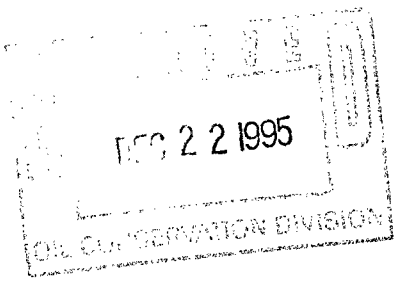
3R - 23

REPORTS

DATE:

Dec. 20, 1995

BLAGG ENGINEERING, INC.
P.O. Box 87, Bloomfield, New Mexico 87413
Phone: (505)632-1199 Fax: (505)632-3903



December 20, 1995

Mr. William C. Olson, Hydrologist
New Mexico Oil Conservation Division
Environmental Bureau
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Re: Quarterly Monitoring Report
Amoco Production Company
Gallegos Canyon Unit Com F #162, Sec. 36-T29N-R12W
San Juan County, New Mexico

Dear Mr. Olson:

Amoco Production Company has retained Blagg Engineering, Inc. to conduct environmental monitoring of groundwater reclamation at Gallegos Canyon Unit Com F Well No. 162 (Figure 1). Following are quarterly monitoring results as required by the New Mexico Oil Conservation Division (NMOCD), pursuant to reclamation plan approval by the NMOCD with letter dated January 27, 1994.

The air injection/vapor extraction system described in the October 11, 1995 quarterly monitoring report has remained in continuous operation. This system is designed to treat soils and groundwater that could not be accessed by excavation.

A microbial treatment at the site was conducted from November 13 - 16, 1995, pursuant to our proposal dated October 17, 1995 and approved by NMOCD with letter dated October 24, 1995. Please note that no hydrocompaction or settling was observed during the treatments. Applied Bioscience, Inc. of Farmington, New Mexico implemented the microbial treatment and a summary of their activities, including application rates and locations, is included as an attachment to this quarterly report. Enhanced hydrocarbon decay from the treatments is anticipated to be observed in future sample events.

Summary Laboratory Analytical Results

Groundwater monitor wells at the site were sampled on December 4 and 11, 1995. A summary of laboratory analytical results for this and previous sample events is included in Table 1 on the following page and laboratory data reports are included in Appendix B. Analytical data indicates that groundwater impacts in excess of NMWQCC standards has not migrated down gradient to monitor wells MW-9 or MW-10.

TABLE 1

Summary Laboratory Analytical Results
Amoco Production Company GCU Com "F" No. 162

Sample ID	Benzene ug/L	Toluene ug/L	Ethyl Benzene ug/L	Total Xylenes ug/L	Naptha-lene ug/L	Benzo(a) pyrene ug/L	Cations meq/L	Anions meq/L	As mg/L	Ba mg/L	Cd mg/L	Cr mg/L	Pb mg/L	Hg mg/L	Se mg/L	Ag mg/L
MW-3																
2/25/94	476	0.7	ND	1.9	ND	ND	15.80	15.49	ND	3.27	0.0001	ND	0.0034	ND	0.0011	ND
6/17/94	13.6	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/27/94	20.9	3.4	0.9	10.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/7/94	241.5	101.1	12.7	223.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-4																
2/25/94	240	3.1	40.2	469	ND	ND	17.74	18.50	0.0022	5.09	0.0016	ND	0.0373	ND	0.0015	ND
6/17/94	273	2.2	34.7	113	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/27/94	355	0.7	59.4	352	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/7/94	1694	7.6	241.3	1575	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/11/95	549	2.9	29.5	281.6												
MW-5																
2/25/94	ND	1.0	ND	2.2	ND	ND	34.59	33.50	0.0064	3.16	0.0034	ND	ND	ND	0.0037	ND
6/17/94	2.1	2.7	4.5	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/27/94	1.3	0.5	1.0	5.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/7/94	0.8	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/8/95	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/12/95	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/27/95	ND	ND	ND	ND												
12/11/95	ND	ND	ND	ND												
MW-6																
2/25/94	15.9	3.2	5.3	140	ND	ND	13.39	12.34	ND	2.68	0.0002	ND	ND	ND	0.0007	ND
6/17/94	15.3	1.9	2.6	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/27/94	70.1	3.7	1.9	109	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/7/94	154.8	44.9	0.2	212.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/8/95	7.0	ND	ND	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/12/95	2.38	0.86	ND	12.6												
9/27/95	12.0	ND	ND	15.33												
12/11/95	31.0	29.1	11.4	175.3												
MW-7																
12/11/95	85.7	522	144	2,422												

MW-9																
2/25/94	ND	1.1	ND	1.4	ND	ND	13.73	13.47	ND	1.17	0.0011	ND	ND	ND	0.0012	ND
6/17/94	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9/27/94	0.8	0.4	0.6	3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/7/94	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/8/95	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/12/95	ND	ND	ND	ND												
9/27/95	ND	ND	ND	ND												
12/4/95	ND	ND	ND	ND												
MW-10																
2/25/94	ND	0.7	ND	1.7	ND	ND	15.04	15.45	ND	2.64	0.0140	ND	0.0012	ND	0.0018	ND
6/17/94	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA
9/27/94	0.8	0.3	0.2	3.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
12/7/94	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3/8/95	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/12/95	ND	ND	ND	ND												
9/27/95	ND	ND	ND	ND												
12/4/95	ND	ND	ND	4.2												
WQCC LIMITS	10	750	750	620	30	0.7	------	------	0.1	1.0	0.01	0.05	0.05	0.002	0.05	0.05

ug/L = micrograms per liter, equivalent to parts per billion (ppb) mg/L= milligrams per liter, equivalent to parts per million (ppm) ND=not detected NA=not analyzed

Water Table Elevations

Depth to groundwater measurements in monitor wells was measured during the December 4, 1995 sample event. Table 2 includes water depth measurements, surface casing relative elevations and groundwater elevations. A contour map of relative water table elevations for this sample event is included in Figure 2.

