris Williams, OCD Hobbs District Office  
Mike Matush, NM State Land Office  
Mike Griffin, Whole Earth Environmental, Inc.



# Tipperary CORPORATION

633 Seventeenth Street  
Suite 1550  
Denver, Colorado 80202

November 20, 1998

## CERTIFIED MAIL

Mr. William C. Olson  
New Mexico Oil Conservation Division  
2040 South Pacheco  
Santa Fe, NM 87505

RECEIVED

NOV 23 1998

Environmental Bureau  
Oil Conservation Division

**RE: Tatum Pit Closure Project  
Fifth Quarterly Progress Report  
Sample Date of October 1, 1998  
Lea County, NM**

Dear Mr. Olson:

Please find enclosed additional results from our monitor wells in the subject project area. These results are from water samples taken on October 1, 1998. These samples represent the fifth quarter of monitoring. The total BTEX concentrations continue to decline. The Vera and Iva Com monitor wells now have at least four consecutive quarters of acceptable concentrations. We will continue to analyze water samples quarterly from the other monitor wells.

If you have any questions, please call me at (303) 293-9379.

Very truly yours,

Larry G. Sugano  
Vice President - Engineering

cc: NMOCD Hobbs District Office

Enclosures



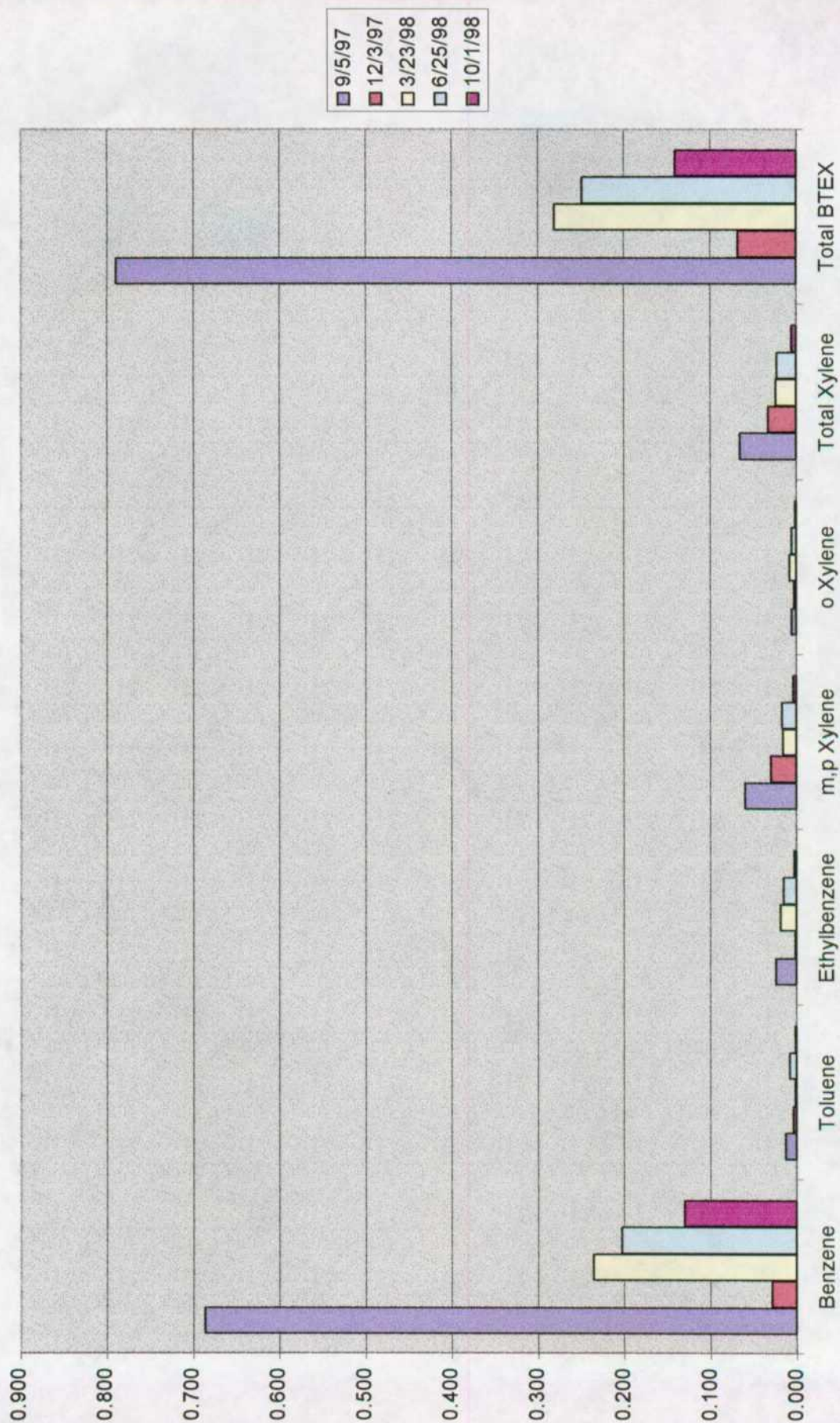
**Tipperary**  
CORPORATION

TATUM PIT CLOSURE PROJECT  
LEA COUNTY, NM  
FIFTH QUARTERLY PROGRESS REPORT  
SAMPLE DATE OF 10/1/98

Monitor Well # 6  
Bell State "A"  
Sampling Results

Lab. #	12481	13179	14062	14661	15593
Sample Date	9/5/97	12/3/97	3/23/98	6/25/98	10/1/98
Benzene	0.687	0.029	0.236	0.203	0.130
Toluene	0.013	0.004	0.002	0.008	0.002
Ethylbenzene	0.024	0.002	0.019	0.015	0.003
m,p Xylene	0.060	0.03	0.016	0.017	0.004
o Xylene	0.006	0.003	0.008	0.006	0.002
Total Xylene	0.066	0.033	0.024	0.023	0.006
Total BTEX	0.790	0.068	0.281	0.249	0.141

# Monitor Well # 6

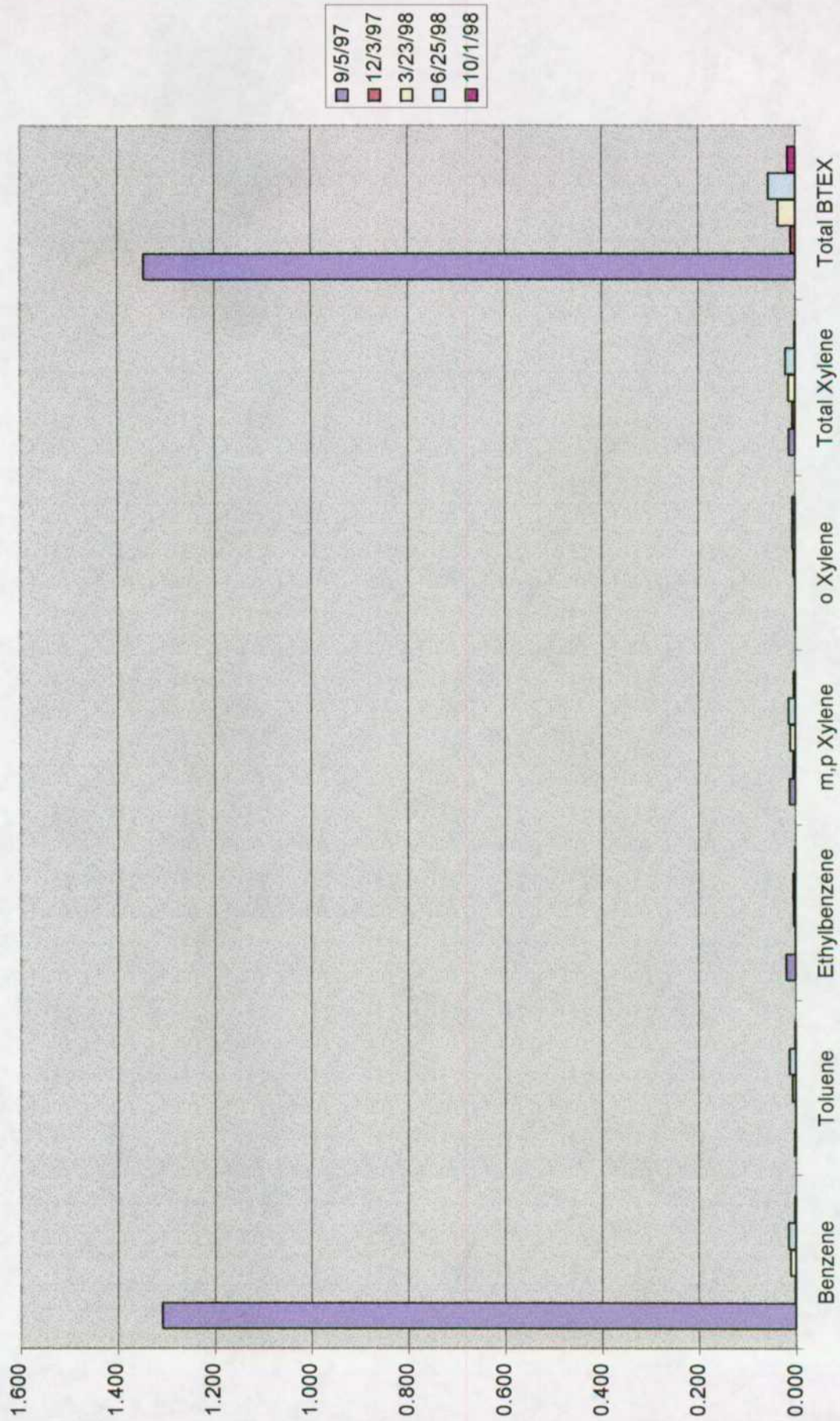




Monitor Well # 13  
Bell State "A"  
Sampling Results

Lab. #	12731	13180	13180	14667	15599
Sample Date	9/5/97	12/3/97	3/23/98	6/25/98	10/1/98
Benzene	1.309	0.002	0.011	0.016	0.003
Toluene	0.003	0.001	0.007	0.014	0.002
Ethylbenzene	0.02	0.001	0.004	0.005	0.002
m,p Xylene	0.013	0.005	0.011	0.015	0.004
o Xylene	0.001	0.001	0.004	0.006	0.006
Total Xylene	0.014	0.006	0.015	0.021	0.002
Total BTEX	1.346	0.010	0.037	0.056	0.017

