

STATE OF WYOMING
OIL AND GAS CONSERVATION COMMISSION
Office of State Oil and Gas Supervisor
P. O. Box 2640
Casper Wyoming 82602

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill, or deepen. Form 1 is provided for such proposals.)

1. Type Well: ☐ Oil ☐ Gas ☐ CBM ☐ Dry Hole ☐ Injection ☒ Other Legacy Site Cleanup

2. Operator: Marathon Oil Company

3. Address: 5555 San Felipe Road, Houston, TX 77056

3b. Phone Number (w/ area code): (713) 296-4287

Email: knielson@marathonoil.com

15. Footages: SHL: NA
BHL: NA

12. API No.: NA

13. County: Park County

Submit Single, Dupl. for State - Instructions on the reverse.

5. Lease No.: NA

6. Unit Agreement or CA: NA

7. Farm or Lease Name: NA

8. Well No.: NA

Reservoir: NA

10. Field Name: NA

4. Quarter- Quarter, Section, Township and Range:

Tract 71 T53N R101W

Elevation: NA GL NA

Latitude: 44.52582

Longitude: -109.03591

18. **CHECK APPROPRIATE BOXES TO INDICATE THE NATURE OF NOTICE, REPORT, OR OTHER DATA**

Type of Submission:

☒ Notice of Intent

☐ Subsequent Report

☐ Change of Address.

List Old & New in space #19.

Split Estate?

Yes ☐ No ☒

If this Split Estate location change affects any one different file a new Form 1A.

Sage Grouse Core Area?

Yes ☐ No ☒

Type of Action:

☐ Change Plans

☐ Convert to injection

Must have a separate UIC approval.

☐ Idle

Not producing or injecting more than 30 days.

☐ Location or Site Change

Original in Space #15. New in Space #19.

☐ Federal Lease Owner

Change

List Old & New in space #19.

☐ Fracture Treat/ Enhance

Must file with a complete stimulation plan

☐ Plug and Abandon

☐ Perforate

☐ Recomplete/ Plugback

Must file with a complete stimulation plan

☐ Reclaim

☐ Rename

☐ Repair Well

☐ Shut-in

☐ Start / Resume Production

☐ Temporarily Abandoned

Must isolate all productive intervals

☐ Water Shut-Off

☒ Other Legacy Site Cleanup

19. Describe the proposed or completed operations: Clearly state all pertinent dates and details, including estimated start date of proposed work.

Attach additional sheets if necessary, referencing API No., Well Name and Legal Location. Form 3 is required following completion and recompletion procedures.

Marathon Oil Company contracted Arcadis to conduct environmental investigations at a property formerly used to operate a crude oil load-out facility (Cody Truck Delivery Facility) located in Tract 71, T53N, R101W, Park County, Wyoming. The area of concern is approximately 2.5 acre vacant piece of land located on eastern Sheridan Avenue, near the intersection with 29th Street, Cody, Wyoming. Following the directive of Marathon, Arcadis personnel carried out the sampling investigations at the site, with the purpose of characterizing the current environmental conditions with respect to observed hydrocarbons in the soils at the site. Upon completion of sampling investigations, Arcadis has created a site specific remediation plan for the area of concern. This report contains details of the remediation plan including processes involved, disposal procedures, and site restoration procedures.

RECEIVED

MAR 28 2016

**WYOMING OIL & GAS
CONSERVATION COMMISSION**

20. I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operations

Name (Printed or Typed): Ben Shoup

Title: Agent

21. Signature: 

Date: 25-Mar-16

(The space below is for State office use)

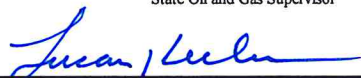
Conditions of approval:

Approval By:

3-29-16

State Oil and Gas Supervisor

Approval Date:



Approvals sent:

