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NMED
Hazardous Waste
Bureau

DEPARTMENT OF THE AIR FORCE
27TH SPECIAL OPERATIONS CIVIL ENGINEER SQUADRON (AFSOC)
CANNON AIR FORCE BASE NEW MEXICO

Sheen Thomas Kottkamp
Environmental Program Manager/Scientist
27 SOCES/CEIER
402 S. Chindit Blvd.
Cannon AFB NM 88103-5003

Mr. Gabriel Acevedo
Environmental Scientist & Specialist-Operational
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Bldg. 1
Santa Fe NM 87501

Dear Mr. Acevedo

Cannon Air Force Base is pleased to provide for your records the *Plugging Plan of Operations Form WD-08* and the *Plugging Records Form WD-11* for the recently plugged and abandoned monitoring wells at Cannon Air Force Base during the month of December 2015.

Cannon AFB appreciates the valued working relationship established with you and your department. If you have further comments or questions pertaining to the referenced documents, please contact Sheen T. Kottkamp, sheen.kottkamp.ctr@us.af.mil (575) 904-6743 or Brandy Chavez, brandy.chavez@us.af.mil, (575) 904-6747.

Sincerely

Sheen Thomas Kottkamp

Attachments:
New Mexico Office of the State Engineer Form WD-08
New Mexico Office of the State Engineer Form WD-11
Site Map

AIR COMMANDOS

STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER
ROSWELL

Tom Blaine, P.E.
State Engineer

DISTRICT II
1900 West Second St.
Roswell, New Mexico 88201
Phone: (575) 622-6521
Fax: (575) 623-8559

November 12, 2015

Cannon AFB
c/o Sheen Thomas Kottkamp
Bldg. 102
402s Chindit Blvd.
Cannon AFB, NM 88103-5003

RE: *Well Plugging Plan of Operations* for nine Non-Permitted Monitoring Wells, Cannon AFB, NM

Greetings:

Enclosed is your copy of the Well Plugging Plan of Operations for the above described project.

The proposed method of operations for the subject well is found to be acceptable and in accordance with the Rules and Regulations Governing Well Driller Licensing; Construction, Repair and Plugging of Wells 19.27.4 NMAC adopted August 31, 2005 by the State Engineer.

Sincerely,

Catherine Goetz, P.G., C.P.G.
Engineer Specialist Supervisor
Water Resource Allocation Program
Enclosure
cc Santa Fe

WELL PLUGGING PLAN OF OPERATIONS

NOTE: A Well Plugging Plan of Operations shall be filed with and accepted by the Office of the State Engineer prior to plugging.

I. FILING FEE: There is no filing fee for this form.

II. GENERAL / WELL OWNERSHIP:

Existing Office of the State Engineer POD Number (Well Number) for well to be plugged: See Below

Name of well owner: Cannon AFB (Sheen Thomas Kottkamp Environmental Program Manager, AGEISS Inc.)

Mailing address: Bldg. 102, 402s Chindit Blvd. Cannon AFB

City: Cannon AFB State: NM Zip code: 88103-5003

Phone number: (575) 904-6743 E-mail: sheen.kottkamp.ctr@us.af.mil

III. WELL DRILLER INFORMATION:

Well Driller contracted to provide plugging services: Enviro-Drill

New Mexico Well Driller License No.: WD-1186 Expiration Date: 3-31-16

2015 OCT 29 P 2:32

IV. WELL INFORMATION:

Note: A copy of the existing Well Record for the well to be plugged should be attached to this plan.

