FINAL – REVISION 01

Emergency Action Plan
Reid Gardner Generating Station
Mesa Ponds M5 and M7

Prepared for

NV Energy

April 2017

ch2m

Pond Name	National Inventory of Dam Number	Nevada State Identification Number
Mesa Pond M5	NV10779	J-652
Mesa Pond M7	NV10780	J-652

Document Control No. _____ of _____

Certification and Change Record

This section contains the written certification by a qualified professional engineer required by §257.73(a)(3)(iv) of the U.S. Environmental Protection Agency's Coal Combustion Residual Rule.

This Emergency Action Plan for Ponds M5 and M7, existing coal combustion residual surface impoundments at Reid Gardner Generating Station, meets the requirements of §257.73(a)(3) of the Coal Combustion Residual Rule.

Revision Date	Certified By	Revision	Description of Changes
April 14, 2017	Nathan Betts, PE /CH2M	0	Initial Plan
April 28, 2017	Nathan Betts, PE /CH2M	1	-Removed Initial Hazard Potential Classification Assessment from Appendix A, and re-lettered Appendixes -Added document control no. label on cover -Added revision number to footer

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Acronyms and Abbreviations

CCR	Coal Combustion Residual
EAP	Emergency Action Plan
EFPS	effluent forwarding pump station
FEMA	Federal Emergency Management Agency
HDPE	high-density polyethylene
I-15	Interstate 15
SR-168	State Road 168
Station	Reid Gardner Generating Station
US-93	U.S. Route 93

SECTION 1

Summary of Emergency Action Plan Responsibilities

1.1 Purpose

A summary of emergency action plan (EAP) responsibilities during and before an emergency is provided in Tables 1-1 and 1-2. Responsibilities are described in greater detail in Section 5.

Table 1-1. Summary of EAP Emergency Responsibilities

Entity	Responsibilities
NV Energy	1. Detect and evaluate emergency conditions, and classify the emergency level (Section 5 and Table 5-1). 2. Follow Notification Flowchart (Section 2 and Figure 2-1). 3. Mitigate with corrective action. 4. Monitor the dam and provide timely status updates. 5. Terminate emergency when resolved. **Prior to an Emergency** 1. Disseminate EAP. Dissemination to local emergency responders is recommended. 2. Provide for EAP training. An annual frequency is recommended. 3. Perform periodic exercises under the EAP. An annual frequency for drills and testing is recommended. At a minimum, conduct a face-to-face meeting or exercise with local emergency responders. 4. At a minimum every 5 years, evaluate the EAP to ensure accuracy as required by the Coal Combustion Residual (CCR) Rule. Reviewing the EAP at least annually is recommended. 5. Update the EAP as necessary to keep it current, incorporate lessons learned from the exercises, and whenever there is a change in conditions that would substantially affect the EAP.
Clark County Emergency Dispatch (911)	1. Receive emergency call from NV Energy. 2. Notify and mobilize Clark County emergency responders. 3. Coordinate initial two-way communication with NV Energy for status reports.
Clark County Police, Fire and Rescue, and Emergency Services	1. Receive notification from Clark County Emergency Dispatch. 2. Establish communication and coordinate directly with NV Energy. 3. Receive status updates. 4. Notify the public within the inundation limits. 5. Evacuate within the inundation limits, if required. Implement own emergency response plan. 6. Assist NV Energy, as necessary.

Table 1-2. Summary of NV Energy Responsibilities by Position

Entity	Responsibilities
Control Room	1. Monitor effluent discharge. 2. Alert plant supervisor of emergency incidents.
Plant Supervisor	1. Determine emergency level. 2. Initiate notification procedures. 3. Establish clear means to rapidly identify the acting plant supervisor when the plant supervisor is not available during an emergency.
Station Security	4. Contact Clark County Emergency Dispatch (911). 5. Respond to suspicious persons.

SECTION 2

Notification Flowchart and Procedure

The notification procedure is listed below and the flowchart shown on Figure 2-1 summarizes who is to be notified by whom, and in what priority, based on the three potential emergency levels.

2.1 Notification Procedure

1. ***Emergency Level*** – Correctly classify the emergency level to ensure proper notification and messaging. Emergency levels are defined here and described in more detail in Section 5 and Table 5-1.
    - **Imminent Failure:** Failure is imminent or has occurred. For example, rapidly increasing seepage erosion, overtopping or an embankment breach.
    - **Potential Failure:** A dam-failure condition may be slowly developing, but failure can be delayed or averted with a timely response; failure is not imminent. For example, a significant earthquake, acts of sabotage or terrorism, water surface elevation within 12 inches of the dam embankment crest, and failure of wastewater pipelines.
    - **Non-Failure:** Will not, by itself, lead to flooding. For example, water surface elevation above the maximum operational level, new seepage or leakage to monitor, security threats, or malfunction of a wastewater valve.
2. ***Message*** – Contact the personnel listed on the notification flowchart, Figure 2-1, in accordance with the emergency level. Contact using the applicable sample message listed in Section 2.1.1.
3. ***Escalation*** – If the emergency level escalates, immediately notify personnel required only for higher emergency levels, per the notification flowchart on Figure 2-1.
4. ***De-escalation*** – If the emergency level de-escalates, first provide an update to all previously contacted personnel, per the notification flowchart, before switching communications to personnel required only for lower-level emergencies.
5. ***Emergency Termination*** – See Section 5.5.

2.1.1 Sample Messages

2.1.1.1 Sample Message for Imminent Failure (to Emergency Response Agency)

My name is _____. I am the _____ at the NV Energy Reid Gardner Station in Moapa, Nevada. A dam at our Station called Mesa Ponds M5/M7 is failing [about to fail, or has failed]. I am initiating the Emergency Action Plan. This is NOT a drill or a test. This is a dam-failure emergency. We recommend that you initiate immediate warnings and evacuation along the Muddy River corridor between Reid Gardner Generating Station and downstream to Interstate Highway 15 (approximately 4.5 miles).

Please refer to your copy of the Emergency Action Plan to see sample inundation maps. If you do not have a copy of the EAP, we can provide one. I can provide details from those maps about locations where people may be at risk, and estimate potential flood-wave arrival times and depths. [Share information from EAP inundation maps.]

The problem at the dam is _____ [explain with a few simple words].

I can provide a status update in roughly ____ minutes at this number. If you have follow-up questions, please call _____ at _____ [give contact and number].

2.1.1.2 Sample Message for Potential Failure (to Emergency Response Agency)

My name is _____. I am the _____ at the NV Energy Reid Gardner Station in Moapa, Nevada. There is a serious situation here at one of our dams, but no immediate danger of a dam failure. I am initiating the Emergency Action Plan. This is NOT a drill or a test.

The problem at the dam is _____ [explain with a few simple words]. Please refer to your copy of the Emergency Action Plan to see sample inundation maps. If you do not have a copy of the EAP, we can provide one.

I will provide a status update when available. If you have follow-up questions, please call _____ at _____ [give contact and number].

2.1.1.3 Sample Message for Non-Failure Event (Internal only)

My name is _____. I am the _____ at the NV Energy Reid Gardner Station in Moapa, Nevada. There is an unusual condition at one of our dams, but no immediate danger of a dam failure. I am initiating the Emergency Action Plan. This is NOT a drill or a test.

The problem at the dam is _____ [explain with a few simple words]. Please refer to your copy of the Emergency Action Plan. If you do not have a copy of the EAP, we can provide one.

SECTION 3

Statement of Purpose

3.1 Purpose

This Emergency Action Plan (EAP) defines responsibilities and provides procedures designed to identify unusual and unlikely conditions that may endanger NV Energy Mesa Ponds M5 or M7 at Reid Gardner Station (Station) in time to take actions to mitigate the problem and notify the appropriate emergency management officials of possible, impending, or actual failure of a pond. The EAP may also be used to provide notification when the potential for major flooding downstream of the facility is present. This EAP was written to meet the requirements of the Nevada Administrative Code 535.320[1] and Section 257.73 of the U.S. Environmental Protection Agency's Coal Combustion Residual (CCR) Rule.

The Mesa ponds are regulated as dams by the Nevada Division of Water Resources' Dam Safety Program (i.e., the State Engineer). The EAP provides for the following prior to, during and after a dam emergency:

- **Responsibilities** for preparedness, emergency action and post-emergency assessment
- **Notification flowcharts** for emergency communication/coordination
- **Project description** containing a site description and key information about the dam
- **EAP response process** (detect, evaluate, notify, mitigate, terminate, follow-up)
- **Preparedness** prior to an emergency
- **Inundation maps** to illustrate potential dam-failure inundation limits
- **Supplemental materials** that may be useful prior to or during an emergency

The general objective is to reduce the risk of death, injury, property damage, ecological damage and contamination due to flooding or an unlikely dam-failure emergency.

3.2 Scope

With careful planning and proper training prior to an emergency, loss of life, property damage and economic and environmental impacts can be reduced. The intent of this EAP is to train and assist employees in the appropriate preparation and response to a flooding or dam-safety emergency at Ponds M5 and M7. As such, it does not cover other facilities, nor does it directly cover related safety topics, such as site security, public access and safety, and response to medical emergencies. The EAP is an important training tool and plan for unusual and emergency dam conditions, and applies to all Station personnel, contractors and others who may be on-site or have responsibilities during an emergency situation.

[1] Nevada Administrative Code 535.320 refers to *FEMA 64*, which presents the Federal Emergency Management Agency's (FEMA) standardized guidelines and template for EAPs for dams. The full title for FEMA 64 is *Federal Guidelines for Dam Safety, Emergency Action Planning for Dams* (July 2013).

SECTION 4

Project Description

4.1 Location of Mesa Ponds

The Mesa Ponds M5 and M7 are located within the southwest quarter and southeast quarter of Section 8, respectively. The facility is in Township 15 South, Range 66 East, Mount Diablo Baseline and Meridian in Clark County, Nevada. The latitude and longitude of the ponds are 36° 38'32" N and 114° 37'50" W.

Reid Gardner Generating Station is approximately 45 miles northeast of Las Vegas within the Moapa Valley, a large and relatively flat-bottomed valley occupied by the Muddy River, a spring-fed perennial stream. The river bisects the NV Energy property in a northwest to southeast orientation. Ponds M5 and M7 are on a mesa overlooking the valley. The latitude and longitude of the plant area is 36° 39'22" N and 114° 38'03" W. Figure 4-1 shows the location and vicinity of the Station and the Mesa Ponds.

4.2 Pond Information Summary

Table 4-1 presents the design information summary for the Mesa Ponds M5 and M7. The pond information was taken from the record drawings for the Mesa Evaporation Ponds (Appendix B). Figure 4-2 shows the facility features and storage curves of the Mesa Ponds. The ponds are lined with two layers of high-density polyethylene (HDPE) geomembrane with an interstitial leak detection and collection system.

Table 4-1. Location and Design Information Summary

Name of Dam: Mesa Pond M5		
State: Nevada	County: Clark	Jurisdiction: Clark County
National ID: NV10779	State ID: J-652 (for M5 and M7)	HAZARD RATINGS: High (per CCR Rule) Significant (per State Permit)
Type of Embankment (Earthfill, Concrete, etc.): Earthfill		
Top of Embankment Elevation: 1,720.0 feet	Height of embankment: 23 feet	
Length of embankment: 1,360 feet	Thickness at top: 20 feet	Thickness at bottom: 160 feet
Operational Water Surface Elevation: 1,715.7 feet	Freeboard: 4.3 feet	Maximum Storage: 260 acre-feet
Name of Dam: Mesa Pond M7		
State: Nevada	County: Clark	Jurisdiction: Clark County
National ID: NV10780	State ID: J-652 (for M5 and M7)	HAZARD RATINGS: High (per CCR Rule) Significant (per State Permit)
Type of Embankment (Earthfill, Concrete, etc.): Earthfill		
Top of Embankment Elevation: 1,723.0 feet	Height of embankment: 23 feet	
Length of embankment: 920 feet	Thickness at top: 20 feet	Thickness at bottom: 130 feet
Operational Water Surface Elevation: ,1718.7 feet	Freeboard: 4.3 feet	Maximum Storage: 265 acre-feet

Table 4-1. Location and Design Information Summary

Name of Dam: Mesa Ponds M5 and M7	
Location of Embankments: (Township, Range, Section): T 15S, R 66E, Section 8	
Name of Stream or Drainage:	Not Applicable – The dams are designed to prevent inflow from drainages.
Access Route:	Primary Route: From Interstate 15 (I-15), take Exit 88. Head north on Hidden Valley Road for approximately 2.5 miles. Turn left onto Wally Kay Way and travel for approximately 1 mile to Reid Gardner Generating Station. Meet up with NV Energy personnel at the security gate. Alternate Route: From I-15, take Exit 64 and head north onto U.S. Route 93 (US-93). Turn right to head east on State Road 168 (SR-168) at Coyote Springs. Travel on SR-168 for approximately 21 miles. Turn right onto Hidden Valley Road and travel for approximately 1 mile to Wally Kay Way. Take a right onto Wally Kay Way and continue to the Station. Meet up with NV Energy personnel at the security gate.

4.3 Pond Piping and Operation

The Mesa Ponds are used to evaporate process wastewater from the Station's power generation plant. One underground 8-inch diameter HDPE effluent discharge pipeline runs from the effluent forwarding pump station (EFPS) to the Mesa Ponds. The pipeline was pressure tested for 150 to 300 pounds per square inch and typically operates in the 110 to 120 pounds per square inch range. The pipeline terminates at a valve station, located at the northwest corner of Pond M7 (Figure 4-2).

The valve station located at the northwest corner of Pond M7 (Figure 4-2) routes flow into one of three underground pipes for discharge into the ponds. These discharge pipes are made of the same material as the pipeline. One pipe discharges into Pond M7, one into Pond M5, and the third is capped and does not discharge. This third pipe was installed for a third proposed mesa pond that has not been built. The pipes discharging into Ponds M4 and M7 are open-ended, to reduce the pressure of the water in pipes buried in the embankments**.** Damage or rupture of the effluent pipes, valve station or cleanout (pigging) stations could result in uncontrolled discharge into the ponds, overtopping of the embankments and eventual discharge of wastewater to the Muddy River and downstream.

Within the ponds, HDPE markers are welded to the HDPE geomembranes to mark the maximum operational water level, and staff gauges are installed on one bridge in each pond. These markers and gauges are visually inspected to check for overtopping. In addition, the flow from the EFPS is monitored by operations personnel. The maximum operational water levels for Ponds M5 and M7 are 1,715.70 and 1,718.70 feet above mean sea level, respectively (Figure 4-2). Vertical datum is the North American Vertical Datum of 1988.

4.4 Geotechnical Information

The earthen pond embankments were designed and constructed as a balanced cut and fill with no embankment zoning. The geotechnical evaluation of the site was performed by Converse Consultants and detailed earthwork specifications were developed by CH2M HILL Engineers, Inc (CH2M). The Converse Geotechnical Report describes the native soil as "predominantly silty to poorly graded sands that were occasionally partially cemented to cemented, intermingled with lean and fat clays and poorly graded gravel." The native soil was excavated then processed to produce earthfill by removing deleterious material and particles larger than 4 inches in diameter.

The embankments were constructed by excavating and placing the native soil with scrapers, spreading the soil into lifts using graders, removing deleterious material with graders or by hand, moisture conditioning

and then compacting with loaded scrapers. The embankment soil was compacted to a minimum dry unit weight corresponding to 95 percent of the maximum dry unit weight determined in the laboratory by ASTM International Test Method 1557.

4.5 Description of Downstream Area

The area downstream of the Mesa Ponds is rural and includes the Muddy River, a few residences, barns, hay fields and cow pastures. Flow from a theoretical Ponds M5 or M7 dam breach would travel down steep cliffs and could make its way to the Muddy River approximately 4,000 feet from the ponds, and then flow generally along the Muddy River and its floodplain. Based on analysis, one of the downstream residences (a manufactured home) is inside the modeled inundation area. The analysis is found in the “Initial Hazard Potential Classification Assessment, Ponds M5 and M7, Reid Gardner Generating Station”, created by CH2M and dated October 11, 2016.

SECTION 5

EAP Response Process

5.1 Response Process Overview

The EAP uses a four-step process:

- Step 1: Detect, evaluate and classify an incident or emergency (Section 5.2.1).
- Step 2: Notify and communicate (Section 2).
- Step 3: Take emergency action (Sections 5, 6 and 7).
- Step 4: Terminate and follow-up (including documentation).

5.2 Step 1: Emergency Detection, Evaluation and Classification

5.2.1 Detection

Detection of an unusual or emergency condition at the dams may be initiated by direct staff observation or by staff tracking monitoring equipment triggers. In terms of staffing, Station personnel are present on-site 7 days a week from 6 a.m. to 6 p.m. Security personnel are present outside of those working hours. Monday through Friday, the Station Personnel observe the Mesa Ponds at least daily. Station personnel visit the ponds and check the staff gauges, HDPE liner markers and pipelines typically a minimum of 4 days per week, usually during daytime hours. In terms of monitoring, the embankments are equipped with an interstitial leak detection and collection system (HDPE geonet). The water surface elevation is monitored and maintained at or below its maximum operational level 4.3 feet below the top of embankment. In addition, the flow of water from the EFPS to the ponds is displayed in the control room. Because the site is staffed continuously, personnel are present who could detect an emergency related to the ponds.

If an emergency is detected, use guidance in this section to evaluate conditions at the dam and classify the emergency as one of three levels: **Imminent Failure**, **Potential Failure,** or **Non-Failure** (Section 5.5).

