Jones, Brad A., EMNRD

From: Barr, Leigh P EMNRD
Sent: Thursday, June 10, 2021 8:15 AM
To: Jones, Brad A., EMNRD
Subject: FW: Sundance Services West
Attachments: _Addressee_.pdf

Brad, do you mind handling this?

Leigh

From: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Sent: Thursday, June 10, 2021 8:12 AM
To: Barr, Leigh P EMNRD <leighp.barr@state.nm.us>
Cc: Hernandez, Emily, EMNRD <Emily.Hernandez@state.nm.us>
Subject: FW: Sundance Services West

Hi Leigh,

This should properly go to the permitting group. It is in regards to surface waste management facility permit NM1-62 and needs to be placed into the imaging system. I went ahead and downloaded the file and attached to this email. If you have any questions, let me know. Thanks.

Jim

From: Peterson, Gundar <gpeterson@geo-logic.com>
Sent: Wednesday, June 9, 2021 5:16 PM
To: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>
Cc: Andrew L. Wambsganss (Andy@Wambsganss.com) <Andy@Wambsganss.com>; Misty Pratt (mpratt@brownpruitt.com) <mpratt@brownpruitt.com>
Subject: [EXT] Sundance Services West

Jim-
Please see below for a link for an update to the Sundance Services West, Inc. (SSWI) hydrogen sulfide monitoring plan (H2S Plan) and a completion report for the relining of two of the evaporation ponds at the site. The pond relining was done out of an abundance of caution after the patching of a number of holes in the primary liner. Please let me know if you have any questions or comments. Thanks

Download Link: http://download.dbstephens.com?File=6284

Gundar Peterson, P.E.

Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company
6020 Academy Road NE, Suite 100
Albuquerque, New Mexico 87109
Office: (505) 822-9400|Direct: (505) 353-9134|Mobile: (505) 730-9146
Licensed in AZ, ID, IL, NM, NV, OH, OK, TX, WA
gpeterson@geo-logic.com

www.dbstephens.com | www.geo-logic.com

June 8, 2021

Jim Griswold
New Mexico Energy, Minerals, and Natural Resources Department
Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Delivered via e-mail

Re: Submittal of Revised Hydrogen Sulfide Prevention and Contingency Plan and Engineering Certification Report for the Evaporation Pond Liners
Sundance Services West, Inc., Eunice, New Mexico

Dear Mr. Griswold:

On behalf of Sundance Services West, Inc. (SSWI), Daniel B. Stephens & Associates, Inc. (DBS&A) is pleased to submit a revised Hydrogen Sulfide (H_2S) Prevention and Contingency Plan (Attachment 1) and Engineering Certification Report for the Evaporation Pond Relining (Attachment 2) to the New Mexico Energy, Minerals and Natural Resources Department Oil Conservation Division (OCD).

The summary attached to the H_2S Prevention and Contingency Plan highlights all changes made in accordance with 19.15.36 NMAC. The changes outlined to the plan are being implemented by SSWI. The revised plan is also being submitted to local authorities in accordance with 19.15.11 NMAC.

Please contact us at (505) 822-9400 if you have any questions or require additional information

Sincerely,

DANIEL B. STEPHENS & ASSOCIATES, INC.

Gundar Peterson, P.E.
Vice President/Principal Engineer

GP/rpf
Attachments

Daniel B. Stephens & Associates, Inc.
6020 Academy NE, Suite 100 505-822-9400
Albuquerque, NM 87109 FAX 505-822-8877

Attachment 1

Revised Hydrogen Sulfide Prevention and Contingency Plan

DBS&A
Daniel B. Stephens & Associates, Inc.

Summary of Changes to the H_2S Contingency Plan

Changes to the Immediate Action Plan and Notifications

Notifications to Emergency Response Agencies and Contacts (Table II.3.2) will not be made until concentrations of > 20 ppm are observed at a measurement point or on a personal monitor (previous notification limit was > 10 ppm).

Change in Number of Monitoring Points at Evaporation Ponds

The current plan includes continuous monitoring around the perimeter of the evaporation ponds using 10 locations. This change reduces that number to 6 while still providing adequate monitoring around the perimeter of the ponds. Figure II.3.3 has been updated to reflect the new layout of the 6 monitors.

The purpose of monitoring for hydrogen sulfide gas at the facility is to protect workers and monitor emissions in order to verify they do not exceed regulatory limits in public areas per 19.15.36 NMAC and 19.15.11 NMAC. The likelihood of the concentrations reaching an action level due to migration from the evaporation ponds, which sit approximately 25 feet below surrounding grade, is low due to higher density of H_2S gas. It is also less likely for gas to form in these ponds when compared to other processes at the facility.

The monitors require quarterly calibration according to the O&M manuals for each device. Calibration is critically important for the continued use of these monitors, and should be included in the O&M schedule for the facility.

Addition of Wind Socks

Two 18-inch-diameter, 5-foot-long wind socks were installed at the East and West ends of the northern fence and are visible from all principle working areas at all times to clearly show the upwind areas during situations where H_2S readings are ≥ 10 ppm.

Removal of Incoming Load Inspection/Monitoring and Daily Testing Activities

Incoming loads are not monitored for H_2S, but the haulers and Sundance personnel are required to wear personal monitors when H_2S might be present. Treatment for H_2S will no longer be provided.

Daily testing of the evaporation ponds for dissolved oxygen (DO), pH, and dissolved sulfide levels is no longer required.

Editorial Changes

Minor editorial corrections were made throughout the document. References to “proposed” plans or facilities were removed and changed to existing conditions.

References

19.15.11 NMAC Hydrogen Sulfide Gas

19.15.36 NMAC Surface Waste Management Facilities

20.2.3 NMAC Ambient Air Quality Standards

20.2.5 NMAC Source Surveillance

https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=HOB&network=NM_ASOS

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

TABLE OF CONTENTS

LIST OF FIGURES

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

LIST OF TABLES

LIST OF ATTACHMENTS

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

1.0 INTRODUCTION

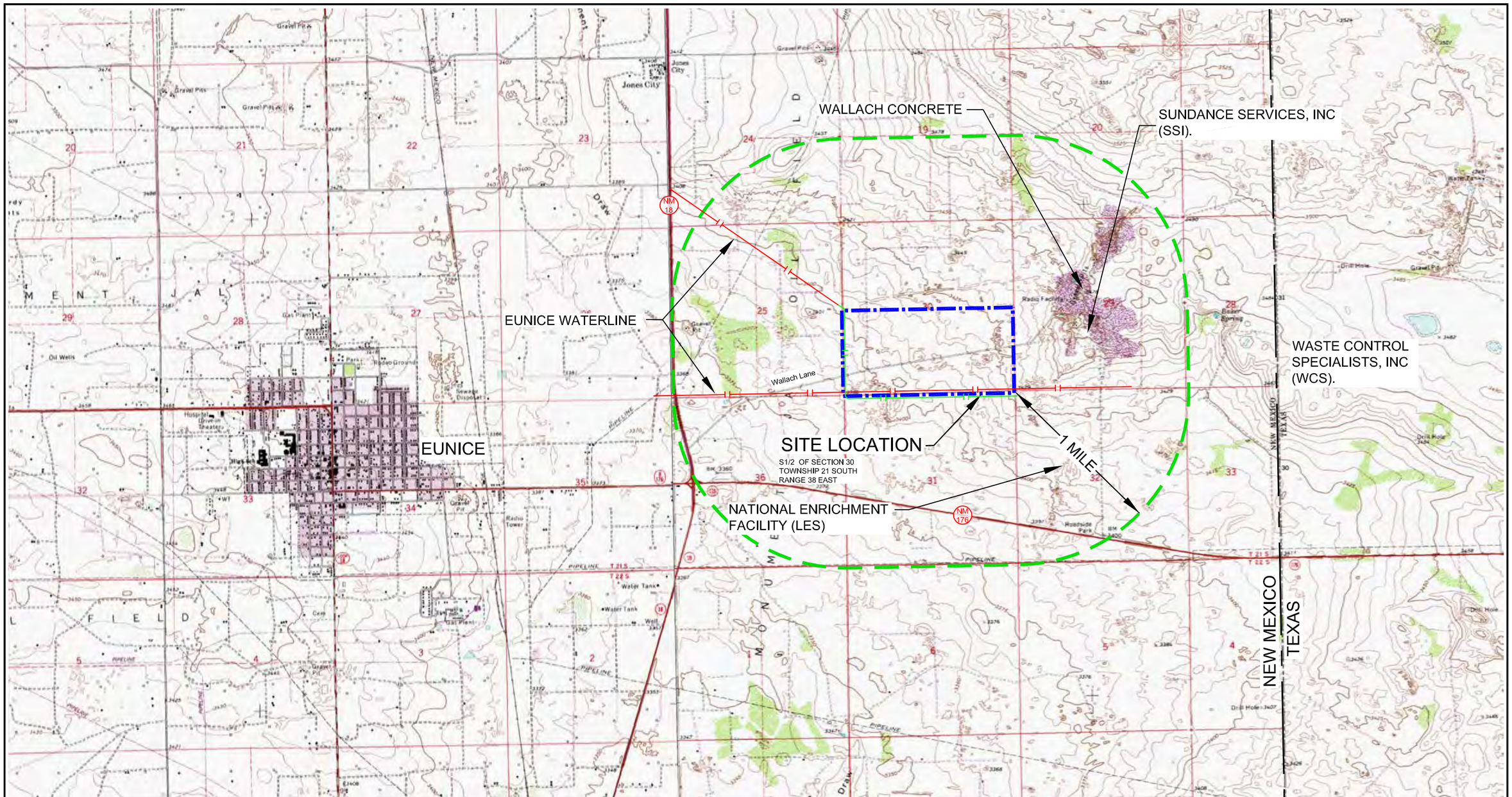
Sundance West is a commercial Surface Waste Management Facility for oil field waste processing and disposal services. The Sundance West Facility is subject to regulation under the New Mexico Oil and Gas Rules, specifically 19.15.36 NMAC, administered by the Oil Conservation Division (OCD). The Facility is designed in compliance with 19.15.36 NMAC, and will be constructed and operated in compliance with a Surface Waste Management Facility Permit issued by the OCD. The Facility is owned by, and will be constructed and operated by, Sundance West, Inc.

1.1 Site Location

The Sundance West site is located approximately 3 miles east of Eunice, 18 miles south of Hobbs, and approximately 1.5 miles west of the Texas/New Mexico state line in unincorporated Lea County, New Mexico (NM). The Sundance West site is comprised of a 320-acre ± tract of land located in the South ½ of Section 30, Township 21 South, Range 38 East, Lea County, NM. Site access will be provided via NM 18 and Wallach Lane. A Site Location Map is provided as **Figure II.3.1**.

1.2 Facility Description

The Sundance West Facility is a commercial Surface Waste Management Facility that will comprise a 320-acre ± tract of land that will include two main components, a liquid oil field waste Processing Area (80 acres ±), and an oil field waste Landfill (180 acres ±). Oil field wastes are delivered to the Sundance West Facility from oil and gas exploration and production operations in southeastern NM and west Texas. The Site Plan provided as **Figure II.3.2** identifies the locations of the Processing Area and Landfill facilities. The facilities are detailed in **Table II.3.1**.



Based on Eunice NE, TX.- NM (1969) Photorevised (1979);
Eunice, NM (1969) Photorevised (1978);
Quadrangles, USGS 7.5' SERIES (1:24,000 Scale)

NOTE:

NO STREAMS, SPRINGS OR WATER COURSES WITHIN 1/2 MILE OF SITE

NORTH

0 1500' 3000'

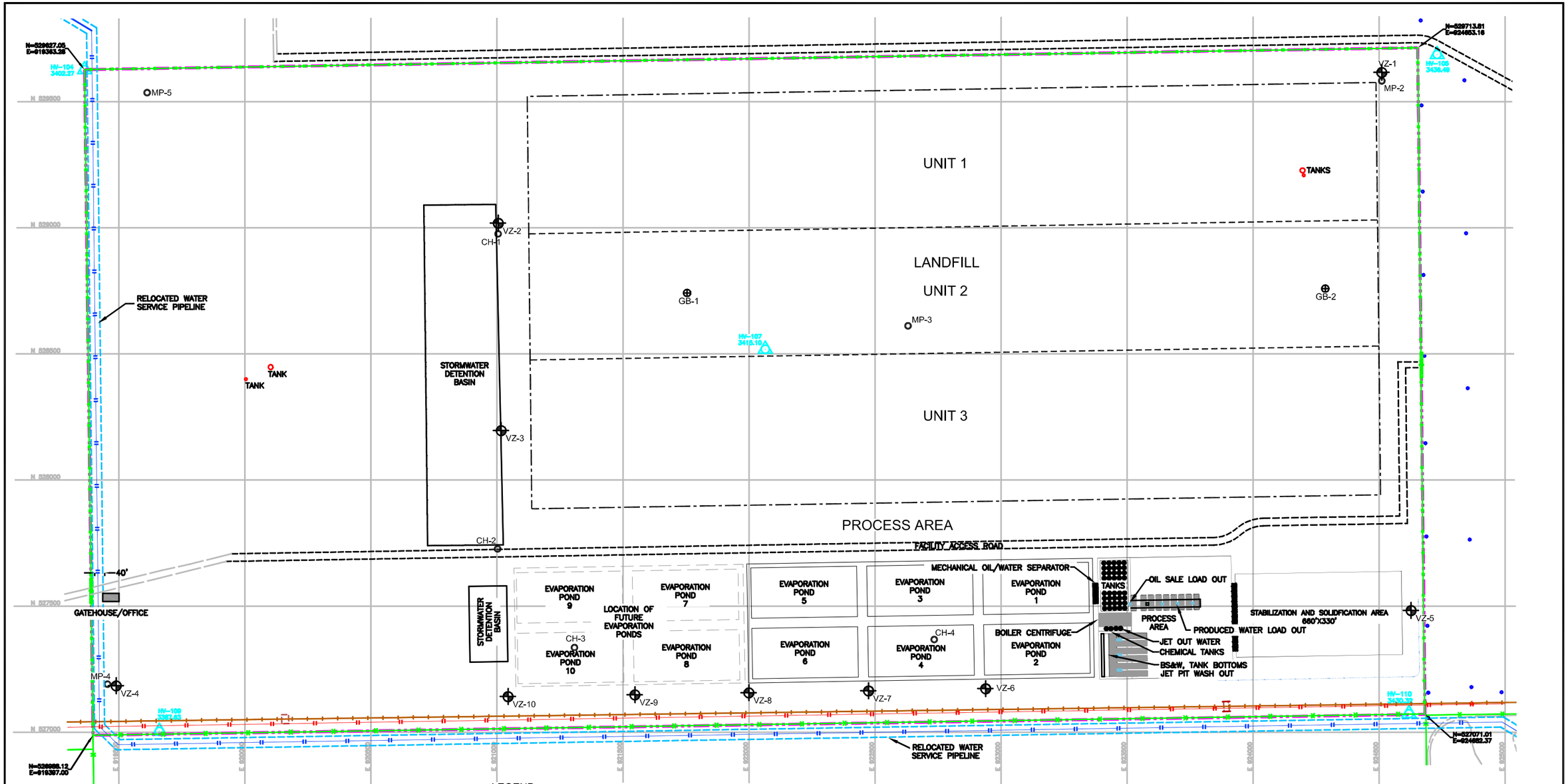
SITE LOCATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/22/2016	CAD: DWG NAME.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: CWF	FIGURE II.3.1
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE LOC REVISED 11 x17.dwg
Date/Time:Aug. 09, 2016-12:21:12 ; LAYOUT: B (LS)



NOTE

AERIAL SURVEY BY THOMAS R. MANN & ASSOCIATES AERIAL MAPPING SERVICES, 5115 COPPER NE, ALBUQUERQUE, NM 87108
DATE OF PHOTOGRAPHY: 10-01-08

LEGEND

- FACILITY BOUNDARY
- LIMIT OF WASTE BOUNDARY
- UNIT BOUNDARY
- FENCE (EXISTING)
- PROPOSED 4-STRAND BARBED WIRE FENCING
- NEW UNPAVED ROAD
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- RAILROAD TRACK
- RELOCATED WATER SERVICE PIPELINE
- EXISTING EUNICE WATERLINE
- PIPELINE EASEMENT
- LOCKING GATE
- GB-1 GEOTECHNICAL BOREHOLE
- MP-2 SOIL BORING
- CH-3 COREHOLE BORING
- VZ-1 VADOSE ZONE MONITORING WELL
- POWER POLE
- STORAGE TANK
- EXISTING BOX CULVERT
- HV-109 3387.63 SURVEY CONTROL POINT
- N 527500 / E 922000 SITE GRID

NORTH

0 200' 400'

SITE PLAN

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/18/2016	CAD: SITE DEV.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.3.2
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE DEV.dwg
Date/Time:Jul, 19, 2016-05:14:34

TABLE II.3.1
Facilities[1]
Sundance West

Description	No.
Oil field waste disposal landfill	1
Produced water load-out points	8
Produced water tanks	45
Mechanical oil/water separation unit	4
Evaporation ponds	10
Stabilization and Solidification Area	1
Oil treatment plant	1
Crude oil receiving tanks	3
Oil sales tanks	2
Customer jet wash	1 (6 bays)

Note:
[1]Subject to change. The facilities are based on projected waste types and volumes; therefore this list may be modified in response to changes in waste streams, technology, etc.

1.3 Purpose

The purpose of this Hydrogen Sulfide (H_2S) Prevention and Contingency Plan (the Plan) is to enhance awareness and establish measures to protect employees from occupational exposure to H_2S while allowing them to perform their assigned duties. The Plan is also designed to protect customers and visitors to the Sundance West Facility, as well as the general public and nearby land users.

This Plan prescribes measures for:

- Constant personnel monitoring.
- Stationary monitoring points at the Facility evaporation ponds.
- Augmenting the monitoring procedures in the event that H_2S is detected in excess of 10 parts per million (ppm).
- Minor, Major, and Critical Alarm levels and actions.
- Notifying Authorities and General Public in the unlikely event of a release as defined in 19.15.29 NMAC.

Sundance West will invite the local emergency response authorities identified in **Table II.3.2** to the site for a briefing on this Plan. During this briefing, Sundance West will discuss notification, emergency response procedures, and evacuation plans. The H_2S monitoring program will be implemented during the active life of the Facility.

TABLE II.3.2
Emergency Response Agencies and Contacts
Sundance West

Agency/Organization	Emergency Number
1. Fire	
Eunice Fire Department	911 or (575) 394-2112
2. Police	
Lea County Sheriff's Department	911 or (575) 396-3611
New Mexico State Police	911 or (575) 392-5580
3. Medical/Ambulance	
Eunice EMS	911 or (575) 394-2112
Lea Regional Medical Center 5419 N. Lovington Highway Hobbs, NM 88240	(575) 492-5000
4. Emergency Response Firm	
Phoenix Environmental, LLC. 2113 N French Drive Hobbs, NM 88240	(575) 391-9685
5. OCD Emergency Response Contacts	
Oil Conservation Division 1625 N. French Drive Hobbs, NM 88240	(575) 393-6161
Mobile Phone	(575) 370-3180
Oil Conservation Division 1220 South St. Francis Drive Santa Fe, NM 87505	(505) 476-3440
6. State Emergency Response Contacts	
Environmental Emergency 24 hr. (NMED)	(505) 827-9329
New Mexico Environment Department Solid Waste Bureau, Santa Fe	(505) 827-0197
7. Local Emergency Response Contacts	
Lea County Emergency Management	(575) 391-2983
8. Federal Emergency Response Contacts	
National Emergency Response Center (U.S. Coast Guard)	(800) 424-8802
Region VI Emergency Response Hotline (USEPA)	(214) 665-2200

1.4 Hydrogen Sulfide Characteristics

H_2S is a colorless and flammable gas with a distinct odor. Being heavier than air, H_2S tends to accumulate at the floor of poorly ventilated spaces. It is found in petroleum and natural gas and is sometimes present in groundwater. The odor of hydrogen sulfide gas can be perceived at levels as low as 10 parts per billion (ppb). At levels of 50-100 ppm, it may cause the human sense of smell to fail. Limited exposure to low concentrations of H_2S can result in eye irritation, sore throat, coughing, shortness of breath, and fluid in the lungs. These symptoms usually recede in a few weeks in the absence of continued exposure. Long-term, low-level exposure may result in fatigue, loss of appetite, headaches, irritability, poor memory, and dizziness. Exposure to high concentrations of H_2S can lead to eye damage, loss of sense of smell, pulmonary edema (swelling and/or fluid accumulation in the lungs), loss of breathing and death. General risks associated with H_2S contact are summarized on **Table II.3.3**, and more detailed chemical hazard information for H_2S is provided on the material safety data sheet (MSDS) furnished in **Attachment II.3.A**.

TABLE II.3.3
H_2S Exposure Health Risk
Sundance West

H_2S EXPOSURE LEVEL[1]	**HEALTH RISK**
Low (0-10 ppm)	Eye, nose, and throat irritation; coughing, shortness of breath, fluid in the lungs
Moderate (10-50 ppm)	Headache, dizziness, nausea and vomiting, coughing and breathing difficulty, loss of sense of smell
High (50-200 ppm)[2]	Severe respiratory tract irritation, loss of sense of smell, eye damage, shock, convulsions, coma, pulmonary edema (swelling and/or fluid accumulation in the lungs), death

[1]*General data obtained from www.osha.gov/hydrogen-sulfide/hazards*
[2]*NIOSH Immediate Danger to Life or Health (IDLH) is 100 ppm*

The oil field waste types, and engineering design and operating procedures specific to the Sundance West Facility, will mitigate against the potential release of H_2S in to the environment. The measures deployed by Sundance West that minimize the potential generation of releases include:

- General screening of existing and new deliveries
- Stationary monitoring points at the Facility evaporation ponds.
- Personnel monitoring.
- Employee training.

The cornerstone of this Plan consists of routine H_2S monitoring conducted for the Facility evaporation ponds to verify that the regulatory limits for H_2S are not exceeded. This approach to monitoring has proven effective in reducing H_2S concentrations and successful in eliminating the need for H_2S Contingency Plan implementation as described in 19.15.11.9 NMAC (i.e., to address H_2S > 100 ppm). In addition, this Plan includes an Immediate Action Plan (**Table II.3.4**) for specific actions to address H_2S > 10 ppm, H_2S > 20 ppm, and H_2S > 100 ppm.

1.5 Regulatory Requirements: 19.15.36 NMAC and 19.15.11 NMAC

The Rules for Surface Waste Management Facilities (19.15.36 NMAC) address the monitoring and management of H_2S in 19.15.36.8.C.(8):

19.15.36.8 SURFACE WASTE MANAGEMENT FACILITY PERMITS AND APPLICATION REQUIREMENTS

C. Application requirements for new facilities, major modifications and permit renewals. An applicant or operator shall file an application, form C-137, for a permit for a new surface waste management facility, to modify an existing surface waste management facility or for permit renewal with the environmental bureau in the division's Santa Fe office. The application shall include:

(8) a hydrogen sulfide prevention and contingency plan that complies with those provisions of 19.15.11 NMAC that apply to surface waste management facilities;

This Plan considered the applicability of the American Petroleum Institute (API) Recommended Practice 55 (RP-55), paragraph 7.6 to address H_2S >30 ppm. Should monitoring results identify unexpected concentrations of H_2S in excess of 30 ppm (RP-55 limit) in a public area, proper notification would be required. The RP-55 limit of 30 ppm will result in a radius of exposure (ROE) of 250 ft from the point of release (assuming a release rate of 100 SCFH on Figure C-2 of RP-55). This ROE is depicted on **Figure II.3.2**, and there are no "public areas" within this ROE.

TABLE II.3.4
IMMEDIATE ACTION PLAN
Sundance West

Overview

Six sensors are installed to monitor H_2S concentrations around the evaporation ponds. The six sensors communicate wirelessly through radio to the GDS C2 controller installed on a steel post on the west side of the ponds. The GDS controller has an audible alarm and is outfit with a rotating red strobe. The controller is programmed to send email and text notifications whenever alarm conditions are present. Alarms will include information on the sensor (channel) producing the alarm. A site map of the ponds can be used to identify the location of the alarming sensor. Personnel monitors will also follow the same alarm conditions and actions. The alarm conditions are outlined in the table below, with concentrations listed in parts per million (ppm).

Alarm Type	Alarm Condition
Minor	10 ppm ≤ Concentration < 20 ppm
Major	20 ppm ≤ Concentration < 100 ppm
Critical	100 ppm ≤ Concentration

Wind socks were installed on the east and west ends of the northern section of chain link fence surrounding the ponds. The purpose of the wind socks is to indicate the direction of the wind so that site personnel can move away from the potential source. Wind speeds and direction will also be monitored and recorded daily when feasible.

Minor Alarm

A minor alarm is reached when an H_2S concentration greater than or equal to 10 ppm and less than 20 ppm is observed at any of the six sensors. If a minor alarm is reached the procedures below shall be implemented:

- Evacuate and move upwind of the area. Notify the Emergency Coordinator (EC).
- Monitor downwind concentrations.
- Obtain analysis of the dissolved sulfides in the ponds if feasible.

Major Alarm

A major alarm is reached when an H_2S concentration greater than or equal to 20 ppm, and less than 100 ppm is observed. In the case of a major alarm the following procedures shall be implemented:

- Evacuate and move upwind of the area. Notify the Emergency Coordinator (EC).
- Evacuate the area following the site evacuation plan and notify the Emergency Coordinator if levels remain greater than 20 ppm for more than 10 minutes.
- Remain upwind of the release until an assessment of the conditions has been made.
- Assess the source, severity, and extent of the alarm using appropriate personal protective equipment (i.e. self-contained breathing apparatus).
- Notify authorities (NM State Police, Lea County Sheriff, Lea County Emergency Management, and OCD) if levels remain greater than 20 ppm for more than 10 minutes..
- Recordkeeping

Critical Alarm

A critical alarm is reached when an H_2S concentration greater than or equal to 100 ppm is observed. In the case of a critical alarm the following procedures shall be implemented in addition to the actions for a Major Alarm:

- Evacuate the area following the site evacuation plan and notify the Emergency Coordinator.
- Close the facility if levels reach 20 ppm at the downwind boundary.
- Notify authorities (NM State Police, Lea County Sheriff, Lea County Emergency Management, and OCD).
- Recordkeeping

SITE EVACUATION PROCEDURE

When evacuation is required, the following procedures will be followed:

1. Facility personnel will be alerted directly or using the Facility telephone, cellular telephones, or radios.
2. Vehicles delivering waste will be diverted away from the location of the emergency and routed towards the Facility exit (**Figure II.3.2**).
3. All Facility operating equipment will be shut down.
4. Personnel will be directed to proceed to the Facility Gatehouse which will be the primary meeting locations (**Figure II.3.4**). The EC will identify missing persons at that time.
5. If the emergency involves the Facility Gatehouse or its immediate environs, the intersection of NM 18 and Wallach Lane will be the secondary assembly point and evacuation routes to this location will be utilized (as applicable).
6. If the emergency precludes access to both, the Facility Gatehouse and the intersection of NM 18 and Wallach Lane, personnel will evacuate the site via an auxiliary access gate at the east end of the facility.
7. Once assembled, personnel will stand by to afford assistance and coordinate further actions.

2.0 EMERGENCY COORDINATORS

Sundance West has designated individual specialists with the responsibility and authority to implement response measures in the event of an emergency which threatens freshwater, public health, safety or the environment per 19.15.36.13.N.(3) NMAC. The Primary, Alternate, and on-site Emergency Coordinators (ECs; **Table II.3.5**) will be thoroughly familiar with all aspects of this Plan; operations and activities at the Facility; location and characteristics of waste to be managed; the repository of all records within the Facility; and the Facility layout. **Table II.3.5** provides a list of names, designations, titles, and phone numbers for each EC, who will be formally identified to OCD prior to commencing Facility operations.

TABLE II.3.5
List of Emergency Coordinators*
Sundance West

Primary Emergency Coordinator

Name: Joe Carrillo	Work Phone: (575) 394-2511
Title: Corporate Plant Manager	Mobile Phone: (575) 390-0342
Address: 605 Ave J	Home Phone: NA
Eunice, NM 88231	

Alternate Emergency Coordinator

Name: TBD	Work Phone: TBD
Title: TBD	Mobile Phone: TBD
Address: TBD	Home Phone: TBD
TBD	

Onsite Emergency Coordinator

Name: TBD	Work Phone: TBD
Title: TBD	Mobile Phone: TBD
Address: TBD	Home Phone: TBD
TBD	

**Or as designated by Sundance West.*

The ECs are responsible for coordinating emergency response measures and have the authority to commit the resources required for implementation of this Plan. A designated EC will be available to respond to emergencies 24 hours a day, 7 days a week. The Sundance West employee who identifies an emergency situation will contact an EC directly; or via phone or radio. Contact will be attempted with each EC (Primary, Alternate, and the On-site) until communication is achieved (**Table II.3.5**). Upon arrival at the scene of an emergency, the first EC to arrive will assume responsibility for initiating response measures. If more than one EC responds, authority is assigned to the highest-ranking EC.

In the rare case that an EC cannot be contacted in an emergency, the Sundance West employee who identifies the emergency will make every effort to follow the emergency procedures outlined in this Plan until an EC or emergency authority (local, state, or federal; **Table II.3.2**) arrives to assist or take charge. The term "EC" as used throughout this Plan to references the responsible Emergency Coordinator at the scene of an emergency regardless of whether that EC is the Primary, Alternate, On-site EC, or EC designee. This Plan will be amended as described in Section 8.0 if the list of ECs changes, with updates submitted in a timely manner to OCD and filed on-site.

3.0 MONITORING

3.1 Incoming loads

Sundance West personnel will wear H_2S personal monitors under circumstances where H_2S may be present. The monitors will issue a visual and audible signal at 10 ppm of H_2S in the ambient air that becomes more rapid at 20 ppm. The Immediate Action Plan shall be followed in the event of an H_2S detection of 10 ppm or greater.

3.2 Evaporation Pond Monitoring

3.2.1 Stationary Monitors

Evaporation ponds are monitored for the presence of H_2S by recording at continuous monitors maintained along the outside perimeter of the pond area as shown on **Figure II.3.3**. These monitors can be observed remotely via the internet and measurements are recorded every 5 minutes on a data logging system. Wind socks are placed at the East and West ends of the Northern fence (shown in **Figure II.3.3**), which will be visible from all principle working areas at all times. Wind speeds and direction will also be monitored and recorded regularly when feasible.

GENERAL NOTES:

1. HYDROGEN SULFIDE (H2S) MONITORING SYSTEM INCLUDES 6 H2S SENSORS (0–100 PPM).
2. BFT–44 H2S SENSOR IS CO–LOCATED WITH THE C2/TX CONTROLLER.
3. 110/220 VAC POWER REQUIRED FOR THE C2/TX CONTROLLER AND THE BFT–44 SENSOR.

KEY NOTES:

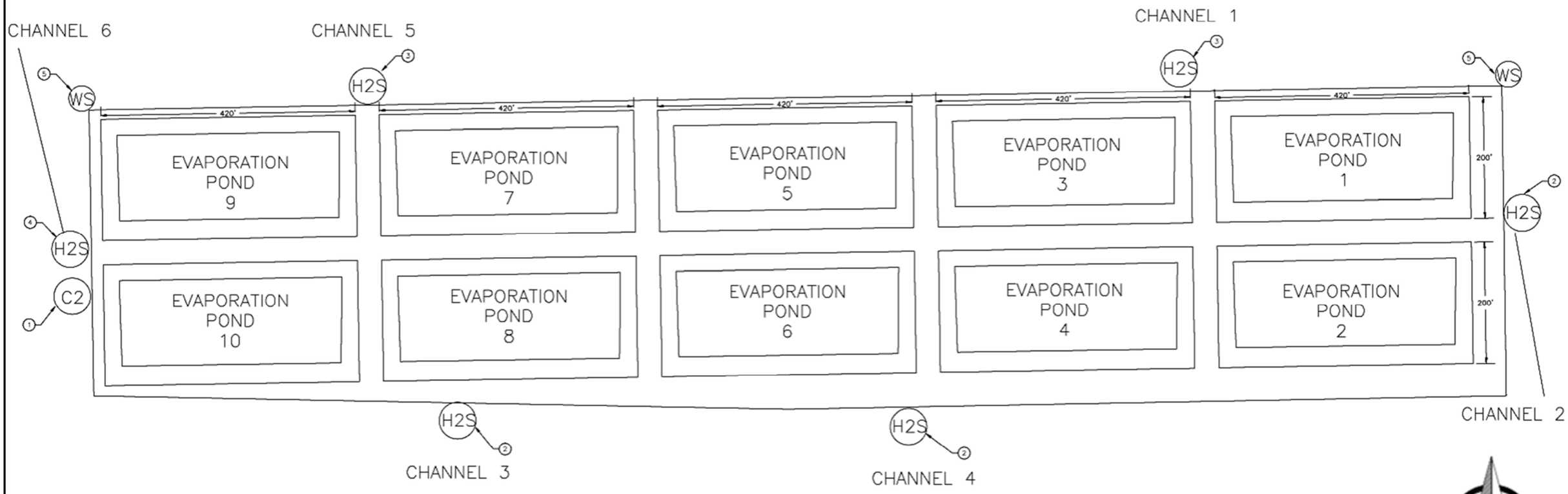
① GDS MODEL C2–TX WIRELESS CONTROLLER WITH OMNIDIRECTIONAL ANTENNA, 100 dB PIEZO BUZZER, AND RED STROBE. MOUNTED ON A POLE IN THE GROUND.

② GDS MODEL GASMAX/TX BATTERY POWERED WIRELESS GAS MONITOR W/ OMNIDIRECTIONAL ANTENNA MOUNTED ON WEIGHTED SENSOR STAND WITH MOUNTING PLATE.

③ GDS MODEL GASMAX/TX BATTERY POWERED WIRELESS GAS MONITOR W/ OMNIDIRECTIONAL ANTENNA MOUNTED ON THE EXISTING CHAIN LINK FENCE.

④ BFT–44 H2S SENSOR CONNECTED TO A GDS MODEL GM/TXDC WIRELESS TRANSMITTER MOUNTED ON THE ELECTRICAL RACK.

⑤ 18" X 60" WIND SOCK WITH SOLAR POWERED LIGHT.



SUNDANCE WEST

Evaporation Ponds Stationary Monitoring

Figure II.3.3

DBS&A Daniel B. Stephens & Associates, Inc.

4/27/2021 Project #DB18.1209

TABLE II.3.7
DELETED

4.0 IMPLEMENTATION, ASSESSMENT, AND NOTIFICATION

The following subsections present a series of procedures for implementation, assessment, and notification of appropriate authorities in the unlikely event that a H_2S emergency develops (19.15.11.9 NMAC).

4.1 Implementation

This H_2S Contingency Plan will be implemented when an imminent or actual emergency situation develops that represents a potential impact to fresh water, public health, safety or the environment. The circumstances that could require implementation of this Plan includes the release of H_2S gas.

Table II.3.4 lists the implementation, assessment, and notification procedures that will be followed in the event of an emergency. Assessment and notification are discussed further in Sections 4.2 and 4.3.

4.2 Assessment

In the event of a release, the EC will immediately identify the character, source, amount and extent of released materials, if possible; as well as assess the potential impact to fresh water, public health, safety or the environment. During an emergency, the EC may amend this Plan, as necessary, to protect fresh water, public health, safety or the environment (19.15.11.9.F NMAC). The EC will also assess the circumstances of an emergency situation and determine the responses required to:

- provide notifications to appropriate agencies and the general public
- implement appropriate response and recordkeeping procedures

The assessment provides the EC with critical data needed to determine whether an evacuation is necessary, whether emergency authorities should be contacted, and whether Sundance West should attempt to control the release with on-site personnel and equipment. **Table II.3.8** provides OCD descriptions of "major" and "minor" releases which are applicable for assessment purposes (19.15.29.7 – 11 NMAC). This section contains additional, detailed information regarding the Site Evacuation Plan (**Table II.3.4)**, and Section 5.0 addresses control procedures.

4.2.1 Site Evacuation Plan

Based upon the type of waste materials and treatment received at Sundance West, the potential for a Facility evacuation is unlikely (19.15.11.9.B.(2)(a) NMAC). However, various circumstances could arise warranting a Facility evacuation. In an emergency situation, the EC is the individual responsible for determining when evacuation of the Facility is required.

When conditions warrant immediate evacuation, on-site persons (e.g., Facility personnel, haulers, visitors, vendors, etc.) will be directed to proceed immediately to evacuate through the main gates (**Figure II.3.4**), the primary evacuation route. Sundance West Personnel will exercise good judgment and common sense in using the primary evacuation route to exit the Facility, or selecting the most appropriate alternative evacuation route, if necessary. Assembly points and primary/secondary evacuation routes are provided on **Figure II.3.4.** Driving directions to the nearest hospital are included as **Figure II.3.5**, and **Table II.3.4** provides detailed procedures for evacuating the Facility.

TABLE II.3.8
Part 29: Release Notification Sundance West

19.15.29.7 DEFINITIONS:

A. "Major release" means:

(1) an unauthorized release of a volume, excluding gases, in excess of 25 barrels;

(2) an unauthorized release of a volume that:

(a) results in a fire;

(b) will reach a watercourse;

(c) may with reasonable probability endanger public health; or

(d) results in substantial damage to property or the environment;

(3) an unauthorized release of gases in excess of 500 MCF; or

(4) a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

B. "Minor release" means an unauthorized release of a volume, greater than five barrels but not more than 25 barrels; or greater than 50 MCF but less than 500 MCF of gases.