# Monitor Well # 13

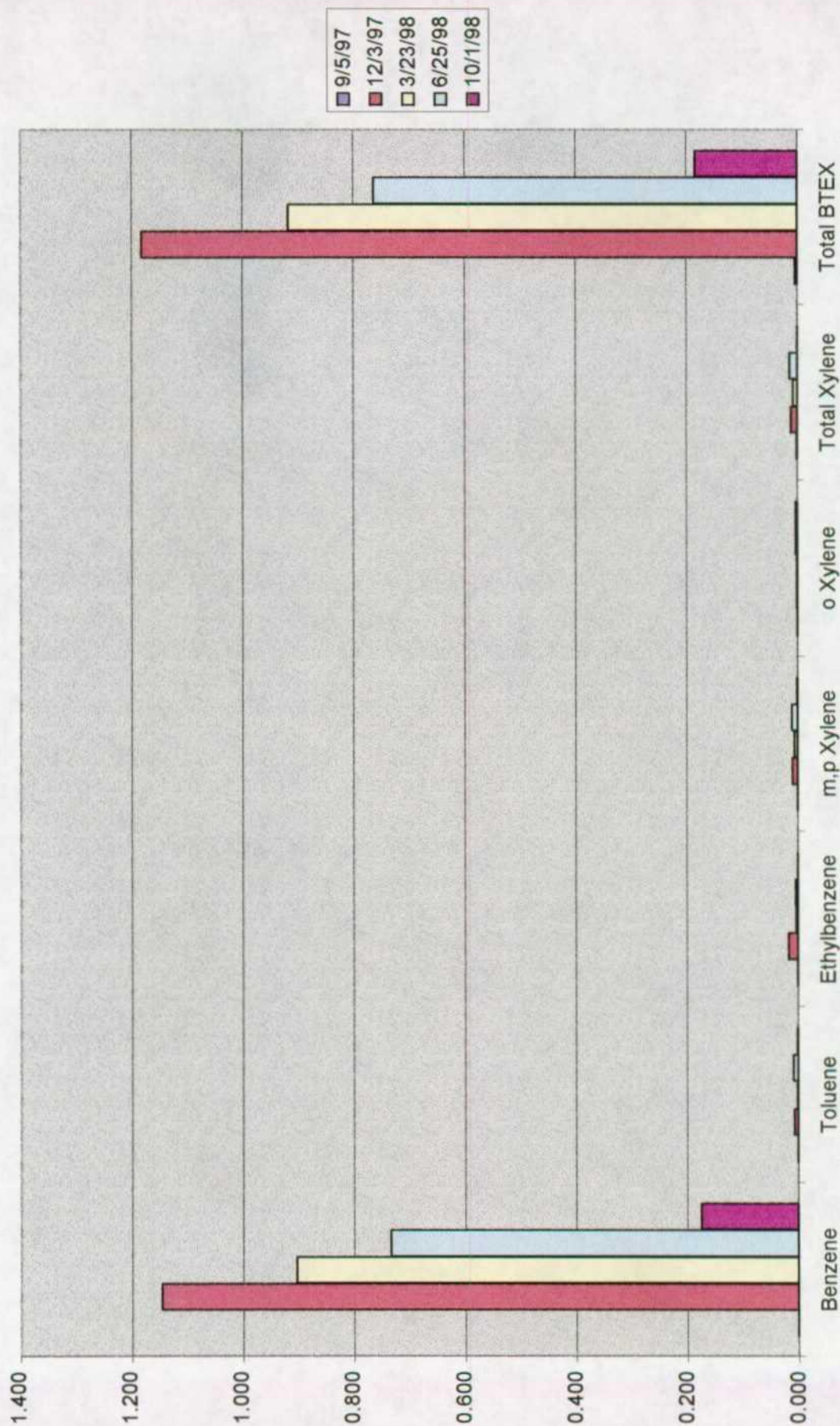




Monitor Well # 14  
Bell State "A"  
Sampling Results

Lab. #	12732	13181	14048	14668	15607
Sample Date	9/5/97	12/3/97	3/23/98	6/25/98	10/1/98
Benzene	0.001	1.147	0.904	0.735	0.175
Toluene	0.001	0.007	0.002	0.009	0.002
Ethylbenzene	0.001	0.017	0.004	0.005	0.001
m,p Xylene	0.001	0.010	0.006	0.011	0.002
o Xylene	0.001	0.002	0.002	0.004	0.004
Total Xylene	0.002	0.012	0.008	0.015	0.001
Total BTEX	0.005	1.183	0.918	0.764	0.184

# Monitor Well # 14



# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"


TIPPERARY  
ATTN: MR. VICTOR A. VICE  
P.O. BOX 857  
TATUM, NM 88267  
FAX: 505-398-6510  
FAX: 281-646-8996

Receiving Date: 09/30/98  
Sample Type: Water  
Project : None Given  
Project Location: Tatum, New Mexico

Analysis Date: 9/30 & 10/01/98  
Sampling Date: 09/29/98  
Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYLBENZENE (mg/l)	m,p-XYLENE (mg/l)	o-XYLENE (mg/l)
15590	Iva Com M/W #1	0.004	0.004	0.002	0.006	0.007
15591	Mable Com M/W #3	0.010	0.015	0.010	0.041	0.017
15592	Vera M/W #5	0.003	0.003	0.001	0.004	0.004
15593	Bell A M/W #6	0.130	0.002	0.003	0.004	0.002
15594	NBN M/W #7	0.006	0.007	0.001	0.006	0.003
15595	NBF M/W #8	0.005	0.004	0.001	0.004	0.004
15596	Satellite #4 M/W #9	0.036	0.002	0.006	0.003	0.001
15597	Sohio St. #1 M/W #10	2.541	0.106	0.182	0.167	0.098
15598	Sohio St. "A" M/W #11	0.070	0.010	0.003	0.014	0.011
15599	Bell A M/W #13	0.003	0.002	0.002	0.004	0.002
15600	NBF M/W #15	3.027	1.630	0.225	0.811	0.393
15601	Sohio St. #1 M/W #17	0.872	0.105	0.071	0.242	0.129
15602	Sohio St. "A" M/W #19	0.033	0.015	0.005	0.018	0.011
15603	G.S. State M/W #21	0.128	0.005	0.069	0.030	0.006
15604	Satellite #4 M/W #23	0.048	0.023	0.001	0.004	0.002
15605	Iva Com M/W #2	0.003	0.002	<0.001	0.003	0.001
15606	Mable Com M/W #4	0.007	0.002	<0.001	0.002	0.001
15607	Bell A M/W #14	0.175	0.002	0.001	0.002	0.001
15608	NBF M/W #16	1.046	0.065	0.037	0.100	0.039
15609	Sohio St. #1 M/W #18	0.542	0.072	0.025	0.093	0.054
15610	Sohio St. "A" M/W #20	0.464	0.011	0.008	0.045	0.011
15611	G.S. State M/W #22	0.049	0.011	0.026	0.040	0.018
15612	Satellite #4 M/W #24	0.002	0.001	<0.001	0.002	<0.001
% IA		100	94	91	90	95
% EA		98	97	93	91	93
BLANK		<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

  
Raland K. Tuttle

10-5-98  
Date

# Environmental Lab of Texas, Inc. 12600 West I-20 East Odessa, Texas 79763 (915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: **Vic Vice**  
 Phone #: 505-398-6507  
 FAX #: 505-398-6510  
 Company Name & Address: **"Wilde Earth" Mike**  
 1-800-854-4358  
 Project #: **TIPPERARY OIL & GAS**  
 Project Name: **TATUM, New Mexico**

Sample Signature: *D.A. Davis*

TATUM, New Mexico										D.A. Van									
LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX						PRESERVATIVE METHOD				SAMPLING					
				WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER	DATE	TIME				
ISS90	TUA Com M/W #1 #2	1													9-28-98				
ISS91	Mable Com M/W #3 #4	1																	
ISS92	Uera # M/W #5	1																	
ISS93	Bella M/W #6	1																	
ISS94	UBN M/W #7	1																	
ISS95	NBF M/W #8	1																	
ISS96	SATILITE #4 M/W #9	1																	
ISS97	Soho ST #1 M/W #10	1																	
ISS98	Soho ST #2 M/W #11	1																	
ISS99	Bella M/W #13 #14	1																	
ISS100	NBF M/W #15 #16	1																	

Relinquished by: *[Signature]* Date: 09-30-98  
 Received by: *[Signature]*  
 Relinquished by: *[Signature]* Date:   
 Received by:   
 Relinquished by:   
 Received by Laboratory:   
 Time:   
 Time:   
 Time:   
 Remarks:   
 BTEX 8020/5030  
 TPH 418.1  
 TCLP Metals Ag As Ba Cd Cr Pb Hg Se  
 Total Metals Ag As Ba Cd Cr Pb Hg Se  
 TCLP Volatiles  
 TCLP Semi Volatiles  
 TDS  
 RCI

# Environmental Lab of Texas, Inc. 12600 West I-20 East Odessa, Texas 79763 (915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:

Vic Vice

Phone #: 505-398-6507

FAX #: 505-398-6510

ANALYSIS REQUEST

Company Name & Address:

TIPPERARY OIL & GAS

" 1-800-854-4358

Wilde Earth "Mike"

Project #:

Project Name:

Project Location:

TATUM, New Mexico

Sampler Signature:

/ ALUM, New VICK120																
LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX				PRESERVATIVE METHOD				SAMPLING				
				WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER	DATE	TIME	
15601	Sohio ST #1 M/W #17 #18	1	1												9-28-98	
15602	Sohio ST "A" M/W #19 #20	1	1													
15603	GS. STATE M/W #21 - #22	1	1													
15604	SATellite #4 - M/W #23 #24	1	1													
15605	Iva COM M/W #2	1	1													
15606	MARLE COM M/W #4	1	1													
15607	Beil A M/W #14	1	1													
15608	NBF M/W #16	1	1													
15609	Sohio ST #1 M/W #18	1	1													
15610	Sohio ST "A" M/W #20	1	1													
15611	GS State M/W #22	1	1													

REMARKS

Received by:

J. Mcmurray

Times:

OBSS.

Date:

09-30-98

Relinquished by:

J. Mcmurray

Date:

Times:

Received by:

J. Mcmurray

Relinquished by:

J. Mcmurray

Date:

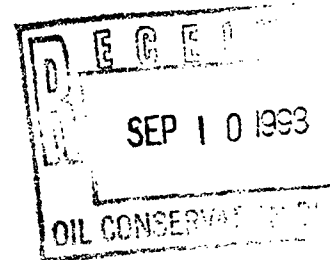
Times:

Received by Laboratory:



**Tipperary**  
CORPORATION

633 Seventeenth Street  
Suite 1550  
Denver, Colorado 80202



September 8, 1998

**CERTIFIED MAIL**

Mr. William C. Olson  
New Mexico Oil Conservation Division  
2040 South Pacheco  
Santa Fe, NM 87505

**RE: Work Plan & 6/98 Progress Report  
Tatum Pit Closure Project  
Lea County, NM**

Dear Mr. Olson:

In response to your June 29, 1998 correspondence, please find enclosed the following:

1. A delineation work plan as requested for the pits requiring additional lateral data.
2. Additional results from the closure of ten pits in the project area. These results are from water samples taken from the monitor wells on June 25, 1998. In general, all pits have shown consistent reductions in BTEX concentrations with the total reduction being 32% during the past four quarters.

If you have any questions, please call me at (303) 293-9379.

