Jason Michelson
Project Manager

Chevron Environmental Management Company
1500 Louisiana Street, #38116
Houston, Texas 77002
Work: 832-854-5601
Cell: 281-660-8564
jmichelson@chevron.com

July 27, 2020

REVIEWED
By Mike Buchanan at 9:28 am, Mar 03, 2025

EMNRD/OCD
5200 Oakland, NE, Suite 100
Albuquerque, NM 87113

Re: Mark Owen No. 9 Reserve Pit
Case No. AP-56
Proposed Groundwater Monitoring Reduction Workplan
Lea County, New Mexico

Dear whom it concerns,

Please find enclosed for your files, copies of the following Workplan:

- Mark Owen No. 9 Reserve Pit Proposed Groundwater Monitoring Reduction Workplan

The submittal was prepared by Arcadis on behalf of Chevron Environmental Management Company (CEMC).

Please do not hesitate to call Russell Grant with Arcadis U.S., Inc., the current consultant, at 432-217-2064 or myself at 832-854-5601, should you have any questions.

Sincerely,

Jason Michelson

Jason Michelson

Encl. Mark Owen No. 9 Reserve Pit AP-56 Proposed Groundwater Monitoring Reduction Workplan

Review of the Mark Owen No. 9 Reserve Pit reduction plan: content satisfactory for approval
1. At this time, removal of sulfate from the sampling requirements is not approved.
2. The following wells are approved to be reduced from the second semi-annual sampling event: MW-2, MW-3, MW-4, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-22, MW-25, and RW-1.
3. Total alkalinity may be removed from the groundwater analysis as a parameter due to consistency in baseline.

ARCADIS Design & Consultancy for natural and built assets

Mr. Bradford Billings
Project Manager
EMNRD/OCD
5200 Oakland, NE, Suite 100
Albuquerque, NM 87113

Subject:
Proposed Groundwater Monitoring Reduction Workplan
Chevron Environmental Management Company
Mark Owen No. 9 Reserve Pit (AP-56)
Lea County, New Mexico

ENVIRONMENT

Date:
July 2, 2020

Contact:
Russell Grant

Phone:
432.217.2064

Email:
russell.grant@arcadis.com

Dear Mr. Billings:

At the request of Chevron Environmental Management Company (CEMC), Arcadis U.S., Inc. (Arcadis) is providing this workplan to request a reduction of groundwater monitoring frequency on select monitoring wells for the Mark Owen No.9 Reserve Pit site (Site).

The Mark Owen No. 9 Reserve Pit is in the NW/4 of the SE/4 of Section 34, Township 21 South, Range 37 East of Lea County, New Mexico. The Site is located at geographic coordinates 32° 25' 56.49"N, 103° 08' 46.27"W.

Groundwater monitoring began at the Site in October 2007. The Site is currently monitored quarterly from a network of 29 monitoring wells and one recovery well. No monitoring wells currently contain light non-aqueous phase liquid (LNAPL). All monitoring wells and the one recovery well are currently sampled during all quarterly sampling events. The constituents of concern (COCs) in groundwater include chloride, total dissolved solids (TDS), sulfate, and total alkalinity.

For additional Site-specific background information please refer to the Arcadis, 2019 Annual Groundwater Monitoring Report, anticipated for submittal to the NMOCD in September 2020. Data in the 2019 annual report is consistent with 2018 and previous data sets.

PROPOSED REDUCED SAMPLING PLAN

The following Workplan outlines the specifics of the proposed reduced sampling plan for select monitoring wells and the methodology for the selection of those monitoring wells. Sampling frequency will be reduced to two semi-annual events. The first semi-annual event will include sampling all Site wells as currently conducted except for total alkalinity and sulfate analysis. The second semi-annual

sampling event will be reduced to only sampling select monitoring wells based on the following proposed sampling methodology. The groundwater sampling frequency will be assessed yearly based on the results of the sampling events for the lifespan of the project and will increase to quarterly for a minimum of 8 consecutive quarters prior to closure request for the Site.

The following sections provide specifics for the proposed reduced groundwater monitoring plan:

Sampling Reduction for Non-impacted Monitoring Wells

Site monitoring wells with COC concentrations reported below New Mexico Water Quality Control Commission (NMWQCC) exceedance standards or monitoring wells with COC concentrations reported above the NMWQCC exceedance standards showing stable to decreasing trends for two consecutive years or longer will not be sampled during one semi-annual monitoring event per year.

The Site wells currently selected for reduction from the second semi-annual sampling event include: MW-2, MW-3, MW-4, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-22, MW-25, and RW-1.

The previously referenced wells have been evaluated based on historical concentration trends, historical concentration trends of nearby monitoring wells, potential receptors, and groundwater gradient.

The Site monitoring/recovery wells that will be sampled during each semi-annual sampling event are presented on attached **Table 1** (Sampling Analysis Plan).

The Site monitoring/recovery wells that will be sampled during the reduced event are presented on **Figure 1** (Potentiometric Surface Map), **Figure 2** (Reduced Sampling Plan - Chloride), **Figure 3** (Reduced Sampling Plan - TDS), and **Figure 4** (Reduced Sampling Plan - Sulfate).

The Summary of Historical Groundwater Analytical Results is presented in **Table 2**.

Request to Reduce Sampling COCs

Total alkalinity has been analyzed at this Site since groundwater monitoring began in the October 2007. Since that time, analysis of total alkalinity has never consistently been reported to be above 600 mg/L and historical data trends have been established. Total alkalinity does not have an assigned NMWQCC standard and does not fall into any regulatory criteria. Arcadis recommends removing total alkalinity from both semi-annual sampling events.

Sulfate is assigned a NMWQCC standard of 600 milligrams per liter (mg/L) and only 3 wells (MW-8, MW-13, and MW-21) have consistently shown sulfate

exceedances above the NMWQCC standard. These exceedances are likely attributable to natural groundwater chemistry or offsite encroachment of a neighboring contaminant plume. Data suggest that it is unlikely that the Mark Owen No. 9 reserve pit contributed to elevated sulfate concnetrations at the Site due to the proximity of the 3 monitoring wells from the Mark Owen No. 9 reserve pit. Additionally, monitoring wells located between the 3 monitoring wells mentioned above and the Mark Owen No. 9 reserve pit report sulfate concentrations below the NMWQCC standard of 600 mg/L, as shown on **Table 2**. Arcadis is requesting approval from the New Mexico Oil Conservation Division (NMOCD) to remove sulfate from the sampling program.

Contact

Arcadis is prepared to initiate the scope of work immediately. If you have any questions or comments, please contact either Russell Grant by phone at 432 217 2064 or by e-mail at russell.grant@arcadis.com or Greg Cutshall by phone at 859 327 4626 or by email at greg.cutshall@arcadis.com.

Sincerely,

Arcadis U.S., Inc.