19.15.29.8 RELEASE NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall notify the division of unauthorized release occurring during the drilling, producing, storing, disposing, injecting, transporting, servicing or processing of oil, gases, produced water, condensate or oil field waste including regulated NORM, or other oil field related chemicals, contaminants or mixture of the chemicals or contaminants, in accordance with the requirements of 19.15.29 NMAC.

B. The person operating or controlling either the release or the location of the release shall notify the division in accordance with 19.15.29 NMAC with respect to a release from a facility of oil or other water contaminant, in such quantity as may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC.

19.15.29.9 REPORTING REQUIREMENTS: The person operating or controlling either the release or the location of the release shall provide notification of releases in 19.15.29.8 NMAC as follows.

A. The person shall report a major release by giving both immediate verbal notice and timely written notice pursuant to Subsections A and B of 19.15.29.10 NMAC.

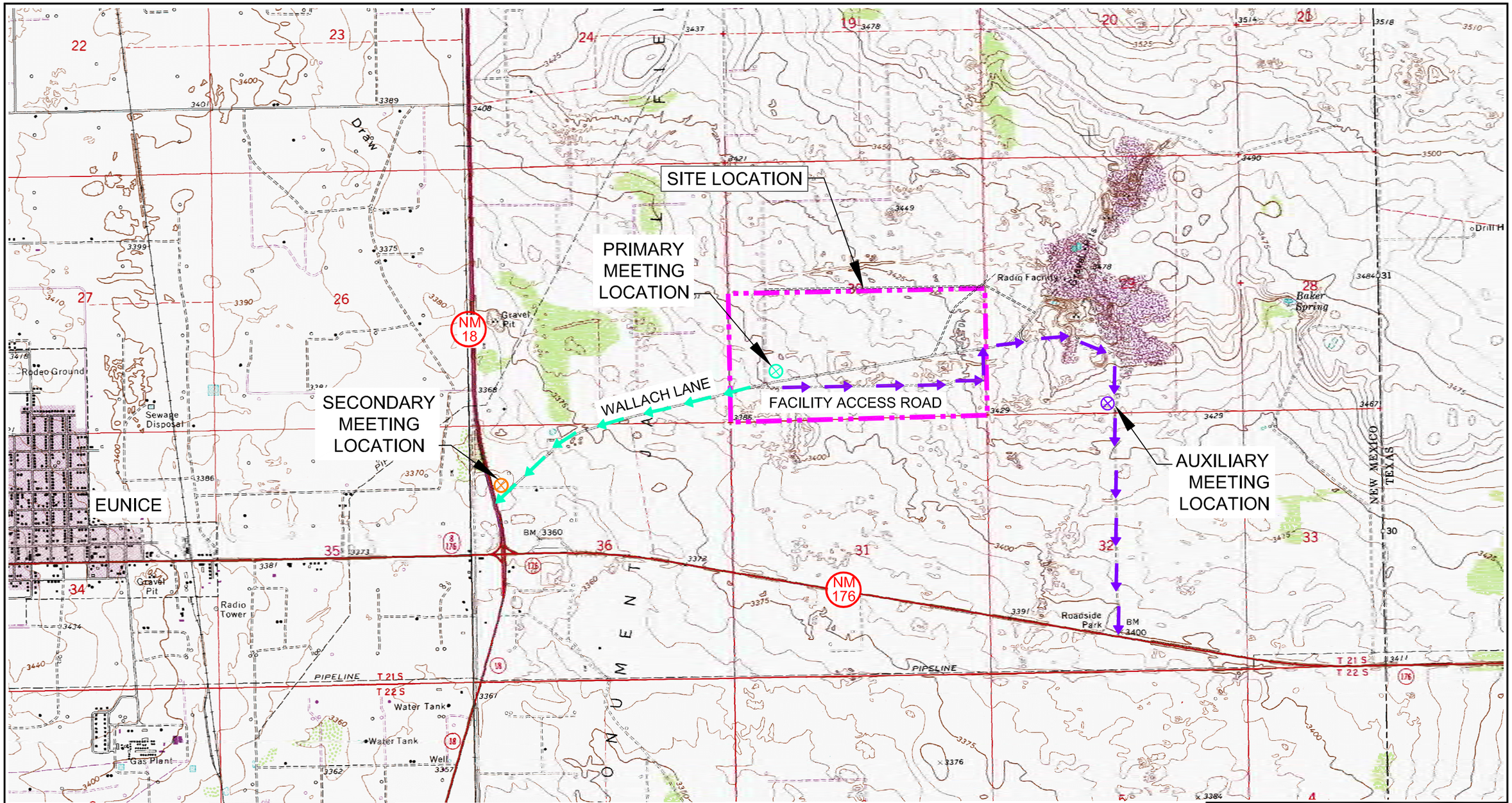
B. The person shall report a minor release by giving timely written notice pursuant to Subsection B of 19.15.29.10 NMAC.

19.15.29.10 CONTENTS OF NOTIFICATION:

A. The person operating or controlling either the release or the location of the release shall provide immediate verbal notification within 24 hours of discovery to the division district office for the area within which the release takes place. In addition, the person shall provide immediate verbal notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief. The notification shall provide the information required on form C-141.

B. The person operating or controlling either the release or the location of the release shall provide timely written notification within 15 days to the division district office for the area within which the release occurs by completing and filing form C-141. In addition, the person shall provide timely written notification of a release of a volume that may with reasonable probability be detrimental to water or exceed the standards in Subsections A and B or C of 19.15.30.9 NMAC to the division's environmental bureau chief within 15 days after the release is discovered. The written notification shall verify the prior verbal notification and provide appropriate additions or corrections to the information contained in the prior verbal notification.

19.15.29.11 CORRECTIVE ACTION: The responsible person shall complete division-approved corrective action for releases that endanger public health or the environment. The responsible person shall address releases in accordance with a remediation plan submitted to and approved by the division or with an abatement plan submitted in accordance with 19.15.30 NMAC.



MAP BASE:
EUNICE N. MEX. 1969, PHOTOREVISED 1979 AND EUNICE NE, TEX.-N. MEX. 1969, PHOTOREVISED 1979, 1:24000, USGS 7.5 MIN. SERIES TOPOGRAPHIC QUADRANGLES

LEGEND

- FACILITY BOUNDARY
- UNPAVED ROADS
- PRIMARY MEETING LOCATION
- PRIMARY EVACUATION ROUTE
- SECONDARY MEETING LOCATION
- AUXILIARY MEETING LOCATION
- AUXILIARY EVACUATION ROUTE

NORTH

0 1000' 2000'

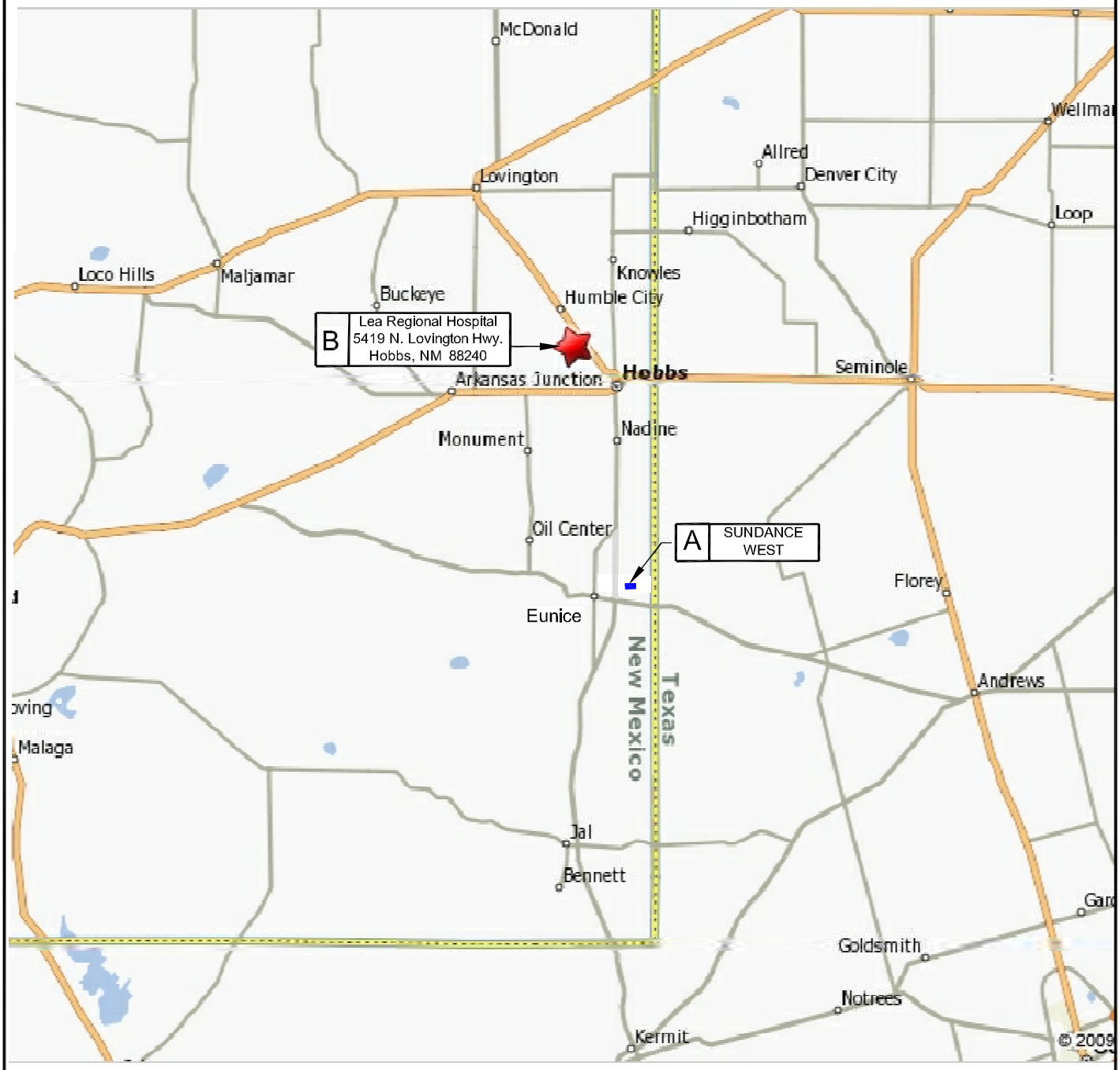
SITE EVACUATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 07/19/2016	CAD: SITE EVAC.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.3.4
APPROVED BY: IKG	gei@gordonenvironmental.com	

Drawing:P:\acad 2003\530.06.01\REVISED FIGURES(RAI 1)\SITE EVACUATION.dwg
Date/Time:Jul. 19, 2016-10:02:31



A: Sundance West, Wallach Lane & NM-18, Eunice, NM 88231

1.	Start out going WEST on WALLACH LN toward NM-18N	0.0 mi
2.	Turn RIGHT on NM-18N	18.0 mi
3.	Turn LEFT onto E SANGER ST/CR-65	0.5 mi
4.	Turn SLIGHT RIGHT onto N TURNER ST	1.3 mi
5.	N TURNER ST becomes NM-18N	3.1 mi
6.	Turn LEFT onto GERRY ST	0.1 mi
7.	Arrive 5419 N LOVINGTON HWY	0.0 mi

B: Lea Regional Medical Center, 5419 N Lovington Hwy, Hobbs, NM 88240-9100

Note: A to B Travel Estimates: 35 minutes / 23.86 miles

Map downloaded from MAPQUEST, September 15, 2009
Drawing:P:\acad 2003\530.06.01\PERMIT FIGURES\HOSPITAL.dwg
Date/Time:Feb. 05, 2015-12:52:43

NORTH
NOT TO SCALE

HOSPITAL LOCATION MAP

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 02/05/2015	CAD: HOSPITAL.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: DRT	FIGURE II.3.5
APPROVED BY: IKG	gei@gordonenvironmental.com	

TABLE II.3.9
DELETED

4.3 Notification of Authorities and General Public

This Section provides a series of procedures for implementation and notification of appropriate authorities in the event that a specific emergency develops (19.15.11.16 NMAC). Whenever there is an imminent or actual emergency, the EC will immediately contact on-site persons (Facility personnel, visitors, vendors, haulers, etc.) via on-site communication systems, as well as notify the appropriate state and local agencies (**Table II.3.2**), as necessary. OCD will be notified within 4 hours after the Contingency Plan has been activated.

Table II.3.2 provides a list of emergency response agencies and contacts that may need to be notified depending on the type and extent of an emergency situation. **Table II.3.2** will be posted as appropriate and near on-site telephones for easy access by Sundance West personnel. Fire, police, and medical authorities will be contacted, as necessary, in an emergency situation (**Table II.3.2**).

Table II.3.8 provides specific information regarding notification of OCD in the case of a release, which by definition includes breaks, leaks, spills, releases, fires or blowouts. In addition, **Table II.3.8** also provides OCD definitions for “major” and “minor” releases.

Additional State, Federal, and other local emergency contact numbers are provided and should be used as deemed appropriate to the situation (**Table II.3.2**). If the EC determines that the incident could threaten fresh water, human health, public safety or the environment beyond the limits of the Facility, the EC will notify the National Response Center and USEPA at the following phone numbers (also included on **Table II.3.2**):

- National Response Center - 24 Hr. Hotline: (800) 424-8802
- Region VI Emergency Response Hotline (USEPA): (214) 665-2200

The EC's notification to authorities will include the following information, as listed on the Incident Report Form (**Attachment II.3.D**):

- name and telephone number of person reporting the incident
- name and address of Facility
- time and type of incident (e.g., hazardous material release, fire)

- name and quantity of material(s) involved, to the extent known
- extent of injuries, if any
- possible hazards to human health or the environment
- other information requested by the response entity

5.0 EMERGENCY EQUIPMENT

The following sections describe emergency equipment at Sundance West that will be available for responding to emergency situations. An Emergency Response Equipment List describing the equipment, quantity, location, and uses is provided as **Table II.3.10**.

TABLE II.3.10
Emergency Response Equipment List[1]
Sundance West

Equipment Description	Quantity	Location	Use(s)
10 lb ABC rated fire extinguisher	2	Facility Gatehouse	Firefighting
10 lb ABC rated fire extinguisher	2	Trucks	Firefighting
10 lb ABC rated fire extinguisher	1	Heavy Equipment	Firefighting
20 lb ABC rated fire extinguisher	1	Crude Oil Recovery Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Centrifuge Building	Firefighting
20 lb ABC rated fire extinguisher	1	Oil Sales Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Produced Water Tanks	Firefighting
20 lb ABC rated fire extinguisher	1	Diesel Storage Tank	Firefighting
Loader	1	Facility	Berm Repair
Oil Booms	4	NE Corner of Pond	Oil Containment
Self-contained Breathing Apparatus	1 per employee	Facility Gatehouse	Protective gear for employees
Pair leather gloves	1 per employee	Assigned to employee	Protective gear for employees
NOMEX Coveralls	7 per Employee	Assigned to Employee	Protective gear for employees
Pair safety glasses	1 per employee	All employee workstations	Protective gear for employees
Round-point wood handled shovels	2	Process Area Building	Contain spillage, putting out fires
First Aid Kit	1	Facility Gatehouse	First Aid
First Aid Kit	1 per vehicle	Facility Vehicles	First Aid
Eye Wash Station	1	Produced Water Receiving Tanks	First Aid
Portable 2-way radio	1 per employee	Base unit at Facility Gatehouse	Communications
Cell Phones	min. 3	Facility Manager Facility Operator Facility Operator	Communications
Office Phone	2	Facility Gatehouse	Communications
Mobile pressure washer	1	Mobile	Decontaminating equipment

Notes:
[1]*Subject to change in response to waste receipts, regulatory requirements, technology, etc.*

5.1 Internal Communications

Communications at Sundance West will be accomplished via cellular telephones, land lines, and two-way radios. These systems provide Facility personnel with immediate emergency notification capabilities, and the opportunity to receive instructions in the event of an emergency incident. Any mechanical difficulties with the communications equipment will be promptly repaired. Internal communication devices are also listed on **Table II.3.10.**

5.2 External Communications

The land-line telephones and cell phones located at Sundance West will have outside access in the event that notification of the local emergency response authorities is required (i.e., fire department, ambulance, etc.). Key Facility personnel including the ECs, Facility Manager, etc., will carry cellular telephones for contacting outside agencies. The cellular telephones also provide a backup means for contacting emergency authorities in the event they cannot be reached by conventional telephone lines. Emergency phone numbers will be posted in the Facility Gatehouse and provided to employees on laminated pocket cards. External communication devices are also listed on **Table II.3.10.**

5.3 Personnel Protection, First Aid, and Safety Equipment

Personal protective equipment (PPE) necessary for responding to a potential release of hazardous materials are maintained in on-site buildings (Facility Gatehouse and the Produced Water Facility) and/or issued to each employee (**Table II.3.10**). These items include Tyvek suits, gloves, safety glasses, hearing protection, self-contained breathing apparatus (SCBA), etc.

First aid and safety equipment are maintained at strategic locations at Sundance West as shown on **Table II.3.10**. Safety equipment located at the Facility includes industrial first aid kits, fire extinguishers, an eye wash station, etc. An emergency shower is located at the Produced Water Facility. First aid kits are placed in the Facility Gatehouse and the Produced Water Facility. In addition, first aid kits are maintained in all Facility vehicles, including heavy equipment. Prominent signs will be placed identifying the location of health and safety equipment, and emergency response items (e.g., fire extinguishers).

6.0 RECORDKEEPING

The EC will be responsible for ensuring that emergency response actions are fully documented. The Primary EC may complete the documentation requirements or delegate to another EC. The Incident Report Form (**Attachment II.3.D**) illustrates the information that will be recorded as a result of any emergency incident and related response action. This form will be signed by both the EC and the Facility Manager. Copies of the form filed for each incident will be retained for OCD review as part of the Facility Operating Record.

In addition, in the case of an unauthorized release at Sundance West, the OCD will be notified pursuant to 19.15.29 NMAC. As defined by OCD a "release" is any *"breaks, leaks, spills, releases, fires or blowouts involving crude oil, produced water, condensate, drilling fluids, completion fluids or other chemical or contaminant or mixture thereof, including oil field wastes and natural gases to the environment"* (19.15.2.7.R(4) NMAC). A major release (19.15.29 NMAC; **Table II.3.8**) includes an unauthorized release of any volume which may, with reasonable probability, endanger public health; or an unauthorized release of natural gases in excess of 500 thousand cubic feet (mcf); or a release of any volume which may with reasonable probability endanger public health or results in substantial damage to property or to the environment, cause detriment to water, or exceed the standards in 19.15.30 NMAC. A major release requires both immediate verbal notification (within 24 hours), as well as timely written notification to OCD (within 15 days) using OCD Form C-141 (*Release Notification and Corrective Action*). A minor release (**Table II.3.8**) is an unauthorized release of greater than 50 mcf but less than 500 mcf of natural gases. A minor release requires timely written notice. A copy of OCD Form C-141 is provided as **Attachment II.3.E**. Copies of the Form filed for each incident will be retained on-site as part of the Facility Operating Record.

7.0 COORDINATION AGREEMENTS

A copy of this Plan will be made available to the organizations identified in **Table II.3.2**. This Plan serves to familiarize each of the identified organizations with the operations of the Facility and types of emergencies and responses that may be required. Each agency will be encouraged to visit the Facility for purposes of assessing site operations, and providing input regarding emergency response procedures (19.15.11.9.B.(2)(e) NMAC).

8.0 PLAN AMENDMENT

The EC will be responsible for assuring that updates to or amendments of this Plan are conducted and recorded in the event of any of the following (19.15.11.9.F NMAC):

1. The Facility Permit is revised or modified with potential impacts on this Plan.
2. The OCD mandates it, including responses to regulatory updates.
3. The Plan fails in an emergency.
4. Modification to the Facility design, construction, operation, maintenance or other circumstances that changes the potential circumstance or locations for fires, explosion, or releases of hazardous oil field waste constituents; or related changes in the appropriate emergency response.
5. The list of ECs changes.
6. The list of emergency equipment changes significantly.

The updated Plan will be distributed to OCD and made available to the organizations identified in **Table II.3.2** with a cover letter highlighting any substantive changes. Proposed changes will be in compliance with 19.15.36 NMAC.

9.0 TRAINING

The EC or Facility training representative will ensure all new and existing employees are trained on the H_2S Prevention and Contingency Plan at least annually; or when significant changes to the Plan have been made, whichever is more frequent. Prior to any new employee commencing work, a training session separate from the standard annual training will be conducted to provide specific proficiency in H_2S safety and procedures. Training will include both classroom drills and field exercises simulating H_2S monitoring, potential releases, and evacuation procedures. Included in this training are H_2S hazards identification and detection, personal protection, and contingency procedures.

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.A

MATERIAL SAFETY DATA SHEET FOR H_2S

MSDS Code: 001909
Status: Final

Date of Issue: 13-Oct-2005

ConocoPhillips

MATERIAL SAFETY DATA SHEET

Hydrogen Sulfide

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Hydrogen Sulfide
Synonyms:	H2S Sour Gas Sulfuretted Hydrogen Hepatic Gas Hydrosulfuric Acid Alliance - Hydrogen Sulfide - 1605 Ferndale - Hydrogen Sulfide - 1605 LAR - Acid Gas LAR - Sour Gas Santa Maria - Acid gas Santa Maria - Sour Gas Trainer - Hydrogen Sulfide - S173 Wood River - Hydrogen Sulfide - 100240
Intended Use:	Refinery by-product
Chemical Family:	Inorganic Gas

Responsible Party:
ConocoPhillips
600 N. Dairy Ashford
Houston, Texas 77079-1175

MSDS Information:
800-762-0942
MSDS@conocophillips.com

Emergency Overview

24 Hour Emergency Telephone Numbers:
Spill, Leak, Fire or Accident Call CHEMTREC:
North America: (800) 424-9300
Others: (703) 527-3887 (collect)

California Poison Control System: (800) 356-3219

Health Hazards/Precautionary Measures: Poisonous hydrogen sulfide gas. Harmful if inhaled. Causes severe eye irritation. Use with ventilation adequate to keep exposure below recommended limits, if any. Do not breathe gas. Avoid contact with eyes. Wash thoroughly after handling.

Physical Hazards/Precautionary Measures: Flammable gas. Can cause flash fire. Keep away from heat, sparks, flames, static electricity or other sources of ignition. Do not enter storage areas or confined space unless adequately ventilated.

Appearance:	Colorless
Physical Form:	Gas
Odor:	Rotten egg (odorless at high concentrations or after prolonged exposure at low concentrations)

NFPA 704 Hazard Class:

Health:	4 (Extreme)
Flammability:	4 (Extreme)
Instability:	0 (Least)

2. COMPOSITION / INFORMATION ON INGREDIENTS

HAZARDOUS COMPONENTS					
Component / CAS No:	**Percent (%)**	**ACGIH:**	**OSHA:**	**NIOSH:**	**Other:**
Hydrogen Sulfide 7783-06-4	100	10 ppm TWA 14 mg/m^3 TWA 15 ppm STEL 21 mg/m^3 STEL	20 ppm CEIL 50 ppm 10 min. peak	100 ppm IDLH	---

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

1%=10,000 PPM.
NE=Not Established

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye: Severe eye irritant. Contact may cause stinging, watering, redness, swelling, and eye damage.

Skin: Skin contact is unlikely. No information available on skin absorption.

Inhalation (Breathing): Toxic. May be harmful if inhaled.

Ingestion (Swallowing): This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Signs and Symptoms: Effects of overexposure may include irritation of the eyes, nose, throat, and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats (arrhythmias), sudden collapse, respiratory failure, convulsions and death.

Cancer: There is no information available on the cancer hazard of this material.

Target Organs: No data available for this material.

Developmental: Inadequate data available for this material.

Other Comments: Hydrogen sulfide is a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure.

Pre-Existing Medical Conditions: Conditions aggravated by exposure may include respiratory (asthma-like) disorders.

4. FIRST AID MEASURES

Eye: Immediately move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek immediate medical attention. For direct contact, immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 20 minutes. Seek immediate medical attention.

Skin: First aid is not normally required. However, it is good practice to wash any chemical from the skin.

Inhalation (Breathing): Immediately move victim away from exposure and into fresh air. If respiratory symptoms or other symptoms of exposure develop, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Notes to Physician: In high doses hydrogen sulfide may produce pulmonary edema and respiratory depression or paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote; however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of H2S is confirmed and the patient does not respond rapidly to supportive care, the use of nitrites is an alternative treatment. For adults the dose is 10 ml of a 3% NaNO2 solution (0.5 gm NaNO2 in 15 mL water) I.V. over 2-4 minutes. Dosage should be adjusted in children or in presence of anemia. Follow blood pressure, methemoglobin levels, arterial blood gases, and electrolytes closely in serious cases.

5. FIRE-FIGHTING MEASURES

Flammable Properties:

Flash Point:	10°F / -12°C
Test Method:	Test Method Unknown
OSHA Flammability Class:	Flammable Gas
LEL%:	4.0
UEL%:	46.0
Autoignition Temperature:	500°F / 260°C

Unusual Fire & Explosion Hazards: This material is flammable and can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, or mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. Vapors are heavier than air and can accumulate in low areas. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. If container is not properly cooled, it can rupture in the heat of a fire. Closed containers exposed to extreme heat can rupture due to pressure buildup.

Extinguishing Media: Dry chemical or carbon dioxide is recommended. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces.

Fire Fighting Instructions: For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential chemical hazard is unknown, in enclosed or confined spaces, or when explicitly required by DOT, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area, keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. If this cannot be done, allow fire to burn. Move undamaged containers from immediate hazard area if it can be done with minimal risk. Stay away from ends of container.

Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done with minimal risk.

6. ACCIDENTAL RELEASE MEASURES

Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. The use of explosion-proof electrical equipment is recommended.

Stay upwind and away from spill/release. Notify persons down wind of the spill/release, isolate danger area and keep unauthorized personnel out. Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section 8).

Water spray may be useful in minimizing or dispersing vapors (see Section 5).

Notify fire authorities and appropriate federal, state, and local agencies. If spill/release in excess of EPA reportable quantity (see Section 15) is made into the environment, immediately notify the National Response Center (phone number 800-424-8802).

7. HANDLING AND STORAGE

Handling: The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-704 and/or API RP 2003 for specific bonding/grounding requirements.

Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8).

Use good personal hygiene practices.

Storage: Keep container(s) tightly closed. In a tank, barge, or other closed container, the vapor space above materials that contain hydrogen sulfide (H2S) may result in concentrations immediately dangerous to life or health (IDLH). Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Post area "No Smoking or Open Flame." Store only in approved containers. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional engineering controls may be required. Where explosive mixtures may be present, electrical systems safe for such locations must be used (see appropriate electrical codes).

Personal Protective Equipment (PPE):

Respiratory: Use a NIOSH approved self-contained breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode in oxygen deficient environments (oxygen content <19.5%) or if exposure concentration is unknown or if conditions immediately dangerous to life or health (IDLH) exist.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

Skin: Not required based on the hazards of the material. However, it is considered good practice to wear gloves when handling chemicals.

Eye/Face: The use of a face shield and chemical goggles to safeguard against potential eye contact, irritation, or injury is recommended.

Other Protective Equipment: A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

Suggestions for the use of specific protective materials are based on readily available published data. Users should check with specific manufacturers to confirm the performance of their products.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Appearance:	Colorless
Physical Form:	Gas
Odor:	Rotten egg (odorless at high concentrations or after prolonged exposure at low concentrations)
Odor Threshold:	0.0047 ppm
pH:	Not applicable
Vapor Pressure (mm Hg):	554.6 psia @ 100°F (38°C)
Vapor Density (air=1):	1.20
Boiling Point:	-60°F / -12°C
Melting/Freezing Point:	-86°F / -66°C
Solubility in Water:	Slight
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity:	1.2 (Gas)
Heat Value (BTU):	-6552 (BTU/lb)

Percent Volatile:	100%
Evaporation Rate (nBuAc=1):	>1
Molecular Weight:	34.08
Flash Point:	10°F / -12°C
Test Method:	Test Method Unknown
LEL%:	4.0
UEL%:	46.0
Autoignition Temperature:	500°F / 260°C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Flammable gas.

Conditions to Avoid: Avoid high temperatures and all sources of ignition (see Sections 5 and 7). Toxic fumes can be released on heating.

Materials to Avoid (Incompatible Materials): Avoid contact with nitric acid, strong oxidizing agents.

Hazardous Decomposition Products: Combustion can yield sulfur oxides.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Chronic Data:

No definitive information available on carcinogenicity, mutagenicity, target organ, or developmental toxicity.

Acute Data:

Hydrogen Sulfide - CAS: 7783-06-4
Dermal LD50 = Not Applicable
LC50 = 600 ppm, 30 min. (Human)
Oral LD50 = Not Applicable

12. ECOLOGICAL INFORMATION

Not evaluated at this time.

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced or spilled to soil or water, would be a RCRA "listed" hazardous waste, as would any soils or waters contaminated by spills of the material. This material is listed as hydrogen sulfide (U135). Further, this material, once it becomes a waste, is subject to the land disposal restrictions at 40 CFR 268.40 and must be treated prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.

Container contents should be completely used and containers should be emptied prior to discard. Container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.

14. TRANSPORTATION INFORMATION

DOT

Note: This material normally remains in plant and does not enter the public transportation system. i.e. rail, highway, air or water.

IMDG

ICAO/IATA

	LTD. QTY.	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	---	---	---
Max. Net Qty. Per Package:	---	---	---

15. REGULATORY INFORMATION

U.S. Regulations:

EPA SARA 311/312 (Title III Hazard Categories)
Acute Health: Yes
Chronic Health: No
Fire Hazard: Yes
Pressure Hazard: No
Reactive Hazard: No

SARA - Section 313 and 40 CFR 372:
This material contains the following chemicals subject to the reporting requirements of SARA 313 and 40 CFR 372:
Hydrogen Sulfide.....7783-06-4.....100%

EPA (CERCLA) Reportable Quantity (in pounds):
Petroleum Exemption applies to this material.

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPQs (in pounds):
This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:
Hydrogen Sulfide.....7783-06-4.....500

California Proposition 65:
Warning: This material contains the following chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm, and are subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):
-- None Known --

Carcinogen Identification:
This material has not been identified as a carcinogen by NTP, IARC, or OSHA.

TSCA:
All components are listed on the TSCA inventory.

International Regulations:

Canadian Regulations:
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Domestic Substances List: Listed
WHMIS Hazard Class:
B1 - Flammable Gases
D1A - Materials Causing Immediate and Serious Toxic Effects - Very Toxic Material
D2B - Materials Causing Other Toxic Effects - Toxic Material

16. OTHER INFORMATION

Issue Date:	13-Oct-2005
Previous Issue Date:	28-Dec-2000
Revised Sections or Basis for Revision:	Responsible party (Section 1) Added facility synonyms - SEE SECTION 1.
MSDS Code:	001909

Disclaimer of Expressed and implied Warranties:
The information presented in this Material Safety Data Sheet is based on data believed to be accurate as of the date this Material Safety Data Sheet was prepared. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED ABOVE, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. No responsibility is assumed for any damage or injury resulting from abnormal use or from any failure to adhere to recommended practices. The information provided above, and the product, are furnished on the condition that the person receiving them shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of their use. In addition, no authorization is given nor implied to practice any patented invention without a license.

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.B

REQUEST FOR APPROVAL TO ACCCEPT SOLID WASTE

OCD FORM C-138

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-138
Revised August 1, 2011

*Surface Waste Management Facility Operator and Generator shall maintain and make this documentation available for Division inspection.

REQUEST FOR APPROVAL TO ACCEPT SOLID WASTE

1. Generator Name and Address:

2. Originating Site:

3. Location of Material (Street Address, City, State or ULSTR):

4. Source and Description of Waste:

Estimated Volume _____ yd^3 / bbls Known Volume (to be entered by the operator at the end of the haul) _____ yd^3 / bbls

5. GENERATOR CERTIFICATION STATEMENT OF WASTE STATUS

I, _____, representative or authorized agent for _____ do hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination, the above described waste is: (Check the appropriate classification)

☐ RCRA Exempt: Oil field wastes generated from oil and gas exploration and production operations and are not mixed with non-exempt waste. *Operator Use Only: Waste Acceptance Frequency* ☐ *Monthly* ☐ *Weekly* ☐ *Per Load*

☐ RCRA Non-Exempt: Oil field waste which is non-hazardous that does not exceed the minimum standards for waste hazardous by characteristics established in RCRA regulations, 40 CFR 261.21-261.24, or listed hazardous waste as defined in 40 CFR, part 261, subpart D, as amended. The following documentation is attached to demonstrate the above-described waste is non-hazardous. (Check the appropriate items)

☐ MSDS Information ☐ RCRA Hazardous Waste Analysis ☐ Process Knowledge ☐ Other (Provide description in Box 4)

GENERATOR 19.15.36.15 WASTE TESTING CERTIFICATION STATEMENT FOR LANDFARMS

I, _____, representative for _____ do hereby certify that representative samples of the oil field waste have been subjected to the paint filter test and tested for chloride content and that the samples have been found to conform to the specific requirements applicable to landfarms pursuant to Section 15 of 19.15.36 NMAC. The results of the representative samples are attached to demonstrate the above-described waste conform to the requirements of Section 15 of 19.15.36 NMAC.

5. Transporter:

OCD Permitted Surface Waste Management Facility

Name and Facility Permit #:

Address of Facility:

Method of Treatment and/or Disposal:

☐ Evaporation ☐ Injection ☐ Treating Plant ☐ Landfarm ☐ Landfill ☐ Other

Waste Acceptance Status:

☐ **APPROVED** ☐ **DENIED** (Must Be Maintained As Permanent Record)

PRINT NAME: _____ TITLE: _____ DATE: _____

SIGNATURE: _____ TELEPHONE NO.: _____

Surface Waste Management Facility Authorized Agent

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.C

DAILY AIR AND WATER INSPECTION REPORT FORM H_2S MONITOR

(TYPICAL)

ATTACHMENT II.3.C
Daily Air and Water Inspection (Typical)
Sundance West

YEAR_____ MONTH_____ WEEK BEGINNING_____

AMBIENT AIR WIND SPEED/DIRECTION
A.AM READINGS, NOTE INTIALS AND TIME
B.PM READINGS, NOTE INTIALS AND TIME
SUMP LEVELS
A. POND AND SLAB CHECKED DAILY,NOTE INTIALS AND TIME
B. PUMP SUMP CHECKED AM & PM,NOTE INTIALS AND TIME
C. LOADING AREA SUMP CHECKED AM & PM, NOTE INTIALS AND TIME

LOADING SUMP EMPTIED
A. LOADING AREA SUMP EMPTIED AT 4 PM, NOTE INTIALS AND TIME
CONCRETE SLAB EMPTIED
A.SLAB EMPTIED AT 4 PM, NOTE INTIALS AND TIME

Date	Sun	Mon	Tues	Wed	Thu	Fri	Sat
Ambient Air H2S (AM)							
H2S Reading (ppm)							
Wind Speed (mph)							
Wind Direction							
Initials and Time							
Ambient Air H2S (PM)							
H2S Reading (ppm)							
Wind Speed (mph)							
Wind Direction							
Initials and Time							
Sump Levels							
AM Pond Sump (ft)							
AM Cement Slab (ft)							
AM Loading Area (ft)							
AM Pump House Sump (ft)							
Intials and Time							
PM Loading Area (ft)							
PM Pump House(ft)							
Intials and Time							
Loading Sump Emptied							
Intials and Time							
Concrete Slab Emptied							
Intials and Time							
Pond Conditions							
Pond Level							
Overflow Color							
Pond Color							
Water Temperature							
pH							
Dissolved Oxygen							
Total Chlorine							
Dissolved H2S/Sulfides							
Bleach/Chemical							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Volume							
Time							
Initials							
Manager Verification							
Intials and Time							

APPLICATION FOR PERMIT
SUNDANCE WEST

VOLUME II: FACILITY MANAGEMENT PLANS
SECTION 3: HYDROGEN SULFIDE (H_2S) PREVENTION AND CONTINGENCY PLAN

ATTACHMENT II.3.D

INCIDENT REPORT FORM (TYPICAL)

INCIDENT REPORT FORM
Sundance West

Lea County, NM

Type of Incident and General Information

- ❑ Work Related Injury/Illness
- ❑ Property Damage
- ❑ Vehicular Accident
- ❑ Unsafe Act/Near Miss
- ❑ Vandalism/Criminal Activity
- ❑ Other _____ (i.e., spill, release, fire, explosion, hot load, etc.)

Employee Name: _____ Job Title: _____

Phone No: _____ Date of Incident: _____ Time of Incident: _____ AM/PM

Location of Incident: _____

Start of Shift:_____ Weather:_____

Date and Time Reported to Management: Date: _____ Time: _____ AM/PM

Reported to: _____ Title: _____ Reported by: _____

What was the injury category of incident at the time it was first reported to management?