TABLE 2

Relative Groundwater Elevations
Amoco Production Company GCU Com "F" No. 162
December 4, 1995

Monitor Well	Total Depth (feet)	Depth to Fluid (feet)	Relative Casing Elevation (feet)	Relative Groundwater Elevation (feet)
MW-1	Well	abandoned	during	excavation
MW-2	23.1	na	100.16	na
MW-3	Well	abandoned	during	excavation
MW-4	24.1	21.28	98.87	77.59
MW-5	25.1	22.28	102.50	80.22
MW-6	26.8	20.45	98.68	78.23
MW-7	25.3	19.83	97.39	77.56
MW-8	Well	abandoned	during	excavation
MW-9	19.6	12.68	88.50	75.82
MW-10	16.3	13.72	90.25	76.53

na = water table elevation not measured

Current and Proposed Activities

Contaminated soil and groundwater at the GCU 162 site that could not be accessed by excavation is presently being remediated with the active air injection/vapor extraction system. Operation of this

system is on-going.

The effectiveness of proprietary microbe placement in and around hydrocarbon contaminated subsurface soils is presently being evaluated. Analytical results from future soil and groundwater sample events will be submitted in quarterly reports transmitted to NMOCD.

Summary

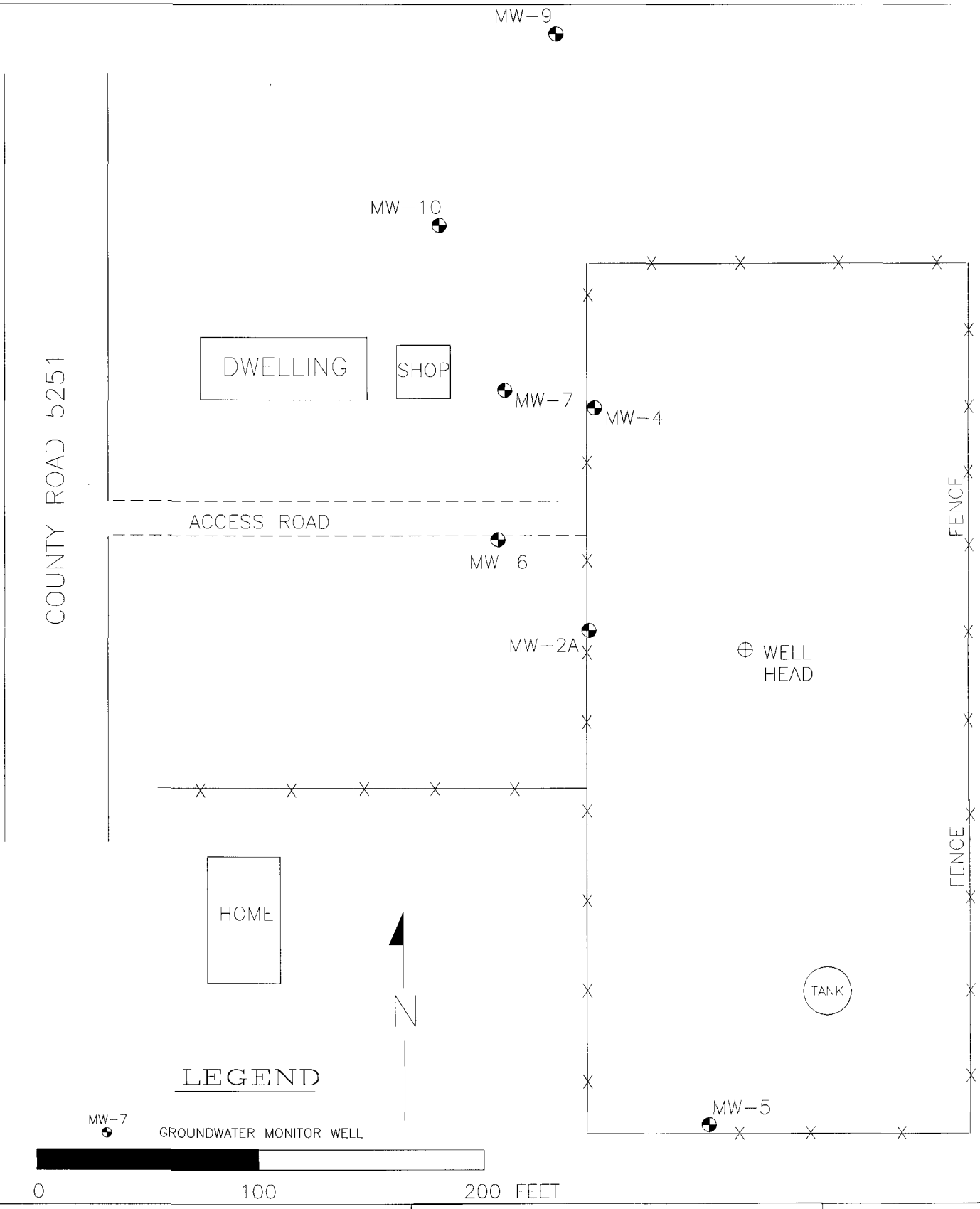
This report has been prepared by Blagg Engineering, Inc. on behalf of Amoco Production Company. Questions or comments may be directed to Jeff Blagg at (505)632-1199.