Russell Grant

Project Manager

Copies:
Jason Michelson, CEMC Project Manager

Enclosures:

Tables

Table 1 – Sampling and Analysis Plan

Table 2 – Summary of Historical Groundwater Analytical Results

Figures

Figure 1 – 2020 Reduced Sampling Plan Potentiometric Surface Map

Figure 2 – 2020 Reduced Sampling Plan Map – Chloride Isoconcentration Map

Figure 3 – 2020 Reduced Sampling Plan Map – TDS Isoconcentration Map

Figure 4 – 2020 Reduced Sampling Plan Map – Sulfate Isoconcentration Map

TABLES

Table 1 - Sampling and Analysis Plan
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

	First Semi-Annual Monitoring Event						Second Semi-Annual Monitoring Event						
Monitoring Well ID	Gauge Depth to Groundwater and Total Depth	Collect Conductivity Level every two (2) feet	Total Alkalinity (as CaCO3) by State Method 2320B	Total Dissolved Solids by State Method 2540C	Inorganic Anions by USEPA Method 300		Gauge Depth to Groundwater and Total Depth	Collect Conductivity Level every two (2) feet	Total Alkalinity (as CaCO3) by State Method 2320B	Total Dissolved Solids by State Method 2540C	Inorganic Anions by USEPA Method 300		Rationale for Reduction
					Chloride	Sulfate					Chloride	Sulfate	
MW-1	X	X	--	X	X	--	X	--	--	X	X	--	
MW-2	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-3	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-4	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-5	X	X	--	X	X	--	X	--	--	X	X	--	
MW-6	X	X	--	X	X	--	X	--	--	X	X	--	
MW-7	X	X	--	X	X	--	X	--	--	X	X	--	
MW-8	X	X	--	X	X	--	X	--	--	X	X	--	
MW-9	X	X	--	X	X	--	X	--	--	X	X	--	
MW-10	X	X	--	X	X	--	X	--	--	X	X	--	
MW-11	X	X	--	X	X	--	X	--	--	X	X	--	
MW-12	X	X	--	X	X	--	X	--	--	X	X	--	
MW-13	X	X	--	X	X	--	X	--	--	X	X	--	
MW-14	X	X	--	X	X	--	X	--	--	X	X	--	
MW-15	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-16	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-17	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-18	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-19	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-20	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-21	X	X	--	X	X	--	X	--	--	X	X	--	
MW-22	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-23	X	X	--	X	X	--	X	--	--	X	X	--	
MW-24	X	X	--	X	X	--	X	--	--	X	X	--	
MW-25	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend
MW-26	X	X	--	X	X	--	X	--	--	X	X	--	
MW-27	X	X	--	X	X	--	X	--	--	X	X	--	
MW-28	X	X	--	X	X	--	X	--	--	X	X	--	
MW-29	X	X	--	X	X	--	X	--	--	X	X	--	
RW-1	X	X	--	X	X	--	X	--	--	--	--	--	Stable Trend

Notes:
USEPA = United States Environmental Protection Agency
X = Data will be collected at monitoring well during respective event.
-- = Data will not be collected at monitoring well during semi-annual event

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-1	MW-1	11/01/07	201	**321**	84	**1,010**
		04/25/08	167	**623**	124	NA
		09/16/08	146	**1,590**	154	**3,620**
		04/21/09	212	**1,320**	207	**2,860**
	DUP	04/21/09	200	**1,740**	181	**3,720**
		10/27/09	126	**9,770**	297	**19,000**
		02/25/10	163	**5,210**	207	**11,900**
	DUP	02/25/10	163	**5,320**	204	**11,300**
		06/03/10	140	**7,390**	243	**15,200**
		08/31/10	166	**8,220**	196	**12,300**
		11/22/10	158	**8,070**	264	**17,600**
		03/10/11	160	**15,500**	**1,350**	**26,000**
		06/03/11	172	**14,000**	258	**26,800**
		08/23/11	140	**14,200**	**886**	**28,500**
		12/16/11	148	**15,800**	**665**	**31,000**
		03/22/12	NA	**17,700**	488	**30,900**
		06/11/12	224	**5,290**	247	**11,000**
	DUP-1	06/11/12	166	**4,630**	293	**10,400**
		09/26/12	154	**17,600**	**619**	**34,100**
		12/14/12	NA	**13,800**	484	**29,600**
		03/19/13	286	**2,820**	177	**4,530**
		06/06/13	168	**14,900**	414	**28,000**
MW-1		09/12/13	315	**4,600**	187	**1,600**
		11/19/13	236	**7,240**	361	**12,000**
		05/13/14	306	**6,680**	517	**11,000**
		08/07/14	331	**2,280**	<200	**3,280**
		11/05/14	267	**2,560**	315	**5,510**
		03/06/15	269	**1,510**	232	**2,770**
		06/10/15	301	**878**	97	**1,990**
		09/29/15	335	**934**	112	**2,120**
	DUP	09/29/15	353	**635**	115	**1,590**
		12/16/15	289	**976**	70	**1,970**
	DUP	12/16/15	290	**838**	67	**1,620**
		03/15/16	284	**552**	73	**1,310**
		06/23/16	222	**2,740**	481	**4,100**
		09/30/16	222	**3,420**	171	**7,090**
		12/16/16	259	**3,120**	199	**7,300**
		03/28/17	279	**3,700**	203	**6,470**
		06/27/17	245	**5,800**	333	**10,500**
		09/20/17	227	**6,400**	350	**9,600**
		12/19/17	225	**5,100**	251	**9,090**
		04/05/19	208	**7,800**	333	**13,300**
		06/21/19	175	**11,300**	NA	**24,400**
		09/12/19	168	**8,170**	363	**15,700**
		11/23/19	179	**11,000**	347	**19,000**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-2		11/01/07	187	200	72	698
		04/25/08	174	190	73	NA
		09/16/08	181	182	92	729
		04/21/09	203	167	172	744
		10/27/09	205	175	163	830
		02/25/10	224	167	193	832
		06/03/10	221	181	141	818
		08/31/10	226	208	138	814
		11/22/10	233	162	125	823
		03/10/11	240	194	120	**2,290**
		08/23/11	220	242	197	837
	DUP	08/23/11	180	249	201	**1,160**
		12/16/11	297	223	167	828
		03/22/12	NA	**256**	189	**1,140**
		06/11/12	275	**257**	204	**1,050**
		09/26/12	286	**256**	204	**1,130**
		12/14/12	NA	**283**	203	**1,030**
		03/19/13	334	**257**	116	928
		06/06/13	306	138	85	972
		09/12/13	311	**270**	156	**1,160**
		11/19/13	344	239	108	942
		05/13/14	322	**286**	161	**1,080**
		08/07/14	310	**293**	156	**1,070**
		11/05/14	304	245	153	**1,120**
		03/06/15	309	**273**	169	**1,020**
		06/10/15	380	247	89	928
		09/29/15	309	242	145	984
		12/16/15	386	240	84	955
		03/15/16	319	242	146	951
		06/23/16	322	224	131	995
		09/30/16	329	**252**	173	**1,070**
		12/16/16	421	184	66	830
		03/28/17	328	**256**	177	888
		06/27/17	327	243	174	**1,040**
		09/20/17	300	**264**	169	**1,030**
		12/19/17	302	208	151	**1,150**
		04/05/19	293	**295**	193	**1,110**
		06/21/19	NA	**281**	NA	**1,210**
		09/12/19	298	**322**	183	**1,200**
		11/23/19	289	**307**	162	**1,120**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-3	MW-3	11/01/07	212	77	41	476
		04/25/08	206	99.3	50	NA
		09/16/08	222	63.7	32	457
		04/21/09	229	53.6	32	447
		10/27/09	223	65.5	36	488
		02/25/10	231	62.7	35	467
		06/03/10	230	87.1	42	530
		08/31/10	226	82.4	47	495
		11/22/10	225	64	53	490
		03/10/11	220	**292**	98	**1,560**
		06/03/11	224	**307**	102	948
		08/23/11	160	101	54	290
		12/16/11	209	**335**	137	834
	DUP	12/16/11	208	**309**	126	**1,030**
		03/22/12	NA	168	83	956
		06/11/12	212	**307**	141	**1,180**
		09/26/12	222	**290**	137	**1,080**
		12/14/12	NA	**282**	121	853
		03/19/13	240	88.6	58	523
		06/06/13	224	139	86	560
		09/12/13	242	128	86	677
		11/19/13	259	130	80	608
		05/13/14	250	227	110	822
		08/07/14	255	191	89	690
		11/05/14	263	162	89	787
		03/06/15	269	181	100	663
		06/10/15	295	141	66	698
		09/29/15	296	147	81	725
		12/16/15	300	160	88	719
MW-3		03/15/16	301	146	77	622
		06/23/16	315	119	70	673
		09/30/16	337	136	89	703
		12/16/16	306	132	44	596
		03/28/17	325	155	88	768
		06/27/17	338	136	75	769
		09/20/17	291	154	81	792
		12/19/17	298	154	77	792
		04/05/19	277	**261**	96.9	878
		06/21/19	NA	**252**	NA	**1,080**
		09/12/19	317	**279**	117	934
		11/23/19	260	**267**	113	974