[ ] N/A. Employee does not claim an injury associated with this incident
[ ] Notice Only of Injury, Declined Medical Treatment at this time
[ ] First Aid done on site, Declined Medical Treatment at this time
[ ] Medical Treatment. Transported by _____ to _____
[ ] Fatality, employee

Employee's Description of Incident / Declaración del empleado de los hechos

THIS SECTION FILLED OUT BY EMPLOYEE

Were you injured? *(Ud. se lastimó ?)* **Yes [ ]** **No [ ]**

Type of Injury: *(Tipo de lesión)* _____

Part of Body: _____ Left _____ Right _____
(Parte del cuerpo) *(Izq)* *(Der)*

Explain in your own words what happened. *(Explique en sus propias palabras lo que sucedió)*

_____

_____

_____

_____

_____

Employee Signature: (*Firma del empleado*) _____

Date: (*Fecha*) _____

P:\FILES\530.06.01\PermitApp\Volume II\II.3-H2S\II.3-Original\SWest-II.3-Att II.3.D-IncidentRptForm.docx

INCIDENT REPORT FORM
Sundance West

TO BE FILLED OUT BY EMERGENCY COORDINATOR

Describe in order of occurrence the events leading to the incident and/or injury. Reconstruct the sequence of events that led to the incident. _____

Identify possible hazards to human health or the environment: _____

Identify name and quantity of material(s) involved: _____

CORRECTIVE ACTIONS. (Equipment, Practices, Environment, Retraining) Steps that have been, or will be taken to prevent recurrence: _____

Date Corrective Action Completed: _____

- I have been briefed on the corrective actions outlined above
- *Estoy consciente de las acciones correctivas mencionadas anteriormente en esta hoja*

_____
Employee's Signature

_____
Date

Report Reviewed and Concluded By:

_____
Emergency Coordinator's Signature

_____
Date

Attachment 2

Engineering Certification Report for the Evaporation Pond Liners

DBS&A
Daniel B. Stephens & Associates, Inc.

Engineering Certification Report
Evaporation Pond Liners at Sundance Services West, Inc. Mud Management Facility

Submitted to

New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division

Submitted by

Sundance Services West, Inc.
Eunice, New Mexico

Prepared by

DBS&A
Daniel B. Stephens & Associates, Inc.
a Geo-Logic Company

6020 Academy NE, Suite 100
Albuquerque, New Mexico 87109
www.dbstephens.com
DB18.1209

June 8, 2021

Table of Contents

List of Appendices

1. Introduction

Daniel B. Stephens & Associates, Inc. (DBS&A) has prepared this certification report for the relining of evaporative ponds at the Sundance Services West, Inc. (SSWI) Mud Management Facility (the facility) on behalf of SSWI to provide documentation of inspection and testing during liner placement at Pond 5 and Pond 6. The report has been prepared for submittal to the New Mexico Energy, Minerals and Natural Resources Department, Oil Conservation Division (OCD) to document that the placement of liner at the surface waste management facility for oil field waste is in conformance with the approved quality control (QC) plan and applicable regulations (19.15.36 NMAC).

In May 2020, SSWI operators observed fluid reporting to the leak detection sumps at Ponds 5 and 6, formally described as Ponds A3 and B3 (Gordon, 2018). SSWI emptied all fluids from Ponds 5 and 6 in early June 2020 and retained Southwest Liner Systems (SLS) (the company that had installed the liners) to inspect and make any required repairs. On their initial site visit in late June 2020, SLS identified and repaired punctures in the primary liner above the silt line and determined that the punctures had been caused by the floating evaporator units becoming untethered during high wind events. At that visit, SLS could not identify or make repairs on any of the evaporator punctures/damage that existed below the silt line until the silt/sand accumulations were removed. SSWI operators removed the evaporator units and began the challenging process of all silt/sand removal from Ponds 5 and 6. After removal of all silt/sand, SLS reinspected and attempted to repair the remaining liner damage.

Due to concerns over liner integrity after SLS's attempted repairs in November 2020, Mustang Extreme Environmental Services (Mustang) of Midland, Texas was subcontracted in spring 2021 to make repairs to the existing pond layer and install new high-density polyethylene (HDPE) flexible membrane liner (FML) over the top of existing liner at Ponds 5 and 6.

DBS&A was on-site to observe, inspect, and record liner installation procedures. In this certification report, the term Engineer refers to the DBS&A quality assurance (QA) certifying engineer and field staff acting under their direct supervision. The term Contractor refers to Mustang as the QC representative and QC personnel, all of whom are representatives of the Contractor.

1.1 Project Overview

The SSWI evaporation ponds are located at 246 Wallach Lane, Eunice, New Mexico 88231. Liner deployment activities were completed from March 31 through April 12, 2021. DBS&A performed on-site construction observation and construction quality assurance (CQA) activities. The primary construction and CQA activities for the evaporation ponds included the following:

- Existing liner repair
  - Marking damaged areas of liner
  - Repairs made with HDPE extrudate beads or patches where necessary
  - Vacuum testing of extrusion welds
- HDPE FML source control and installation
  - FML source control
  - FML installation
  - Seam testing

The purpose of the CQA work was to document that construction activities performed at the facility comply with regulatory requirements. Engineering design plans, technical specifications, field observations, and tests were used to provide quantitative criteria with which to evaluate the final installation. The Engineer was responsible for a variety of CQA activities, including the following:

- Observing liner repair procedures
- Observing liner installation procedures
- Observing liner material seaming and testing procedures
- Reviewing documentation, including laboratory and field test results

1.2 Report Organization

This certification report describes the CQA activities and procedures performed during the relining of Ponds 5 and 6 at the facility. The appendices to this report provide appropriate construction documentation. Appendix A includes primary liner layout and grading details for Pond 5 and 6 extracted from *Engineering Certification Report for Evaporation Ponds A1-3 and B1-3 Construction, Sundance West Inc. Lea County, New Mexico* (Gordon, 2018), provided by

SSWI for use in this project. A final panel layout drawing for Ponds 5 and 6 is also included, provided by Mustang and approved by the Engineer.

Daily field reports and photographs are provided in Appendix B. Liner material and deployment data are included in Appendices C and D. Existing liner repair details and contractor acceptance forms are included in Appendices E and F.

1.3 Qualifications of Professional Engineer Licensed in New Mexico

DBS&A's QA certifying engineer is Gundar Peterson, P.E., who is a licensed professional engineer in the State of New Mexico (License #16038).

2. Evaporation Pond Repair and Relining

2.1 Summary

The evaporation ponds are located on the west side of the facility, and approximately 1.5 miles east of the intersection of Wallach Lane and New Mexico Highway 18 (NM 18). The initial installation of the evaporation ponds was designed and observed by Gordon Environmental/PSC in February and March 2018. Design, construction, and CQA of the existing ponds is detailed in Gordon (2018). Relining design consideration and material estimates were based on materials furnished by SSWI to DBS&A to perform relining and certification. The total project area is approximately 4.5 acres, consisting of two 2.1-acre ponds located in the center of the evaporation pond facility and the textured walking surface between these two ponds.

As outlined above, in preparation for liner installation, SSWI staff removed the floating evaporators and pumped existing water to neighboring ponds. Sediment was removed from the ponds by hand, primarily using plastic shovels to avoid additional damage to the liner and floating evaporators were removed. Mustang installed 60-mil FML at the two ponds and 40-mil textured FML on top of the north/south transition area between the ponds. FML installation activities were performed from March 31 to April 12, 2021. CQA activities were conducted by DBS&A. Destructive tests were marked by DBS&A and field tested by Mustang. All laboratory testing was coordinated by Mustang and supervised by DBS&A. Results were reviewed by Mustang CQA personnel and DBS&A.

2.2 Existing Liner Repair

The following subsections describe repair activities for the existing liner performed during subgrade preparation, observation, and CQA testing.

2.2.1 Existing Liner Installation

Mass excavation was performed by Enviroworks LLC with the excavation of soils, placement and compaction of perimeter berm soils, and subgrade fine grading and compaction, performed from September 18, 2017 through March 9, 2018. Geosynthetic clay liner (GCL), secondary FML, geonet, leak detection system, and primary FML installation activities were performed by Southwest Liner Systems Inc. (SLS) from February 12 through March 22, 2018 (Gordon, 2018).

In May 2020, SSWI operators observed fluid reporting to the leak detection sumps at Ponds 5 and 6, formally described as Ponds A3 and B3 (Gordon, 2018). SSWI emptied all fluids from Ponds 5 and 6 in early June 2020 and retained SLS (the company that had installed the liners) to inspect and make any required repairs. On their initial site visit in late June 2020, SLS identified and repaired punctures in the primary liner above the silt line and determined that the punctures had been caused by the floating evaporator units becoming untethered during high wind events. At that visit, SLS could not identify or make repairs on any of the evaporator punctures/damage that existed below the silt line until the silt/sand accumulations were removed. SSWI operators removed the evaporator units and began the challenging process of all silt/sand removal from Ponds 5 and 6. After removal of all silt/sand, SLS reinspected and attempted to repair the remaining liner damage.

Due to concerns over liner integrity after SLS's attempted repairs in November 2020, Mustang was subcontracted in spring 2021 to make repairs to the existing pond layer and install new HDPE FML over the top of existing liner at Ponds 5 and 6.

DBS&A was on-site to observe, inspect, and record liner installation procedures. In this certification report, the term Engineer refers to the DBS&A QA certifying engineer and field staff acting under their direct supervision. The term Contractor refers to Mustang as the QC representative and QC personnel, all of whom are representatives of the Contractor.

2.2.2 Liner Patching and Repair

Liner repairs at the ponds were conducted by Mustang on March 31 and April 1, 2021. Damages to the existing liner were identified by SSWI, Mustang, and DBS&A. Damage identified in the sight walkthrough included dents, tears, creases, and punctures. Mustang used extrusion

welds to place patches and beads of HDPE extrudate at the repair locations as warranted. The extrusion welds were tested using a clear vacuum box. Field testing was performed by the Contractor in the presence of the Engineer.

Patches and beads were inspected upon completion in multiple stages. Repair locations were marked and recorded by the CQA Officer (Appendix F). Vacuum testing was performed along the seams of patches and at each bead location. Upon completion of the repairs, DBS&A granted approval for placement of 60-mil FML to cover the existing layer.

2.3 Flexible Membrane Liner

New FML was placed on top of the existing liner. The FML consisted of approximately 190,000 square feet of 60-mil smooth HDPE liner and approximately 20,000 square feet of 40-mil textured HDPE liner. All liner materials were manufactured by Solmax Geosynthetics, LLC (Solmax) of Houston, Texas. The FML was delivered to the site in rolls that were 22.5 feet wide by 630 feet long (60-mil) and 22.5 feet wide by 800 feet long (40-mil), and was stored in a staging area adjacent to Pond 5.

2.3.1 Manufacturing Quality Control and Manufacturing Quality Assurance

Prior to delivery of the FML, copies of the manufacturer's and resin supplier's QC test results and certifications were submitted to the Engineer for review and approval. Based on the manufacturer's submitted certifications and test results, the FML was approved for delivery to the site. Manufacturer's quality test results and certifications are provided in Appendices D1 and D2. During offloading of the FML, the Engineer verified the FML roll numbers against the geomembrane inventory control log (Appendix D3). The documentation provided by the manufacturer included the following:

- 60-mil HDPE smooth
  - Thickness, ASTM D5199
  - Density, ASTM D1505
  - Tensile properties, ASTM D6693
  - Tear resistance, ASTM D1004
  - Puncture resistance, ASTM D4833
  - Carbon black content, ASTM D4218
  - Carbon dispersion, ASTM D5596

- 40-mil HDPE textured
  - Thickness, ASTM D5994
  - Asperity height, ASTM D7466
  - Density, ASTM D1505
  - Tensile properties, ASTM D6693
  - Tear resistance, ASTM D1004
  - Puncture resistance, ASTM D4833
  - Carbon black content, ASTM D4218
  - Carbon dispersion, ASTM D5596

2.3.2 Conformance Testing

With the Engineer's approval, conformance samples were collected in accordance with ASTM D4354 from random FML rolls as materials arrived at the construction site. TRI Environmental (TRI) of Austin, Texas was employed for independent laboratory testing. Conformance samples were collected at a frequency of at least one per 100,000 square feet of each type of liner to confirm that the FML delivered to the site conformed to the minimum technical specifications required. A total of four conformance samples were collected and tested: three from the 60-mil liner and one from the 40-mil liner. Based on the independent laboratory results, the Engineer approved the delivered FML for installation. The results of the laboratory conformance testing are presented in Appendices D4 and D5. Conformance testing for the FML included the following:

- 60-mil HDPE smooth
  - Thickness, ASTM D5199
  - Density, ASTM D1505
  - Tensile properties, ASTM D6693
  - Tear resistance, ASTM D1004
  - Carbon black content, ASTM D1603
- 40-mil HDPE textured
  - Thickness, ASTM D5994
  - Density, ASTM D1505
  - Tensile properties, ASTM D6693

- Tear resistance, ASTM D1004
- Carbon black content, ASTM D1603
- Carbon black dispersion, ASTM D5596

2.3.3 Flexible Membrane Liner Installation

Deployment of the FML panels was accomplished using a CAT skid steer, pull-line and pull vehicle, and manual labor. Panels were unrolled from the top of the pond berm with a pull-line to reduce equipment contact with the existing liner surface. During FML deployment, the Contractor and Engineer recorded the roll number, panel number, and location on the geomembrane deployment log (Appendix C1). The FML panel layout with the seam, repair, and test locations is provided in Appendix A3.

After each FML panel was placed, adjoining panels were positioned with a 4- to 6-inch overlap required for hot-wedge fusion welding. The panels were permanently anchored to the top of the slopes to the existing liner using extrusion welds, leaving a maximum of 12 inches of the original liner exposed at the top of the slope. The smooth 60-mil FML was installed on the west and east slopes with a minimum 5-foot runout from the toe of side slope onto the cell floor. The textured 40-mil FML was installed and seamed on the flat edge of the upper slope between the two ponds. The Engineer observed placement activities to verify that the deployment and seaming procedures were performed in accordance with project specifications, including existing liner subgrade inspection, seam cleaning, and precautions against potential liner damage. The Engineer observed that all FML field seams were oriented parallel to the line of maximum slope, and that the number of field seams in corners and irregular shaped areas was minimized.

2.3.4 Trial Welds

Each of the fusion and extrusion welders were required to perform trial welds prior to the start of each welding period and after down periods longer than one hour. Trial welds were performed on excess liner material and cut into 1-inch coupons. The coupons were tested in the field using a tensiometer. Fusion welds were tested for peel and shear strength to check for machine failures or welder errors. Fusion weld tests for 60-mil liner were considered passing when both the peel and shear measurements exceeded 98 pounds per inch (lb/in) and 121 lb/in, respectively. Fusion weld tests for 40-mil liner were considered passing when both the peel and shear measurements exceeded 80 lb/in and 80 lb/in, respectively. Trial weld testing was performed in the presence of the Engineer. Additionally, the Contractor tested 1-inch coupons

of extrusion welds for inside peel and shear strength; measurements of 60-mil FML exceeded 78 lb/in and 121 lb/in, respectively. Measurements of 40-mil FML exceeded 60 lb/in and 80 lb/in, respectively. Trial weld documentation is provided in Appendix C2. The Engineer's written authorization is found on the daily subgrade acceptance forms in Appendix E.

2.3.5 Construction Quality Assurance

The Engineer and Contractor visually inspected all material for manufacturing and installation defects. The primary seaming method used for joining FML panels was an automated double-track fusion welder. Extrusion welding was used to anchor the panels to the existing liner at the top of the ponds. Extrusion welds were also used for patches, repairs, intersections of fusion seams, and seam reconstruction. Monitoring of the seaming methods consisted of periodic visual observation of the seaming process, visual examination of the completed seam, and verification that the seam was welded for its entire length. Seaming imperfections were marked and subsequently repaired. Geomembrane repair logs are provided in Appendix C5. Repair locations are noted on the FML panel layout drawing in Appendix A3.

2.3.6 Non-Destructive Seam Testing

Integrity of seams, repairs, and patches was non-destructively tested by the Contractor in accordance with ASTM D5641 and D5820 using air pressure. For double-tracked fusion welds, seams were isolated and pressurized to ±35 pounds per square inch (psi) and observed for a decrease in pressure for a period of 5 minutes. Extrusion welds were applied around the perimeter of the panels, at the top of the ponds, or in areas of destructive seam tests, and in select locations where T-seams were present or repairs were required. To test the extrusion welds, a soap solution was applied and a clear vacuum box was placed on top to allow crews to find leaks. Field testing was performed by the Contractor in the presence of the Engineer. The results of non-destructive seam testing are provided in Appendix C4. All but two seams passed the non-destructive tests. The leak locations, both at Pond 6, were isolated and repaired by the Contractor, and the seam was retested and passed.

2.3.7 Destructive Seam Testing

In accordance with the project specifications, a minimum of 1 destructive test for every 500 linear feet of welded seam or as the Engineer directed was performed on the FML. A total of 22 tests were conducted on the 60-mil FML, and 1 test was conducted on the 40-mil FML. Each destructive test sample was divided into three segments: (1) a segment tested in the field for peel and shear strength by the installer, (2) a segment shipped to TRI for laboratory testing,

and (3) a segment retained by the Engineer and delivered to the Owner to be archived at the site. All of the 23 destructive tests passed field and laboratory testing. Results of the field and laboratory destructive tests are provided in Appendices C2 and C6, respectively.

2.3.8 Liner Deployment Records

Documentation for liner deployment and testing of each area was required prior to liner approval and acceptance. Each submittal for the lined area included the following:

- Geomembrane deployment log (Appendix C1)
- Start-up weld test and geomembrane destructive test log (Appendix C2)
- Geomembrane seam and pressure test log (Appendix C3 and C4)
- Geomembrane laboratory destructive test results (Appendix C6)

The FML installation was accepted after these data were submitted to, reviewed by, and approved by the Engineer. The as-built FML panel layout for the mud management facility is provided as Appendix A3.

2.3.9 Archived Samples

As required by the project specifications, 23 destructive test samples of the seams were obtained. These samples were then cut into three sections, as described in Section 2.3.7. The Owner's archived samples are retained at the DBS&A offices.

3. Certification Statement

This construction certification report for the Sundance West Mud Management Facility in Eunice, New Mexico was prepared by me and staff under my direct supervision. I certify that, to the best of my knowledge, the information contained in this report is accurate and the construction complies with the approved QC plan for Sundance West Mud Management Facility and 19.15.36 NMAC. I am a registered professional engineer in the State of New Mexico.

Gundar Peterson, P.E. No. 16038
Vice President/Senior Engineer
Daniel B. Stephens & Associates, Inc.

Reference

Gordon Environmental/PSC (Gordon). 2018. *Engineering certification report for evaporation ponds A1-3 and B1-3 construction, Sundance West Inc., Lea County, New Mexico*. Prepared for Sundance West, Inc., Lea County, New Mexico. Project No. 01011717. April 2018.

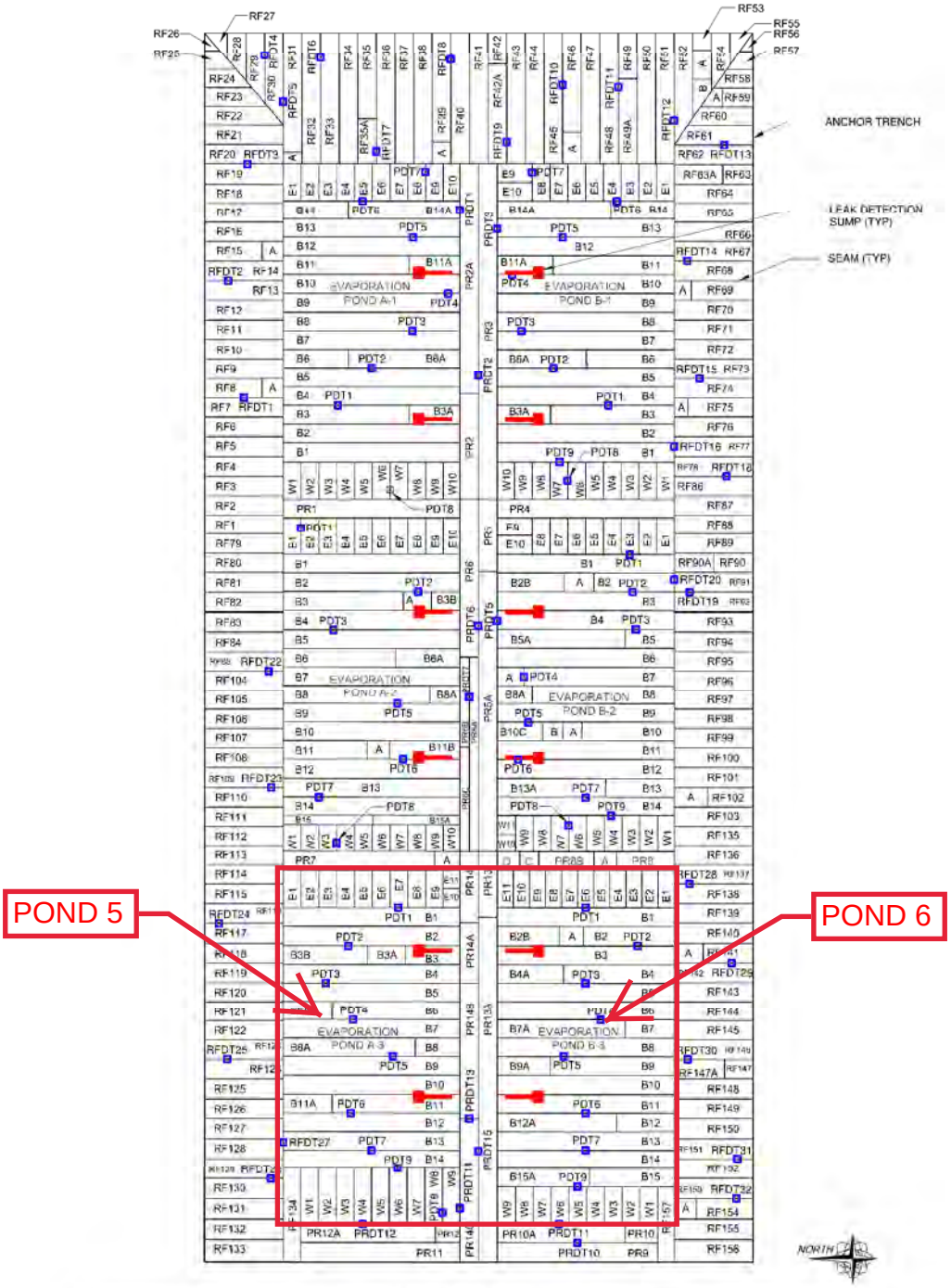
Appendix A

Drawings

Appendix A1

Existing Primary Panel Layout

DBS&A
Daniel B. Stephens & Associates, Inc.



Southwest Liner Systems, Inc.	SUNDANCE WEST SURFACE WASTE MANAGEMENT FACILITY LEA COUNTY, NEW MEXICO EVAPORATION PONDS A-1, A-2, A-3, B-1, B-2, B-3	4/6/2018	NO SCALE

LEGEND

LEAK DETECTION SUMP

SDT4 DESTRUCT TEST LOCATION

NOT FOR CONSTRUCTION

Drawing:X:\2017\0117.17\05_POST_CONSTR\03_AS_BLT\Figures\PRIMARY LINER.dwg

SIZE: ANSI-A Date/Time:Apr. 23, 2018-12:06:49 ; LAYOUT: A (P)

60–MIL PRIMARY LINER PANEL LAYOUT

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

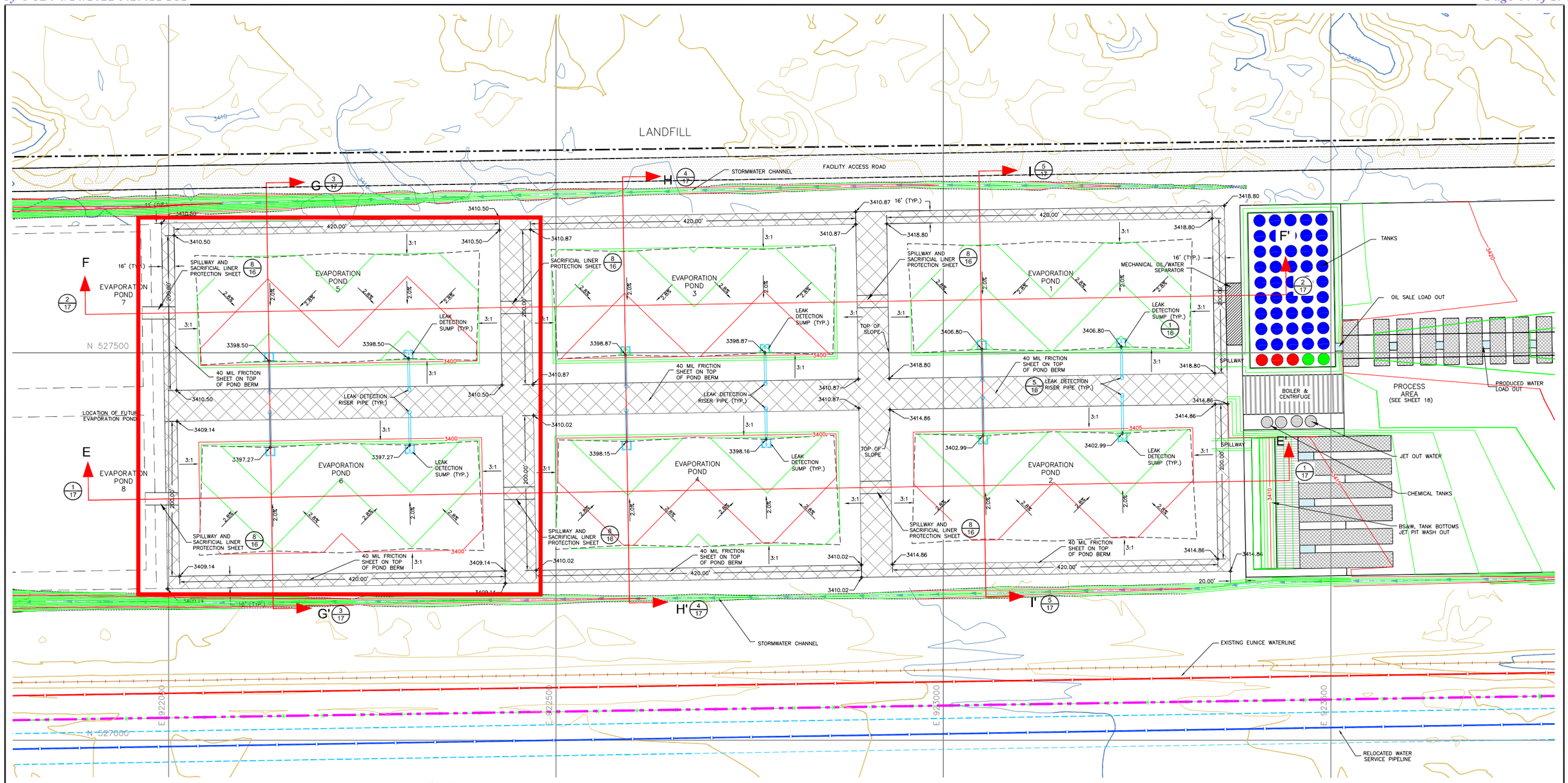
GORDON ENVIRONMENTAL PSC
333 Rio Rancho Blvd., NE.
Suite 400.
Rio Rancho, New Mexico
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 04/10/2018	CAD: PRIMARY.dwg	PROJECT #: 010117.17
DRAWN BY: DMI	REVIEWED BY: CRK	FIGURE 8
APPROVED BY: CWF	www.team-psc.com	

Appendix A2

Evaporation Pond Layout

DBS&A
Daniel B. Stephens & Associates, Inc.



NOTES

1) AERIAL SURVEY BY THOMAS R. MANN & ASSOCIATES AERIAL MAPPING SERVICES, 5115 COPPER NE, ALBUQUERQUE, NM 87108
   DATE OF SURVEY: 10-01-08
2) NO CATTLE GUARDS IN PROJECT AREA

LEGEND

- FACILITY BOUNDARY
- LIMIT OF LANDFILL
- 10' CONTOUR (EXISTING)
- 2' CONTOUR (EXISTING)
- 5' AND 10' EVAPORATION POND CONTOUR
- 1' EVAPORATION POND CONTOUR
- TOP OF SLOPE
- TOE OF SLOPE
- CUT/FILL LINE
- NEW UNPAVED ROAD
- PAVED LANDFILL ACCESS ROAD
- FENCE
- RAILROAD TRACKS
- EXISTING EUNICE WATERLINE
- RELOCATED WATER SERVICE PIPELINE
- PIPELINE EASEMENT
- STORMWATER CHANNEL FLOW LINE
- 3410.02 SPOT ELEVATION
- 1/17 DETAIL NUMBER / SHEET NUMBER
- H H' SECTION LOCATION
- PRODUCED WATER TANK
- CRUDE OIL RECOVERY TANK
- OIL SALES TANK
- N 527500 / E 922000 SITE GRID

NOT FOR CONSTRUCTION
Drawing:P:\acad 2003\530.06.01\PERMIT PLANS (RAI 1)\15 EVAP POND LAYOUT.dwg
Date/Time:Aug. 03, 2016-14:09:52

NORTH

0 60' 120'

I, KEITH GORDON, P.E.
N.M. PROFESSIONAL ENGINEER NO. 10984

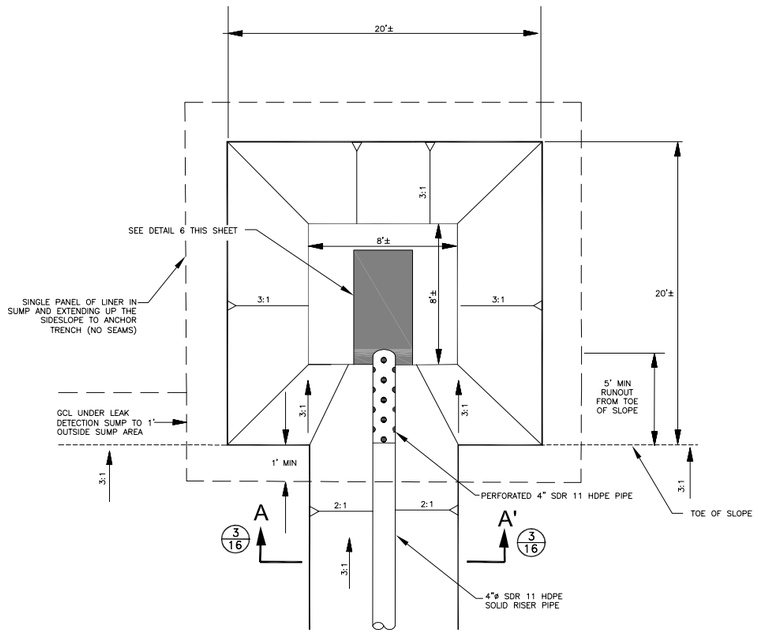
UPDATED: AUGUST, 2016

EVAPORATION POND LAYOUT

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

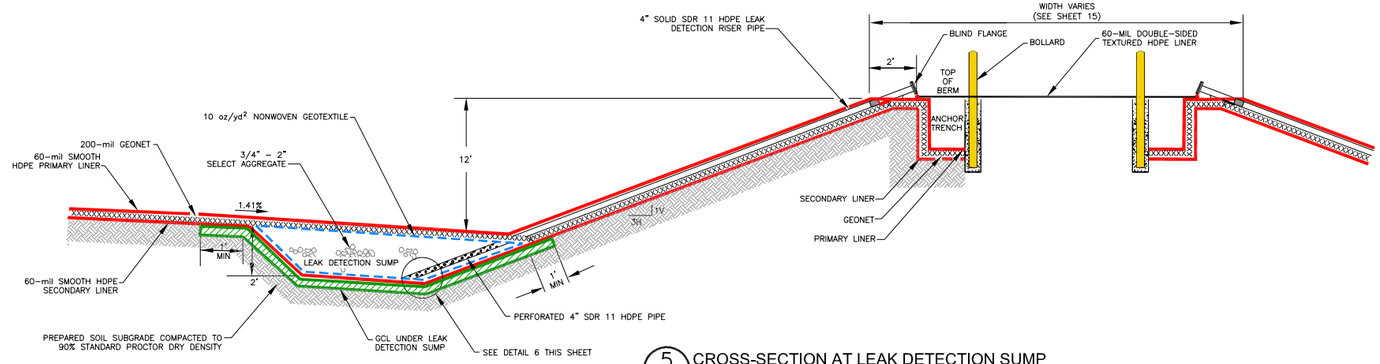
Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 08/02/2016	CAD: 15 EVAP POND LAYOUT.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: CWF	SHEET 15 of 19
APPROVED BY: IKG	gel@gordonenvironmental.com	



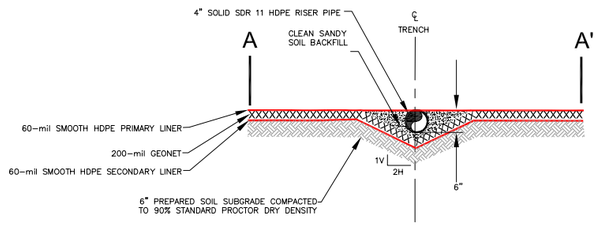
1/16 LEAK DETECTION SUMP

NOT TO SCALE



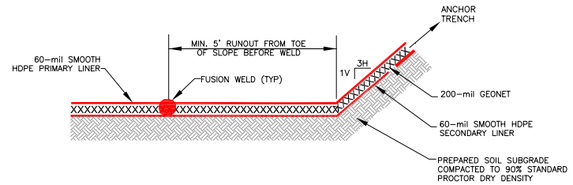
5/16 CROSS-SECTION AT LEAK DETECTION SUMP

NOT TO SCALE



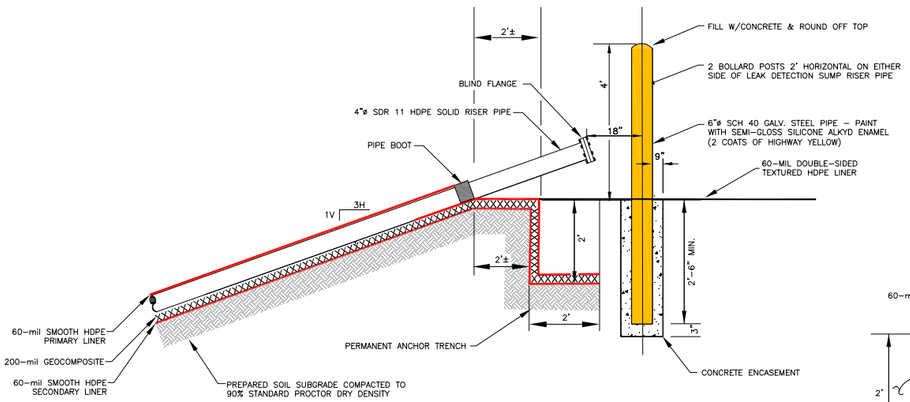
3/16 LEAK DETECTION SUMP RISER PIPE CROSS SECTION A-A'

NOT TO SCALE



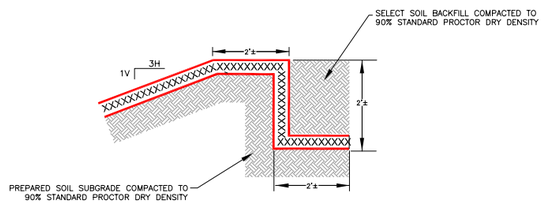
7/16 LINER RUNOUT ON POND FLOOR

NOT TO SCALE



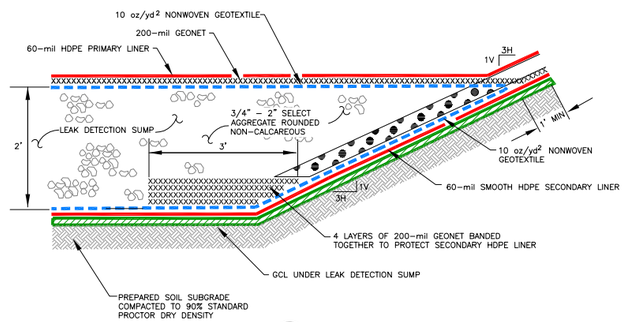
2/16 LEAK DETECTION SUMP RISER PIPE

SECTION VIEW NOT TO SCALE



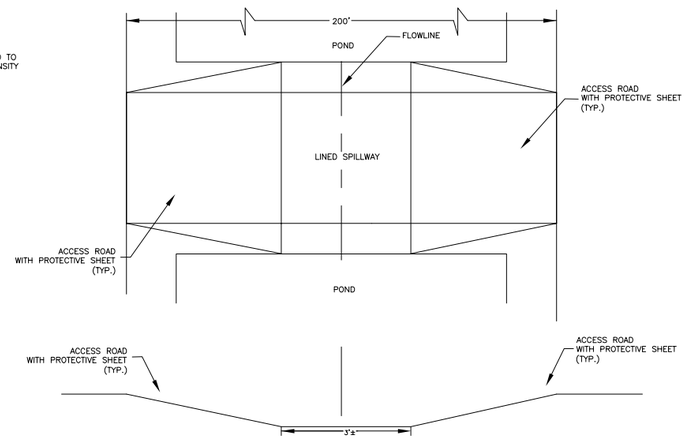
4/16 ANCHOR TRENCH DETAIL

NOT TO SCALE



6/16 SUMP FLOOR DETAIL

NOT TO SCALE



8/16 SPILLWAY PLAN PROFILE

NOT TO SCALE

NOT FOR CONSTRUCTION

Drawing:P:\acad 2003\530.06.01\PERMIT PLANS (RAI 1)\16 EVAP POND DET.dwg

Date/Time:Aug, 03, 2016-14:11:01

UPDATED: AUGUST, 2016

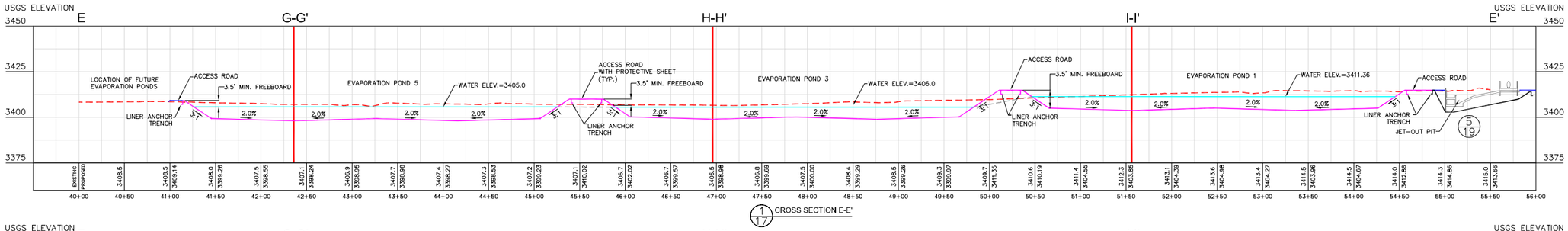
EVAPORATION POND DETAILS

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

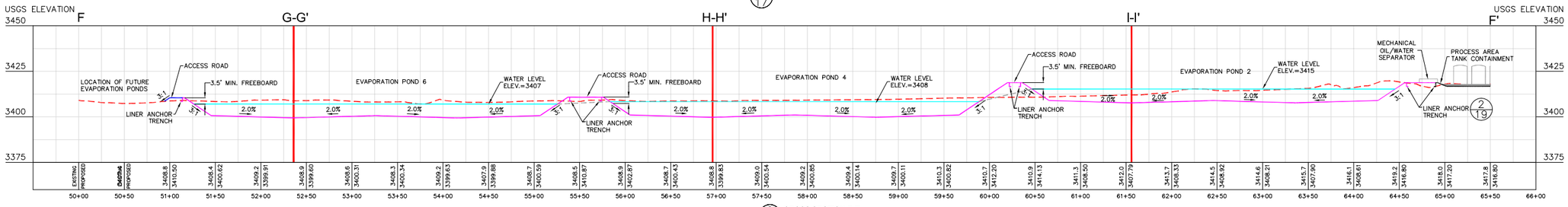
I. KEITH GORDON, P.E.
N.M. PROFESSIONAL ENGINEER NO. 10984

Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

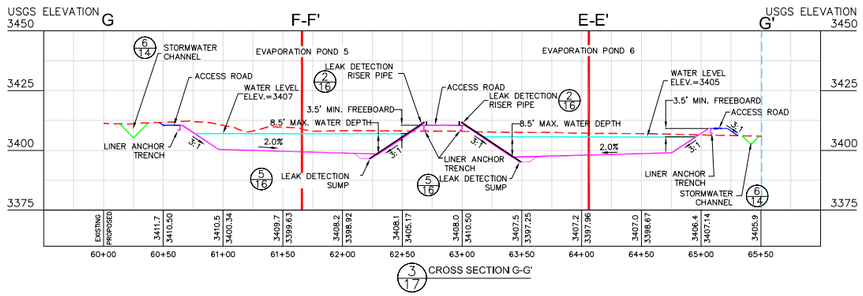
DATE: 08/02/2016	CAD: 16 EVAP POND DET.dwg	PROJECT #: 530.06.01
DRAWN BY: DMI	REVIEWED BY: CWF	SHEET 16 of 19
APPROVED BY: IKG	gel@gordonenvironmental.com	