Respectfully submitted:
Blagg Engineering, Inc.

Jeffrey C. Blagg, P.E.
President

cc: Mr. Denny Foust, NMOCD
Mr. Buddy Shaw, Amoco Production Company

Attachment: Microbial Treatment Summary - Applied Bioscience, Inc.



AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

DECEMBER, 1995

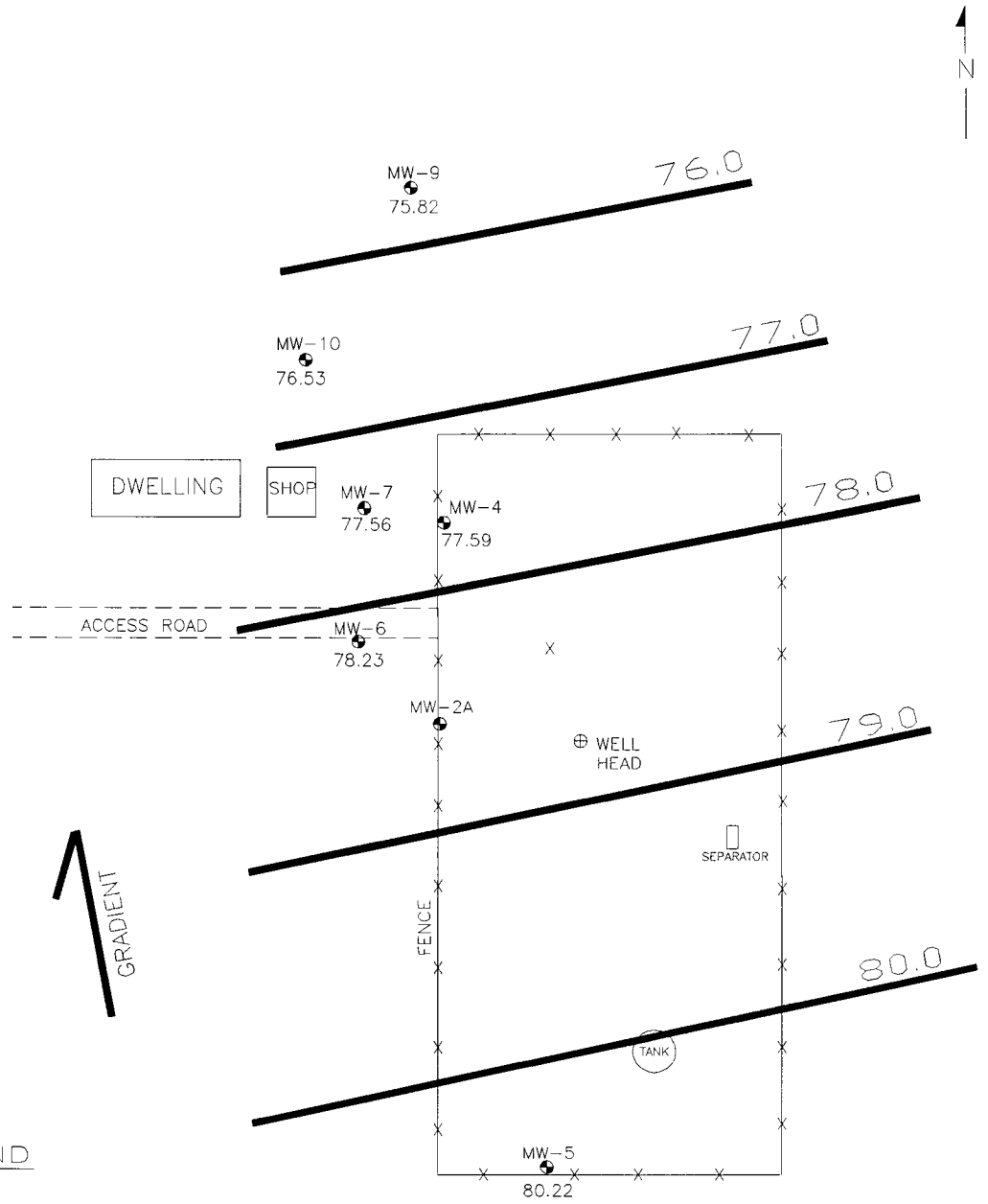
BLAGG ENGINEERING, INC.
CONSULTING PETROLEUM / RECLAMATION SERVICES

P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413

PHONE: (505) 632-1199

SITE PLAN

FIGURE 1	DRWN BY: JCB
162REV	PROJ MGR: JCB



AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

DECEMBER, 1995

BLAGG ENGINEERING, INC.
CONSULTING ENGINEERING SERVICES

P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413

PHONE:(505)632-1199

GW SURFACE CONTOUR 12/4/95

FIGURE 2	DRWN BY: JCB
162SITE6	PROJ MANG: JCB

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/GCU Com F162	Report Date:	12/18/95
Sample ID:	MW - 4	Date Sampled:	12/11/95
Lab ID:	2171	Date Received:	12/11/95
Sample Matrix:	Water	Date Analyzed:	12/13/95
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	549	25.0
Toluene	2.87	0.50
Ethylbenzene	29.5	5.00
m,p-Xylenes	237	10.0
o-Xylene	44.6	5.00
Total BTEX	**860**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	97	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/GCU Com F162	Report Date:	12/18/95
Sample ID:	MW - 5	Date Sampled:	12/11/95
Lab ID:	2172	Date Received:	12/11/95
Sample Matrix:	Water	Date Analyzed:	12/13/95
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50
Total BTEX	**ND**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	94	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/GCU Com F162	Report Date:	12/18/95
Sample ID:	MW - 6	Date Sampled:	12/11/95
Lab ID:	2173	Date Received:	12/11/95
Sample Matrix:	Water	Date Analyzed:	12/13/95
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	31.0	5.00
Toluene	29.1	5.00
Ethylbenzene	11.4	5.00
m,p-Xylenes	140	10.0
o-Xylene	35.3	5.00
Total BTEX	**247**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	98	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/GCU Com F162	Report Date:	12/18/95
Sample ID:	MW - 7	Date Sampled:	12/11/95
Lab ID:	2174	Date Received:	12/11/95
Sample Matrix:	Water	Date Analyzed:	12/13/95
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	85.7	25.0
Toluene	522	125
Ethylbenzene	144	25.0
m,p-Xylenes	1,830	250
o-Xylene	592	125
Total BTEX	**3,250**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	96	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/GCU Com F162	Report Date:	12/18/95
Sample ID:	MW - 9	Date Sampled:	12/04/95
Lab ID:	2051	Date Received:	12/04/95
Sample Matrix:	Water	Date Analyzed:	12/13/95
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50
Total BTEX	**ND**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	101	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

ANALYTICA
ENVIRONMENTAL LABORATORY