1) GPS Well Location: WGS 1984 UTM Zone 13N

WELL ID	Latitude	Longitude
MW-I	34° 21' 58.946" N	103° 18' 10.393" W
MW-J	34° 21' 56.341" N	103° 18' 12.037" W
MW-L	34° 22' 0.992" N	103° 18' 9.948" W
MW-M	34° 21' 59.940" N	103° 18' 10.068" W
MW-N	34° 23' 18.110" N	103° 17' 46.577" W
MW-O	34° 23' 0.250" N	103° 17' 50.420" W
MW-P	34° 23' 10.426" N	103° 18' 8.028" W
MW-Q	34° 22' 18.910" N	103° 18' 31.440" W
MW-Ra	34° 23' 23.502" N	103° 18' 8.228" W

2015 NOV -9 PM 3:50

STATE ENGINEER OFFICE

2) Reason(s) for plugging well: Wells are dry due to dropping water table or no longer in use

3) Was well used for any type of monitoring program? Yes If yes, please use section VII of this form to detail what hydrogeologic parameters were monitored. If the well was used to monitor contaminated or poor quality water, authorization from the New Mexico Environment Department may be required prior to plugging.

4) Does the well tap brackish, saline, or otherwise poor quality water? No If yes, provide additional detail, including analytical results and/or laboratory report(s):

5) Static water level: see table below feet below land surface / feet above land surface (circle one)

6) Depth of the well: see table below feet
Please note that omissions in the table are due to lack of information available.

Well I.D.	Depth to GW (5)	Casing Diameter (7)	Stick-up	Well Depth (6)	Screened Interval (9)
I	dry	6"		293'	3989.36 - 3969.36
J	dry				
L	dry	4"			4001.72 - 3981.72
M	dry	4"		289'	4000.29 - 3980.29
N	312.35	4"	2.4	297.5'	3968 - 3908
O	325.12	4"	0.96	303.9'	3965.11 - 3905.1
P	315.60		0.97		3970.85 - 3910.85
Q	dry	4"	2.09		4000.3 - 3970.3
Ra			3		3991.31 - 3961.30

7) Inside diameter of innermost casing: 4" or 6" inches.

8) Casing material: PVC

9) The well was constructed with:

_____ an open-hole production interval, state the open interval: _____

X a well screen or perforated pipe, state the screened interval(s): see table

10) What annular interval surrounding the artesian casing of this well is cement-grouted? NA

11) Was the well built with surface casing? YES If yes, is the annulus surrounding the surface casing grouted or otherwise sealed? YES If yes, please describe: insufficient information, typically bentonite chip seal above the sand pack and Portland cement grout to the surface.

12) Has all pumping equipment and associated piping been removed from the well? YES If not, describe remaining equipment and intentions to remove prior to plugging in Section VII of this form.

V. DESCRIPTION OF PLANNED WELL PLUGGING:

Note: If this plan proposes to plug an artesian well in a way other than with cement grout, placed bottom to top with a tremie pipe, a detailed diagram of the well showing proposed final plugged configuration shall be attached, as well as any additional technical information, such as geophysical logs, that are necessary to adequately describe the proposal.

1) Describe the method by which cement grout shall be placed in the well, or describe requested plugging methodology proposed for the well: The grout will be tremied in to the casing from the bottom to the surface

2) Will well head be cut-off below land surface after plugging? YES

VI. PLUGGING AND SEALING MATERIALS:

Note: The plugging of a well that taps poor quality water may require the use of a specialty cement or specialty sealant

1) For plugging intervals that employ cement grout, complete and attach Table A.

2) For plugging intervals that will employ approved non-cement based sealant(s), complete and attach Table B.

3) Theoretical volume of grout required to plug the well to land surface:
4" wells, 0.65 gal/ft., Approximately 200 -250 gal/well
6" wells, 1.47 gal/ft, +/- 450 gal.

4) Type of Cement proposed: Portland Type I Type II

5) Proposed cement grout mix: about 6 gallons of water per 94 pound sack of Portland cement.

6) Will the grout be: _____ batch-mixed and delivered to the site

X mixed on site

7) Grout additives requested, and percent by dry weight relative to cement: Bentonnite 5%

8) Additional notes and calculations: insufficient well construction info for all wells

VII. ADDITIONAL INFORMATION: List additional information below, or on separate sheet(s):

Monitoring wells were used as part of Cannon AFB monitoring program. Wells are no longer needed as data has either proved levels below RSLs or wells have gone dry and are no longer used for monitoring as replacement wells have been installed for continued monitoring.