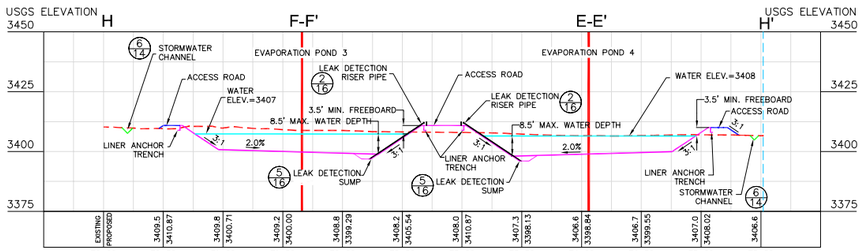
1/17 CROSS SECTION E-E'



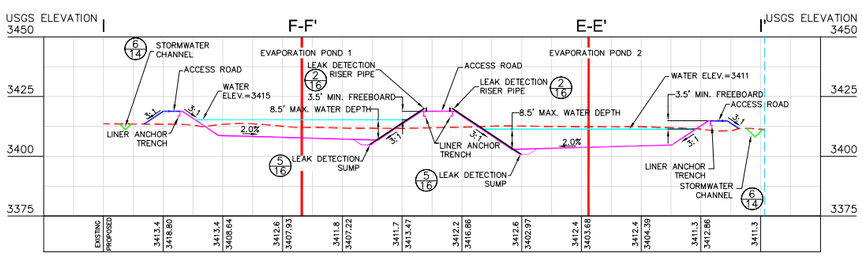
2/17 CROSS SECTION F-F'



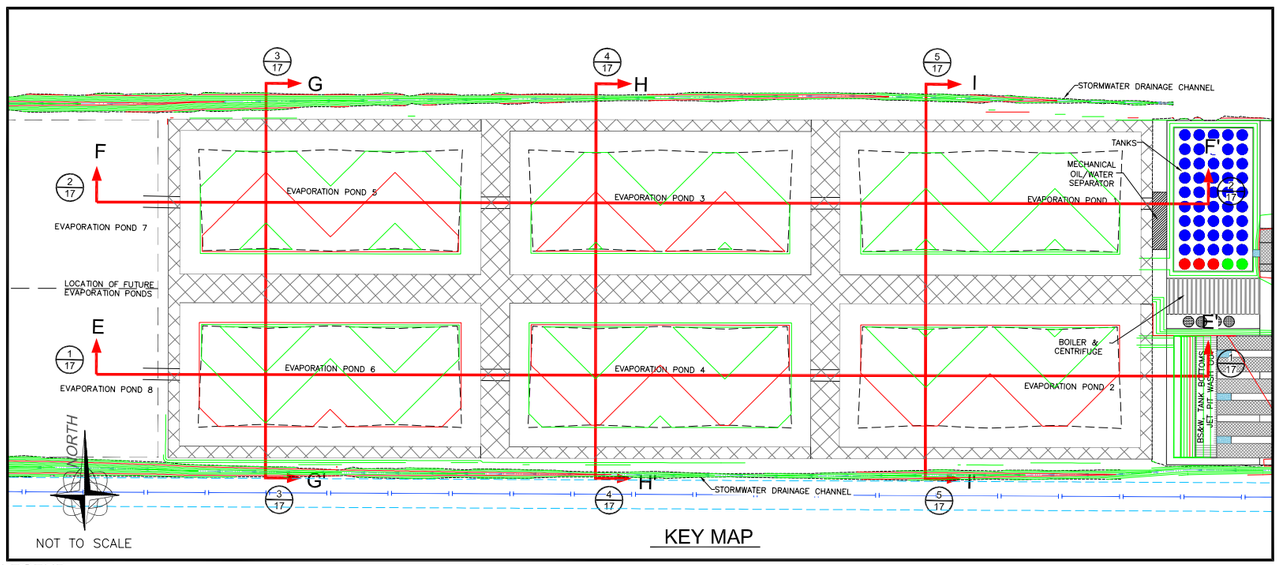
3/17 CROSS SECTION G-G'



4/17 CROSS SECTION H-H'



5/17 CROSS SECTION I-I'



LEGEND

- FINISHED GRADE
- EXISTING GRADE
- SPILLWAY
- 5' AND 10' CONTOUR
- 1' CONTOUR
- 60-MIL HDPE LINER
- 30-MIL POLYESTER LINER
- WATER LEVEL
- RELOCATED WATER SERVICE PIPELINE
- PIPELINE EASEMENT
- STORMWATER CHANNEL FLOW LINE
- DETAIL NUMBER / DETAIL LOCATED ON SHEET NUMBER
- SECTION LOCATION
- PRODUCED WATER TANK
- CRUDE OIL RECOVERY TANK
- OIL SALES TANK

60' / 30' VERTICAL — CROSS SECTION SCALE — HORIZONTAL 0 60' 120'

I, KEITH GORDON, P.E.
N.M. PROFESSIONAL ENGINEER NO. 10984

All reports, drawings, specifications, computer files, field data, notes and other documents and instruments prepared by the Engineer as instruments of service shall remain the property of the Engineer. The Engineer shall retain all common law, statutory and other reserved rights, including the copyright thereto.

UPDATED: AUGUST, 2016

EVAPORATION POND CROSS SECTIONS

SUNDANCE WEST
SURFACE WASTE MANAGEMENT FACILITY
LEA COUNTY, NEW MEXICO

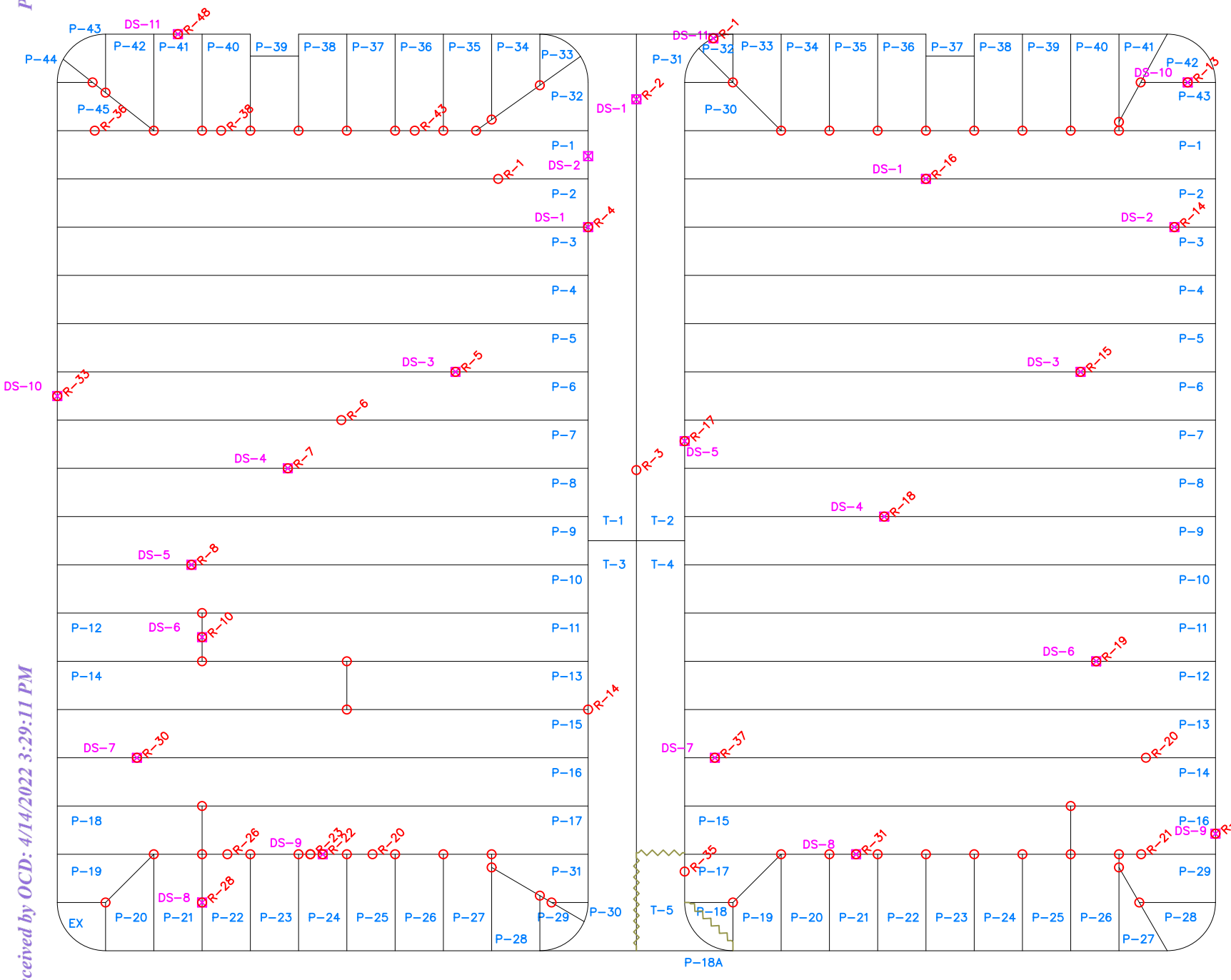
Gordon Environmental, Inc.
Consulting Engineers
213 S. Camino del Pueblo
Bernalillo, New Mexico, USA
Phone: 505-867-6990
Fax: 505-867-6991

DATE: 08/02/2016	CAD: 17 EVAP POND X SECTIONS.dwg	PROJECT #: 530.06.01	
DRAWN BY: DMI	REVIEWED BY: CWF	SHEET 17 of 19	
APPROVED BY: IKG	gel@gordonenvironmental.com		

Appendix A3

Mustang Primary Liner Layout

DBS&A
Daniel B. Stephens & Associates, Inc.



LINER SEAMS

REPAIR R-108

PANEL # P-97 5305

DESTRUCT DS-18

EXTRUSION

PRIMARY LINER LAYOUT

CUSTOMER: SUNDANCE
WEST PITS 5 & 6 & WALKWAY
60&40 MIL BLACK SMOOTH HDPE

5049 EDWARDS RANCH RD STE 200
FORT WORTH TX 76109
PHONE: 817-441-1235
WWW.MUSTANGEXTREME.COM

MUSTANG extreme environmental services

REVISION: 0	DATE: APR 2021	NOT TO SCALE	DRAWN BY: TR

N W E S

SHEET NO. 1 OF 1

Appendix B

Daily Field Reports and Photographs

DBS&A
Daniel B. Stephens & Associates, Inc.

Appendix B1

Submittal Transmittal

Daniel B. Stephens & Associates, Inc.

Submittal Transmittal No. _CQA Plan_____ – _Pond Relining__

(Spec Section) (Series)

Project Name: Sundance West Landfill - Evaporation Pond Relining		Date reviewed: 3/23/2021
Contractor: Mustang Extreme	DBS&A Engineering	Reviewed by: GMH
Address:	6020 Academy Road NE, Suite 100	Job no. DB18.1209.00.P6.T2
	Albuquerque, NM 87109	Spec section:
	Attn:	Drawing/Detail no.
Attn:		1st Submittal ☐ Resubmittal ☐
Date transmitted: 3/22/2021	Previous transmittal date:	

Item No.	No. Copies	Description	Manufacturer / Vendor	Mft/Vendor Dwg. or Data No.	Action Taken *
1		List of Geomembrane Rolls & Testing	SOLMAX		B
2					
3					
4					
5					
6					
7					

Remarks: See below.

* Action codes:

A – Furnish as submitted

B – Furnish as noted

C – Revise and resubmit:
1. Not enough information for review.
2. No reproducibles submitted.
3. Copies illegible.
4. Not enough copies submitted.
5. See Comments.

D – Rejected

E – Engineer's review not required:
1. Submittal not required.
2. Supplemental information. Submittal refined for informational purposes only.
3. Information reviewed on prior submittal.
4. See Comments.

Comments:

Please furnish the product as submitted with the following comments:

1. Perform conformance testing per the requirements for HDPE liner material in Section 7.2 of the attached document. The technical specifications are also included on Table 5 of the attachment.

2. The conformance sampling may be performed once the material arrives onsite and sent to an independent laboratory.

By: Grace Herrmann 03/23/2021

Date

Distribution: Contractor ☒ File ☒ Field ☐ Owner ☐ Other ☐

This review is only for general conformance with the design concept and the information given in the Construction Documents. Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the drawings and specifications. Review of a specific item shall not include review of an assembly of which the item is a component. The Contractor is responsible for dimensions to be confirmed and correlated at the jobsite, information sequences and procedures of construction, coordination of the Work with that of all other trades, and performing all Work in a safe and satisfactory manner.

7. Flexible Geomembrane Liner

The flexible membrane (FML) used for liner installation shall be textured 60-mil-thick high-density polyethylene (HDPE) for landfill sideslopes and smooth 60-mil-thick HDPE for the landfill floor and ponds. The tank farm and jet out pit will be lined with 60-mil-thick HDPE, overlain with 200-mil-thick geocomposite and covered with a second layer of 60-mil-thick HDPE.

The geomembrane shall be manufactured of new, prime first-quality products designed and manufactured specifically for the purpose of liquid containment in hydraulic structures and chemically resistant to leachate.

The geomembrane material shall be produced so as to be free of holes, blisters, undispersed raw materials, or any sign of contamination by foreign matter.

The sheets shall have NSF label of approval and shall be manufactured in a minimum 15-foot seamless width. Labels on the roll shall identify the thickness, length, width, and manufacturer's lot number.

The geomembrane rolls shall meet the minimum properties listed in Table 4 for textured HDPE liner, Table 5 for smooth HDPE liner, and Table 6 for reinforced polyester liner.

Extrudate welding rods shall be of the same compound as the geomembrane and supplied by the manufacturer and shall be delivered in the original sealed containers. Each container shall have a label bearing the brand name, manufacturer's lot number and complete directions as to proper storage.

7.1 Manufacturer Quality Control Documentation

Prior to installation commencement of any geomembrane material, the Contractor shall provide to the Site CQA Manager the following information certified by the manufacturer for the delivered geomembrane:

- Origin, identification, and production of the resin (supplier's name, brand name, and production plant).
- Copies of quality control certificates issued by the resin supplier.
- Manufacturer's certification verifying that the quality of the resin used to manufacture the geomembrane meets the resin specifications fingerprint properties shown in Table 4 for 60-mil textured HDPE liner, Table 5 for smooth HDPE liner, and Table 6 for the reinforced polyester liner.
- Each roll delivered to the project site shall have the following identification information:
  - Manufacturer's name
  - Product identification
  - Thickness
  - Roll number
  - Roll dimensions
- Quality control certificates, signed by the manufacturer's quality assurance manager. Each certificate shall have roll identification number, sampling procedures, frequency, and test results. At a minimum, the following test results shall be provided in accordance with applicable test requirements specified in Tables 4 and 5 for the HDPE liner:
  - Thickness (smooth, ASTM D 5199; textured, ASTM D5994)
  - Density (ASTM D1505)
  - Tensile properties (ASTM D638, as modified by annex A)
  - Tear properties (ASTM D6693)
  - Carbon black content (ASTM D 1603 or ASTM D 4218)
  - Carbon black dispersion (ASTM D5596)
  - Puncture Resistance (ASTM D4833)

- Notched constant tensile load (ASTM D 5397, Appendix)
- Interface Friction Angle (Textured Geomembrane) [GRI - GS -7]

- Quality control certificates, signed by the manufacturer's quality assurance manager. Each certificate shall have roll identification number, sampling procedures, frequency, and test results. At a minimum, the following test results shall be provided in accordance with applicable test requirements specified in Table 6 for the reinforced polyester liner:
  - Thickness (ASTM D751, Optical Method)
  - Weight (ASTM D751)
  - Break strength (ASTM D751 Grab Tensile Method, Procedure A)
  - Break elongation (ASTM D751)
  - Tear strength (ASTM D751)
  - Puncture Resistance (ASTM D4833)
  - Hydrostatic resistance (ASTM D751, Procedure A)
  - Bursting strength (ASTM D751, Ball Tip)

7.2 Conformance Testing

Conformance testing shall be performed by an independent quality assurance laboratory at a minimum of 1 per 100,000 square feet. As stated in the contract documents, the Site CQA Manager or Installer shall obtain the samples from the roll, mark the machine direction and identification number. The number of lots and samples will be determined in accordance with ASTM D4354. The following conformance tests shall be conducted at the independent laboratory for the HDPE liner material:

- Thickness (ASTM D5199, or ASTM D5994)
- Density (ASTM D1505)

- Tensile properties (ASTM D6693)
- Tear resistance (ASTM D1004)
- Carbon black content (ASTM D1603, or ASTM D4218)
- Carbon black dispersion (ASTM D5996)

Conformance testing shall be performed by an independent quality assurance laboratory at a minimum of 1 per 100,000 square feet. As stated in the contract documents, the Site CQA Manager or Installer shall obtain the samples from the roll and mark the machine direction and identification number. The number of lots and samples will be determined in accordance with ASTM D4354. The following conformance tests shall be conducted at the independent laboratory for the reinforced polyester liner material:

- Thickness (ASTM D751, Optical Method)
- Weight (ASTM D751)
- Break strength (ASTM D751, Grab Test Method, Procedure A)
- Break elongation (ASTM D751)
- Tear strength (ASTM D751)
- Puncture resistance (ASTM D4833)

These conformance tests shall be performed in accordance with Tables 4, 5, and 6.

Conformance test results shall be reviewed by the Site CQA Officer, and lots shall be accepted or rejected prior to the placement of the geomembrane. Test results shall meet or exceed the property values listed in Tables 4 and 5. If the sampling results do not meet property values for any individual lot sample, the lot shall be resampled and retested. This retesting shall be paid for by the manufacturer or Installer. If the test values from the resamples pass the acceptable specification values listed in Tables 4, 5, and 6, the lot shall be accepted.

Table 5. Technical Specifications, 60-mil HDPE Smooth Geomembrane

Property	Qualifier	Unit	Value	Test Method [a]
Physical Properties				
Thickness	Minimum average	mil	60	ASTM D5199
	Minimum	mil	54	
Density	Minimum	g/cc	0.94	ASTM D1505
Melt index	Range	g/10 min	≤1.0	ASTM D1238
Tensile properties (each direction)				ASTM D6693, Type IV Dumbell, 2 ipm
Break strength	Minimum average	lb/in	228	
Yield strength	Minimum average	lb/in	126	
Elongation at break	Minimum average	%	700	G.L. = 2.0 in
Elongation at yield	Minimum average	%	12	G.L. = 1.3 in
Tear resistance	Minimum	lb	42	ASTM D1004
Puncture resistance	Minimum	lb	108	ASTM D4833
Carbon black content	Minimum	%	2.0	ASTM D1603
Carbon black dispersion	Rating	N/A	Note b	ASTM D5596
Notched constant tensile load	Minimum	hours	300	ASTM D5397, Appendix
Seam Properties				
Thickness	Minimum	mil	60	ASTM D5199/D5994
Bonded seam strength	Minimum	lb/in	120	ASTM D6392
Tensile properties:				
Fusion weld	Minimum	lb/in	90	ASTM D6392
Extrusion weld	Minimum	lb/in	78	ASTM D6392

[a] Standard test methods will be updated to reflect the most current industry standards.
[b] Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.

Appendix B2

Daily Summary Reports

DBS&A
Daniel B. Stephens & Associates, Inc.

DAILY SUMMARY REPORT

Project: Evap Pond Relining **Project No.:** DB18.1209

Owner: Sundance West **Date:** 3/31/2021

Project Location: Eunice, NM- Pond 5/6 **Report No.:**

Weather: A.M: 45 °F, Sunny, Windy
P.M: ~~75~~ 60 °F, Sunny, windy

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
Took inventory of delivered HDPE rolls. Mustang Extreme inspected Ponds 5+6 and repaired and tested all damaged areas located. Conformance testing samples were collected from rolls ~~#~~0102-200114, 0102-200118, 0102-200119 (smooth) and #104-201034 (textured).

Summary of Problems and Resolutions:
CQA plan requires any holes larger than 1/4" be patched. Since we are placing a new liner over top, larger holes may be repaired with HDPE extruder beads. Air pressure tests on seams may be ±3psi, rather than ~~+1~~ 1 psi. (more flexibility is allowed.)

Equipment:
~~(2)~~ CAT 2990 skid steers (2)
DemTech Extrusion Welder (2)

Summary of Meeting Held and Attendees:
Monica, Ross, Gundar, and Grace discussed CQA requirements and testing.

Site CQA Technician

Signature

Grace Herrmann
Print Name

DBSA CQA Officer

Signature

Gundar Peterson
Print Name

DAILY SUMMARY REPORT

Project: Evap. Pond Relining **Project No.:** DB18.1209
Owner: Sundance West **Date:** 4/1/2021
Project Location: Eunice, NM - Pond 5 **Report No.:** _
Weather: A.M.: 35°F, windy, sunny
P.M.: 65°F, windy sunny

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
Panels 1–4 placed from ~~EOS~~ East end as starting point. Panels were seamed together and sandbags placed at the open ends to prevent wind from lifting the panels. The edge on the south rim was trimmed and the new panels ~~was~~ were extrusion welded to the existing south liner (12" gap to textured liner). Cont'd...

Summary of Problems and Resolutions:
Sundance Ops. manager was originally upset about another company's dumpster being onsite. In the future, Sundance dumpsters will be used. OK to use this one for this project.
High winds prevented more panels from being placed today.

Equipment:
CAT 2990 Skid Steers (2)
DemTech Pro Wedge (2)
DemTech Extrusion Welder (2)

Summary of Meeting Held and Attendees:
Walk through with Gundar Peterson. Determined the textured liner will go over the large center bench between ponds 5 & 6.

Site CQA Technician

Signature

Grace Herrmann
Print Name

DBSA CQA Officer

Signature

Gundar Peterson
Print Name

Summary continued:
The south seam of panels 1–4 were vacuum tested. All passed. Destructive tests were marked by DBSA (DT-1 and DT-2). DT-1 was collected and stored in the Mustang trailer. DT-1 was patched.

DAILY SUMMARY REPORT

Project: Evap Pond Relining **Project No.:** DB18.1209

Owner: Sundance West **Date:** 4/2/2021

Project Location: Eunice, NM - Pond 5 **Report No.:** _

Weather: A.M: 50°F, wind 9mph, lower winds till late morning
P.M.: 74°F, windy, sunny

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
Placed and seamed panels 5-12 14 (some partial panels). All seams were completed between panels. Pressure tests were performed for each seam. Destructive tests 3-6 were collected. All field DTs pass. Patches were applied. The south seam of the panels was completed and vacuum tested. Monica took DT samples to ship to the lab (TRI in Austin, TX).

Summary of Problems and Resolutions:
originally we agreed not to drive the ATV on the liner surrounding the ponds, but to help speed up the progress, Gundar gave the OK. the liner is technically rated for vehicles w/ light load.

Equipment:
CAT 2990 skidsteers (2)
Dem Tech Pro wedge (2)
DemTech Extrusion welder (2)

Summary of Meeting Held and Attendees:
N/A

Site CQA Technician	DBSA CQA Officer
Grace Herrmann	
Signature	Signature
Grace Herrmann	Gundar Peterson
Print Name	Print Name

DAILY SUMMARY REPORT

Project: Evap Pond Relining **Project No.:** DBIB.1209

Owner: Sundance West **Date:** 4/3/2021

Project Location: Eunice, NM - Pond 5 **Report No.:** _

Weather: A.M: 50°F, sunny, light wind

P.M.: 73°F, ~~sunny~~, windy; partially sunny, potential for rain/thunderstorm in evening.

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
placed and seamed together panels P-15 through P-31. Completed seam along south edge to existing liner, bottom toe seam, and started the seam to the North existing liner. All areas for patching / T-seams are marked for repair on 4/4/21. Marked DT-7 through DT-9.

Summary of Problems and Resolutions:
One of the generators was not working, so this prevented the use of multiple machines. Could not complete West top seam.

Equipment:
CAT 2990 skid steers (2)
DemTech Pro Wedge (2)
DemTech Extrusion Welder (2)

Summary of Meeting Held and Attendees:
N/A

Site CQA Technician

Grace Herrmann
Signature

Grace Herrmann
Print Name

DBSA CQA Officer

Signature

Gundar Peterson
Print Name

DAILY SUMMARY REPORT

Project: Evap. Pond Relining **Project No.:** DB18.1209

Owner: Sundance West **Date:** 4/4/2021

Project Location: Eunice, NM - Pond 5 **Report No.:** _

Weather: A.M.: 55°F, cloudy, light winds
P.M.: 68°F, cloudy; light winds

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
Completed west seam to existing liner. Placed and seamed the East slope (panels P-32 through P-45). Performed pressure tests on the seams. Completed seam btwn. slope panels and P-1 (floor seam).

Summary of Problems and Resolutions:
Rain water accumulated in the ponds overnight. Crew used leaf blowers, brooms/squeegees and pumps to clear water to complete west weld and patches, and dry area @east end for liner on slope.

Equipment:
CAT 2990 skid steers (2)
Demtech ProWedge (2)
Demtech Extrusion Welder (2)

Summary of Meeting Held and Attendees:
N/A.

Site CQA Technician	DBSA CQA Officer
Signature	Signature
Grace Herrmann	Gundar Peterson
Print Name	Print Name

DAILY SUMMARY REPORT

Project: Evap Pond Relining **Project No.:** DB18.1209
Owner: Sundance West **Date:** 4/5/2021
Project Location: Eunice, NM - Pond 5/6 **Report No.:** _
Weather: A.M: 57°F, light winds, partly cloudy
P.M.: 85°F, windy, partly cloudy/sunny

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
Completed pressure tests on remaining seams. Marked and collected DT-10 and DT-11. Completed all repairs for DTs and T-seams. Moved sandbags to Pond 6 area. Removed some scrap and trash from pond and work area. Completed vacuum testing on repair areas. Assembled and installed ladder onto East slope. Used white extrusion for visibility.
Summary of Problems and Resolutions: pumps + hoses prepped in Pond 6. 4/6/21 - expecting strong winds. May not be able to place liner in Pond 6 until 4/7/21 A.M. Planning on working 1/2 day 4/6/21.

Equipment:
CAT 2990 skidsteers (2)
Demtech Pro Wedge (2)
Demtech Extrusion Welder (2)

Summary of Meeting Held and Attendees:
N/A.

Site CQA Technician
Grace Herrmann
Signature
Grace Herrmann
Print Name

DBSA CQA Officer
Signature
Gundar Peterson
Print Name

Summary continued:
Vents were installed in the corners of the pond and along the high points along the pond edge.

DAILY SUMMARY REPORT

Project: Evap Pond Relining **Project No.:** DB18.1209
Owner: Sundance West **Date:** 4/6/2021
Project Location: Eunice, NM; Pond 5/6 **Report No.:** _
Weather: A.M: 55°F, Sunny, moderate winds
P.M.: 85°F, Sunny, strong winds and gusts.

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
Created another ladder for pond 6 slope. Pumped out remaining rain water in pond 6 to prep. for liner install on 4/7/2021. Repaired a few more identified holes in pond 6. Moved large white docks/barricades away from edge of pond 6. Removed all trash. Put old HDPE scraps in the dumpster. Mobilized skidsteer to south rim.

Summary of Problems and Resolutions:
Strong winds from the west prevented liner install today. The crew will bring the remaining destructive test samples to midland Mustang office for Monica to ship to TRI. There is an issue w/ one of the ~~see~~ pro wedges. Fabian hopes to have a different one on 4/7/2021.

Equipment:
CAT 299D skid steers (2)
DemTech Pro Wedge (2)
DemTech Extrusion Welders (2)

Summary of Meeting Held and Attendees:
N/A.

Site CQA Technician

Grace Herrmann
Signature

Grace Herrmann
Print Name

DBSA CQA Officer

Signature

Gundar Peterson
Print Name

DAILY SUMMARY REPORT

Project: Evap Pond Relining **Project No.:** DB18.1209

Owner: Sundance West **Date:** 4/7/2021

Project Location: Eunice, NM- Pond 6 **Report No.:** _

Weather: A.M: 50°F, clear, low winds
P.M.: 79°F, high winds, sunny

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
completed placement of P-1 thru P-10 in pond 6, and wedge seams between each panel. Pressure tested all wedge seams. started extrusion welding on the North seam. Marked DT-1 through DT-5 (cut DT-5 but did not test).

Summary of Problems and Resolutions:
High winds started to move the liner. crew moved sand bags to try to secure it until tomorrow. covered DT-5 on North seam so wind couldn't get in.

Equipment:
CAT 2990 skid steers (2)

Summary of Meeting Held and Attendees:

Site CQA Technician	DBSA CQA Officer
Signature	Signature
Grace Herrmann	Gundar Peterson
Print Name	Print Name

DAILY SUMMARY REPORT

Project: Evap Pond Relining **Project No.:** DB18.1209
Owner: Sundance West **Date:** 4/8/2021
Project Location: Eunice, NM - Pond 6 **Report No.:** _
Weather: A.M.: 50°F, clear, low winds
P.M.: 70°F, sunny, some wind

Contractor(s)
Mustang Extreme

Summary of Daily Construction Progress and Inspections:
Placed all remaining panels and seamed them together, except for the toe seams @ the East and West toes, and P-17 to P-15. ~~East~~, North, south, and west seams are completed. still working on the East seam w/ extrusion welding.

Summary of Problems and Resolutions:
Moved cables that were in pond 6 @ west slope toe.
Leak somewhere between seam of P-14/P-13 was found and repaired (North top edge). 5' south of EN. There was some confusion on what roll # was used in the NE corner, but it was sorted out.

Equipment:
CAT 299D skid steers (2)
Demtech Pro Wedge (2)
Demtech Extrusion welders (2)

Summary of Meeting Held and Attendees:
There was a discussion about not relining the center pan but since we already scoped it, then we will still do it. Called Joe Carillo about having his crew move equipment btwn. ponds 5 & 6.

Site CQA Technician	DBSA CQA Officer
Signature	Signature
Grace Herrmann	Gundar Peterson
Print Name	Print Name

DAILY SUMMARY REPORT

Project: Sundance Pond Relining **Project No.:** DB20-1209

Owner: _____ **Date:** 4-9-21

Project Location: Pond 6 **Report No.:** _

Weather: 0600 A.M: 48°F, Strong wind from NW
1600 P.M.: 80°F.

Contractor(s)
Mustang extreme, Sundance West staff

Summary of Daily Construction Progress and Inspections:
Mustang finished extrusion welding on SE and NE corners of pond 6 liner to existing, DBSA marked remaining DTS, cut and patched by Mustang. Sundance staff removed Jersey blocks and debris from walkway before 40 mil deployment.

Summary of Problems and Resolutions:
no problems

Equipment:
Extrusion welders Demtech #403
#397

Summary of Meeting Held and Attendees:

Site CQA Technician

Signature

Mike Brozek
Print Name

DBSA CQA Officer

Signature

Gundar Peterson
Print Name

DAILY SUMMARY REPORT

Project: Sundance Pond Relining **Project No.:** DB20-1209 (18)

Owner: _____ **Date:** 4-10-21

Project Location: Walkway Pond 5/6 **Report No.:** -

Weather: 0630 A.M. 50°F. calm
1100 P.M. 80°F. Wind from west

Contractor(s)

Mustang extreme - Reduced crew 6

Summary of Daily Construction Progress and Inspections:

Installation of 40-mil HDPE on walkway between pond 5 + 6
Marked 1 DT on 40-mill P1-P2 seam.

Summary of Problems and Resolutions:

Some visible "crimping" on Liner from spools Determined not to effect liner durability, installation approved by MG

Equipment:

Demtech wedge welder #3671
Demtech extrusion welder 0397

Summary of Meeting Held and Attendees:

Site CQA Technician

Signature

Mike Dvorak
Print Name

DBSA CQA Officer

Signature

Gundar Peterson
Print Name

DAILY SUMMARY REPORT

Project: Sundance Pond Relining **Project No.:** D816d209.

Owner: _____ **Date:** 4-12-21

Project Location: Eunice. **Report No.:** _

Weather: 0700 A.M: 48°F, Strong wind ~20+mph from NE.
P.M.: °F.

Contractor(s)
Mojang

Summary of Daily Construction Progress and Inspections:
Vacuum testing of 40-mil, Repairs as necessary. Removal of sand bags + trash.
Walk through final Repairs if needed.

Summary of Problems and Resolutions:

Equipment:

Summary of Meeting Held and Attendees:

Site CQA Technician

Signature

Print Name

DBSA CQA Officer

Signature

Gundar Peterson
Print Name

Appendix B3

Photographs

DBS&A
Daniel B. Stephens & Associates, Inc.