PURGEABLE AROMATICS

Blagg Engineering, Inc.

Project ID:	Amoco/GCU Com F162	Report Date:	12/18/95
Sample ID:	MW - 10	Date Sampled:	12/04/95
Lab ID:	2052	Date Received:	12/04/95
Sample Matrix:	Water	Date Analyzed:	12/13/95
Preservative:	Cool, $HgCl_2$		
Condition:	Intact		

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	3.23	1.00
o-Xylene	1.00	0.50
Total BTEX	**4.23**	

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	101	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

PURGEABLE AROMATICS

Quality Control Report

Method Blank Analysis

Sample Matrix: Water
Lab ID: MB35046

Report Date: 12/18/95
Date Analyzed: 12/13/95

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	103	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

Purgeable Aromatics

Matrix Spike Analysis

Lab ID:	2051Spk	Report Date:	12/18/95
Sample Matrix:	Water	Date Sampled:	12/04/95
Preservative:	Cool, HgCl2	Date Received:	12/04/95
Condition:	Intact	Date Analyzed:	12/13/95

Target Analyte	Spike Added (ug/L)	Original Conc. (ug/L)	Spiked Sample Conc. (ug/L)	% Recovery	Acceptance Limits (%)
Benzene	10	ND	10.0	100%	39 -150
Toluene	10	ND	9.87	99%	46 - 148
Ethylbenzene	10	ND	10.1	100%	32 - 160
m,p-Xylenes	20	ND	19.7	98%	NE
o-Xylene	10	ND	9.94	99%	NE

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.
NE - Spike acceptance range not established by the EPA.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	99	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

VOLATILE AROMATIC HYDROCARBONS

Matrix Spike Duplicate Analysis

Lab ID:	2051Spkdup	Report Date:	12/18/95
Sample Matrix:	Water	Date Sampled:	12/04/95
Preservative:	Cool, HgCl2	Date Received:	12/04/95
Condition:	Intact	Date Analyzed:	12/13/95

Target Analyte	Spike Added (ug/L)	Sample Spike Recovery (%)	Duplicate Spike Recovery (%)	Acceptance Limits (%)
Benzene	10	100%	99%	81 - 119
Toluene	10	99%	97%	79 - 117
Ethylbenzene	10	100%	95%	79 - 115
m,p-Xylenes	20	98%	93%	NE
o-Xylene	10	99%	94%	NE

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.
NE - Spike acceptance range not established by the EPA.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	96	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

PURGEABLE AROMATICS

Quality Control Report

Method Blank Analysis

Sample Matrix:	Water	Report Date:	12/18/95
Lab ID:	MB35046	Date Analyzed:	12/13/95

Target Analyte	Concentration (ug/L)	Detection Limit (ug/L)
Benzene	ND	0.50
Toluene	ND	0.50
Ethylbenzene	ND	0.50
m,p-Xylenes	ND	1.00
o-Xylene	ND	0.50

ND - Analyte not detected at the stated detection limit.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	103	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

VOLATILE AROMATIC HYDROCARBONS

Matrix Spike Duplicate Analysis

Lab ID:	2051Spkdup	Report Date:	12/18/95
Sample Matrix:	Water	Date Sampled:	12/04/95
Preservative:	Cool, HgCl2	Date Received:	12/04/95
Condition:	Intact	Date Analyzed:	12/13/95