Very truly yours,

Larry G. Sugano  
Vice President - Engineering

cc: Wayne Price, NMOCD Hobbs Office

Enclosures





---

**Delineation Protocol  
Tipperary Corporation  
Tatum Pit Closure Project**

---

**1.0 Purpose**

This protocol is provide a detailed outline of the steps to be employed in the remediation and final closure of the Tipperary Tatum, New Mexico pits.

**2.0 Scope**

This protocol is site specific for the above stated site.

**3.0 Define the Lateral Extent of Contamination**

3.1 Whole Earth Environmental will contact Mr. Wayne Price of the Hobbs office of the NMOCD and request a site visit to five pits presently requiring lateral delineation. Mr. Price will select the best location for an additional monitoring well at each pit site. The location will be marked with pin flags and plotted on a plat map.

3.2 Atkins Engineering will be instructed to drill, case and develop an additional monitoring well at each pit site. Whole Earth will collect water samples in accordance with WEQP-76 (previously submitted) and transfer them to Environmental Labs of Tx. for testing. For purposes of defining the lateral extent of contamination we propose that a single BTEX measurement run in accordance with EPA Method 8020 be used.

3.3 The analysis will be reviewed by Whole Earth to confirm that the individual BTEX values all fall below NMWQCC standards. If not, we will repeat the steps contained within paragraph 3 of this protocol until the final results pass NMWQCC standards.

3.4 Once established, these delineation wells will not be subject to quarterly monitoring. They will be tested to insure acceptable concentrations of all criteria pollutants at the time of final pit closure.

**4.0 Documentation & Reporting**

4.1 At the conclusion of the pit remediation project, Whole Earth will prepare a closure report to include the following information:

- A plat map of the location showing the exact location of the pits, the location and orientation of all monitoring wells associated with the pit.
- Laboratory analyses of the BTEX concentration within the ground water.
- Well diagram to include the construction, soil morphology and final depth of the monitor wells.



## **Tipperary Tatum Pit Closure Project One Year Sampling Summary**

### **Project History**

Tipperary began the excavation and remediation of ten pit locations located west of Tatum, New Mexico in August 1997. The remediation protocol was to model the potential migration of all pits having hydrocarbon concentrations in excess of 1,000 ppm TPH and 10 ppm benzene, to determine their potential for impacting the Ogallala Aquifer. The model was "ground truthed" by the installation of twenty-four down gradient monitor wells. Free product was discovered within three monitor wells and wind driven recovery wells were erected to capture the hydrocarbons. The seven sites not having recovery wells were covered with 20 mill polyethylene liners to prevent any further potential vertical migration of hydrocarbons. Each monitoring well was sampled quarterly and the BTEX concentrations studied to determine trending.

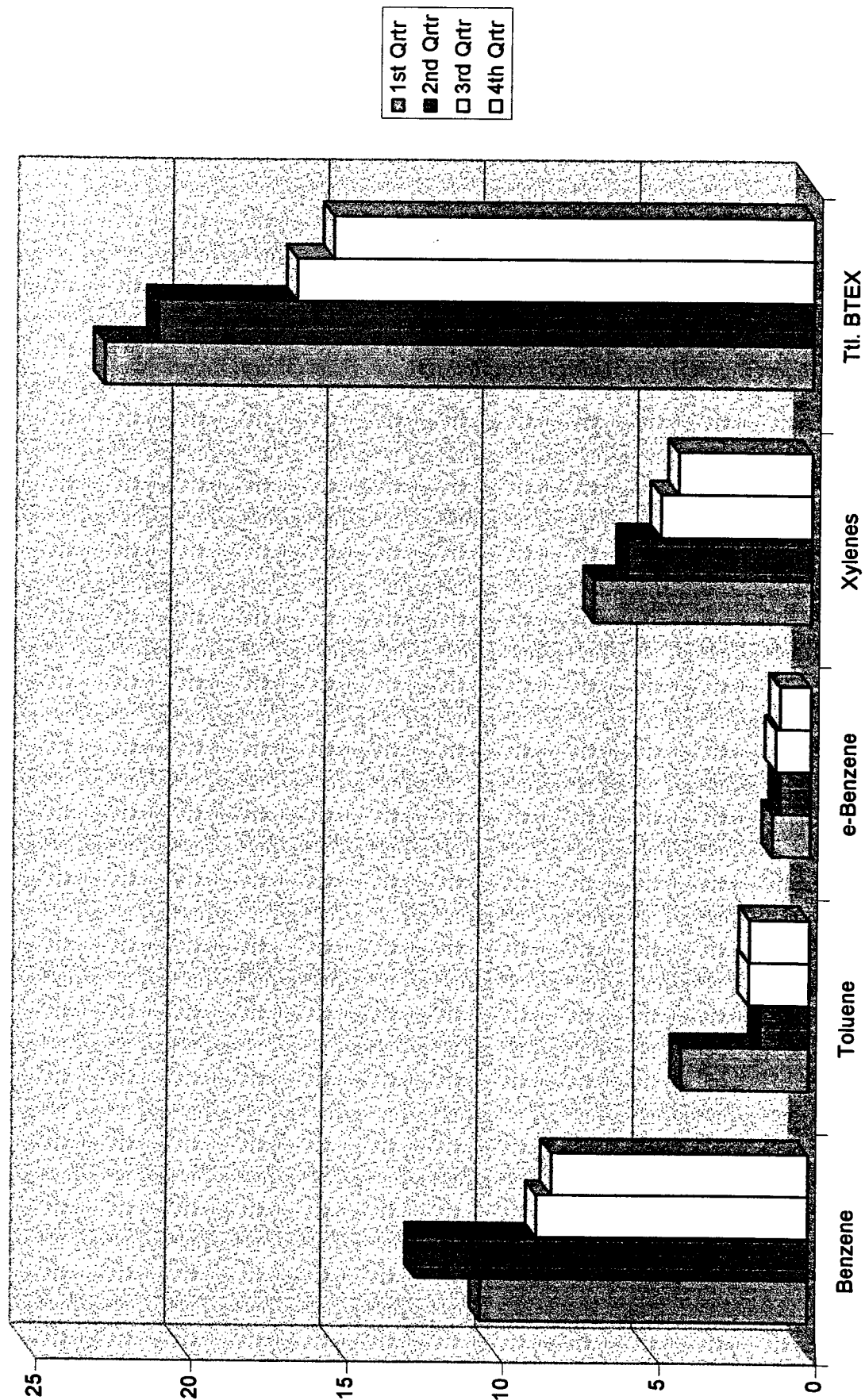
### **Present Status**

One pit site is ready for closure having never shown BTEX concentrations in excess of WQCC standards. Three sites have shown two or more consecutive quarters with BTEX concentrations within WQCC standards. All remaining sites have shown consistent reductions in BTEX concentrations and will continue to be sampled quarterly until four consecutive quarters of acceptable results are obtained. The attached bar graph shows the total reduction in BTEX concentrations for all wells to have been 32% over the past year.

### **Future Activities**

Tipperary will install an additional monitoring well at each of five sites to delineate the lateral extent of contamination. Those monitor wells not showing four consecutive quarters of acceptable BTEX concentrations will be monitored quarterly until they do.

# One Year BTEX Survey



# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

TIPPERARY  
ATTN: MR. VICTOR A. VICE  
P.O. BOX 857  
TATUM, NM 88267  
FAX: 1-281-646-8996

Receiving Date: 06/26/98  
Sample Type: WATER  
Project: TATUM, NM  
Project Location: TATUM, NM

Analysis Date: 06/26/98  
Sampling Date: 06/25/98  
Sample Condition: Intact/Iced

ELT#	FIELD CODE	BENZENE (mg/l)	TOLUENE (mg/l)	ETHYLBENZENE (mg/l)	m,p-XYLENE (mg/l)	o-XYLENE (mg/l)
14657	IVA COM M/W #1	0.006	0.005	0.002	0.008	0.009
14658	MABLE COM M/W #3	0.009	0.011	0.009	0.033	0.009
14659	MABLE COM M/W #4	0.020	0.006	0.003	0.015	0.005
14660	VERA M/W #5	0.007	0.006	0.005	0.011	0.008
14661	BELL A M/W #6	0.203	0.008	0.015	0.017	0.006
14662	NBN M/W #7	0.009	0.007	0.007	0.016	0.009
14663	NBF M/W #8	0.034	0.003	0.007	0.011	0.003
14664	SATELITE #4 M/W #9	0.055	0.003	0.010	0.011	0.002
14665	SOHIO STATE #1 M/W #10	1.313	0.113	0.206	0.611	0.180
14666	SOHIO STATE A M/W #11	0.093	0.009	0.005	0.020	0.014
14667	BELL A M/W #13	0.016	0.014	0.005	0.015	0.006
14668	BELL A M/W #14	0.735	0.009	0.005	0.011	0.004
14669	NBF M/W #15	1.415	1.165	0.270	0.927	0.412
14670	NBF M/W #16	1.058	0.113	0.070	0.145	0.060
14671	SOHIO STATE #1 M/W #17	1.111	0.138	0.118	0.379	0.174
14672	SOHIO STATE #1 M/W #18	1.357	0.272	0.131	0.589	0.252
14673	SOHIO STATE A #1 M/W #19	0.029	0.010	0.007	0.022	0.011
14674	SOHIO STATE A #1 MW/ #20	0.517	0.009	0.008	0.061	0.009
14675	GS STATE #1 M/W #21	0.047	0.009	0.019	0.086	0.038
14676	GS STATE #1 M/W #22	0.183	0.012	0.062	0.077	0.010
14677	SATELITE #4 M/W #23	0.002	<.001	0.001	0.003	0.001
14678	SATELITE #4 M/W #24	0.003	0.003	0.002	0.006	0.003
14679	IVA COM WINDMILL SW #1	1.174	1.290	0.265	1.262	1.241
	% IA	99	95	92	90	94
	% EA	98	95	94	92	95
	BLANK	<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

  
Michael R. Fowler

7-7-98  
Date

Environmental Lab of Texas, Inc. 12600 West I-20 East Odessa, Texas 79763  
(915) 563-1800 FAX (915) 563-1713

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Victor A. Vice  
Phone #: 1-800-854-4358  
FAX #:

Company Name & Address: Tipton Oil & Gas P.O. Box 857  
Tatum, N.M. 88267

Project #: Tatum, N.M. 88267

Project Location: Tatum, N.M.