Clean up to 1000 mg/kg TPH



RECEIVED

MAR 28 2016

WYOMING OIL & GAS
CONSERVATION COMMISSION

ARCADIS U.S., Inc.
189 N Cedar Street
Buffalo, Wyoming 82834
Tel 307 684 5891
Fax 307 684 5961
www.arcadis-us.com

Mr. Lucas Keeler
Wyoming Oil & Gas Conservation Commission
2211 King Blvd.
Casper, WY 82602

Subject:

**Remediation & Restoration Work Plan for the Borkenhagen Property Legacy Crude Oil
Truck Loading Facility**

ENVIRONMENTAL

Dear Mr. Keeler:

ARCADIS U.S., Inc. (ARCADIS), on behalf of Marathon Oil Company (Marathon), is presenting the Wyoming Oil & Gas Conservation Commission (WOGCC) with the attached Sundry Notice for planned remediation and site restoration activities at the Borkenhagen Property in Cody, Wyoming. Legacy impacts associated with a Crude Oil Truck Loading Facility were discovered by the property owner at the site in late 2015. The site is not associated with any particular well, as it was the former location of crude oil bulk storage tanks associated with Marathon's truck loading facility. Through various site investigations, it has been determined that remedial activities are required to clean up historic hydrocarbon (crude oil) impacts to soils at the site. The determination is based on the Oil Contaminated Soils Remediation Ranking System administered by the WOGCC. Please find the following documents included with this letter for your review:

- Sundry Notice
- Site Remediation and Restoration Plan

Remediation activities are tentatively scheduled to commence during the spring of 2016. A report documenting the remedial activities, including confirmation sample results, photographs, and figures, will be submitted to the WOGCC for approval upon completion of those activities.

Marathon appreciates the opportunity to provide this information to the WOGCC. If you have any questions regarding this Plan, or require additional information, please contact me at the number listed on this letter.

Sincerely,

Ben Shoup, PG, RP
Vice President

cc: Kai Nielson, Marathon Oil Company

Date:

March 25, 2016

Contact:

Ben Shoup

Phone:

307.299.5950

Email:

ben.shoup@arcadis.com

Our ref:

WY002741.0001



SITE REMEDIATION AND RESTORATION PLAN

Borkenhagen Parcel

Site Location
Part of Tract 71, T53N, R101W
Cody, WY

Prepared for:

Marathon Oil Company
5555 San Felipe Road
Houston, TX 77056

Prepared by:

Arcadis
189 N Cedar Street
Buffalo, WY 82834

March 2016

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BORKENHAGEN PROPERTY

INTRODUCTION

Marathon Oil Company (Marathon) contracted Arcadis to conduct environmental investigations at a property formerly used to operate a crude oil load-out facility (Cody Truck Delivery Facility) located in Tract 71, T53N, R101W, Park County, Wyoming (**Appendix A**). The area of concern (**Appendix B**) is approximately 2.5 acre vacant piece of land located on eastern Sheridan Avenue, near the intersection with 29th Street, Cody, Wyoming. Following the directive of Marathon, Arcadis personnel carried out the sampling investigations at the site, with the purpose of characterizing the current environmental conditions with respect to observed hydrocarbons in the soils at the site (see Phase II Report for details). Upon completion of sampling investigations, Arcadis has created a site specific remediation plan for the area of concern. This report contains details of the remediation plan including processes involved, disposal procedures, and site restoration procedures. Sites of this nature are overseen by the WOGCC or WDEQ. The characteristics of this site dictate that the WOGCC has regulatory authority.

LIST OF ACRONYMS

BMP = Best Management Practice

COC = contaminant of concern

CY = cubic yard

SQ FEET = square feet

DRO = Diesel Range Organics

GRO = Gasoline Range Organics

TPH = Total Petroleum Hydrocarbons

MCL = Maximum Contaminant Level

PID = Photo ionization detector

WDEQ = Wyoming Department of Environmental Quality

WOGCC = Wyoming Oil & Gas Conservation Commission

SITE DESCRIPTION

Geography

The property is located in Tract 71, T53N, R101W, in Park County, Wyoming. The site is in a relatively flat alluvial terrace located between the Shoshone River and the Sidon Canal. The terrace is located south of the Shoshone River and is flanked by small hills to the north, west, and northeast (**Figures 1 to 4**). Foot Creek Rim is a prominent landform to the northwest. The Shoshone River flows from the Buffalo Bill Reservoir near the Shoshone National Forest west of Cody, Wyoming.