5.2.2 Evaluation and Classification

During an emergency associated with the ponds at the Station, it is important to correctly evaluate and classify the conditions for accurate communication using the notification procedure. The three emergency classifications at the facility are described below and in Table 5-1.

Imminent Failure

Failure is imminent or has already occurred. Due to lack of time or mitigation options, immediate downstream evacuation is warranted. Examples are listed below and in Table 5-1.

- Rapid inflow to a pond cannot be controlled and will cause overtopping of the embankment. Resulting failure is likely.
- Uncontrolled seepage through, under or around the embankment is removing embankment material at an accelerating pace. Stop-gap granular fill cannot be placed in time to stop progressive internal erosion. Uncontrolled release of the reservoir is projected.

5.2.2.2 Potential Failure

Conditions are developing that could progress to a dam failure, but time is available for analyses, decisions and mitigating actions before the dam could fail. Although a failure may occur, predetermined actions may prevent or moderate failure. Examples are listed below and in Table 5-1.

- Rising reservoir levels may yet be diverted.
- Transverse cracking of the embankment (from earthquake or incipient slope movement).
- A verified threat to use explosives to damage the dam.
- Seepage is slowly eroding the embankment toe and staff are mobilizing to place granular fill at the point of discharge, or have already placed inadequate fill.

5.2.2.3 Non-Failure

An unusual event at a dam that will not, by itself, lead to dam failure, but requires internal or external notifications. External notifications are only required if there is an immediate threat to the public. Examples are listed below and in Table 5-1.

- Water surface elevation is above maximum operational level. The maximum operational water levels for Ponds M5 and M7 are 1,715.70 and 1,718.70 feet above mean sea level, respectively (Figure 4-2). Vertical datum is the North American Vertical Datum of 1988 (i.e., NAVD 88).
- New seepage or leakage through the dam requires increased monitoring and assessment.
- Unauthorized persons appear to be watching or surveilling the dam.
- Malfunction of water conveyance infrastructure.

5.3 Step 2: Notification and Communication

Use the notification flowchart and procedure in Section 2. As indicated in Section 2, the people notified and the message delivered depend on the emergency level (Table 5-1). While the EAP notification flowchart must be updated whenever personnel or contact information changes, a current Emergency Response Phone List must also be posted in the Control Room and security office.

5.3.1.1 Imminent Failure (or has already occurred)

If failure of the dam is imminent, the priority is to immediately initiate evacuations downstream of the dams. Engage notified dam-safety experts to complete dam evaluation and emergency classification in parallel, while notifications are completed. Update notifications when status is better understood.

5.3.1.2 Potential Failure

If a potential dam-safety emergency is detected early, there may be time to evaluate and mitigate concerns prior to completing *all* external notifications. Immediately engage notified dam-safety experts to allow for better evaluation, classification and appropriate action to avert failure or mitigate impacts, and to alert key supervisors and emergency responders to facilitate emergency preparation and coordination.

5.3.1.3 Non-Failure

If an unusual, non-failure condition is discovered at a dam, focus on engaging internal experts for evaluation, monitoring and response; or law enforcement if there is a security concern.

Table 5-1. Emergency Level Determination Guidance

Risk	Emergency Level Determination Guidance	Emergency Level		
		Non-Failure	Potential Failure	Imminent Failure
Flooding	Not considered a likely event for Pond M5 and M7 because far from waterways			
Erosion	Southwest stormwater berm has eroded and the ponds are receiving offsite inflow	●		
Overtopping of top of dam	Water level is above maximum operational level, but more than 12 inches below dam embankment crest	●		
	Water level within 12 inches of dam embankment crest		●	
	Erosion of dam embankment crest by large overtopping waves			●
	Water level at or nearly at top of dam; water overtopping top of dam, with or without erosion			●
Seepage	New seepage area on or near the dam	●		
	New seepage area with cloudy discharge or increasing flow rate		●	
	Rapid flow rate increase with cloudy discharge from an existing seepage area			●
	New, small sand boil, whirlpool, rapid settlement, or sinkhole	●		
	Enlarging sand boil, whirlpool, settlement, or sinkhole – imminent failure if rapid		●	●
Sinkholes	Observation of new sinkhole in pond area or on embankment	●		
	Rapidly enlarging sinkhole		●	●
Embankment cracking	New cracks in the embankment, greater than 0.25 inch wide, without seepage	●		
	Cracks in the embankment with seepage		●	
Embankment movement	Evidence of embankment slope movement (sliding, slumping, rotation, settlement)	●		
	Sudden or rapidly progressing slides of the embankment slopes			●
Earthquake	Earthquake felt at dam or earthquake with Magnitude ≥ 4.0 reported within 30 miles	●		
	Earthquake resulting in visible damage to the dam or appurtenances		●	
	Earthquake resulting in uncontrolled release of water from the dam			●
Piping	Conveyance piping is inoperable or leaking	●		
	Damaged piping produces uncontrolled release of water into or from reservoir	●	●	
Security threat	Demonstration or public protest that raises security threat levels for dam	●		
	Verified bomb threat that, if carried out, could result in damage to the dam		●	
	Detonated bomb that has resulted in damage to the dam or appurtenances			●
Sabotage/ vandalism	Damage to the dam or appurtenances with no impact to dam function	●		
	Modification of dam or appurtenances that could adversely impact dam function	●		
	Damage to dam or appurtenances that has resulted in seepage flow		●	
	Damage to dam or appurtenances that has resulted in uncontrolled water release			●

5.4 Step 3: Emergency Actions

In parallel or subsequent to initial notifications, NV Energy must take action to prevent or delay a dam failure, and to mitigate its impacts if failure cannot be avoided. While a dam-failure emergency is unfolding, NV Energy is responsible for monitoring conditions at the dam and providing timely status updates internally and to external emergency responders, using the appropriate notification flowchart(s).

Pre-planned actions to some dam-safety emergencies are summarized in Tables 5-2 through 5-4. Responsibilities of specific personnel are described in Section 6. Pre-planned steps to be prepared are described in Section 7.

Table 5-2. Emergency Operations and Repair Actions for Imminent Failure Conditions

Indicators Requiring Action:	Mitigation and Control Actions to be taken:
Embankment or structural integrity appears to be uncontrollably deteriorating or a breach in the dam has occurred.	Follow notification and evacuation procedures outlined in Section 2 this EAP. Inspect and clear evacuation routes on and from the Station. Place traffic control devices to barricade entry into anticipated flood areas on the Station. Post site monitors where they can safely observe and monitor the dam. Monitors should not be stationed on the dam or within the projected dam-failure floodplain. If additional site monitors are available and can be placed on high ground, consider providing assistance to emergency responders by observing predicted areas of inundation (from a safe distance) to monitor flow, debris buildup and damage conditions. Initiate emergency evacuation of the downstream floodplain area indicated by corresponding inundation maps by notifying emergency responders via the notification flowchart in Section 2. Initiate evacuation of the Station if any portions are in the downstream floodplain area indicated by inundation maps. If time is available, place sandbags, concrete barriers, earthen dikes, or other protective devices on Station property to confine flows to the open spaces and divert flow around Station property where possible.

Table 5-3. Emergency Operations and Repair Actions for Potential Failure Conditions

Indicators Requiring Action:	Mitigation and Control Actions to be Taken:
The water surface elevation is within 12 inches of the dam embankment crest.	Observer will notify the Control Room to monitor effluent discharge and check water level in the EFPS. Plant supervisor will begin notification procedures in Section 2 of this EAP. Plant supervisor will direct Station personnel to stop discharging effluent to the pond with the developing emergency condition. Depending on water level in the EFPS, the plant supervisor will direct Station personnel to transfer water from pond with developing emergency condition to the other pond. If water levels in the pond(s) reach the dam embankment crest or begin overtopping, proceed to *Table 5-2.*
Verified bomb threat to Mesa Ponds embankment.	Observer will notify Reid Gardner Generating Station Security and Control Room. Plant supervisor will begin notification procedures in Section 2 of this EAP.

Table 5-3. Emergency Operations and Repair Actions for Potential Failure Conditions

Indicators Requiring Action:	Mitigation and Control Actions to be Taken:
Transverse cracking of embankment (from earthquake or incident slope movement)	Observer will notify Control Room. Plant supervisor will begin notification procedures in Section 2 of this EAP. Notify operations manager or their dam safety engineer to develop recommendations for buttressing or other strengthening measures. Repair operations should only be undertaken if the embankment is deemed stable enough to support such activities. If repair operations are not successful, or cannot be performed proceed to *Table 5-2.*
Seepage is slowly eroding embankment and Station personnel have not started placing granular fill at the point of discharge, or have not placed adequate fill.	Begin or continue repair operations only if embankment is deemed stable enough to support such activities. Plant supervisor will begin notification procedures in Section 2 of this EAP. If repair operations are not successful, or cannot be performed, proceed to *Table 5-2.*

Table 5-4. Emergency Operations and Repair Actions for Non-Failure Conditions

Indicators Requiring Action:	Mitigation and Control Actions to be Taken:
New seepage detected in embankment.	Observer will notify Control Room to monitor seepage detection. Plant supervisor will begin notification procedures in Section 2 of this EAP. Plant supervisor will designate a site monitor and send them to monitor the Mesa Ponds. Site monitor will look for seepage in the embankment, and communicate with the plant supervisor. If seepage is detected, arrange for notified dam-safety experts to observe site.
Unauthorized persons appear to be surveilling or watching the dam.	Observer will notify Reid Gardner Generating Station Security and Control Room of possible trespassers at the Mesa Ponds. Plant supervisor will begin notification procedures in Section 2 of this EAP. Observer will not approach person(s) on their own.
Damage or rupture of the effluent discharge pipes or valve station that results in a uncontrolled discharge of water into the ponds.	Observer will notify Control Room to monitor effluent discharge pipes. Plant supervisor will begin notification procedures in Section 2 of this EAP. Plant supervisor will direct Station personnel to stop discharging effluent to the pond with the developing emergency condition.
Water surface elevation is above maximum operation level in either pond, but more than 12 inches below the dam embankment crest.	Observer will notify the Control Room to monitor effluent discharge and check water level in the EFPS. Plant supervisor will begin notification procedures in Section 2 of this EAP. Plant supervisor will direct Station personnel to stop discharging effluent to the pond with the developing emergency condition. Plant supervisor may direct Station personnel to transfer water from pond with developing emergency condition to the other pond.

5.5 Step 4: Termination and Follow-up (Including Documentation)

Reid Gardner Generating Station is responsible for initiating the EAP and deciding when the emergency has passed and activation of the EAP is officially terminated. Termination must be communicated to all previously-contacted parties using the same notification flowchart in Section 2. After termination, it is recommended to follow-up EAP activations with post-event documentation and to also to conduct supplemental evaluation of the EAP for its effectiveness and recommended improvements. The EAP evaluation can best be conducted in a post-event evaluation workshop to solicit input from those who were involved in the EAP activation, including those from external emergency responders.

Form templates are provided in Appendix C to document EAP activations. Complete these forms prior to terminating the EAP and as part of follow-up. The forms are:

- Emergency Response Event Log – used to document a timeline of events, actions and communications taken during the emergency.
- Dam Emergency Termination Log – used to assess damage to the dam, Station, and downstream and justify termination of the dam-safety emergency.
- It is recommended that the post-event EAP evaluation can be documented in a brief report documenting when and where the workshop was held, who participated, what the workshop outcomes were, who will update the EAP and when updates to the EAP will be completed. The report should be attached to future reversions of the EAP in a new appendix.

SECTION 6

Responsibilities under the EAP

6.1 General Responsibilities

The EAP is a structured plan to help ensure appropriate emergency response. That plan includes preparedness (Section 7), pre-planned notifications (Section 2) and pre-planned actions (Section 5). Effective use of the EAP requires prior training and fulfillment of planned responsibilities. EAP responsibilities can be broadly described as follows. Assigned responsibilities by title, described in the subsections that follow, help ensure these broad responsibilities are fulfilled.

- Owner
  - Employ an EAP coordinator who will ensure all requirements in the EAP (including preparedness, training and follow-up) are performed as required in the EAP
  - Provide for annual training and exercises (internal and external), to include holding an annual face-to-face meeting or exercise between local emergency responders as required by the CCR Rule
  - Update and improve the EAP
  - Surveillance and monitoring
  - Detecting an incident and activating the EAP
  - Evaluating and classifying an incident. Ensure dam-safety experts are available (either on staff or have informed consultants available)
  - Notifying emergency management authorities
  - Provide inundation maps and summarize downstream impacts
  - Provide supplemental (appended) information
  - Performing pre-planned response actions
  - Coordinate in advance any warnings or evacuations to be performed by owner
  - Monitor an incident and provide for staff safety and security
  - Termination an activated EAP and follow-up
- Emergency Management Authorities
  - Issue public warnings
  - Perform any evacuations
  - Coordinate multiple emergency management agencies and their staff
- Dam-Safety Agencies
  - Provide technical support
  - Help with post-event assessment and information

6.2 Owner Responsibilities

The specific actions NV Energy personnel should take after implementing the EAP notification procedures are described below. When time permits, supervisory personnel should be consulted before any response

actions are taken. Advice may be needed concerning predetermined remedial action to delay, moderate, or alleviate the severity of the emergency condition.

6.2.1 Notifications

Notification responsibilities and lines of communication are illustrated on the notification flowcharts in Section 2. If a link in the chain of communication is unavailable or unable to perform, the incident commander will assign an alternative person to fill that role.

6.2.2 Incident Commander

The incident commander is the senior official is who is available on-site. Typically, during normal work hours the plant supervisor will begin serving as the incident commander, until the role is transferred. After work hours, the on-site head of security will typically begin serving as the incident commander until the role is transferred. Generally, the role will be transferred to the plant director, EAP coordinator, or plant supervisor, and in that order of preference. At no point will the incident commander role be left unfilled. The incident commander title must be immediately adopted by an available staff member until transferred. The incident commander has the authority to take the necessary actions described in this EAP and direct emergency response actions.

If time permits, the incident commander should consult with an operations manager or the dam safety engineer and dam inspection team before initiating notifications; however, *Imminent Failure* notifications should be initiated immediately. If a link in the chain of communication is unavailable, the incident commander will assign an alternative person to fill that link. The incident commander is responsible to confirm and ensure that all notifications are completed and updated as required.

The incident commander will ensure that the full response process (Section 5) is implemented during the event, following event detection: event evaluation and classification, dam monitoring and status updates, notifications and communications and emergency actions.

The incident commander is responsible for termination of the EAP when the event is fully resolved. For non-urgent conditions, this may take several days or possibly weeks.

The incident commander will also carry out any specific actions and duties listed in complementary NV Energy emergency response plans.

6.2.2.1 Transfer of Incident Commanders

When transferring the incident commander role and title from one person to another for whatever reason, a formal statement of the transfer must be made between the ex-commander and the commander-to-be (such as, “Are you assuming the role of incident commander?”).

The reply would be, “Yes, I am assuming the role of incident commander” or “I am taking over as incident commander.” This conversation or statement clarifies who is acting as incident commander and assuming incident commander responsibilities and that the acting incident commander is being relieved of his/her incident commander responsibilities and duties at that time.

There should be only one incident commander for a given situation.

6.2.3 Plant Supervisor

The plant supervisor or person acting in that role will act as the incident commander until relieved by NV Energy management.

When time allows, the plant supervisor shall account for all personnel on-site who may be affected or assist during a dam-safety emergency. He or she will assist the incident commander, EAP coordinator and others with EAP responsibilities.

6.2.4 EAP Coordinator

The EAP coordinator is responsible for providing and coordinating assistance to the incident commander and corporate officials during an emergency, serving as a deputy. The EAP coordinator is responsible for organizing follow-up meetings and completing follow-up reports after the termination of an event.

The EAP coordinator will ensure that the provisions of the EAP are fulfilled, including preparedness, notification contact updates and other EAP requirements. The EAP coordinator will coordinate and provide for training, EAP exercises/tests, an EAP update, and other EAP revisions, as needed (enlisting in-house or consultant dam-safety EAP experts, as needed). The EAP coordinator will answer general questions pertaining to the EAP.

The designated EAP coordinator is the plant environmental advisor.

6.2.5 Operations Manager and Dam-Safety Engineer

The operations manager will assign an engineer or retain and informed outside consultant as a dam-safety engineer. That engineer must be an experienced expert in dam design and dam safety, and be available for consultation and expert opinion prior to and during dam-safety emergencies. The dam-safety engineer, and optionally the operations manager, will participate as part of the technical team to provide periodic dam inspections in advance of an emergency, and assist in evaluation, classification and suggesting response actions when the EAP is activated or under consideration for activation. The engineers will provide input regarding the timing of EAP termination and during post-event follow-up.

6.2.6 Plant Director

The plant director has overall responsibility for the implementation of this EAP and for assigning an incident commander when in doubt.

The plant director is responsible for overseeing and confirming that the EAP responsibilities of the EAP coordinator, operations manager and dam-safety engineer have been adequately completed each year, consistent with this EAP and EAP objectives.

6.2.7 Corporate Responsibilities

Although most emergencies will be handled at the plant level, there may be instances when the Corporate Emergency Response Plan may require activation. The decision to activate the Corporate Emergency Response Plan may only be made by a corporate officer. The decision to alert the corporate officer in charge of generation will be made by the plant director or their designee.

6.2.8 Observer's Responsibilities

The observer can be anyone that notices a potential problem at the Mesa Ponds whether it is someone at the Ponds or someone monitoring the pipes and instruments. In the event of an emergency, the observer should evaluate the situation and, if necessary, contact the Control Room and the plant supervisor to initiate one of the emergency notification procedures.

