HESS CORPORATION
1501 McKinney
Houston, TX 77010

Brian Epperson
Remediation Manager
EHS&SR
Phone: (713) 496-7296
E-Mail: bepperson@hess.com

APPROVED
By Olivia Yu at 12:51 pm, Jun 11, 2018

May 4, 2018

NMOCD approves of the proposed delineation plan for 1RP-4862. Depth to groundwater is estimated to be < 50 bgs.

Ms. Olivia Yu
Environmental Specialist
New Mexico Oil Conservation District
1625 N. French Dr.
Hobbs, New Mexico 88240
VIA: Electronic Submittal Only

Re: Site Assessment Workplan
Former Marathon McGrail
State Tank Battery 1RP-4862
Unit K, Sec 26, T-19S, R-36E, Lea County

Dear Ms. Yu:

Enclosed please find the Site Assessment Workplan for 1RP-4862, Former Marathon McGrail State Tank Battery, located in Monument, New Mexico. The proposed scope of work will be completed upon your approval of this Workplan, and an investigation report will be submitted within the requested timeline.

If you should have any further questions or require additional information, please feel free to contact the undersigned at 713-496-7296.

Sincerely,

Brian Epperson
Remediation Manager

cc: Brad Billings, NMOCD
Rex Meyer, GeoMonitoring Services

FORMER MARATHON MCGRAIL STATE TANK BATTERY 1RP-4862

UNIT LETTER K, SECTION 26, TOWNSHIP 19 SOUTH, RANGE 36 EAST
MONUMENT, LEA COUNTY, NEW MEXICO

SITE ASSESSMENT WORKPLAN

Prepared for:

Hess Corporation
1501 McKinney
Houston, TX 77010

Prepared by:

GMS
GeoMonitoring Services
Environmental Remediation & Consulting

May 4, 2018

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APPENDICES

1.0 INTRODUCTION

The Former Marathon McGrail State Tank Battery (Marathon McGrail or Site) is located west of Monument, New Mexico in southern Lea County. The legal description of the site is Unit Letter K, of Section 26, Township 19 South, and Range 36 East. The Site latitude is 32° 37' 43.86" and longitude is 103° 19' 37.56". The Site was formerly a tank battery that was dismantled and rebuilt in 1994 as a drilling pad for McGrail State Well #3. The State McGrail Well #2 and #3 are currently located in the vicinity of the Marathon McGrail tank battery. A regional location map showing the site location is included as **Figure 1**.

On December 5, 2005, the New Mexico Oil Conservation Division (NMOCD) approved a work plan submitted by Hess Corporation (Hess) to investigate and remediate locations within the North Monument Grayburg San Andres Unit (NMGSAU) that have historical contamination. Efforts to investigate Marathon McGrail began in April 2009 by BBC International; however, it was discovered that the incorrect location was investigated, as detailed in BBC International's (BBC) letter dated April 25, 2014. This letter is found in **Attachment 1.** In a letter dated November 29, 2017, NMOCD concurred that the investigatory work had occurred in a different unit, and any contamination associated with the tank battery not in Unit K is not the responsibility of Hess Corporation. This letter is found in **Attachment 2**.

No known environmental incidents have occurred at the Site; however, the Site is under investigation due to its historical use as a former tank battery. A C-141 form was submitted and approved by NMOCD on November 15, 2017, and remediation case number 1RP-4862 was assigned. According to NMOCD records, the State McGrail Well #1 was spudded in 1936 and completed as an oil well. The State McGrail Well #2 was spudded in 1937 and completed as a gas well. In 1954, the State McGrail Well #1 was converted to a gas well. In 1992, the Marathon McGrail State #2 well was unitized to the Hess NMGSAU Block 8, #11. The Marathon McGrail tank battery site was dismantled in 1994, and the site was rebuilt as a drilling pad for State Well #3 which was spudded in that same year. Additional historical information for the McGrail State wells was provided by BBC in their April 25, 2014 letter, found in **Attachment 2**. On September 11, 2017, GeoMonitoring Services (GMS) conducted an initial site evaluation. Site photographs from this site evaluation are included in **Attachment 3**.

2.0 2017 SOIL SAMPLING ACTIVITIES

An initial site evaluation was conducted on September 11, 2017. Since no known environmental impacts have occurred at the Site, GMS searched for signs of stressed vegetation, weathered hydrocarbon, signs of impacts on wildlife or air quality, or loss of use of the property. Soil samples were collected from six locations that appeared to potentially exhibit stressed vegetation. No other impacts were determined.

Two samples were collected from each location at the surface and from 18 inches below ground surface (bgs). Samples were collected directly into laboratory-provided glassware and placed into a cooler with ice. All collected samples were delivered by GMS to

Cardinal Laboratories in Hobbs, New Mexico. The samples were accompanied by a completed chain of custody and were analyzed for total petroleum hydrocarbons (TPH) for both gasoline range organics (GRO) and diesel range organics (DRO) by EPA Method 8015. The samples were also analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8021 and for chlorides by Method SM4500. All samples met the temperature limits, the correct number of bottles and preservatives for each analysis were utilized, and all samples arrived at the laboratory unbroken, labeled, and usable. All samples were extracted, prepared, and analyzed within the recommended holding times. Sample locations are shown in **Figure 2**. A strong hydrocarbon odor was observed at the location for the sample labeled M-2@surface; however, the odor dissipated with depth for the sample collected at 18 inches bgs. No other hydrocarbon odors were observed at the other sample locations.

2.1 2017 Soil Sampling Results

The soil analytical results are summarized on **Table 1**. BTEX and TPH-GRO were not detected above the laboratory reporting limit. TPH-DRO was detected from M-1@surface with a concentration of 5,260 milligrams per kilogram (mg/kg), and the TPH-DRO concentration decreased to 11 mg/kg at 18 inches bgs. TPH-DRO was detected from M-2@surface with a concentration of 18,600 mg/kg but decreased to 734 mg/kg at 18 inches bgs. The New Mexico Water Quality Control Commission (NM WQCC) standard for Total TPH is 100 mg/kg.

Chloride results ranged from not detected (ND) to 32 mg/kg, which are all below the NM WQCC standard of 500 mg/kg. **Figure 2** provides a summary of the sample locations and analytical results. The laboratory analytical reports are included in **Attachment 4**. This initial sample data will be utilized in determining the investigation area for the site assessment scope of work.

3.0 PROPOSED SITE ASSESSMENT WORKPLAN

3.1 Purpose and Goals

The goal of the initial site visit in September 2017 was to walk the location of the former tank battery and search for any visual indications of environmental impact, such as stressed vegetation or stained surface soils.

The purpose of this Work Plan is to establish an investigation protocol to characterize any historical releases at the Former Marathon McGrail State Tank Battery through achieving the four following goals:

1. Determine the lateral and vertical extents, along with the magnitude, of soil contamination.
2. Determine if groundwater or surface waters have been impacted.
3. If groundwater or surface waters have been impacted, the extents and magnitude of that impact will be determined.

4. Characterize any other adverse impacts that may have historically occurred as a result of operations at the former tank battery.

3.2 Soil Investigation Approach

In order to characterize any releases as a result of historical operations at the former tank battery, the horizontal and vertical extent of soil impact will first be determined. The data gathered from the initial surface samples collected on September 11, 2017 will be utilized in providing a starting point. The location of surface sample M-2 will serve as the center point for the horizontal delineation, and the investigation area will extend out from this point in each of the four cardinal directions. A backhoe will be used to excavate soils to a minimum depth of two feet bgs and a minimum distance of 100 feet in each cardinal direction. The approximate investigation areas are shown in **Figure 3.** The lithologic description of encountered soils will be recorded, and photographic documentation of the location and field activities will be collected.

The soil will be screened with a photo-ionization detector (PID) at intervals of every five feet horizontally and at a depth of two feet bgs. At a minimum, soil samples will be collected for analysis at intervals of 10 feet laterally from the location of M-2. Additional soil samples will be collected based on elevated PID readings and observations of potential impact. Areas exhibiting elevated PID readings or observations of potential impact will be further delineated vertically at a minimum interval of five feet in depth. Horizontal delineation will continue past 100 feet in distance until PID readings and observations of potential impact subside. The soil samples will be analyzed for:

Compound	Analytical Method	NM WQCC Standards	units
Benzene	SW8466 8260B/5030A	100	mg/Kg
Toluene	SW8466 8260B/5030A	None	mg/Kg
Ethylbenzene	SW8466 8260B/5030A	None	mg/Kg
Total Xylenes	SW8466 8260B/5030A	None	mg/Kg
Total BTEX	SW8466 8260B/5030A	50	mg/Kg
TPH (C6 through C36)	Petroleum Hydrocarbons by 8015 GC FID - GRO and DRO Range + MNO	100	mg/Kg
Total Chlorides	SM 300	500	mg/Kg

Samples will be collected directly into laboratory-provided glassware and placed into a cooler with ice. All collected samples will be delivered by GMS to Cardinal Laboratories in Hobbs, New Mexico with a chain of custody. Soil duplicate samples will be collected at a 10% ratio (1 duplicate for every 10 sample locations) and submitted to the laboratory as a blind duplicate sample. The duplicate samples will include the locations that are laterally farthest and vertically deepest. GPS coordinates will be recorded at each sample location. The soil will be backfilled upon completing the excavation in each direction to avoid leaving an open hole.

The laboratory data will be compiled in tables and shown on figures with the sample locations to aid in determining if further delineation is necessary. Lateral and vertical delineation will continue until contaminant concentrations are at or below the NM WQCC standards listed in the table above. At least ten vertical feet of soils with contaminant concentrations at or below these values will be demonstrated as existing above the water table.

3.3 Groundwater Investigation Approach

The depth to groundwater at the site is unknown; however; the two closest wells found on the United States Geological Survey (USGS) database show the depth to groundwater to be greater than 50 feet. Information on the two closest groundwater wells found on the USGS database are provided in **Attachment 5.** If soil impacts are encountered at 50 feet bgs or greater, a groundwater investigation workplan will be submitted. That workplan will include a proposal for installation of monitoring wells, groundwater sampling for volatile organic compounds, sulfates, total chlorides, total dissolved solids, pH, dissolved iron, and dissolved manganese.

4.0 REPORTING

The proposed scope of work will be completed upon approval of this Work Plan, and an investigation report will be submitted within the requested timeline by NMOCD. The investigation report will include a summary of completed field activities and will be accompanied by site maps displaying the excavated area and sample locations. Digital photographic documentation of the location and fieldwork will also be provided.