Figure 1. Overview of the site looking west



Figure 2 Drainage canal looking north



Figure 3. Drainage canal looking northwesterly.



Figure 4. Overview looking east.

SITE BACKGROUND

The focus of this investigation is a parcel currently owned by Mr. Glenn Borkenhagen (Cody, WY). The 2.55-acre parcel (Site) is located at the corner of Sheridan Avenue and 29th Street, Cody, Park County, Wyoming (*See Site Location Map – Appendices A, Project Area Excavation – Appendix B*). The property is vacant with no structures and is bordered to the west by residential housing, to the south by multi-tenant residential housing, and to the east by a pole barn and small shop of brick construction. An irrigation ditch owned by the McMillan Water Association flows across the western and northern portion of the property. There are no irrigation water users downstream of the Borkenhagen property, according to the McMillan Water Associations (owner of the ditch).



Figure 5. Irrigation ditch looking north



Figure 6. Irrigation ditch looking south

The property was previously owned by Marathon Pipe Line Company and other predecessors. The property was used to operate a crude oil load-out facility (Cody Truck Delivery Facility) and includes an easement for the eight inch, steel, Oregon Basin – Cody crude oil pipeline (OBC). The pipeline was constructed in the late 1920s or early 1930s and truck load-out facilities were installed in the mid-1930s. Operation of the truck loading facility ceased in the late 40's or early 50s, whereas operation of the OBC ceased with closure of the Husky Oil Refinery in Cody, WY during the mid-1970s. Mr. Glen Borkenhagen purchased the 2.55-acre parcel in 2005 from Linville Limited, a Wyoming partnership comprising Robert L. and Ramona S. Linville. At the time of this purchase, Mr. Borkenhagen was aware of a small amount of asphalt-like petroleum hydrocarbon contamination on the surface of a portion of the western half of the parcel. In April of 2015, Mr. Borkenhagen began removing the asphalt-like material from the surface. During removal activities, Mr. Borkenhagen discovered that the impacts were more significant than first assumed.

Geology and Hydrogeology

The substrate at the Site is composed of coarse-grained alluvial terrace deposits. These conglomeratic deposits are clast supported with varying degrees of cementation. Clasts are gravel to large cobble size and the matrix is fine- to coarse-grained sand and silt. Due to refusal using the drilling equipment, several test pits (or trenches) were excavated using a mini-excavator. These pits were excavated to investigate the vertical and lateral extents of hydrocarbon impacts at the site. No groundwater was encountered during subsurface investigations.

An irrigation ditch crosses the site from south to north, then northeasterly to where it crosses under Sheridan Avenue before discharging to a vacant lot. This ditch is owned by the McMillan Water Association. There are no downstream users of the water conveyed by the ditch. The Watkins Ditch, down gradient to the north, is located within 300 feet of the Site.

There is no perennial surface water near the Site. Review of topographic and aerial maps indicate that the Shoshone River is located approximately 1.10 miles north of the Site.

SITE REMEDIATION AND RESTORATION PLAN

Overview

The remediation and restoration plan for the Borkenhagen site consists of three primary tasks designed to ensure complete removal of hydrocarbon contaminated soil and successful site restoration. Task I of remediation will entail removal from the site of contaminated soils exceeding the TPH cleanup goal of 2,500 mg/kg (per WOGCC Oil Contaminated Soil Remediation Ranking System OCSRRS). Tables 1 through 4 in the Tables and Appendices section have detailed information relating to the existing soil contamination levels and the OCSRRS values. Task II will include confirmation sampling to ensure all contaminated soil exceeding the TPH cleanup goal has been removed and soils around the periphery of the site have not been contaminated. Task III will involve site restoration, including the backfill of the excavation with confirmed clean soil, and installation of stormwater BMPs. The site characteristics dictate that the WOGCC has regulatory authority for the cleanup activity.