Sampler Signature:

ANALYSIS REQUEST									
BTEX 8020/5030									
TPH 418.1									
TCLP Metals Ag As Ba Cd Cr Pb Hg Se									
Total Metals Ag As Ba Cd Cr Pb Hg Se									
TCLP Volatiles									
TCLP Semi Volatiles									
TDS									
RCI									
Other									

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX						PRESERVATIVE METHOD				SAMPLING	
				WATER	SOIL	AIR	SLUDGE	OTHER	HCL	HNO3	ICE	NONE	OTHER	DATE	TIME
14657	Tua Com M/W #1	1	1											6-25-98	
14658	Mable Com M/W #3	1	1												
14659	u u u #4	1	1												
14660	Uera M/W #5	1	1												
14661	Bella M/W #6	1	1												
14662	NBN M/W #7	1	1												
14663	URF M/W #8	1	1												
14664	Satchite #4 M/W #9	1	1												
14665	Solio STARE #1 M/W #10	1	1												
14666	Solio STARE M/W #11	1	1												

REMARKS

Received by: *Calvin K. Smith*

Received by:

Received by Laboratory:

Date: 6-26-98

Date:

Date:

Time: 1035

Time:

Time:

RECEIVED

SEP 10 1998

ENVIRONMENTAL BUREAU  
OIL CONSERVATION DIVISION

**Remediation Results  
One Year Review  
Bell State "A"**

**Remediation Summary**

The site was excavated to an approximate depth of 20' bgl., lined and three monitor wells installed down gradient from the pit center.

**Present Status**

The monitor well nearest to the pit center has shown a 70% decline in BTEX concentrations in one year. The outer two wells show the passage of a "slug" of BTEX caused by the excavation of the pit. Though the reduction in BTEX concentrations within the outer wells have averaged 36% since the passage of the "slug", we cannot predict acceptable concentrations within the next two sampling rounds.

**Future Remediation Activities**

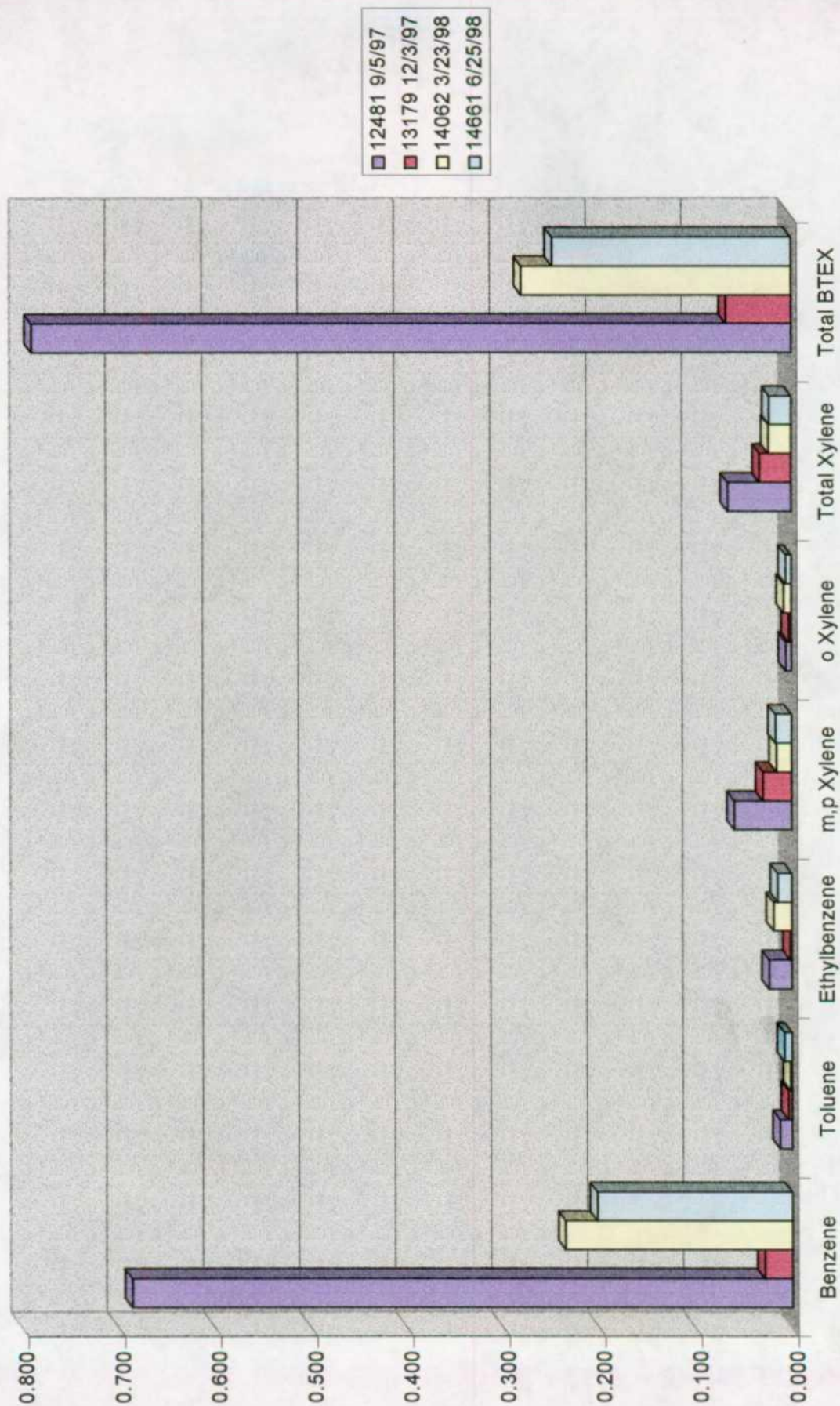
We will install a fourth monitoring well at the location to define lateral extent within thirty days of your acceptance of our plan.

**Monitor Well # 6**  
**Bell State "A"**  
**Sampling Results**

Lab. #	12481	13179	14062	14661
Sample Date	9/5/97	12/3/97	3/23/98	6/25/98
Benzene	0.687	0.029	0.236	0.203
Toluene	0.013	0.004	0.002	0.008
Ethylbenzene	0.024	0.002	0.019	0.015
m,p Xylene	0.060	0.03	0.016	0.017
o Xylene	0.006	0.003	0.008	0.006
Total Xylene	0.066	0.033	0.024	0.023
Total BTEX	0.790	0.068	0.281	0.249



# Monitor Well # 6

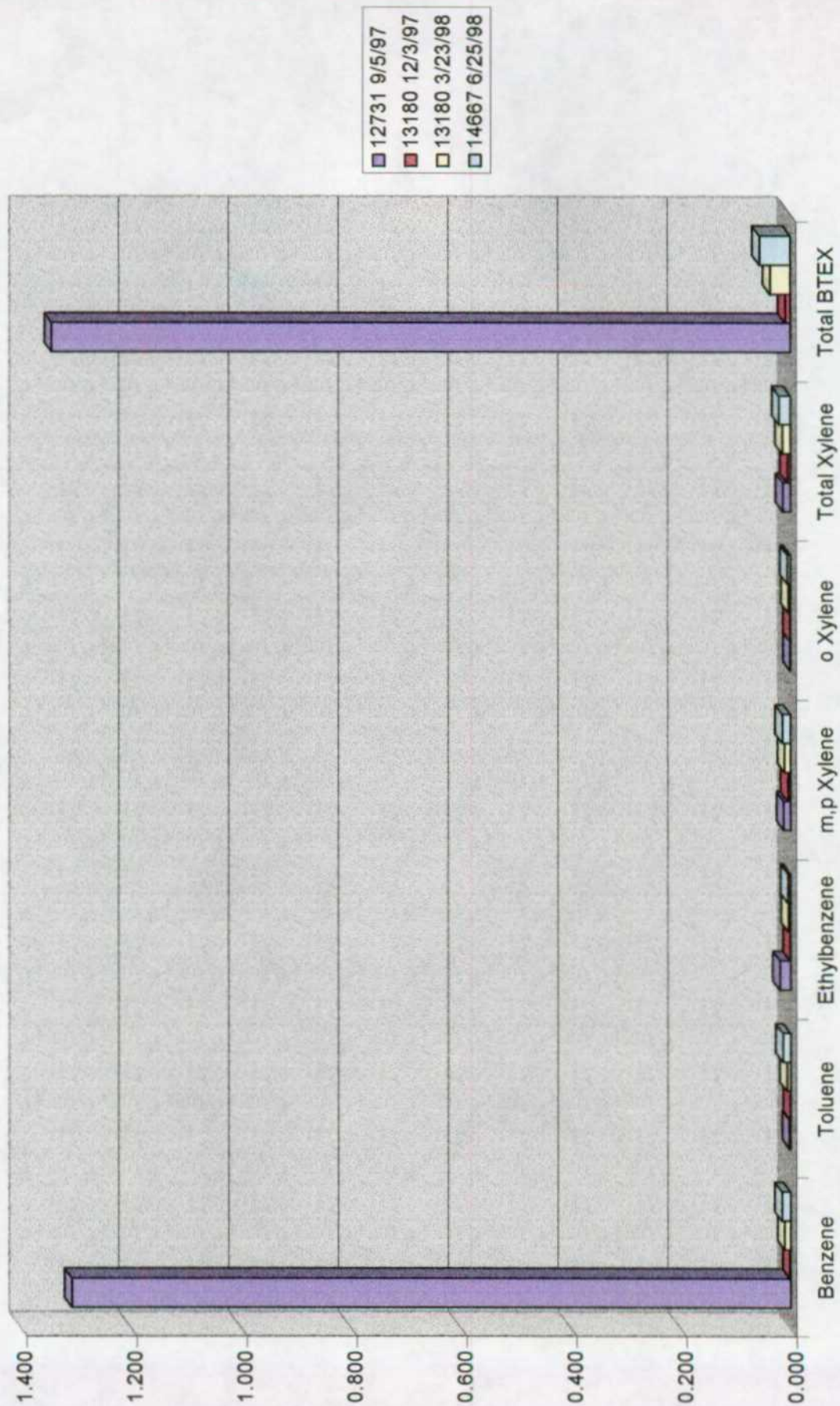


**Monitor Well # 13**  
**Bell State "A"**  
**Sampling Results**

Lab. #	12731	13180	13180	14667
Sample Date	9/5/97	12/3/97	3/23/98	6/25/98
Benzene	1.309	0.002	0.011	0.016
Toluene	0.003	0.001	0.007	0.014
Ethylbenzene	0.02	0.001	0.004	0.005
m,p Xylene	0.013	0.005	0.011	0.015
o Xylene	0.001	0.001	0.004	0.006
Total Xylene	0.014	0.006	0.015	0.021
Total BTEX	1.346	0.010	0.037	0.056