VIII. SIGNATURE:

I, Rodney Hammer, say that I have carefully read the foregoing Well Plugging Plan of Operations and any attachments, which are a part hereof; that I am familiar with the rules and regulations of the State Engineer pertaining to the plugging of wells and will comply with them, and that each and all of the statements in the Well Plugging Plan of Operations and attachments are true to the best of my knowledge and belief.

Signature of Applicant — Date: 10-28-15

IX. ACTION OF THE STATE ENGINEER:

This Well Plugging Plan of Operations is:

X Approved subject to the attached conditions.
____ Not approved for the reasons provided on the attached letter.

Witness my hand and official seal this 12th day of November, 2015

Tom Blaine P.E., New Mexico State Engineer

By: C. Goetz

For ANDY MORLEY
DISTRICT II MANAGER

TABLE A - For plugging intervals that employ cement grout. Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of grout placement (ft bgl)			ground surface
Bottom of proposed interval of grout placement (ft bgl)			Bottom of boring
Theoretical volume of grout required per interval (gallons)			4" well 0.65 gal/ft 6" well 1.47 gal/ft
Proposed cement grout mix gallons of water per 94-lb. sack of Portland cement			Approximately 6 gal
Mixed on-site or batch-mixed and delivered?			On-site
Grout additive 1 requested			5% bentonite
Additive 1 percent by dry weight relative to cement			
Grout additive 2 requested			
Additive 2 percent by dry weight relative to cement			

TABLE B - For plugging intervals that will employ approved non-cement based sealant(s). Start with deepest interval.

	Interval 1 – deepest	Interval 2	Interval 3 – most shallow
			Note: if the well is non-artesian and breaches only one aquifer, use only this column.
Top of proposed interval of sealant placement (ft bgl)			Ground surface
Bottom of proposed sealant of grout placement (ft bgl)			Bottom of well
Theoretical volume of sealant required per interval (gallons)			
Proposed abandonment sealant (manufacturer and trade name)			

MONITORING WELL IDENTIFICATION REPORT

-F005

Depth from TOC = 289'

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER M

WELL LOCATION (LONGITUDE) 103° 18' 00"

WELL LOCATION (LATITUDE) 34° 22' 01"

AQUIFER NAME Ogalalla

AQUIFER CONFINED ______ UNCONFINED X

WELL INSTALLATION DATE 02-04-92

DRILLING METHOD HYDRT

INNER CASING DIAMETER 5.8"

BOREHOLE DIAMETER 12"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3975.29

ELEV BOTTOM OF WELL CASING 3975.29

ELEV BOTTOM OF SCREENED INT 3980.29

ELEV OF TOP OF SCREENED INT 4000.29

SURVEYED ELEV OF CASING TOP 4264.29

DATE OF REPORT 10-21-92 SIGNATURE ______

NAME (TYPED) Sanford Hutsell

254. 12

MONITORING WELL IDENTIFICATION REPORT

LF005

Depth 293'

GwNC

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER 1

WELL LOCATION (LONGITUDE) 103° 18' 06.8"

WELL LOCATION (LATITUDE) 34° 21' 58.8"

AQUIFER NAME Ogalalla

AQUIFER CONFINED ________ UNCONFINED X

WELL INSTALLATION DATE 08-19-88

DRILLING METHOD HYDRT

INNER CASING DIAMETER 6"

BOREHOLE DIAMETER 9 7/8"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3959.36

ELEV BOTTOM OF WELL CASING 3969.36

ELEV BOTTOM OF SCREENED INT 3969.36

ELEV OF TOP OF SCREENED INT 3989.36

SURVEYED ELEV OF CASING TOP 4262.36

DATE OF REPORT 02-24-89 SIGNATURE ________

NAME (TYPED) Sanford Hutsell

LF005

Depth from NC-287'

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER L

WELL LOCATION (LONGITUDE) 103° 18' 00"

WELL LOCATION (LATITUDE) 34° 22' 02"

