



MODERN GEOSCIENCES
TRUSTED ENVIRONMENTAL ADVISORS

DATE February 1, 2022
PROJECT 22001
ATTN **Mr. Matthew Woods**
Town of Flower Mound
2121 Cross Timbers Road
Flower Mound, Texas 75208

Padsite Inspection Report	
Padsite:	Obenchain
Operator:	EagleRidge
Inspection:	<input checked="" type="checkbox"/> First Half Year <input type="checkbox"/> Second Half Year

Modern Geosciences, LLC (Modern) is pleased to provide the attached Padsite Inspection Report documenting the results of our recent inspection and monitoring events at the above-referenced padsite. A general summary of findings is presented below with detailed results provided in the attached report.

- **Field Inspection Results:** As part of the field inspection efforts, Modern evaluated the padsite concerning general ordinance or operational requirements set forth by the Town.

No operational or ordinance compliance issues were noted by Modern during our inspection efforts other than noted below:

- **Corrosion noted on Separators A and B and AST A.**
- **Near-Equipment Inspection Results:** Our inspection efforts at this padsite included near-equipment monitoring using optical gas imaging (OGI) to identify leaks of methane and/or volatile organic compounds (VOCs) and radiation meters to identify equipment exhibiting naturally-occurring radioactive material (NORM) above applicable regulatory criteria. The accumulation of scale within equipment can cause elevated NORM levels requiring proper signage and equipment management. A summary of near-equipment findings is presented below with further detail in the attached report.

Near Equipment Inspection Summary:				
Equipment	Number	Leaks*	Unlabeled NORM**	Labeled NORM**
Wells	2	0	0	0
Separators	2	0	0	0
ASTs	1	0	0	0
Other	0	0	0	0

*OGI leaks identified exclude operational low bleed components (≤6 scf/hr)

**NORM exceeding 50 µR/hr

All near-equipment inspection concerns (e.g., leaks) were communicated to the town inspector. If items were addressed, this will be documented in the report.



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- **Fenceline Inspection Results:** Our inspection efforts for this padsite included an evaluation of air quality at the padsite boundary. Our approach utilized a variety of equipment to screen for potential impacts that could affect air quality off of the padsite. Real-time monitoring included VOCs, hydrogen sulfide, particulate matter and radiation. Additionally, two (2) discrete air samples were collected consistent with EPA Method TO-17. This included one (1) upwind (UW-1) and one (1) downwind (DW-1) air sample that were analyzed for VOCs using a gas chromatograph/mass spectrometer (GC/MS) to allow identification and quantification of individual chemicals of concern. Please refer to the report and Table 1 for additional detail on our findings.

None of the observed compounds identified in the upwind and downwind samples exceeded the applicable screening criteria. Please see the attached table for further details.

- **Next Inspection Event:** The Town of Flower Mound completes periodic inspections at all padsites throughout the year. In addition to this, the Town has asked Modern to perform supplemental inspections with high-resolution equipment based on proximity to sensitive property uses. This padsite is scheduled to be inspected again by Modern in July 2022.
- **Post Production Considerations:** When the padsite and wells are no longer used for production purposes Modern recommends that inspection(s) be performed to close out monitoring efforts. This should include confirmation that all ordinance and regulatory requirements have been satisfied. Additionally, confirmation that elevated NORM is not present should be included in the field survey.



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DATE

February 1, 2022

PROJECT

22001

PADSITE INSPECTION REPORT

Padsite – Obenchain

PREPARED FOR

Town of Flower Mound

2121 Cross Timbers Road
Flower Mound, Texas 75208

PREPARED BY

Sydney Borrer
PROJECT SCIENTIST

REVIEWED BY

Kenneth S. Tramm, PhD, PG, CHMM
SENIOR PROGRAM MANAGER

PADSITE INSPECTION REPORT

Padsite Name: Obenchain

Inspection Date: 01/04/22

Operator: EagleRidge

Inspectors: ZT, SB



FIELD INSPECTION RESULTS:

Pass	Fail	N/A	General Inspection Checklist Items
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 1: Appropriate signage present at padsite entrance including operator name, site address, well names, 24 hr phone number, and no smoking. Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 2: Appropriate signage present at padsite entrance and/or equipment including RRC/API numbers. Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 3: Fencing present surrounding padsite and/or equipment. Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 4: Surface free of stains or other signs of significant spills/releases. Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 5: Site secured. Gates locked to control unauthorized access. Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 6: Knox padlock or knox box with a key located at the front gate. Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 7: Padsite free of trash/waste debris. Comments: None
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Item 8: Lighting not directed toward adjacent property/roads (as applicable). Comments: None
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Item 9: All equipment painted with no bare pipe present. Comments: Bare pipe/corrosion noted (detailed in near-equipment summary)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 10: Landscaping appears well maintained (no high grass, weeds, or combustable trash within 100 foot radius of equipment). Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 11: Tank battery and secondary containment appear to have integrity with no significant corrosion. Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 12: Tank battery facilities shall be equipped with a remote foam line and a lightening arrestor system (as applicable). Comments: None
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Item 13: Other Audio, Visual, or Olfactory concerns noted during the inspection. Comments: None