Task I – Hydrocarbon Contaminated Soil Removal

Task I of the remediation plan for the Borkenhagen site is the removal of contaminated soils exceeding the

TPH cleanup standard established for the site. 2,500 mg/kg. (WOGCC Oil Contaminated Soil Remediation Ranking System OCSRRS). The area of contamination exceedances in Area 1 is approximately 7,516 sq feet with contamination depths up to five feet below ground surface. In Area 2, approximately 1,808 sq feet with contamination depths up four feet. In Area 3, approximately 322 sq feet with contamination depths to 2.5 feet. Arcadis staff calculated an approximate combined volume of 1968 cubic yards of contaminated soil to be excavated from the site. Calculations are based on soil sampling data. The distribution of hydrocarbon contamination exceeding the TPH cleanup standard is uneven across the site, therefore excavation depths will vary.

Arcadis will finalize pre-construction planning and oversee the necessary laborers, equipment and materials to initiate the project. Arcadis will coordinate the establishment of Site support facilities and sanitary facilities, as needed.

Arcadis will establish and initiate administrative and support procedures at the beginning of the project. These support activities include:

- Daily Tailgate Meetings – Arcadis will lead a daily meeting at the Site. The purpose of the meeting will be to facilitate the transfer of information on the status of the project and cover safety topics as applicable to the project operations.
- Weekly Summary Reports – A weekly summary report will be prepared to summarize the work completed, present scheduled work, and describe any issues and/or action items.
- Health and Safety Program – Arcadis will establish its health and safety program for the Site. Site workers will be trained on the Site-specific health and safety issues presented in the Construction Health and Safety Plan/Contingency Plan (HASP) and will be required to review and sign the plan prior to performing work at the Site. They will also be compliant with all Marathon required registrations and trainings.
- Traffic Control Program – Arcadis will implement a traffic control program. The program will include truck traffic patterns for each portion of the work and procedures for traffic control personnel.
- Traffic Protection Program – Arcadis will implement a traffic protection program. The program includes BMP's for protecting the traffic on Sheridan Ave from being impacted by remediation earthwork.
- Dust Control Program – Arcadis will implement a Dust Control Program, if needed. The program includes necessary preventative measures and engineering controls. Arcadis will include the use of a water truck, if necessary, for dust control during earthwork.

Arcadis will have a publicly available utility mark-out (One-Call of Wyoming) completed and a confirmation utility mark-out completed by an independent company to confirm locations of utilities prior to excavation in each area. Arcadis will utilize vacuum excavation techniques and/or hand digging to identify the location of each marked utility in 10 foot increments along the length of the utility.

Arcadis will install stormwater BMP's in the form of erosion and sedimentation control measures (silt fence, rock-check dams, etc.) where needed to prevent sediment migration from the active work areas. Arcadis will also keep roads clear of dirt and debris, as needed.

Offsite tracking of soils/sediments will be controlled through the use of properly installed construction exits. If tracking of material into the roadways becomes an issue, Arcadis will instigate preventative measures such as tire washing to decrease the amount of dirt that falls on the road. During loading operations, Arcadis will ensure crews place plastic under the trucks being loaded, as necessary, to prevent potentially contaminated soils from entering the roadway.

Silt fence and/or other measures will be installed at the down-gradient perimeter of the excavation areas, where run-off can potentially transport sediments outside of the removal areas. Actual locations of erosion and sediment control measures will be based on site conditions observed during construction.

Daily inspections of soil erosion and sediment control measures will be completed by an Arcadis representative. Deficiencies identified during these inspections will be repaired immediately. Other measures will be installed, as necessary, based on observations and inspections.