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-4		11/01/07	193	**6,360**	180	**12,100**
	DUP	11/01/07	193	**6,170**	189	**12,800**
		04/25/08	195	**5,680**	163	NA
	DUP	04/25/08	191	**5,540**	163	NA
		09/16/08	196	**4,420**	136	**8,140**
	DUP	09/16/08	202	**4,210**	135	**7,940**
		04/21/09	208	128	33	551
		10/27/09	196	**5,070**	173	**10,800**
	DUP	10/27/09	209	**1,520**	73	**2,810**
		02/25/10	189	**10,600**	339	**21,800**
		06/30/10	204	**3,640**	124	**6,530**
	DUP	06/30/10	202	**3,310**	124	**6,480**
		08/31/10	205	**3,520**	121	**6,480**
	DUP	08/31/10	207	**3,520**	125	**6,480**
		11/22/10	202	**3,160**	122	**11,500**
		03/10/11	280	**36,900**	**5,970**	**63,200**
		06/03/11	228	**35,600**	575	**51,300**
		08/23/11	170	**39,500**	**3,690**	**90,800**
		12/16/11	172	**33,700**	<2,500	**68,500**
MW-4		03/22/12	NA	**15,600**	472	**28,300**
		03/22/12	NA	**16,500**	492	**27,600**
		06/11/12	283	**7,870**	284	**14,600**
		09/26/12	173	**38,200**	**1,320**	**66,900**
		12/14/12	NA	**14,400**	567	**28,800**
		03/19/13	235	129	48	572
		06/06/13	239	131	45	525
		09/12/13	239	127	50	605
		11/19/13	245	115	52	549
		05/13/14	202	**21,100**	**1,400**	**39,600**
		08/07/14	211	**13,900**	<1,000	**23,500**
	DUP	08/07/14	210	**13,800**	<1,000	**25,400**
		11/05/14	225	**11,300**	**1,550**	**19,000**
		03/06/15	252	**3,750**	438	**8,410**
		06/10/15	273	**559**	**84.4**	**1,330**
		09/29/15	190	**6,540**	317	**15,100**
		12/16/15	265	**1,040**	**56.4**	**1,770**
		03/16/16	194	**2,070**	66	**11,600**
	DUP	03/15/16	241	**2,060**	97	**3,710**
		06/23/16	241	**8,810**	249	**17,300**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-4 cont.		09/30/16	218	**8,870**	363	**17,300**
		12/16/16	220	**8,090**	306	**14,000**
		03/28/17	217	**9,150**	241	**15,400**
		06/27/17	219	**6,250**	269	**11,400**
		09/20/17	184	**12,200**	530	**19,800**
		12/19/17	201	**7,420**	294	**12,800**
		04/05/19	214	**3,460**	180	**5,960**
		06/21/19	NA	**1,860**	NA	**4,370**
	DUP-2	06/21/19	207	**2,350**	NA	**4,370**
		09/12/19	205	**345**	67.7	920
	DUP-3	09/12/19	214	**339**	62.9	892
		11/23/19	213	117	52.7	486
	DUP-1	11/23/19	207	166	63.4	492
MW-5	**MW-5**	09/23/10	NA	**571**	102	NA
		11/22/10	285	**1,030**	120	**2,500**
		03/10/11	310	**7,530**	582	**12,700**
		06/03/11	288	**6,480**	376	**13,400**
		08/23/11	242	**7,380**	545	**15,900**
		12/16/11	286	**5,200**	279	**10,500**
		03/22/12	NA	**679**	90	**1,690**
		06/11/12	242	**7,700**	410	**16,200**
		09/25/12	240	**7,570**	485	**15,700**
		12/14/12	NA	**3,890**	337	**8,570**
		03/19/13	329	**319**	62	**1,010**
		06/06/13	286	**581**	73	**4,550**
		09/12/13	246	**6,090**	319	**6,110**
		11/19/13	236	**4,240**	294	**7,250**
	DUP-1	11/19/13	238	**2,030**	171	**4,110**
		05/13/14	260	**7,650**	**617**	**14,500**
		08/07/14	237	**1,910**	<400	**4,220**
		11/05/14	246	**3,340**	417	**7,920**
		03/06/15	270	**2,810**	455	**6,460**
	DUP-1	03/06/15	305	**1,850**	255	**3,970**
		06/10/15	268	**1,450**	191	**3,050**
		09/29/15	234	**3,760**	339	**9,920**
		12/16/15	243	**5,570**	267	**11,100**
		03/15/16	248	**2,520**	209	**5,140**
		06/23/16	248	**2,910**	144	**7,340**
		09/30/16	241	**3,230**	240	**11,300**
		12/16/16	309	**447**	66	**1,130**
		03/28/17	242	**5,630**	202	**11,100**
		06/27/17	235	**5,600**	333	**10,600**
		09/20/17	225	**5,920**	455	**10,500**
		12/19/17	205	**3,710**	234	**7,940**
		04/05/19	263	**3,900**	273	**7,260**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-5 cont.		06/21/19	222	**5,090**	NA	**12,000**
		09/12/19	279	**4,260**	288	**9,560**
		11/23/19	237	**4,680**	271	**9,500**
MW-6	MW-6	09/23/10	NA	**554**	349	NA
		11/22/10	198	**589**	310	**1,710**
	DUP	11/22/10	193	**551**	302	**1,720**
		03/10/11	212	**745**	284	**1,840**
	DUP	03/10/11	236	**664**	262	**1,940**
		06/03/11	232	**796**	296	**2,270**
	DUP	06/03/11	220	**797**	299	**3,290**
		08/23/11	160	**891**	372	**2,530**
		12/16/11	215	**715**	334	**1,920**
		03/22/12	NA	**394**	328	**1,710**
		06/11/12	208	**838**	379	**2,510**
		09/26/12	207	**825**	367	**2,580**
		12/14/12	NA	**888**	384	**2,000**
		03/19/13	249	**307**	256	**1,220**
		06/06/13	249	**304**	252	**1,080**
		09/12/13	250	**264**	226	**1,130**
		11/19/13	255	**254**	228	**1,010**
		05/13/14	225	**618**	572	**1,720**
		08/07/14	215	**805**	337	**2,240**
		11/05/14	214	**677**	339	**2,180**
		03/06/15	224	**449**	241	**1,440**
		06/10/15	211	**677**	296	**2,060**
	DUP-1	06/10/15	217	**612**	274	**1,850**
		09/29/15	205	**654**	297	**2,180**
		12/16/15	200	**731**	294	**1,990**
		03/15/16	199	**584**	248	**1,780**
		06/23/16	211	**515**	243	**1,750**
		09/30/16	216	**597**	284	**1,720**
	DUP	09/30/16	212	**617**	294	**1,730**
		12/16/16	239	194	137	816
	DUP	12/16/16	241	199	142	933
		03/28/17	207	**675**	298	**1,700**
		06/27/17	202	**640**	286	**2,080**
		09/20/17	189	**706**	271	**1,940**
		12/19/17	185	**671**	263	**1,550**
		04/05/19	173	**877**	250	**1,880**
	DUP-1	04/05/19	179	**911**	247	**2,060**
		06/21/19	NA	**910**	NA	**2,870**
	DUP-1	06/21/19	NA	**905**	NA	**3,060**
		09/12/19	168	**959**	213	**2,630**
		11/23/19	188	**433**	117	**1,320**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-7	MW-7	09/23/10	NA	120	71	NA
		11/22/10	204	**372**	178	**1,260**
		03/10/11	20	**798**	252	**1,880**
		06/03/11	220	**353**	116	**1,040**
		08/23/11	190	**872**	324	**2,730**
		12/16/11	214	**618**	237	**1,620**
		03/22/12	NA	80	70	712
		06/11/12	201	**875**	335	**2,650**
		09/26/12	199	**863**	313	**2,600**
	DUP-1	09/26/12	196	**882**	318	**2,460**
		12/13/12	NA	195	86	779
		03/19/13	218	**420**	166	**1,220**
		06/06/13	215	**556**	214	**1,180**
		09/12/13	222	**457**	181	**1,480**
	DUP	09/12/13	219	**473**	187	**1,680**
		11/19/13	250	**538**	207	**1,210**
		05/13/14	220	**666**	270	**1,670**
		08/07/14	233	**412**	164	**1,160**
		11/05/14	239	243	129	760
		03/06/15	245	177	93	687
		06/10/15	262	69.8	64	532
		09/29/15	230	**327**	133	**1,110**
		12/16/15	208	**604**	205	**1,540**
		03/15/16	205	**551**	185	**2,230**
		06/23/16	253	**272**	117	998
		09/30/16	221	**495**	195	**1,370**
		12/16/16	257	48.9	49	411
		03/28/17	206	**686**	244	**1,760**
		06/27/17	226	87.5	35	**1,200**
		09/20/17	180	**758**	233	**1,990**
		12/19/17	207	**353**	127	**1,130**
		04/05/19	204	**434**	153	**1,120**
		06/21/19	NA	151	NA	782
		09/12/19	214	89.7	50.6	545
	DUP-2	09/12/19	196	249	98.9	858
		11/23/19	206	**326**	119	968