1. SOLMAX delivery #1, 3/31/2021: Using fork attachment on skid steer and straps to offload all of the rolls in the first shipment (view to west)

2. 3/31/2021: Rolls stored near the work site

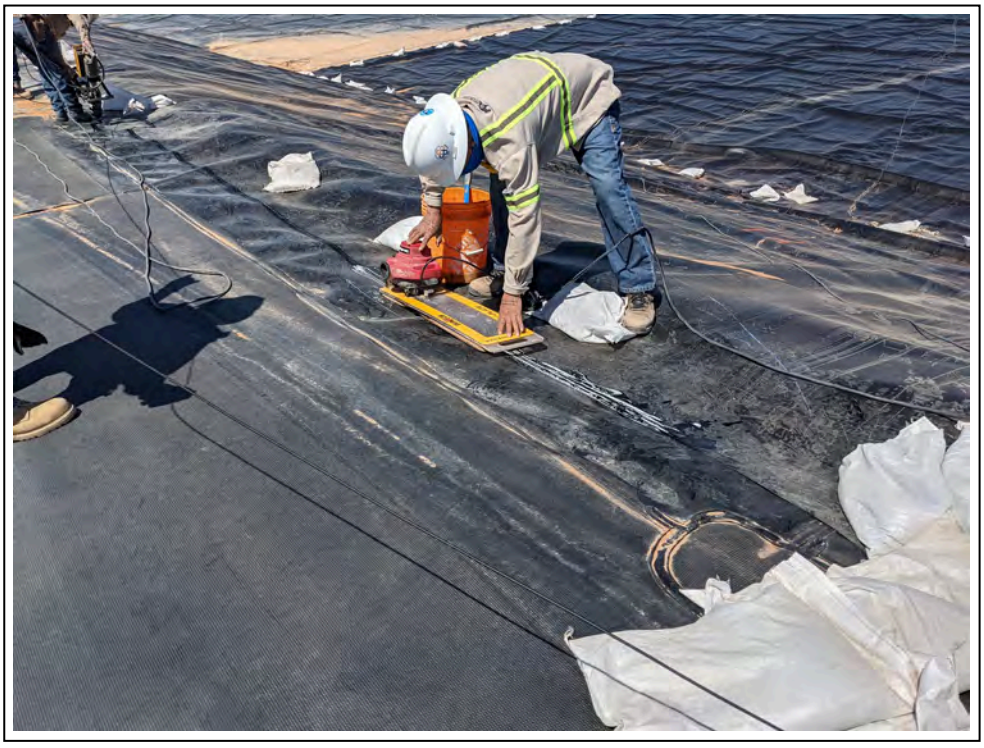
3. 3/31/2021: Crew repairing existing liner in Pond 5; vacuum test was performed on each repair bead and patch (view to southwest)

4. 3/31/2021: Unloading the second delivery of liner rolls, including the 40-mil textured liner

5. 4/1/2021: Pond 5, P-1 through P-4 placed and seamed (view to north)

6. 4/1/2021: Top seams tacked down using a heat gun prior to extrusion welding

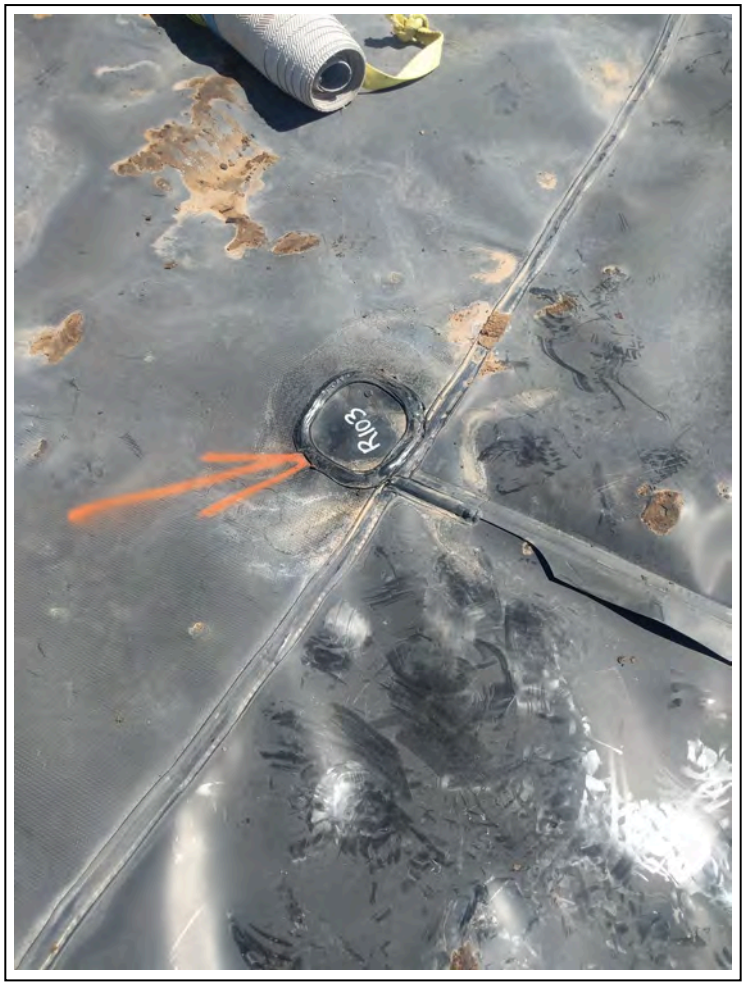
7. 4/1/2021: Top seams extrusion welded; T-seams patched



8. 4/1/2021: Pond 5 South seam vacuum testing

P:_DB18-1209\Pond Liner CQA.5-21\Appx B3_Photos\pg05.doc

9. 4/1/2021: Pond 5 existing liner repair (bead)



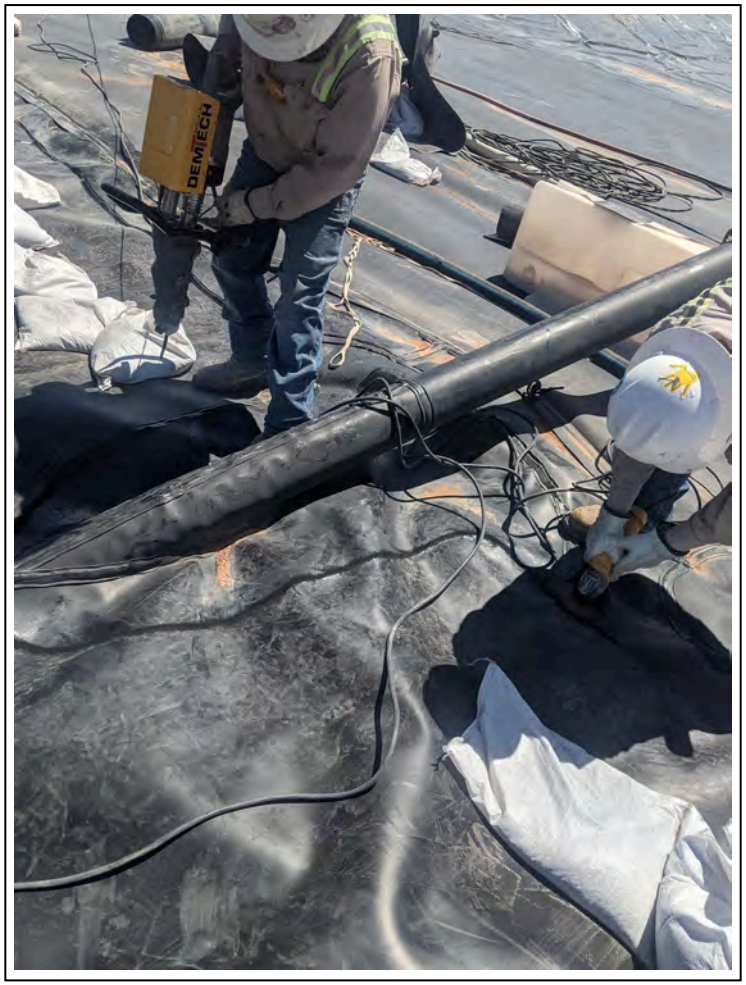
10. 4/1/2021: Pond 6 existing liner/textured liner repair (patch)

SUNDANCE WEST MUD MANAGEMENT FACILITY

Photographs

P:_DB18-1209\Pond Liner CQA.5-21\Appx B3_Photos\pg06.doc

11. 4/1/2021: Pond 6 existing liner repair (patch)



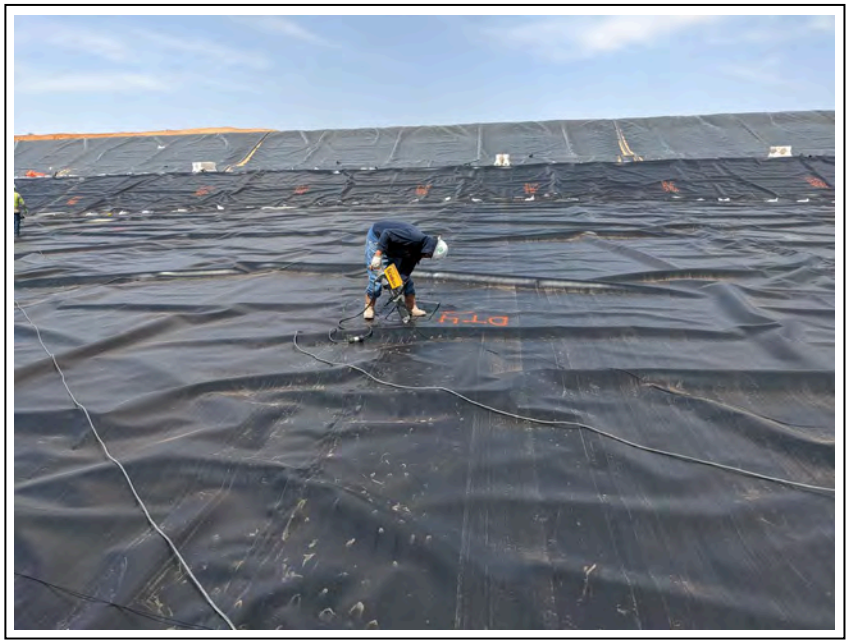
12. 4/1/2021: Existing boot seal around leachate collection pipe

SUNDANCE WEST MUD MANAGEMENT FACILITY

Photographs

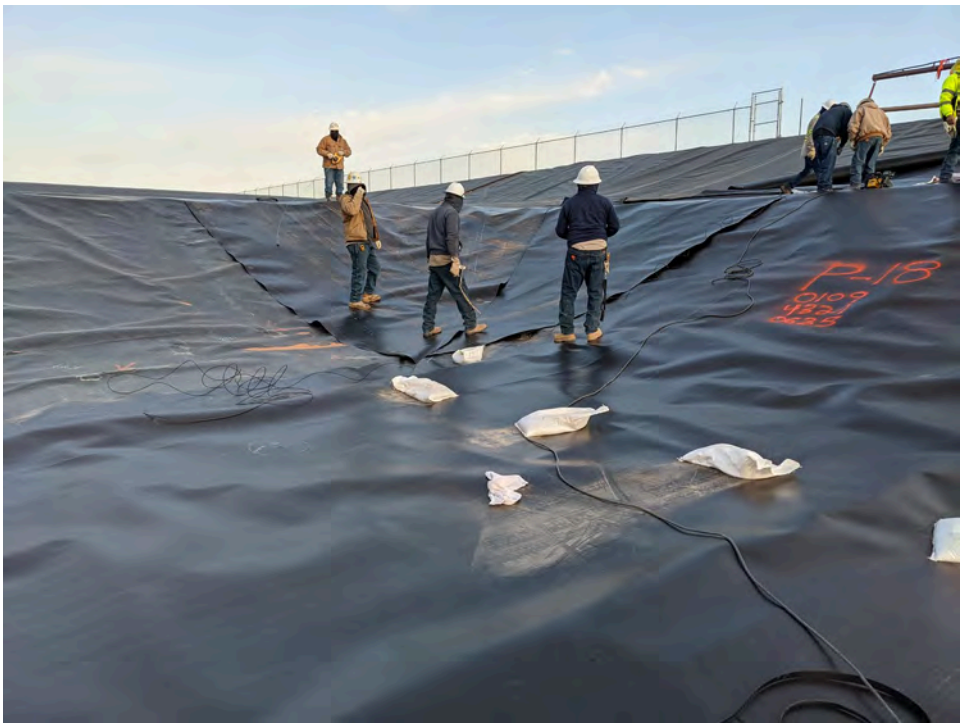
13. 4/2/2021: Placing P-14 in Pond 5 (partial panel) (view to north)

14. 4/2/2021: Seam pressure testing



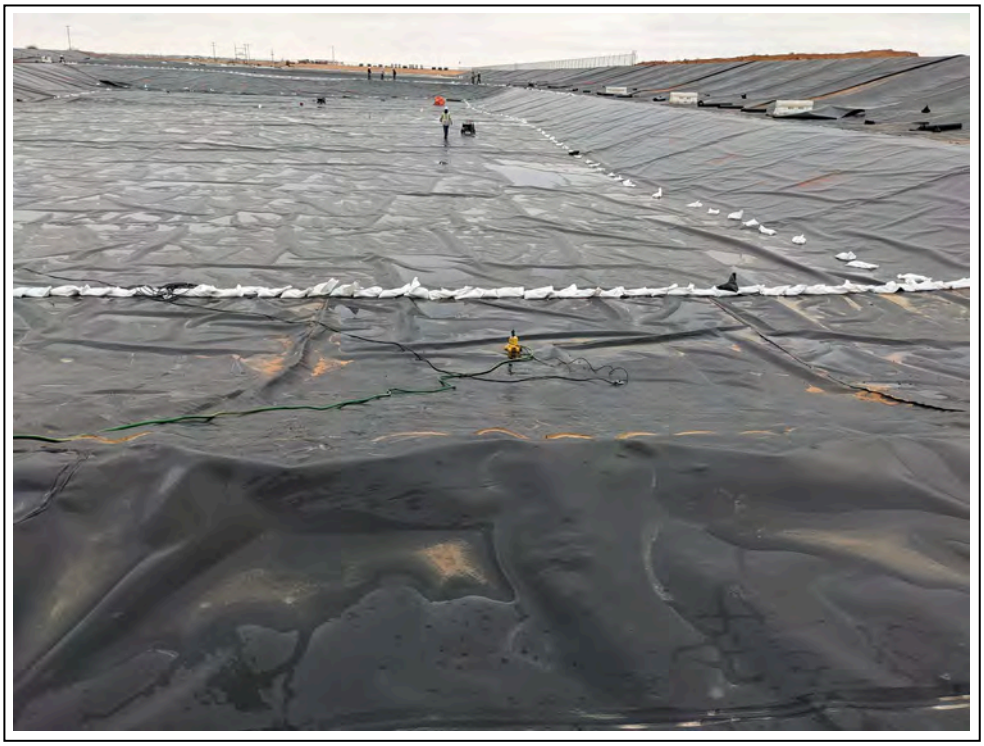
15. 4/2/2021: Repair of destructive test DT-4 in Pond 5

16. 4/2/2021: Vacuum test at DT repair location



17. 4/3/2021: Corner panels of Pond 5, northwest corner (view to northwest)

18. 4/3/2021: Wedge weld along toe of west slope of Pond 5 (view to north)



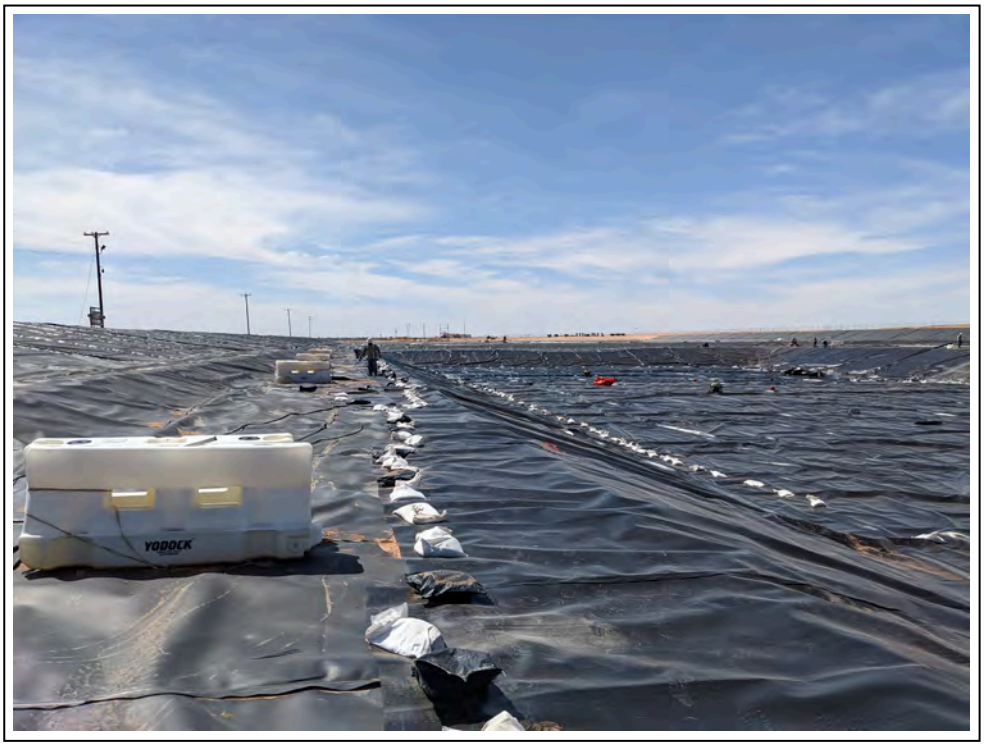
19. 4/4/2021: Post-storm rainwater removal using pumps and brooms (view to west)

20. 4/6/2021: Liner rolls staged near the south ridge (view to west)

21. 4/7/2021: P-1 of Pond 6 (South Pond) placed (view to south)

22. 4/7/2021: DT-2 of Pond 6, located on seam P-3/P-2 (view to south)

23. 4/7/2021: View of skid steer on the top north ridge, pulling liner from the south (view to southwest)

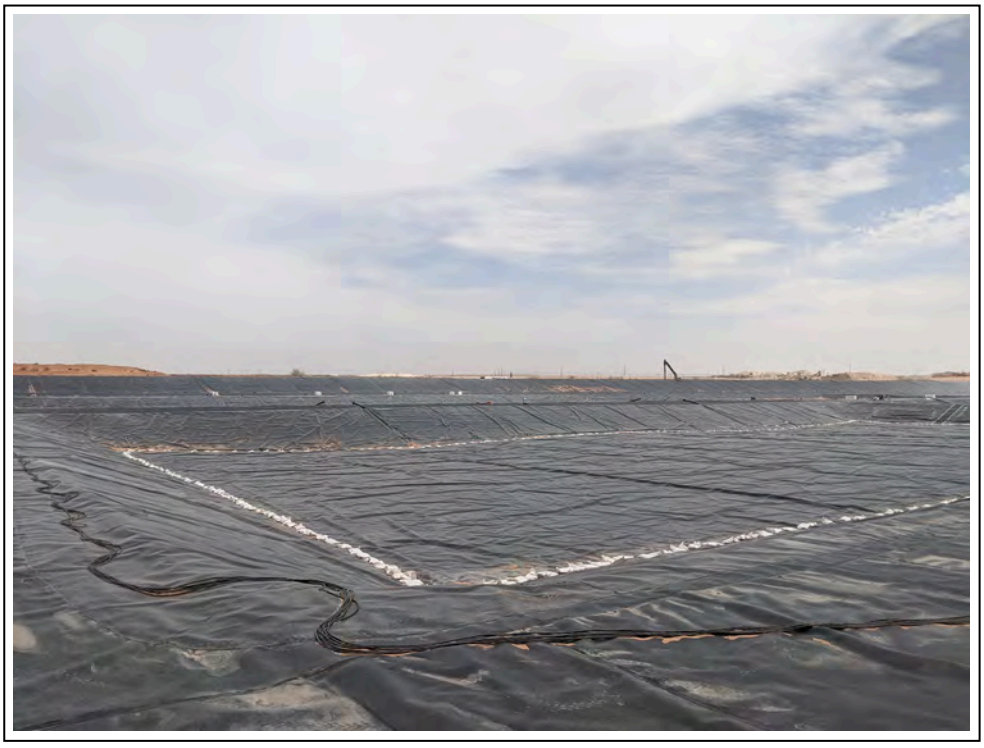


24. 4/8/2021: All panels of Pond 6 placed (view to west)

25. 4/9/2021: Vacuum test along northeast extrusion weld seam (view to west)

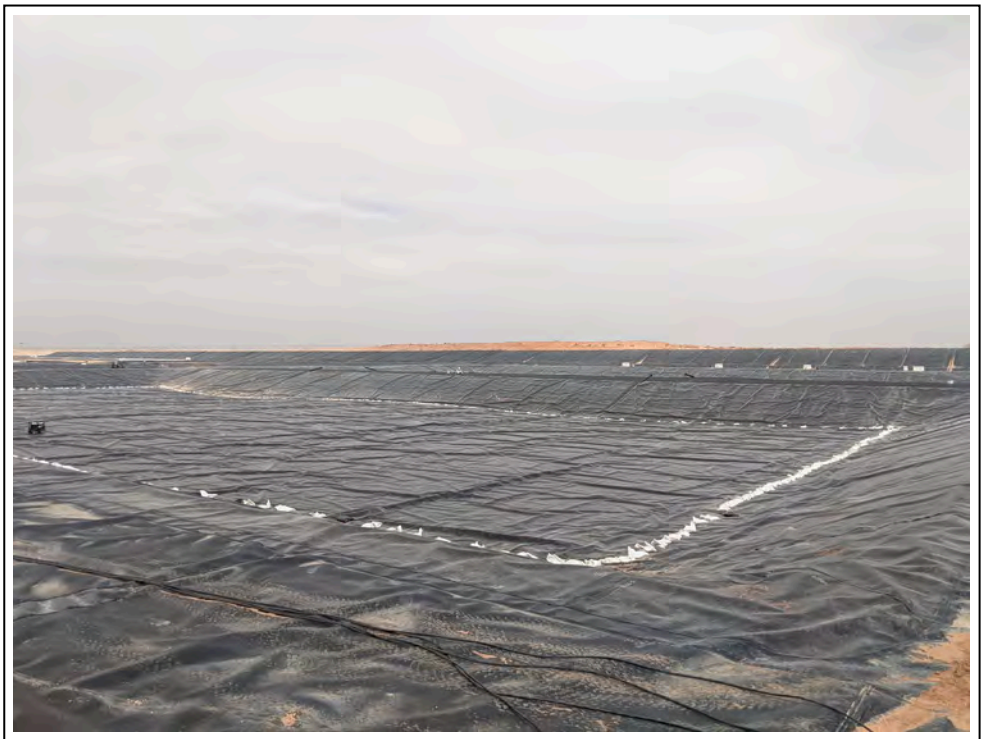
26. 4/12/2021: View of Pond 5 from southwest corner (view to northeast)

27. 4/12/2021: View of Pond 6 from northwest corner (view to southeast)



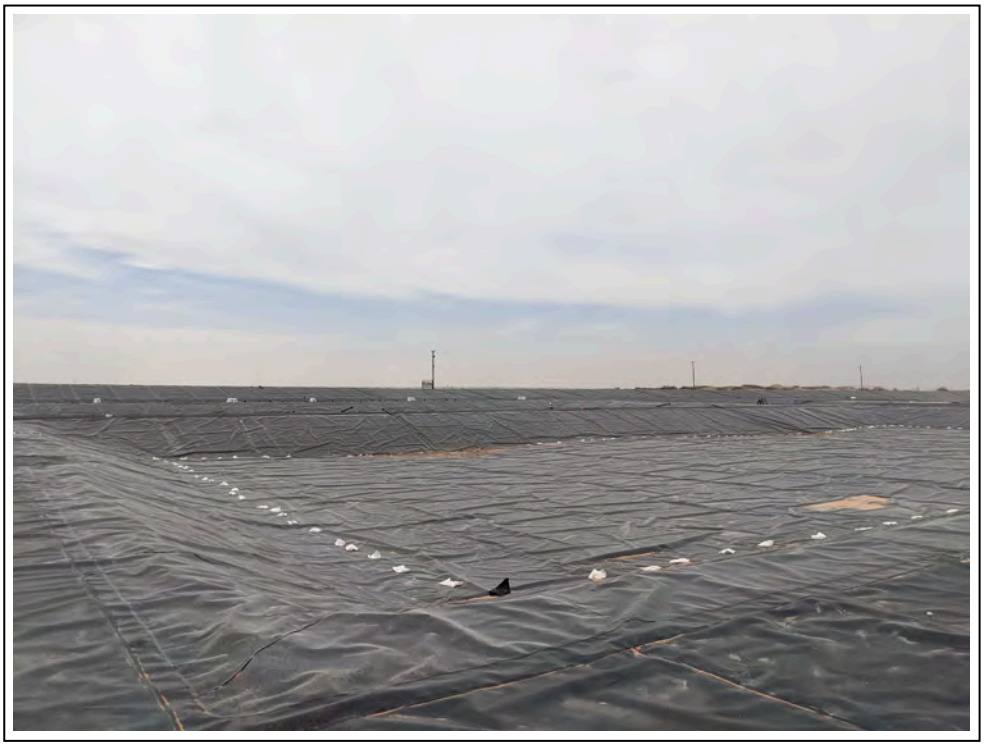
28. 4/12/2021: View of project from top of Pond 6, southwest corner (view to northeast)

29. 4/12/2021: View of project from top of south slope, northwest corner (view to southeast)



30. 4/12/2021: View of project from top of Pond 6, southeast corner (view to northwest)

31. 4/12/2021: View of project from center of Pond 5/6 walkway (view to west)



32. 4/12/2021: View of project from top of Pond 5, northeast corner (view to southwest)

Appendix C

Panel Deployment and Seaming

DBS&A
Daniel B. Stephens & Associates, Inc.

Appendix C1

Geomembrane Deployment Log

DBS&A
Daniel B. Stephens & Associates, Inc.

FML DEPLOYMENT LOG

PROJECT NAME: Sundance West, Evap Pond, Pond 5
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Panel Number	Roll Number	Approximate Length (ft)	Approximate Width (ft)	Approximate Area (ft^2)	Date Installed	Observed By
P1	0109	234	22.5	5265	4/1/2021	MZ/GMH
P2	0109	232	22.5	5220	4/1/2021	MZ/GMH
P3	0118	235	22.5	5287.5	4/1/2021	MZ/GMH
P4	0118	229	22.5	5152.5	4/1/2021	MZ/GMH
P5	0122	230	22.5	5175	4/2/2021	MZ/GMH
P6	0122	236	22.5	5310	4/2/2021	MZ/GMH
P7	0121	230	22.5	5175	4/2/2021	MZ/GMH
P8	0121	230	22.5	5175	4/2/2021	MZ/GMH
P9	0115	231	22.5	5197.5	4/2/2021	MZ/GMH
P10	0115	230	22.5	5175	4/2/2021	MZ/GMH
P11	0115	170	22.5	3825	4/2/2021	MZ/GMH
P12	0121	57	22.5	1282.5	4/2/2021	MZ/GMH
P13	0121	88	22.5	1980	4/2/2021	MZ/GMH
P14	0122	134	22.5	3015	4/2/2021	MZ/GMH
P15	0114	231	22.5	5197.5	4/3/2021	MZ/GMH
P16	0114	231	22.5	5197.5	4/3/2021	MZ/GMH
P17	0114	165	22.5	3712.5	4/3/2021	MZ/GMH
P18	0109	61	22.5	1372.5	4/3/2021	MZ/GMH
P19	0109	31	22.5	697.5	4/3/2021	MZ/GMH
P20	0109	33	22.5	742.5	4/3/2021	MZ/GMH
P21	0109	42	22.5	945	4/3/2021	MZ/GMH
P22	0118	41	22.5	922.5	4/3/2021	MZ/GMH
P23	0118	40	22.5	900	4/3/2021	MZ/GMH
P24	0118	41	22.5	922.5	4/3/2021	MZ/GMH
P25	0112	39	22.5	877.5	4/3/2021	MZ/GMH
P26	0112	39	22.5	877.5	4/3/2021	MZ/GMH
P27	0112	39	22.5	877.5	4/3/2021	MZ/GMH
P28	0112	36	22.5	810	4/3/2021	MZ/GMH

FML DEPLOYMENT LOG

PROJECT NAME: Sundance West, Evap Pond, Pond 5
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Panel Number	Roll Number	Approximate Length (ft)	Approximate Width (ft)	Approximate Area (ft^2)	Date Installed	Observed By
P29	0112	12	22.5	270	4/3/2021	MZ/GMH
P30	0112	12	22.5	270	4/3/2021	MZ/GMH
P31	0112	33	22.5	742.5	4/3/2021	MZ/GMH
P32	0112	27	22.5	607.5	4/4/2021	MZ/GMH
P33	0112	13	12	156	4/5/2021	MZ/GMH
P34	0112	20	16	320	4/6/2021	MZ/GMH
P35	0112	38	22.5	855	4/7/2021	MZ/GMH
P36	0112	39	22.5	877.5	4/8/2021	MZ/GMH
P37	0112	39	22.5	877.5	4/9/2021	MZ/GMH
P38	0112	32	22.5	720	4/10/2021	MZ/GMH
P39	0112	35	22.5	787.5	4/11/2021	MZ/GMH
P40	0112	41	22.5	922.5	4/12/2021	MZ/GMH
P41	0112	40	22.5	900	4/13/2021	MZ/GMH
P42	0112	22	22.5	495	4/14/2021	MZ/GMH
P43	0112	22	22.5	495	4/15/2021	MZ/GMH
P44	0112	19	17	323	4/16/2021	MZ/GMH
P45	0112	16	22.5	360	4/17/2021	MZ/GMH
TOTAL LINER PLACED (ft^2)				91983.5		

FML DEPLOYMENT LOG

PROJECT NAME: Sundance West, Evap Pond, Pond 6
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Panel Number	Roll Number	Approximate Length (ft)	Approximate Width (ft)	Approximate Area (ft^2)	Date Installed	Observed By
P1	0108	222	22.5	4995	4/7/2021	GMH
P2	0108	226	22.5	5085	4/7/2021	GMH
P3	0120	224	22.5	5040	4/7/2021	GMH
P4	0120	228	22.5	5130	4/7/2021	GMH
P5	0113	232	22.5	5220	4/7/2021	GMH
P6	0113	230	22.5	5175	4/7/2021	GMH
P7	0119	235	22.5	5287.5	4/7/2021	GMH
P8	0119	230	22.5	5175	4/7/2021	GMH
P9	0110	233	22.5	5242.5	4/7/2021	GMH
P10	0110	233	22.5	5242.5	4/7/2021	GMH
P11	0117	235	22.5	5287.5	4/8/2021	GMH
P12	0117	235	22.5	5287.5	4/8/2021	GMH
P13	0111	230	22.5	5175	4/8/2021	GMH
P14	0111	229	22.5	5152.5	4/8/2021	GMH
P15	0111	175	22.5	3937.5	4/8/2021	GMH
P16	0117	57	22.5	1282.5	4/8/2021	GMH
P17	0117	42	15	630	4/8/2021	GMH
P18	0117	15	22.5	337.5	4/8/2021	GMH
P19	0117	37	22.5	832.5	4/8/2021	GMH
P20	0110	37	22.5	832.5	4/8/2021	GMH
P21	0110	37	22.5	832.5	4/8/2021	GMH
P22	0110	37	22.5	832.5	4/8/2021	GMH
P23	0110	37	22.5	832.5	4/8/2021	GMH
P24	0119	35	22.5	787.5	4/8/2021	GMH
P25	0119	36	22.5	810	4/8/2021	GMH
P26	0119	42	22.5	945	4/8/2021	GMH
P27	0119	28	23	644	4/8/2021	GMH
P28	0113	24	19	456	4/8/2021	GMH
P29	0113	30	22.5	675	4/8/2021	GMH
P30	0113	38	22.5	855	4/8/2021	GMH
P31	0113	15	22.5	337.5	4/8/2021	GMH
P32	0113	11	22.5	247.5	4/8/2021	GMH
P33	0113	35	22.5	787.5	4/8/2021	GMH
P34	0113	35	22.5	787.5	4/8/2021	GMH
P35	0120	34	5	170	4/8/2021	GMH
P36	0120	36	22.5	810	4/8/2021	GMH
P37	0120	26	22.5	585	4/8/2021	GMH
P38	0120	31	22.5	697.5	4/8/2021	GMH
P39	0120	23	16	368	4/8/2021	GMH
P40	0108	23	22.5	517.5	4/8/2021	GMH
P41	0108	23	41	943	4/8/2021	GMH
P42	0108	17	14	238	4/8/2021	GMH
P43	0108	31	3	93	4/8/2021	GMH
P18A	0117	20	20	400	4/8/2021	GMH
			TOTAL LINER PLACED (ft^2)	94999.5		

FML DEPLOYMENT LOG

PROJECT NAME: Sundance West,40-mil Walkway
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Panel Number	Roll Number	Approximate Length (ft)	Approximate Width (ft)	Approximate Area (ft^2)	Date Installed	Observed By
P1	1034	208	22	4576	4/10/2021	MZ
P2	1034	212	18	3816	4/10/2021	MZ
P3	1034	194	22	4268	4/10/2021	MZ
P4	1034	174	18	3132	4/10/2021	MZ
P5	2195	14	18	252	4/10/2021	MZ
TOTAL LINER PLACED (ft^2)				16044		

Appendix C2

Startup Welds and Destructive Field Test Recommendations

DBS&A
Daniel B. Stephens & Associates, Inc.

FML DESTRUCTIVE FIELD TEST RECORD

PROJECT INFORMATION									PROJECT SPECIFICATIONS						
Project Name: Sundance West - Pond 5									Fusion Weld	Textured: PEEL 98 lbs/in SHEAR 121 lbs/in					
Project Location: Eunice, NM										Smooth: PEEL 98 lbs/in SHEAR 121 lbs/in					
Project Number: DB18.1209.00									Extrusion Weld	Textured: PEEL 78 lbs/in SHEAR 121 lbs/in					
Contractor: Mustang Extreme										Smooth: PEEL 78 lbs/in SHEAR 121 lbs/in					
					Wedge Welds		Extrusion Welds			Field Test Results (lbs/in)					
Date	DT #	Tester's Initials	Welder's Initials	Machine #	Temp (°F)	Speed (ft/min)	Barrel Temp (°F)	Pre-Heat Temp (°F)	Test Type	Test #1	Test #2	Test #3	Test #4	Test #5	Comments
4/1/21	Startup weld	AH	MV	17	860	400	--	--	p	138	137	132	130	146	
									p	149	134	122	127	145	
									S	165	179	171	194	181	
4/1/21	Startup weld	AH	JV	3671	861	500	--	--	p	124	128	135	122	121	
									p	128	135	122	138	133	
									S	148	165	138	170	163	
4/1/21	Startup weld	AH	JV	50397	--	--	500	500	p	121	125	1223	122	124	
									p	--	--	--	--	--	extrusion
									S	158	154	138	172	137	
4/1/21	DT-1	AH	JV	3671	860	500	--	--	p	128	123	118	123	127	
									p	--	--	--	--	--	extrusion
									S	165	162	166	167	164	
4/1/21	DT-2	AH	JV	50397	--	--	500	500	p	125	117	117	122	118	
									p	--	--	--	--	--	extrusion
									S	135	157	138	160	138	
4/2/21	Startup weld	AH	JV	3671	860	500	--	--	p	124	126	123	121	127	
									p	120	134	124	136	140	
									S	156	172	153	177	176	
4/2/21	Startup weld	AH	JV	50397	--	--	500	500	p	124	125	120	121	125	
									p	--	--	--	--	--	extrusion
									S	142	161	145	164	167	
4/2/21	Startup weld	AH	FC	50403	--	--	500	500	p	114	139	138	124	128	
									p	--	--	--	--	--	extrusion
									S	124	148	136	152	149	
4/2/21	DT-3	AH	MV	17	860	400	--	--	p	123	123	117	129	114	
									p	125	123	115	120	125	
									S	132	158	134	155	162	
4/2/21	DT-4	AH	MV	17	860	400	--	--	p	119	119	114	128	120	
									p	117	121	111	118	124	
									S	132	156	131	158	160	

FML DESTRUCTIVE FIELD TEST RECORD

PROJECT INFORMATION									PROJECT SPECIFICATIONS						
Project Name: Sundance West - Pond 5									Fusion Weld	Textured: PEEL 98 lbs/in SHEAR 121 lbs/in					
Project Location: Eunice, NM										Smooth: PEEL 98 lbs/in SHEAR 121 lbs/in					
Project Number: DB18.1209.00									Extrusion Weld	Textured: PEEL 78 lbs/in SHEAR 121 lbs/in					
Contractor: Mustang Extreme										Smooth: PEEL 78 lbs/in SHEAR 121 lbs/in					
					Wedge Welds		Extrusion Welds			Field Test Results (lbs/in)					
Date	DT #	Tester's Initials	Welder's Initials	Machine #	Temp (°F)	Speed (ft/min)	Barrel Temp (°F)	Pre-Heat Temp (°F)	Test Type	Test #1	Test #2	Test #3	Test #4	Test #5	Comments
4/2/21	DT-5	AH	JV	17	860	400	--	--	p	117	131	113	122	135	
									p	119	131	117	132	121	
									S	127	155	133	158	159	
4/2/21	DT-6	AH	JV	3671	860	500	--	--	p	118	126	113	126	123	
									p	117	131	122	131	126	
									S	129	156	131	157	156	
4/3/21	Startup weld	AH	MV	17	860	400	--	--	p	124	132	129	146	133	
									p	128	141	128	140	151	
									S	150	176	1552	181	166	
4/3/21	Startup weld	AH	JV	3671	860	500	--	--	p	124	122	128	125	120	
									p	123	136	125	135	124	
									S	157	164	158	165	166	
4/3/21	Startup weld	AH	FC	50403	--	--	500	500	p	122	133	130	141	140	
									p	--	--	--	--	--	extrusion
									S	144	135	140	150	149	
4/3/21	Startup weld	AH	JV	50397	--	--	500	500	p	124	123	125	121	122	
									p	--	--	--	--	--	extrusion
									S	146	142	145	148	152	
4/3/21	DT-7	AH	JV	3671	860	500	--	--	p	127	127	122	130	121	
									p	123	122	126	117	125	
									S	161	166	164	162	163	
4/3/21	DT-8	AH	MV	17	860	420	--	--	p	115	122	125	124	127	
									p	127	121	126	121	120	
									S	169	171	162	170	172	
4/3/21	DT-9	AH	JV	3671	860	500	--	--	p	125	122	121	121	123	
									p	125	123	122	128	118	
									S	157	157	164	169	166	
4/3/21	DT-10	AH	JV	50403	--	--	500	500	p	113	118	123	122	115	
									p	--	--	--	--	--	extrusion
									S	150	171	167	168	165	