In order to provide for the removal and eventual disposal of soils contaminated with hydrocarbons above project specific actionable concentrations, Arcadis will remove soils with a number of hydraulic excavators and articulated haulers, as well as other appropriate pieces of heavy earthmoving equipment. Continuous in-field visual surveying and confirmation sampling will be employed to provide for horizontal and lateral controls and the segregation of clean versus contaminated soils as the excavations are advanced.

To advance each excavation to the depths specified, Arcadis plans to excavate the side walls bordering each excavation area on a 1.5:1 slope, where necessary. This approach will allow for safe excavation entry by personnel, efficient equipment access, the accurate removal and segregation of impacted soils, and the effective backfilling and compaction of the remedial area upon completion.

Soil from known contamination areas will either be direct loaded into trucks or stockpiled on polypropylene sheeting surrounded by straw bales or wattles. Initial waste characterization samples have been collected from the in-place material to confirm that the material meets established profiles for disposal as petroleum contaminated material at the selected Landfill. The material will be loaded into trucks and transported to the Park County (Cody) Landfill for primary disposal.

Waste manifests will be completed for all hydrocarbon contaminated soils being transported and disposed at the landfill. Arcadis personnel will provide oversight for excavation operations and compliance with all site environmental and safety requirements.

Task II - Confirmation Sampling

Task II of the remediation plan for the Borkenhagen site involves a two step sampling program at the site during and after the removal of hydrocarbon contaminated soil. The first step involves in-field environmental monitoring of the excavation. The second step involves comprehensive confirmation sampling after all known contaminated soil has been removed.

The first step of this task will require in-field Arcadis personnel to actively monitor excavation of hydrocarbon contaminated soil. Arcadis personnel will document the visual characteristics of the excavated soils noting visual hydrocarbon contamination. Oversight personnel will also use a PID to test for volatile hydrocarbon gasses which may be released during excavation. Field screening of soils sampled from the impacted area will be used to guide the excavation in order to both minimize waste generation and ensure impacted soils have been sufficiently removed before confirmation sampling is conducted. Volatile organic compounds (VOCs) will be screened using a MiniRae 2000 portable VOC photo-ionization Detector (PID) (Model PGM 7600). The PID will be calibrated prior to use utilizing 100 ppm isobutylene gas. Each sample screened will be placed into a clean zip-lock bag, sealed with ample head space, and inserted into a jar or baggie. The sample will be allowed to sit for ten minutes before the headspace is sampled using the PID.

Once field screening indicates each cell has been sufficiently excavated, confirmation soil samples will be collected by Arcadis personnel. The impacted portion of the site will be divided into cells (sample areas) for confirmation sampling. Each cell will be approximately 31.5 feet square. Some cells may be slightly larger or smaller depending on their location on the perimeter of the site. One 5-point composite sample will be collected from the floor of each cell and described and documented on field sample log forms. If the cell is located on the perimeter extent of the site, numerous samples will be collected from the wall

material. Samples will be collected using a stainless steel trowel or hand auger, homogenized in a stainless steel mixing bowl, then placed into sample containers provided by the testing laboratory. Samples will be stored on ice and transported under chain of custody protocol to ESC Lab Sciences in Mount Juliet, Tennessee for analysis. All soils samples will be analyzed for the following parameters:

- Total Petroleum Hydrocarbons (TPH)- Gasoline Range Organic (GRO)
- TPH-Diesel Range Organic (DRO)

Expedited turnaround time will be requested for these analyses. Should the results exceed the TPH cleanup goal, excavation will continue, repeating both Task I & II until no soil sample laboratory results exceed the cleanup goal.

All sampling equipment will be decontaminated between each sample by first washing with Alconox solution, then rinsing with distilled water. Sampling personnel will don nitrile gloves during the sampling activities, donning new gloves between each sample location. Finally, sample locations and cells will be photographed and the coordinates documented using a handheld GPS receiver. Once no soil samples are found to exceed the cleanup goal, remediation will progress to Task III, Site Restoration.