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-8	MW-8	09/12/11	194	**3,180**	**765**	**7,680**
		12/16/11	196	**3,440**	**706**	**8,010**
		03/22/12	NA	**2,960**	**753**	**7,840**
		06/11/12	199	**3,310**	**732**	**8,450**
		09/26/12	200	**3,130**	**732**	**7,940**
		12/13/12	NA	**4,360**	**725**	**6,660**
		03/19/13	219	**2,590**	**755**	**5,860**
		06/06/13	224	**2,280**	**712**	**4,810**
		09/12/13	227	**2,040**	**674**	**5,600**
		11/19/13	235	**2,110**	**731**	**4,620**
		05/13/14	207	**2,760**	**699**	**6,690**
		08/07/14	197	**2,680**	580	**7,770**
		11/05/14	194	**2,500**	**697**	**7,500**
		03/06/15	213	**2,200**	**671**	**5,020**
		06/10/15	200	**2,520**	**624**	**6,860**
		09/29/15	189	**2,460**	599	**6,640**
		12/16/15	191	**2,600**	562	**6,020**
		03/15/16	191	**2,480**	575	**5,710**
		06/23/16	201	**2,020**	547	**6,480**
		09/30/16	199	**2,390**	**653**	**6,340**
		12/16/16	243	**1,510**	**636**	**4,050**
		03/28/17	203	**2,270**	565	**5,730**
		06/27/17	197	**2,370**	**672**	**5,490**
		09/20/17	176	**2,390**	583	**5,650**
		12/19/17	183	**2,270**	583	**4,150**
		04/05/19	185	**2,150**	572	**4,260**
	DUP-2	04/05/19	188	**2,200**	579	**6,030**
		06/21/19	NA	**2,200**	NA	**6,810**
		09/12/19	177	**2,180**	563	**5,690**
		11/23/19	169	**2,170**	557	**6,380**
MW-9	MW-9	09/12/11	261	**913**	104	**2,580**
		12/16/11	291	**6,660**	362	**14,700**
		03/22/12	NA	**403**	74	**1,150**
		06/11/12	292	**8,380**	524	**16,700**
		09/26/12	283	**9,920**	585	**20,500**
		12/13/12	NA	**10,000**	595	**17,500**
		03/19/13	308	**385**	81	**1,170**
	DUP	03/19/13	306	**400**	88	**1,200**
		06/06/13	326	**393**	80	**1,040**
		09/12/13	329	**359**	65	**1,260**
		11/19/13	330	**2,000**	153	**3,720**
		05/13/14	306	**9,800**	**713**	**17,200**
		08/07/14	304	**7,660**	408	**16,500**
		11/05/14	354	**386**	105	**1,880**
		03/06/15	335	**2,350**	404	**5,340**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-9 cont.		06/10/15	319	**1,680**	177	**3,340**
		09/29/15	292	**3,030**	295	**6,940**
		12/16/15	361	**740**	131	**1,850**
		03/15/16	317	**3,700**	232	**6,130**
		06/23/16	309	**2,730**	155	**6,120**
		09/30/16	298	**4,980**	312	**10,200**
		12/16/16	349	**366**	101	**1,100**
		03/28/17	305	**4,850**	250	**11,600**
		06/27/17	303	**6,530**	409	**13,800**
		09/20/17	269	**7,610**	531	**14,500**
		12/19/17	285	**5,040**	312	**9,320**
		04/05/19	280	**4,600**	304	**8,120**
		06/21/19	264	**5,420**	NA	**11,700**
		09/12/19	270	**4,850**	286	**10,700**
		11/23/19	279	**5,020**	334	**5,860**
MW-10	MW-10	12/14/12	NA	**1,500**	149	**3,810**
		03/19/13	319	**2,580**	211	**5,010**
		06/06/13	326	**2,330**	177	**8,760**
		09/12/13	329	**2,550**	206	**5,420**
		11/19/13	336	**2,610**	244	**5,020**
		05/13/14	341	**3,030**	486	**5,650**
	DUP	05/13/14	340	**2,920**	557	**5,630**
		08/07/14	333	**2,730**	<400	**6,280**
		11/05/14	328	**2,430**	<200	**6,140**
		03/06/15	340	**2,520**	407	**5,960**
		06/10/15	339	**2,550**	297	**5,710**
		09/29/15	320	**2,760**	239	**5,000**
		12/16/15	324	**3,030**	181	**5,470**
		03/15/16	332	**2,970**	200	**5,430**
		06/23/16	365	**2,430**	151	**5,160**
		09/30/16	343	**2,700**	215	**5,170**
		12/16/16	384	**1,090**	115	**2,240**
		03/28/17	342	**2,640**	148	**5,170**
		06/27/17	335	**2,810**	224	**5,180**
		09/20/17	306	**2,100**	223	**5,570**
		12/19/17	312	**2,530**	172	**4,480**
		02/13/18	299	**2,670**	211	**4,630**
		06/14/18	335	**2,470**	184	**4,560**
		09/14/18	344	**1,830**	148	**2,200**
		12/13/18	337	**2,390**	194	**4,560**
		04/05/19	314	**2,530**	183	**4,790**
		06/21/19	295	**2,420**	NA	**5,350**
		09/12/19	298	**2,500**	159	**5,280**
		11/23/19	292	**3,720**	129	**5,170**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-11	MW-11	12/14/12	NA	1,030	224	2,000
		03/19/13	255	3,480	127	6,940
		06/06/13	238	3,760	113	4,430
		09/12/13	241	4,290	106	5,320
		11/19/13	242	4,630	166	10,600
		05/13/14	249	5,210	400	12,200
		08/07/14	235	5,150	<400	13,400
		11/05/14	229	4,510	296	12,500
		03/06/15	223	4,430	395	12,400
	DUP-2	03/06/15	223	4,440	384	12,100
		06/10/15	227	5,310	291	12,000
	DUP-2	06/10/15	227	5,100	267	13,900
		09/29/15	221	4,970	261	7,150
		12/16/15	218	5,510	157	11,700
		03/15/16	215	4,970	169	11,300
		06/23/16	216	4,570	102	11,900
		09/30/16	214	4,900	180	12,700
		12/16/16	151	3,020	150	8,390
		03/28/17	218	5,100	102	11,200
		06/27/17	201	4,620	161	11,400
		09/20/17	185	5,570	230	8,980
		12/19/17	187	4,790	151	10,100
		02/13/18	183	4,740	200	9,060
		06/14/18	202	5,040	175	7,530
		09/14/18	198	4,650	189	9,330
		12/14/18	204	4,930	198	8,360
		12/14/18	204	4,990	199	8,350
		04/05/19	192	5,050	194	10,000
		06/21/19	178	5,020	NA	14,200
		09/11/19	158	5,050	218	15,000
	DUP-1	09/11/19	168	5,030	215	14,600
		11/23/19	181	5,150	138	12,500
MW-12	MW-12	12/23/14	298	2,220	545	6,270
		03/06/15	282	2,410	549	6,820
		06/10/15	310	2,460	497	7,390
		09/29/15	295	2,270	440	5,670
		12/16/15	311	2,370	407	4,570
		03/15/16	317	1,840	375	4,570
		06/23/16	342	1,440	330	4,090
		09/30/16	340	1,570	407	3,520
		12/16/16	346	1,020	296	2,720
		03/28/17	332	1,270	335	3,080
		06/27/17	299	2,370	436	4,530
		09/20/17	280	2,260	370	4,390