# Monitor Well # 13

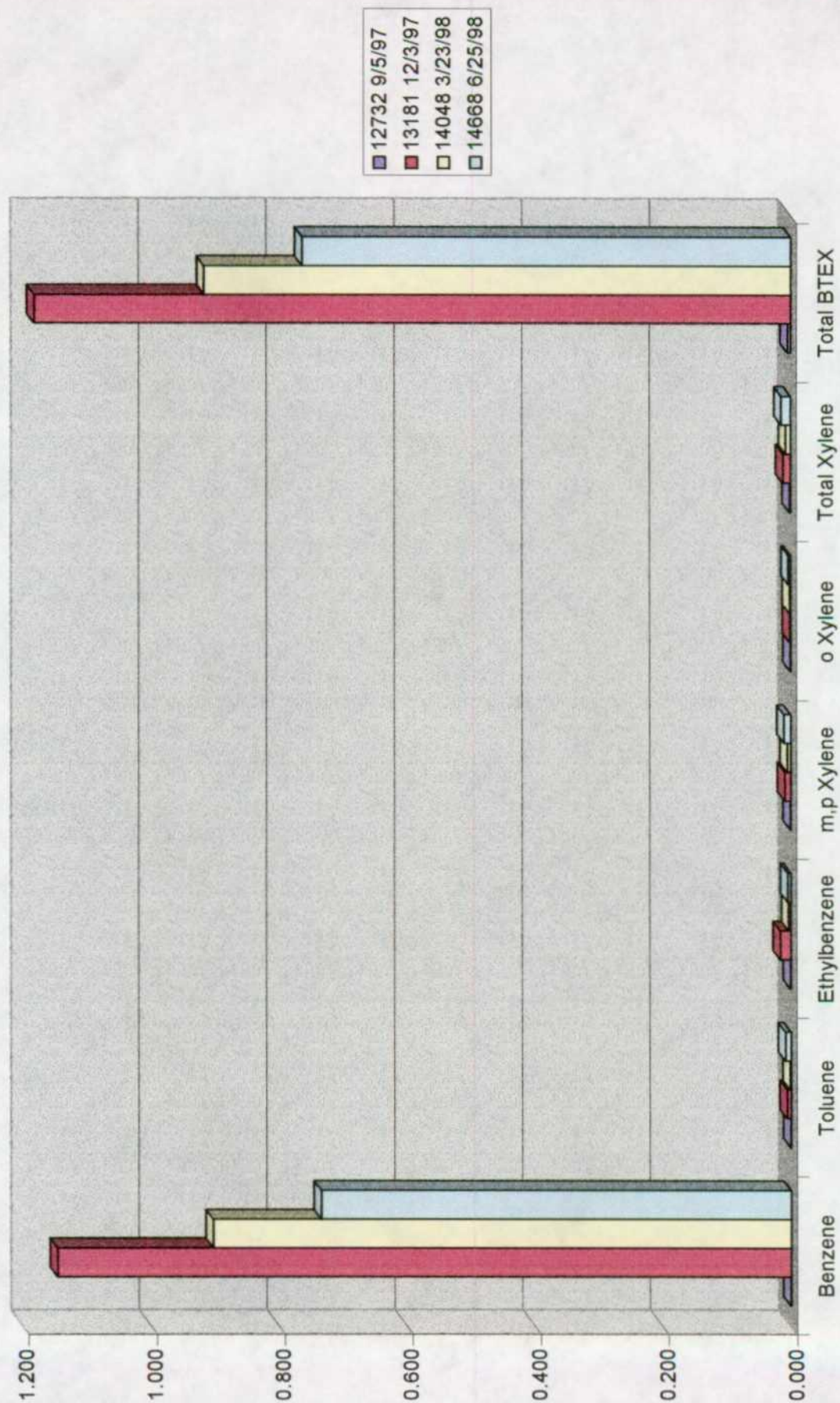


Monitor Well # 14  
 Bell State "A"  
 Sampling Results

Lab. #	12732	13181	14048	14668
Sample Date	9/5/97	12/3/97	3/23/98	6/25/98
Benzene	0.001	1.147	0.904	0.735
Toluene	0.001	0.007	0.002	0.009
Ethylbenzene	0.001	0.017	0.004	0.005
m,p Xylene	0.001	0.010	0.006	0.011
o Xylene	0.001	0.002	0.002	0.004
Total Xylene	0.002	0.012	0.008	0.015
Total BTEX	0.005	1.183	0.918	0.764



# Monitor Well # 14





STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION  
2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

June 29, 1998

**CERTIFIED MAIL**  
**RETURN RECEIPT NO. Z-235-437-303**

Mr. Larry Sugano  
Tipperary Corporation  
633 Seventeenth St., Suite 1550  
Denver, Colorado 80202

**RE: TATUM PIT CLOSURES  
LEA COUNTY, NEW MEXICO**

Dear Mr. Sugano:

The New Mexico Oil Conservation Division (OCD) has reviewed Tipperary Corporation's (TC) April 2, 1998 "PROGRESS REPORT, TATUM PIT CLOSURE PROJECT, LEA COUNTY, NEW MEXICO" and December 11, 1997 "TATUM PIT CLOSURE PROJECT, CLOSURE REPORT". These documents contain the results of TC's investigation of ground water contamination related to the closure of 10 unlined pits west of Tatum, New Mexico.

A review of the above referenced documents shows that at the majority of the sites the extent of ground water contamination has not been completely defined. Therefore, the OCD requires that TC submit a work plan to completely define the extent of ground water contamination which is in excess of New Mexico Water Quality Control Commission (WQCC) ground water standards. The work plan will be submitted to the OCD Santa Fe Office by August 28, 1998 with a copy provided to the OCD Hobbs District Office.

If you have any questions, please call me at (505) 827-7154.

Sincerely,

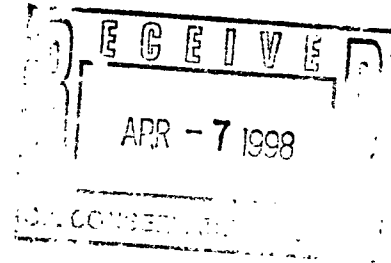
William C. Olson  
Hydrologist  
Environmental Bureau

xc: Wayne Price, OCD Hobbs District Office  
Mike Matush, NM State Land Office  
Mike Griffin, Whole Earth Environmental, Inc.



**Tipperary**  
CORPORATION

633 Seventeenth Street  
Suite 1550  
Denver, Colorado 80202



April 2, 1998

**CERTIFIED MAIL**

Mr. William C. Olson  
New Mexico Oil Conservation Division  
2040 South Pacheco  
Santa Fe, NM 87505

**RE: Progress Report  
Tatum Pit Closure Project  
Lea County, NM**

Dear Mr. Olson:

Please find enclosed additional results from our monitor wells in the subject project area. These results are from water samples taken on March 23, 1998. The total BTEX concentrations have declined significantly from the December 1997 sample results. We are currently planning to analyze water samples quarterly from the project monitor wells.

If you have any questions, please call me at (303) 293-9379.

Very truly yours,

Larry G. Sugano  
Vice President - Engineering

cc: Wayne Price, NMOCD Hobbs Office

Enclosure



**Executive Summary  
Tipperary Corporation  
Tatum Pit Closure Project  
March, 1998 Well Sampling**

**Procedures**

On March 23, 1998, Mr. Vic Vice, Tipperary Production Foreman, sampled the fluid contents of twenty-three monitoring wells in accordance with WEQP-76. The samples were delivered the next day to Environmental Labs of Texas and results provided to Whole Earth Environmental on March 26, 1998. Analysis methods and QA / QC data are provided on the laboratory report.

Whole Earth prepared various spreadsheets and graphs comparing the results to those of two prior sampling events.

**Results**

The total BTEX concentrations within the monitoring wells are shown to decline by an average of 20% per quarter. There was a 39% increase in the number of wells having all individual BTEX compound concentrations within WQCC standards. Though benzene remains the principal contaminant, the benzene concentrations were reduced by an average of 31% from the December sampling indicating that the "slug" resultant from the closure activities is now passing the monitoring perimeter.

**Conclusions**

The process of natural attenuation is demonstrated to be working. In June one and possibly two pit sites should be considered for final closure as it is expected that they will have shown four consecutive quarters of BTEX concentrations falling below New Mexico WQCC standards.

The construction of any additional delineation wells is not recommended at this time. One additional sampling round should provide us with enough statistical data to forecast which wells (if any) will require further testing.





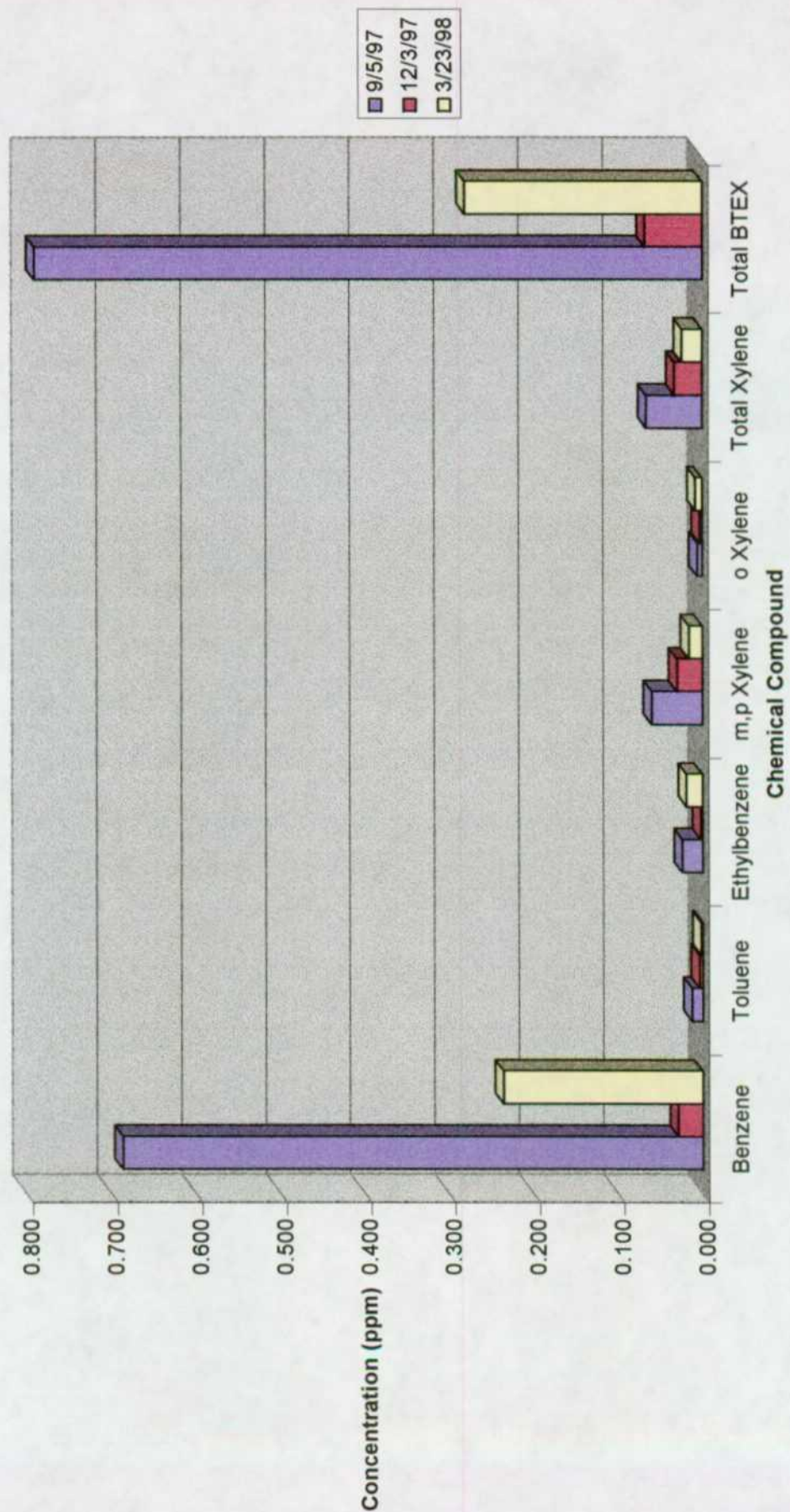
**Tipperary Corporation  
Sampling Instructions  
June 1, 1998 Sampling Round**

1. Sample Monitor Wells # 1-24 as performed on 3/23/98 sampling round.
2. Sample Iva COM source well for BTEX. If results are acceptable, we will then immediately test for PAH's. If PAH results are acceptable, we will request formal closure from the State. *(The State may require additional witnessed sampling for final closure).*
3. Sample Vera for PAH's. Use 1 liter amber jar with no preservatives for PAH and 1 liter clear jar with H<sub>2</sub>SO<sub>4</sub> preservative for metals in addition to your normal BTEX sample vial. If PAH's are acceptable, we will request immediate closure. *(PAH & RCRA 8 metals were all within limits on 9/5/97 sampling).*
4. Save G.S. State monitor well # 12 for last. Pump well bore for at least 30 minutes in an attempt to remove all of the free product from the sample. If free product is still present, forward the sample to the lab anyway with instructions to additionally run TPH analysis.