Clear, concise communication of the situation is essential. All communications should be done in a calm manner so as not to unnecessarily alarm the recipient. However, communications should be done in a serious manner to demonstrate the reality of the situation. Example communications are provided in Section 2 following each notification flowchart.

6.3 External Communications

The notification flowcharts (Section 2) indicate notifications outside of NV Energy.

Do not communicate with the media (reporters). Reporters should be directed to the corporate public information officer, who is on the notification flowchart, and to the company emergency response authorities.

The corporate public information officer or his or her designated representative will be responsible for disseminating information to the media and the public on a periodic basis throughout the emergency.

If a flood warning needs to be issued, follow the notification flowchart to contact emergency dispatch.

6.4 Responsibility for Evacuation

The incident commander will determine whether evacuation is required for Station personnel and Station property. In the event of evacuation, the incident commander will make sure that the Station's gates are closed and locked.

Evacuations of the public and property not owned by NV Energy will be the responsibility of emergency responders. Notifications will be made to the emergency responders in accordance with the Notification Flowchart (Figure 2-1) and Notification Procedures (Section 2).

6.5 Responsibility for Duration, Security, Termination and Follow-Up

The EAP coordinator or incident commander will monitor the emergency situation as described above and keep local and state authorities informed of the developing conditions from the time an emergency starts until the emergency has been terminated. Security shall be maintained by the Station security and any additional help coordinated by the incident commander.

Procedures for event termination are in Section 5.5 (Step 4). The incident commander is responsible for declaring that the emergency at the facility is terminated after state or local emergency management officials have terminated their disaster response activities. After termination of the emergency situation, a follow-up evaluation should be completed by all participants. It is recommended that the results of the evaluation be documented in a written report.

SECTION 7

Preparedness

7.1 Preparedness Overview

Preparedness actions are taken prior to EAP activation to pre-plan and enable actions during an emergency that may prevent, slow or mitigate a dam failure or other EAP event. The preparedness actions in this Plan include:

- Surveillance and monitoring
- Evaluation of detection and response timing
- Access to the site
- Response during periods of darkness
- Response during weekends and holidays
- Response during adverse weather
- Alternative systems of communication
- Emergency supplies and information
- Sources of earthen materials and earth-moving equipment to stall a breach
- Training and exercises

Preparedness actions involve the installation of equipment or the establishment of procedures for one or more of the following purposes:

- Preventing the development of emergency conditions, if possible, or warning of the development of emergency situations;
- Facilitating the operation of the ponds to limit impacts in an emergency situation; and
- Minimizing the extent of damage resulting from emergency situations that do develop

7.2 Surveillance and Monitoring

Surveillance and monitoring are an important part of the day-to-day operations at the Station. NV Energy maintains a Control Room that monitors the effluent discharge to the Mesa Ponds. Additionally, Station personnel physically observe the Mesa Ponds to ensure the water surface elevation is at or below maximum operational level. The water surface elevation should be at or below the “0” on the elevation gage for each pond.

7.3 Evaluation of Detection and Response Timing

As part of EAP training and testing, the EAP coordinator may devise annual drills or desktop assessments to assess the time it takes to detect and respond to developing emergencies. Drills may be enhanced by including simulated performance obstacles, such as loss of power, darkness, employees absent on vacation or holiday, and other hurdles to manage. Using lessons learned, revise the EAP to improve the likelihood of early detection and shorten the required response time, and to customize annual training modules. When participants are not informed of the drill in advance to improve realism, always clearly communicate that this is ONLY A DRILL and NOT AN ACTUAL EMERGENCY. Debrief participants at the end of the drill, and document results for inclusion in the EAP.

7.4 Access to the Site

Access to the Mesa Ponds from the Station involves leaving the Station at Lincoln Road and heading southwest on the Haul Road to the South Lateral Landfill Expansion also referred to as the SLLE). On the south side of the South Lateral Landfill Expansion, head south and continue to the Mesa Ponds. The access route from the Station to the Mesa Ponds can be found in Figure 4-1. Refer to Table 4-1 for directions to the Station.

Overton, Mesquite and Las Vegas have emergency medical services that could respond to the plant. These cities are approximately 20 (Overton), 40 (Mesquite), and 55 (Las Vegas) miles from the Station. It can be assumed that most emergency responders would be coming from Mesquite or Las Vegas as these are the largest metropolitan areas close to the facility.

7.5 Response during Periods of Darkness

In the event of an emergency incident during periods of darkness, the observer would contact security, who would then contact the operations manager. The operations manager would enact the emergency notification pertinent to the emergency level of the incident at the Mesa Ponds.

Exterior lighting at the Station and ponds is provided by NV Energy, while the electrical provider in the local area is Overton Power. Minimal lighting is provided at the Mesa Ponds. During a power failure, the operations manager will be notified and act as needed. Temporary mobile lighting may be available at the plant and could be used at an incident location. NV Energy Transmission and Distribution Department staff or the Overton Power District would be contacted by the plant supervisor to repair damaged power poles or lines.

7.6 Response during Weekends and Holidays

The Station is staffed 7 days per week from 6 a.m. to 6 p.m. Security personnel are present outside of those working hours. The ponds are typically checked a minimum of 4 days per week. In the event of an emergency incident during weekends or holidays, the observer would contact the Control Room who would then contact the plant supervisor. The plant supervisor would initiate the notification procedure pertinent to the emergency level of the incident.

7.7 Response during Adverse Weather

Changes in the weather associated with fast-moving severe storms give little or no warning. In the event of impending severe weather, plant personnel will monitor the local emergency weather broadcast. The safety of on-site personnel and the integrity of plant equipment, in that order, will be the first concerns. The plant director will be notified of any impending severe storms. If the plant director cannot be contacted, the plant supervisor or operations manager will determine the appropriate action.

During severe thunderstorms, caution should be used during outside activities. If thunderstorms are in the immediate area of the plant, outside activities should be limited as much as possible. Personnel should avoid being at the highest elevation on any structure. The safety of plant personnel should be the prime concern and reasonable judgment should be used.

In the event of an emergency incident during periods of adverse weather, the observer would contact the Control Room who would then contact the plant supervisor. The plant supervisor would initiate the notification procedure pertinent the emergency level of the incident.

Table 7-1 lists emergency resources, including equipment to be used during periods of adverse weather.

7.8 Alternative Systems of Communication

Systems of communication available to the Station personnel (apart from conventional telephone service) include cellular phones, pagers and radios.

7.9 Emergency Supplies and Information

7.9.1 Stockpiling Materials and Equipment

In general, several 0.5-ton pickup trucks are available for use by the Station staff. Additional emergency equipment that is available is listed in Table 7-1. Equipment is divided into that readily available and other equipment that is available but would likely require more time to deliver to the ponds. If extra equipment (not listed in Table 7-1), more personnel, specific materials, or additional expertise is needed for emergency response actions, the EAP coordinator should contact an appropriate local contractor for these services.

The Station has an emergency medical technician that has the capability and resources to supplement the Station staff at the ponds as necessary during high water events or other emergency conditions. The area is served by a volunteer fire department.

Table 7-1. Available Emergency Equipment

Quantity	Description
1	One-ton, 4x4 pickup
2	Half-ton, 4x4 pickups
1	Caterpillar 928 front-end loader
2	Bobcat skid steer loaders
1	Ranger rescue boat with 2-25 horsepower motors
11	All-terrain vehicles

7.9.2 Coordination of Information

Knowledge of current and forecasted streamflow and weather information may prove critical to emergency situation decisions at the Station ponds. Sources of such information are described below.

The U.S. Geological Survey maintains a streamflow gage approximately 1 mile downstream of the Station on the Muddy River. The gage measures and records the stage of the river in feet. River flow in cubic feet per second can be estimated using the stage-discharge relationship. Stage can be obtained from the gage at any time. Note that the U.S. Geological Survey periodically modifies streamflow gage rating tables and, therefore, the rating should be replaced when appropriate.

Related information is available at the following web addresses:

http://waterdata.usgs.gov/nv/nwis/rt – U.S. Geological Survey Real-Time Water Data for Nevada

http://www.wrh.noaa.gov/vef/ – National Weather Service (Las Vegas, NV).

http://water.weather.gov/ahps2/index.php?wfo=vef – National Weather Service Advanced Hydrologic Prediction Service.

7.10 Training and Exercises

The EAP coordinator will provide EAP training for applicable staff. It is recommended that that training occur annually. Part of the training may include an annual EAP exercise that includes evaluation of detection and response timing (Section 7.3). Period exercises should be performed as required by the Nevada Administrative Code. At a minimum, conduct an annual face-to-face meeting or exercise with local emergency responders as required by the CCR Rule. It is recommended that the annual meetings or exercises be documented. Additional details are provided in Appendix A.

SECTION 8

Inundation Maps

8.1 Results of Dam Breach Analysis

A “sunny day” full pool dam breach analysis was performed on the Mesa Ponds. The following is a list of results from the analysis. The analysis is found in the “Initial Hazard Potential Classification Assessment, Ponds M5 and M7, Reid Gardner Generating Station”, created by CH2M and dated October 11, 2016.

- The resulting water surface elevation of the Muddy River from a theoretical dam breach is less than the 100-year water surface elevation on the Muddy River.
- The leading edge of the flood wave will reach the private residence, near where Hidden Valley Road crosses the Muddy River, in approximately 0.60 hours after a dam breach of the Mesa Ponds.
- The maximum flow at the private residence is approximately 4,000 cubic feet per second.
- The flow from a theoretical dam breach of the Mesa Ponds will be contained in the Muddy River banks approximately 2.0 river miles from the Station.

8.2 Inundation Maps

Figure 8-1, Inundation Map 1, and Figure 8-2, Inundation Map 2, on the following pages show the inundation limits due to the “sunny day” failure scenario analyzed for Pond M5.

Limits of inundation and flooding characteristics shown on the map are approximate and based on the theoretical failure of the Mesa Ponds described above. This map is only to be used as a general basis for downstream hazard evaluation. Actual inundation and flood wave characteristics may vary depending upon actual river and berm conditions during failure.

Figures

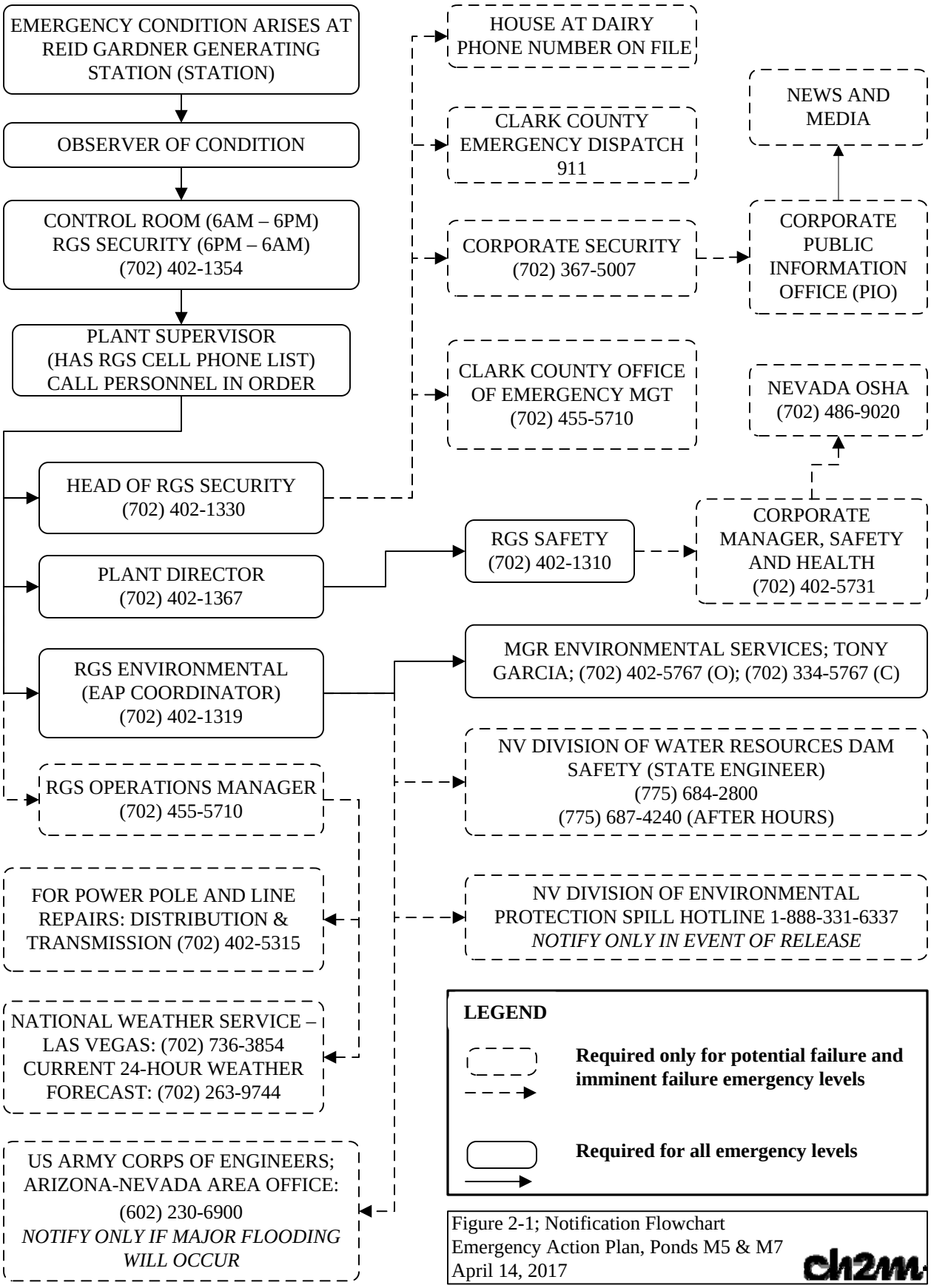
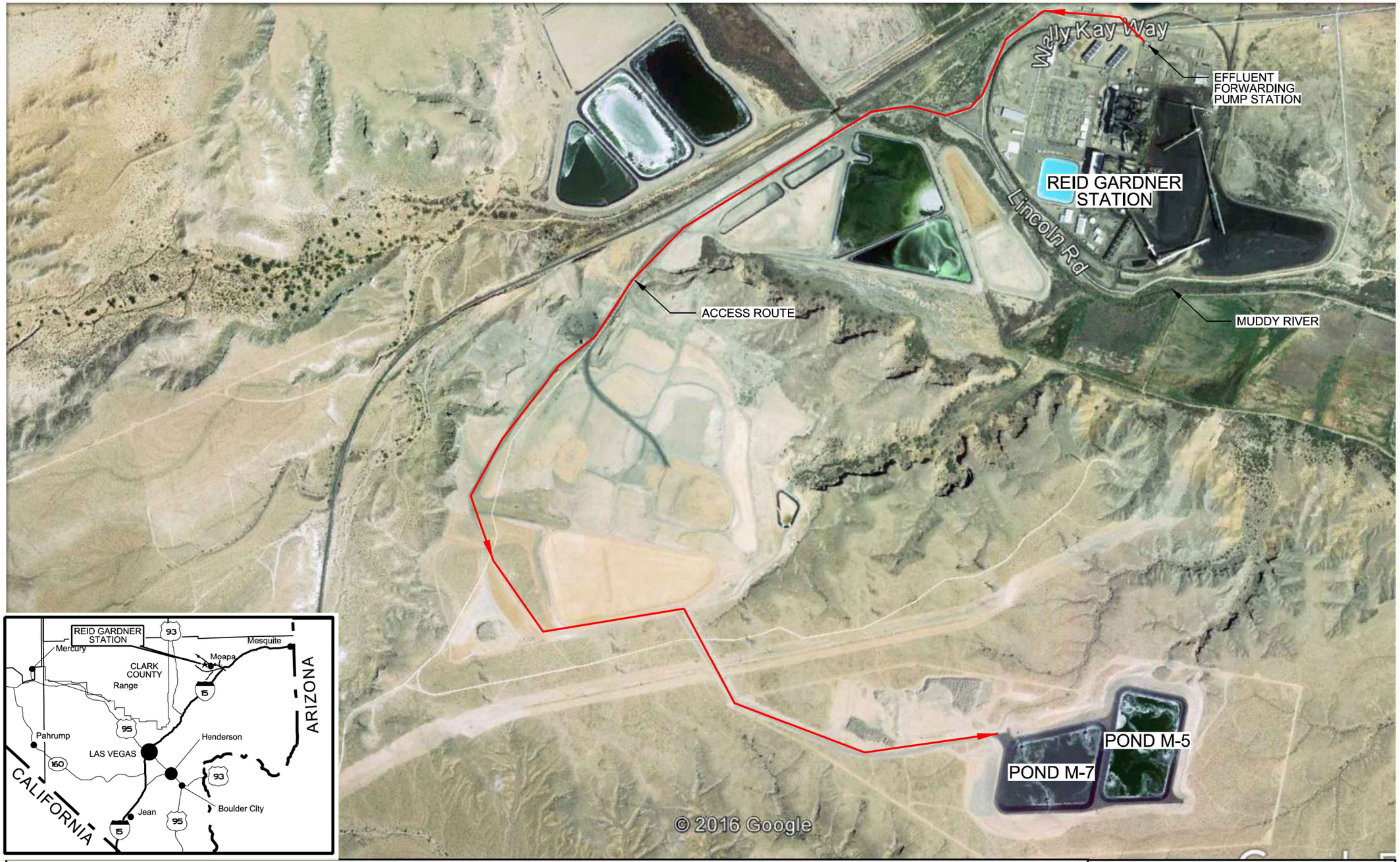