PADSITE INSPECTION REPORT

Padsite Name: Obenchain

Inspection Date: 01/04/22

Operator: EagleRidge

Inspectors: ZT, SB



NEAR EQUIPMENT INSPECTION CRITERIA:

Constituent:	Methane	NORM
At Equipment:	10,000 ppmv ¹	50 µR/hr ²
Equipment:	OGI Camera	Radiation Meter
Resolution:	3,000-10,000 ppmv	1 µR/hr

FENCELINE INSPECTION CRITERIA:

Constituent:	Methane	tVOCs	H ₂ S	NORM	PM _{2.5}	PM ₁₀	VOCs
Fenceline:	500 ppmv ³	0.1 ppmv ⁴	0.08 ppmv ⁵	20 µR/hr ⁶	35 µg/m ³ (7)	150 µg/m ³ (8)	COC Specific ⁽⁹⁾
Equipment:	DPIR Meter	PID	H ₂ S Meter	Radiation Meter	Particulate Meter	Particulate Meter	GC/MS (TO-17M)
Resolution:	1 ppmv	0.001 ppmv	0.003 ppmv	1 µR/hr	1 µg/m ³	1 µg/m ³	0.001 ppmv

Notes:

- Utilizes the Interstate Natural Gas Association of America (INGAA) recommended leak definition within their December 4, 2015 response to EPA Docket No. EPA-HQ-OAR-2010-0505 – “Oil and Natural Gas Sector: Emission Standards for New and Modified Sources,” dated September 18, 2015 (80 FR 56593). Also represents 20% of the Lower Explosive Limit. A lower leak definition and additional inspection and reporting may be required at facilities subject to 40 CFR §60 Subpart OOOOa. Documented continuous low-bleed components (<6 scf/hr) and intermittent emissions from properly functioning pneumatic devices are not considered leaks for the purposes of this inspection.
- The Texas Railroad Commission (RRC) regulates NORM under 16 TAC §4 (*Environmental Protection, Subchapter F, Oil and Gas NORM*). Subchapter F establishes the requirements for oil and gas NORM waste disposal for the purpose of protecting public health and the environment. NORM-contaminated equipment is defined in Subchapter F as “equipment that, at any accessible point, exhibits a minimum radiation exposure level greater than 50 µR/hr including background radiation level.” When identified, the equipment suspected of being NORM-containing will be communicated to the City and operator(s) to allow further inspection and where appropriate compliance with RRC signage and management requirements.
- Represent half of the American Conference of Governmental Industrial Hygienists (ACGIH) 8-hour threshold limit value (TLV) of 1,000 ppmv (0.1% by volume) set for potential cardiac sensitization and central nervous system depression.
- Consistent fenceline concentrations of 0.1 ppmv could indicate a potential off-site air quality exceedance of applicable TCEQ Air Monitoring Comparison Values (AMCVs) or Effect Screening Levels (ESLs). Further sampling will be needed to confirm the individual compounds present and direct regulatory comparison.
- Indicative of possible 30 TAC §112.31 (30-min avg.) exceedance of 0.08 ppmv. Further sampling will be needed to confirm the 30-minute average and allow direct regulatory comparison.
- EPA average background criteria established under Document No. 402-R-08-005; April 2008. Reported background ranged from 10 µR/hr to 85 µR/hr. Elevated fenceline observations may require further screening to confirm attenuated levels near sensitive receptors.
- National Ambient Air Quality Standard (NAAQS) for Particulate Matter (PM) PM_{2.5}. Further monitoring will be needed to confirm if a continuous average (24-hr, 3yr) exceedance is indicated. Elevated PM_{2.5} can also be indicative of elevated semi-volatile organic compounds or other emission products may be present. Individual COC monitoring required for comparison with AMCVs or ESLs.
- NAAQS for PM₁₀. Further monitoring will be needed to confirm if a continuous average (24-hr, 3yr) exceedance is indicated.
- Lesser of the Air Monitoring Comparison Values (AMCV_{ST}) or Effects Screening Levels (ESL_{ST}) used for screening purposes. Please see attached tabulated results for individual chemical of concern and screening criteria.