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-12 cont.		12/19/17	275	**2,050**	358	**4,070**
		02/13/18	262	**1,530**	355	**3,860**
		06/14/18	266	**1,310**	254	**2,590**
		09/14/18	271	**1,270**	257	**3,390**
		12/14/18	297	**1,520**	282	**3,040**
		04/05/19	299	**1,460**	225	**3,080**
		06/21/19	279	**1,470**	NA	**4,480**
		09/12/19	568	**1,550**	207	**5,090**
		11/23/19	298	**646**	154	**3,440**
MW-13	MW-13	08/07/14	183	**7,330**	**729**	**8,840**
		11/05/14	179	**6,510**	**851**	**16,100**
		03/06/15	155	**6,350**	**814**	**17,600**
		06/10/15	182	**7,940**	**929**	**20,800**
		09/29/15	175	**8,260**	**893**	**20,500**
		12/16/15	178	**8,610**	**796**	**16,700**
		03/15/16	179	**8,120**	**801**	**18,500**
		06/23/16	182	**7,330**	**717**	**20,700**
		09/30/16	189	**8,730**	**986**	**18,400**
		12/16/16	184	**7,770**	**838**	**18,800**
		03/28/17	195	**9,680**	**949**	**18,900**
		06/27/17	196	**8,970**	**996**	**19,100**
		09/20/17	178	**10,900**	**1,070**	**18,700**
		12/19/17	188	**9,820**	**1,030**	**17,500**
		02/13/18	174	**10,500**	**1150**	**20,900**
		06/14/18	203	**10,600**	**965**	**17,800**
		09/14/18	201	**9,510**	**899**	**16,500**
		12/13/18	213	**10,100**	**992**	**17,200**
		04/05/19	202	**10,100**	**936**	**17,400**
		06/21/19	191	**10,700**	NA	**24,400**
		09/11/19	196	**10,400**	**849**	**26,600**
		11/23/19	179	**6,380**	**683**	**22,000**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-14	MW-14	08/07/14	401	**786**	326	**2,010**
		11/05/14	375	**659**	266	**2,030**
		03/06/15	365	**786**	269	**2,050**
		06/10/15	368	**870**	249	**2,100**
		09/29/15	363	**832**	229	**2,180**
		12/16/15	367	**888**	210	**1,950**
		03/15/16	374	**777**	181	**2,020**
		06/23/16	384	**721**	182	**2,000**
	DUP	06/23/16	380	**726**	180	**2,030**
		09/30/16	382	**785**	204	**1,860**
		12/16/16	378	**626**	165	**1,740**
		03/28/17	392	**821**	174	**2,100**
		06/27/17	378	**787**	195	**1,850**
		09/20/17	333	**860**	181	**2,060**
		12/19/17	337	**813**	166	**2,270**
		02/13/18	319	**895**	212	**2,110**
		06/14/18	351	**823**	176	**2,000**
		09/14/18	348	**792**	165	**1,800**
		12/13/18	349	**894**	201	**1,880**
		04/05/19	332	**956**	200	**2,120**
		06/21/19	306	**908**	NA	**2,500**
		09/12/19	307	**953**	186	**2,320**
		11/23/19	314	**963**	181	**2,030**
MW-15	MW-15	08/07/14	202	**1,340**	502	**3,840**
		11/05/14	215	**1,080**	464	**3,130**
		03/06/15	236	**770**	353	**2,130**
		06/10/15	225	**1,140**	466	**3,240**
		09/29/15	215	**1,110**	485	**8,740**
		12/16/15	213	**1,190**	507	**2,450**
		03/15/16	217	**1,110**	482	**3,100**
		06/23/16	220	**1,120**	515	**3,600**
		09/30/16	221	**1,120**	559	**3,360**
		12/16/16	274	**375**	209	**1,320**
		03/28/17	224	**1,070**	510	**2,740**
		06/27/17	217	**1,000**	503	**2,560**
		09/20/17	197	**1,030**	462	**3,110**
		12/19/17	206	**966**	459	**2,940**
		02/13/18	195	**959**	540	**2,360**
		06/14/18	212	**1,010**	493	**2,320**
		09/14/18	210	**951**	456	**2,820**
		12/13/18	215	**986**	546	**2,450**
		04/05/19	209	**1,020**	495	**2,560**
		06/21/19	NA	**958**	NA	**2,920**
		09/12/19	363	**990**	494	**2,990**
		11/23/19	217	**456**	241	**1,450**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-16	MW-16	08/07/14	283	**549**	351	114
		11/05/14	305	**447**	350	**1,590**
		03/06/15	307	**513**	318	**1,910**
		06/10/15	302	**480**	362	**1,790**
		09/29/15	292	**473**	364	**1,760**
		12/16/15	282	**474**	359	**1,550**
		03/15/16	286	**507**	341	**1,870**
		06/23/16	298	**442**	331	**1,960**
		09/30/16	230	**516**	448	**1,820**
		12/16/16	298	**508**	382	**1,910**
		03/28/17	342	**527**	382	**1,850**
		06/27/17	312	**508**	424	**1,750**
		09/20/17	299	**424**	379	**1,750**
		12/19/17	316	**290**	279	**1,510**
		02/13/18	326	**339**	322	**1,310**
		06/14/18	317	**367**	327	**1,460**
		09/14/18	310	**321**	304	**1,440**
		12/13/18	325	245	218	843
		04/05/19	317	**306**	224	**1,130**