AQUIFER NAME Ogalalla

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 06-02-92

DRILLING METHOD HYDRT

INNER CASING DIAMETER 4" inside 5.8"

BOREHOLE DIAMETER 12"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3972.72

ELEV BOTTOM OF WELL CASING 3977.72

ELEV BOTTOM OF SCREENED INT 3981.72

ELEV OF TOP OF SCREENED INT 4001.72

SURVEYED ELEV OF CASING TOP 4264.72

DATE OF REPORT 10-21-92 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

371 20

LFOS
Depth Gun
TOC = 30'

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER Q

WELL LOCATION (LONGITUDE) 103° 18' 31"

WELL LOCATION (LATITUDE) 34° 22' 19"

AQUIFER NAME Ogalalla

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 02-24-96

DRILLING METHOD _____

INNER CASING DIAMETER 4"

BOREHOLE DIAMETER 8"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3969.30

ELEV BOTTOM OF WELL CASING 3970.30

ELEV BOTTOM OF SCREENED INT 3970.30

ELEV OF TOP OF SCREENED INT 4000.30

SURVEYED ELEV OF CASING TOP 4266.89

DATE OF REPORT 11-27-96 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

Dec. 18, 1996 (TD)

Well Purge Data Sheet for ~~October 2, 1996~~ - Clovis, New Mexico

DW = 275.66

Water Column = (21.840) feet X 0 .655 = Bore Volume ≅ 14.31

Groundwater Quality Parameters - MWN, 18 Dec, 1996 TD=297.5						
Bore Volumes	pH	Conductivity	Salinity	Dissolved Oxygen	Temperature	Turbidity
½ = 7 GAL	8.26	0.946	0.04	9.19 mS/L	16.2	9
1 14	8.24	0.957	0.04	9.01	17.1	12
1½ 21	8.23	0.999	0.03	9.27	17.2	10
2 28	8.24	0.978	0.04	9.44	17.1	10
2½ 35	8.24	0.997	0.04	9.38	17.2	7
3 42	8.22	0.994	0.04	9.21	17.2	9

Finished Sampling @ 1200 12/18/96

Water Column = (20.8) feet X 0 .655 = Bore Volume ≅ 13.6

DW = 283.18

Groundwater Quality Parameters - MWO, 18 Dec. 1996 TD= 303.9						
Bore Volumes	pH	Conductivity	Salinity	Dissolved Oxygen	Temperature	Turbidity
½ 7	7.37	2.00	0.09	9.06	14.9	10
1 14	7.48	2.07	0.09	8.85	15.3	10
1½ 21	7.53	2.05	0.09	8.79	15.2	10
2 28	7.50	2.06	0.09	8.56	15.3	10
2½ 35	7.51	2.05	0.09	8.62	15.2	10
3 42	7.52	2.04	0.09	8.41	15.3	10

Finished Sampling @ 1500 12/18/96

4 ASEWIDE AND SITE GR UNDWATER

4 1 asewide Groundwater

Cannon AFB is situated within the Southern High Plains physiographic region of New Mexico and is underlain by Ogallala Formation deposits. The water-bearing sediments of the Ogallala comprise the unconfined Southern High Plains aquifer, the principal potable water source for Cannon AFB and the surrounding area. Basewide groundwater levels were measured at 12 monitoring wells between October 30 and November 5, 2010 (Figure 4). Well construction details and elevation data for each well are presented in Table 1.