Task III - Site Restoration

Upon completion of excavation and receipt of acceptable confirmation sample results, an Arcadis technician will provide for field verification and recording of excavation extents. Layback and over-burden materials previously stockpiled will initially be placed in the excavation profile and compacted in 12 inch lifts.

Additional confirmed clean backfill materials, approximately 1,968 CY or 2,952 tons of soil, will be imported to the site from an approved source. The backfill material will be transported to the site by ND Contracting of Cody and placed in the excavation area in 12-inch lifts and compacted with the placement equipment to provide for verifiably clean surface soil conditions upon placement and final grading. Special care will be taken when compacting soils around underground utilities and existing structures to make sure that they are properly supported and not damaged by compaction efforts. Backfill will be placed and compacted to match original/final grade.

Notably the aforementioned volume of backfill allows for the procurement and placement of an additional 15% by volume of soil in comparison to the excavation quantity to allow for loss on compaction and

grading. Soil density was calculated at 1.5/tons per CY.

Upon completion of backfilling, the site will be restored to pre-excavation conditions.

Any items that are removed or damaged during the performance of the work will be repaired or replaced to pre-construction condition. Arcadis will prepare a complete inventory of items that need restored during the mobilization/site preparation phase of the project.

Following completion of restoration and necessary clean-up operations, all temporary structures will be removed from the area.

CONCLUSION

This Remediation and Restoration Plan for Borkenhagen site will be conducted by implementing three tasks. Task I includes the removal of contaminated soil which exceeds the TPH cleanup goal. Task II includes monitoring of excavation activities and laboratory testing of soil samples from headwalls and the floor of the excavated area. Task III covers restoration of the site including backfill, compaction, stormwater erosion prevention, and fencing off the area to prevent disturbance.

Upon successful completion of remediation and restoration activities at the site, Arcadis will prepare a final closure report to be submitted to the WOGCC. The report will provide a detailed account of the remediation activities, including clearance sample results, photographs of the operations, and drawings/figures as appropriate.

TABLES

Table 1: Soil sample analytical results. All results listed in mg/kg (unless noted otherwise), except SAR which is unitless.

Contaminant		Date Time	Specific Conductance(u mhos/cm)	SAR	TPH-GRO	TPH-DRO	TPH-Total	Benzene	Toluene	Ethyl-benzene	Xylenes
Cleanup Level			< 6,000	< 13			2,500				
Sample ID	Stump	02/09/16 12:23	217	1.6	8.06	37,100	37,108	U	U	0.0135	0.0748
	TP 2.1	02/09/16 13:12	287	0.226	U	5,520	5,520	U	U	U	U
	TP 2.2	02/09/16 13:30	599	0.429	U	932	932	U	U	U	U
	TP 3	02/09/16 13:45	934	0.425	0.67	25,400	25,401	U	U	U	U
	TP 4	02/09/16 14:30	353	0.300	U	2,690	2,690	U	U	U	U
	TP 5	02/10/16 08:50	172	0.996	U	3,770	3,770	U	U	U	U

SAR = Sodium Adsorption Ratio
 TPH = Total Petroleum Hydrocarbons
 GRO = Fraction: Gasoline Range Organics
 DRO = Fraction: Diesel Range Organics
 U = Not Detected

Table 2: Results of waste characterization analysis for sample compiled from the sample ID listed in the table, above.

Analyte		Reactive Sulfide	pH	Paint Filter Test	Ignitability	TCLP Metals								BTEX
Sample ID	Composite	ND	6.69	Pass	No Ig at 170 F	Hg	As	Ba	Cd	Cr	Pb	Se	Ag	ND
						ND	ND	ND	ND	ND	ND	ND	ND	

BTEX = benzene, toluene, ethyl-Benzene, xylene
 ND = Not Detected

Table 3: Permitted ground water wells within one mile of the Borkenhagen property.