**Monitor Well # 6**  
**Bell State "A"**  
**Sampling Results**

Lab. #	12481	13179	14062
Sample Date	9/5/97	12/3/97	3/23/98
Benzene	0.687	0.029	0.236
Toluene	0.013	0.004	0.002
Ethylbenzene	0.024	0.002	0.019
m,p Xylene	0.060	0.03	0.016
o Xylene	0.006	0.003	0.008
Total Xylene	0.066	0.033	0.024
Total BTEX	0.790	0.068	0.281

# Monitor Well # 6

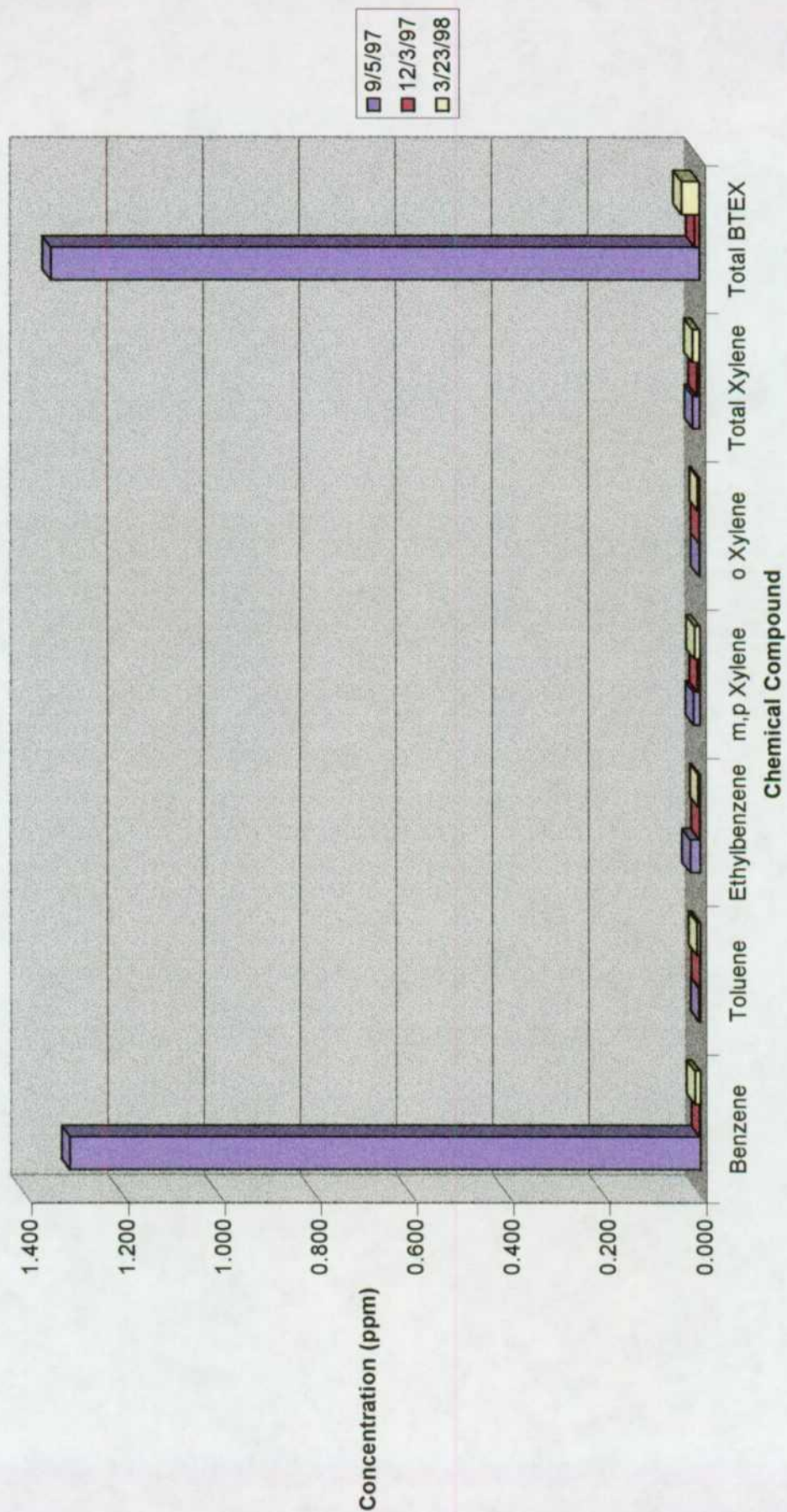


**Monitor Well # 13**  
**Bell State "A"**  
**Sampling Results**

Lab. #	12731	13180	13180
Sample Date	9/5/97	12/3/97	3/23/98
Benzene	1.309	0.002	0.011
Toluene	0.003	0.001	0.007
Ethylbenzene	0.02	0.001	0.004
m,p Xylene	0.013	0.005	0.011
o Xylene	0.001	0.001	0.004
Total Xylene	0.014	0.006	0.015
Total BTEX	1.346	0.010	0.037



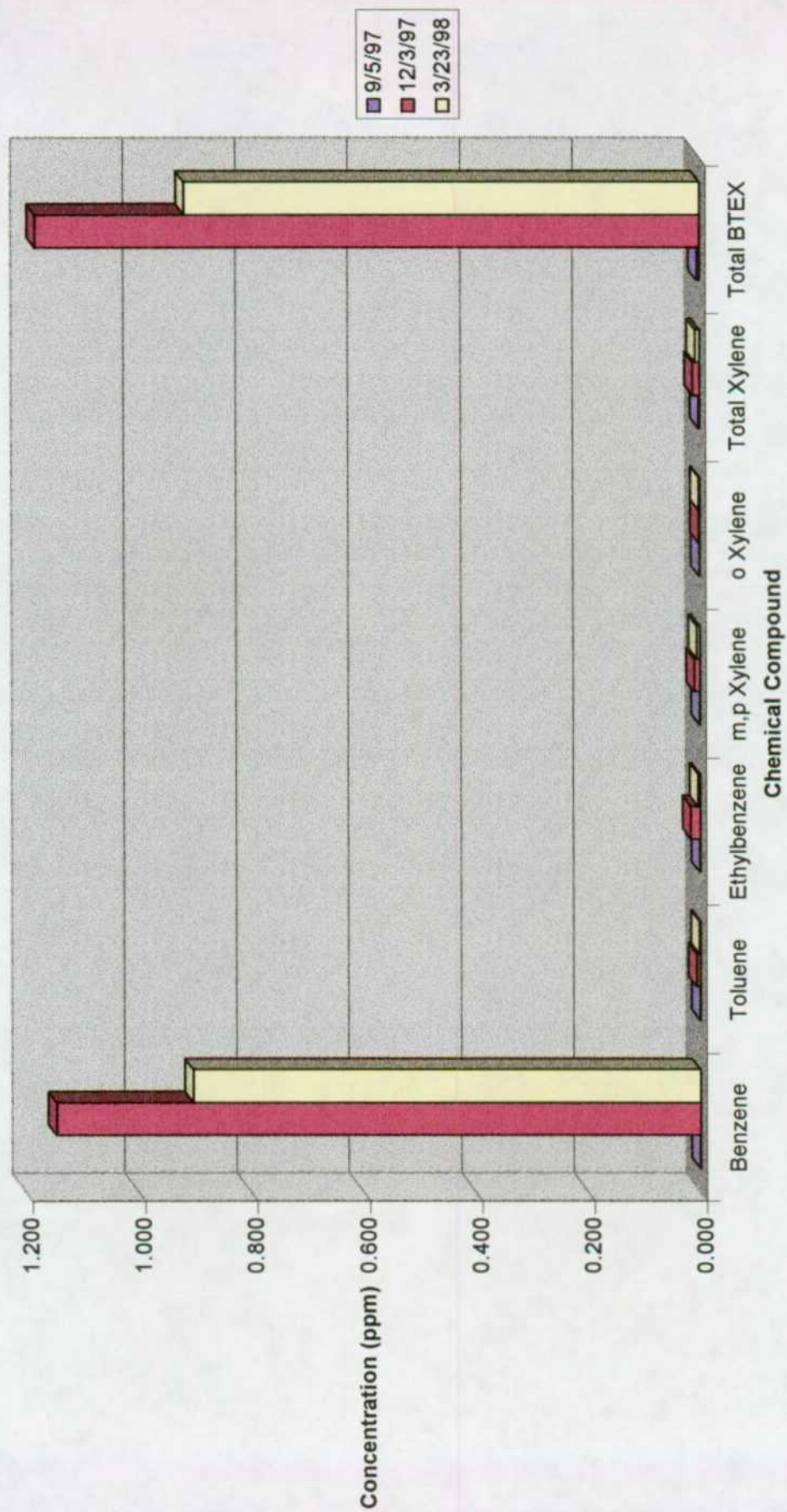
Monitor Well # 13



**Monitor Well # 14**  
**Bell State "A"**  
**Sampling Results**

Lab. #	12732	13181	14048
Sample Date	9/5/97	12/3/97	3/23/98
Benzene	0.001	1.147	0.904
Toluene	0.001	0.007	0.002
Ethylbenzene	0.001	0.017	0.004
m,p Xylene	0.001	0.010	0.006
o Xylene	0.001	0.002	0.002
Total Xylene	0.002	0.012	0.008
Total BTEX	0.005	1.183	0.918

# Monitor Well # 14







State of New Mexico  
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT  
Santa Fe, New Mexico 87505

STATE OF  
NEW MEXICO  
OIL  
CONSERVATION  
DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

<input checked="" type="checkbox"/> Telephone <input type="checkbox"/> Personal	Time 1530	Date 9/22/97
---	-----------	--------------

Originating Party	Other Parties
Bill Olson - Environmental Bureau	Bob Fehlmann - Tipperary Corp. (303) 293-9379

Subject

Tipperary Pit Closures - Tatum, NM

Discussion

Gave verbal approval of 9/22/97 fax from Mike Grafton with following conditions:

- 1.) Monitor well construction, water quality sampling and waste disposal will be conducted according to OCD's June 4, 1997 approval conditions.
- 2.) Wayne Price at OCD Hobbs will be contacted about the drilling and sampling schedule.