Figure 2-1; Notification Flowchart
Emergency Action Plan, Ponds M5 & M7
April 14, 2017



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Location & Vicinity Map

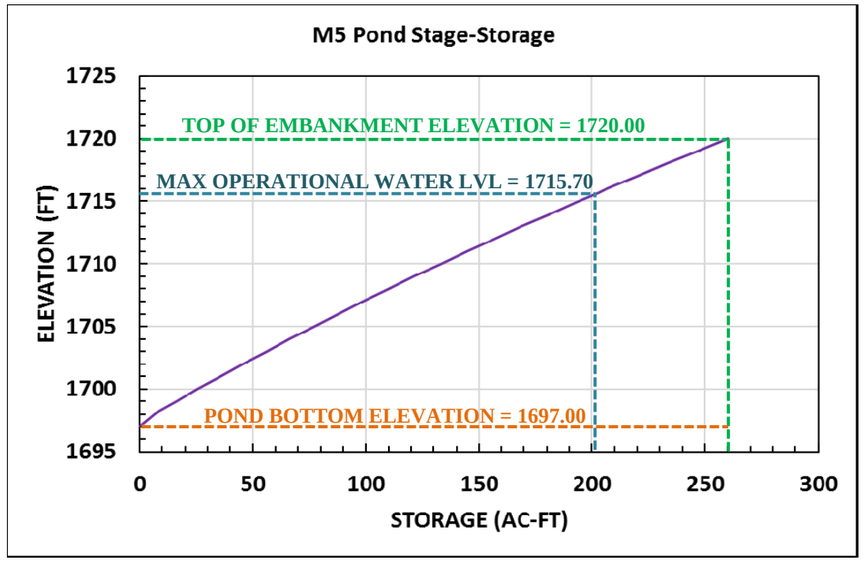
Mesa Ponds M5 and M7

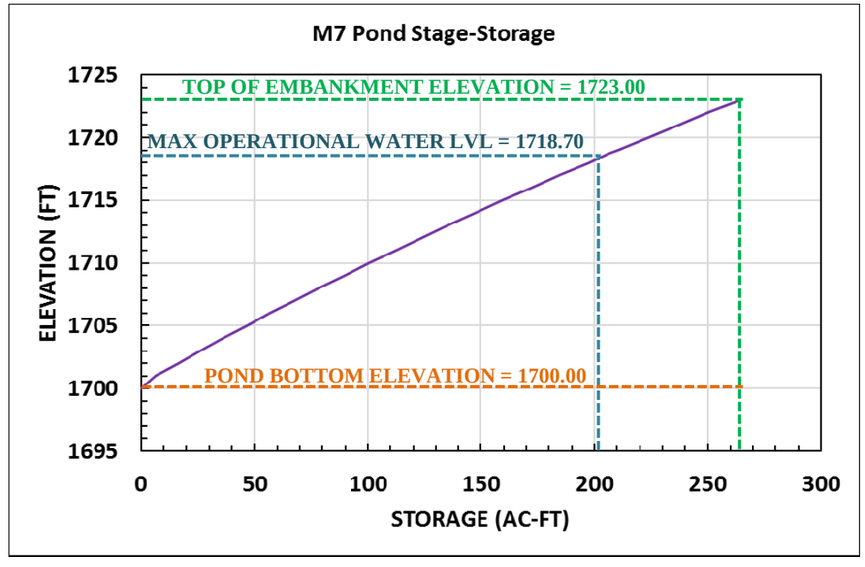
Emergency Action Plan, Reid Gardner Station

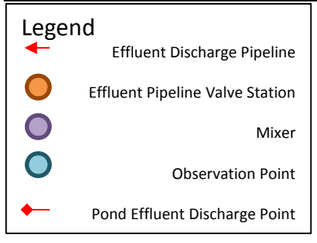
Figure 4-1

04/2017

ch2m

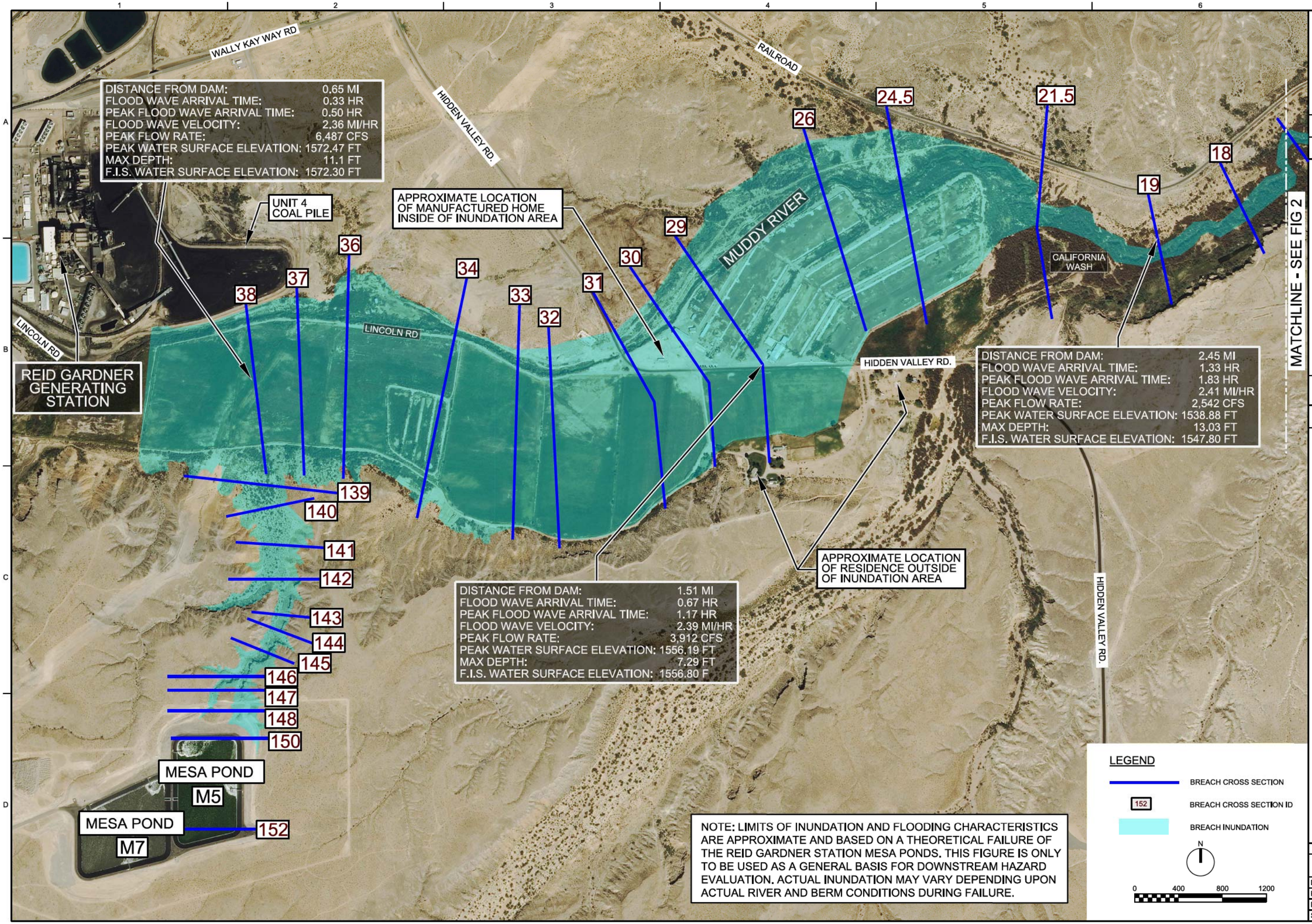






Note: all elevations reference NAVD 1988 vertical datum

Figure 4-2
Dam Facilities Map
Mesa Ponds M5 and M7
Dam Facilities and Hydraulic Information
Emergency Action Plan
Reid Gardner Station
Moapa, Nevada



NO.	DATE	REVISION	BY
0			APVD

DSGN M.SCHWAB DR R.VILORIA CHK APVD

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-3694175

REID GARDNER STATION
Moapa, Nevada

NVEnergy

ch2m:

RGS

M5M7 BREACH INUNDATION MAP

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCT 2016
PROJ	671059
DWG	FIG 1
SHEET	1 OF 2

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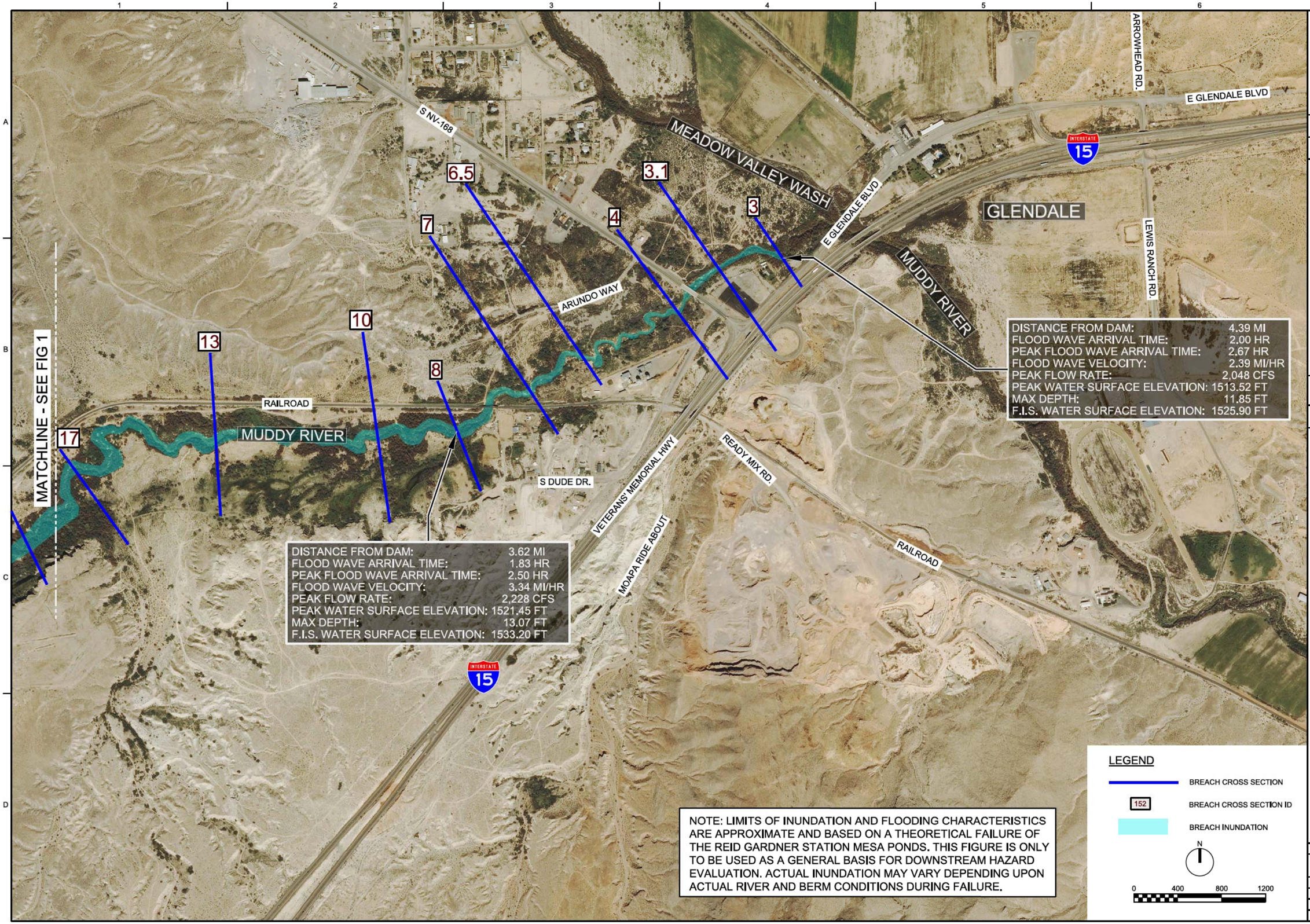

NO.	DATE	DSGN	DR	CHK	APVD	BY
0		M.SCHWAB	R. VILORIA		APVD	

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HENDERSON, NEVADA 89074
PHONE: 702-368-4175

NVEnergy

REID GARDNER STATION
Moapa, Nevada

ch2m:

RGS

M5M7 BREACH INUNDATION MAP

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	OCT 2016
PROJ	671059
DWG	FIG 2
SHEET	2 OF 2

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Appendix A
Plans for Training, Exercising, Updating and Posting the Plan

APPENDIX A

Plans for Training, Exercising, Updating and Posting the Plan

B.1 Training

EAP training is to take place for applicable facility employees periodically (annual is recommended).

Training for facility personnel should include a review of the EAP and the notification flowchart as well as overall emergency response training. Specific items to be covered include how to correctly respond to emergencies, emergency procedures, and the Station chain of command. Trained personnel should be familiar with the elements of this Plan, the availability of equipment, and their responsibilities and duties. Technically qualified personnel should be trained in problem detection and evaluation and appropriate remedial measures. A sufficient number of people should be trained to ensure adequate coverage of the positions listed in Sections 4 and 5, the notification flowchart, and the notification procedure.

Training is to be performed by the EAP coordinator or specialists arranged by the EAP coordinator as identified in Sections 6 and 7 of this Plan. Training for the EAP coordinator is available from the FEMA and the Nevada Division of Emergency Management at the addresses below:

FEMA
Region IX: Oakland
1111 Broadway., Suite 1200
Oakland, CA 94607
510.627.7220

Nevada Division of Emergency Management
2478 Fairview Drive
Carson City, NV 89701
775.687.0300

B.2 Exercising

Training should be performed at a frequency that ensures a state of readiness of personnel who are responsible to take action during an emergency situation. Testing should include a drill that simulates an emergency condition. Special procedures for nighttime, weekends and holidays, as outlined in Section 6, should be included. If possible, coordination and consultation with state and local emergency management officials and other organizations listed in the notification flowchart should be included in the drill and functional exercises. Participation by the affected state and local officials will enhance the effectiveness of the exercises. The exercises should be evaluated and the EAP should be revised to correct any deficiencies noted. The following subsections discuss the different types of exercises that could be conducted at the Station.

At a minimum, to meet the requirements of CCR Rule Section 257.73(a)(3)(i)(E), the annual exercise must include a face-to-face meeting or exercise with local emergency responders. It is recommended that the annual exercise required to satisfy the CCR Rule be documented.

B.2.1 Orientation Seminar

This exercise is an annual seminar that involves bringing together those with roles or interests in the EAP. The individuals and departments listed on the notification flowchart (Figure 1-1) would attend this seminar.

A representative from each of the local and state emergency agencies and the neighboring property owners should be encouraged to attend. The EAP coordinator or their representative will lead the presentation and discuss the roles, responsibilities and procedures associated with the EAP. The orientation seminar can also be used to discuss and describe technical matters with involved, non-technical personnel.

B.2.2 Drill

A drill is the lowest level of exercise that involves an actual implementation of the EAP. A drill should test, develop and maintain skills in a single emergency response procedure. An example of a drill is an in-house exercise performed to verify the validity of telephone numbers and other means of communication.

B.2.3 Tabletop Exercise

The tabletop exercise is a higher level exercise than a drill. The tabletop exercise involves a meeting of facility personnel, potentially with state and local emergency management officials, in a conference room environment. The format of the meeting should include a description of a simulated event and a discussion to evaluate the EAP response procedures. Recommendations should be made to revise the EAP to resolve concerns regarding coordination and responsibilities.

B.2.4 Functional Exercise

An outline of a functional drill exercise for the EAP is as follows:

- Plant supervisor and EAP coordinator meet in the Control Room.
- Plant supervisor initiates a **TEST** notification procedure using the notification flowchart. It is imperative that all communications during the test clearly state that it is a test. An example communication would be:
- My name is _____ and I am a plant supervisor at the Reid Gardner Station in Moapa, Nevada. We are conducting a test of the Emergency Action Plan for the Mesa Ponds. Repeat, **THIS IS A TEST** and there is no actual emergency at the ponds. Please refer to your copy of the Emergency Action Plan and make any communications that are required. Be sure that your communications clearly identify that this is only a test.
- **Calls to emergency agencies should be made using numbers other than "911."**
- The EAP coordinator should take notes throughout the exercise. Notes should include start time, time required to reach each person on the notification flowcharts, problems and any other information that might prove useful.
- Subsequent to the exercise, the EAP coordinator should fill out the Emergency Action Plan Exercise Reporting Form. The form should include the following (a blank copy is included in Appendix C):
  - Time required for completing notifications;
  - Critique on notification procedure; and
  - Verification that all persons notified had current copies of the EAP.

B.3 Updating

Evaluate the EAP, at a minimum every 5 years, to ensure accuracy per the CCR Rule Section 257.(a)(3)(ii). It is recommended that the EAP should be reviewed at least annually. Update the EAP as necessary to keep it current, incorporate lessons learned from the exercises and whenever there is a change in conditions that would substantially affect the EAP. The review and update should include:

- Names, titles, telephone numbers, etc. of operating personnel and personnel responsible for implementation of the EAP.

- Names and telephone numbers of contacts to be notified under the EAP (for example, state or local agencies, neighboring property owners, media, etc.)
- Changes in the ponds that could affect results of the embankment failure analysis (for example, changes in flood inundation areas, downstream developments, embankment heights, or in the reservoir)
- Changes in operation and/or maintenance of the ponds that could substantially affect the implementation of the EAP.