Ta le 1 Well Construction Details

Well No	Date Installed	Total Well Depth (ft)	Screened Inter al (ft)	Te C Elevation (ft above msl)	Stic up (ft)	Ground Surface Elevation (ft ab o/e msl)
MW-E	11/17/1985	373.00	15.00	4,282.61	2.91	4,279.70
MW-F	11/19/1985	375.00	15.00	4,278.50	3.57	4,274.93
MW-G	11/10/1985	372.00	15.00	4,279.55	3.09	4,276.46
MW-H	11/18/1985	375.00	15.00	4,278.98	3.00	4,275.98
MW-Oa	02/29/2004	365.00	60.00	4,271.07	0.96	4,270.11
MW-Na	12/16/2004	358.00	60.00	4,268.40	2.40	4,266.00
MW-Pa	02/21/2004	360.00	60.00	4,271.82	0.97	4,270.85
MW-Ra	06/29/2001	311.00	30.00	4,275.31[1]	3.00	4,272.31
MW-T	12/10/1998	365.00	40.00	4,262.69	1.87	4,260.82
MW-V	08/08/2001	370.00	60.00	4,326.41	1.59	4,324.82
MW-W	06/01/2002	365.00	60.00	4,299.03	2.08	4,296.95
MW-X	02/26/2004	336.00	40.00	4,266.00	1.24	4,264.76

[1] The top of casing (TOC) elevation for MW-Ra could not be obtained; the approximate elevation was calculated from the known ground surface elevation.

The calculated groundwater elevations ranged from 3,987.06 ft above mean sea level (msl) at MW-V (northwestern corner of the Base) to 3,940.18 ft above msl at MW-T (southeastern corner). Water levels were recorded in feet below the top of casing (TOC) elevation and used to construct a groundwater elevation and potentiometric flow map (Figure 4). The groundwater flow direction generally follows surface topography, moving in a southeasterly trend across the Base.

Groundwater elevation data for each well are listed in Table 2. These data were used to construct a hydrograph for the period from 1993 through 2010 (Figure 5). Water level data from U.S. Geological Survey (USGS) Scientific Investigations Report 2006-5280 (USGS, 2006) and Base gauging data demonstrate the significantly declining water table beneath Cannon AFB (Table 2 and Figure 5).

4 2 Groundwater at LF-03 LF-04 LF-25 and the Sewage Lagoons

Monitoring wells MW-Oa, MW-Na, MW-Pa, and MW-Ra are located southeast and downgradient of their respective landfills (Figure 4). Wells MW-E and MW-F are located upgradient of the sites,

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-I FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 21 min, 58.946 sec
Longitude: 103 deg, 18 min, 10.393 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 302 ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc)
	PORTLAND TYPE I & II WITH 5% BENTONITE	475 GALLONS	450 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rody He — 12-16-15

Signature of Well Driller — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-J FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 21 min, 56.341 sec
Longitude: 103 deg, 18 min, 12.037 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 272' ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	PORTAND TYPE I & II WITH 5% BENTONITE	475 GALLONS	450 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7 4805	=	gallons
cubic yards	x	201 97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rodney Hammer — Signature of Well Driller

12-18-15 — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP **MW-L** **FPM 453**

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 22 min, 0.992 sec
Longitude: 103 deg, 18 min, 9.948 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 285' ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	PORTLAND TYPE I & II WITH 5% ~~BOATH~~ BENTONITE	270 GALLONS	250 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7 4805	=	gallons
cubic yards	x	201 97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rody Ham — 12-18-15

Signature of Well Driller — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-M FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 21 min, 59.940 sec
Longitude: 103 deg, 18 min, 10.068 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 287 ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	PORTLAN TYPE 1411 WITH 5% BENTONITE	475 GALLONS	450 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7 4805	=	gallons
cubic yards	x	201 97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rody Ham — 12-18-15

Signature of Well Driller — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-N FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 23 min, 18.110 sec
Longitude: 103 deg, 17 min, 46.577 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 297 ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	PORTLAND TYPE I + II 5% BENTONITE	275 GALLONS	250 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rod Hammer — 12-18-15

Signature of Well Driller — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-O FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 23 min, 0.250 sec
Longitude: 103 deg, 17 min, 50.420 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 305 ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	PORTLAND TYPE I & II 5% BENTONITE	260 GALLONS	250 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rod Ham — Signature of Well Driller

12-18-15 — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-P FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 23 min, 10.426 sec
Longitude: 103 deg, 18 min, 8.028 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 296 ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc)
	PORTLAND TYPE I & II 5% BENTONITE	270 GALLONS	250 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7 4805	=	gallons
cubic yards	x	201 97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rody Ham — 12-18-15