PADSITE INSPECTION REPORT

Padsite Name: Obenchain

Inspection Date: 01/04/22

Operator: EagleRidge

Inspectors: ZT, SB



NEAR EQUIPMENT INSPECTION RESULTS:

INSPECTION RESULTS - WELLS

Location ID:	Leaks (OGI):	NORM ($\mu\text{R/hr}$; max):	Date Reported ¹ :	Date Addressed ² :
Well A	None	<15	NA	NA
Well B	None	<15	NA	NA

General Notes: Minor corrosion noted at Wellhead A.

¹ – Reported to operator; ² – If reported to Modern by operator/Town; *NORM exceeding 50 $\mu\text{R/hr}$ not labeled

INSPECTION RESULTS – SEPARATORS

Location ID:	Leaks (OGI):	NORM ($\mu\text{R/hr}$; max):	Date Reported ¹ :	Date Addressed ² :
Separator A	None	<15	NA	NA
Separator B	None	<15	NA	NA

General Notes: Corrosion noted at Separators A and B.

¹ – Reported to operator; ² – If reported to Modern by operator/Town; *NORM exceeding 50 $\mu\text{R/hr}$ not labeled

INSPECTION RESULTS – TANK BATTERY (ASTs)

Location ID:	Leaks (OGI):	NORM ($\mu\text{R/hr}$; max):	Date Reported ¹ :	Date Addressed ² :
AST A	None	<15	NA	NA

General Notes: Corrosion noted at AST A. Modern noted standing water within secondary containment due to recent rain events.

¹ – Reported to operator; ² – If reported to Modern by operator/Town; *NORM exceeding 50 $\mu\text{R/hr}$ not labeled

INSPECTION RESULTS – COMPRESSORS OR ANCILLARY EQUIPMENT

N/A

PADSITE INSPECTION REPORT

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Inspection Date: 01/04/22

Operator: EagleRidge
Inspectors: ZT, SB



FENCELINE INSPECTION RESULTS:

Meteorological Data	Avg. Wind Direction (to): NW	Avg. Wind Speed (mph): 6.5	Bar. Pressure ("Hg): 29.41
	Avg. Temp (°F): 44.6	Humidity (%): 54.5	Precipitation: N/A

Fenceline Screening Criteria:	Yes	No	N/A	Upwind Observations:	Downwind Observations:
¹ PID > 100 ppbv (0.1 ppmv)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<1 ppbv	<1 ppbv
¹ Radiation > 20 µR/hr?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<15 µR/hr	<15 µR/hr
¹ H ₂ S > 80 ppbv (0.08 ppmv)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<5 ppbv	<5 ppbv
¹ Methane > 500 ppmv?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<5 ppmv	<5 ppmv
² PM _{2.5} > 35 µg/m ³ ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.02 µg/m ³	4.60 µg/m ³
² PM ₁₀ > 150 µg/m ³ ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	22.11 µg/m ³	14.24 µg/m ³
VOCs (EPA TO-17M) > AMCV _{ST} or ESL _{ST} ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Table 1	
Other perimeter/fenceline observations suggestive of releases or concerns: None					
Comments: None					

Notes:

- 1- Represents the maximum discrete sampling result recorded by Modern across fenceline screening alignment.
- 2- Represents the approximately 20-minute average result recorded by Modern. Sample point selected by field professional as a conservative representation of fenceline conditions at the time of sampling.

General Inspection Program Notes:

- 1- Modern confirmed operation of all field equipment in accordance with manufacture specifications and Modern’s standard operating procedures prior to field inspection efforts. This included the use of zero and prepared calibration samples.
- 2- Modern’s services were performed in a manner consistent with a level of care and skill ordinarily exercised by other members of our profession practicing in the same locality, under similar conditions and at the time the services were performed. The scope of services performed was in accordance with the scope of work agreed with by our client, as set forth in our proposal and related authorization agreement(s).
- 3- Laws, regulations and professional standards applicable to Modern's services are continually evolving. Techniques are, by necessity, often new and relatively untried. Different professionals may reasonably adopt different approaches to similar problems. As such, our services are intended to provide our client with a source of professional advice, opinions and recommendations based on a limited number of field observations and tests, collected and performed in accordance with the generally accepted practice that exists at the time, and may depend on, and be qualified by, information gathered previously by others and provided to Modern by our Client. Modern does not warrant the work of third parties supplying information used in the report.
- 4- The monitoring results collected as part of these services represent field conditions at the time of inspection or monitoring only. Samples or monitoring data collected at other times may reveal different results that are representative of site conditions during other periods of time. The use of monitoring efforts is not intended to replace laboratory methodology, but rather provide data indicative of when additional efforts may be warranted. Modern’s air sampling is consistent with current regulatory guidance and/or manufacturer specification. For a higher level of certainty, our monitoring methods can be expanded over longer periods of time and/or supplemented by use of a state-accredited laboratory when evaluation of specific COCs is desired or further verification is needed.