FML DESTRUCTIVE FIELD TEST RECORD

PROJECT INFORMATION									PROJECT SPECIFICATIONS						
Project Name: Sundance West - Pond 5									Fusion Weld	Textured: PEEL 98 lbs/in SHEAR 121 lbs/in					
Project Location: Eunice, NM										Smooth: PEEL 98 lbs/in SHEAR 121 lbs/in					
Project Number: DB18.1209.00									Extrusion Weld	Textured: PEEL 78 lbs/in SHEAR 121 lbs/in					
Contractor: Mustang Extreme										Smooth: PEEL 78 lbs/in SHEAR 121 lbs/in					
					Wedge Welds		Extrusion Welds			Field Test Results (lbs/in)					
Date	DT #	Tester's Initials	Welder's Initials	Machine #	Temp (°F)	Speed (ft/min)	Barrel Temp (°F)	Pre-Heat Temp (°F)	Test Type	Test #1	Test #2	Test #3	Test #4	Test #5	Comments
4/4/21	Startup weld	AH	JV	50397	--	--	500	500	p	128	124	124	127	127	
									p	--	--	--	--	--	extrusion
									S	166	174	171	171	168	
4/4/21	Startup weld	AH	FC	50403	--	--	500	500	p	127	126	125	118	124	
									p	--	--	--	--	--	extrusion
									S	161	168	174	172	158	
4/4/21	Startup weld	AH	JV	3671	860	500	--	--	p	122	123	127	124	127	
									p	167	171	171	175	169	
									S	127	116	128	129	122	
4/4/21	Startup weld	AH	JV	17	860	400	--	--	p	124	125	126	121	127	
									p	129	122	126	124	121	
									S	180	180	180	184	177	
4/5/21	Startup weld	AH	JV	50397	--	--	500	500	p	121	118	118	129	126	
									p	--	--	--	--	--	extrusion
									S	169	166	167	169	174	
4/5/21	Startup weld	AH	FC	50403	--	--	500	500	p	124	123	117	120	122	
									p	--	--	--	--	--	extrusion
									S	162	165	164	166	165	
4/5/21	Startup weld	AH	JV	50397	--	--	500	500	p	135	132	134	139	129	
									p	--	--	--	--	--	extrusion
									S	145	146	143	145	146	
4/5/21	Startup weld	AH	FC	50403	--	--	500	500	p	132	137	131	127	126	
									p	--	--	--	--	--	extrusion
									S	154	158	158	149	155	
4/5/21	DT-11	AH	FC	50403	--	--	500	500	p	112	111	115	131	113	
									p	--	--	--	--	--	extrusion
									S	169	165	162	160	159	

FML DESTRUCTIVE FIELD TEST RECORD

PROJECT INFORMATION									PROJECT SPECIFICATIONS						
Project Name: Sundance West - Pond 6									Fusion Weld		Textured: PEEL 98 lbs/in SHEAR 121 lbs/in				
Project Location: Eunice, NM											Smooth: PEEL 98 lbs/in SHEAR 121 lbs/in				
Project Number: DB18.1209.00									Extrusion Weld		Textured: PEEL 78 lbs/in SHEAR 121 lbs/in				
Contractor: Mustang Extreme											Smooth: PEEL 78 lbs/in SHEAR 121 lbs/in				

Date	DT #	Tester's Initials	Welder's Initials	Machine #	Wedge Welds		Extrusion Welds		Test Type	Field Test Results (lbs/in)					Comments
					Temp (°F)	Speed (ft/min)	Barrel Temp (°F)	Pre-Heat Temp (°F)		Test #1	Test #2	Test #3	Test #4	Test #5	
4/1/21	Startup weld	AH	MV	17	860	430	--	--	p	132	130	128	129	135	
									p	120	151	133	139	150	
									S	188	187	189	182	185	
4/7/21	Startup weld	AH	JV	3671	861	410	--	--	p	137	152	141	155	145	
									p	137	137	126	126	135	
									S	183	181	189	190	194	
4/7/21	Startup weld	AH	FC	50403	--	--	500	500	p	124	122	120	126	120	
									p	--	--	--	--	--	extrusion
									S	157	151	160	154	152	
4/7/21	Startup weld	AH	JV	50397	--	--	500	500	p	128	123	118	123	127	
									p	--	--	--	--	--	extrusion
									S	165	162	166	167	164	
4/7/21	DT-1	AH	MV	17	860	430	--	--	p	124	121	120	118	129	
									p	125	134	129	128	124	
									S	146	157	158	160	158	
4/7/21	DT-2	AH	JV	3671	860	410	--	--	p	119	120	122	124	114	
									p	122	123	111	115	118	
									S	140	150	144	152	151	
4/7/21	DT-3	AH	MV	17	860	430	--	--	p	122	140	128	135	128	
									p	122	123	118	124	125	
									S	150	154	154	153	153	
4/7/21	DT-4	AH	JV	3671	860	410	--	--	p	115	118	113	120	117	
									p	116	117	116	121	119	
									S	139	141	141	144	141	
4/7/21	DT-5	AH	JV	50397	--	--	500	500	p	128	134	125	135	126	
									p	--	--	--	--	--	extrusion
									S	142	148	147	142	149	
4/8/21	Startup weld	AH	MV	17	860	430	--	--	p	125	150	146	124	126	
									p	134	121	154	139	133	
									S	178	180	175	177	179	
4/8/21	Startup weld	AH	JV	3671	860	410	--	--	p	141	140	142	151	134	
									p	140	141	161	162	139	
									S	177	183	181	189	194	
4/8/21	Startup weld	AH	JV	50397	--	--	500	500	p	125	129	126	120	127	
									p	--	--	--	--	--	
									S	145	140	146	141	142	
4/8/21	Startup weld	AH	FC	50403	--	--	500	500	p	119	119	122	113	128	
									p	--	--	--	--	--	extrusion
									S	130	136	137	143	146	
4/9/21	Startup weld	AH	MV	17	860	400	--	--	p	122	124	119	120	116	
									p	129	130	129	141	134	
									S	161	165	164	173	170	
4/9/21	Startup weld	AH	JV	3671	860	410	--	--	p	123	127	115	124	170	
									p	120	129	119	118	119	
									S	145	151	147	153	152	

FML DESTRUCTIVE FIELD TEST RECORD

PROJECT INFORMATION		PROJECT SPECIFICATIONS	
Project Name: Sundance West - Pond 6		Fusion Weld	Textured: PEEL 98 lbs/in SHEAR 121 lbs/in
Project Location: Eunice, NM			Smooth: PEEL 98 lbs/in SHEAR 121 lbs/in
Project Number: DB18.1209.00		Extrusion Weld	Textured: PEEL 78 lbs/in SHEAR 121 lbs/in
Contractor: Mustang Extreme			Smooth: PEEL 78 lbs/in SHEAR 121 lbs/in

Date	DT #	Tester's Initials	Welder's Initials	Machine #	Wedge Welds		Extrusion Welds		Test Type	Field Test Results (lbs/in)					Comments
					Temp (°F)	Speed (ft/min)	Barrel Temp (°F)	Pre-Heat Temp (°F)		Test #1	Test #2	Test #3	Test #4	Test #5	
4/9/21	Startup weld	AH	FC	50403	--	--	500	500	p	116	111	124	118	107	
									p	--	--	--	--	--	extrusion
									S	151	155	148	153	156	
4/9/21	Startup weld	AH	JV	50397	--	--	500	500	p	118	124	123	122	124	
									p	--	--	--	--	--	extrusion
									S	141	141	137	142	141	
4/9/21	DT-6	AH	MV	17	860	430	--	--	p	117	114	118	121	119	
									p	118	123	119	121	117	
									S	139	138	147	141	139	
4/9/21	DT-7	AH	JV	3671	860	410	--	--	p	115	119	110	111	111	
									p	116	113	114	118	114	
									S	139	138	140	140	140	
4/9/21	DT-8	AH	JV	3671	860	410	--	--	p	111	117	110	113	114	
									p	120	121	113	117	127	
									S	136	140	133	139	135	
4/9/21	DT-9	AH	JV	50397	--	--	500	500	p	129	135	124	122	118	
									p	--	--	--	--	--	extrusion
									S	131	137	138	141	140	
4/9/21	DT-10	AH	MV	17	860	430	--	--	p	111	116	115	120	127	
									p	119	119	125	123	130	
									S	135	142	136	148	147	
4/9/21	DT-11	AH	JV	50397	--	--	500	500	p	122	133	129	128	128	
									p	--	--	--	--	--	extrusion
									S	144	141	140	144	149	

FML DESTRUCTIVE FIELD TEST RECORD

PROJECT INFORMATION									PROJECT SPECIFICATIONS						
Project Name: Sundance West - 40-mil walkway									Fusion Weld	Textured: PEEL 80 lbs/in SHEAR 80 lbs/in					
Project Location: Eunice, NM										Smooth: PEEL 80 lbs/in SHEAR 80 lbs/in					
Project Number: DB18.1209.00									Extrusion Weld	Textured: PEEL 60 lbs/in SHEAR 80 lbs/in					
Contractor: Mustang Extreme										Smooth: PEEL 60 lbs/in SHEAR 80 lbs/in					
					Wedge Welds		Extrusion Welds			Field Test Results (lbs/in)					
Date	DT #	Tester's Initials	Welder's Initials	Machine #	Temp (°F)	Speed (ft/min)	Barrel Temp (°F)	Pre-Heat Temp (°F)	Test Type	Test #1	Test #2	Test #3	Test #4	Test #5	Comments
4/10/21	Startup weld	AH	JV	3671	860	750	--	--	p	109	114	108	108	107	
									p	104	114	103	111	110	
									S	143	149	145	149	143	
4/10/21	Startup weld	AH	JV	50397	--	--	500	500	p	94	95	99	93	97	
									p	--	--	--	--	--	Extrusion
									S	105	102	105	101	109	
4/10/21	Startup weld	AH	MV	2018	--	--	500	500	p	110	96	94	97	94	
									p	--	--	--	--	--	Extrusion
									S	108	108	110	109	11	
4/10/21	DT-1	AH	JV	3671	860	440	--	--	p	83	83	82	77	81	
									p	85	82	79	82	--	
									S	106	107	105	107	106	

Appendix C3

Geomembrane Seam Log

DBS&A
Daniel B. Stephens & Associates, Inc.

FML SEAMING LOG	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/1/2021	P1/P2	232	0818	MV	17	860	420	--	MCZ
4/1/2021	P2/P3	232	0850	JV	3671	860	440	DT-1	MCZ
4/1/2021	P3/P4	235	0900	MV	17	860	420	--	MCZ
4/1/2021	P1/ES	20	1210	JV	50397	500	500	DT-2	GMH
4/1/2021	P2/ES	22	1215	JV	50397	500	500	--	GMH
4/1/2021	P3/ES	22	1220	JV	50397	500	500	--	GMH
4/1/2021	P4/ES	28	1225	JV	50397	500	500	--	GMH
4/2/2021	P4/P5	229	0610	HM	3671	860	440	--	GMH
4/2/2021	P5/P6	230	0609	MV	17	860	420	DT-3	GMH
4/2/2021	P6/P7	236	0647	MV	17	860	420	--	GMH
4/2/2021	P7/P8	230	0721	MV	17	860	420	DT-4	MCZ
4/2/2021	P8/P9	230	0724	JV	3671	860	440	--	MCZ
4/2/2021	P9/P10	231	0800	MV	17	860	420	DT-5	MCZ
4/2/2021	P10/P11	170	0818	JV	3671	860	440	--	MCZ
4/2/2021	P11/P13	88	0846	MV	17	860	420	--	MCZ
4/2/2021	P11/P12	22	0841	JV	3671	860	440	DT-6	MCZ
4/2/2021	P10/P12	57	--	JV	3671	860	440	--	MCZ
4/2/2021	P12/P14	54	--	MV	17	860	420	--	MCZ
4/2/2021	P11/P14	82	--	MV	17	860	420	--	MCZ
4/2/2021	P13/P14	22	--	MV	17	860	420	--	MCZ
4/2/2021	P5/ES	22	1030	JV	50397	500	500	--	GMH
4/2/2021	P6/ES	22	1030	JV	50397	500	500	--	GMH
4/2/2021	P7/ES	22	1030	JV	50397	500	500	--	GMH
4/2/2021	P8/ES	22.5	1030	JV	50397	500	500	--	GMH
4/2/2021	P9/ES	22	1030	JV	50397	500	500	--	GMH
4/2/2021	P10-ES	22.5	1031	JV	50397	500	500	--	GMH
4/2/2021	P11/ES	22	1315	JV	50397	500	500	--	GMH
4/2/2021	P13/ES	27	1315	JV	50397	500	500	--	GMH
4/3/2021	P13/P15	231	0605	MV	17	860	420	--	GMH
4/3/2021	P14/P15	136	0605	MV	17	860	420	--	MCZ
4/3/2021	P15/P16	230	0627	JV	3671	860	440	DT-7	MCZ
4/3/2021	P16/P17	165	0650	MV	17	860	420	--	MCZ
4/3/2021	P16/P18	61	0650	MV	17	860	420	--	MCZ
4/3/2021	P18/P17	22	0655	JV	3671	860	440	--	MCZ
4/3/2021	P18/P19	31	0727	JV	3671	860	440	--	GMH
4/3/2021	P19/P20	33	0735	JV	3671	860	440	--	GMH
4/3/2021	P20/P21	33	0750	JV	3671	860	440	--	MCZ
4/3/2021	P21/P22	41	0800	MV	17	860	420	DT-8	MCZ
4/3/2021	P22/P23	40	0815	JV	3671	860	440	--	GMH
4/3/2021	P23/P24	40	0834	MV	17	860	420	--	GMH
4/3/2021	P24/P25	39	0857	JV	3671	860	440	--	GMH
4/3/2021	P25/P26	39	0905	MV	17	860	420	--	GMH
4/3/2021	P26/P27	38	0922	JV	3671	860	440	--	GMH
4/3/2021	P27/P28	37	0938	MV	17	860	420	--	GMH
4/3/2021	P28/P29	17	0948	MV	17	860	420	--	GMH
4/3/2021	P29/P30	12	1022	MV	17	860	420	--	GMH
4/3/2021	P30/P31	10	1020	MV	17	860	420	--	GMH
4/3/2021	P31/P29	6	1023	MV	17	860	420	--	GMH
4/3/2021	P28/P31	25	1023	MV	17	860	420	--	GMH
4/3/2021	P17/P31	33	1010	MV	17	860	420	--	GMH
4/3/2021	P1/EN	21	1350	FC	50403	500	500	--	GMH
4/3/2021	P2/EN	22	1350	FC	50403	500	500	--	GMH

FML SEAMING LOG	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/3/2021	P3/EN	22	1350	FC	50403	500	500	--	GMH
4/3/2021	P4/EN	22	1330	FC	50403	500	500	--	GMH
4/3/2021	P27/P17	21	1058	JV	3671	860	440	--	GMH
4/3/2021	P26/P17 Patch	18	1056	JV	3671	860	440	--	GMH
4/3/2021	P25/P17 Patch	8	1053	JV	3671	860	440	--	GMH
4/3/2021	P25/P17	11	1053	JV	3671	860	440	--	GMH
4/3/2021	P24/P17 Patch	6	1050	JV	3671	860	440	--	GMH
4/3/2021	P24/P17	17	1050	JV	3671	860	440	DT-9	GMH
4/3/2021	P23/P17	22.5	1048	JV	3671	860	440	--	GMH
4/3/2021	P22/P17 To P18/P17	14	1044	JV	3671	860	440	--	GMH
4/3/2021	P22/P18	8	1044	JV	3671	860	440	--	GMH
4/3/2021	P21/P18	22	1040	JV	3671	860	440	--	GMH
4/3/2021	P15/ES	22	1300	JV	50397	500	500	--	GMH
4/3/2021	P16/ES	22	1300	JV	50397	500	500	--	GMH
4/3/2021	P17/ES	22	1300	JV	50397	500	500	--	GMH
4/3/2021	P31/ES	22	1300	JV	50397	500	500	--	GMH
4/3/2021	P30/ES	10	1300	JV	50397	500	500	--	GMH
4/3/2021	P5/EN	22	1300	FC	50403	500	500	--	GMH
4/3/2021	P6/EN	22	1300	FC	50403	500	500	DT-10	GMH
4/3/2021	P7/EN	21	1300	FC	50403	500	500	--	GMH
4/3/2021	P8/EN	22	1300	FC	50403	500	500	--	GMH
4/3/2021	P9/EN	21	1300	FC	50403	500	500	--	GMH
4/3/2021	P10/EN	21	1300	FC	50403	500	500	--	GMH
4/3/2021	P12/EN	11	1300	FC/JV	50403	500	500	--	GMH
4/3/2021	P12/EN	10	1549	JV	50397	500	500	--	GMH
4/3/2021	P14/EN	22	1549	JV	50397	500	500	--	GMH
4/3/2021	P15/EN	22	1449	JV	50397	500	500	--	GMH
4/3/2021	P16/EN	22	1449	JV	50397	500	500	--	GMH
4/3/2021	P18/EN	21	1449	JV	50397	500	500	--	GMH
4/3/2021	P19/EN	21	1449	JV	50397	500	500	--	GMH
4/3/2021	P16/ES	22	1300	JV	50397	500	500	--	GMH
4/4/2021	P20/EW	22	0845	FC	50403	500	500	--	GMH
4/4/2021	P21/EW	22	0845	FC	50403	500	500	--	GMH
4/4/2021	P22/EW	22	0845	FC	50403	500	500	--	GMH
4/4/2021	P23/EW	22	0845	FC	50403	500	500	--	GMH
4/4/2021	P24/EW	2	0830	JV	50397	500	500	--	GMH
4/4/2021	P25/EW	22	0845	JV	50397	500	500	--	GMH
4/4/2021	P26/EW	22	0845	JV	50397	500	500	--	GMH
4/4/2021	P17/EW	22	0845	JV	50397	500	500	--	GMH
4/4/2021	P28/EW	22	0845	JV	50397	500	500	--	GMH
4/4/2021	P29/EW	16	0845	JV	50397	500	500	--	GMH
4/4/2021	P24/EW	20	0930	FC	50403	500	500	--	GMH
4/4/2021	P32/P1	27	1415	MV	17	860	420	--	GMH
4/4/2021	P33/P32	13	1039	JV	3671	860	440	--	GMH
4/4/2021	P34/P33	17	1101	JV	3671	860	440	--	GMH
4/4/2021	P34/P32	5	1103	JV	3671	860	440	--	GMH
4/4/2021	P35/P34	20	1056	JV	3671	860	440	--	GMH
4/4/2021	P36/P1 Patch	11	1426	MV	17	860	420	--	GMH
4/4/2021	P36/P1 Patch	5	1426	MV	17	860	420	--	GMH
4/4/2021	P37/P1	19	1428	MV	17	860	420	--	GMH
4/4/2021	P38/P1	19.5	1428	MV	17	860	420	--	GMH
4/4/2021	P39/P1	20	1428	MV	17	860	420	--	GMH

FML SEAMING LOG	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/4/2021	P40/P1 Patch	4	1428	MV	17	860	420	--	GMH
4/4/2021	P40/P1 Patch	13	1428	MV	17	860	420		
4/4/2021	P41/P1 Cap	0	1428	MV	17	860	420	--	GMH
4/4/2021	P42/P1 Cap	0	1428	MV	17	860	420	--	GMH
4/4/2021	P42/P43	22	1343	MV	17	860	420	--	GMH
4/4/2021	P45/P1 Patch	10	1333	MV	17	860	420	--	GMH
4/4/2021	P45/P1 Patch	28	1333	MV	17	860	420	--	GMH
4/4/2021	P44/P45	16	1343	MV	17	860	420	--	GMH
4/4/2021	P44/P43	19	1400	MV	17	860	420	--	GMH
4/4/2021	P36/P37	39	1223	MV	17	860	420	--	GMH
4/4/2021	P37/P38	39	1235	MV	17	860	420	--	GMH
4/4/2021	P38/P39	32	1248	MV	17	860	420	--	GMH
4/4/2021	P39/P40	35	1253	MV	17	860	420	--	GMH
4/4/2021	P32/P35	25	1100	JV	3671	860	440	--	GMH
4/4/2021	P35/P1 Patch	3	1426	MV	17	860	420	--	GMH
4/4/2021	P40/P41	41	1302	MV	17	860	420	--	GMH
4/4/2021	P41/P42	4	1310	MV	17	860	420	--	GMH
4/4/2021	P42/P45	22	1400	MV	17	860	420	--	GMH
4/4/2021	P45/EN	22	0800	MV	50403	550	550	--	GMH
4/4/2021	P44/EN	17	0800	MV	50403	550	550	--	GMH
4/4/2021	P43/EE	22	0800	MV	50403	550	550	--	GMH
4/4/2021	P42/EE	22	0800	MV	50403	550	550	--	GMH
4/4/2021	P41/EE Patch	12	0800	MV	50403	550	550	DT-11	GMH
4/4/2021	P41/EE	2	0800	MV	50403	550	550	--	GMH
4/4/2021	P43/P45	7	1400	MV	17	860	420	--	GMH
4/4/2021	P35/P36	38	1218	MV	17	860	420	--	GMH
4/5/2021	P40/EE	22	0800	FC	50403	500	500	--	GMH
4/5/2021	P39/EE Patch	10	0909	JV	50397	500	500	--	GMH
4/5/2021	P39/EE Patch	17	0800	FC	50403	500	500	--	GMH
4/5/2021	P38/EE	28	0738	JV	50397	500	500	--	GMH
4/5/2021	P37/EE	22	0738	JV	50397	500	500	--	GMH
4/5/2021	P36/EE	22	0738	JV	50397	500	500	--	GMH
4/5/2021	P35/EE	22	0738	JV	50397	500	500	--	GMH
4/5/2021	P34/EE	16	0738	JV	50397	500	500	--	GMH
4/5/2021	P33/ES	12	0738	JV	50397	500	500	--	GMH
4/5/2021	P32/ES	22	0738	JV	50397	500	500	--	GMH

FML SEAMING LOG	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/7/2021	P2/P1	222	0640	MV	17	860	500	DT-1	GMH
4/7/2021	P3/P2	223	0650	JV	3671	860	500	DT-2	GMH
4/7/2021	P4/P3	224	0712	MV	17	860	500	--	GMH
4/7/2021	P5/P4	228	0723	JV	3671	860	500	--	GMH
4/7/2021	P6/P5	233	0748	MV	17	860	500	DT-3	GMH
4/7/2021	P7/P6	230	0800	JV	3671	860	500	--	GMH
4/7/2021	P7/P8	222	0820	MV	17	860	500	--	GMH
4/7/2021	P8/P9	230	0830	JV	3671	860	500	DT-4	GMH
4/7/2021	P9/P10	233	0855	MV	17	860	500	--	GMH
4/7/2021	P1/EN	20	0921	FC	50403	500	500	--	GMH
4/7/2021	P2/EN	20	0921	FC	50403	500	500	--	GMH
4/7/2021	P3/EN	22	0921	FC	50403	500	500	--	GMH
4/7/2021	P4/EN	35	0921	FC	50403	500	500	--	GMH
4/7/2021	P5/EN	22	0921	FC/JV	50403/50397	500	500	--	GMH
4/7/2021	P6/EN	22	0955	JV	50397	500	500	--	GMH
4/7/2021	P7/EN	22	0955	JV	50397	500	500	DT-5	GMH
4/7/2021	P8/EN	22	0955	JV	50397	500	500	--	GMH
4/7/2021	P9/EN	22	0955	JV	50397	500	500	--	GMH
4/7/2021	P10/EN	20	0955	JV	50397	500	500	--	GMH
4/8/2021	P10/EN	2		JV	50397	500	500	--	GMH
4/8/2021	P10/P11	224	0630	JV	3671	860	500	--	GMH
4/8/2021	P12/P11	226	0627	MV	17	860	500	DT-6	GMH
4/8/2021	P12/P13	225	0700	MV	17	860	500	--	GMH
4/8/2021	P14/P13	222	0711	JV	3671	860	500	DT-7	GMH
4/8/2021	P15/P14	169	0735	MV	17	860	500	--	GMH
4/8/2021	P16/P14	52	0735	MV	17	860	500	--	GMH
4/8/2021	P16/P15	21.5	0741	JV	3671	860	500	--	GMH
4/8/2021	P17/P15	37	0700	MV	17	860	500	--	GMH
4/8/2021	P18/P17	15	0758	JV	3671	860	400	--	GMH
4/8/2021	P19/P18	16	0751	JV	3671	860	400	--	GMH
4/8/2021	P20/P19	37	0821	MV	17	860	400	--	GMH
4/8/2021	P21/P20	37	0828	JV	3671	860	400	--	GMH
4/8/2021	P22/P21	37	0827	MV	17	860	400	--	GMH
4/8/2021	P23/P22	37	0838	JV	3671	860	400	--	GMH
4/8/2021	P24/P23	35	0845	MV	17	860	400	--	GMH
4/8/2021	P25/P24	35	0848	JV	3671	860	400	--	GMH
4/8/2021	P26/P25	42	0853	MV	17	860	500	--	GMH
4/8/2021	P27/P26	28	0858	JV	3671	860	500	--	GMH
4/8/2021	P28/P27	24	0910	JV	3671	860	500	--	GMH
4/8/2021	P29/P28	20	0908	JV	3671	860	500	--	GMH
4/8/2021	P29/27	10	0912	JV	3671	860	500	--	GMH
4/8/2021	P29/P26	13	0912	JV	3671	860	500	--	GMH
4/9/2021	P29/P16	30	0800	JV	3671	860	500	--	GMH
4/8/2021	P19/P17	31	0800	JV	3671	860	500	--	GMH
4/8/2021	P1/P30	38	0930	JV	3671	860	500	--	GMH
4/8/2021	P31/P30	15	0948	JV	3671	860	500	--	GMH
4/8/2021	P31/P32	14	1008	JV	3671	860	500	--	GMH
4/8/2021	P30/P33	33	1010	JV	3671	860	500	--	GMH
4/8/2021	P32/P33	11	1018	MV	17	860	500	--	GMH
4/8/2021	P33/P34	35	1020	MV	17	860	500	--	GMH
4/8/2021	P31/P33	3	1023	JV	3671	860	500	--	GMH
4/8/2021	P34/P35	35	1035	JV	3671	860	500	--	GMH

FML SEAMING LOG	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/8/2021	P35/P36	34	1035	MV	17	860	500	--	GMH
4/8/2021	P36/P37	36	1035	JV	3671	860	500	--	GMH
4/8/2021	P37/P38	26	0806	MV	17	860	500	--	GMH
4/8/2021	P38/P39	31	0812	JV	3671	860	500	--	GMH
4/8/2021	P39/P40	23	0810	MV	17	860	500	--	GMH
4/8/2021	P18A/P18	20	0758	FC	50403	500	500	--	GMH
4/8/2021	P18A/P17	4	0757	FC	50403	500	500	--	GMH
4/8/2021	P11/EN	22	0800	FC	50403	500	500	--	GMH
4/8/2021	P12/EN	32	0835	FC	50403	500	500	--	GMH
4/8/2021	P13/EN	21	0837	FC	50403	500	500	--	GMH
4/8/2021	P14/EN	22	0720	FC	50403	500	500	--	GMH
4/8/2021	P15/EN	19	0722	FC	50403	500	500	--	GMH
4/8/2021	P17/EN	15	0723	FC	50403	500	500	--	GMH
4/8/2021	P18A/EW	15	0730	FC	50403	500	500	--	GMH
4/8/2021	P19/EW	22	0732	FC	50403	500	500	--	GMH
4/8/2021	P20/EW	22	0739	FC	50403	500	500	--	GMH
4/8/2021	P21/EW	22	0741	FC	50403	500	500	--	GMH
4/8/2021	P22/EW	22	0750	FC	50403	500	500	--	GMH
4/8/2021	P18A/EN	13	0752	FC	50403	500	500	--	GMH
4/8/2021	P23/EW	22	0754	FC	50403	500	500	--	GMH
4/8/2021	P24/EW	22	0756	FC	50403	500	500	--	GMH
4/8/2021	P25/EW	22	1325	JV	50403	500	500	--	GMH
4/8/2021	P26/EW	22	1325	JV	50403	500	500	--	GMH
4/8/2021	P40/P41	23	1041	JV	3671	860	500	--	GMH
4/8/2021	P41/P42	15	1100	MV	17	860	500	--	GMH
4/8/2021	P41/P43	16	1100	MV	17	860	500	--	GMH
4/8/2021	P40/P43	9	1100	MV	17	860	500	--	GMH
4/8/2021	P42/P43	17	1055	MV	17	860	500	DT-10	GMH
4/8/2021	P27/EW	23	1325	JV	50397	500	500	--	GMH
4/8/2021	P28/ES	19	1325	JV	50397	500	500	--	GMH
4/8/2021	P29/ES	20	1325	JV	50397	500	500	--	GMH
4/8/2021	P16/ES	22	1325	JV	50397	500	500	DT-9	GMH
4/8/2021	P14/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P13/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P12/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P11/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P10/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P9/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P8/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P7/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P6/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P5/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P4/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P3/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P2/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P1/ES	22	1325	JV	50397	500	500	--	GMH
4/8/2021	P43/ES	15	1700	JV	50397	500	500	--	GMH
4/8/2021	P39/EE	7	1643	FC	50403	500	500	--	GMH
4/8/2021	P38/EE	25	1643	FC	50403	500	500	--	GMH
4/8/2021	P37/EE	23	1643	FC	50403	500	500	--	GMH
4/8/2021	P36/EE	27	1643	FC	50403	500	500	--	GMH
4/8/2021	P35/EE	18	1643	FC	50403	500	500	--	GMH

FML SEAMING LOG	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/9/2021	P43/ES	3	0822	JV	50397	500	500	--	GMH
4/9/2021	P42/ES	14	0822	JV	50397	500	500	--	GMH
4/9/2021	P41/EE	21	0822	JV	50397	500	500	--	GMH
4/9/2021	P40/EE	22	0822	JV	50397	500	500	--	GMH
4/9/2021	P34/EE	16	0822	JV	50397	500	500	--	GMH
4/9/2021	P35/EE	5	0822	JV	50397	500	500	--	GMH
4/9/2021	P34/EE	22.5	0822	JV	50397	500	500	--	GMH
4/9/2021	P33/EE	22.5	0822	JV	50397	500	500	--	GMH
4/9/2021	P32/EE	9	0822	JV	50397	500	500	DT-11	GMH
4/9/2021	P31/EN	14	0822	JV	50397	500	500	--	GMH
4/9/2021	P30/EN	15	0822	JV	50397	500	500	--	GMH
4/9/2021	P40/P1	22	0620	MV	17	500	500	--	GMH
4/9/2021	P39/P1	22	0620	MV	17	500	500	--	GMH
4/9/2021	P38/P1	22	0620	MV	17	500	500	--	GMH
4/9/2021	P37/P1	22	0620	MV	17	500	500	--	GMH
4/9/2021	P36/P1	22	0630	MV	17	500	500	--	GMH
4/9/2021	P35/P1	22	0630	MV	17	500	500	--	GMH
4/9/2021	P34/P1	22	0632	MV	17	500	500	--	GMH
4/9/2021	P17/P15	39	0700	MV	17	500	500	--	GMH
4/9/2021	P20/P15	22.5	0739	MV	17	500	500	--	GMH
4/9/2021	P21/P15	22	0742	MV	17	500	500	DT-8	GMH
4/9/2021	P22/P15	22	0745	MV	17	500	500	--	GMH
4/9/2021	P23/P15	22	0748	MV	17	500	500	--	GMH
4/9/2021	P24/P15	22	0751	MV	17	500	500	--	GMH
4/9/2021	P25/P15	20	0754	MV	17	500	500	--	GMH
4/9/2021	P25/P16	2	0754	MV	17	500	500	--	GMH
4/9/2021	P26/P16	22	0757	MV	17	500	500	--	GMH
4/9/2021	P29/P16	10	0800	MV	17	500	500	--	GMH
4/9/2021	P29/P16	27	0800	MV	17	500	500	--	GMH

FML SEAMING LOG	
PROJECT NAME: Sundance West, 40-mil walkway	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/10/2021	P3/P1	22	0844	JV	3671	860	470	--	MZ
4/10/2021	P4/P2	18	0840	JV	3671	860	470	--	MZ
4/10/2021	P1/P2	209	0900	JV	3671	860	470	DT-1	
4/10/2021	P3/P4	171	0920	JV	3671	860	470	--	MZ
4/10/2021	P1/EE	22	1025	MV	3018	500	450	--	MZ
4/10/2021	P2/EE	22	1025	MV	3018	500	450	--	MZ
4/10/2021	P2/P31 (60mil)	14	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P30 (60mil)	15	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P1 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P2 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P3 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P4 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P5 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P6 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P7 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P2/P8 (60mil)	10	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P8 (60mil)	12	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P9 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P10 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P11 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P12 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P13 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P14 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P4/P15 (60mil)	22	1025	JV	50397	500	500	--	MZ
4/10/2021	P1/P33 (60mil)	12	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P32 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P1 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P2 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P3 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P4 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P5 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P6 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P7 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P1/P8 (60mil)	11	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P8 (60mil)	11	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P9 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P10 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P11 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P13 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P15 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P16 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P17 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P31 (60mil)	22	1515	JV	50397	500	500	--	MZ
4/10/2021	P3/P30 (60mil)	5	1515	JV	50397	500	500	--	MZ
4/10/2021	P5/P3	14	1630	JV	50397	500	500	--	MZ
4/10/2021	P5/P4	18	1630	JV	50397	500	500	--	MZ
4/10/2021	P5/P17 (60mil)	15	1630	JV	50397	500	500	--	MZ

FML SEAMING LOG	
PROJECT NAME: Sundance West, 40-mil walkway	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/10/2021	P5/P18A (60mil)	13	1630	JV	50397	500	500	--	MZ

FML SEAMING LOG	
PROJECT NAME: Sundance West, 40-mil walkway	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Approx. Length Welded	Start Time	Seam Initials	Machine #	Temp Setting	Speed Setting	Destructive test	Monitored By
4/10/2021	P5/EW	22	1630	JV	50397	500	500	--	MZ
4/10/2021	P4/EW	22	1630	JV	50397	500	500	--	MZ

Appendix C4

Geomembrane Seam Pressure Tests

DBS&A
Daniel B. Stephens & Associates, Inc.