TABLES

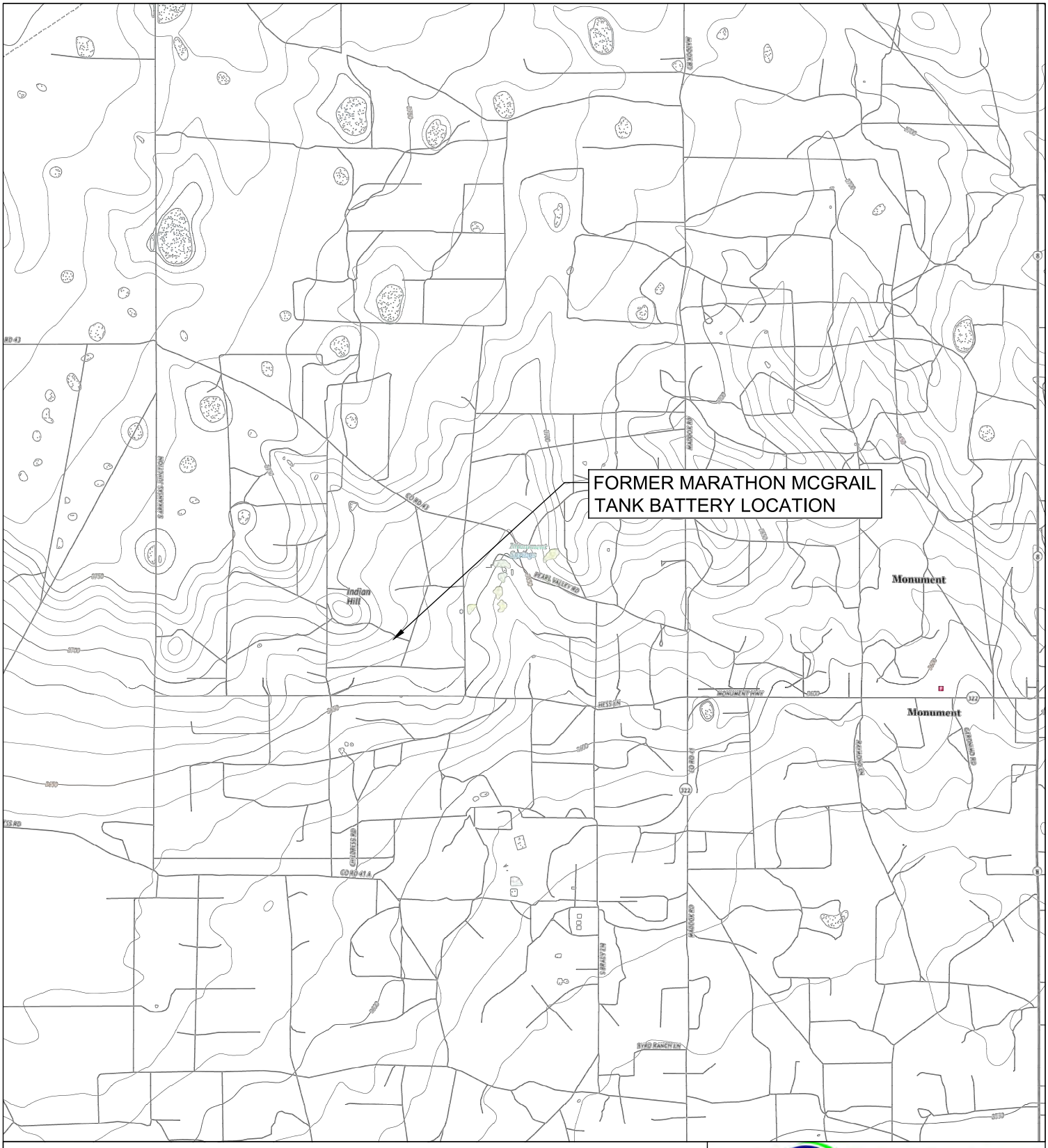
Table 1
Summary of Soil Laboratory Results
BTEX, TPH, Chloride
Former Marathon McGrail State Tank Battery, Monument, NM

Sample Identification	Date Sampled	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (ng/kg)	Xylenes (mg/kg)	Total BTEX (mg/kg)	TPH-GRO (C6-C10) (mg/kg)	TPH-DRO (C10-C28) (mg/kg)	Total TPH (mg/kg)	Chloride (mg/kg)
NM WQCC Standards:		100	NONE	NONE	NONE	50	NONE	NONE	100	500
M-1 @surface	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<100	5260	**5260**	32
M-1 @18"	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	11.0	11	16
M-2 @surface	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<100	18,600	**18,600**	<16
M-2 @18"	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<50	734	**734**	16
M-3 @surface	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	<16
M-3 @18"	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	<16
M-4 @surface	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	16
M-4 @18"	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	32
M-5 @surface	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	32
M-5 @18"	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	32
M-6 @surface	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	16
M-6 @18"	9/11/2017	<0.05	<0.05	<0.05	<0.15	<0.3	<10	<10	ND	16

NOTE:
BTEX = Benzene, Toluene, Ethylbenzene, Total Xylenes
TPH = Total Petroleum Hydrocarbons
TPH-GRO = Total Petroleum Hydrocarbons Gasoline Range Organics
TPH-DRO = Total Petroleum Hydrocarbons Diesel Range Organics
NM WQCC = New Mexico Water Quality Control Commission
ND = Not Detected
mg/kg - milligrams per kilogram
NONE = no NM WQCC Standard for this constituent
BOLD values exceed NM WQCC standards

GeoMonitoring Services

FIGURES



N

0 2000 4000 8000

APPROXIMATE SCALE IN FEET

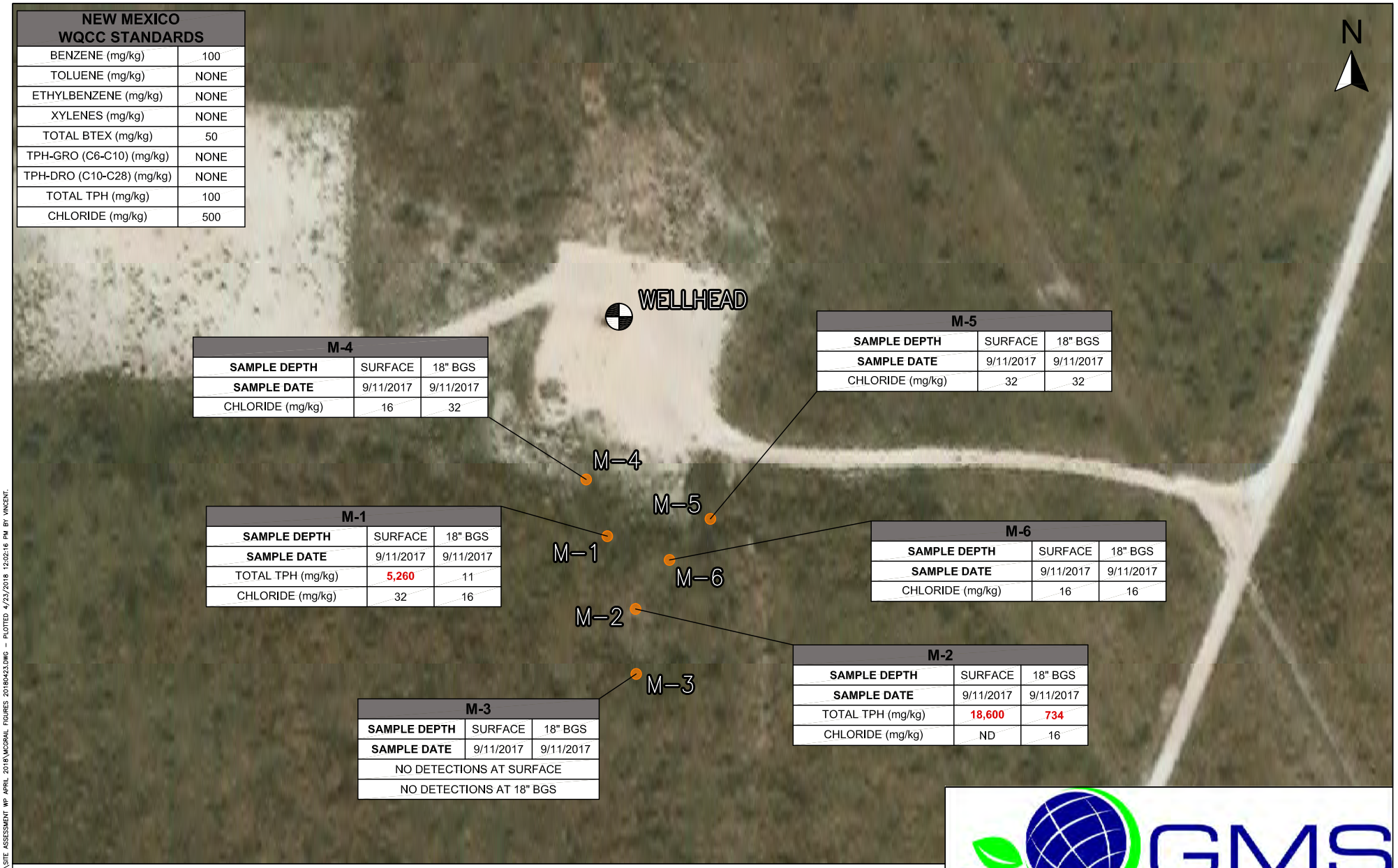
MAP SOURCE: USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP – NONUMENT NORTH QUADRANGLE (2017)

GMS
GeoMonitoring Services
Environmental Remediation & Consulting

FIGURE 1
FORMER TANK BATTERY LOCATION MAP
FORMER MARATHON MCGRAIL STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

DRAWN BY: VMW	DATE: 04/23/18	PROJECT NO: HESS E&P

XYZ:ES - MONUMENT SITES\AUTOCAD FILES\MARATHON MCGRAIL\SITE ASSESSMENT MP APRIL 2018\FIGURE 1 - MCGRAIL SITE LOCATION.DWG - PLOTTED: 4/23/2018 11:40:50 AM BY VMCERT.



NEW MEXICO WQCC STANDARDS	
BENZENE (mg/kg)	100
TOLUENE (mg/kg)	NONE
ETHYLBENZENE (mg/kg)	NONE
XYLENES (mg/kg)	NONE
TOTAL BTEX (mg/kg)	50
TPH-GRO (C6-C10) (mg/kg)	NONE
TPH-DRO (C10-C28) (mg/kg)	NONE
TOTAL TPH (mg/kg)	100
CHLORIDE (mg/kg)	500

M-4		
SAMPLE DEPTH	SURFACE	18" BGS
SAMPLE DATE	9/11/2017	9/11/2017
CHLORIDE (mg/kg)	16	32

M-5		
SAMPLE DEPTH	SURFACE	18" BGS
SAMPLE DATE	9/11/2017	9/11/2017
CHLORIDE (mg/kg)	32	32

M-1		
SAMPLE DEPTH	SURFACE	18" BGS
SAMPLE DATE	9/11/2017	9/11/2017
TOTAL TPH (mg/kg)	5,260	11
CHLORIDE (mg/kg)	32	16

M-6		
SAMPLE DEPTH	SURFACE	18" BGS
SAMPLE DATE	9/11/2017	9/11/2017
CHLORIDE (mg/kg)	16	16

M-2		
SAMPLE DEPTH	SURFACE	18" BGS
SAMPLE DATE	9/11/2017	9/11/2017
TOTAL TPH (mg/kg)	18,600	734
CHLORIDE (mg/kg)	ND	16

M-3		
SAMPLE DEPTH	SURFACE	18" BGS
SAMPLE DATE	9/11/2017	9/11/2017
NO DETECTIONS AT SURFACE		
NO DETECTIONS AT 18" BGS		

LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION

NOTES:
1. AERIAL SOURCE – USGS IMAGEPATCH.COM © MICROSOFT CORPORATION
2. FOR EACH SOIL BORING, ONLY DETECTED ANALYTICAL DATA IS SHOWN. CONSTITUENTS THAT WERE NOT DETECTED ARE NOT SHOWN.

0 50 100 200
APPROXIMATE SCALE IN FEET

GMS GeoMonitoring Services
Environmental Remediation & Consulting

FIGURE 2
INITIAL SOIL SAMPLE ANALYTICAL RESULTS
FORMER MARATHON MCGRAIL STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

DRAWN BY: VMW	DATE: 04/23/18	PROJECT NO: HESS E&P

X:\HESS – MONUMENT SITES\AUTOCAD FILES\MARATHON MCGRAIL\SITE ASSESSMENT WP APRIL 2018\MCGRAIL FIGURES 20180423.DWG – PLOTTED 4/23/2018 12:02:16 PM BY VINCENT.

LEGEND

- GAS WELL (API # 30-025-32579)
- SOIL BORING LOCATION
- PROPOSED SOIL EXCAVATION AREA

0 30 60 120

APPROXIMATE SCALE IN FEET

NOTES:
1. AERIAL SOURCE – USGS IMAGEPATCH.COM © MICROSOFT CORPORATION
2. FOR EACH SOIL BORING, ONLY DETECTED ANALYTICAL DATA IS SHOWN. CONSTITUENTS THAT WERE NOT DETECTED ARE NOT SHOWN.

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FIGURE 3
PROPOSED SOIL EXCAVATION AREA
FORMER MARATHON MCGRAIL STATE TANK BATTERY
LEA COUNTY, NEW MEXICO

DRAWN BY: VMW	DATE: 04/26/18	PROJECT NO: HESS E&P

X:\HESS - MONUMENT SITES\AUTOCAD FILES\MARATHON MCGRAIL\SITE ASSESSMENT WP APRIL 2018\MCGRAIL FIGURES 20180423.DWG - PLOTTED 4/27/2018 10:08:12 AM BY VINCENT.