Target Analyte	Spike Added (ug/L)	Sample Spike Recovery (%)	Duplicate Spike Recovery (%)	Acceptance Limits (%)
Benzene	10	100%	99%	81 - 119
Toluene	10	99%	97%	79 - 117
Ethylbenzene	10	100%	95%	79 - 115
m,p-Xylenes	20	98%	93%	NE
o-Xylene	10	99%	94%	NE

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.
NE - Spike acceptance range not established by the EPA.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	96	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

Purgeable Aromatics

Matrix Spike Analysis

Lab ID:	2051Spk	Report Date:	12/18/95
Sample Matrix:	Water	Date Sampled:	12/04/95
Preservative:	Cool, HgCl2	Date Received:	12/04/95
Condition:	Intact	Date Analyzed:	12/13/95

Target Analyte	Spike Added (ug/L)	Original Conc. (ug/L)	Spiked Sample Conc. (ug/L)	% Recovery	Acceptance Limits (%)
Benzene	10	ND	10.0	100%	39 -150
Toluene	10	ND	9.87	99%	46 - 148
Ethylbenzene	10	ND	10.1	100%	32 - 160
m,p-Xylenes	20	ND	19.7	98%	NE
o-Xylene	10	ND	9.94	99%	NE

ND - Analyte not detected at the stated detection limit.
NA - Not applicable or not calculated.
NE - Spike acceptance range not established by the EPA.

Quality Control:

Surrogate	Percent Recovery	Acceptance Limits
Trifluorotoluene	99	88 - 110%

Reference: Method 602.2, Purgeable Aromatics; Federal Register, Vol. 49, No. 209, Oct. 1984.

Comments:

Analyst

Review

APPLIED BIOSCIENCE INC.

Reply To:
1119 Farmington Avenue
Farmington, New Mexico 87
(505) 325-5036
Fax (505) 326-2555

310 W. Texas, Suite 907
Midland, Texas 79701
(915) 685-3311
Fax (915) 684-8746

MICROBIAL TREATMENT SUMMARY

AMOCO PRODUCTION COMPANY -- GCU #162

11/13/95 PHASE I -- Filled 18 upper horizontal vapor extraction lines with microbial solution consisting of 70 lbs. microbes, 36 BBLs biocatalyst and 35 BBLs fresh water, 13-1/4 lbs. micro-nutrients and 3/4 gallon surfactant. Averaged 4 BBLs of solution to each line. See Figure B for exact amounts.

PHASE II -- Made 38 - 46' horizontal injections into the area of contamination with microbial solution consisting of 45 lbs. microbes, 25 BBLs biocatalyst and 25 BBLs fresh water, 9-1/4 lbs. micro-nutrients and 3/4 gallon surfactant.

11/14/95 -- Made 7 - 46' horizontal injections to finish PHASE II. Used 5 BBLs of microbial solution consisting of 5 lbs. microbes, 3 BBLs biocatalyst and 2 BBLs fresh water, 1 lb. micro-nutrients and 1 pint surfactant. See Figure B(1) for sketch of horizontal injections.

PHASE III -- Made 42 - 19' vertical injections and 8 - 19' diagonal injections in the area around the shop. NOTE: Each hole was entered twice. The first time entered was with only microbial solution. After all holes were made, the hole was entered a second time to inject air and microbial solution.

11/15/95 -- PHASE III continues. Made 100 - 19' vertical injections in the garden area south of the access road. Approximately 80% of the holes were re-entered a second time with air and microbial solution. The remaining 20% could not be re-entered due to sand or cobble rock.