FML SEAM PRESSURE TEST LOG

Project Specifications
Min Start psi: 35
Test Duration: 5 min.
Max pressure drop: 5 psi

PROJECT NAME: Sundance West, Pond 5
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Tester Initials	Time		Pressure (psi)		Observed By	Pass/Fail
			Start	Finish	Start	Finish		
4/1/2021	P1/P2	AH	1020	1025	37	35	MZ	Pass
4/1/2021	P2/P3	AH	1026	1031	35	35	MZ	Pass
4/1/2021	P3/P4	AH	1039	1044	35	34	MZ	Pass
4/1/2021	P1/P2	AH	1050	1055	35	35	MZ	Pass
4/1/2021	P2/P3	AH	1026	1031	35	35	MZ	Pass
4/1/2021	P3/P4	AH	1039	1044	35	35	MZ	Pass
4/2/2021	P4/P5	AH	0816	0821	35	35	MZ	Pass
4/2/2021	P5/P6	AH	0820	0825	35	35	MZ	Pass
4/2/2021	P6/P7	AH	0823	0828	35	35	MZ	Pass
4/2/2021	P7/P8	AH	0828	0833	35	35	MZ	Pass
4/2/2021	P8/P9	AH	0830	0835	35	35	MZ	Pass
4/2/2021	P11/P13	AH	0909	0914	35	35	MZ	Pass
4/2/2021	P13/P14	AH	0909	0914	35	35	MZ	Pass
4/2/2021	P11/P14	AH	0931	0936	35	35	MZ	Pass
4/2/2021	P12/P14	AH	0933	0938	35	35	MZ	Pass
4/2/2021	P11/P12	AH	0931	0936	35	35	MZ	Pass
4/2/2021	P10/P11	AH	0943	0948	35	35	MZ	Pass
4/2/2021	P9/P10	AH	0948	0953	35	35	MZ	Pass
4/2/2021	P10/P12	AH	0943	0948	35	35	MZ	Pass
4/2/2021	P11/P12	AH	0943	0948	35	35	MZ	Pass
4/3/2021	P13/P15	AH	0835	0840	35	35	MZ	Pass
4/3/2021	P14/P15	AH	0835	0840	35	35	MZ	Pass
4/3/2021	P15/P16	AH	0830	0835	35	35	MZ	Pass
4/3/2021	P16/P18	AH	0843	0848	35	35	MZ	Pass
4/3/2021	P16/P17	AH	0843	0848	35	35	MZ	Pass
4/3/2021	P18/P17	AH	0843	0848	35	35	MZ	Pass
4/3/2021	P19/P18	AH	0850	0855	35	35	MZ	Pass
4/3/2021	P20/P19	AH	0852	0857	35	35	MZ	Pass
4/3/2021	P21/P20	AH	0852	0857	38	36	MZ	Pass
4/3/2021	P22/P21	AH	0923	0928	37	37	MZ	Pass
4/3/2021	P23/P22	AH	0923	0928	35	35	MZ	Pass
4/3/2021	P24/P23	AH	0924	0929	35	35	MZ	Pass
4/3/2021	P25/P24	AH	0937	0942	35	35	MZ	Pass
4/3/2021	P26/P25	AH	0937	0942	35	35	MZ	Pass
4/3/2021	P27/P26	AH	0938	0943	35	35	MZ	Pass
4/3/2021	P28/P27	AH	0948	0953	35	35	MZ	Pass
4/3/2021	P29/P28	AH	1029	1034	35	35	MZ	Pass
4/3/2021	P31/P28	AH	1038	1043	35	35	MZ	Pass
4/3/2021	P30/P29	AH	1038	1043	35	35	MZ	Pass

FML SEAM PRESSURE TEST LOG

Project Specifications
Min Start psi: 35
Test Duration: 5 min.
Max pressure drop: 5 psi

PROJECT NAME: Sundance West, Pond 5
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Tester Initials	Time		Pressure (psi)		Observed By	Pass/Fail
			Start	Finish	Start	Finish		
4/3/2021	P30/P31	AH	0927	0932	35	35	MZ	Pass
4/3/2021	P29/P31	AH	1038	1043	35	35	MZ	Pass
4/3/2021	P31/P17	AH	1028	1033	35	35	MZ	Pass
4/3/2021	P27/P17	AH	1243	1248	35	35	MZ	Pass
4/3/2021	P26/P17	AH	1243	1248	35	35	MZ	Pass
4/3/2021	P25/P17	AH	1250	1255	35	35	MZ	Pass
4/3/2021	P25/P17	AH	1250	1255	35	35	MZ	Pass
4/3/2021	P24/P17	AH	1256	1301	35	35	MZ	Pass
4/3/2021	P24/P17	AH	1256	1301	35	35	MZ	Pass
4/3/2021	P23/P17	AH	1302	1307	35	35	MZ	Pass
4/3/2021	P22/P17 - P18/P17	AH	1302	1307	35	35	MZ	Pass
4/3/2021	P22/P18	AH	1308	1313	35	35	MZ	Pass
4/3/2021	P21/P18	AH	1308	1313	35	35	MZ	Pass
4/4/2021	P32/P33	AH	1245	1250	35	35	MZ	Pass
4/4/2021	P33/P34	AH	1245	1250	35	35	MZ	Pass
4/4/2021	P34/P35	AH	1253	1258	35	35	MZ	Pass
4/4/2021	P32/P35	AH	1253	1258	35	35	MZ	Pass
4/4/2021	P32/P34	AH	1253	1258	35	35	MZ	Pass
4/4/2021	P35/P36	AH	1301	1306	35	35	MZ	Pass
4/4/2021	P36/P37	AH	1301	1306	35	35	MZ	Pass
4/4/2021	P37/P38	AH	1301	1306	35	35	MZ	Pass
4/4/2021	P38/P39	AH	1323	1328	35	35	MZ	Pass
4/4/2021	P39/P40	AH	1323	1328	35	35	MZ	Pass
4/4/2021	P40/P41	AH	1323	1328	35	35	MZ	Pass
4/4/2021	P41/P42	AH	1328	1333	35	35	MZ	Pass
4/4/2021	P42/P43	AH	1328	1333	35	35	MZ	Pass
4/5/2021	P43/P45	AH	0645	0650	35	35	MZ	Pass
4/5/2021	P43/P44	AH	0645	0650	35	35	MZ	Pass
4/5/2021	P44/P45	AH	0645	0650	35	35	MZ	Pass
4/5/2021	P32/P1	AH	0733	0738	35	35	MZ	Pass
4/5/2021	P42/P45	AH	0647	0653	35	35	MZ	Pass
4/5/2021	P35/P1	AH	0733	0738	35	35	MZ	Pass
4/5/2021	P45/P1	AH	0656	0701	35	35	MZ	Pass
4/5/2021	P41/P1	AH	0715	0721	35	35	MZ	Pass
4/5/2021	P40/P1	AH	0715	0721	35	35	MZ	Pass
4/5/2021	P39/P1	AH	0723	0728	35	35	MZ	Pass
4/5/2021	P38/P1	AH	0723	0728	35	35	MZ	Pass
4/5/2021	P37/P1	AH	0726	0731	35	35	MZ	Pass
4/5/2021	P36/P1	AH	0733	0738	35	35	MZ	Pass

FML SEAM PRESSURE TEST LOG

Project Specifications
Min Start psi: 35
Test Duration: 5 min.
Max pressure drop: 3 psi

PROJECT NAME: Sundance West, Pond 6
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Tester Initials	Time		Pressure (psi)		Observed By	Pass/Fail
			Start	Finish	Start	Finish		
4/7/2021	P2/P1	AH	0755	0800	35	35	GMH	Pass
4/7/2021	P3/P2	AH	0755	0800	35	35	GMH	Pass
4/7/2021	P4/P3	AH	0755	0800	35	35	GMH	Pass
4/7/2021	P5/P4	AH	0808	0815	35	35	GMH	Pass
4/7/2021	P6/P5	AH	0828	0833	35	35	GMH	Pass
4/7/2021	P7/P6	AH	0828	0833	35	35	GMH	Pass
4/7/2021	P7/P8	AH	0848	0853	35	35	GMH	Pass
4/7/2021	P8/P9	AH	0857	0902	35	35	GMH	Pass
4/7/2021	P9/P10	AH	0925	0930	35	35	GMH	Pass
4/8/2021	P10/P11	AH	0715	0720	35	35	GMH	Pass
4/8/2021	P12/P11	AH	0717	0722	35	35	GMH	Pass
4/8/2021	P12/P13	AH	0728	0733	35	35	GMH	Pass
4/8/2021	P14/P13	AH	0805	0810	35	35	GMH	Fail, Patch
4/8/2021	P15/P14	AH	0817	0822	35	35	GMH	Pass
4/8/2021	P16/P14	AH	0817	0822	35	35	GMH	Pass
4/8/2021	P16/P15	AH	0817	0822	35	35	GMH	Pass
4/8/2021	P14/P13	AH	0728	0733	35	35	GMH	Pass
4/8/2021	P17/P15	AH	0740	0745	35	35	GMH	Pass
4/8/2021	P18/P17	AH	0910	0915	35	35	GMH	Pass
4/8/2021	P19/P18	AH	0910	0915	35	35	GMH	Pass
4/8/2021	P20/P19	AH	0912	0917	35	35	GMH	Pass
4/8/2021	P21/P20	AH	0913	0918	35	35	GMH	Pass
4/8/2021	P22/P21	AH	0915	0920	35	35	GMH	Pass
4/8/2021	P23/P22	AH	0920	0925	35	35	GMH	Pass
4/8/2021	P24/P23	AH	0920	0925	35	35	GMH	Pass
4/8/2021	P25/P24	AH	0920	0925	35	35	GMH	Pass
4/8/2021	P26/P25	AH	0928	0933	35	35	GMH	Pass
4/8/2021	P27/P26	AH	0928	0933	35	35	GMH	Pass
4/8/2021	P28/P27	AH	0928	0933	35	35	GMH	Pass
4/8/2021	P29/P28	AH	0933	0938	35	35	GMH	Pass
4/8/2021	P29/P27	AH	0933	0938	35	35	GMH	Pass
4/8/2021	P29/P26	AH	0933	0938	35	35	GMH	Pass
4/8/2021	P29/P16	AH	0823	0828	35	35	GMH	Pass
4/8/2021	P19/P17	AH	0910	0915	35	35	GMH	Pass
4/8/2021	P1/P30	AH	1328	1333	35	35	GMH	Pass
4/8/2021	P31/P30	AH	1333	1338	35	35	GMH	Pass
4/8/2021	P31/P32	AH	1333	1338	35	35	GMH	Pass
4/8/2021	P30/P33	AH	1333	1338	35	35	GMH	Pass
4/8/2021	P32/P33	AH	1333	1338	35	35	GMH	Pass
4/8/2021	P33/P34	AH	1355	1400	35	35	GMH	Pass

FML SEAM PRESSURE TEST LOG

Project Specifications
Min Start psi: 35
Test Duration: 5 min.
Max pressure drop: 3 psi

PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Tester Initials	Time		Pressure (psi)		Observed By	Pass/Fail
			Start	Finish	Start	Finish		
4/8/2021	P31/P33	AH	1333	1338	35	35	GMH	Pass
4/8/2021	P34/P35	AH	1348	1353	35	35	GMH	Pass
4/8/2021	P35/P36	AH	1346	1351	35	35	GMH	Pass
4/8/2021	P36/P37	AH	1345	1350	35	35	GMH	Pass
4/8/2021	P37/P38	AH	1405	1410	35	35	GMH	Pass
4/8/2021	P38/P39	AH	1406	1411	35	35	GMH	Pass
4/8/2021	P39/P40	AH	1406	1411	35	35	GMH	Pass
4/8/2021	P40/P41	AH	1406	1411	35	35	GMH	Pass
4/8/2021	P41/P42	AH	1410	1415	35	35	GMH	Pass
4/8/2021	P42/P43	AH	1410	1415	35	35	GMH	Pass
4/8/2021	P43/P1	AH	1410	1415	35	35	GMH	Pass
4/9/2021	P34/P1	AH	0733	0738	35	35	MZ	Pass
4/9/2021	P35/P1	AH	0728	0733	35	35	MZ	Pass
4/9/2021	P36/P1	AH	0728	0733	35	35	MZ	Pass
4/9/2021	P37/P1	AH	0711	0716	35	35	MZ	Pass
4/9/2021	P38/P1	AH	0711	0716	35	35	MZ	Pass
4/9/2021	P39/P1	AH	0703	0708	35	35	MZ	Pass
4/9/2021	P40/P1	AH	0703	0708	35	35	MZ	Pass
4/9/2021	P20/P15	AH	0802	0807	35	35	MZ	Pass
4/9/2021	P21/P15	AH	0802	0807	35	35	MZ	Pass
4/9/2021	P22/P15	AH	0808	0813	35	35	MZ	Pass
4/9/2021	P23/P15	AH	0808	0813	35	35	MZ	Pass
4/9/2021	P24/P15	AH	0814	0819	35	35	MZ	Pass
4/9/2021	P25/P15	AH	0814	0819	35	35	MZ	Pass
4/9/2021	P26/P16	AH	0820	0825	35	35	MZ	Pass
4/9/2021	P29/P16	AH	0820	0825	35	35	MZ	Fail, Patch
4/9/2021	P29/P16	AH	0823	0828	35	35	MZ	Pass

FML SEAM PRESSURE TEST LOG

Project Specifications
Min Start psi: 35
Test Duration: 5 min.
Max pressure drop: 5 psi

PROJECT NAME: Sundance West, 40-mil
PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00
INSTALLED BY: Mustang Extreme

Date	Panel #s Top-Bottom	Tester Initials	Time		Pressure (psi)		Observed By	Pass/Fail
			Start	Finish	Start	Finish		
4/10/2021	P3/P1	AH	0920	0925	35	35	MZ	Pass
4/10/2021	P4/P2	AH	0920	0925	35	35	MZ	Pass
4/10/2021	P1/P2	AH	0920	0925	35	35	MZ	Pass
4/10/2021	P3/P4	AH	0920	0925	35	35	MZ	Pass
4/10/2021	P1/P2 Patch	AH	0930	0935	35	35	MZ	Pass

Appendix C5

Geomembrane Repair Logs

DBS&A
Daniel B. Stephens & Associates, Inc.

Appendix C5. FML Seam Vacuum Test and Repair Log

PROJECT NAME: Sundance West, Pond 5 PROJECT LOCATION: Eunice, NM

PROJECT NUMBER: DB18.1209.00 INSTALLED BY: Mustang Extreme

Repair #	Repair Date	Panel #s Top-Bottom	Type of Repair	Patch Size (ft)	Repair Tech	Number of Leaks	Testing Tech	Date Accepted	Observed By
R1	4/1/2021	P2/P1	Seam	2x2	JV	0	WC	4/1/221	GMH
R2	4/2/2021	P1/ES	DT-2	2x5	JV	0	WC	4/2/2021	GMH
R3	4/1/2021	P1/P2/ES	T-Seam	2x2	JV	0	WC	4/1/2021	GMH
R4	4/2/2021	P2/P3	DT-1	2x5	FC	0	WC	4/2/2021	GMH
R5	4/2/2021	P5/P6	DT-3	2x5	FC	0	WC	4/2/2021	GMH
R6	4/2/2021	P6/P7	Seam	2x2	FC	1 (fixed)	WC	4/2/2021	GMH
R7	4/2/2021	P7/P8	DT-4	2x5	FC	0	WC	4/2/2021	GMH
R8	4/2/2021	P9/P10	DT-5	2x5	FC	0	WC	4/2/2021	GMH
R9	4/2/2021	P11/P12/P10	T-Seam	3x4	FC	0	WC	4/2/2021	GMH
R10	4/2/2021	P11/P12	DT-6	2x5	FC	0	WC	4/2/2021	GMH
R11	4/2/2021	P11/P12/P14	T-Seam	2x3	FC	0	WC	4/2/2021	GMH
R12	4/2/2021	P11/P13/P14	T-Seam	2x3	JV	0	WC	4/2/2021	GMH
R13	4/3/2021	P13/P14/P15	T-Seam	3x3	JV	0	WC	4/3/2021	GMH
R14	4/3/2021	P13/P5/ES	T-Seam	2x2	JV	0	WC	4/3/2021	GMH
R15	4/5/2021	P29/P31/P30	T-Seam	2x2	JV	0	WC	4/5/2021	GMH
R16	4/5/2021	P29/P28/P31	T-Seam	2x2	JV	0	WC	4/5/2021	GMH
R17	4/5/2021	P17/P31/P28/P21	T-Seam	2x2	JV	0	WC	4/5/2021	GMH
R18	4/5/2021	P27/P26/P17	T-Seam	2x5	JV	1 (fixed)	WC	4/5/2021	GMH
R19	4/5/2021	P26/P25/P17	T-Seam	2x2	JV	0	WC	4/5/2021	GMH
R20	4/5/2021	P25/P17	Seam	2x2	JV	0	WC	4/5/2021	GMH
R21	4/5/2021	P25/P24/P17	T-Seam	2x3	JV	1 (fixed)	WC	4/5/2021	GMH
R22	4/5/2021	P24/P17	T-Seam	2x3	JV	0	WC	4/5/2021	GMH
R23	4/5/2021	P24/P17	DT-9	3x5	FC	0	WC	4/5/2021	GMH
R24	4/5/2021	P24/P23/P17	T-Seam	2x2	FC	0	WC	4/5/2021	GMH
R25	4/5/2021	P23/P22/P17	T-Seam	2x2	FC	0	WC	4/5/2021	GMH
R26	4/5/2021	P22/P18/P17	T-Seam	4x5	FC	0	WC	4/5/2021	GMH
R27	4/5/2021	P22/P21/P18	T-Seam	2x2	FC	0	WC	4/5/2021	GMH
R28	4/5/2021	P21/P22	DT-8	2x5	FC	0	WC	4/5/2021	GMH
R29	4/5/2021	P18/P20/P21	T-Seam	3x5	FC	0	WC	4/5/2021	GMH
R30	4/5/2021	P15/P16	DT-7	2x5	FC	0	WC	4/5/2021	GMH
R31	4/4/2021	P19/P20	T-Seam	4x9	FC	0	WC	4/4/2021	GMH
R32	4/4/2021	P19/P20	T-Seam	4x4	FC	0	WC	4/5/2021	GMH
R33	4/5/2021	P6/EN	DT-10	2x5	FC	0	WC	4/5/2021	GMH
R34	4/5/2021	P43/P44/P45	T-Seam	2x3	FC	0	WC	4/5/2021	GMH
R35	4/5/2021	P42/P43/P45	T-Seam	2x2	FC	0	WC	4/5/2021	GMH
R36	4/5/2021	P45/P1	Seam	4x7	FC	0	WC	4/5/2021	GMH
R37	4/5/2021	P40/P41/P42/P43/P1	Cap	3x28	FC	0	WC	4/5/2021	GMH
R38	4/5/2021	P40/P1	Seam	2x2	FC	0	WC	4/5/2021	GMH
R39	4/5/2021	P39/P40/P1	T-Seam	2x2	FC	0	WC	4/5/2021	GMH
R40	4/5/2021	P38/P39/P1	T-Seam	2x2	JV	1 (fixed)	WC	4/5/2021	GMH
R41	4/5/2021	P37/P38/P1	T-Seam	2x3	JV	0	WC	4/5/2021	GMH
R42	4/5/2021	P37/P36/P1	T-Seam	2x2	JV	1 (fixed)	WC	4/5/2021	GMH
R43	4/5/2021	P36/P1	Seam	2x2	JV	0	WC	4/5/2021	GMH
R44	4/5/2021	P35/P36/P1	T-Seam	2x2	JV	0	WC	4/5/2021	GMH
R45	4/5/2021	P1/P32/P35	T-Seam	3x8	JV	0	WC	4/5/2021	GMH

Appendix C5. FML Seam Vacuum Test and Repair Log

PROJECT NAME: Sundance West, Pond 5 PROJECT LOCATION: Eunice, NM

PROJECT NUMBER: DB18.1209.00 INSTALLED BY: Mustang Extreme

Repair #	Repair Date	Panel #s Top-Bottom	Type of Repair	Patch Size (ft)	Repair Tech	Number of Leaks	Testing Tech	Date Accepted	Observed By
R46	4/5/2021	P32/P34/P35	T-Seam	2x2	JV	0	WC	4/5/2021	GMH
R47	4/5/2021	P34/P33/P32	T-Seam	2x2	JV	0	WC	4/5/2021	GMH
R48	4/5/2021	P41/EE	DT-11	2x5	JV	1	WC	4/6/2021	GMH

Appendix C5. FML Seam Vacuum Test and Repair Log

PROJECT NAME: Sundance West, Pond 6 PROJECT LOCATION: Eunice, NM

PROJECT NUMBER: DB18.1209.00 INSTALLED BY: Mustang Extreme

Repair #	Repair Date	Panel #s Top-Bottom	Type of Repair	Patch Size (ft)	Repair Tech	Number of Leaks	Testing Tech	Date Accepted	Observed By
R1	4/9/2021	P32/EE	DT-11	5x15	JV	0	WC	4/9/2021	MZ
R2	4/9/2021	P30/P31/P32/P33	Y-Seam	4.5x2	FC	0	WC	4/9/2021	MZ
R3	4/9/2021	P1/P30/P33/P34	Y-Seam	5x5	FC	0	WC	4/9/2021	MZ
R4	4/9/2021	P34/P35/P1	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R5	4/9/2021	P35/P36/P1	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R6	4/9/2021	P36/P37/P1	T-Seam	2x2	FC	1 (fixed)	WC	4/10/2021	MZ
R7	4/9/2021	P37/P38/P1	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R8	4/9/2021	P38/P39/P1	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R9	4/9/2021	P39/P40/P1	T-Seam	2x2	FC	1 (fixed)	WC	4/10/2021	MZ
R10	4/9/2021	P40/P43/P1	Y-Seam	4x3.5	FC	0	WC	4/9/2021	MZ
R11	4/9/2021	P40/P41/P43	Y-Seam	2x2	FC	0	WC	4/9/2021	MZ
R12	4/9/2021	P41/P42/P43	Y-Seam	2x2	FC	0	WC	4/9/2021	MZ
R13	4/9/2021	P42/P43	DT-10	5x2	FC	0	WC	4/9/2021	MZ
R14	4/9/2021	P2/P3	DT-2	4x2	FC	0	WC	4/9/2021	MZ
R15	4/9/2021	P5/P6	DT-3	2x4	FC	0	WC	4/9/2021	MZ
R16	4/9/2021	P2/P1	DT-1	2x4	FC	0	WC	4/9/2021	MZ
R17	4/9/2021	P7/EN	DT-5	2x4	FC	0	WC	4/9/2021	MZ
R18	4/9/2021	P8/P9	DT-4	2x4	FC	1 (fixed)	WC	4/10/2021	MZ
R19	4/9/2021	P11/P12	DT-6	2x4	FC	0	WC	4/9/2021	MZ
R20	4/9/2021	P13/P14	DT-7	2x4	FC	0	WC	4/9/2021	MZ
R21	4/9/2021	P16/P29	Seam	4x15	FC	1 (fixed)	WC	4/10/2021	MZ
R22	4/9/2021	P29/P28/P27	Y-Seam	1x1	FC	0	WC	4/9/2021	MZ
R23	4/9/2021	P29/P27/P26	Y-Seam	2x2	FC	0	WC	4/9/2021	MZ
R24	4/9/2021	P16/P29/P26	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R25	4/9/2021	P26/P25/P16/P15	T-Seam	2x4	FC	0	WC	4/9/2021	MZ
R26	4/9/2021	P16/P15/P14	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R27	4/9/2021	P25/P24/P15	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R28	4/9/2021	P24/P23/P15	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R29	4/9/2021	P23/P22/P15	T-Seam	2x2	FC	1 (fixed)	WC	4/10/2021	MZ
R30	4/9/2021	P22/P21/P15	T-Seam	2x3	FC	0	WC	4/9/2021	MZ
R31	4/9/2021	P21/P15	DT-8	2x4	FC	0	WC	4/9/2021	MZ
R32	4/9/2021	P21/P20/P15	T-Seam	2x2	FC	0	WC	4/9/2021	MZ
R33	4/9/2021	P20/P19/P17/P15	Y-Seam	2x2	FC	0	WC	4/9/2021	MZ
R34	4/9/2021	P19/P18/P17	Y-Seam	2x3	FC	0	WC	4/9/2021	MZ
R35	4/9/2021	P17/EN	Seam	2x2	FC	0	WC	4/9/2021	MZ
R36	4/9/2021	P16/ES	DT-9	2x4	FC	0	WC	4/9/2021	MZ
R37	4/9/2021	P14/P13	Seam	2x2	FC	0	WC	4/9/2021	MZ

Appendix C5. FML Seam Vacuum Test and Repair Log

PROJECT NAME: Sundance West, 40-mil walkway PROJECT LOCATION: Eunice, NM

PROJECT NUMBER: DB18.1209.00 INSTALLED BY: Mustang Extreme

Repair #	Repair Date	Panel #s Top-Bottom	Type of Repair	Patch Size (ft)	Repair Tech	Number of Leaks	Testing Tech	Date Accepted	Observed By
R1	4/10/2021	P1/P2	T-Seam	2x2	JV	0	WC	4/12/2021	MZ
R2	4/10/2021	P1/P2	DT-1	2x5	FC	0	WC	4/13/2021	MZ
R3	4/10/2021	P1/P2	Seam	2x2	FC	0	WC	4/14/2021	MZ
R4	4/10/2021	P1/P2/P3/P4	Cross seam	2x2	FC	0	WC	4/15/2021	MZ

Appendix C6

Destructive Test Results

DBS&A
Daniel B. Stephens & Associates, Inc.

TESTING, RESEARCH, CONSULTING AND FIELD SERVICES
AUSTIN, TX - USA | ANAHEIM, CA - USA | ANDERSON, SC - USA | GOLD COAST - AUSTRALIA | SUZHOU - CHINA

Date: 2021-04-06

Mail To:
Monica Peine
Mustang Extreme Enviromental Service

, ,

e-mail:mpeine@mustangextreme.com

Bill To:

Mustang Extreme Enviromental Service

Dear Ms. Peine,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Sundance West**
TRI Job Reference Number:	**62875**
Material(s) Tested:	(5) Heat Fusion Weld Seam(s) (1) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Kendall Villarreal
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 62875

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	106	116	98	112	**110**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	128	130	107	127	131	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	158	156	156	154	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-3 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	124	125	129	131	125	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	119	123	106	133	131	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	158	154	152	152	151	**153**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 62875

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-4 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	126	117	129	120	125	**123**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	115	116	122	122	116	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	159	155	155	155	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-5 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	131	131	129	133	135	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	114	117	117	117	129	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	158	154	154	151	**155**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 62875

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-6 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	122	116	125	113	126	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	112	104	112	100	122	**110**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	152	158	148	147	145	**150**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 62875

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-2 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	129	150	132	142	116	**134**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	163	164	163	164	165	**164**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

TESTING, RESEARCH, CONSULTING AND FIELD SERVICES
AUSTIN, TX - USA | ANAHEIM, CA - USA | ANDERSON, SC - USA | GOLD COAST - AUSTRALIA | SUZHOU - CHINA

Date: 2021-04-09

Mail To:
Monica Peine
Mustang Extreme Enviromental Service

, ,

e-mail:mpeine@mustangextreme.com

Bill To:

Mustang Extreme Enviromental Service

Dear Ms. Peine,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Sundance West**
TRI Job Reference Number:	**62964**
Material(s) Tested:	(3) Heat Fusion Weld Seam(s) (2) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Kendall Villarreal
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 62964

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-7 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	99	92	99	104	92	**97**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	123	112	114	119	116	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	159	150	154	150	**154**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-8 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	118	126	116	124	126	**122**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	109	118	135	126	113	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	154	154	153	156	157	**155**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 62964

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-9 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	120	130	132	126	127	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	126	131	128	144	130	**132**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	144	146	146	148	146	**146**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 62964

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-10 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	92	94	91	90	93	**92**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	164	158	161	162	162	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-11 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	131	131	140	124	131	**131**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	149	159	155	154	146	**153**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

TESTING, RESEARCH, CONSULTING AND FIELD SERVICES
AUSTIN, TX - USA | ANAHEIM, CA - USA | ANDERSON, SC - USA | GOLD COAST - AUSTRALIA | SUZHOU - CHINA

Date: 2021-04-15

Mail To:
Monica Peine
Mustang Extreme Enviromental Service

, ,

e-mail:mpeine@mustangextreme.com

Bill To:

Mustang Extreme Enviromental Service

Dear Ms. Peine,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Sundance West**
TRI Job Reference Number:	**63098**
Material(s) Tested:	(8) Heat Fusion Weld Seam(s) (3) Single Extrusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Patricia Zabaleta
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 63098

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	139	105	108	136	139	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	106	128	105	84	105	**106**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	157	156	155	154	**157**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-2 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	120	116	119	120	110	**117**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	99	94	113	115	91	**102**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	159	158	155	152	154	**156**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 63098

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-3 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	133	134	115	123	131	**127**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	106	106	111	105	104	**106**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	160	156	151	154	153	**155**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-4 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	116	117	116	108	114	**114**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	110	120	117	119	120	**117**
Peel Incursion (%)	40	<5	<5	<5	<5	
Peel Locus Of Failure Code	AD-BRK	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	157	163	158	156	159	**159**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 63098

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-6 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	103	137	117	122	113	**118**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	128	120	126	121	105	**120**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	156	158	158	163	163	**160**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-7 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	102	109	112	106	113	**108**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	112	131	120	113	119	**119**
Peel Incursion (%)	<5	<5	90	<5	90	
Peel Locus Of Failure Code	SE	SE	AD-BRK	SE	AD-BRK	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	161	161	157	156	155	**158**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 63098

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-8 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	105	121	124	131	123	**121**
Peel Incursion (%)	90	<5	<5	<5	<5	
Peel Locus Of Failure Code	AD-BRK	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	117	127	111	123	119	**119**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	153	147	151	150	148	**150**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-10 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	109	109	108	112	107	**109**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	139	120	119	125	121	**125**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	159	159	162	165	**161**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS - SINGLE TRACK
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 60 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 63098

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-5 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	131	131	134	145	145	**137**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	162	151	155	156	158	**156**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-9 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	166	160	159	164	150	**160**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	155	157	162	158	158	**158**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID: DT-11 | Weld: Single Extrusion						
Side: Peel						**Peel**
Peel Strength (ppi)	134	110	143	113	132	**126**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	145	152	151	146	145	**148**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

TESTING, RESEARCH, CONSULTING AND FIELD SERVICES
AUSTIN, TX - USA | ANAHEIM, CA - USA | ANDERSON, SC - USA | GOLD COAST - AUSTRALIA | SUZHOU - CHINA

Date: 2021-04-15

Mail To:
Monica Peine
Mustang Extreme Enviromental Service

, ,

e-mail:mpeine@mustangextreme.com

Bill To:

Mustang Extreme Enviromental Service

Dear Ms. Peine,

Thank you for consulting with TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Sundance West**
TRI Job Reference Number:	**63099**
Material(s) Tested:	(1) Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)

Codes:	
AD	Adhesion Failure (100% Peel)
BRK	Break in sheeting away from Seam edge.
SE	Break in sheeting at edge of seam.
AD-BRK	Break in sheeting after some adhesion failure - partial peel.
SIP	Separation in the plane of the sheet (leaving the bond intact).
FTB	Film tearing bond (all non "AD" failures).
NON-FTB	100% peel.

If you have any questions or require any additional information, please call us at 1-800-880-8378.
Sincerely,

Patricia Zabaleta
Project Manager
Geosynthetic Services Division
http://www.geosyntheticstestinc.com

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS
TRI Client: Mustang Extreme Enviromental Service
Project: Sundance West

Material: 40 mil. HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54/882 mod.)
TRI Log#: 63099

	TEST REPLICATE NUMBER					
PARAMETER	1	2	3	4	5	MEAN
Sample ID: DT-1 | Weld: Heat Fusion						
Side: A						**Peel A**
Peel Strength (ppi)	86	86	96	112	90	**94**
Peel Incursion (%)	30	30	<5	<5	35	
Peel Locus Of Failure Code	AD-BRK	AD-BRK	SE	SE	AD-BRK	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side: B						**Peel B**
Peel Strength (ppi)	101	103	107	103	103	**103**
Peel Incursion (%)	<5	<5	<5	<5	<5	
Peel Locus Of Failure Code	SE	SE	SE	SE	SE	
Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Shear						**Shear**
Shear Strength (ppi)	125	125	124	128	127	**126**
Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

Appendix D

FML Certifications

Appendix D1

60-mil Geomembrane Certifications

SOLMAX

LIST OF GEOMEMBRANE ROLLS

SOLMAX APPROVED QUALITY ASSURANCE

PROJECT NUMBER: 304128

REFERENCE NUMBER: SO-091600

PACKING SLIP NUMBER: Pre-SO-091600-2

PROJECT NAME : EUNICE PROJECT

ROLL NUMBER	RESIN LOT NUMBER	MANUFACT. DATE	RESIN MELT INDEX 190/2.16 g/10 min D1238	RESIN DENSITY g/cc D1505	OIT min D3895	HPOIT min D5885	ESCR SP-NCTL hours D5397
Product Code : 1102198							
HDPE 7000 60 mil Black Smooth			**1.0**	**> 0.932**	**100**		**500**
0102-200107	D661L1RL3B	2021-03-21	0.09	0.936	120		>500 Certified 0102-200104
0102-200108	D661L1RL3B	2021-03-21	0.09	0.936	120		>500 Certified 0102-200104
0102-200109	D661L1RL3B	2021-03-21	0.09	0.936	120		>500 Certified 0102-200104
0102-200110	D661L1RL3B	2021-03-21	0.09	0.936	120		>500 Certified 0102-200104
0102-200111	D661L1RL3B	2021-03-21	0.09	0.936	120		>500 Certified 0102-200104
0102-200112	D661L1RL3C	2021-03-21	0.09	0.936	120		>500 Certified 0102-200114
0102-200113	D661L1RL3C	2021-03-21	0.09	0.936	120		>500 Certified 0102-200114
0102-200114	D661L1RL3C	2021-03-21	0.09	0.936	120		>500 Certified 0102-200114
0102-200115	D661L1RL3C	2021-03-21	0.09	0.936	120		>500 Certified 0102-200114
0102-200116	D661L1RL3C	2021-03-21	0.09	0.936	120		>500 Certified 0102-200114
0102-200117	D661L1RL3C	2021-03-22	0.09	0.936	120		>500 Certified 0102-200114
0102-200118	D661L1RL3C	2021-03-22	0.09	0.936	120		>500 Certified 0102-200114
0102-200119	D661L1RL3C	2021-03-22	0.09	0.936	120		>500 Certified 0102-200114
0102-200120	D661L1RL3C	2021-03-22	0.09	0.936	120		>500 Certified 0102-200114
0102-200121	D661L1RL3C	2021-03-22	0.09	0.936	120		>500 Certified 0102-200114
0102-200122	D661L1RL3C	2021-03-22	0.09	0.936	120		>500 Certified 0102-200114

Solmax Geosynthetics LLC
19103 GUNDLE RD,, HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM

SOLMAX

LIST OF GEOMEMBRANE ROLLS

SOLMAX APPROVED QUALITY ASSURANCE

PROJECT NUMBER: 304128

REFERENCE NUMBER: SO-091600

PACKING SLIP NUMBER: Pre-SO-091600-2

PROJECT NAME : EUNICE PROJECT

QUANTITY (ROLLS): 16

Solmax Geosynthetics LLC
19103 GUNDLE RD,, HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM

SOLMAX

MANUFACTURING QUALITY CONTROL

SOLMAX APPROVED QUALITY ASSURANCE

TEST RESULTS - ROLLS

PROJECT NUMBER: 304128

REFERENCE NUMBER: SO-091600

PACKING SLIP NUMBER: Pre-SO-091600-2

PROJECT NAME : EUNICE PROJECT

PRODUCT: 1102198
HDPE 7000 60 mil Black Smooth

Properties	Thickness average	GeoM Density	Carbon Black Content	Carbon Black Dispersion	Tensile Yield Strength	Tensile Yield Elong.	Tensile Break Strength	Tensile Break Elong.	Tear Resist.	Puncture Resist.	Dimension Stability	Asperity Height In/Out
Unit	mils	g/cc	%	Cat 1 and 2	ppi	%	ppi	%	lbs	lbs	%	mils
Test Method	D5199	D792	D4218	D5596	D6693				D1004	D4833	D1204	
Frequency	Each roll	1/Batch	Every 2 rolls	Every 10 rolls	Every 5 rolls				Every 10 rolls	Every 10 rolls		
Specification	54.0	≥ 0.940	2.0 - 3.0	Cat. 1 & Cat. 2	126	12	228	700	38	108		
0102-200107 MD	57.6	0.947	2.46	10/10 views	182.8	20.0	323	774	45	151		
XD					221.6	17.8	366	878	49			
0102-200108 MD	56.8	0.947	2.46	10/10 views	182.8	20.0	323	774	45	151		
XD					221.6	17.8	366	878	49			
0102-200109 MD	58.6	0.947	2.49	10/10 views	155.9	19.8	289	792	45	151		
XD					160.5	16.9	294	861	49			
0102-200110 MD	57.8	0.947	2.49	10/10 views	155.9	19.8	289	792	45	151		
XD					160.5	16.9	294	861	49			
0102-200111 MD	57.6	0.947	2.52	10/10 views	155.9	19.8	289	792	45	151		
XD					160.5	16.9	294	861	49			
0102-200112 MD	58.0	0.947	2.52	10/10 views	145.4	19.8	299	842	45	151		
XD					154.2	16.9	310	925	49			
0102-200113 MD	57.8	0.947	2.42	10/10 views	145.4	19.8	299	842	45	151		
XD					154.2	16.9	310	925	49			
0102-200114 MD	56.5	0.947	2.42	10/10 views	145.4	19.8	299	842	45	151		
XD					154.2	16.9	310	925	49			
0102-200115 MD	57.1	0.947	2.48	10/10 views	145.4	19.8	299	842	45	151		
XD					154.2	16.9	310	925	49			
0102-200116 MD	56.4	0.947	2.51	10/10 views	145.4	19.8	299	842	45	151		
XD					154.2	16.9	310	925	49			
0102-200117 MD	57.2	0.947	2.55	10/10 views	150.8	19.4	320	906	44	147		
XD					155.2	17.1	292	865	49			
0102-200118 MD	55.9	0.947	2.55	10/10 views	150.8	19.4	320	906	44	147		
XD					155.2	17.1	292	865	49			
0102-200119 MD	55.8	0.947	2.44	10/10 views	144.5	19.0	321	947	44	147		
XD					148.2	17.4	297	895	49			
0102-200120 MD	57.3	0.947	2.44	10/10 views	144.5	19.0	321	947	44	147		
XD					148.2	17.4	297	895	49			

Solmax Geosynthetics LLC
19103 GUNDLE RD,, HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM

SOLMAX

MANUFACTURING QUALITY CONTROL

SOLMAX APPROVED QUALITY ASSURANCE

TEST RESULTS - ROLLS

PROJECT NUMBER: 304128

REFERENCE NUMBER: SO-091600

PACKING SLIP NUMBER: Pre-SO-091600-2

PROJECT NAME : EUNICE PROJECT

0102-200121	**MD**	57.5	0.947	2.38	10/10 views	146.2	21.8	286	784	44	147		
	XD					157.3	18.4	291	818	49			
0102-200122	**MD**	57.5	0.947	2.38	10/10 views	146.2	21.8	286	784	44	135		
	XD					157.3	18.4	291	818	48			

Solmax Geosynthetics LLC

19103 GUNDLE RD,, HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM

Appendix D2

40-mil Geomembrane Certifications

SOLMAX

LIST OF GEOMEMBRANE ROLLS

SOLMAX APPROVED QUALITY ASSURANCE

PROJECT NUMBER: 304128

REFERENCE NUMBER: SO-091600

PACKING SLIP NUMBER: Pre-SO-091600-1

PROJECT NAME : EUNICE PROJECT

ROLL NUMBER	RESIN LOT NUMBER	MANUFACT. DATE	RESIN MELT INDEX 190/2.16 g/10 min D1238	RESIN DENSITY g/cc D1505	OIT min D3895	HPOIT min D5885	ESCR SP-NCTL hours D5397
Product Code : 1102195							
HDPE 7000 40 mil Black Top Side Single Textured ST (top)			**1.0**	**> 0.932**	**100**		**500**
0104-201033	PMF610180	2021-03-19	0.10	0.936	120		>500 Certified 0104-201033
0104-201034	PMF610180	2021-03-19	0.10	0.936	120		>500 Certified 0104-201033

QUANTITY (ROLLS): 2

Solmax Geosynthetics LLC
19103 GUNDLE RD,, HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM

MANUFACTURING QUALITY CONTROL

TEST RESULTS - ROLLS

PROJECT NUMBER: 304128

REFERENCE NUMBER: SO-091600

PACKING SLIP NUMBER: Pre-SO-091600-1

PROJECT NAME : EUNICE PROJECT

PRODUCT: 1102195
HDPE 7000 40 mil Black Top Side Single Textured ST
(top)

Properties	Thickness average	GeoM Density	Carbon Black Content	Carbon Black Dispersion	Tensile Yield Strength	Tensile Yield Elong.	Tensile Break Strength	Tensile Break Elong.	Tear Resist.	Puncture Resist.	Dimension Stability	Asperity Height In/Out
Unit	mils	g/cc	%	Cat 1 and 2	ppi	%	ppi	%	lbs	lbs	%	mils
Test Method	D5994	D792	D4218	D5596	D6693				D1004	D4833	D1204	D7466
Frequency	Each roll	1/Batch	Every 2 rolls	Every 10 rolls	Every 5 rolls				Every 10 rolls	Every 10 rolls		Every roll
Specification	36.0	≥ 0.940	2.0 - 3.0	Cat. 1 & Cat. 2	84	12	60	100	28	60		16 / 16
0104-201033 MD	47.7	0.943	2.42	10/10 views	116.2	19.6	192	611	42	126		17.8 /
XD					125.3	17.3	162	535	37			
0104-201034 MD	45.8	0.943	2.42	10/10 views	105.9	20.3	165	549	35	124		19.9 /
XD					120.7	15.9	143	449	39			

Solmax Geosynthetics LLC
19103 GUNDLE RD,, HOUSTON, TX, UNITED STATES, 77073

SOLMAX.COM

Appendix D3

Geomembrane Receiving Log

DBS&A
Daniel B. Stephens & Associates, Inc.