Also expressed concern about source well located 60' from pit instead of directly adjacent to pit area as required in OCD's 6/4/97 approval.

Conclusions or Agreements

I will fax copy of verbal approval to Tipperary at (303) 291-0398

Distribution

Signed

Will Olson

file  
Bob Fehlmann - Tipperary (fax copy)  
Wayne Price - OCD Hobbs





**Whole Earth  
Environmental**

19606 S. Gabriel  
Houston, TX 77084  
Phone: (281) 492-7077  
Fax: (281) 646-8996

## FAX COVER PAGE

To: Bill Olsen

From: Mike Griffin

Company: NM OCD

Company: Whole Earth Environmental, Inc.

Fax No.: (505) 827-8177

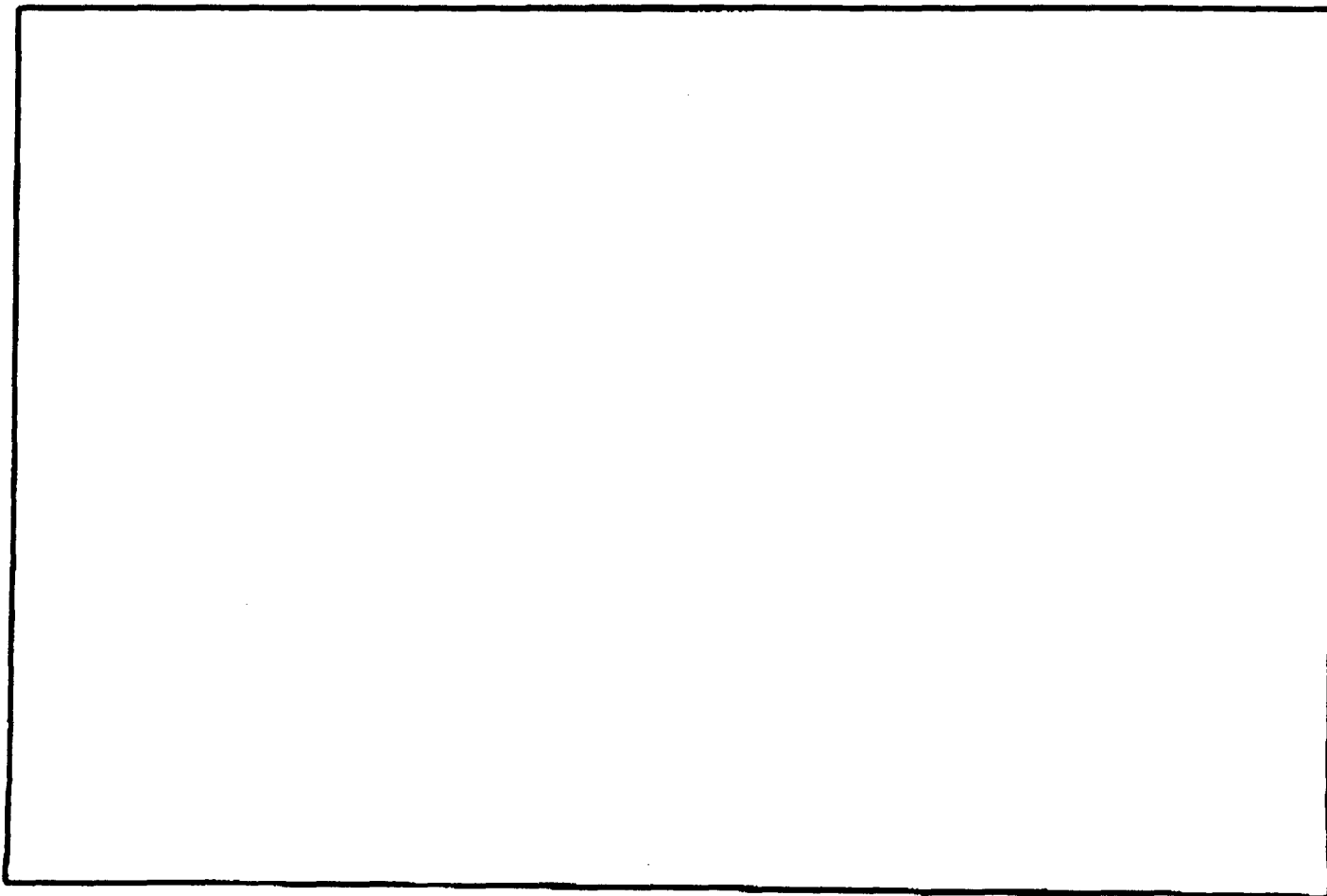
Pages including cover sheet: 3

Subject:

Extension Request

Message:

Date: 9/22/97





To: Bill Olsen

From: Mike Griffin

Date: September 9, 1997

Subject: Extension Request

Sent by FAX to: (505) 827-8177

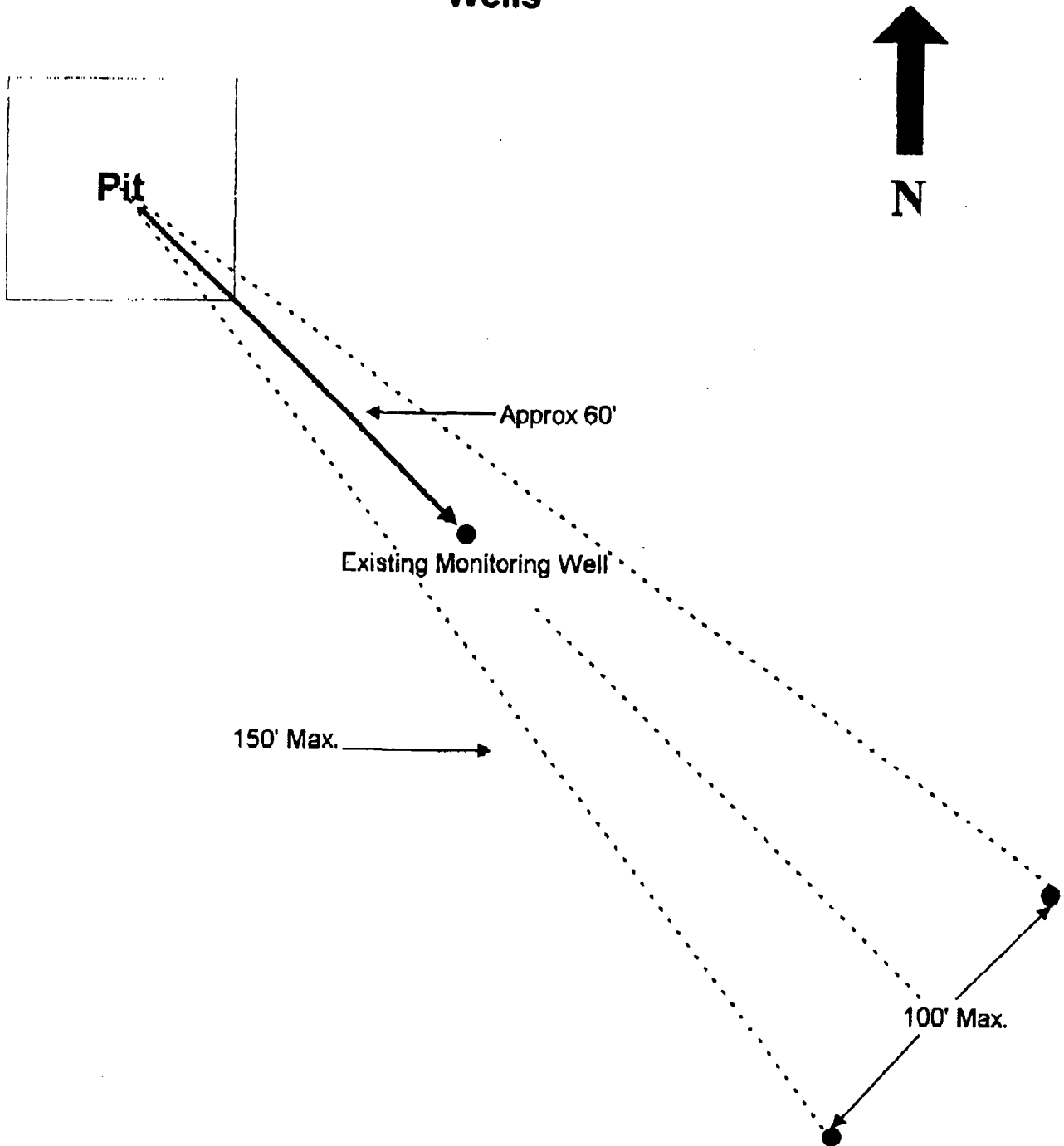
Bill, as you know we experienced an unforeseen delay in completing the Tipperary Tatum Pit Closure Project due to the discovery of detectable BTEX concentrations on five pit locations and the presence of free product in the G.S. State monitoring well. (Reference two letters Bob Fehlmann of Tipperary to you dated Sept. 11).

The new monitoring and recovery wells will be drilled beginning the morning of the 25<sup>th</sup> and will be sampled as soon as possible thereafter. We request an additional extension for project completion to the end of October.

By copy of this memorandum, I'm notifying Mr. Wayne Price of your Hobbe office as to the new schedule and will further advise him telephonically in advance of the final sampling events so as to allow him to witness.

Please advise if this causes any problems for you.

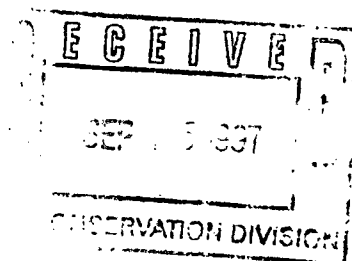
# Typical Location of Monitoring Wells





**Tipperary**  
CORPORATION

633 Seventeenth Street  
Suite 1550  
Denver, Colorado 80202



September 11, 1997

Mr. William C. Olson  
Hydrogeologist – Environmental Bureau  
New Mexico Energy And Natural Resources Dept.  
Oil Conservation Division  
2040 South Pacheco  
Santa Fe, New Mexico 87504

**Subject: Tatum, New Mexico Area “Pit Closure Project”.**

Dear Mr. Olson:

Enclosed is a copy of the laboratory analyses of the first water samples taken from the new monitoring wells at our Tatum, New Mexico “Pit Closure Project”. The data indicates BTEX concentrations below allowable maximums for pit closures, but higher than maximums allowed for the more stringent WQCC standards that here apply to the Ogalla Aquifer. Pits with monitor well water samples exceeding the WQCC BTEX maximums include the: Bell State “A” #1, Sohio State “A”, Sohio State #1, Satellite #4, and the State NBF#1.