		06/21/19	NA	**386**	NA	**1,480**
		09/12/19	1,020	**410**	213	**1,340**
		11/23/19	281	**368**	186	**1,230**
MW-17	MW-17	12/16/16	220	**4,300**	284	**8,950**
		03/28/17	207	**6,080**	341	**12,700**
		06/27/17	178	**6,040**	418	**13,400**
		09/20/17	177	**6,870**	449	**11,200**
		12/19/17	174	**6,370**	408	**11,100**
		02/13/18	166	**6,860**	482	**11,800**
		06/14/18	211	**11,800**	592	**24,200**
		09/14/18	218	**12,000**	**653**	**22,400**
		12/14/18	219	**10,300**	**698**	**17,400**
		04/05/19	214	**9,400**	584	**17,200**
		06/21/19	187	**10,300**	NA	**23,200**
		09/11/19	186	**9,030**	544	**21,200**
		11/23/19	194	**9,050**	488	**17,900**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replicate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-18	MW-18	12/16/16	152	**1,180**	128	**2,780**
		03/28/17	221	**2,610**	149	**5,900**
		06/27/17	221	**2,080**	183	**4,500**
		09/20/17	208	**2,070**	179	**4,050**
		12/19/17	219	**1,710**	146	**3,240**
		02/13/18	217	**1,580**	166	**2,750**
		06/14/18	222	**1,170**	131	**2,560**
		09/14/18	226	**1,380**	145	**3,050**
		12/13/18	228	**1,410**	159	**2,500**
		04/05/19	229	**1,360**	138	**2,810**
		06/21/19	211	**988**	NA	**3,170**
		09/11/19	1,580	**1,220**	134	**3,540**
		11/23/19	196	**1,040**	123	**2,760**
MW-19	MW-19	12/16/16	201	42.4	83	439
		03/28/17	225	50.8	93	519
		06/27/17	224	51.3	98	462
		09/20/17	198	54.5	101	532
		12/19/17	209	42.3	77	493
		02/13/18	205	58.3	104	538
		06/14/18	218	60.9	96.2	521
		09/14/18	219	67.2	99.5	500
		12/14/18	224	65.9	104	534
		4/5/2019	210	72.6	92.2	529
		06/21/19	562	78.1	NA	516
		09/11/19	382	82.1	97.9	599
		11/23/19	203	86.6	85.8	476
MW-20	MW-20	12/16/16	280	187	184	**1,380**
		03/28/17	295	199	224	**1,120**
		06/27/17	298	192	246	**1,120**
		09/20/17	268	211	256	**1,030**
		12/19/17	272	157	219	**1,070**
		02/13/18	266	191	261	935
		06/14/18	296	153	202	934
		09/14/18	295	145	198	954
		12/13/18	283	163	188	865
		04/05/19	265	187	208	969
		06/21/19	261	197	NA	**1,330**
		09/11/19	382	**401**	378	**2,500**
		11/23/19	324	**274**	245	**1,460**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
MW-21	MW-21	12/16/16	157	**8,120**	392	**22,500**
		03/28/17	202	**9,720**	**618**	**20,100**
		06/27/17	207	**8,830**	**632**	**19,400**
		09/20/17	186	**10,800**	**784**	**18,400**
		12/19/17	193	**9,710**	**696**	**16,200**
		02/13/18	179	**9,790**	**676**	**14,000**
		06/14/18	196	**9,990**	**607**	**16,800**
		09/14/18	199	**9,120**	584	**17,900**
		12/14/18	200	**9,380**	**621**	**16,400**
		04/05/19	206	**9,640**	525	**17,900**
		06/21/19	195	**10,400**	NA	**25,100**
		09/11/19	223	**10,600**	536	**26,900**
		11/23/19	200	**11,300**	486	**21,300**
MW-22		04/05/19	227	87.4	36.6	437
		06/21/19	210	80.9	NA	521
		09/11/19	196	79.7	44.5	444
		11/23/19	210	84.5	50.4	360
MW-23		04/05/19	267	**4,990**	247	**9,600**
		06/21/19	264	**6,770**	NA	**15,100**
		09/11/19	698	**5,270**	240	**12,500**
		11/23/19	240	**8,680**	346	**11,500**
MW-24		04/05/19	185	**1,670**	203	**3,390**
		06/21/19	192	**1,590**	NA	**4,760**
		09/12/19	223	**1,530**	188	**4,380**
		11/23/19	200	**2,230**	284	**3,640**
MW-25		04/05/19	247	**2,150**	560	**4,600**
		06/21/19	NA	**2,140**	NA	**6,760**
		09/12/19	261	**2,160**	529	**6,340**
		11/23/19	237	**1,360**	289	**6,180**
RW-1	RW-1	09/13/11	156	**9,820**	306	**18,600**
		12/16/11	177	**18,000**	**661**	**32,200**
		03/22/12	NA	**17,800**	**944**	**34,200**
		06/11/12	245	**1,430**	520	**3,720**
		09/26/12	183	**19,100**	**665**	**35,500**
		12/13/12	NA	**17,300**	**633**	**29,600**
		03/19/13	214	**10,600**	573	**15,200**
		06/06/13	203	**17,000**	457	**27,200**
	DUP-1	06/06/13	201	**16,100**	451	**32,000**
		09/12/13	207	**13,400**	391	**20,200**
		11/19/13	202	**11,500**	558	**21,500**
		05/13/14	194	**15,200**	**763**	**30,500**
		08/07/14	216	**7,040**	<400	**14,100**
		11/05/14	190	**16,400**	**952**	**29,400**