ATTACHMENT 1
APRIL 25, 2014 BBC INTERNATIONAL LETTER

WORLD-WIDE ENVIRONMENTAL SPECIALISTS

BBC INTERNATIONAL
INCORPORATED

PHONE (575) 397-6388 • FAX (575) 397- 0397 • 1324 W. MARLAND • P.O. BOX 805 • HOBBS, NM 88241-0805
E-MAIL: cbrunson@bbcinternational.com

April 25, 2014

Jim Griswold
New Mexico Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, New Mexico 87505

RE: Former Marathon McGrail State Tank Battery, Monument, NM
Unit Letter K, Section 26, Township 19S, Range 36E, Lea County

Dear Mr. Griswold:

The purpose of this report is to present information that the Former Marathon McGrail State Tank Battery Site near Monument, NM that Hess Corp. conducted a site investigation in April 2009 is not the correct location of the actual Marathon McGrail State Tank Battery that was incorporated into the formation of the North Monument Grayburg San Andres Unit (NMGSAU) in 1992.

As you may recall, this site was discussed with you in both e-mail and report correspondence on February 19 and 24, 2010 and March 22, 2010. In addition, on March 22, 2010, we had a meeting discussing this site in the NMOCD's office in Santa Fe. At that time, Hess believed that the location that had been assessed was the correct location for the former battery site based on instructions from a former Hess employee. For discussion purposes, the assessed site will be referred to as the Unknown Battery site going forward.

Upon further investigation and interviews with other personnel familiar with the field operations of the NMGSAU, it has been determined that the assessed Unknown Battery site is the incorrect location of the former Marathon McGrail State Tank Battery.

BBC personnel conducted a field visit with a former Hess field foreman and current Apache foreman and a former Marathon field operations employee that had direct knowledge of the field operations and where the actual Marathon McGrail State Tank Battery had been located within the NMGSAU.

These gentlemen confirmed that the Marathon McGrail State Tank Battery had been located north of the Unknown Battery site that had been assessed. The Former Marathon McGrail State Tank Battery had been dismantled and the battery site was rebuilt as a drilling pad location for the current McGrail State #3 well in 1994. The former Marathon employee had direct experience with the dismantling of the battery so he was very knowledgeable about the location of the actual battery site.

A review of historical aerial photographs was conducted and the photographs are included in Appendix I of this report. A review of available well records from the NMOCD was conducted and the information and timeline is included in Appendix II.

The historical aerial photographs located in Appendix I have been overlaid with labels depicting the locations of the both the Former Marathon McGrail State Tank Battery and the Unknown Battery site along with the wells that are located in the McGrail lease.

The review of the information included in this report does not identify the correct name or operator of the Unknown Battery site that was incorrectly assessed by Hess.

In conclusion, Hess assessed the incorrect battery site based on faulty information. This Unknown Battery site was not included in the NMGSAU unitization; therefore, this site is not the responsibility of any further action from Hess. Therefore, Hess respectfully requests an acknowledgement from the NMOCD that Hess is no longer responsible for the Unknown Battery site.

Sincerely,

BBC International, Inc.

Cliff P. Brunson
President

cpb/jg

WORLD-WIDE ENVIRONMENTAL SPECIALISTS

BBC INTERNATIONAL
INCORPORATED

PHONE (575) 397-6388 • FAX (575) 397- 0397 • 1324 W. MARLAND • P.O. BOX 805 • HOBBS, NM 88241-0805
E-MAIL: cbrunson@bbcinternational.com

Monument Batteries

Update: April 29, 2014

SHELL STATE A BATTERY 57: Remediation Completed December 2013

Final report submitted to the NMOCD.

AHC WEIR BATTERY: Remediation Completed January 2014

Final report submitted to the NMOCD.

FORMER MARATHON McGRAIL STATE TANK BATTERY:

This former tank battery site was initially identified by former Hess personnel as a battery that was formed into the NMGSAU unit. The site was delineated and the NMOCD was notified of ground water impact in 2010. Upon further review of records and other former Hess personnel with knowledge of the location of the McGrail Battery that was put into the NMGSAU unit, it appears that this location is the wrong battery site. Therefore, Hess has decided to notify the NMOCD that this site is not Hess' responsibility to remediate. A draft report has been created for Hess review and approval then it will be sent to the NMOCD in Santa Fe.

TEXACO STATE E BATTERY #79: Remediation Plan approved April 25, 2014

MOBIL STATE A-1 BATTERY #77: Remediation Plan approved April 25, 2014

AHC STATE G BATTERY 4 (PIT AREA):

The tank battery was remediated in 2010. The pit area has a groundwater monitoring well installed in it that has measureable hydrocarbons. A soil remediation plan needs to be created and submitted to the NMOCD for approval.

Historical Information – Marathon McGrail

1936 – NMOCD Records - Spudded - State McGrail Well #1 (Oil Well)

1937 – NMOCD Records - Spudded – State McGrail Well #2

1942 – NMOCD Records - State McGrail #2 – Shut in as a gas well only

1949 – Aerial Photo – State McGrail Well #1, State McGrail Well #2, Unknown Battery

1954 - NMOCD Records - Converted State McGrail Well #1 to Gas Well, Converted State McGrail Well #2 to Oil Well

1966 – Aerial Photo – State McGrail Well #1, State McGrail Well #2, McGrail Battery, Unknown Battery appears abandoned

1975 – Aerial Photo – State McGrail Well #1, State McGrail Well #2, McGrail Battery, Unknown Battery appears abandoned

1978 – Aerial Photo – State McGrail Well #1, State McGrail Well #2, McGrail Battery, Unknown Battery appears abandoned

1986 – Aerial Photo – State McGrail Well #1, State McGrail Well #2, McGrail Battery, Unknown Battery appears abandoned

1992 – NMOCD Records – Marathon McGrail State #2 unitized to Hess NMGSAU Blk. 8, #11

1994 – NMOCD Records - Spudded date – McGrail State Well #3

1996 – NMOCD Records - Spudded date – McGrail State Well #9, McGrail State Well #10

1997 – Aerial Photo – State McGrail Well #1, NMGSAU Blk. 8, #11 (State McGrail Well #2), McGrail State #3, McGrail State #9, McGrail State #10, McGrail Battery, Unknown Battery appears abandoned

2004 – Aerial Photo – State McGrail Well #1, NMGSAU Blk. 8, #11 (State McGrail Well #2), McGrail State #3, McGrail State #9, McGrail State #10, McGrail Battery, Unknown Battery appears abandoned

2005 – Aerial Photo – State McGrail Well #1, NMGSAU Blk. 8, #11 (State McGrail Well #2), McGrail State #3, McGrail State #9, McGrail State #10, McGrail Battery, Unknown Battery appears abandoned

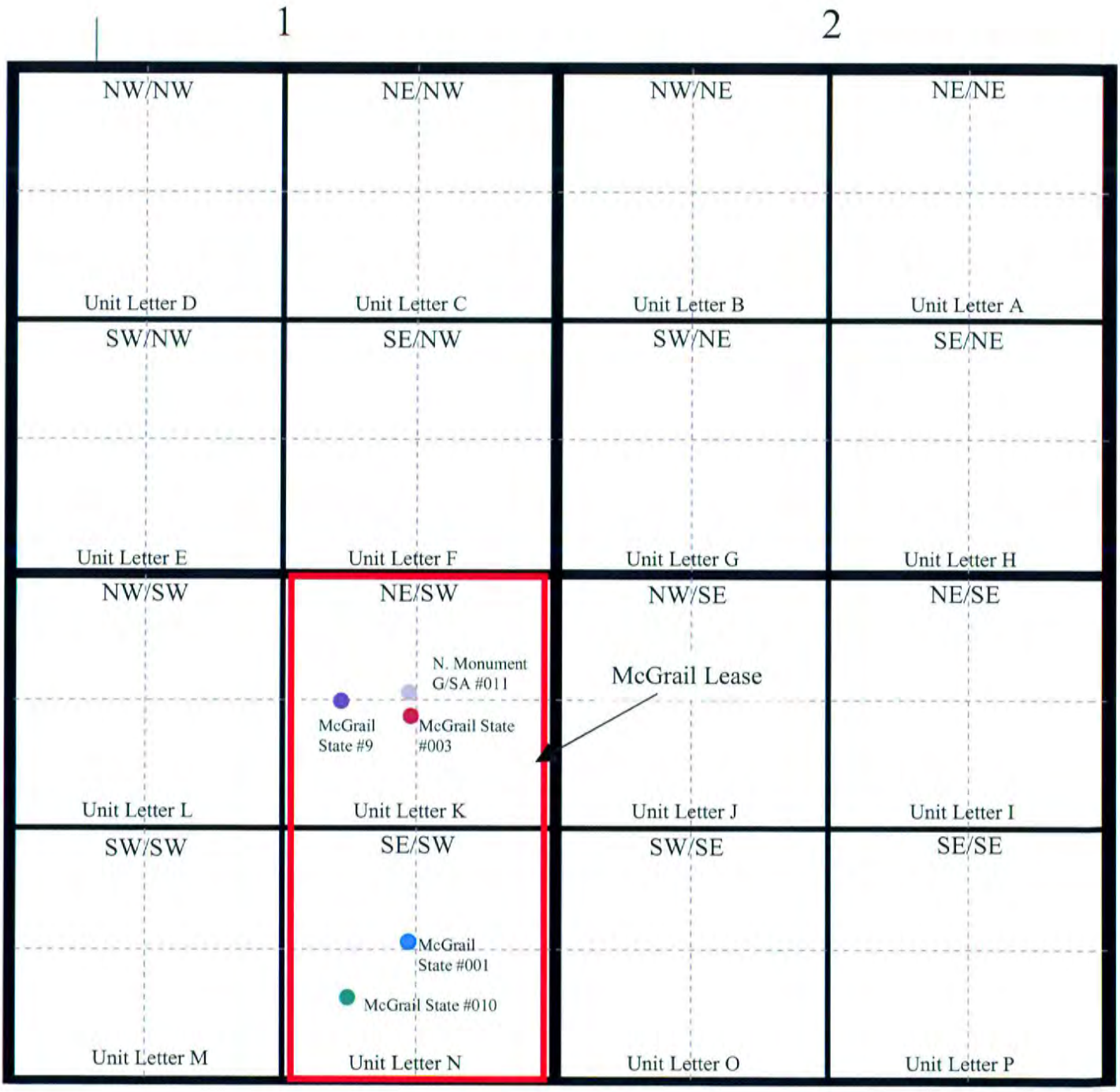
2008 – NMOCD Records - P&A – McGrail State Well #1 - 9-4-08

2009 – Aerial Photo – NMGSAU Blk. 8, #11 (State McGrail Well #2), McGrail State #3, McGrail State #9, McGrail State #10, McGrail Battery, Unknown Battery appears abandoned

