Baseline Water Monitoring Fieldsheet

APEX

Sample Date: 3/22/2017

Samplers: BG

Client(s): Encana Oil & Gas (Morton Water Well)

Initial ☐ 1st Subsequent ☐ 2nd Subsequent ☐ Response ☒ Annual ☐ Frequency: SP

O&G Well: API: Spud Date: Completed Date:

Regulation: Voluntary Distance from Well (ft): Billing #:

Well Parameters

Well / Facility Name: Morton 288643 Permit: 288643 Receipt: 3655701 ID: 753196

Map No. Project: 240.1601.01 QQ: SENE Sec: 33 Twn: 1N Rng: 67W Use: Domestic

County: Weld State: CO Elev: 5140 UTM Easting: 509543 UTM Northing: 4428750 Zone: 13

West side of CR 19. Wellhead in field west of red shop building.

Owner Information

	Mailing Address:	Physical Address:	Individuals Present During Sampling
Morton, Thomas	*515 County Road 19*	*515 County Road 19*	Steven Arauza (COGCC) in + out
Phone: 3039563615	*Brighton, Colorado 80603*	*Brighton, Colorado 80603*	Rod @ beginning
Cell:	Alt Contact:		

Well Information

CAN/ABA: No Refused Sample: No Reported Water Level: Reported Total Depth: 840 Surface Casing Diameter: 6.000

Well House: N Vault: Y Pitless: Y Surf. Discharge Pipe: N Confined Space: Y Airline Installed: unk

Well Seal: Y Type/Manufacturer: Baker Vented: Y Gas Flow from Vent: N Access for WL: Y

Storage Tank: Y Storage Tank Volume (gal): unk Pressure Tank: Y Pressure Tank Volume (gal): ~50

Ground Slope Away from Well? Y Area Desc/Proximity: ~150 yds W of house near driveway + field

Condition of well: Good

LEL(%): 0 x0.05= Methane Concentration: 0 % LEL Sample Location: wellhead

Measured Flow Rate (gpm): 0.30 Time: 1350 Sampling Flow Rate: 0.5

Measured Water Level: — Time: — Instrument: —

Pump Specifications & Power

Pump Type: sub Pump Manufacturer: Goulds HP: 3 Phase: 1 Fused Shut Off: Y

Fuse: — Time on: — Time Off: — Breaker: Y Time On: 10:30 Time Off: 1500

Timer: — Time on: — Time Off: — Other: — Time On: — Time Off: — Other Description: —

Mini-Test Data

Clock Time	Elapsed Time	Water Level	Flow Rate (calc)	Flow (gal/sec)		Temp (°C)	pH	EC (uS/cm)	ORP (mg/L)	DO (mg/L)	Turbidity	Color	Odor	Sediment	Bubbles / Effervescence	CH4 (%)	
1050	0	—	7	7	60	13.35	6.35	7180.3	-124.9	4.33	49.7	light grey	None	fine black	B Eff	0	
1236	1:46	—	0.28	1	216	20.30	6.84	7279.9	-217.0	0.09	4.80	light grey	"	"	slight eff	0	54
1239	1:49	—	0.28	1	216	20.31	6.98	7276.1	-220.5	0.07	3.23	slight cloudy	"	None	"	0	54
1242	1:52	—	0.28	1	212	20.32	7.06	7294.2	-222.0	0.06	2.87	"	"	"	"	0	53
1245	1:55	—	0.28	1	216	20.32	7.11	7288.5	-223.3	0.05	3.49	"	"	"	"	0	54
1248	1:58	—	0.28	1	212	20.34	7.14	7294.5	-223.0	0.05	2.19	"	"	"	"	0	53

Sample: Y No Sample Reason:

Sample Location: cistern hose

Sampling Before Tank: N Flow Cell Used: Y Purge Volume: 581 gal = (Pumped 21 min @ 0.30 gpm) = 575 gal

Well Volume = 230.00 gal (Radius 2.25 in) Squared * Water Column 280 *0.163 Casing Volumes Removed 2.51

Sample/Visit Time: 1350 Weather: 65°, sunny, calm Field Conditions: Dry

Comments: 840 ft − 560 ft = 280 ft

280 ft × 2.25² in × 0.163 = 231 gallons

1500 - Red turned off power

3 casings = 693 gal

300 - 1st parameter check

500 gal prior to sampling flow cell

Clock	Elapsed	W.L.	FlowRt.	g/sec	Temp	pH	EC	ORP	DO	Turb	Color	Odor	Sed	Bub/Eff	CH4
1344	2:54	—	0.34	1	176	21.37	7.29	71849	-222.3	0.06	5.18	None	None	fine black	slight eff	0
1347	2:57	—	0.34	1	176	20.79	7.27	7272.4	-221.0	0.04	2.55	"	"	"	"	0
1350	3:00	—	0.34	1	176	20.75	7.27	7278.8	-220.0	0.03	2.94	"	"	"	"	0
		—														

44

Arrived on site @ 1040 and met Rod (Morton's son?) and Steven Aranza (COGCC). Rod had already connected the hose and turned on the breaker ~10 min prior. The water is not being used. The wellhead is located ~150 yds west of the house near the driveway and field. The sample location is a rubber hose connected inside the cistern. I connected a y-valve because the water can not be shut off while sampling. Discharge water was purged into 2 300 gal. tanks. Flow started ~7 GPM and reduced to 1.6 - 2 GPM after 30 min and remained there for ~~remainder~~ duration of purge. Water was intermittently dark grey and relatively clear, but would oxidize quickly to dark rust color. Initial & Post buckets both contain fine black sediment. Purged ~300 gallons then conducted mini tests and parameters were stable. Purged another 500 gallons prior to using flow-thru cell for 2nd series of mini-tests. Parameters stable so started sampling. A total of 581 gallons purged prior to collecting the samples. All sample bottles filled via silicone tubing and rubber hose. Rob returned at 1500 and turned off the breaker. Purge tanks left next to well along driveway.