Signature of Well Driller — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-Q FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 22 min, 18.910 sec
Longitude: 103 deg, 18 min, 31.440 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 294 ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/ Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	PORTLAND TYPE I & II 5% BENTONITE	260 GALLONS	250 GALLONS	TREMMIE	

MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rod Ham — Signature of Well Driller

12-18-15 — Date

PLUGGING RECORD

NOTE: A Well Plugging Plan of Operations shall be approved by the State Engineer prior to plugging - 19.27.4 NMAC

I. GENERAL / WELL OWNERSHIP MW-RA FPM 453

Well owner: CANNON AFB (SHEEN THOMAS KOTTKAMP) Phone No.: 575-904-6713

Mailing address: BUILDING 102, 402S CHINDIT BLVD.

City: CANNON AFB State: NM Zip code: 88103-5003

II. WELL PLUGGING INFORMATION:

1) Name of well drilling company that plugged well: ENVIRO-DRILL, INC.

2) New Mexico Well Driller License No.: WD 1186 Expiration Date: 03/31/16

3) Well plugging activities were supervised by the following well driller(s)/rig supervisor(s): RODNEY HAMMER

4) Date well plugging began: 11/05/15 Date well plugging concluded: 11/05/15

5) GPS Well Location: Latitude: 34 deg, 23 min, 23.502 sec
Longitude: 103 deg, 18 min, 8.228 sec, NAD83

6) Depth of well confirmed at initiation of plugging as: 308 ft below ground level (bgl), by the following manner:

7) Static water level measured at initiation of plugging: DRY ft bgl

8) Date well plugging plan of operations was approved by the State Engineer: 11-12-15

9) Were all plugging activities consistent with an approved plugging plan? YES If not, please describe differences between the approved plugging plan and the well as it was plugged (attach additional pages as needed):

10) Log of Plugging Activities - Label vertical scale with depths, and indicate separate plugging intervals with horizontal lines as necessary to illustrate material or methodology changes. Attach additional pages if necessary.

For each interval plugged, describe within the following columns:

Depth (ft bgl)	Plugging Material Used (include any additives used)	Volume of Material Placed (gallons)	Theoretical Volume of Borehole/Casing (gallons)	Placement Method (tremie pipe, other)	Comments ("casing perforated first", "open annular space also plugged", etc.)
	PORTLAND TYPE I+II 5% BENTONITE	470 GALLONS	450 GALLONS		