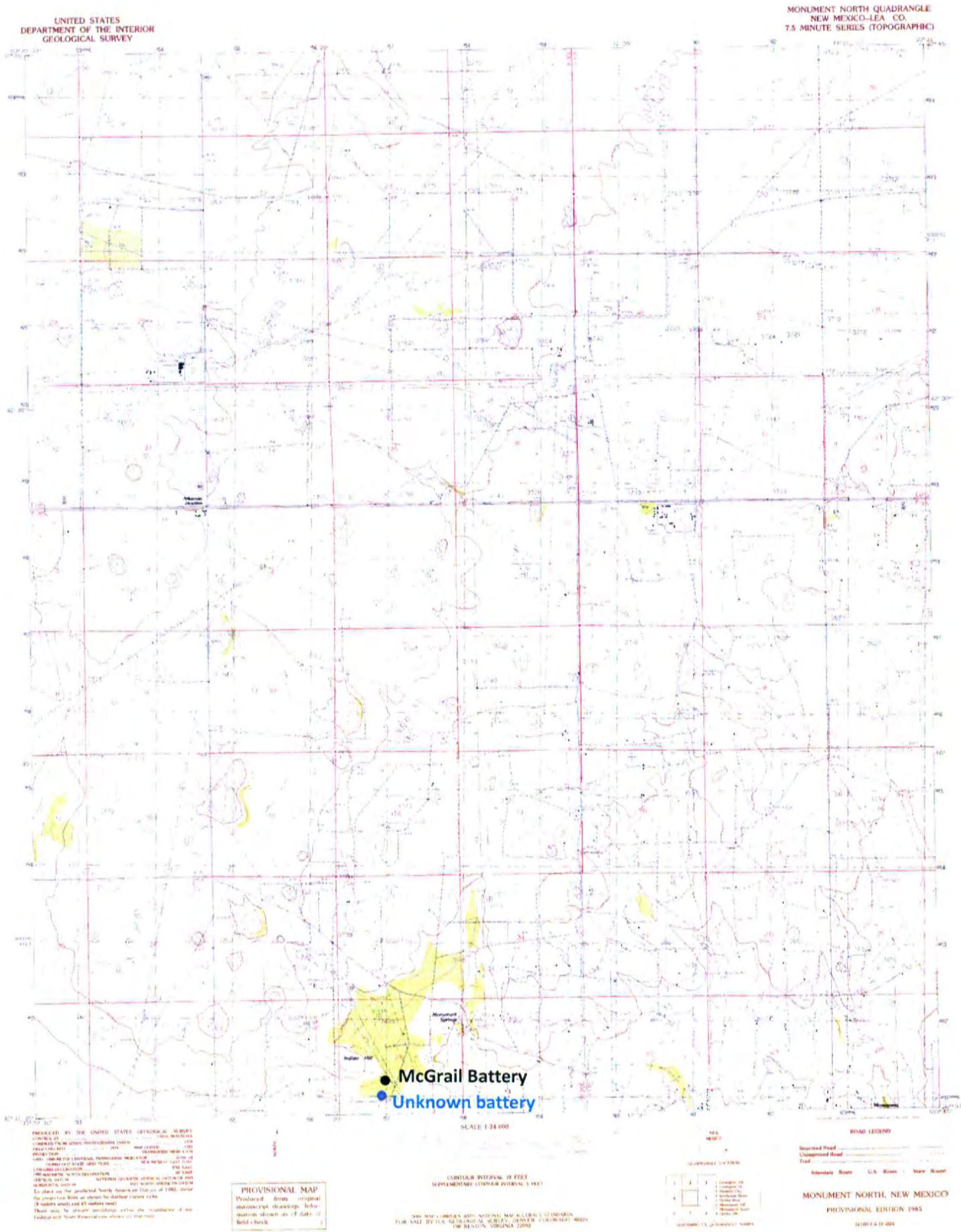
2011 – Aerial Photo – NMGSAU Blk. 8, #11 (State McGrail Well #2), McGrail State #3, McGrail State #9, McGrail State #10, McGrail Battery, Unknown Battery appears abandoned

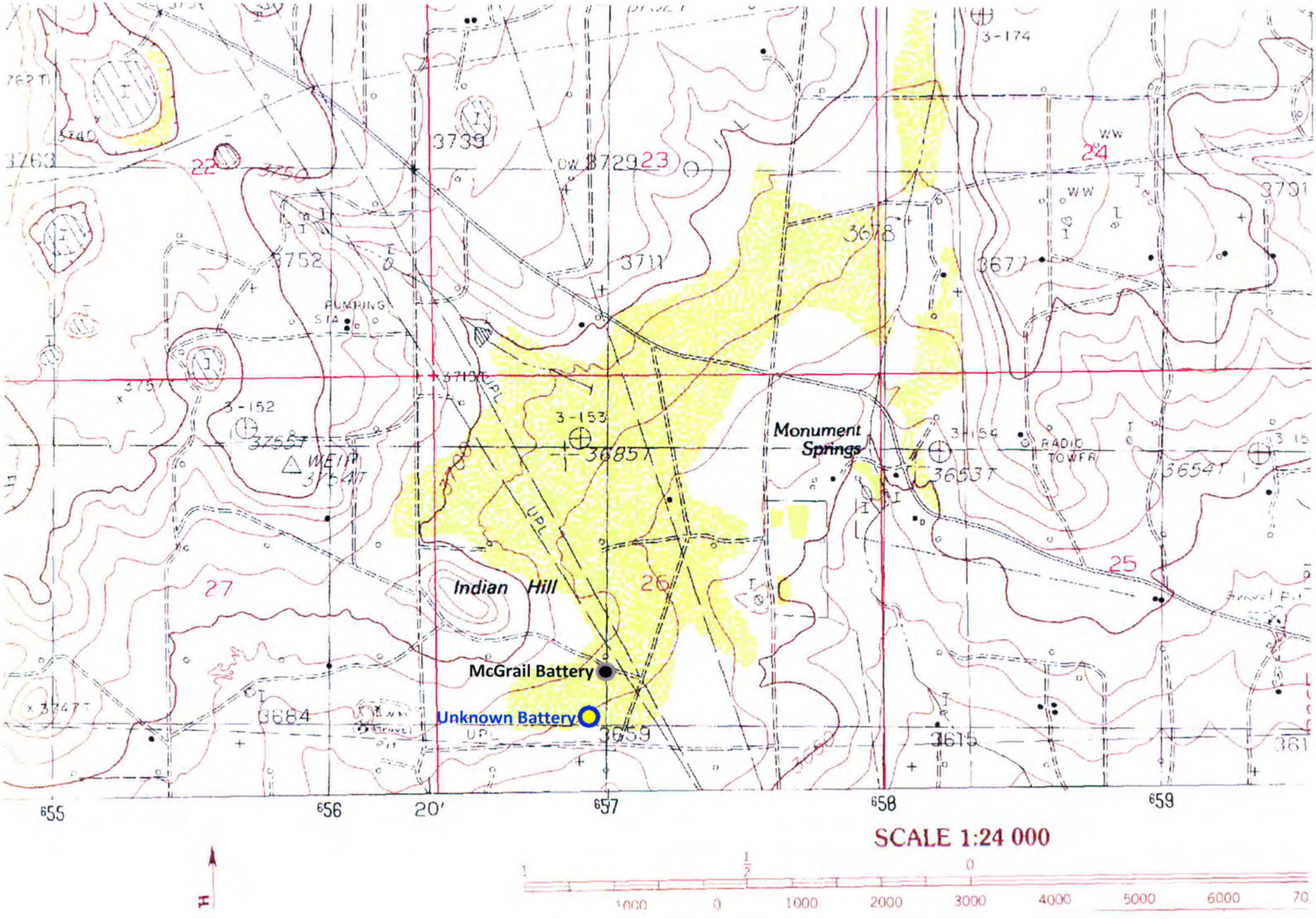
2011 – NMOCD Records - P&A - NMGSAU Blk. 8, #11 - 4-27-11

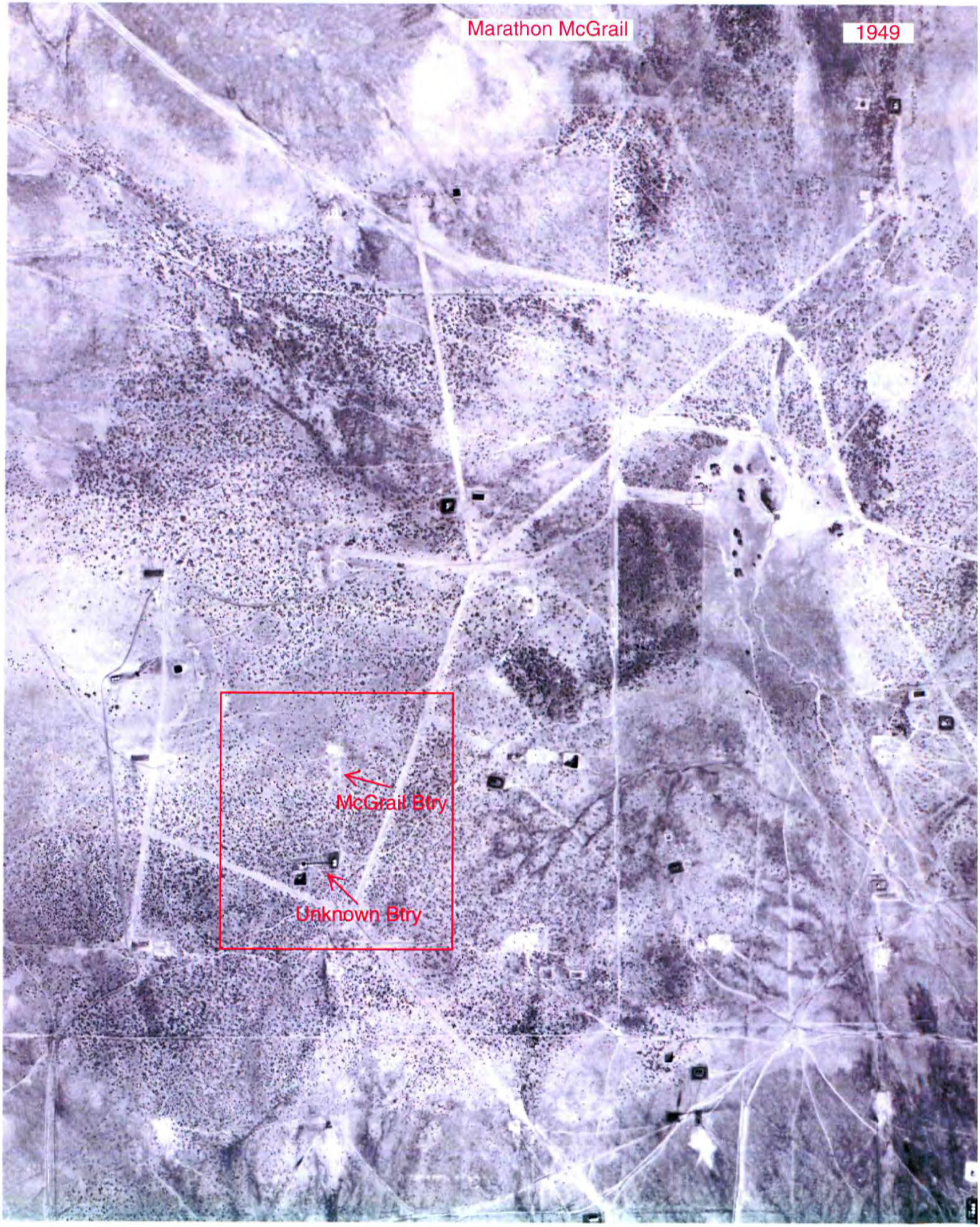
McGrail Well Locations in Section 26, Township 19S, Range 36E