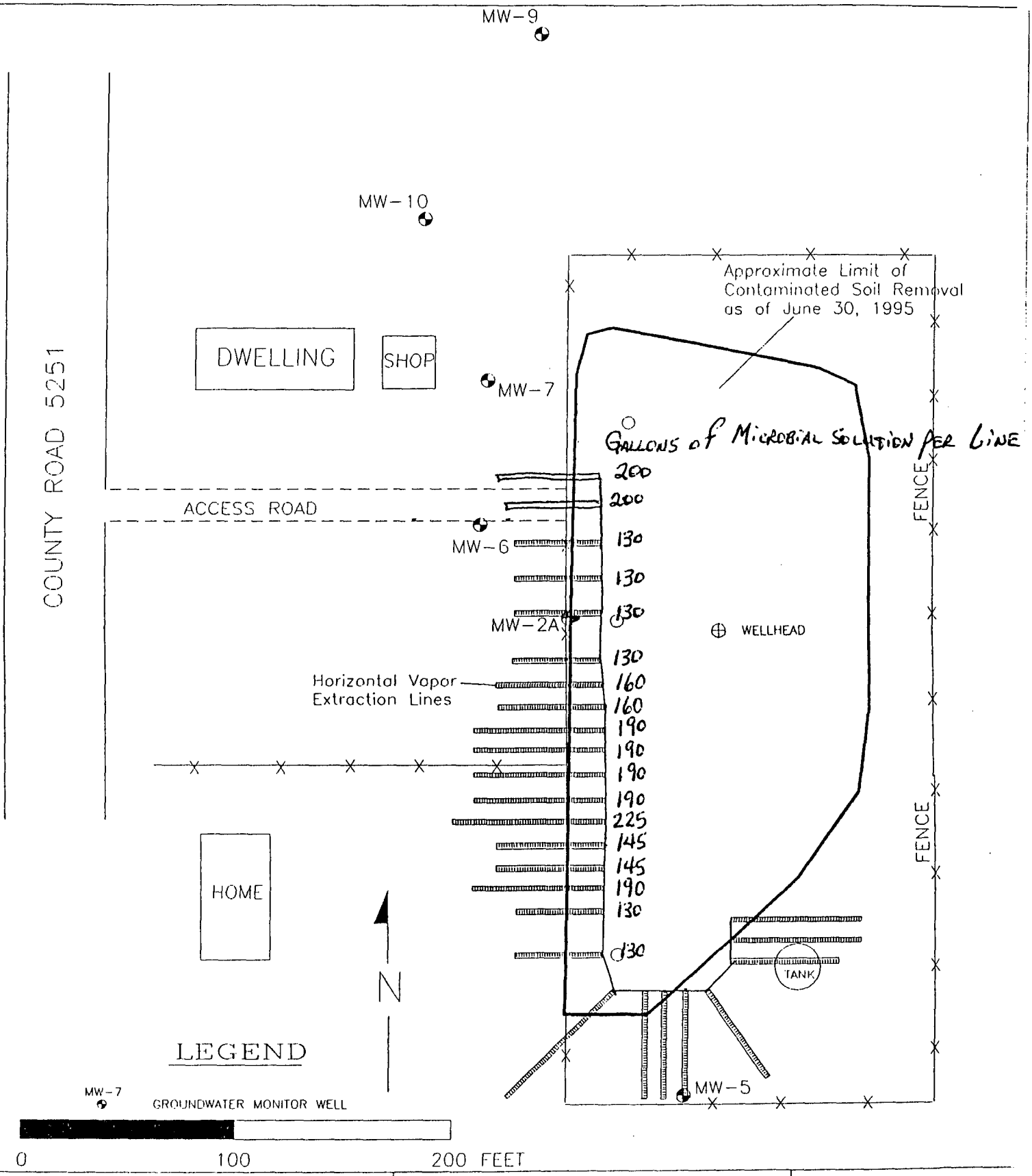
11/16/95 -- PHASE III continues. Made 56 - 19' vertical injections behind the home. Approximately 95% of the holes were re-entered. Also, 55 - 8' vertical injections were made within the fenced area north of the "chicken coop." These holes were not re-entered. A total of 55 BBLs biocatalyst and 30 BBLs fresh water, 80 lbs. microbes, 16 lbs. micro-nutrients and 1-1/2 gallons surfactant were used in PHASE III. Only 5 BBLs of this was used in the 55 - 8' vertical injections.

The balance of 52 BBLs of biocatalyst and fresh water and 10 lbs. of nutrients remaining after finishing PHASE III was pumped into 10 lower horizontal vapor extraction wells. See Figure A.

AMOCO PRODUCTION COMPANY -- GCU #162

Total microbial solution used for the project was:

183 BBLs Alpha biocatalyst
80 BBLs fresh water
200 lbs. Alpha microbes
49-1/2 lbs. Alpha micro-nutrients
3-1/4 gallons Biotek surfactant



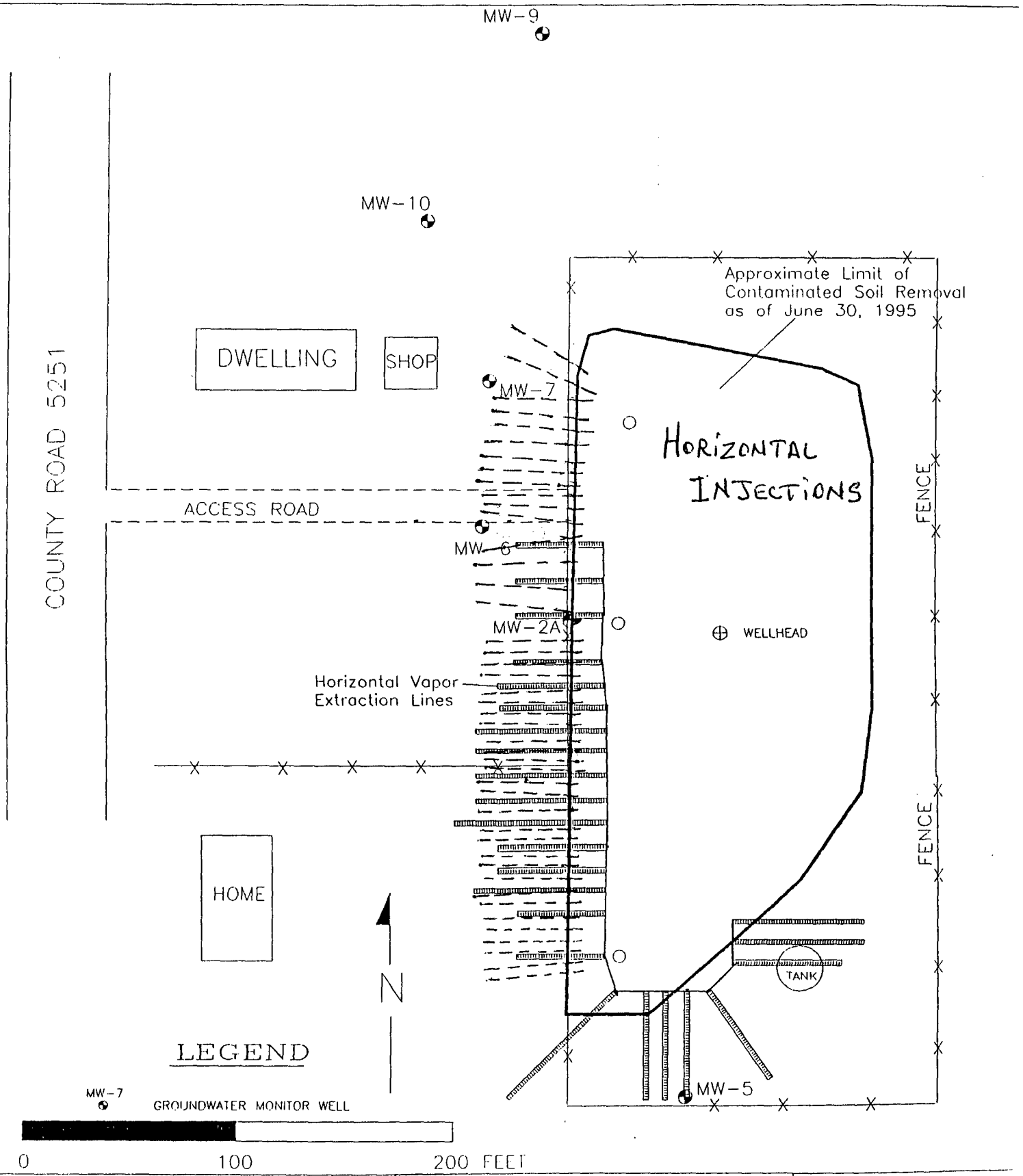
AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