Table 2
Summary of Historical Groundwater Analytical Results
Chevron Environmental Management Company
Mark Owen #9 Reserve Pit East (AP-56)
Lea County, New Mexico

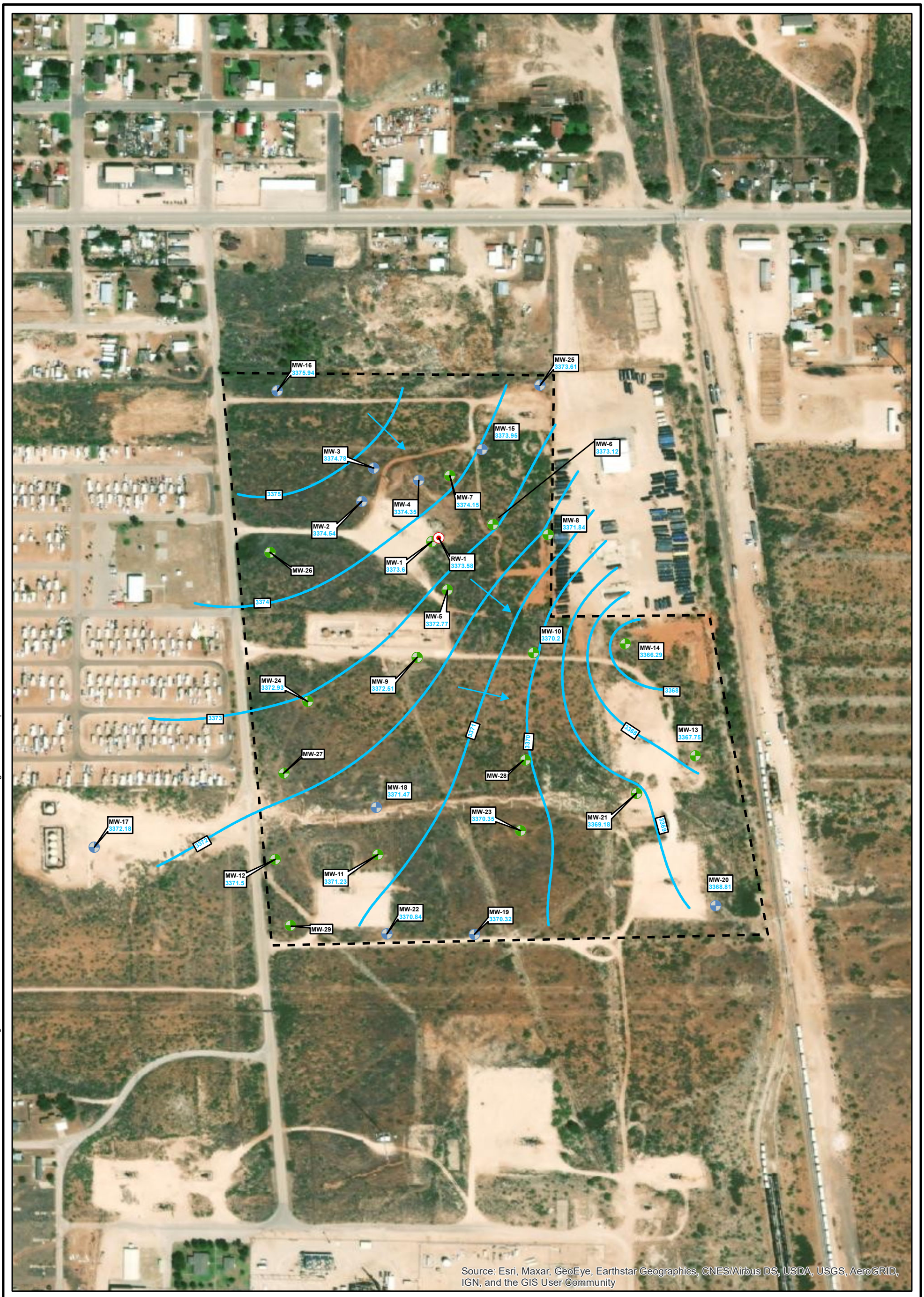
ARCADIS Design & Consultancy for natural and built assets

Sample I.D. No.	Replecate Sample I.D.	Date	Groundwater Quality			
			Total Alkalinity ($CaCO_3$)	Chloride	Sulfate	Total Dissolved Solids
			(mg/L)	(mg/L)	(mg/L)	(mg/L)
NMWQCC Human Health Standards			NMWQCC Other Standards for Domestic Water Supply[2]			
				250	600	1,000
				mg/L	mg/L	mg/L
RW-1 cont.	DUP	11/05/14	192	**14,700**	**889**	**29,500**
		03/06/15	196	**15,100**	**1,070**	**33,700**
		06/10/15	243	**2,020**	227	**4,750**
		09/29/15	238	**13,600**	465	**23,200**
		12/16/15	258	**4,420**	155	**6,900**
		03/15/16	232	**10,900**	325	**18,900**
		06/23/16	217	**6,250**	214	**13,000**
		09/30/16	224	**14,100**	456	**25,500**
		12/16/16	230	**10,300**	322	**21,900**
		03/28/17	217	**14,000**	362	**16,000**
		06/27/17	213	**12,200**	442	**218,000***
		09/20/17	196	**13,600**	549	**17,500**
		12/19/17	203	**11,200**	416	**21,400**
		02/13/18	220	**4,950**	337	**14,000**
		06/14/18	231	**12,100**	435	**21,200**
		09/14/18	227	**9,520**	348	**17,100**
		12/13/18	240	**10,200**	406	**17,700**
		04/05/19	242	**8,000**	347	**13,600**
		06/21/19	NA	**7,870**	NA	**15,400**
		09/12/19	186	**9,460**	350	**17,800**
		11/23/19	229	**8,000**	285	**12,800**

Notes:

1) RCRA Metals Analysis by Environment Protections Agency (EPA) Methods 6010B and 7470A.
2) Groundwater Quality by EPA Methods 160.1, 300.0, and 310.1.
3) Highlighted values indicate concentrations above NMWQCC Other Standards for Domestic Water Supply.
4) [1] NMWQCC Human Health Standards Per NMAC 20.6.2.3103A.
5) [2] NMWQCC Other Standards for Domestic Water Supply Per NMAC 20.6.2.3103B.
6) NA= Not analyzed.
7) DUP = Duplicate sample.
8) D = Dilution factors are included in the final results. The result is from a diluted sample.
9) * = Likely an order of magnitude higher then actual result; however reported value was verified by the laboratory.

FIGURES



Legend

- Monitoring Well Location
- Monitoring Well Location to be Sampled During Reduced Event
- Recovery Well
- 3374 — Potentiometric Contour and Elevation
- 3373.65 — Groundwater Elevation (ft above mean sea level)
- Approximate Groundwater Flow
- Property Boundary

Notes:
1. Datum: D_WGS_1984
2. Site Location: 32.432397, -103.146391
3.Monitoring Wells Highlighted Green are Proposed to be Sampled During Reduced Sampling Event (One Semi-annual Event)

Chevron Environmental Management Company
Mark Owen No. 9 Reserve Pit
Lea County, New Mexico

2020 REDUCED SAMPLING PLAN POTENTIOMETRIC SURFACE MAP NOVEMBER 2019

ARCADIS

FIGURE 1

Document Path: \\arcadis-us\officedata\Houston-TX\ENV\ChevronTexaco TX8\HES Transfer\04 Field Investigations\2019\6 - Annual GWMR\Mark Owen\GIS - Mark Owen\ Figure 3 - GW Map 2019 Combined

Legend

- Monitoring Well Location
- Monitoring Well Location to be Sampled During Reduced Event
- Recovery Well
- 250 — Chloride Isoconcentration Contour
- 79.7 — Chloride Concentration (mg/L)
- 1,550 — Chloride Concentration (mg/L) Exceeds NMWQCC Other Standards for Domestic Water Supply
- Property Boundary

Notes:
1. Datum: D_WGS_1984
2. Site Location: 32.432397, -103.146391
3. Monitoring Wells Highlighted Green are Proposed to be Sampled During Reduced Sampling Event (One Semi-annual Event)