We have already removed the BTEX source (pit sludge) at these locations, and believe that through time, the processes of natural attenuation will remediate the minor amounts detected. Therefore, as a continuation of our pit closure project, in an effort to establish the extent of the plume we intend to set one new monitor well 150 feet down the ground-water gradient from each of the pits listed above. Tipperary believes these new monitor wells will define the lateral extent of the BTEX at these sites. We intend to sample these wells quarterly.


Please indicate your approval of the above modification to Tipperary’s pit closure plan so that we may proceed with the work. Let me know if you have questions or need more information.

Sincerely,

Robert H. Fehlmann  
Environmental Coordinator

WPWIN \ TIP \ LETTERS \ NMPClose.L09

Tipperary Oil & Gas Corporation  
Phone (303) 293-9379

Burro Pipeline Corporation  
 Fax (303) 292-3428

# ENVIRONMENTAL LAB OF , INC.

"Don't Treat Your Soil Like Dirt!"

WHOLE EARTH ENVIRONMENTAL

ATTN: MR. MIKE GRIFFIN

18606 SAN GABRIEL

HOUSTON, TEXAS 77064

FAX: 1-281-846-8996

Receiving Date: 08/08/97

Sample Type: WATER

Project: TIPPERARY

Project Location: NONE GIVEN

Analysis Date: 08/09/97

Sampling Date: 08/06/97, 08/06/97

Sample Condition: Intact/ice

ELTS	FIELD CODE	BENZENE mg/l	TOLUENE mg/l	ETHYLBENZENE mg/l	m,p-XYLENE mg/l	o-XYLENE mg/l
12475	NA COM MWW1	<.001	<.001	<.001	0.002	0.007
12476	NA COM MWW2	<.001	<.001	<.001	<.001	<.001
12477	NA COM SW	3.129	2.551	0.209	1.182	0.094
12478	GS #12	1.834	0.055	0.061	3.085	0.084
12481	BELL #8	0.687	0.013	0.024	0.060	0.008
12482	NBN #7	<.001	<.001	<.001	<.001	<.001
12483	SOHIO 1 #10	2.558	1.148	0.243	1.257	0.081
12484	SOHIO A #11	0.096	0.004	0.002	0.008	0.012
12485	SAT 4 #9	0.092	0.010	0.015	0.082	0.002
12486	N&F #8	0.302	0.208	0.039	0.753	0.161
12487	VERA #6	0.003	0.003	0.003	0.021	0.029
12488	MABLE MW #3	0.010	0.008	0.031	0.139	0.012
12489	MABLE MW #4	0.015	0.002	0.002	0.010	0.002
% IA		111	111	112	111	113
% EA		113	112	114	112	111
BLANK		<0.001	<0.001	<0.001	<0.001	<0.001

METHODS: SW 846-8020,5030

  
Michael R. Fowler

9-10-97  
Date



STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

2040 S. PACHECO  
SANTA FE, NEW MEXICO 87505  
(505) 827-7131

June 4, 1997

**CERTIFIED MAIL**

**RETURN RECEIPT NO. P-410-431-177**

Mr. Larry G. Sugano  
Tipperary Corporation  
633 Seventeenth St., Suite 1550  
Denver, Colorado 80202

RE: PIT CLOSURES  
TATUM, NEW MEXICO

Dear Mr. Sugano:

The New Mexico Oil Conservation Division (OCD) has reviewed Tipperary Corporation's (TC) April 9, 1997 "PIT CLOSURES TATUM, NEW MEXICO" and TC's undated "TATUM PIT CLOSURE PROJECT". This document contains the results of soil investigations and remedial action plans for field production pits at the following TC locations in the North Bagley Oil Field near Tatum, New Mexico:

- Bell State "A"	Unit C, Sec 21, T11S, R33E
- G.S. State #1	Unit G, Sec 08, T11S, R33E
- Iva Com #1	Unit H, Sec 20, T11S, R33E
- Mabel Com #1	Unit D, Sec 29, T11S, R33E
- Satellite #4	Unit I, Sec 12, T11S, R33E
- Sohio State "A"	Unit P, Sec 04, T11S, R33E
- State NBF #1	Unit N, Sec 22, T11S, R33E
- State NBN #1	Unit N, Sec 16, T11S, R33E
- Vera #1	Unit E, Sec 32, T11S, R33E

The remedial action work plan, as contained in the above referenced documents, is approved with the following conditions:

1. All soil samples from the excavations and remediated soils will be taken and analyzed for total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and xylene (BTEX) using EPA approved methods and quality assurance/quality control procedures.

**NOTE:**

The proposed BTEX soil analytical method QP-19 is not an EPA approved method for analysis of soils. In fact, the QP-19 procedure does not measure BTEX in soils but actually measures the concentrations of BTEX in vapors emanating from the soil in an enclosed headspace. This method is not acceptable for a final determination of the

Mr. Larry G. Sugano  
June 4, 1997  
Page 2

remaining concentrations of BTEX in soils. EPA approved methods must be used.

In addition, the TPH analytical data sheets for the initial surveys do not contain the EPA method QA/QC data such as duplicates, spikes, etc. for each site nor do they contain the signature of the analyst. The soil TPH analyses from the excavations and remediated soils must include appropriate QA/QC data for the EPA method TPH soil analysis and a data sheet signed by the analyst.

2. Upon completion of the soil remedial actions at the Vera #1, State NBN #1, State NBF #1, Bell State "A" and G.S. State #1, TC will install a monitor well directly adjacent to and downgradient of the pit at each site.
3. At the Mabel Com #1 and Iva Com #1, TC will define the full extent of free phase and dissolved phase hydrocarbon contaminants in ground water which are in excess of New Mexico Water Quality Control Commission (WQCC) standards. During the initial ground water investigations at least 2 monitor wells will be installed in a radial pattern downgradient of each site recovery well such that the direction of the local ground water gradient can be determined.
4. At the Mabel Com #1 and Iva Com #1, the recovery wells will be installed directly adjacent to the excavated pit such that the well bore does not pierce the liners in the excavated pit areas.
5. All monitor wells and recovery wells will be constructed and completed as set out below:
  - a. A minimum of fifteen feet of well screen will be installed, with at least five feet of well screen above the water table and ten feet of well screen below the water table.
  - b. An appropriately sized gravel pack will be set around the well screen from the bottom of the hole to 2-3 feet above the top of the well screen.
  - c. A 2-3 foot bentonite plug will be placed above the gravel pack.
  - d. The remainder of the hole will be grouted to the surface with cement containing 5 % bentonite.
  - e. Each well will be developed after construction using EPA approved procedures.



6. Ground water from all monitor wells and recovery wells will be initially sampled and analyzed for concentrations of benzene, toluene, ethylbenzene, xylene (BTEX), major cations and anions, WQCC metals and polynuclear aromatic hydrocarbons using EPA approved methods and QA/QC procedures.
7. All wastes generated during the investigative and remedial actions will be disposed of at an OCD approved facility.

**NOTE:** The OCD permitted Gandy/Marley Landfarm is not allowed to accept liquids. This landfarm is only permitted to accept contaminated soils and sludges. If liquids are recovered during the remedial actions they will need to be disposed of at an alternate OCD approved facility which is permitted for those types of wastes.

8. TC will submit a report on the investigations and remedial actions to the OCD by September 5, 1997. The report will contain:
  - a. A description of all activities which occurred during the investigations and remedial actions including the final excavated size of each pit, the volume of material remediated as well as conclusions and recommendations.
  - b. A completed OCD "PIT REMEDIATION AND CLOSURE REPORT" form for each site for which final pit closure approval is sought.
  - c. A summary of all laboratory analytic results of soil and water quality sampling for each site including copies of all laboratory analytical data sheets and associated QA/QC data.
  - d. A water table elevation map for the Mable Com #1 and Iva Com #1 sites using the water table elevation of the ground water in all site monitor wells.
  - e. A geologic log and as built well completion diagram for each monitor well and recovery well.
9. The OCD defers comment on the long term ground water monitoring plan for the Mabel Com #1 and Iva Com #1 until the full extent of contamination has been determined.
10. TC will notify the OCD at least one week in advance of all scheduled activities such that the OCD has the opportunity to witness the events and/or split samples.

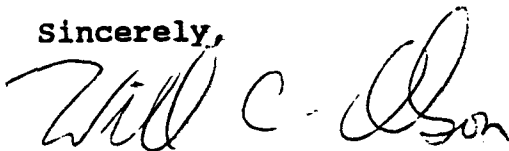
Mr. Larry G. Sugano  
June 4, 1997  
Page 4

11. All documents submitted for approval will be submitted to the OCD Santa Fe Office with copies provided to the OCD Hobbs District Office.

Please be advised that OCD approval does not relieve TC of liability if contamination exists which is beyond the scope of the work plan or if the activities fail to adequately determine the extent of or adequately remediate contamination related to TC's activities. In addition, OCD approval does not relieve TC of responsibility for compliance with any other federal, state or local laws and/or regulations.

If you have any questions, please call me at (505) 827-7154.

Sincerely,



William C. Olson  
Hydrogeologist  
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor  
Wayne Price, OCD Hobbs Office  
Linda Freedman, NM State Land Office  
Mike Griffin, Whole Earth Environmental, Inc.

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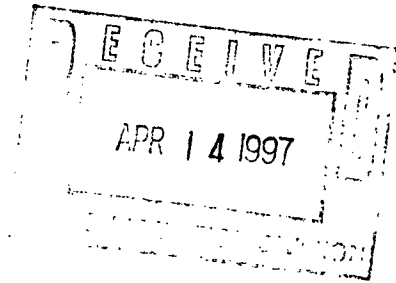
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**Tipperary**  
CORPORATION

633 Seventeenth Street  
Suite 1550  
Denver, Colorado 80202



April 9, 1997

Mr. William C. Olson  
Hydrogeologist - Environmental Bureau  
New Mexico Energy and Natural Resources Dept.,  
Oil Conservation Division  
2040 Pacheco  
Santa Fe, New Mexico

**RE: PIT CLOSURES TATUM, NEW MEXICO**

Dear Mr. Olson:

Enclosed is a copy of Tipperary's work results to date, and a new proposed closure plan, for the production emergency upset pits at Tatum, New Mexico. I believe that this report includes all the information that you requested in your March 27, 1997 letter concerning Tipperary's progress with this project.

I have forwarded a copy of this report to Jerry Sexton, in the OCD's Hobbs, NM office. Let me know if you have any questions.

Sincerely,

Larry G. Sugano  
Vice President - Engineering

cc: Jerry Sexton, OCD Hobbs Office