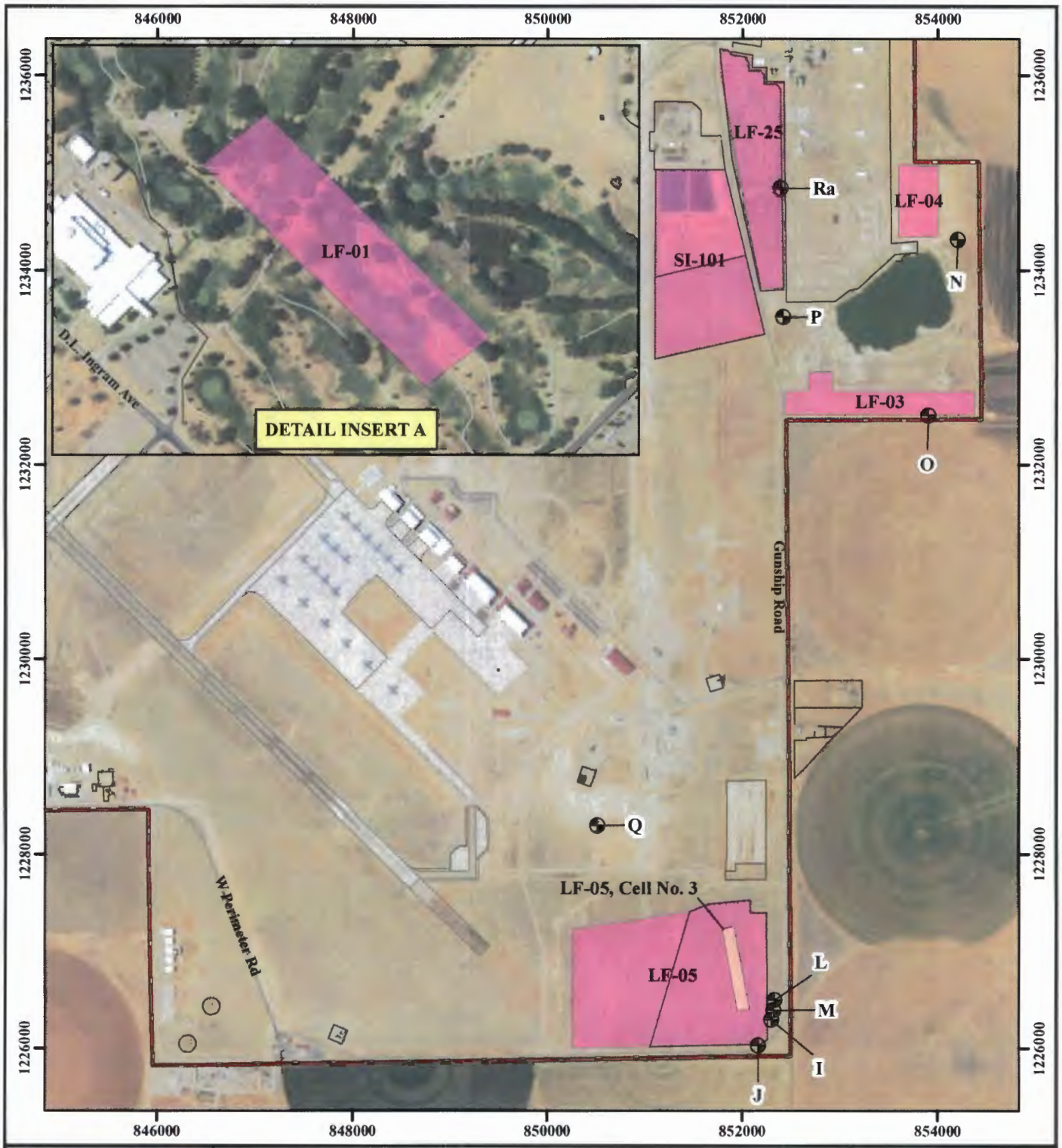
MULTIPLY		BY		AND OBTAIN
cubic feet	x	7.4805	=	gallons
cubic yards	x	201.97	=	gallons

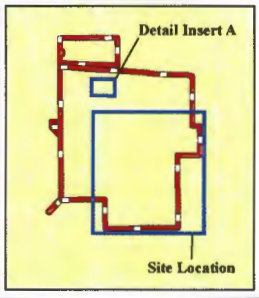
III. SIGNATURE:

I, Rodney Hammer, say that I am familiar with the rules of the Office of the State Engineer pertaining to the plugging of wells and that each and all of the statements in this Plugging Record and attachments are true to the best of my knowledge and belief.

Rody Ham — Signature of Well Driller

12-18-15 — Date





Key to Features

- Monitoring Well (to be Abandoned)
- Site Boundary
- Base Boundary

1 inch = 1,400 feet

0 213 426 Meters

0 700 1,400 Feet

N W E S

NOTES:
Revision Date: 9/29/2015

Path: Y:\GIS_Projects\Cannon_AFB\Projects\GISA_LTM\CAD\Fig_1.mxd

Coordinate System:NAD 1983 StatePlane New Mexico East FIPS 3001 Feet
Projection: Transverse Mercator
False Easting: 541,337.5000
Central Meridian: -104.3333
Latitude Of Origin: 31.0000
Horizontal Datum: North American 1983
False Northing: 0.0000
Scale Factor: 0.9999
Units: Foot US

Cannon Air Force Base
Clovis, NM
AFCEC

FIGURE 1

Long Term
Management Sites

FPM

2015