Any and all changes to the EAP must be distributed to all holders of the EAP listed in Table B-1.

The EAP coordinator should ensure that each original copy of the EAP on the distribution list (Table B-1) is up to date after a revision is completed.

Updated or revised EAPs must be placed in the Station's operating record per CCR Rule Section 257.73(a)(3)(ii)(B). The EAP, and any amendment must be certified by a qualified professional engineer per CCR Rule Section 257.73(a)(3)(iv).

A distribution summary for copies of the EAP is shown in Table B-1 below.

Table B-1. EAP Distribution Summary

Document Control Number	Name	Address
1	Control Room	Reid Gardner Generating Station 501 Wally Kay Way Moapa, Nevada 89025
2	Jason Hammons, Plant Director	Reid Gardner Generating Station 501 Wally Kay Way Moapa, Nevada 89025
3	Michael Rojo, Supervisor, Environmental EAP coordinator	Reid Gardner Generating Station 501 Wally Kay Way Moapa, Nevada 89025
4	Todd Robison Operations Manager	Reid Gardner Generating Station 501 Wally Kay Way Moapa, Nevada 89025
5	To Be Determined, Manager, Health and Safety	NV Energy P.O. Box 98910 Las Vegas, Nevada 89151 *Physical Address: 6226 W. Sahara Ave.*
6	Tony Garcia Manager, Environmental	NV Energy P.O. Box 98910 Las Vegas, Nevada 89151 *Physical Address: 6226 W. Sahara Ave.*
7	Nathan Betts Engineer of Record	CH2M HILL Engineers, Inc. 2485 Village View Drive, Suite 350 Henderson, NV 89074

It is recommended that the entire EAP be reprinted and redistributed to all parties at least every 5 years.

Appendix B
Select Mesa Ponds M5 and M7 Record Drawings

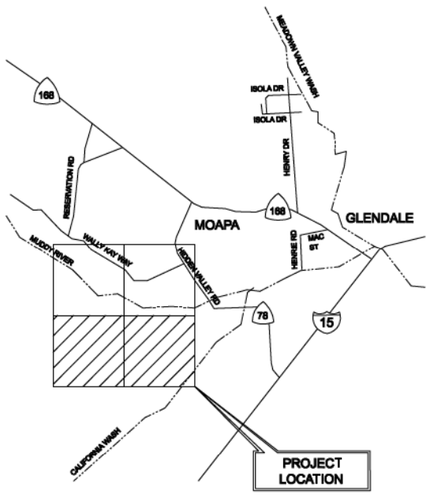
MOAPA, NEVADA

REID GARDNER STATION
WASTEWATER SYSTEM IMPROVEMENT PROJECTS
DRAWINGS FOR CONSTRUCTION OF
MESA EVAPORATION PONDS - M5 AND M7

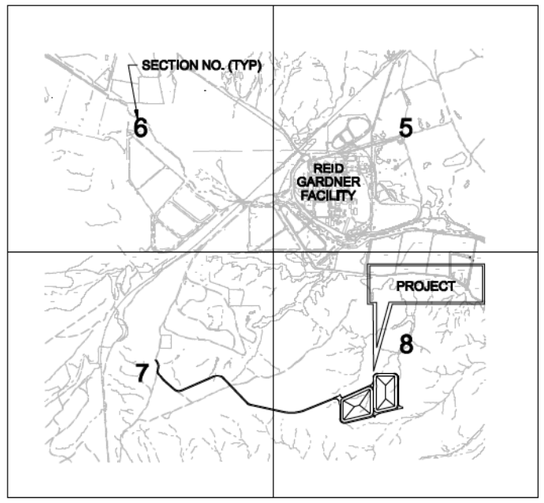
M5: RC171 WO# 9825650201

M7: RC171 WO# 9821855101

JULY 2011



VICINITY MAP



T. 15 S., R. 66E. M.D.M.

LOCATION MAP

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS IN 2011. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	P. TSCHESCHKE	J. WALKER	J. SCHNEIDER	S. DETHLOFF
0	4/16/10				

REVISION	BY	APVD
RECORD DRAWING ISSUED FOR CONSTRUCTION	NKB PDT	SWD SWD

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-5175

CH2MHILL

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9825650201 M7: RC171 WO# 9821855101

TITLE SHEET, VICINITY AND LOCATION MAPS

VERIFY SCALE

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0 1"

DATE	JULY 2011
PROJ	401621
DWG	G-1
SHEET	1 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-G-00201_401621RD.dgn PLOT DATE: 7/11/2011 PLOT TIME: 11:28:16 AM

DRAWING INDEX

SHEET OR PAGE NO.	DWG NO. OR SHT NO.	TITLE	INCLUDED WITH DAM IMPOUND APPLICATION	ENGINEER
		GENERAL DRAWINGS FOR SCHEDULE A AND B		
1	G-1	Title Sheet, Vicinity and Location Maps	Y	CH2M HILL
2	G-1A	Drawing Index	Y	CH2M HILL
3	G-2	Abbreviations, General Notes and Civil Legend	Y	CH2M HILL
4	G-3	Structural Notes	Y	CH2M HILL
5	G-4	Mechanical Legend	Y	CH2M HILL
6	G-5	Electrical Legend	Y	CH2M HILL
7	G-6	Instrumentation and Control Legend	Y	CH2M HILL
		SCHEDULE A DRAWINGS		
8	D-1	Elevation/Capacity and Elevation/Area Curves	Y	CH2M HILL
	D-2	Not Used		
9	D-3	General Layout Plan Pond M5	Y	CH2M HILL
10	D-4	General Layout Plan Pond M7	Y	CH2M HILL
	D-5	Not Used		
11	D-6	Berm Profile Pond M5	Y	CH2M HILL
12	D-7	Berm Profile Pond M7	Y	CH2M HILL
13	C-1	General Site Plan	Y	CH2M HILL
14	C-2	General Pond Site Plan	Y	CH2M HILL
15	C-3	Pond Site Plan - Area 1	Y	CH2M HILL
16	C-4	Pond Site Plan - Area 2	Y	CH2M HILL
17	C-5	Pond Site Plan - Area 3	Y	CH2M HILL
18	C-6	Pond Site Plan - Area 4	Y	CH2M HILL
19	C-7	Pond Site Plan - Area 5	Y	CH2M HILL
20	C-8	Pond Site Plan - Area 6	Y	CH2M HILL
21	C-9	Drainage Ditch Details	Y	CH2M HILL
22	C-10	Pond Sections	Y	CH2M HILL
	C-11	Not Used		
23	C-12	Pond Berm Typical Sections	Y	CH2M HILL
	C-13	Not Used		
	C-14	Not Used		
24	C-15	Pond M5 Liner Plan	Y	CH2M HILL
25	C-16	Pond M7 Liner Plan	Y	CH2M HILL
26	C-17	Leak Detection and Recovery System - Civil Details	Y	CH2M HILL
27	C-18	Leak Detection and Recovery System and Liner System Details	Y	CH2M HILL
28	C-19	Liner System Details	Y	CH2M HILL
		SCHEDULE B DRAWINGS		
29	C-20	Paved MEP Access Road		Forsgren Associates
30	C-21	Paved MEP Access Road		Forsgren Associates
31	C-22	Paved MEP Access Road		Forsgren Associates
32	C-23	Paved MEP Access Road	Y	Forsgren Associates
33	C-24	Civil Details	Y	Forsgren Associates
34	P-1	Effluent Discharge Pipeline - Site West		Forsgren Associates
35	P-2	Effluent Discharge Pipeline - Site East	Y	Forsgren Associates
36	P-3	Pond Berm Typical Sections	Y	Forsgren Associates
37	P-4	Discharge Pipeline Details	Y	Forsgren Associates
38	P-5	Effluent Discharge Pipelines - Sta 0+00 to 10+00	Y	Forsgren Associates
39	P-6	Effluent Discharge Pipelines - Sta 10+00 to 20+00	Y	Forsgren Associates
40	P-7	Effluent Discharge Pipelines - Sta 20+00 to 25+00	Y	Forsgren Associates
41	S-1	General Notes	Y	Forsgren Associates
42	S-2	Bridge Plan and Elevation	Y	Forsgren Associates
43	S-3	Foundation M5-2, M5-3	Y	Forsgren Associates
44	S-4	Foundation M7-1	Y	Forsgren Associates
45	S-5	Foundation M7-2, M7-3, M5-1	Y	Forsgren Associates
46	S-6	Column Details	Y	Forsgren Associates
47	S-6a	Column Details		Forsgren Associates
48	S-7	Pond M5 Pier/Platform Plan		Forsgren Associates
49	S-7A	Pond M7 Pier/Platform Plan		Forsgren Associates
50	S-8	Pier Cap M5-2, M5-3 Details		Forsgren Associates
51	S-8a	Pier Cap M5-2, M5-3 Details		Forsgren Associates
52	S-8b	Pier Cap M5-2, M5-3 Details		Forsgren Associates
53	S-9	Pier Cap M7-1 Details		Forsgren Associates
54	S-9a	Pier Cap M7-1 Details		Forsgren Associates
55	S-9b	Pier Cap M7-1 Details		Forsgren Associates
56	S-10	Pier Cap M7-2, M7-3, M5-1 Detials		Forsgren Associates
57	S-10a	Pier Cap M7-2, M7-3, M5-1 Detials		Forsgren Associates
58	S-10b	Pier Cap M7-2, M7-3, M5-1 Detials		Forsgren Associates
59	S-11	Details	Y	Forsgren Associates
60	S-11A	Details	Y	Forsgren Associates
61	S-11B	Details	Y	Forsgren Associates
62	S-11C	Details	Y	Forsgren Associates
	S-11D	Not Used		
63	S-11E	Details		Forsgren Associates
64	S-12	Mixer Access Bridge #M7-3 Erection Layout		Solutions Inc / R&M Eng.
65	S-13	Mixer Access Bridge #M7-3 Splice Details		Solutions Inc / R&M Eng.
66	S-14	Mixer Access Bridge #M7-3 Plans, Sections & Details		Solutions Inc / R&M Eng.
67	S-15	Mixer Access Bridge #M7-3 Plans, Sections & Details		Solutions Inc / R&M Eng.
68	S-16	Mixer Access Bridge #M7-3 Plans, Sections & Details		Solutions Inc / R&M Eng.
69	S-17	Mixer Access Bridge #M7-3 Plans, Sections & Details		Solutions Inc / R&M Eng.
70	S-18	Mixer Access Bridge #M7-3 Plans, Sections & Details		Solutions Inc / R&M Eng.
71	S-19	Mixer Access Bridge #M7-3 Plans, Sections & Details		Solutions Inc / R&M Eng.
72	S-20	Mixer Access Bridge #M5-1,2,3 & M7-1,2 Erection Layout		Solutions Inc / R&M Eng.
73	S-21	Mixer Access Bridge #M5-1,2,3 & M7-1,2 Splice Details		Solutions Inc / R&M Eng.
74	S-22	Mixer Access Bridge #M5-1,2,3 & M7-1,2 Plans, Sections & Details		Solutions Inc / R&M Eng.

SHEET OR PAGE NO.	DWG NO. OR SHT NO.	TITLE	INCLUDED WITH DAM IMPOUND APPLICATION	ENGINEER
75	S-23	Mixer Access Bridge #M5-1,2,3 & M7-1,2 Plans, Sections & Details		Solutions Inc / R&M Eng.
76	S-24	Mixer Access Bridge #M5-1,2,3 & M7-1,2 Plans, Sections & Details		Solutions Inc / R&M Eng.
77	S-25	Mixer Access Bridge #M5-1,2,3 & M7-1,2 Plans, Sections & Details		Solutions Inc / R&M Eng.
78	S-26	Mixer Access Bridge#M5-1,2,3 & M7-1,2 Plans, Sections & Details		Solutions Inc / R&M Eng.
79	S-27	Mixer Access Bridge #M5-1,2,3 & M7-1,2 Plans, Sections & Details		Solutions Inc / R&M Eng.
80	S-28	Mixer Platforms General Steel Notes and Standard Details		Solutions Inc / R&M Eng.
81	S-29	Mixer Platforms Handrail Standards		Solutions Inc / R&M Eng.
82	S-30	Mixer Platform #M5-1 Steel Framing and Grating Plan		Solutions Inc / R&M Eng.
83	S-31	Mixer Platform #M5-1 Sections and Details		Solutions Inc / R&M Eng.
84	S-32	Mixer Platform #M5-1 Sections and Details		Solutions Inc / R&M Eng.
85	S-33	Mixer Platform #M5-1 Sections and Details		Solutions Inc / R&M Eng.
86	S-34	Mixer Platform #M5-2 Steel Framing and Grating Plan		Solutions Inc / R&M Eng.
87	S-35	Mixer Platform #M5-2 Sections and Details		Solutions Inc / R&M Eng.
88	S-36	Mixer Platform #M5-2 Sections and Details		Solutions Inc / R&M Eng.
89	S-37	Mixer Platform #M5-2 Sections and Details		Solutions Inc / R&M Eng.
90	S-38	Mixer Platform #M5-3 Steel Framing and Grating Plan		Solutions Inc / R&M Eng.
91	S-39	Mixer Platform #M5-3 Sections and Details		Solutions Inc / R&M Eng.
92	S-40	Mixer Platform #M5-3 Sections and Details		Solutions Inc / R&M Eng.
93	S-41	Mixer Platform #M5-3 Sections and Details		Solutions Inc / R&M Eng.
94	S-42	Mixer Platform #M7-1 Steel Framing and Grating Plan		Solutions Inc / R&M Eng.
95	S-43	Mixer Platform #M7-1 Sections and Details		Solutions Inc / R&M Eng.
96	S-44	Mixer Platform #M7-1 Sections and Details		Solutions Inc / R&M Eng.
97	S-45	Mixer Platform #M7-1 Sections and Details		Solutions Inc / R&M Eng.
98	S-46	Mixer Platform #M7-1 Sections and Details		Solutions Inc / R&M Eng.
99	S-47	Mixer Platform #M7-1 Sections and Details		Solutions Inc / R&M Eng.
100	S-48	Mixer Platform #M7-2 Steel Framing and Grating Plan		Solutions Inc / R&M Eng.
101	S-49	Mixer Platform #M7-2 Sections and Details		Solutions Inc / R&M Eng.
102	S-50	Mixer Platform #M7-2 Sections and Details		Solutions Inc / R&M Eng.
103	S-51	Mixer Platform #M7-2 Sections and Details		Solutions Inc / R&M Eng.
104	S-52	Mixer Platform #M7-2 Sections and Details		Solutions Inc / R&M Eng.
105	S-53	Mixer Platform #M7-3 Steel Framing and Grating Plan		Solutions Inc / R&M Eng.
106	S-54	Mixer Platform #M7-3 Sections and Details		Solutions Inc / R&M Eng.
107	S-55	Mixer Platform #M7-3 Sections and Details		Solutions Inc / R&M Eng.
108	S-56	Mixer Platform #M7-3 Sections and Details		Solutions Inc / R&M Eng.
109	S-57	Mixer Platforms Embedded Plate Sections and Details		Solutions Inc / R&M Eng.
110	S-58	General Arrangement Rising Post		Solutions Inc / OnPoint
111	S-59	GA Elevations M5-3 Rising Post		Solutions Inc / OnPoint
112	S-60	GA Elevations M5-1,2 & M7-1,2,3 Rising Post		Solutions Inc / OnPoint
113	S-61	Reserved		Solutions Inc / OnPoint
114	S-62	General Arrangement Mixer/Diffuser		Solutions Inc / OnPoint
115	S-63	Bill of Materials Headframe Assembly		Solutions Inc / OnPoint
116	S-64	Fabrication Detail Headframe Assembly		Solutions Inc / OnPoint
117	S-65	Fabrication Detail Headframe Parts 1		Solutions Inc / OnPoint
118	S-65a	Assembly Detail Headframe Parts		Solutions Inc / OnPoint
119	S-66	Fabrication Detail Headframe Parts 2		Solutions Inc / OnPoint
120	S-67	Fabrication Details Roller Mounts		Solutions Inc / OnPoint
121	S-68	Fabrication Details Aeration Feed Pipe		Solutions Inc / OnPoint
122	S-69	Fabrication Details Ratchet Assembly		Solutions Inc / OnPoint
123	S-70	Fabrication Details Diffuser Assembly		Solutions Inc / OnPoint
124	S-71	Fabrication Details Motor Mount		Solutions Inc / OnPoint
125	S-72	Installation Details Air Hose Assembly		Solutions Inc / OnPoint
126	S-73	installation Details Cable Support		Solutions Inc / OnPoint
127	S-74	Fabrication Details 32' Post M5-3		Solutions Inc / OnPoint
128	S-75	Fabrication Details 30' post M5-1,2 & M7-1,2,3		Solutions Inc / OnPoint
129	S-76	Fabrication Detail Post Attachments & Brackets		Solutions Inc / OnPoint
130	M-1	Leak Detection and Recovery Syestem - Mechanical Details	Y	Forsgren Associates
131	M-2	Pond M7 Mechanical - Site Plan	Y	Forsgren Associates
132	M-3	Pond M5 Mechanical - Site Plan	Y	Forsgren Associates
133	M-4	Mixer Bridge and Platform - Mechanical Plan		Forsgren Associates
134	M-5	Mixer Bridge and Platform - Mechanical Sections		Forsgren Associates
135	M-6	Blower Pad	Y	CH2M HILL
136	E-0	Electrical Legend	Y	Forsgren Ass./TJK Eng.
137	E-1	Electrical Site Plan	Y	Forsgren Ass./TJK Eng.
138	E-2	One Line Diagram		Forsgren Ass./TJK Eng.
139	E-3	Electrical Details		Forsgren Ass./TJK Eng.
140	E-4	Electrical Details	Y	Forsgren Ass./TJK Eng.
141	E-5	Electrical Calculations		Forsgren Ass./TJK Eng.
142	E-6	Electrical Details		Forsgren Ass./TJK Eng.
143	E-7	Electrical Details		Forsgren Ass./TJK Eng.
144	E-8	Control Wiring Details		Forsgren Ass./TJK Eng.
145	E-9	Electrical Details	Y	Forsgren Ass./TJK Eng.
146	N-0	P&ID Legend		Forsgren Ass./TJK Eng.
147	N-1	P&ID		Forsgren Ass./TJK Eng.