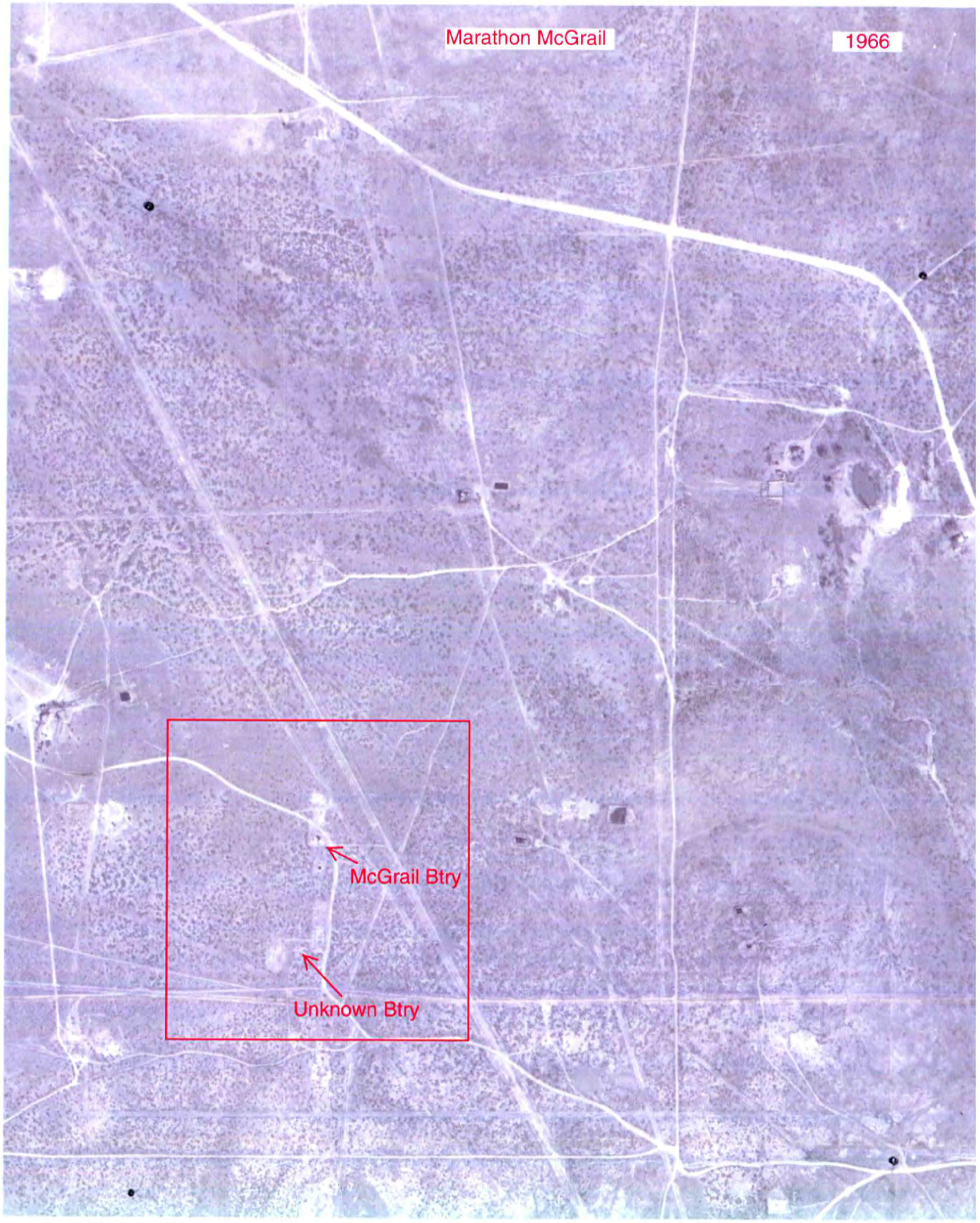


Original Oil Co.	The Ohio Oil Co.	The Ohio Oil Co.	Marathon Oil Co.	Marathon Oil Co.	Marathon Oil Co.
Spud date	8-29-1936	2-22-1937	8-20-1994	10-15-1996	12-14-1996
Original well name	State McGrail #1	State McGrail #2	McGrail State #3	McGrail State #9	McGrail State #10
Current Oil Co.	Marathon Oil Co.	Apache Corp.	Apache Corp.	Apache Corp.	Apache Corp.
Current well name	McGrail State #1	NMGSA Unit, Blk 08 #11	McGrail State #3	McGrail State #9	McGrail State #10
P&A Date	9-4-2008	4-27-11	-------	------	------


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MONUMENT NORTH QUADRANGLE
NEW MEXICO—LEA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
McGrail Battery
Unknown battery
SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
SUPPLEMENTARY CONTOUR INTERVAL 5 FEET
PROVISIONAL MAP
ROAD LEGEND
MONUMENT NORTH, NEW MEXICO
PROVISIONAL EDITION 1985


Monument Springs
Indian Hill
McGrail Battery
Unknown Battery
RADIO TOWER
PUMPING STA
WEIR
3-152
3-153
3-154
3-174
3739
3729
3752
3711
3678
3677
3791
3755
3685
3653
3654
3684
3659
3615
3747
655
656
20'
657
658
659
SCALE 1:24 000
1000
0
1000
2000
3000
4000
5000
6000