Appendix D3. Geomembrane Receiving and Manufacturing/Conformance Log

Material Type	Receiving Date	Lot Number	Roll Number	Sheet Area (est. sf)	MQC Recieved Date	MQC Results (P/F)	Conformance Test Results(P/F)	Approved for Installation (Y/N)
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3B	0102-200107	11,596	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3B	0102-200108	11,596	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3B	0102-200109	11,596	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3B	0102-200110	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3B	0102-200111	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200112	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200113	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	**03/31/21**	**D661L1RL3C**	**0102-200114**	14,175	**3/22/2021**	**P**	**P**	**Y**
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200115	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200116	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200117	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	**03/31/21**	**D661L1RL3C**	**0102-200118**	14,175	**3/22/2021**	**P**	**P**	**Y**
SOLMAX 60 mil Smooth HDPE	**03/31/21**	**D661L1RL3C**	**0102-200119**	14,175	**3/22/2021**	**P**	**P**	**Y**
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200120	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200121	14,175	3/22/2021	P	N/A	Y
SOLMAX 60 mil Smooth HDPE	03/31/21	D661L1RL3C	0102-200122	14,175	3/22/2021	P	N/A	Y

Bold indicates that a conformance test was conducted for the sample.

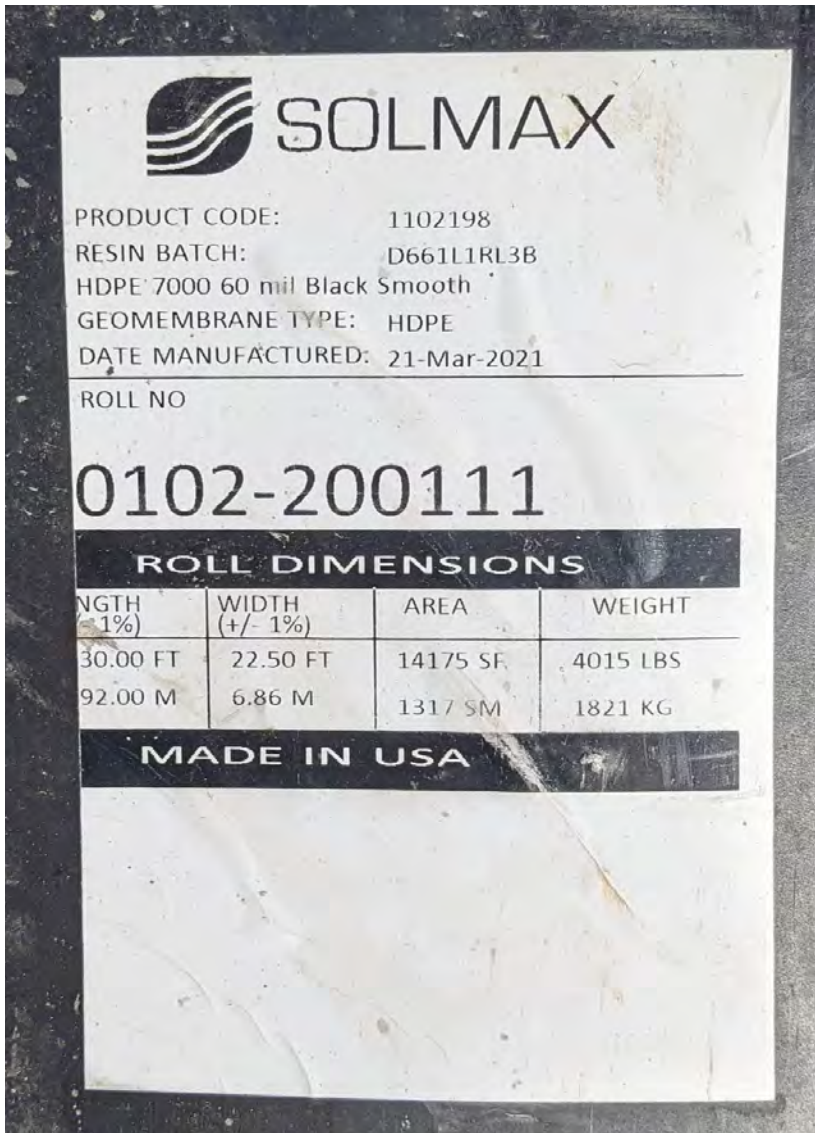
***** Denotes roll not used in installation or partial roll removed from site

Appendix D3. Geomembrane Receiving and Manufacturing/Conformance Log

Material Type	Receiving Date	Lot Number	Roll Number	Sheet Area (est. sf)	MQC Recieved Date	MQC Results (P/F)	Conformance Test Results(P/F)	Approved for Installation (Y/N)
SOLMAX 40 mil Textured HDPE	03/31/21	PMF610180	0104-201033	18,000	3/22/2021	P	N/A	Y
SOLMAX 40 mil Textured HDPE*	**03/31/21**	**PMF610180**	**0104-201034**	**18,000**	**3/22/2021**	**P**	**N/A**	**Y**

Bold indicates that a conformance test was conducted for the sample.

***** Denotes roll not used in installation or partial roll removed from site



Appendix D4

60-mil Conformance Certification

DBS&A
Daniel B. Stephens & Associates, Inc.

TESTING, RESEARCH, CONSULTING AND FIELD SERVICES
Austin, TX - USA | Anaheim, CA - USA | Anderson, SC - USA | Gold Coast - Australia | Suzhou - China

April 20, 2021

Mail To:

Monica Peine
Mustang Extreme Environmental Services
5049 Edwards Ranch Road Suite 200
Ft Worth TX 76109

email: mpeine@mustangextreme.com

Bill To:

<= Same

Greetings

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs.
TRI is pleased to submit this final report of the laboratory testing for the sample(s) listed below.

Project:	**Liner Assessment**
TRI Job Reference Number:	62817
Material(s) Tested:	Three, Solmax 60 mil Smooth HDPE Gemembrane
Test(s) Requested:	Thickness (ASTM D 5199) Density (ASTM D 1505) Carbon Black Content (ASTM D 1603, mod.) Tensile Properties (ASTM D 6693) Tear Resistance (ASTM D 1004)

If you have any questions or require any additional information, please call us at 1-800-880-8378

Sincerely,

Mansukh Patel
Laboratory Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

*Signature is on file

GEOMEMBRANE TEST RESULTS
TRI Client: Mustang Extreme Environmental Services
Project: Liner Assessment

Material: Solmax 60 mil Smooth HDPE Gemembrane
Sample Identification: 0102-200114
TRI Log #: 62817

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.
Thickness (ASTM D 5199)												
Thickness (mils)	64.2	61.9	61.4	60.6	59.7	60.2	60.8	61.8	58.6	60.2	**60.9**	1.5
											58.6	<< min
Density (ASTM D 1505)												
Density (g/cm3)	0.948	0.948	0.948								**0.948**	0.000
Carbon Black Content (ASTM D 1603, mod.)												
% Carbon Black	2.56	2.55									**2.56**	0.01
Carbon Black Dispersion (ASTM D 5596)												
Rating - 1st field view	1	1	1	1	1							
Rating - 2nd field view	1	1	1	1	1							
Tensile Properties (ASTM D 6693, 2 ipm strain rate)												
MD Yield Strength (ppi)	158	156	146	156	146						**152**	6
TD Yield Strength (ppi)	160	164	160	161	158						**161**	2
MD Break Strength (ppi)	300	309	271	318	297						**299**	18
TD Break Strength (ppi)	284	312	318	241	292						**289**	30
MD Yield Elongation (%)	21	23	20	23	22						**22**	1
TD Yield Elongation (%)	19	17	18	17	19						**18**	1
MD Break Elongation (%)	798	839	789	872	843						**828**	34
TD Break Elongation (%)	814	863	894	696	839						**821**	76
Tear Resistance (ASTM D 1004)												
MD Tear Strength (lbs)	50	50	50	51	49	52	51	50	52	50	**51**	1
TD Tear Strength (lbs)	49	49	47	49	47	47	48	46	47	47	**48**	1

MD Machine Direction TD Transverse Direction

GEOMEMBRANE TEST RESULTS
TRI Client: Mustang Extreme Environmental Services
Project: Liner Assessment

Material: Solmax 60 mil Smooth HDPE Gemembrane
Sample Identification: 0102-200118
TRI Log #: 62817

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.
Thickness (ASTM D 5199)												
Thickness (mils)	56.8	60.1	63.0	59.9	62.2	59.7	58.1	60.1	59.3	61.0	**60.0**	1.8
											56.8	<< min
Density (ASTM D 1505)												
Density (g/cm3)	0.948	0.948	0.949								**0.948**	0.001
Carbon Black Content (ASTM D 1603, mod.)												
% Carbon Black	2.42	2.45									**2.44**	0.02
Carbon Black Dispersion (ASTM D 5596)												
Rating - 1st field view	1	1	1	1	1							
Rating - 2nd field view	1	1	1	1	1							
Tensile Properties (ASTM D 6693, 2 ipm strain rate)												
MD Yield Strength (ppi)	141	144	144	147	144						**144**	2
TD Yield Strength (ppi)	150	151	153	153	153						**152**	1
MD Break Strength (ppi)	269	285	293	286	297						**286**	11
TD Break Strength (ppi)	234	284	283	262	279						**268**	21
MD Yield Elongation (%)	21	21	21	21	21						**21**	0
TD Yield Elongation (%)	18	18	18	17	17						**18**	1
MD Break Elongation (%)	785	829	852	825	877						**834**	34
TD Break Elongation (%)	765	896	875	830	890						**851**	55
Tear Resistance (ASTM D 1004)												
MD Tear Strength (lbs)	45	46	45	47	45	48	47	45	45	47	**46**	1
TD Tear Strength (lbs)	49	48	48	49	47	48	48	48	48	48	**48**	0

MD Machine Direction TD Transverse Direction

GEOMEMBRANE TEST RESULTS
TRI Client: Mustang Extreme Environmental Services
Project: Liner Assessment

Material: Solmax 60 mil Smooth HDPE Gemembrane
Sample Identification: 0102-200119
TRI Log #: 62817

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.
Thickness (ASTM D 5199)												
Thickness (mils)	61.2	57.8	54.9	55.7	58.1	60.2	60.0	61.5	62.0	57.6	**58.9**	2.5
											54.9	<< min
Density (ASTM D 1505)												
Density (g/cm3)	0.948	0.949	0.949								**0.949**	0.001
Carbon Black Content (ASTM D 1603, mod.)												
% Carbon Black	2.48	2.49									**2.49**	0.01
Carbon Black Dispersion (ASTM D 5596)												
Rating - 1st field view	1	1	1	1	1							
Rating - 2nd field view	1	1	1	1	1							
Tensile Properties (ASTM D 6693, 2 ipm strain rate)												
MD Yield Strength (ppi)	145	146	145	147	147						**146**	1
TD Yield Strength (ppi)	152	157	155	154	156						**155**	2
MD Break Strength (ppi)	287	284	289	288	232						**276**	25
TD Break Strength (ppi)	302	298	284	262	260						**281**	20
MD Yield Elongation (%)	19	22	20	20	20						**20**	1
TD Yield Elongation (%)	17	17	19	18	19						**18**	1
MD Break Elongation (%)	836	827	854	851	701						**814**	64
TD Break Elongation (%)	932	926	877	836	816						**877**	52
Tear Resistance (ASTM D 1004)												
MD Tear Strength (lbs)	45	45	45	44	42	46	44	46	44	42	**44**	1
TD Tear Strength (lbs)	49	46	49	48	48	49	49	49	48	48	**48**	1

MD Machine Direction TD Transverse Direction

Appendix D5

40-mil Conformance Certification

DBS&A
Daniel B. Stephens & Associates, Inc.

TESTING, RESEARCH, CONSULTING AND FIELD SERVICES
Austin, TX - USA | Anaheim, CA - USA | Anderson, SC - USA | Gold Coast - Australia | Suzhou - China

April 20, 2021

Mail To:

Monica Peine
Mustang Extreme Environmental Services
5049 Edwards Ranch Road Suite 200
Ft Worth TX 76109

email: mpeine@mustangextreme.com

Bill To:

<= Same

Greetings

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs.
TRI is pleased to submit this final report of the laboratory testing for the sample(s) listed below.

Project:	**Liner Assessment**
TRI Job Reference Number:	62816
Material(s) Tested:	One, Solmax 40 mil Single Sided Textured HDPE Gemembrane
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Black Content (ASTM D 1603, mod.) Carbon Black Dispersion (ASTM D 5596) Tensile Properties (ASTM D 6693) Tear Resistance (ASTM D 1004)

If you have any questions or require any additional information, please call us at 1-800-880-8378

Sincerely,

Mansukh Patel
Laboratory Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

*Signature is on file

GEOMEMBRANE TEST RESULTS
TRI Client: Mustang Extreme Environmental Services
Project: Liner Assessment

Material: Solmax 40 mil Single Sided Textured HDPE Gemembrane
0104-201034
TRI Log #: 62816

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.
Thickness (ASTM D 5994)												
Thickness (mils)	45	44	46	48	46	47	45	43	45	43	**45**	1.7
											43	<< min
Density (ASTM D 1505)												
Density (g/cm3)	0.943	0.943	0.943								**0.943**	0.000
Carbon Black Content (ASTM D 1603, mod.)												
% Carbon Black	2.37	2.33									**2.35**	0.03
Carbon Black Dispersion (ASTM D 5596)												
Rating - 1st field view	1	1	1	1	1							
Rating - 2nd field view	1	1	1	1	1							
Tensile Properties (ASTM D 6693, 2 ipm strain rate)												
MD Yield Strength (ppi)	115	115	118	120	116						**117**	2
TD Yield Strength (ppi)	114	119	127	127	124						**122**	6
MD Break Strength (ppi)	145	179	176	184	129						**163**	24
TD Break Strength (ppi)	145	126	137	162	95						**133**	25
MD Yield Elongation (%)	20	20	19	20	20						**20**	0
TD Yield Elongation (%)	18	17	17	18	18						**18**	1
MD Break Elongation (%)	475	591	582	585	391						**525**	89
TD Break Elongation (%)	533	443	449	570	52						**409**	207
Tear Resistance (ASTM D 1004)												
MD Tear Strength (lbs)	36	40	39	42	41	39	40	39	39	37	**39**	2
TD Tear Strength (lbs)	39	44	42	41	40	39	39	42	42	40	**41**	2

MD Machine Direction TD Transverse Direction

Appendix E

Daily Subgrade Acceptance Forms

DBS&A
Daniel B. Stephens & Associates, Inc.

APPROVAL/AUTHORIZATION TO PROCEED FORM

THE FOLLOWING LINER SYSTEM SURFACE IS DEEMED ACCEPTABLE ON A VISUAL INSPECTION BY LINER CONTRACT REPRESENTATIVE.

PROJECT: Sundance West Evap. Pond Relining

LAYER:
1. SUBGRADE
2. GEOSYNTHETIC CLAY LINER (GCL)
3. HDPE GEOMEMBRANE (FML) Pond 5
4. GEONET

LOCATION: Smooth ~~TO~~ 60 mil. HDPE

TO

REMARKS: Entire smooth surface of Pond 5 is acceptable for relining. All holes and other damages were repaired with patches and/or beads of extruded HDPE and checked using a vacuum test. All passed.

THE ABOVE NOTED LAYER IS NOW ACCEPTABLE FOR COVERING BY THE NEXT LAYER.

AUTHORIZATION BY:

LINER CONTRACTOR REPRESENTATIVE

Alfonso Hernandez — SIGNATURE

4721 — DATE

Alfonso Hernandez — PRINT NAME

SUBMITTED TO:

CQA REPRESENTATIVE

Grace Herrmann — SIGNATURE

4/1/2021 — DATE

Grace Herrmann — PRINT NAME

APPROVAL/AUTHORIZATION TO PROCEED FORM

THE FOLLOWING LINER SYSTEM SURFACE IS DEEMED ACCEPTABLE ON A VISUAL INSPECTION BY LINER CONTRACT REPRESENTATIVE.

PROJECT: Sundance West Evap. Pond Relining

LAYER:
1 SUBGRADE
2. GEOSYNTHETIC CLAY LINER (GCL)
3. HDPE GEOMEMBRANE (FML) Pond 6
4. GEONET

LOCATION: Smooth ~~-to-~~ 60mil HDPE
Small area ~~to~~ of 60mil. textured

REMARKS: Entire area of Pond 6 surface is acceptable for relining. All holes and other damaged areas are patched/ repaired w/ beads of extruded HDPE and checked using a vacuum test. All passed.

THE ABOVE NOTED LAYER IS NOW ACCEPTABLE FOR COVERING BY THE NEXT LAYER.

AUTHORIZATION BY:

LINER CONTRACTOR REPRESENTATIVE

Alfonso Hernandez — SIGNATURE
4721 — DATE
Alfonso Hernandez — PRINT NAME

SUBMITTED TO:

CQA REPRESENTATIVE

Grace Herrmann — SIGNATURE
4/7/2021 — DATE
Grace Herrmann — PRINT NAME

APPROVAL/AUTHORIZATION TO PROCEED FORM

THE FOLLOWING LINER SYSTEM SURFACE IS DEEMED ACCEPTABLE ON A VISUAL INSPECTION BY LINER CONTRACT REPRESENTATIVE.

PROJECT: Sundance West Evap. Pond Relining

LAYER:
1. SUBGRADE
2 GEOSYNTHETIC CLAY LINER (GCL)
3. HDPE GEOMEMBRANE (FML) 40-mil Walkway
4. GEONET

LOCATION: Between pond 5 TO Pond 6

TO

TO

REMARKS: Textured Walkway cleared by Sundance West Staff. Debris blocks, Plumbing fixtures, Debris. Mustang cleaned along extrusion weld seam

THE ABOVE NOTED LAYER IS NOW ACCEPTABLE FOR COVERING BY THE NEXT LAYER.

AUTHORIZATION BY:

LINER CONTRACTOR REPRESENTATIVE

Andrew Ortz
SIGNATURE

10-4-21
DATE

Andrew Ortz
PRINT NAME

SUBMITTED TO:

CQA REPRESENTATIVE

SIGNATURE

4-10-21
DATE

Mike Zbrozek
PRINT NAME

Appendix F

Existing Liner Repair Logs

DBS&A
Daniel B. Stephens & Associates, Inc.

Pre-Installation Repair Log	
PROJECT NAME: Sundance West, Pond 5	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Repair ID	Repair Type (Bead, Patch)	# of Repairs	Vacuum Tested	Approval Date	Monitored By
R-1	Bead	1	Y	4/1/2021	GMH
R-2	Bead	1	Y	4/1/2021	GMH
R-3	Bead	1	Y	4/1/2021	GMH
R-4	Bead	3	Y	4/1/2021	GMH
R-5	Bead	9	Y	4/1/2021	GMH
R-6	Bead	20	Y	4/1/2021	GMH
R-7	Bead	1	Y	4/1/2021	GMH
R-8	Bead	12	Y	4/1/2021	GMH
R-9	Bead	9	Y	4/1/2021	GMH
R-10	Bead	12	Y	4/1/2021	GMH
R-11	Bead	1	Y	4/1/2021	GMH
R-12	Bead	1	Y	4/1/2021	GMH
R-13	Bead	1	Y	4/1/2021	GMH
R-14	Bead	1	Y	4/1/2021	GMH
R-15	Bead	3	Y	4/1/2021	GMH
R-16	Bead	3	Y	4/1/2021	GMH
R-17	Bead	3	Y	4/1/2021	GMH
R-18	Bead	1	Y	4/2/2021	GMH
R-19	Bead	1	Y	4/2/2021	GMH
R-20	Bead	3	Y	4/1/2021	GMH
R-21	Bead	4	Y	4/1/2021	GMH
R-22	Bead	9	Y	4/1/2021	GMH
R-23	Bead	3	Y	4/1/2021	GMH
R-24	Bead	3	Y	4/1/2021	GMH
R-25	Bead	4	Y	4/1/2021	GMH
R-26	Bead	1	Y	4/1/2021	GMH
R-27	Bead	2	Y	4/1/2021	GMH
R-28	Bead	1	Y	4/2/2021	GMH
R-29	Bead	2	Y	4/1/2021	GMH
R-30	Bead	2	Y	4/1/2021	GMH
R-31	Bead	1	Y	4/1/2021	GMH
R-32	Bead	2	Y	4/1/2021	GMH
R-33	Bead	6	Y	4/1/2021	GMH
R-34	Bead	2	Y	4/1/2021	GMH
R-35	Bead	6	Y	4/1/2021	GMH
R-36	Bead	5	Y	4/1/2021	GMH
R-37	Bead	9	Y	4/1/2021	GMH
R-38	Bead	2	Y	4/1/2021	GMH
R-39	Bead	2	Y	4/1/2021	GMH

Pre-Installation Repair Log	
PROJECT NAME: Sundance West, Pond 5	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Repair ID	Repair Type (Bead, Patch)	# of Repairs	Vacuum Tested	Approval Date	Monitored By
R-40	Bead	2	Y	4/1/2021	GMH
R-41	Bead	1	Y	4/1/2021	GMH
R-42	Bead	1	Y	4/1/2021	GMH
R-43	Bead	1	Y	4/1/2021	GMH
R-44	Bead	1	Y	4/1/2021	GMH
R-45	Bead	1	Y	4/1/2021	GMH
R-46	Bead	4	Y	4/1/2021	GMH
R-47	Bead	6	Y	4/1/2021	GMH
R-48	Bead	11	Y	4/1/2021	GMH
R-49	Bead	2	Y	4/1/2021	GMH
R-50	Bead	3	Y	4/1/2021	GMH
R-51	Bead	1	Y	4/1/2021	GMH
R-52	Bead	5	Y	4/1/2021	GMH
R-53	Bead	1	Y	4/1/2021	GMH
R-54	Bead	5	Y	4/1/2021	GMH
R-55	Bead	1	Y	4/1/2021	GMH
R-56	Bead	3	Y	4/1/2021	GMH
R-57	Bead	3	Y	4/1/2021	GMH
R-58	Bead	1	Y	4/1/2021	GMH
R-59	Bead	3	Y	4/1/2021	GMH
R-60	Bead	1	Y	4/1/2021	GMH
R-61	Bead	4	Y	4/1/2021	GMH
R-62	Bead	5	Y	4/1/2021	GMH
R-63	Bead	10	Y	4/1/2021	GMH
R-64	Bead	8	Y	4/1/2021	GMH
R-65	Bead	3	Y	4/1/2021	GMH
R-66	Bead	2	Y	4/1/2021	GMH
R-67	Bead	1	Y	4/1/2021	GMH

Pre-Installation Repair Log	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Repair ID	Repair Type (Bead, Patch)	# of Repairs	Vacuum Tested	Approval Date	Monitored By
R-100	Bead	1	Y	4/1/2021	GMH
R-101	Bead	3	Y	4/1/2021	GMH
R-102	Bead	2	Y	4/1/2021	GMH
R-103	Patch	1	Y	4/1/2021	GMH
R-104	Bead	8	Y	4/1/2021	GMH
R-105	Bead	1	Y	4/1/2021	GMH
R-106	Bead	1	Y	4/1/2021	GMH
R-107	Bead	3	Y	4/1/2021	GMH
R-108	Bead	2	Y	4/1/2021	GMH
R-109	Bead	5	Y	4/1/2021	GMH
R-110	Bead	4	Y	4/1/2021	GMH
R-111	Bead	6	Y	4/1/2021	GMH
R-112	Bead	1	Y	4/1/2021	GMH
R-113	Bead	1	Y	4/1/2021	GMH
R-114	Bead	2	Y	4/1/2021	GMH
R-115	Bead	1	Y	4/1/2021	GMH
R-116	Bead	1	Y	4/1/2021	GMH
R-117	Bead	1	Y	4/1/2021	GMH
R-118	Bead	1	Y	4/1/2021	GMH
R-119	Bead	3	Y	4/1/2021	GMH
R-120	Bead	4	Y	4/1/2021	GMH
R-121	Bead	2	Y	4/1/2021	GMH
R-122	Bead	2	Y	4/1/2021	GMH
R-123	Bead	3	Y	4/1/2021	GMH
R-124	Bead	2	Y	4/1/2021	GMH
R-125	Bead	1	Y	4/1/2021	GMH
R-126	Bead	1	Y	4/1/2021	GMH
R-127	Bead	1	Y	4/1/2021	GMH
R-128	Bead	4	Y	4/1/2021	GMH
R-129	Bead	1	Y	4/1/2021	GMH
R-130	Bead	1	Y	4/1/2021	GMH
R-131	Bead	2	Y	4/1/2021	GMH
R-132	Bead	1	Y	4/1/2021	GMH
R-133	Bead	2	Y	4/1/2021	GMH
R-134	Bead	7	Y	4/1/2021	GMH
R-135	Bead	3	Y	4/1/2021	GMH
R-136	Bead	1	Y	4/1/2021	GMH
R-137	Bead	3	Y	4/1/2021	GMH
R-138	Bead	4	Y	4/1/2021	GMH

Pre-Installation Repair Log	
PROJECT NAME: Sundance West, Pond 6	PROJECT LOCATION: Eunice, NM
PROJECT NUMBER: DB18.1209.00	INSTALLED BY: Mustang Extreme

Repair ID	Repair Type (Bead, Patch)	# of Repairs	Vacuum Tested	Approval Date	Monitored By
R-139	Bead	3	Y	4/1/2021	GMH
R-140	Bead	1	Y	4/1/2021	GMH
R-141	Bead	4	Y	4/1/2021	GMH
R-142	Bead	2	Y	4/1/2021	GMH
R-143	Bead	2	Y	4/1/2021	GMH
R-144	Bead	1	Y	4/1/2021	GMH
R-145	Bead	1	Y	4/1/2021	GMH
R-146	Bead	1	Y	4/1/2021	GMH
R-147	Bead	7	Y	4/1/2021	GMH
R-148	Bead	5	Y	4/1/2021	GMH
R-149	Patch	1	Y	4/1/2021	GMH
R-150	Bead	3	Y	4/1/2021	GMH
R-151	Bead	1	Y	4/1/2021	GMH
R-152	Bead	3	Y	4/1/2021	GMH
R-153	Bead	5	Y	4/3/2021	GMH
R-154	Bead	1	Y	4/3/2021	GMH
R-155	Bead	1	Y	4/3/2021	GMH
R-156	Bead	1	Y	4/3/2021	GMH
R-157	Bead	4	Y	4/3/2021	GMH
R-158	Bead	3	Y	4/3/2021	GMH
R-159	Bead	5	Y	4/3/2021	GMH
R-160	Bead	3	Y	4/3/2021	GMH
R-161	Bead	4	Y	4/3/2021	GMH
R-162	Bead	3	Y	4/3/2021	GMH
R-163	Bead	4	Y	4/3/2021	GMH
R-164	Bead	4	Y	4/3/2021	GMH
R-165	Bead	1	Y	4/3/2021	GMH
R-166	Bead	2	Y	4/3/2021	GMH

Jones, Brad A., EMNRD

From: Jones, Brad A., EMNRD
Sent: Thursday, April 14, 2022 2:25 PM
To: andy@wambsganss.com
Cc: gpeterson@dbstephens.com
Subject: Revised Hydrogen Sulfide Prevention and Contingency Plan and Engineering Certification Report for the Evaporation Pond Liners OCD Review
Attachments: 2022 0414 NM1-62 Sundance West Inc Revised H2S plan review signed.pdf

Mr. Mussani,

Please see the attached OCD's review of the Revised Hydrogen Sulfide Prevention and Contingency Plan and Engineering Certification Report for the Evaporation Pond Liners. If you have any questions regarding this matter, please do not hesitate to contact me.

Sincerely,

Brad Jones

Brad A. Jones ● Environmental Scientist Specialist - Advanced
Environmental Bureau
EMNRD - Oil Conservation Division
1220 S. Saint Francis Drive | Santa Fe, New Mexico 87505
(505) 469-7486 | brad.a.jones@state.nm.us
www.emnrd.nm.gov

State of New Mexico
Energy, Minerals and Natural Resources Department

April 14, 2022

Mr. Arif Mussani
Sundance Services West, Inc.
1006 6th Street
Eunice, New Mexico 88231
andy@wambsganss.com

RE: Revised Hydrogen Sulfide Prevention and Contingency Plan and Engineering Certification Report for the Evaporation Pond Liners
Sundance Services West, Inc. – OGRID 371811
Permit NM1-62
South 1 /2 of Section 30, Township 21 South, Range 38 East NMPM,
Lea County, New Mexico

Mr. Mussani:

The Oil Conservation Division (OCD) has completed its review of Sundance Services West, Inc.'s (SSWI) revised Hydrogen Sulfide (H_2S) Prevention and Contingency Plan and Engineering Certification Report for the Evaporation Pond Relining, dated June 8, 2021, for the Sundance West surface waste management facility under permit NM1-62. The OCD has discovered a few discrepancies in the revised Hydrogen Sulfide (H_2S) Prevention and Contingency Plan submittal that must be addressed.

Table of Contents:

- List of Tables, Table II.3.8: In accordance with 19.15.11.16 NMAC, "the person shall notify the division upon a release of hydrogen sulfide requiring activation of the hydrogen sulfide contingency plan as soon as possible, but no more than four hours after plan activation, recognizing that a prompt response should supersede notification. The person shall submit a full report of the incident to the division on form C-141 no later than 15 days following the release." The notice requirements of 19.15.29 NMAC are not applicable during a H_2S release. Update the plan notice requirements to recognize compliance to Part 11.

- List of Attachments, Request for Approval to Accept Solid Waste, OCD Form C-138: OCD was unable to locate a protocol in the H_2S plan that required the use of the Form C-138 either during or after a hydrogen sulfide release. Either update the plan to include a protocol for the use of Form C-138 or omit the form from the plan.

Attachment 1, Hydrogen Sulfide (H_2S) Prevention and Contingency Plan:

- Section 1.3 Purpose: Update the fifth bullet in the second paragraph to recognize compliance to the notice and reporting requirements of 19.15.11.16 NMAC. Part 29 is not applicable for a H_2S release.

- Table II.3.2, Emergency Response Agencies and Contacts: Update the OCD Santa Fe office number to (505) 476-3441.

- Section 1.4 Hydrogen Sulfide Characteristics: In accordance with 19.15.11.9.B(2)(b) NMAC, "the hydrogen sulfide contingency plan *shall include a discussion of the characteristics of* hydrogen sulfide and *sulfur dioxide.*" Update the plan accordingly and provide the required information for sulfur dioxide.

- Section 1.5 Regulatory Requirements: 19.15.36 NMAC and 19.15.11 NMAC: Update this section to recognize compliance to 19.15.11.2 NMAC. In accordance with 19.15.11.2 NMAC, "19.15.11 NMAC does not exempt or otherwise excuse surface waste management facilities the division permits pursuant to 19.15.36 NMAC from more stringent conditions on the handling of hydrogen sulfide required of such facilities by 19.15.36 NMAC or more stringent conditions in permits issued pursuant to 19.15.36 NMAC, nor shall the facilities be exempt or otherwise excused from the requirements set forth in 19.15.11 NMAC by virtue of permitting under 19.15.36 NMAC." Recognize the scope of Part 11 as it applies to this Part 36 facility.

- OCD was unable to locate the radius of exposure (ROE) depicted on Figure II.3.2, as proposed in the last sentence of the second paragraph. Provide a reference to a different figure or update Figure II.3.2 accordingly and illustrate the ROE of 30 ppm. Also complete the assessment of public roads defined in 19.15.11.7.J NMAC, as required of 19.15.11.9.B(2)(a) NMAC.

- Table II.3.4, Immediate Action Plan: *Minor Alarm*: Based upon the propose immediate action plan, SSWI will activate the H_2S Plan at the first detection of 10 ppm or greater. Update this section to recognize that a detection of 10 ppm or greater is the plan activation level required of 19.15.11.9.B(2)(f) NMAC.

- Update the Minor Alarm section to include the OCD notice and reporting protocols of 19.15.11.16 NMAC when SSWI activates the H_2S Plan at the first detection of 10 ppm or greater.

- In the second bullet, identify the equipment and method SSWI will implement to monitor downwind concentrations.

- Section 3.1, Incoming loads: Update Table II.3.10 in Section 5 to include the H_2S personal monitors on the Emergency Response Equipment List. Provide and reference the location of the specification sheet of the model of the H_2S personal monitors proposed for use. The H_2S personal monitor should be capable of monitoring for hydrogen sulfide and *sulfur dioxide*.

- Section 3.2.1 Stationary Monitors: Update Table II.3.10 in Section 5 to include the continuous H_2S monitors installed along the outside perimeter of the pond area and windsocks on the Emergency Response Equipment List. Provide and reference the location of the specification sheet of the model of the continuous H_2S monitors proposed for use.

- Section 4.1 Implementation: Update the paragraph to clarify that SSWI will activate the H_2S Plan at the first detection of 10 ppm or greater to protect public safety, as required of 19.15.11.9 NMAC.

- Section 4.2 Assessment: Pursuant to 19.15.11.9.F NMAC, "the person shall review the hydrogen sulfide contingency plan any time a subject addressed in the plan materially changes and make appropriate amendments. If the division determines that a hydrogen sulfide contingency plan is inadequate *to protect public safety*, the division may require the person to add provisions to the plan or amend the plan as necessary *to protect public safety*." Update the written response to clarify that SSWI will amend this Plan, as necessary, to protect *public safety*, as required of 19.15.11 NMAC.

- In the second paragraph, omit the discussion regarding major and minor releases pursuant to Part 29. Part 29 is not applicable for a H_2S release. SSWI must comply with the notice and reporting requirements of 19.15.11.16 NMAC. Update accordingly.

- Table II.3.8, Part 29: Release Notification Sundance West: Replace to regulatory language of Part 29 with the regulatory language of 19.15.11.16 NMAC and provide a copy of the most recent OCD Form C-141, so that it will be available for reporting.

- Section 4.3, Notification of Authorities and General Public: Update the last sentence of the first paragraph to clarify that OCD will be notified within 4 hours after the Contingency Plan has been activated *when H_2S is detected at 10 ppm or greater*.

- In the third paragraph, update the discussion to recognize the notice and reporting requirements of 19.15.11.16 NMAC and omit the discussion regarding Part 29 and "major" and "minor" releases.

- Section 5.2 External Communications: Update Table II.3.10 in Section 5 to recognize the emergency phone number laminated pocket cards on the Emergency Response Equipment List.

- Section 5.3 Personnel Protection, First Aid, and Safety Equipment: Update Table II.3.10 in Section 5 to recognize the emergency shower discussed in the second paragraph on the Emergency Response Equipment List.

- Section 6.0 Recordkeeping: Update the second paragraph to recognize the notice and reporting requirements of 19.15.11.16 NMAC and omit the discussion regarding Part 29 and "major" and "minor" releases. OCD was unable to locate Attachment II.3.E, a copy of OCD Form C-141, in the revised H_2S plan. Provide a copy of the required form so SSWI may complete the reporting requirements of 19.15.11.16 NMAC.

- Section 9.0 Training: Update the written response to describe how SSWI will document the training, drills, and attendance, as required of 19.15.11.9.B(2)(d) NMAC. Also update the written response, to address the training of residents as appropriate on the proper protective measures to be taken in the event of a release and shall provide for briefing of public officials on issues such as evacuation or shelter-in-place plans.

- Attachment II.3.A, Material Safety Data Sheet: Update the plan accordingly and provide the information for sulfur dioxide required of 19.15.11.9.B(2)(b) NMAC.

- Attachment II.3.B, OCD FORM C-138: Either update the plan to include a protocol for the use of Form C-138 or omit the form from the plan.

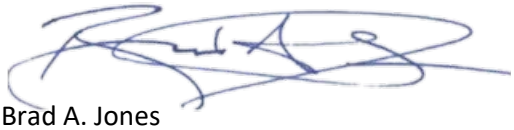
Based upon Table II.3.1, SSWI will have a tank battery of 45 produced water tanks. Review the requirements of 19.15.11.12 NMAC to determine if the plan needs to be updated to address any concerns regarding the tank battery.

Please update the Hydrogen Sulfide (H_2S) Prevention and Contingency Plan based upon the review comments above to recognize compliance to the requirements of 19.15.11 NMAC and resubmit.

Attachment 2, Engineering Certification Report for the Evaporation Pond Liners:
OCD has completed the review of Attachment 2, the Engineering Certification Report for the Evaporation Pond Liners. The certification report will be placed in the administrative record of permit NM1-62.

If there are any questions regarding this matter, please do not hesitate to contact me at (505) 469-7486 or brad.a.jones@state.nm.us.

Respectfully,



Brad A. Jones
Environmental Specialist

Cc: Gundar Peterson, Daniel B. Stephens & Associates, Inc., gpeterson@dbstephens.com

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 98776

CONDITIONS

Operator: Sundance Services West, Inc. 1006 6th Street Eunice, NM 88231	OGRID: 371811
	Action Number: 98776
	Action Type: [C-137] Non-Fee SWMF Submittal (SWMF NON-FEE SUBMITTAL)

CONDITIONS

Created By	Condition	Condition Date
bjones	None	4/14/2022