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
0	07/14/11	N. BETTS	A. KAYDEN	R. DRESSEL		NKB	SWD
			REVISION				S. DETHLOFF

RECORD DRAWING

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-369-8175

CH2MHILL

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9825650201 M7: RC171 WO# 9821655101

DRAWING INDEX

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	G-1A
SHEET	2 OF 147

RECORD DRAWING

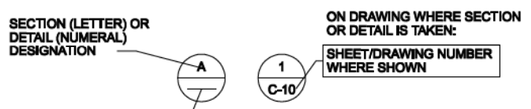
NDM-LAS:RGS Mesa Facility IDP\ 200-G-00201a_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 3:30:45 PM

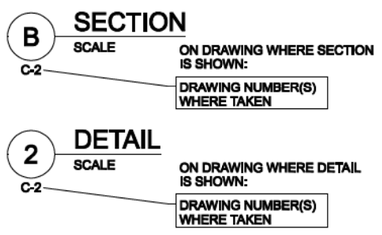
ABBREVIATIONS, CIVIL, STRUCTURAL, MECHANICAL

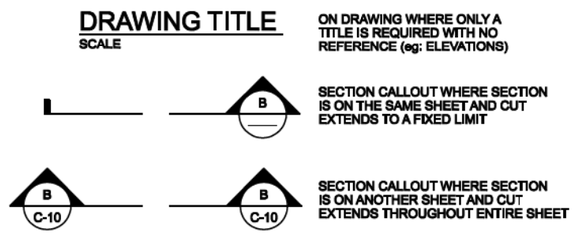
ABDN	ABANDON	OPNG	OPENING
ACP	ASPHAULT CONCRETE PAVEMENT	OPP	OPPOSITE
ADDTL	ADDITIONAL	P	PUMP
AI	INSTRUMENT AIR	PC	POINT OF CURVATURE
AL	ALUMINUM	PCV	PRESSURE CONTROL VALVE
ALT	ALTERNATE	PI	POINT OF INTERSECTION, PRESSURE INSTRUMENT
APPROX	APPROXIMATE	PJF	PREMOLDED JOINT FILLER
ARCH	ARCHITECTURAL	PL	PLATE, PROPERTY LINE
ARV	AIR RELEASE VALVE	PLCS	PLACES
AVRV	AIR VACUUM RELEASE VALVE	PMP	PEAK MAXIMUM PRECIPITATION
BLM	BUREAU OF LAND MANAGEMENT	POB	POINT OF BEGINNING
BM	BEAM, BENCHMARK	POE	POINT OF ENDING
BMP	BEST MANAGEMENT PRACTICE	POT	POTABLE
BOT	BOTTOM	PP	POWER POLE
BS	BOTH SURFACES	PRV	PRESSURE RELEASE VALVE
BVC	BEGINNING OF VERTICAL CURVE	PSDC	POND SOLIDS DISPOSAL CELL
CDN	COMPOSITE DRAINAGE NET	PT	PRESSURE TREATED
CFM	CUBIC FEET PER MINUTE	PT	POINT OF TANGENCY
CHKD	CHECKERED	PVC	POLYVINYL CHLORIDE, POINT OF VERTICAL CURVE
CJ	CONSTRUCTION, CONTROL JOINT	PVI	POINT OF VERTICAL INTERSECTION
CL	CENTERLINE	PVT	POINT OF VERTICAL TANGENCY
CLDI	CEMENT LINED DUCTILE IRON	PWP	POTABLE WATER LINE
CLR	CLEAR	R	RADIUS
CLSF	CONTROLLED LOW STRENGTH FILL	R/W	RIGHT OF WAY
CMP	CORRUGATED METAL PIPE	RD	ROAD
CMU	CONCRETE MASONRY UNIT	RDCR	REDUCER
CONC	CONCRETE	REINF	REINFORCING
CONN	CONNECTION	RGS	RIGID GALVANIZED STEEL
CONT	CONTINUED/ CONTINUATION/ CONTINUOUS	RGS	REID GARDNER STATION
COORD	COORDINATE	RT	RIGHT
CTRD	CENTERED	S	SLOPE
CWCS	CONTACT WATER COLLECTION SYSTEM	SCH	SCHEDULE
CWPS	CONTACT WATER POND SYSTEM	SF	SQUARE FEET
CY	CUBIC YARDS	SIM	SIMILAR
DCS	DISTRIBUTED CONTROL SYSTEM	SLLE	SOUTH LATERAL LANDFILL EXPANSION
DIA	DIAMETER	SST	STAINLESS STEEL
DIP	DUCTILE IRON PIPE	STA	STATION
DN	DRAINAGE NET	STD	STANDARD
DT	DESERT TORTOISE	SWPPP	STORMWATER POLLUTION PREVENTION PLAN
DWG	DRAWING	T&B	TOP AND BOTTOM
EA	EACH	TE	TREATED EFFLUENT
EE	EACH END	TEMP	TEMPORARY
EF	EACH FACE	TI	TREATED INFLUENT
EFPS	EFFLUENT FORWARDING PUMPING SYSTEM	TO	TOP OF
EL	ELEVATION	TOC	TOP OF CONCRETE, TOP OF CURB
ELLE	EAST LATERAL LANDFILL EXPANSION	TOF	TOP OF FOOTING
EQ	EQUAL	TOS	TOP OF SLAB
EQPT	EQUIPMENT	TOW	TOP OF WALL
EUH	ELECTRIC UNIT HEATER	TST	TOP OF STEEL
EW	EACH WAY	TYP	TYPICAL
EXST	EXISTING	UPRR	UNION PACIFIC RAILROAD
FD	FLOOR DRAIN	USFWS	U.S. FISH AND WILDLIFE SERVICE
FG	FINISHED GRADE	VERT	VERTICAL
FIN	FINISHED	VF	VENTILATION FAN
FIP	FACILITY IMPROVEMENT PROGRAM	W/	WITH
FT	FOOT OR FEET	WL	WATER LEVEL
FTG	FOOTING	WMU	WASTE MANAGEMENT UNIT
GALV	GALVANIZED	WS	WATER STOP
HAS	HEADED ANCHOR STUD	WWF	WELDED WIRE FABRIC
HDPE	HIGH DENSITY POLYETHYLENE		
HGL	HYDRAULIC GRADE LINE		
HORIZ	HORIZONTAL		
HP	HYDROGEN PEROXIDE		
HPS	HYDROGEN PEROXIDE STATION		
HPT	HIGH POINT		
HTP	HEAT PUMP AIR CONDITIONING UNIT		
IE	INVERT ELEVATION		
IN	INCH		
INV	INVERT		
JT	JOINT		
kVA	KILOVOLT-AMPERES		
LDRS	LEAK DETECTION AND RECOVERY SYSTEM		
LIT	LEVEL INDICATING TRANSMITTER		
LLS	LEAK LOCATION SYSTEM		
LPT	LOW POINT		
LT	LEFT		
MAX	MAXIMUM		
MEP	MESA EVAPORATION PONDS		
MH	MANHOLE, MOUNTING HEIGHT		
MIN	MINIMUM		
MJ	MECHANICAL JOINT		
MO	MASONRY OPENING		
N	NORTH, NEUTRAL		
NAC	NEVADA ADMINISTRATIVE CODE		
NDEP	NEVADA DIVISION ENVIRONMENTAL PROTECTION		
NDOW	NEVADA DEPARTMENT OF WILDLIFE		
NGVD	NATIONAL GEODETIC VERTICAL DATUM		
NIC	NOT IN CONTRACT		
NTS	NOT TO SCALE		
NVDOT	NEVADA DEPARTMENT OF TRANSPORTATION		
OC	ON CENTER		
OH	OVERHEAD		

NOTE: SOME ABBREVIATIONS MAY NOT BE USED ON THIS PROJECT.

SECTION / DETAIL DESIGNATIONS







RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS IN 2011. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

CIVIL LEGEND

EXISTING	THIS CONTRACT		EXISTING	THIS CONTRACT	
× 157.7	⊗ 158.5	SPOT ELEVATION		CB OR CB	CATCH BASIN OR INLET
155	155	CONTOUR LINE			TRENCH DRAIN
	3:1	EMBANKMENT AND SLOPE		OR	SIGN
		DRAINAGEWAY OR DITCH		D OR S	MANHOLE
		PROPERTY LINE			CLEANOUT
		CENTER LINE		E	ELECTRICAL MANHOLE
		EASEMENT/RIGHT-OF-WAY		H	ELECTRIC HANDHOLE
GS	GS	NATURAL GAS			POST OR GUARD POST
E-OVH	E-OVH	ELECTRICAL (OVERHEAD)			GUY ANCHOR
W	W	WATER LINE			FIRE HYDRANT
T-BUR	T-BUR	TELEPHONE (BURIED)			UTILITY POLE
	CL	CONSTRUCTION LIMITS			LIGHT POLE
	△	SURVEY CONTROL POINT OR POINT OF INTERSECTION		BM	BENCH MARK
		BRUSH/TREE LINE			SOIL BORING
		TREE			TEST PIT
X X	X X	DESERT TORTISE FENCE			
		BURIED PIPELINE BY OTHERS			

GENERAL SITE NOTES:

1. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS PREPARED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHY DATED: 1-2-09. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
2. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY-LINED.
3. HORIZONTAL DATUM: NAD83 NEVADA SP EAST
4. VERTICAL DATUM: NAVD 1988
5. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER.
6. FOR LOCATION OF CONTROL POINT ON STRUCTURES, SEE STRUCTURAL DRAWINGS.
7. STAGING AREA SHALL BE FOR CONTRACTOR'S TRAILERS, EQUIPMENT AND ON-SITE STORAGE OF MATERIALS.
8. ALL PRIVATE CARS AND TRUCKS SHALL BE PARKED IN THE RGS NORTH CONSTRUCTION PARKING AREA. LOCATED NORTHWEST OF THE PLANT. CONTRACTOR SHALL PROVIDE SHUTTLES AS NECESSARY TO GET EMPLOYEES TO CONSTRUCTION SITE.
9. PROVIDE TEMPORARY FENCING AS NECESSARY TO MAINTAIN SECURITY AT ALL TIMES.
10. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN.
11. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
12. CONTRACTOR WILL IMPLEMENT AND MAINTAIN EROSION CONTROL DEVICES WITHIN PROJECT LIMITS THROUGHOUT THE DURATION OF CONSTRUCTION.
13. CONTRACTOR SHALL TAKE ALL OTHER MEASURES TO POSITIVELY PRECLUDE EROSION MATERIALS FROM LEAVING THE SITE. CONTRACTOR TO SUBMIT EROSION CONTROL PLAN. PER SPECIFICATIONS.
14. FILLS GREATER THAN 5 FEET IN HEIGHT PLACED ON NATIVE SLOPES STEEPER THAN 5:1 SHALL BE KEYED INTO THE PRE-EXISTING SLOPE WITH HORIZONTAL BENCHES. REFER TO THE SPECIFICATIONS FOR BENCHING REQUIREMENTS

GENERAL YARD PIPING AND UTILITIES NOTES:

1. EXISTING UNDERGROUND UTILITIES OBTAINED FROM AS-BUILTS AND FROM FIELD SURVEY. FIELD VERIFY DEPTH AND LOCATION PRIOR TO EXCAVATION. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
2. EXISTING PIPING AND EQUIPMENT ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW EQUIPMENT IS SHOWN HEAVY-LINED. NEW PIPING IS SHOWN AS HEAVY, DASHED LINES.
3. UNLESS OTHERWISE SHOWN ALL PIPING SHALL HAVE A MINIMUM OF 3' COVER.
4. ALL PIPES SHALL HAVE A CONSTANT SLOPE BETWEEN INVERT ELEVATIONS UNLESS A FITTING IS SHOWN.
5. ALL NEW PIPES MUST BE PROPERLY FLUSHED AND, PRESSURE TESTED AS SPECIFIED.
6. FOR TYPICAL TRENCHING, SEE DWG P-3.
7. FLUSHING OF HDPE PIPELINE IS NOT REQUIRED.
8. ALL SECTIONS AND COMPONENTS OF THE EFFLUENT PIPING SYSTEM SHALL BE HYDROTESTED WITH CONSTRUCTION WATER PRIOR TO ACCEPTANCE.

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	P. TSCHESCHKE	J. WALKER	J. SCHNEIDER	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

NKB SWD
PDT SWD
BY APVD

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-9179

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

CH2MHILL

MESA EVAPORATION PONDS M5, AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

ABBREVIATIONS, GENERAL NOTES AND CIVIL LEGEND

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	G-2
SHEET	3 OF 147

RECORD DRAWING

DESIGN CRITERIA

1. APPLICABLE CODE: 2006 INTERNATIONAL BUILDING CODE (IBC), AS AMENDED BY THE STATE OF NEVADA AND ALL OTHER APPLICABLE LOCAL AGENCIES.
2. REFER TO THE DRAWINGS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS.
3. FLOOR LIVE LOADS:

ELECTRICAL AREA	300 PSF
MECHANICAL AREA	200 PSF
BRIDGE DECK AND MIXING PLATFORM	75 PSF
BRIDGE DECK WHEEL LOAD	750 LB WHEEL LOAD

4. WIND LOAD:

BASIC WIND SPEED (3-SECOND GUST)	= 90 MPH
EXPOSURE	= C
OCCUPANCY CATEGORY	= II
I	= 1.0

5. SEISMIC LOAD:

MAPPED SPECTRAL RESPONSE ACCELERATIONS	
S_S	= 0.622 g
S_1	= 0.194 g
DESIGN SPECTRAL RESPONSE ACCELERATIONS	
S_{DS}	= 0.540 g
S_{D1}	= 0.262 g
SITE CLASS	= C
OCCUPANCY CATEGORY	= II
SEISMIC DESIGN CATEGORY	= D
I	= 1.0

6. SOIL DESIGN PARAMETERS:
   A. SEE SECTION "FOUNDATIONS" FOR GEOTECHNICAL REFERENCE MATERIALS.

GENERAL INFORMATION

1. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS: PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
2. DETAILING AND DIMENSIONS OF EXISTING STRUCTURES SHOWN ARE BASED ON AS-BUILT DESIGN DRAWINGS, AND DO NOT NECESSARILY REPRESENT THE AS-CONSTRUCTED CONDITIONS. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AND DETAILING OF THE EXISTING STRUCTURES PRIOR TO FABRICATION OF ADJACENT FRAMING OR CONNECTIONS OR SUPPORTS THAT ARE AFFECTED BY THE EXISTING STRUCTURE.
3. FOR NUMBER, TYPE, SIZE, ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS SEE OTHER DISCIPLINE DRAWINGS.
4. STRUCTURAL MEMBERS SHALL NOT BE CUT OR MODIFIED FOR PIPES, DUCTS, ETC, UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE DESIGNER.

SPECIAL INSPECTION, OBSERVATIONS AND TESTING

1. SPECIAL INSPECTION (CONTRACTOR PROVIDED AND OWNER APPROVED) IS REQUIRED IN ACCORDANCE WITH IBC SECTIONS 109 AND 1704. CONTRACTOR'S DESIGN ENGINEER SHALL PROVIDE LIST OF ITEMS REQUIRING SPECIAL INSPECTION IN ACCORDANCE WITH IBC.
2. SPECIFIED CONCRETE TESTING DURING CONSTRUCTION WILL BE CONTRACTOR FURNISHED BY OWNER APPROVED INDEPENDANT TESTING AGENCY. SPECIFIED LABORATORY TEST MIXES. SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

FOUNDATIONS

1. REFER TO GEOTECHNICAL DATA REPORT "GEOTECHNICAL INVESTIGATION: MESA EVAPORATION PONDS" BY CONVERSE CONSULTANTS, DATED MAY 4, 2009. SOIL DESIGN PARAMETERS SHALL BE DETERMINED BASED ON SOIL DESCRIPTIONS AND INFORMATION CONTAINED IN GEOTECHNICAL DATA REPORT.
2. ALL FOUNDATION BEARING SURFACES SHALL BE OBSERVED BY A GEOTECHNICAL ENGINEER OR HIS DESIGNEE PRIOR TO PLACEMENT OF FORMING OR REINFORCING STEEL THE OBSERVATION SHALL VERIFY THAT THE ACTUAL EXPOSED SUBGRADE IS AS ANTICIPATED BY THE SITE SPECIFIC BORINGS, TEST PITS, TESTING AND DATA REPORTS.

FORMWORK, SHORING AND BRACING

1. CONTRACTOR IS RESPONSIBLE FOR ALL WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.
2. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL ELEVATED CONCRETE FLOOR OR SLABS HAVE REACHED 80 PERCENT OF THE 28 DAY DESIGN STRENGTH AS DETERMINED BY CYLINDER BREAKS.