Marathon McGrail
1949
McGrail Btry
Unknown Btry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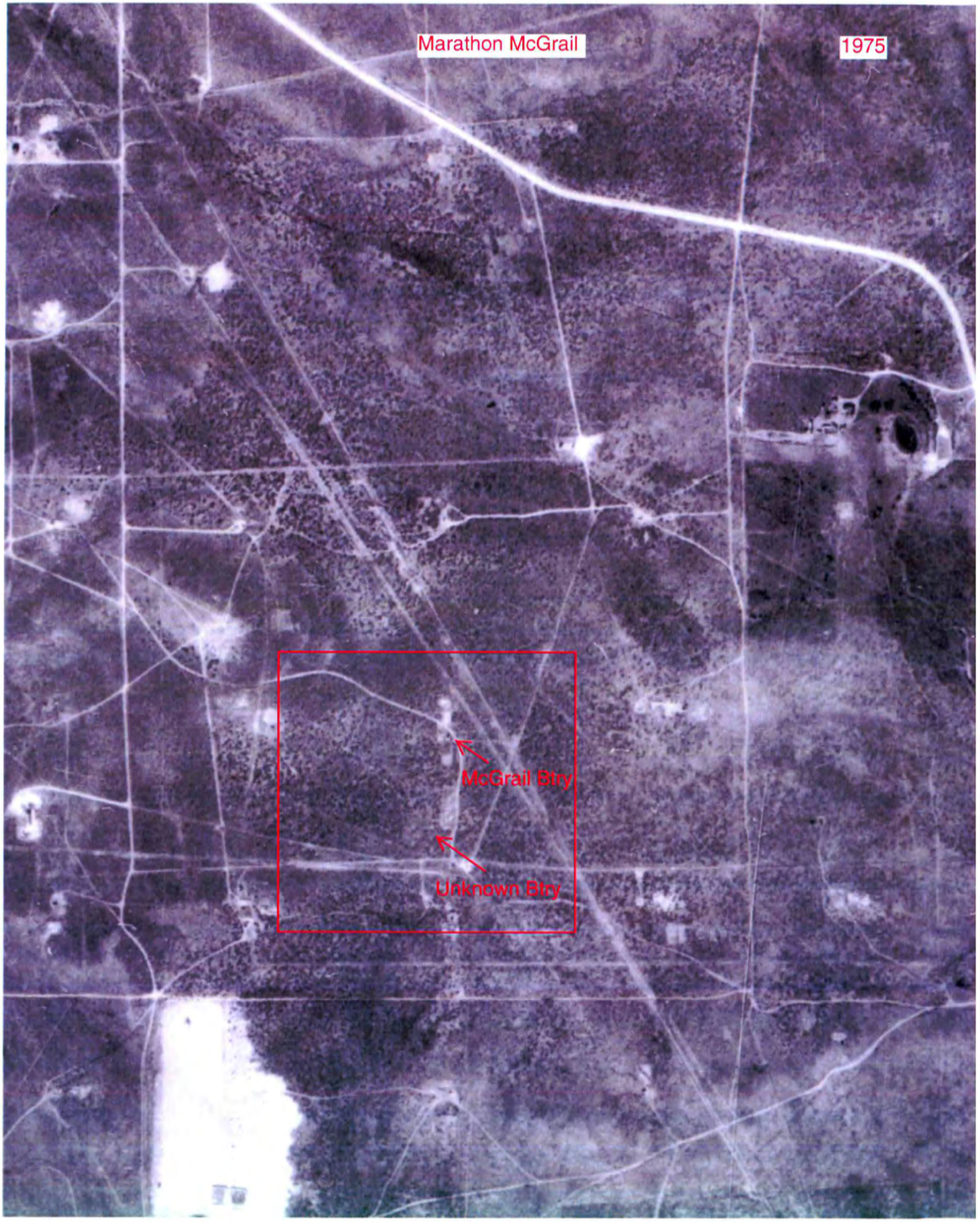
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1975
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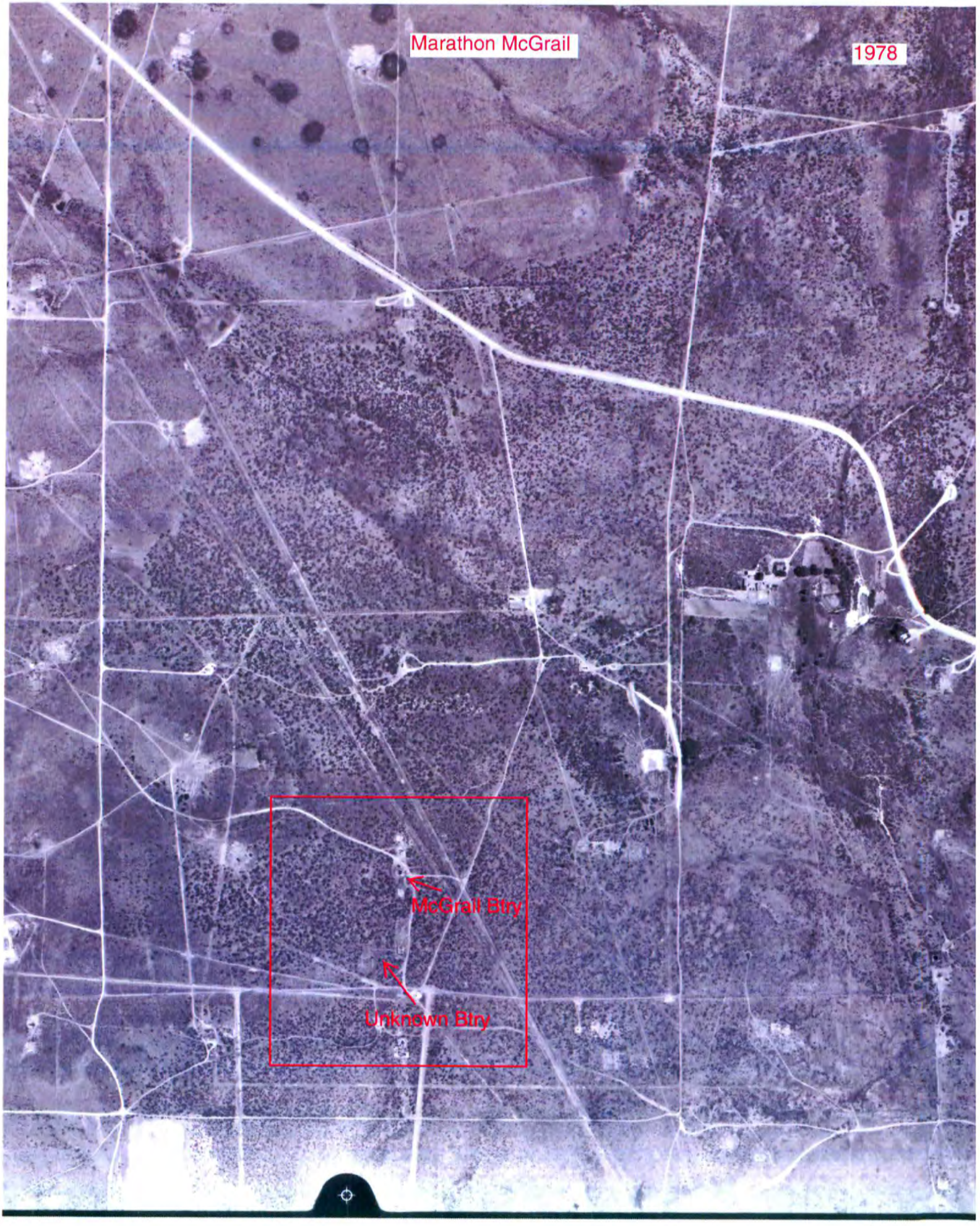
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1978
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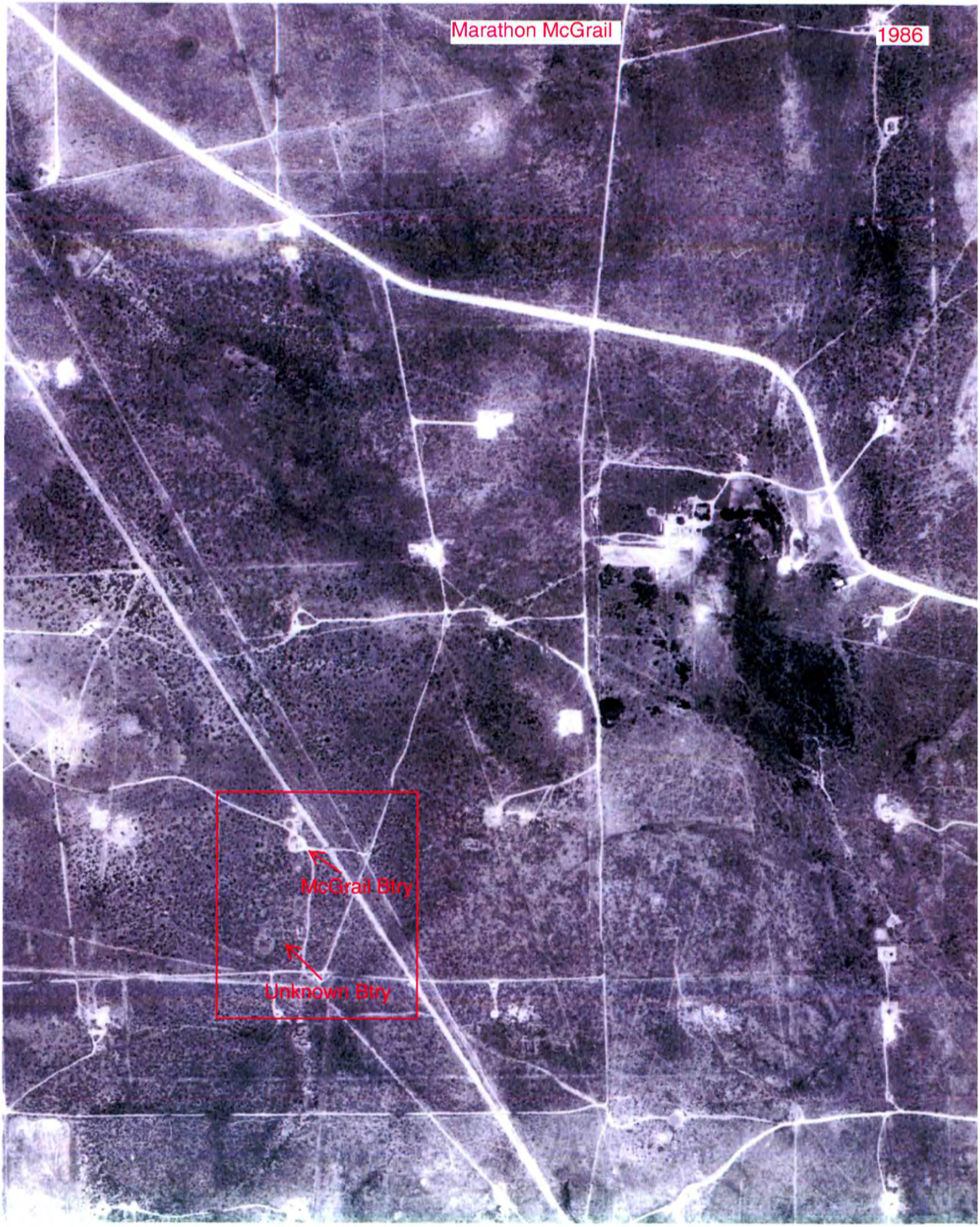
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1986
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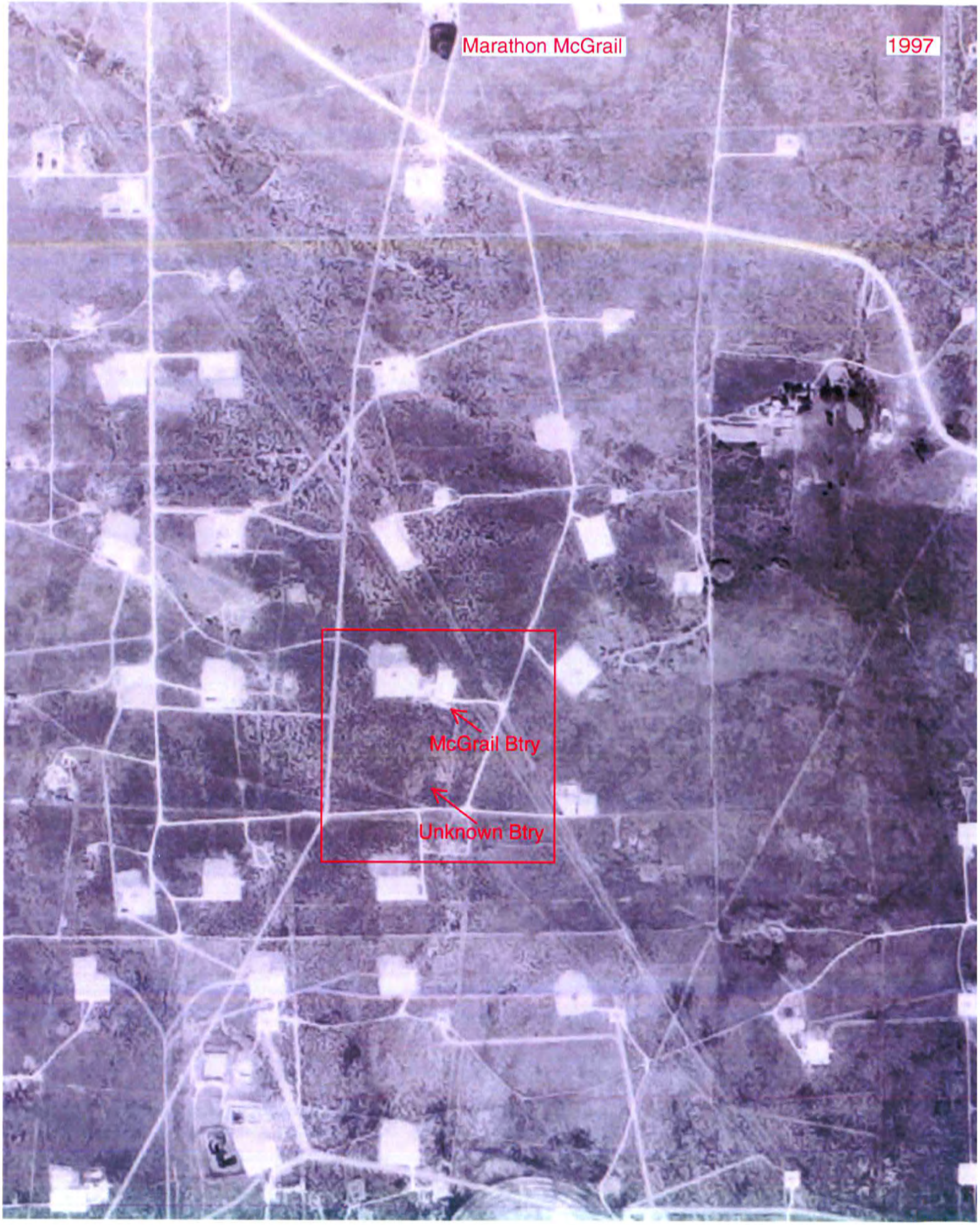
Marathon McGrail
1997
McGrail Btry
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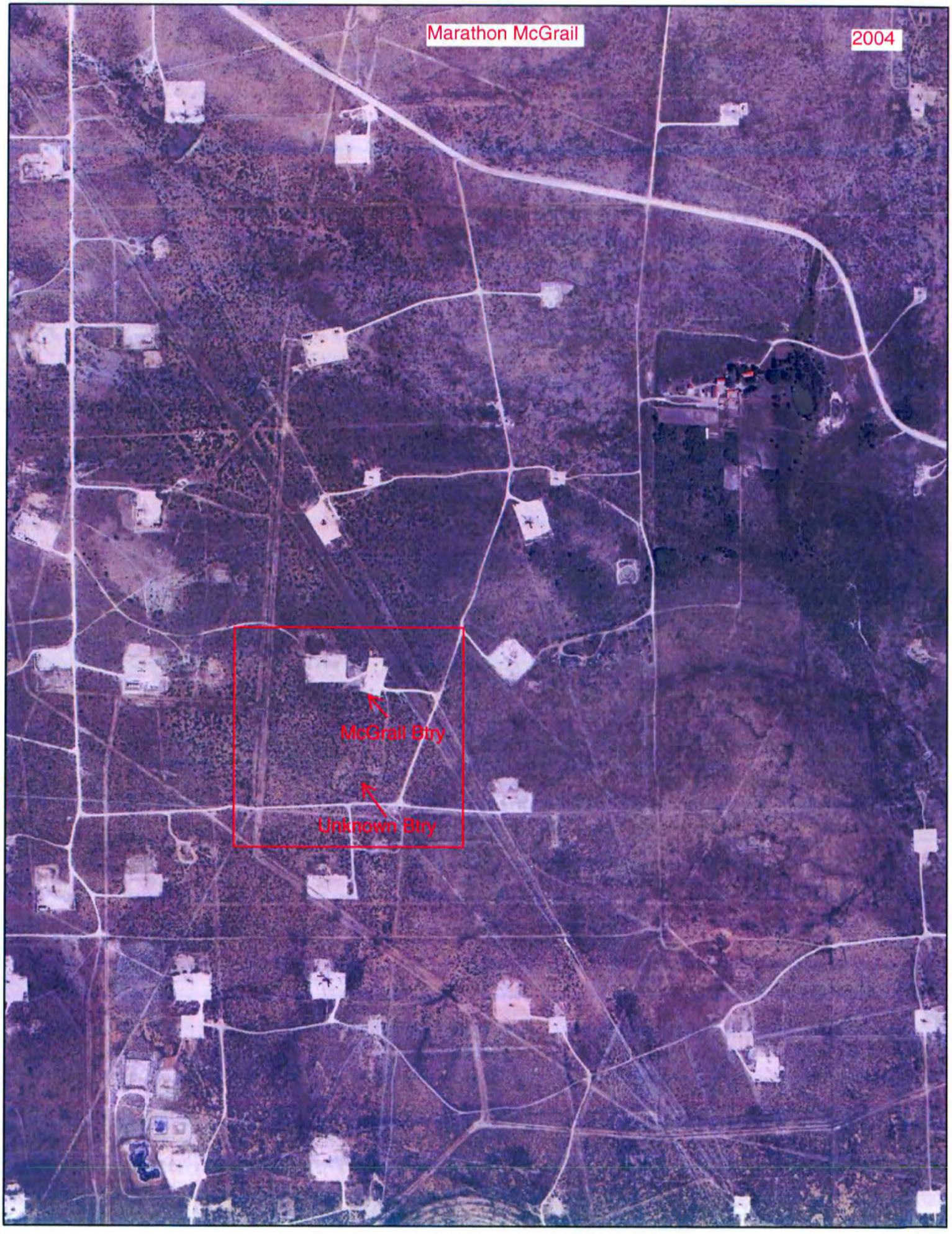
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2004
McGrail Btry
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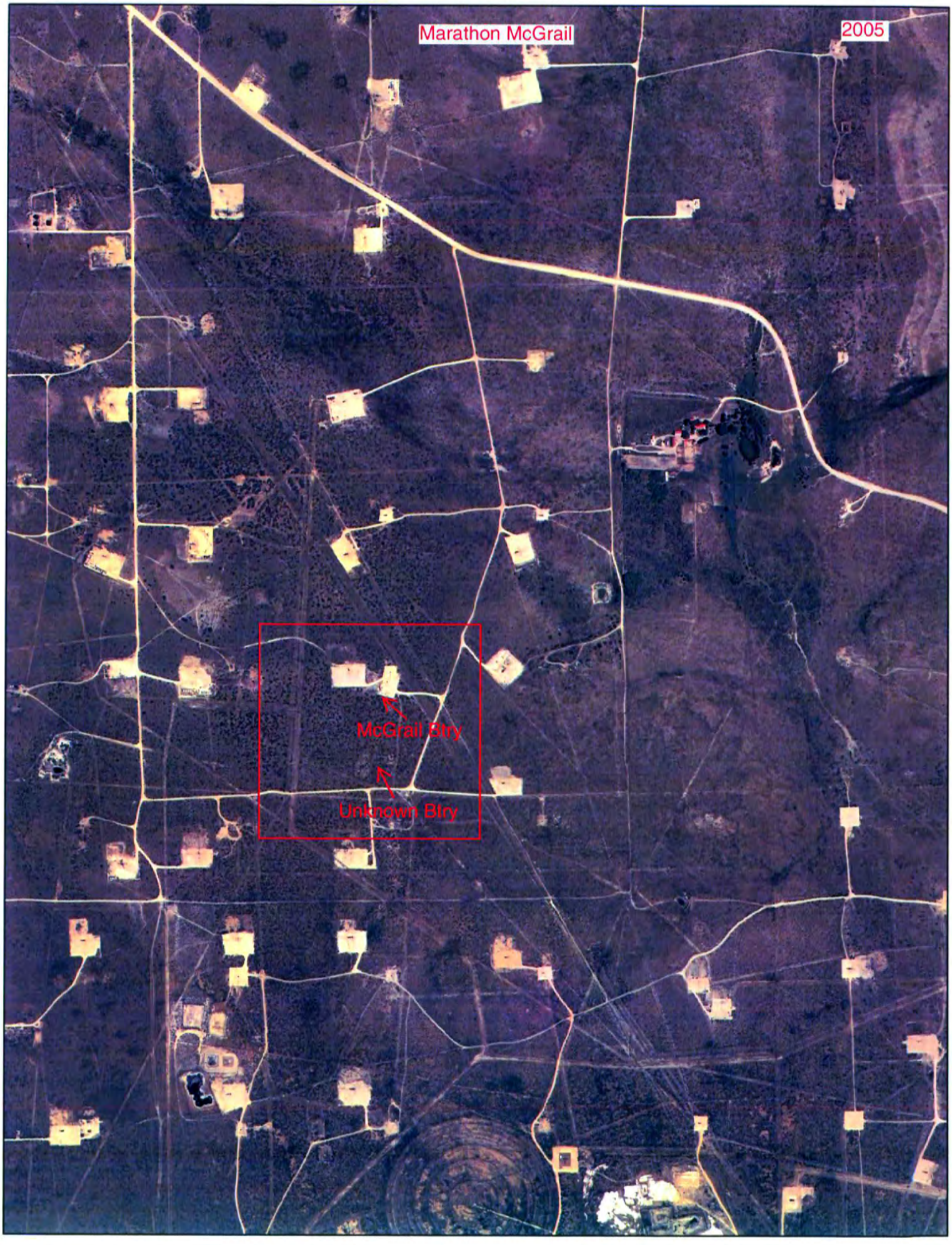
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2005
McGrail Btry
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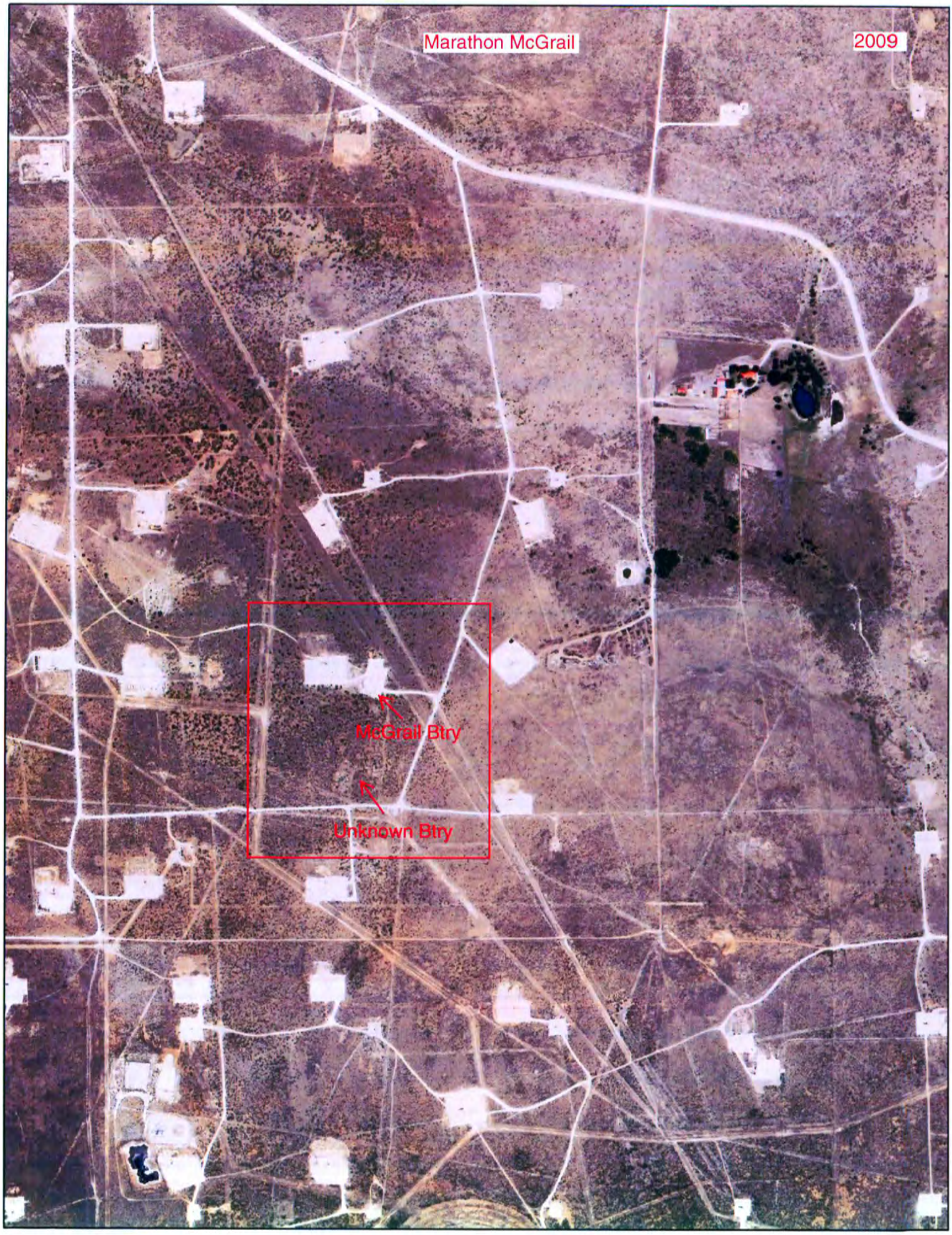
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2009
McGrail Btry
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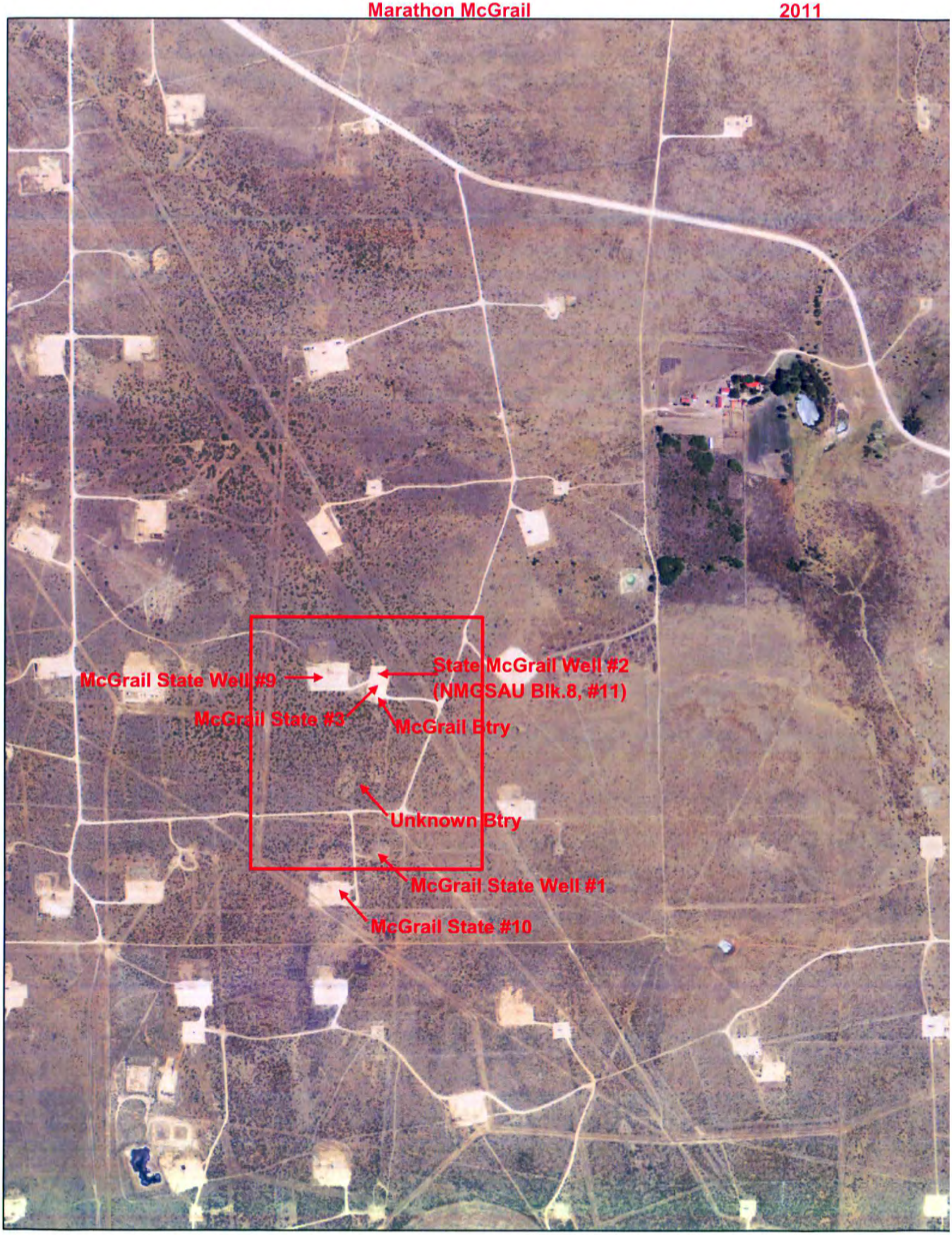
Marathon McGrail
2011
McGrail State Well #9
State McGrail Well #2
(NMGSAU Blk.8, #11)
McGrail State #3
McGrail Btry
Unknown Btry
McGrail State Well #1
McGrail State #10