AUGUST, 1995

BLAGG ENGINEERING, INC.
CONSULTING PETROLEUM / RECLAMATION SERVICES
P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413
PHONE: (505) 632-1199

RECLAMATION PLAN
Upper AS-BUILT

FIGURE 8 VAPOR EXTRACTION	DRWN BY: REO
162-VE	PROJ MGR: JCB



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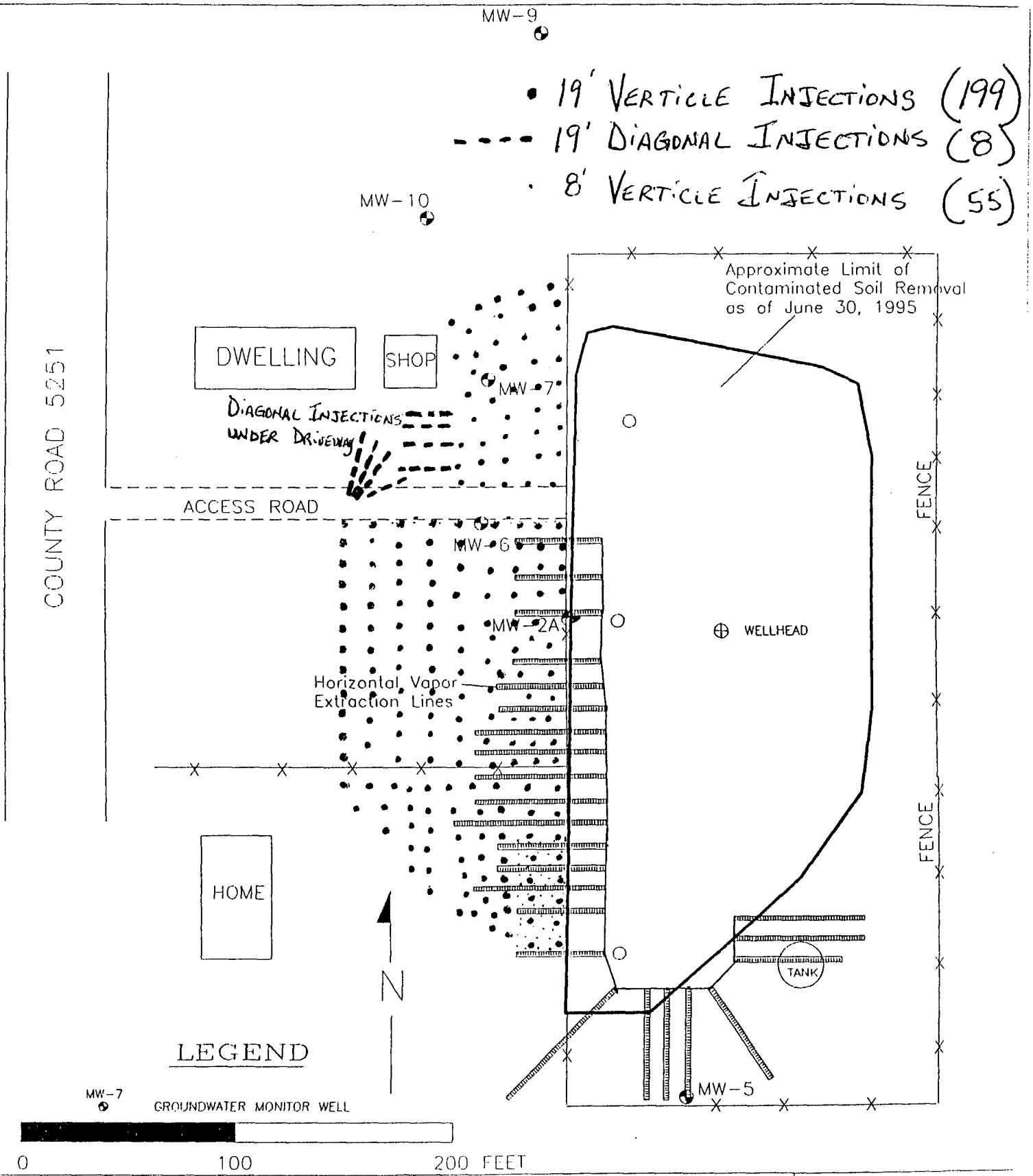
RECLAMATION PLAN
Upper AS-BUILT