PERMIT	Proximity	STATUS	LATITUDE	LONGITUDE	USES	STATIC WATER DEPTH (feet)	WELL DEPTH (feet)
P190105.0W	<1.0 mi	COM	44.52972	-109.0194	DOM_GW	80	100
P180902.0W	<0.25 mi	INC	44.52297	-109.0343	MIS	35	51
P6617.0W	<0.5 mi	FADJ	44.52846	-109.0277	DOM_GW	75	120
P7796.0P	<0.5 mi	FADJ	44.52846	-109.0277	DOM_GW	88	150
P166919.0W	<1.0 mi	FADJ	44.53045	-109.0259	MIS	95	115

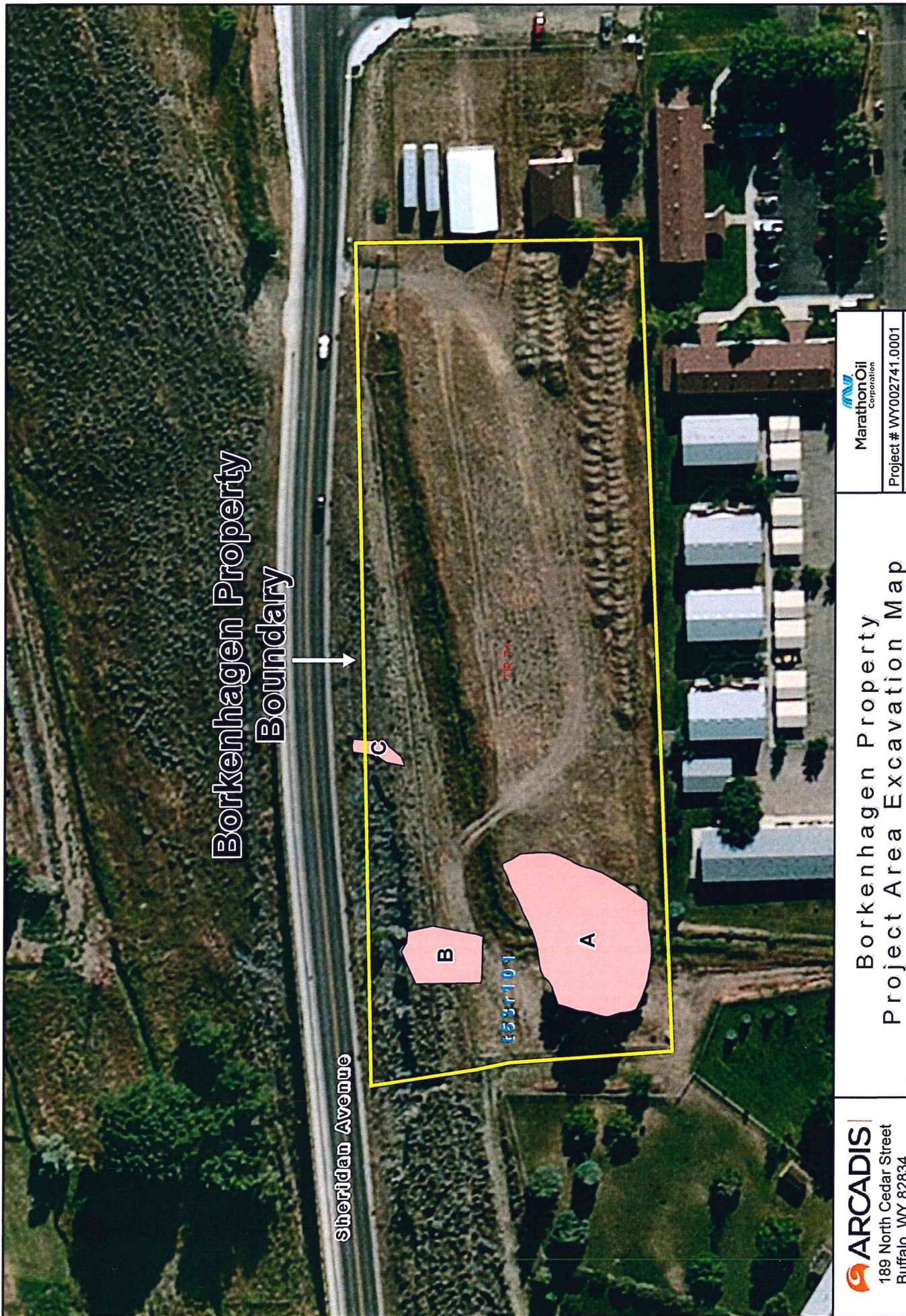
Table 4: WOGCC – OCSRRS worksheet for the Borkenhagen property. Total petroleum hydrocarbons (TPH; GRO+DRO) area the primary contaminant of concern used for measuring cleanup thresholds.