ATTACHMENT 2
NOVEMBER 29, 2017 NMOCD LETTER

Donald Bull 11/29/2017

EHS Advisor

HESS

Hess Tower 1501McKinney St. – Houston, Texas 77010

Dear Mr. Bull,

RE: 1R-4862 (Marathon McGrail State Tank Battery UNIT K, Section 26, Township 19S, Range 36E)

After in depth review of available data and information and post a detailed meeting on the site indicated above, Oil Conservation Division (OCD) approves/acknowledges the following:

1) Please note that the accurate site identification is above, and it has been assigned an RP identification (1R-4862). Please include this identification on all future correspondence.
2) It has been determined that the investigatory work done on another McGrail Tank Battery occurred in a different UNIT and any contamination associated with Tank Battery not in UNIT K is not the responsibility of HESS Corp. OCD nonetheless, asks that whatever surface impact on the WRONG site be rectified and returned to as near as possible original condition prior to any work on site by HESS. Following avowing this to OCD, HESS will have no current/continuing responsibility to the site NOT in UNIT K. A simple email to OCD indicating reclamation of any surface disruption on the wrong location has been accommodated will be sufficient if surface owner is satisfied with current situation. Please indicate surface owner cooperation/agreement.
3) Please coordinate delineation/remediation efforts for this 1R-4862 location with Ms. Olivia Yu (Env. Spec.) in the Hobbs District I Office of the OCD.

If there are any questions, please do not hesitate to contact this office at 505.476.3482.

Please keep this email communication for your records, as no paper communication will be sent. Thank you for your efforts.

Sincerely,

Bradford Billings

Hydrologist/E.Spec. A.

EMNRD/Oil Conservation Division

Santa Fe, New Mexico

NOTE: OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations.