FIGURE B(1) VAPOR EXTRACTION	DRWN BY: REO
162-VE	PROJ. MGR: JCB



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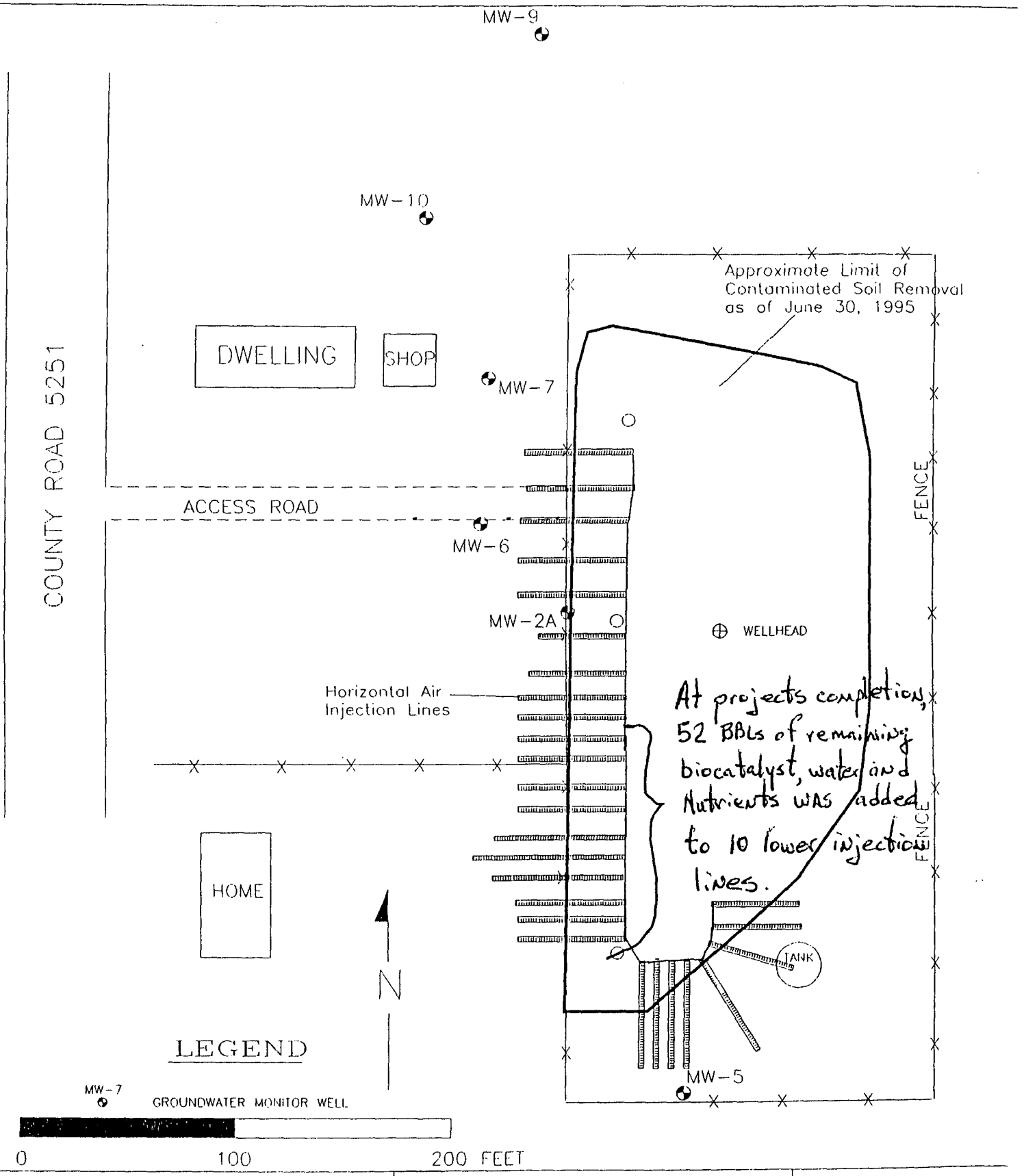
RECLAMATION PLAN
upper AS-BUILT

FIGURE B(2)
VAPOR EXTRACTION

DRWN BY: REO

162-VE

PROJ. MGR. JCB



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RECLAMATION PLA
AS-BUILT
Lower

FIGURE A AIR INJECTION	DRWN BY: REO
162-AI	PROJ. MGR: JCB