WOGCC Oil Contaminated Soil Remediation Ranking System (OCSRRS)

		SITE NAME:		MARATHON Borkenhagen Property
Risk Factor	Value	Score	Selected	Comment/Reference
Depth from contamination to water, feet	>100	0		According to SEO wells within 1 mile, the typical static water level averages ~84 feet. Nearest well static water level is ~35 ft.
	99-75	2		
	74-50	6		
	49-20	10	10	
	<20	20		
Water Quality, mg/L TDS	> 5000	0		If unknown, default = 10 points per WOGCC guidance document. No Date available, assumed potable.
	5000-2000	5		
	<2000	10	10	
Soil Medium	Clays and Shales	0		Conglomerate, clast supported, clasts gravel to large cobble, matrix fine to coarse grained sand, and silt.
	Sandy Loams	10		
	Sand, gravel, limestone	20	20	
Feet to Surface Water	>1320	0	0	Nearest surface water is a canal off Shoshone River < 300' north.
	1320-500	5		
	500-300	10		
	<300	20	20	
Feet to Registered Water Well	>1320	0		Per WSEO Water Rights Database (P180902.0W)
	1320-500	2	2	
	500-300	5		
	<300	10		
Distance to Public Areas and Residences, feet	>1320	0		Per aerial photo review and site visit, residences to west, south, and east of site(<300)
	1320-500	2		
	500-300	5		
	<300	10	10	
Annual Precipitation, Inches	<10	0		Per NRCS precipitation data from PRISM (Parameter-elevation Regressions on Independent Slopes Model). Average annual precipitation = 11 inches.
	10-15	5	5	
	15-20	10		
	>20	15		
Irrigated Crops	No	0	0	No irrigated crops immediately down gradient of site.
	Yes	5		
Oil API Gravity	<15	0	0	<15, very thick, non-viscous tar-like material, or extremely weather, hydrocarbon stained soil
	16-20	2		
	21-30	5		
	31-40	15		
	>40	20		
POINT TOTAL:			77	
TPH LIMIT (mg/kg):	10,000	Lowest Risk	30	CONCLUSIONS: Soils should be cleaned up to TPH levels below 2,500 mg/kg
	8,500		40	
	7,000		50	
	5,500		60	
	4,000		70	
	2,500		80	
	1,000	Highest Risk	90+	

APPENDIX A – PROJECT AREA OVERVIEW MAPS

APPENDIX B – PROJECT AREA EXCAVATION MAP



Borkenhagen Property
Boundary

Sheridan Avenue

t53r101

TR 71

B

A

C



189 North Cedar Street
Buffalo, WY 82834
Phone (307) 684-5891
Fax (307) 684-5961

Source: ESRI Imagery Basemap
Projection: UTM NAD 83 Zone 12



Project # WY002741.0001
Date: 3/15/2016
Cartography By: AM
Appendix: **B**

Borkenhagen Property Project Area Excavation Map

Park County, Wyoming



Map Key

- Hydrocarbon Impacted Area
- Approx. Property Boundary