ATTACHMENT 3
SITE PHOTOGRAPHS

Attachment 3 – Site Photo Log
Former Marathon McGrail State Tank Battery
1RP-4862

Photo 1 –McGrail State Well #3

Photo 2 – View of former tank battery location facing North

Photo 3 – View of former tank battery location facing South

Photo 4 – View of former tank battery location facing North East

ATTACHMENT 4
LABORATORY DATA

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

September 20, 2017

BRAD FREEMAN

GEOMONITORING SERVICES

PO BOX 295

FULSHEAR, TX 77441

RE: MC GRAIL

Enclosed are the results of analyses for samples received by the laboratory on 09/12/17 17:00.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-16-8. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accreditated through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-1 @ SURFACE (H702458-01)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	QR-03
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	QR-03
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	QR-03
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	QR-03
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS **S-06**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<100	100	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	**5260**	100	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *103 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *364 %* *34.7-157*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-1 @ 18'' (H702458-02)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	**11.0**	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *96.1 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *93.6 %* *34.7-157*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-2 @ SURFACE (H702458-03)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *98.7 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS S-06

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<100	100	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	**18600**	100	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *102 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *516 %* *34.7-157*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-2 @ 18" (H702458-04)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *99.8 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<50.0	50.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	**734**	50.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *89.7 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *156 %* *34.7-157*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-3 @ SURFACE (H702458-05)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *103 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *108 %* *34.7-157*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-3 @ 18'' (H702458-06)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *100 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *103 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *113 %* *34.7-157*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-4 @ SURFACE (H702458-07)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *98.2 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *96.2 %* *34.7-157*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-4 @ 18'' (H702458-08)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *105 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *101 %* *34.7-157*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-5 @ SURFACE (H702458-09)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *99.0 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *104 %* *34.7-157*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-5 @ 18" (H702458-10)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	09/15/2017	ND	416	104	400	3.77	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *95.0 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *95.3 %* *34.7-157*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-6 @ SURFACE (H702458-11)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *102 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	09/15/2017	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *101 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *98.7 %* *34.7-157*

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Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

GEOMONITORING SERVICES
BRAD FREEMAN
PO BOX 295
FULSHEAR TX, 77441
Fax To: NA

Received:	09/12/2017	Sampling Date:	09/11/2017
Reported:	09/20/2017	Sampling Type:	Soil
Project Name:	MC GRAIL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	NOT GIVEN		

Sample ID: M-6 @ 18'' (H702458-12)

BTEX 8021B mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	09/19/2017	ND	1.95	97.6	2.00	0.549	
Toluene*	<0.050	0.050	09/19/2017	ND	1.79	89.6	2.00	0.457	
Ethylbenzene*	<0.050	0.050	09/19/2017	ND	1.87	93.5	2.00	0.518	
Total Xylenes*	<0.150	0.150	09/19/2017	ND	5.67	94.5	6.00	0.307	
Total BTEX	<0.300	0.300	09/19/2017	ND					

Surrogate: 4-Bromofluorobenzene (PID *101 %* *72-148*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	09/15/2017	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	09/15/2017	ND	198	99.1	200	2.68	
DRO >C10-C28	<10.0	10.0	09/15/2017	ND	209	105	200	0.235	

Surrogate: 1-Chlorooctane *99.6 %* *28.3-164*

Surrogate: 1-Chlorooctadecane *95.8 %* *34.7-157*

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

S-06	The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
QR-03	The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. QC batch accepted based on LCS and/or LCSD recovery and/or RPD values.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name:	GeoMonitoring Services
Project Manager:	Brad Freeman
Address:	Brad@geomon.net
City:	State: Zip:
Phone #:	713-417-6141 Fax #:
Project #:	Project Owner:
Project Name:	McGrail
Project Location:	
Sampler Name:	

BILL TO

P.O. #:	
Company:	
Attn:	
Address:	
City:	
State:	Zip:
Phone #:	
Fax #:	

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	BTEX	TPH	Chloride
H702458																	
1	m-1 @ Surface					X							9/11/17	1525	X	X	X
2	m-1 @ 18'					X							9/11/17	1530			
3	m-2 @ Surface					X							9/11/17	1547			
4	m-2 @ 18'					X							9/11/17	1558			
5	m-3 @ Surface					X							9/11/17	1600			
6	m-3 @ 18'					X							9/11/17	1605			
7	m-4 @ Surface					X							9/11/17	1610			
8	m-4 @ 18'					X							9/11/17	1613			
9	m-5 @ Surface					X							9/11/17	1615			
10	m-5 @ 18'					X							9/11/17	1618			

Relinquished By:	Date: 9/12/17	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 1700		Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS:
	Time:		

Delivered By: (Circle One) Sampler - UPS - Bus - Other: 3.8°C / 4.05°C

Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No

CHECKED BY: (Initials) HC

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

Corrected 4.25°C

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name:	GeoMonitoring Services
Project Manager:	Brad Freeman
Address:	Brad@geoman.net
City:	State: Zip:
Phone #:	713-247-6141 Fax #:
Project #:	Project Owner:
Project Name:	McGrail
Project Location:	
Sampler Name:	

BILL TO

P.O. #:	
Company:	
Attn:	
Address:	
City:	
State:	Zip:
Phone #:	
Fax #:	

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	PRESERV.: ACID/BASE:	ICE / COOL	OTHER :	SAMPLING: DATE	TIME	BTEX	TPH	Chloride
H702458																	
11	m-6@Surface					X							9/11/17	1622	X	X	X
12	m-6@18"					X							9/11/17	1625	X	X	X

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequental damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 9/12/17	Received By:	Holly Curbow
Relinquished By:	Date:	Received By:	
	Time:		
Delivered By: (Circle One) Sampler - UPS - Bus - Other:	3.8°C / 4.05°C	Sample Condition Cool: ☑ Yes ☐ No Intact: ☑ Yes ☐ No	CHECKED BY: (Initials) HC

Time: 1700

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:
REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

Corrected 4.05°C

ATTACHMENT 5
USGS Water Well Data

National Water Information System: Web Interface

Click to hideNews Bulletins

- Please see news on new formats
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 323903103202701

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

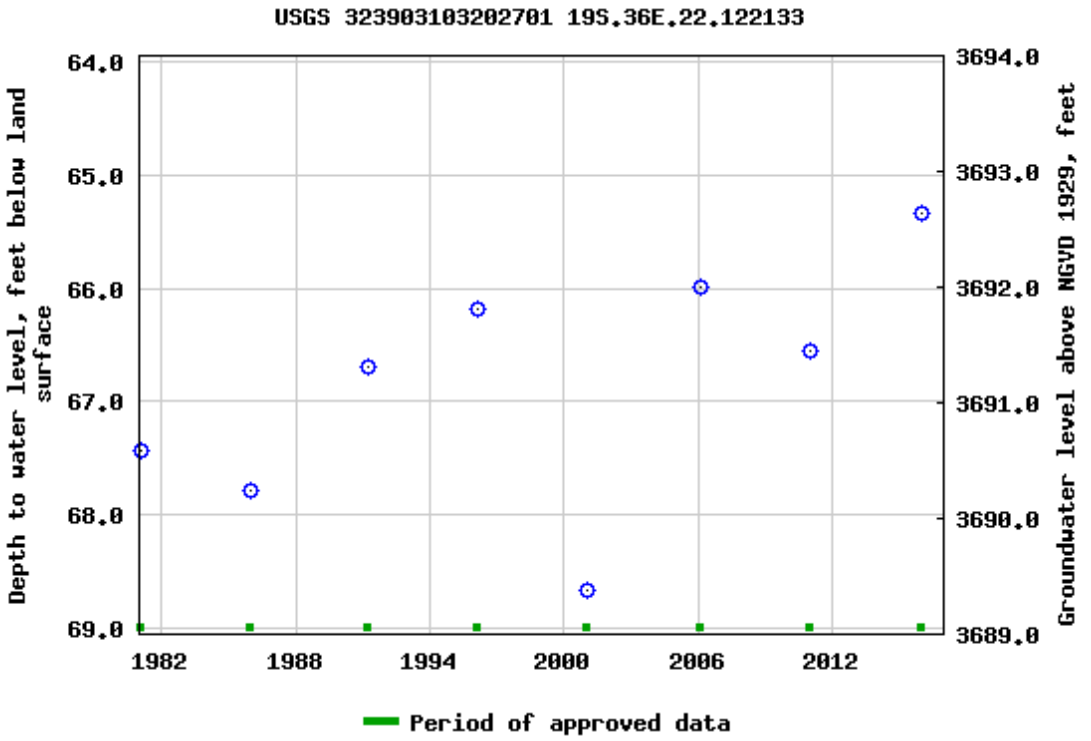
USGS 323903103202701 19S.36E.22.122133

Available data for this site Groundwater: Field measurements GO

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°39'08.1", Longitude 103°20'37.2" NAD83
Land-surface elevation 3,758.00 feet above NGVD29
The depth of the well is 110 feet below land surface.
This well is completed in the Ogallala Formation (121OGLL) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
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Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
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National Water Information System: Web Interface

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- Please see news on new formats
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

site_no list =

- 323631103195701

Minimum number of levels = 1

Save file of selected sites to local disk for future upload

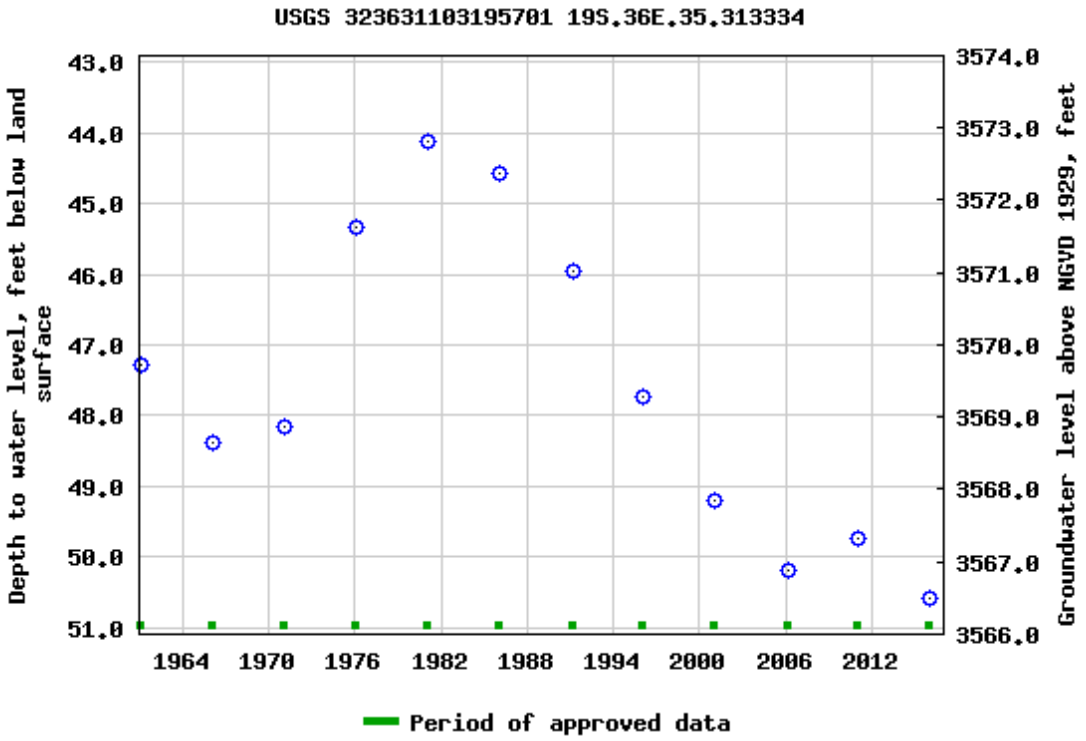
USGS 323631103195701 19S.36E.35.313334

Available data for this site Groundwater: Field measurements GO

Lea County, New Mexico
Hydrologic Unit Code 13070007
Latitude 32°36'48", Longitude 103°19'59" NAD27
Land-surface elevation 3,617.00 feet above NGVD29
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
Automated retrievals
Help
Data Tips
Explanation of terms
Subscribe for system changes
News

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2018-04-19 17:04:15 EDT
1.09 0.94 nadww01