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TABLES



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PHOTOGRAPHIC DOCUMENTATIONS



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FIGURES

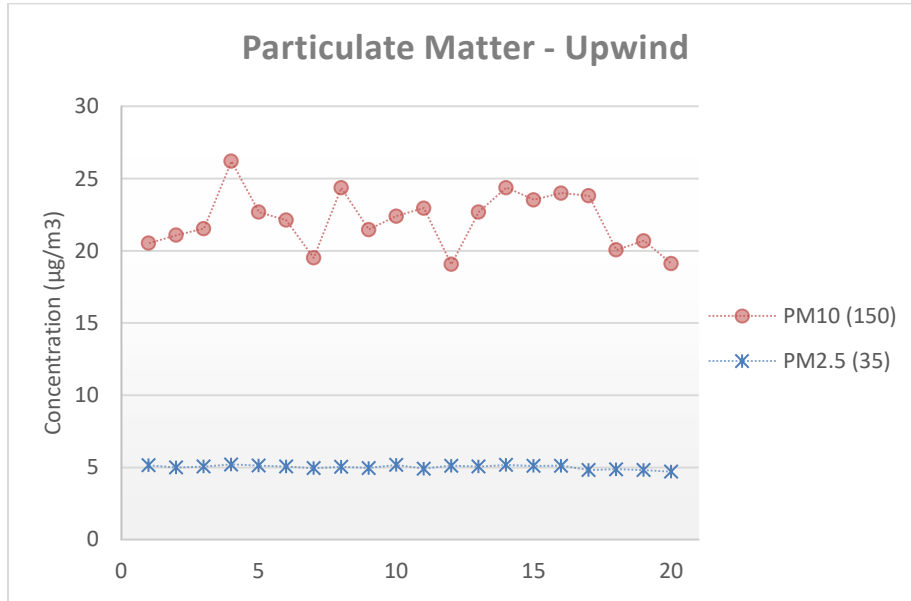


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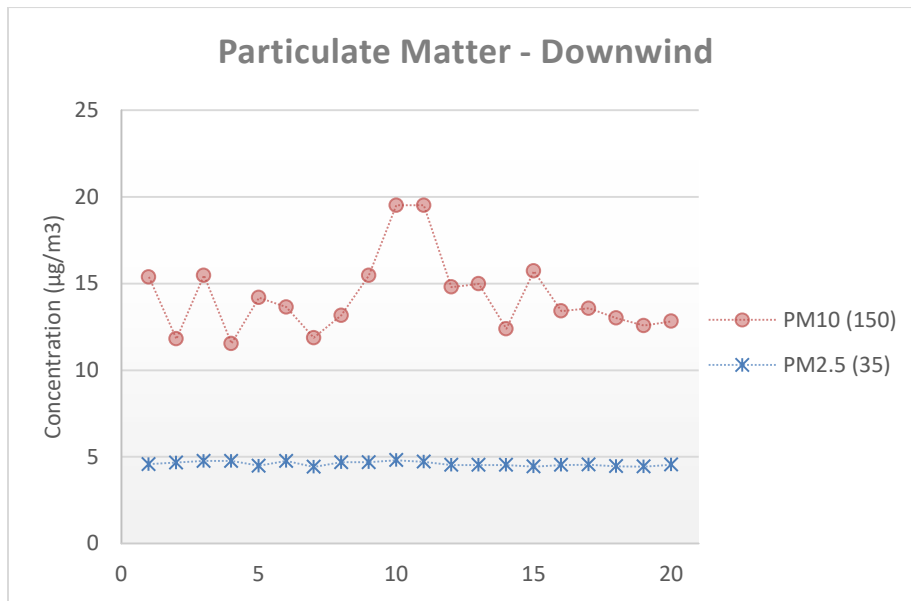
PM GRAPHS



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Particulate Matter – Upwind Results (20 Minute Sampling)



Particulate Matter – Downwind Results (20 Minute Sampling)

The above particulate monitoring data provides a summary of both upwind and downwind observations during Modern's monitoring activities. Please see the attached figures for sampling locations.