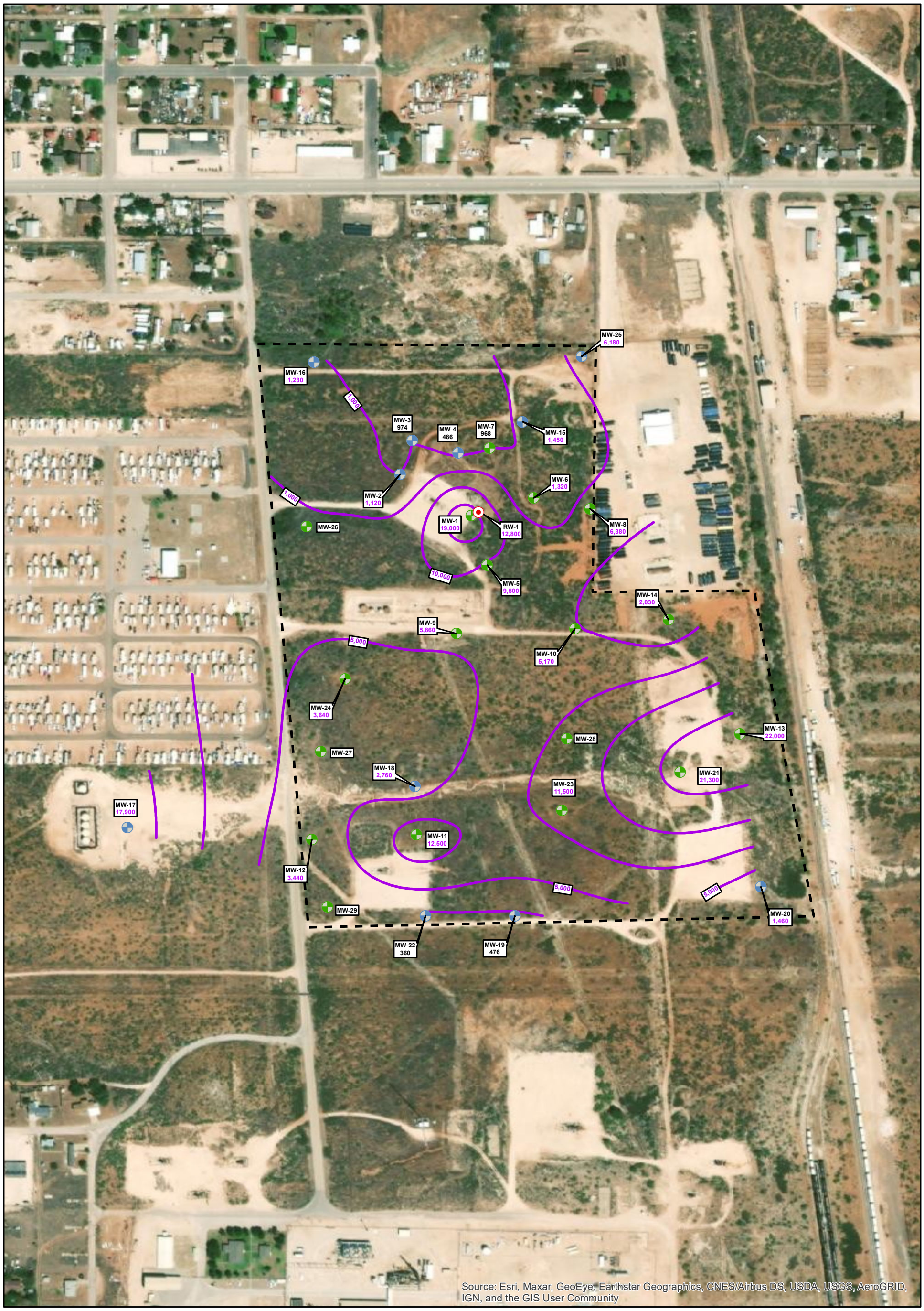
Chevron Environmental Management Company
Mark Owen No. 9 Reserve Pit
Lea County, New Mexico

2020 REDUCED SAMPLING PLAN CHLORIDE ISOCONCENTRATION MAP NOVEMBER 2019

ARCADIS

FIGURE 2

Document Path: \\arcadis-us\officedata\Houston-TX\ENV\Chevron Texaco TX8\HES Transfer\04 Field Investigations\2019\6 - Annual GWMR\Mark Owen\GIS - Mark Owen\ Figure 4 - Chloride Map 2019 Combined



Legend

- Monitoring Well Location
- Monitoring Well Location to be Sampled During Reduced Event
- Recovery Well
- 1,000 — Total Dissolved Solids (TDS) Isoconcentration Contour
- 974 — TDS Concentration (mg/L)
- 1,120 — TDS Concentration (mg/L) Exceeds NMWQCC Other Standards for Domestic Water Supply
- Property Boundary

Notes:
1. Datum: D_WGS_1984
2. Site Location: 32.432397, -103.146391
3.Monitoring Wells Highlighted Green are Proposed to be Sampled During Reduced Sampling Event (One Semi-annual Event)

Chevron Environmental Management Company
Mark Owen No. 9 Reserve Pit
Lea County, New Mexico

2020 REDUCED SAMPLING PLAN TDS ISOCONCENTRATION MAP NOVEMBER 2019

ARCADIS

FIGURE 3

Document Path: \\arcadis-us\officedata\Houston-TX\ENV\ChevronTexaco TX8\HES Transfer\04 Field Investigations\2019\6 - Annual GWMR\Mark Owen\GIS - Mark Owen\ Figure 5 - TDS Map 2019 Combined.mxd

Legend

- Monitoring Well Location
- Monitoring Well Location to be Sampled During Reduced Event
- Recovery Well
- 500 — Sulfate Isoconcentration Contour
- 50.4 — Sulfate Concentration (mg/L)
- 683 — Sulfate Concentration (mg/L) Exceeds NMWQCC Other Standards for Domestic Water Supply
- Property Boundary

Notes:
1. Datum: D_WGS_1984
2. Quarter 2 Groundwater Samples were not collect for sulfate Analysis
3. Site Location: 32.432397, -103.146391
4. Monitoring Wells Highlighted Green are Proposed to be Sampled During Reduced Sampling Event (One Semi-annual Event)

Chevron Environmental Management Company
Mark Owen No. 9 Reserve Pit
Lea County, New Mexico

2020 REDUCED SAMPLING PLAN
SULFATE ISOCONCENTRATION MAPS
NOVEMBER 2019

ARCADIS

FIGURE
4

Document Path: \\arcadis-us\officedata\Houston-TX\ENV\Chevron Texaco TX8\HES Transfer\04 Field Investigations\2019\6 - Annual GWMR\Mark Owen\GIS - Mark Owen\ Figure 6 - Sulfate Map 2019 Combined.mxd

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Operator:	OGRID:
Arcadis U.S., Inc 630 Plaza Drive Highlands Ranch, CO 80129	329073
	Action Number: 9409
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the Mark Owen No. 9 Reserve Pit reduction plan: content satisfactory for approval 1. At this time, removal of sulfate from the sampling requirements is not approved. 2. The following wells are approved to be reduced from the second semi-annual sampling event: MW-2, MW-3, MW-4, MW-15, MW-16, MW-17, MW-18, MW-19, MW-20, MW-22, MW-25, and RW-1. 3. Total alkalinity may be removed from the groundwater analysis as a parameter due to consistency in baseline.	3/3/2025