CONCRETE REINFORCING

1. CLEARANCE FOR REINFORCEMENT BARS, UNLESS SHOWN OTHERWISE, SHALL BE:

WHEN PLACED ON GROUND:	3"
ALL OTHER CONCRETE SURFACES	2"

2. 90 DEGREE BENDS, UNLESS OTHERWISE SHOWN, SHALL BE ACI 318 STANDARD HOOKS.
3. REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

CONCRETE DESIGN STRENGTH = 4,000 PSI **		GRADE 60 REINFORCING STEEL								
BAR SIZE		#3	#4	#5	#6	#7	#8	#9	#10	#11
LAP SPLICE LENGTH										
SPACING<6"	TOP BAR *	1'-4"	2'-0"	3'-0"	4'-0"	5'-10"	6'-8"	7'-7"	8'-6"	9'-5"
	OTHER BAR	1'-4"	1'-7"	2'-4"	3'-1"	4'-6"	5'-2"	5'-10"	6'-7"	7'-3"
SPACING≥6"	TOP BAR *	1'-4"	1'-6"	2'-0"	2'-5"	3'-6"	4'-0"	5'-0"	6'-2"	7'-5"
	OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"	4'-9"	5'-8"
EMBEDMENT LENGTH										
SPACING<6"	TOP BAR *	1'-0"	1'-7"	2'-4"	3'-1"	4'-6"	5'-2"	5'-10"	6'-7"	7'-3"
	OTHER BAR	1'-0"	1'-3"	1'-9"	2'-5"	3'-6"	4'-0"	4'-6"	5'-1"	5'-7"
SPACING≥6"	TOP BAR *	1'-0"	1'-3"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"	4'-9"	5'-8"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	2'-1"	2'-5"	3'-0"	3'-8"	4'-5"

* TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 INCHES OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

** WHERE 3000 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 16 PERCENT

CONCRETE

1. 28-DAY CAST-IN-PLACE CONCRETE STRENGTHS:

TYPICAL:	4500 PSI
PIPE AND CONDUIT ENCASEMENTS	3000 PSI

2. REINFORCING STEEL: ASTM A615, GRADE 60
3. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE".
4. ROUGHEN AND CLEAN CONSTRUCTION JOINTS AS SPECIFIED PRIOR TO PLACING ADJACENT CONCRETE.
5. THE CONTRACTOR SHALL COORDINATE PLACEMENT OF OPENINGS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS AND INSERTS PRIOR TO PLACEMENT OF CONCRETE.
6. NO ALUMINUM CONDUIT OR PRODUCTS CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO THE CONCRETE SHALL BE EMBEDDED IN THE CONCRETE.

WELDING

1. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS), LATEST EDITION:
   D1.1, STRUCTURAL WELDING CODE – STEEL
   D1.3, STRUCTURAL WELDING CODE – SHEET STEEL
   D1.4, STRUCTURAL WELDING CODE – REINFORCING STEEL
   D1.6, STRUCTURAL WELDING CODE – STAINLESS STEEL
2. REPAIR WELDS FOUND DEFECTIVE IN ACCORDANCE WITH AWS D1.1 SECTION 5.26.
3. USE INTERMITTENT WELDS AT FIELD WELDS OF EMBED PLATES AND ANGLES TO AVOID SPALLING OR CRACKING OF THE EXISTING CONCRETE.
4. BUTT JOINT WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

STRUCTURAL STEEL AND METAL FABRICATIONS

1. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING:

W-SHAPES	A992
MISCELLANEOUS SHAPES INCLUDING ANGLES, CHANNELS, PLATES, ETC.	A36
SQUARE OR RECTANGULAR STEEL TUBING	A500, GRADE B
STEEL PIPE	A53, GRADE B

2. STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN CONFORMANCE WITH THE AISC MANUAL OF CONSTRUCTION, CURRENT EDITION, AND CURRENT OSHA STANDARDS.
3. BOLTS SHALL BE HIGH STRENGTH BOLTS CONFORMING TO THE FOLLOWING EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE:

UNLESS SHOWN OTHERWISE	A325-N, GALVANIZED
SLIP CRITICAL	A325-SC, GALVANIZED
ANCHOR BOLTS (AB)	
STAINLESS STEEL	F593, AISI TYPE 316, CONDITION CW
GALVANIZED STEEL	F1554, GR 36 / A153
MACHINE BOLTS (MB)	A307, GALVANIZED

4. ITEMS TO BE EMBEDDED IN CONCRETE SHALL BE CLEAN AND FREE OF OIL, DIRT AND PAINT.
5. NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STRUCTURAL STEEL IS PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER.

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD	BY
1	07/14/11	C. BURKE	M. DUNN	M. RANDALL	APVD	S. DETHLOFF
0	04/16/10					

RECORD DRAWING
ISSUED FOR CONSTRUCTION
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CH2MHILL

REID GARDNER STATION
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NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9825650201 M7: RC171 WO# 9821655101

STRUCTURAL NOTES

RECORD DRAWING

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
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SHEET	4 OF 147

NDM-LAS:RGS Mesa Facility IDP\ 200-G-00204_401621RD.dgn PLOT DATE: 7/11/2011 PLOT TIME: 2:42:40 PM

PIPE AND FITTING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		EXISTING PIPE
		NEW PIPE
		EXISTING PIPE TO BE ABANDONED
		EXISTING PIPE TO BE DEMOLISHED OR SALVAGED AS INDICATED
		WELDED JOINT
		GROOVED END JOINT
		FLANGED JOINT
		PROPRIETARY RESTRAINED JOINT
		BELL & SPIGOT JOINT (LEADED)
		HUB & SPIGOT JOINT (RUBBER GASKET)
		BALL JOINT
		ADAPTER SIDE GROOVED END ADAPTER FLANGE
		FLANGED COUPLING ADAPTER
		FLEXIBLE COUPLING
		METAL BELLOWS EXP JOINT
		ELASTOMER BELLOWS EXP JOINT
		ELBOW UP
		ELBOW DOWN
		TEE UP

DOUBLE LINE	SINGLE LINE	
		TEE DOWN
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		REDUCING BUSHING
		UNION
		CAP
		ANCHOR
		ELBOW, 90 DEGREE
		CROSS
		TEE
		ELBOW, 45 DEGREE
		LATERAL

NOTES:

1. ONLY FLANGED END CONNECTIONS ARE SHOWN HERE FOR DOUBLE LINE FITTINGS. FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS.
2. SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
3. EXISTING PIPE AND EQUIPMENT IS SHOWN LIGHT-LINED AND/OR SCREENED AND IS NOTED AS EXISTING. NEW PIPING AND EQUIPMENT IS SHOWN HEAVY-LINED.

VALVE SYMBOLS

SINGLE LINE	DOUBLE LINE
GATE	
KNIFE GATE	OR
BUTTERFLY	OR
GLOBE	OR
BALL	OR
SEATING PORT	
ECCENTRIC PLUG	OR
PLUG OR COCK	OR
NEEDLE	OR
DIAPHRAGM	OR
PINCH	OR
SWING CHECK	OR
BALL CHECK	OR

HOSE VALVE (HV- X) OR (V-X)
X = NO. IN SPECS

SAMPLE

MUD

PRESSURE RELIEF

AIR AND/OR VACUUM RELEASE

REGULATED SIDE

PRESSURE CONTROL (INTERNAL PILOT)

REGULATED SIDE

PRESSURE CONTROL (EXTERNAL PILOT)

MULTI-PORT VALVE,
ARROWS INDICATE FLOW PATTERN.
SEATING PORTS ARE IMPLIED BY
INDICATED FLOW PATTERN.

TELESCOPING SCUM VALVE

ACTUATOR SYMBOLS

PNEUMATIC DIAPHRAGM

PNEUMATIC CYLINDER

ELECTRIC MOTOR

HYDRAULIC

MANUAL

SOLENOID

ELECTRO HYDRAULIC

MECHANICAL NOTES

GENERIC PIPING NOTES

1. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
2. SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
3. IF SHOWN, LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS IS ONLY APPROXIMATE. CONTRACTOR SHALL DESIGN SUPPORTS.
4. ALL JOINTS SHALL BE WATERTIGHT.
5. ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST PROTECTION, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
6. SYMBOLS AND LEGENDS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.
7. ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED, BUTT-FUSED, OR SCREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED.
8. IF SHOWN, NUMBER AND LOCATION OF UNIONS ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
9. WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.

RECORD DRAWINGS

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NO.	DATE	DSGN
0	4/16/10	S. HUSSAIN
	07/14/11	

RECORD DRAWING
ISSUED FOR CONSTRUCTION

REVISION	BY	CHK	DR
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CH2MHILL

MESA EVAPORATION PONDS M5, AND M7
M5: RC171 WO# 8925650201 M7: RC171 WO# 8921855101

MECHANICAL LEGEND

RECORD DRAWING

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
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SHEET	5 OF 147

NDM-LAS:RGS Mesa Facility IDP\ 200-G-00206_401621RD.dgn PLOT DATE: 7/11/2011 PLOT TIME: 2:51:57 PM

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	NEW EQUIPMENT, WIRING AND TEXT
	EXISTING OR OWNER FURNISHED AND CONTRACTOR INSTALLED EQUIPMENT, WIRING AND TEXT IS SHOWN WITH SCREENED LINES
	EXISTING EQUIPMENT, CONDUIT AND WIRING TO BE REMOVED
OR	CONNECTION POINT TO DEVICES UNDER THIS CONTRACT AND SPECIFIED IN DIVISIONS OTHER THAN 16. WIRING, RACEWAYS AND CONNECTIONS SHALL BE PROVIDED UNDER THIS CONTRACT AS SPECIFIED UNDER DIVISION 16.
MCC-A	MAJOR ELECTRICAL COMPONENT OR DEVICE - NAME OR IDENTIFYING SYMBOL AS SHOWN.
	BRANCH CIRCUIT PANELBOARD
UH1	UNIT HEATER NO.1 SEE SCHEDULE
TEL	TELEPHONE TERMINAL CABINET
	TERMINAL JUNCTION BOX
5	MOTOR, SQUIRREL CAGE INDUCTION - HORSEPOWER INDICATED
	LUMINAIRE
	LUMINAIRE AND POLE
	WALL MOUNTED LUMINAIRE
	FLOOD LIGHTS
	LUMINAIRE W/EMERGENCY BATTERY PACK
	EMERGENCY DC LIGHT UNIT

TYPE INDICATED SEE LUMINAIRE SCHEDULE

LA-2	HOME RUN - DESTINATION SHOWN
or G	EXPOSED CONDUIT AND CONDUCTORS*
or G	CONCEALED CONDUIT AND CONDUCTORS*

NOTE:

RUNS WITH CROSSHATCHES INDICATE NUMBER OF NO.12 CONDUCTORS MINIMUM. CROSSHATCH WITH SUBSCRIPT "G" INDICATES GREEN GROUND WIRE. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODES.

	CROSSHATCHES WITH BAR INDICATE #10 CONDUCTOR. SIZE CONDUIT ACCORDING TO SPECIFICATIONS & APPLICABLE CODE.
CE	CONCRETE ENCASED DUCT BANK
	CONDUIT DOWN
	CONDUIT UP
S_a or 2a	SMALL LETTER SUBSCRIPT AT SWITCH AND LUMINAIRE INDICATES SWITCHING. SUBSCRIPT NUMBER AT LUMINAIRE INDICATES CIRCUIT IN PANELBOARD.
S	WALL SWITCH:

2- DOUBLE POLE P- PILOT LIGHT
3- THREE WAY K- KEY OPERATED
4- FOUR WAY D- DIMMER
WP- WEATHERPROOF CRE- CORROSION RESISTANT
S_M = MANUAL MOTOR STARTER SWITCH

T	SPRING WOUND TIME SWITCH
T	THERMOSTAT
	TERMINAL POLE
	HAND HOLE

SYMBOL	DESCRIPTION
	CONVENIENCE RECEPTACLE - DUPLEX UNLESS SPECIFIED OTHERWISE
	WP- WEATHERPROOF C- CLOCK HANGER TL- TWIST LOCK CRE- CORROSION RESISTANT
PNL 4-1-1 (2)	CONVENIENCE RECEPTACLE - WITH PANEL NUMBER AND CIRCUIT NUMBER IN PARENTHESIS.
	CONVENIENCE RECEPTACLE, PEDESTAL, DUPLEX SINGLE FACE UNLESS INDICATED OTHERWISE
30	RECEPTACLE - 240V, 1 PH, AMPERAGE INDICATED
30	RECEPTACLE, SPECIAL PURPOSE - AMPERAGE AS INDICATED
	MULTI OUTLET ASSEMBLY
	RECEPTACLE - 4-PLEX
	TELEPHONE RECEPTACLE (OUTLET BOX ONLY) FLUSH IN FLOOR
	TELEPHONE RECEPTACLE (OUTLET BOX ONLY)
J	GENERAL CONTROL OR WIRING DEVICE. NEMA 4 ENCLOSURE UNLESS INDICATED OTHERWISE. LETTER SYMBOLS OR ABBREVIATIONS INDICATE TYPE OF DEVICE.
CS	CONTROL STATION, NEMA 4 ENCLOSURE UNLESS INDICATED OTHERWISE.
30	NONFUSED DISCONNECT SWITCH, SIZE INDICATED, 3 POLE UNLESS INDICATED OTHERWISE, NEMA 12 ENCLOSURE, WP = WEATHERPROOF (NEMA 4X)
60/40 F	FUSED DISCONNECT SWITCH, SIZE INDICATED (60/40, 60 = SWITCH RATING; 40 = FUSE RATING) 3 POLE UNLESS INDICATED OTHERWISE, NEMA 12 ENCLOSURE, WP = WEATHERPROOF (NEMA 4X)
2	CONTACTOR, MAGNETIC, NEMA SIZE INDICATED, NEMA 12 ENCLOSURE, UNLESS INDICATED OTHERWISE.
30 L	LIGHTING CONTACTOR, CURRENT RATING INDICATED, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM FOR NUMBER OF POLES.
2	STARTER MAGNETIC NEMA SIZE INDICATED, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM.
2	COMBINATION (FUSE OR CIRCUIT BREAKER AS INDICATED) MAGNETIC STARTER, NEMA SIZE INDICATED, NEMA 12 ENCLOSURE UNLESS INDICATED OTHERWISE. SEE CONTROL DIAGRAM.
	METERING FACILITIES
	TERMINAL CABINET FOR COMMUNICATIONS SYSTEM
F	FIRE ALARM STATION, MANUAL
FA	FIRE ALARM STATION, AUTOMATIC, HEAT DETECTOR
F	FIRE ALARM BELL
F	FIRE ALARM HORN
	GROUND ROD

RECORD DRAWINGS

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SYMBOL	DESCRIPTION
1	CONTACT - NORMALLY OPEN WITH NEMA SIZE INDICATED AS APPLICABLE
1	CONTACT - NORMALLY CLOSED WITH NEMA SIZE INDICATED AS APPLICABLE
TDR TC or TDR TO	TIME DELAY RELAY CONTACT (TIME ACTION INDICATED)
	REMOTE DEVICE
XX	RELAY COIL: CR= CONTROL RELAY, TDR=TIME DELAY RELAY
	OVERLOAD RELAY HEATER
1	MAGNETIC STARTER WITH NEMA SIZE INDICATED
100/M	CIRCUIT BREAKER, MAGNETIC TRIP ONLY, FRAME SIZE SHOWN, 3 POLE UNLESS INDICATED OTHERWISE.
400	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE UNLESS INDICATED OTHERWISE.
400 400	CIRCUIT BREAKER WITH CURRENT LIMITING FUSES, TRIP AND FUSE RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
400 225	FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
100	SWITCH - CURRENT RATING INDICATED, 3 POLE UNLESS INDICATED OTHERWISE.
	DRAWOUT AIR CIRCUIT BREAKER, LOW VOLTAGE
	DRAWOUT AIR CIRCUIT BREAKER, MEDIUM VOLTAGE
	DRAWOUT FUSED SWITCH, MEDIUM VOLTAGE
	LIGHTNING ARRESTER
	FUSE
10	CAPACITOR - KVAR INDICATED
V SW 0-600V	METER WITH SWITCH - SCALE RANGE SHOWN
	GROUND
120V or 120/240V 15 KVA 1 PH	TRANSFORMER, SECONDARY VOLTAGES, PHASE AND RATING INDICATED AS APPLICABLE
GFR 25A 0.1	PICK-UP SETTING / TIME CURRENT CHARACTERISTIC — GROUND FAULT RELAY WITH C.T.
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED
	PUSH BUTTON SWITCH, MAINTAINED CONTACTS WITH MECHANICAL INTERLOCK
	TEMPERATURE SWITCH, CLOSES ON TEMPERATURE RISE
	3 POSITION SELECTOR SWITCH MAINTAINED CONTACT
OFF HAND AUTO xoo oox	SELECTOR SWITCH - MAINTAINED CONTACT - CHART IDENTIFIES OPERATION:

POSITION			
CKT.	HAND	OFF	AUTO
1	X	O	O
2	O	O	X

X - CLOSED CONTACT
O - OPEN CONTACT

(3)	CURRENT TRANSFORMER, NUMBER INDICATED
A	INDICATING LIGHT, PUSH-TO-TEST, LETTER INDICATES COLOR
A	INDICATING LIGHT LETTER INDICATES COLOR: A - AMBER, B - BLUE, C - CLEAR, G - GREEN, R - RED, W - WHITE

ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
A	AMMETER, AMPERE
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AS	AMPERE SENSOR
ASU	AIR SUPPLY UNIT
ATCS	AUTOMATIC TRANSFER CONTROL SYSTEM
ATS	AUTOMATIC TRANSFER SW
AT	AMP TRIP
BO	BOILER
BCU	BARE COPPER
BRKR	BREAKER
C	CONDUIT, CONTACTOR
CB	CIRCUIT BREAKER
CC	CONTROL CABLE
CKT	CIRCUIT
COMM	COMMUNICATIONS
COND	CONDUCTOR
CONT	CONTINUED
CPT	CONTROL POWER XFMR
CR	CONTROL RELAY
CRS	COATED RIGID STEEL CONDUIT
CS	CONTROL STATION
CT	CURRENT TRANSFORMER
CU	COPPER
DC	DIRECT CURRENT
DCU	DISTRIBUTED CONTROL UNIT
DIV	DIVISION
DPI	DIGITAL PROCESS INDICATOR
E	EXISTING
ECP	ENVIRONMENT CONTROL PNL
EF	EXHAUST FAN
EMER	EMERGENCY
ETM	ELAPSED TIME METER
FACP	FIRE ALARM CONTROL PANEL
FDR	FEEDER
F, FU	FUSE
FLA	FULL LOAD AMPS
FLR	FLOOR
FLUOR	FLUORESCENT
G	GREEN GROUND, GROUND
GALV	GALVANIZED
GFI	GROUND FAULT INTERRUPTER
GFR	GROUND FAULT RELAY
H	HIGH SPEED
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HPS	HIGH PRESSURE SODIUM
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING & AIR CONDITIONING
IC	INTERRUPTING CAPACITY
I & C	INSTRUMENTATION AND CONTROL
ICL	INDUSTRIAL CONTROL LINKS
INST	INSTANTANEOUS
INSTR	INSTRUMENTATION
J, J-BOX	JUNCTION BOX
K	KEY INTERLOCK
L	LIGHTING CONTACTOR, LOW SPEED
LA	LIGHTNING ARRESTER
LC	LOAD CENTER
LDRS	LEAK DETECTION RECOVERY SYSTEM
LIT	LEVEL INDICATE / TRANSMIT
LP	LIGHTING PANELBOARD
LS	LIMIT SWITCH
LTG	LIGHTING
LV	LOW VOLTAGE
M	MAGNETIC CONTACTOR COIL
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MEP	MESA EVAPORATION PONDS
MERC	MERCURY VAPOR
MFR	MANUFACTURER
MH	MANHOLE
MMP	MECHANICAL MOUNTING PANEL
MO	MOTOR OPERATOR
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT	MOUNT
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
MX	MIXER
N	NEUTRAL
NC	NORMALLY CLOSED
NEMA	NATIONAL ELECTRIC MANUFACTURERS ASSOCIATION
NO	NORMALLY OPEN
NP	NAMEPLATE
OL	OVERLOAD RELAY
PB	PULL BOX
PC	PHOTOCELL
PH	PHASE
PNL	PANEL
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE CONDUIT
RECEPT	RECEPTACLE
REQD	REQUIRED
RM	REMOTE MULTIPLEXER
RP	RELAY PANEL
RPA	RISING POST ASSEMBLY
RS	RIGID STEEL CONDUIT
RTU	REMOTE TELEMETRY UNIT
RVSS	REDUCED VOLTAGE SOLID STATE
S	SWITCH
SC	SPEED CONTROL
SH	SPACE HEATER
S/N	SOLID NEUTRAL
SPD	SPEED
SPEC	SPECIFICATIONS
SSRV	SOLID STATE REDUCED VOLTAGE
SST	STAINLESS STEEL
ST	SHUNT TRIP
SV	SOLENOID VALVE
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRICAL
T	THERMOSTAT
TB	TERMINAL BOARD
TBD	TO BE DETERMINED
TC	TIME CLOSED
TSH	TEMPERATURE SWITCH HIGH
TDR	TIME DELAY RELAY
TJB	TERMINAL JUNCTION BOX
TS	TRANSFER SWITCH
TSP	TWISTED SHIELDED PAIR
TYP	TYPICAL
UH	UNIT HEATER
UVR	UNDER VOLTAGE RELAY
V	VOLTMETER, VOLT
VFD	VARIABLE FREQUENCY DRIVE
VCS	VALVE CONTROL STATION
VSP	VALVE SEQUENCING PANEL
W	WATT
WC	WATER COIL
WH	WATTHOUR
WHD	WATTHOUR DEMAND
WP	WEATHERPROOF (NEMA 4X)
XFMR	TRANSFORMER
XP	EXPLOSION PROOF CLASS 1, DIV 1
ZS	POSITION SWITCH

NOTES:

1. THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE PLANS.

NO.	DATE	DSGN	DR	CHK	REVISION
1	07/14/11	R. CONSTANTINESCU	J. WALKER	M. TOVAR	RECORD DRAWING ISSUED FOR CONSTRUCTION
0	4/16/10				

	NKB	SWD	
	RC	SWD	
	BY	APVD	S. DETHLOFF

2485 VILLAGE VIEW DRIVE, SUITE 350
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PHONE: 702-369-9175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

CH2MHILL

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 922585201 M7: RC171 WO# 922195101

ELECTRICAL LEGEND

VERIFY SCALE

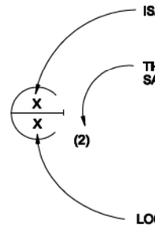
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	JULY 2011
PROJ	401621
DWG	G-5
SHEET	6 OF 147

RECORD DRAWING

INSTRUMENTATION IDENTIFICATION

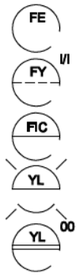
EXAMPLE SYMBOLS



ISA DESIGNATOR, SEE TABLE

THE TOTAL NUMBER OF COMPONENTS OF THE SAME TYPE (VARIES)

LOOP AND COMPONENT IDENTIFICATION



FIELD MOUNTED INSTRUMENT

REAR-OF-PANEL MOUNTED INSTRUMENT

PANEL MOUNTED INSTRUMENT

PANEL MOUNTED INDICATING LIGHT

MOTOR CONTROL CENTER MOUNTED INSTRUMENT

SPECIAL CASES

ON-OFF HAND SWITCH. MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON A RETURN OF POWER AFTER POWER FAILURE)

STOP-START HAND SWITCH MOMENTARY CONTACT SWITCH (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE)

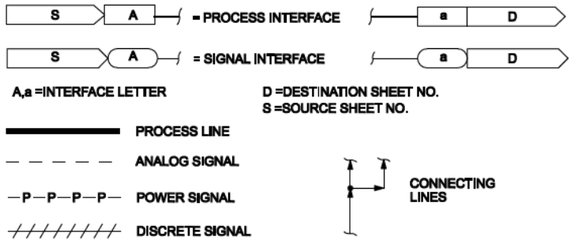
INSTRUMENT IDENTIFICATION LETTERS TABLE

LETTER	FIRST LETTER (S)		SUCCEEDING LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (+)		ALARM		
B	BURNER FLAME		USERS CHOICE (+)	USERS CHOICE (+)	USERS CHOICE (+)
C	CONDUCTIVITY			CONTROL	
D	DENSITY (S.G)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO			
G	GAUGE		GLASS	GATE	
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION				MIDDLE
N	USERS CHOICE (+)		USERS CHOICE (+)	USERS CHOICE (+)	USERS CHOICE (+)
O	USERS CHOICE (+)		ORIFICE		
P	PRESSURE (OR VACUUM)		POINT (TEST CONNECTION)		
Q	QUANTITY	INTEGRATE	INTEGRATE		
R			RECORD OR PRINT		
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE (+)		MULTIFUNCTION	MULTIFUNCTION (+)	MULTIFUNCTION (+)
V	VISCOSITY			VALVE OR DAMPER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED (+)		UNCLASSIFIED (+)	UNCLASSIFIED (+)	UNCLASSIFIED (+)
Y	EVENT			RELAY OR COMPUTE (+)	
Z	POSITION			DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

TABLE BASED ON THE INSTRUMENTATION, SYSTEMS, AND AUTOMATION SOCIETY (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS.

INTERFACE SYMBOLS & LINE LEGEND



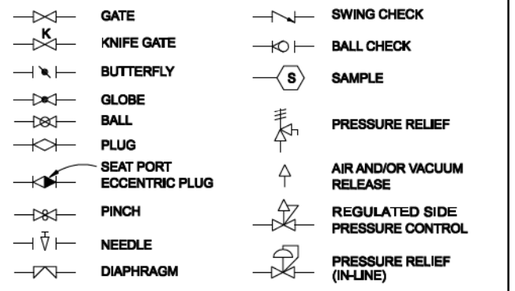
SELF CONTAINED VALVE & EQUIPMENT TAG NUMBERS

D-X

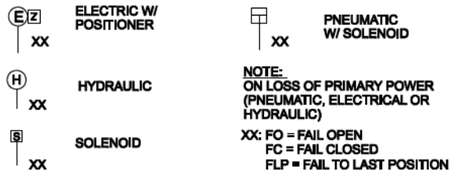
D: ARV = AIR RELEASE VALVE
ASV = ANTI-SYPHON VALVE
AVRV = AIR AND VACUUM RELEASE VALVE
E = INJECTOR
FCV = FLOW CONTROL VALVE
G = GATE
LCV = LEVEL CONTROL VALVE
M = MECHANICAL EQUIPMENT
MX = MIXER
P = PUMP
PCV = PRESSURE CONTROL VALVE
PSE = RUPTURE DISK
PSV = PRESSURE RELIEF VALVE
T = TANK
TCV = TEMPERATURE CONTROL VALVE

X = LOOP IDENTIFICATION

VALVE SYMBOLS



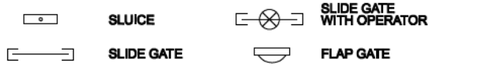
ACTUATOR SYMBOLS



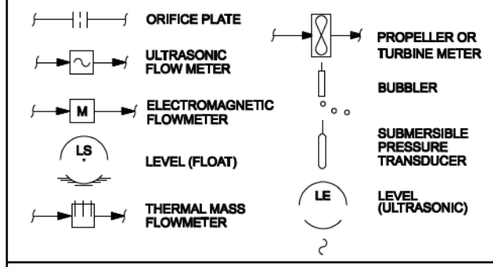
NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL OR HYDRAULIC)

XX: FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

GATE SYMBOLS

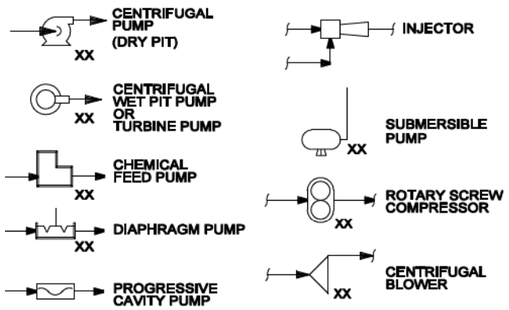


PRIMARY ELEMENT SYMBOLS

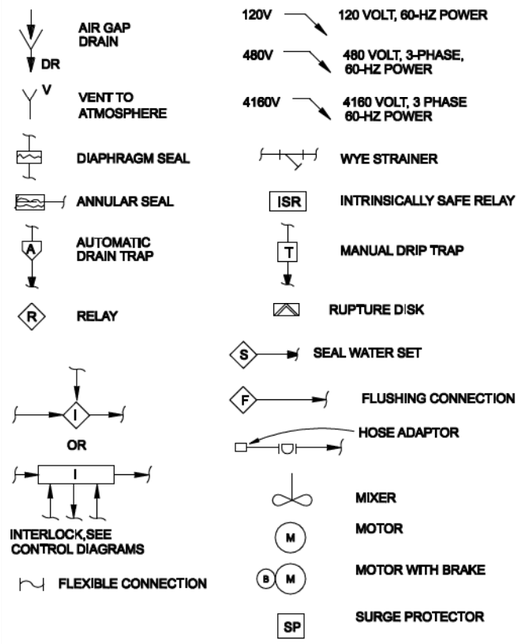


PUMP SYMBOLS

NOTE: XX : AS ADJUSTABLE SPEED
CS-1 CONSTANT SPEED (SINGLE SPEED)
CS-2 CONSTANT SPEED (TWO SPEED)



MISCELLANEOUS SYMBOLS



ABBREVIATIONS

ACK	ACKNOWLEDGE
AFD	ADJUSTABLE FREQUENCY DRIVE
CS	CONSTANT SPEED
DIO	DISTRIBUTED INPUT/OUTPUT
DSC	DISTRIBUTED CONTROL SYSTEM
EFPS	EFFLUENT FORWARDING PUMP STATION
EMERG	EMERGENCY
FWD	FORWARD
GW	GROUNDWATER
HOA	HAND-OFF-AUTO
H_2O_2	HYDROGEN PEROXIDE
I/O	INPUT / OUTPUT
LCP	LOCAL CONTROL PANEL
LDRS	LEAK DETECTION RECOVERY SYSTEM
LOR	LOCAL-OFF-REMOTE
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MCC	MOTOR CONTROL CENTER
MFR	MANUFACTURER
MLD	MOTOR LEAKAGE DETECTOR
MSC	MANUFACTURER SUPPLIED CABLE
MX	MIXER
OC	OPEN-CLOSE (D)
OCR	OPEN-CLOSE-REMOTE
OCA	OPEN-CLOSE-AUTO
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OSC	OPEN-STOP-CLOSE
REV	REVERSE
RSL	RAISE-STOP-LOWER
PLC	PROGRAMMABLE LOGIC CONTROLLER
QTY	QUANTITY
RM	RAPID MIX
RPA	RISING POST ASSEMBLY
SSRV	SOLID STATE REDUCED VOLTAGE
SS	START-STOP
SW	SURFACE WATER
TBD	TO BE DETERMINED
TYP	TYPICAL

GENERAL NOTES

1. THIS A STANDARD LEGEND, THEREFORE NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.
2. FOR FLOW STREAM IDENTIFICATION, SEE MECHANICAL LEGEND.

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS IN 2011. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	R. CONSTANTINESCU	J. WALKER	M. TOVAR	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

		SWD	
NKB	RC	SWD	
	BY	APVD	

CH2M HILL
2485 VILLAGE VIEW DRIVE, SUITE 350
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PHONE: 702-369-5175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9025550201 M7: RC171 WO# 9021855101

INSTRUMENTATION AND CONTROL LEGEND

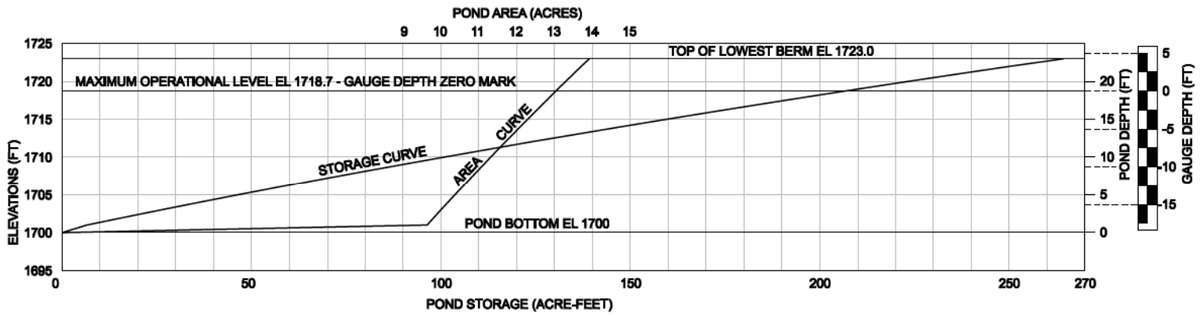
VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	G-6
SHEET	7 OF 147

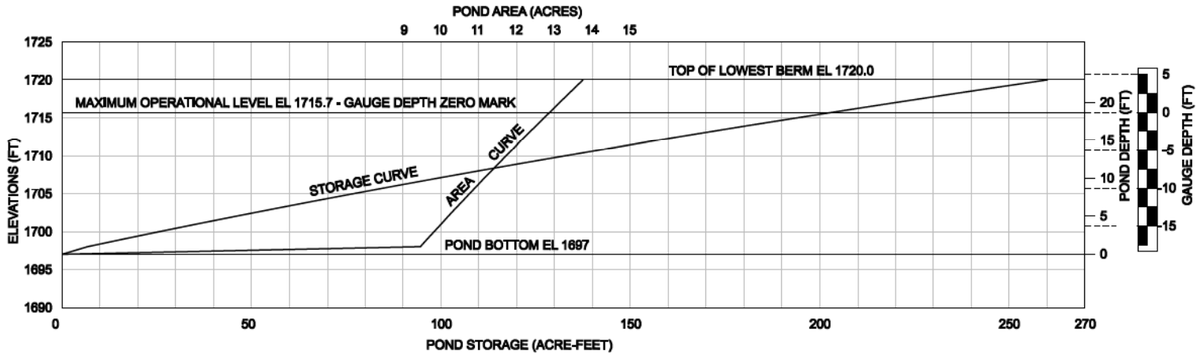
RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-G-00208_401621RD.dgn PLOT DATE: 7/11/2011 PLOT TIME: 2:56:58 PM



POND M7 STORAGE AND AREA CURVES

NTS



POND M5 STORAGE AND AREA CURVES

NTS

POND M5

Pond Depth (Ft)	EL	Area (Acres)	Cumulative Volume (AF)
0	1697	0	0
1	1698	9.45	6.61
2	1699	9.63	16.11
3	1700	9.82	25.79
4	1701	10.00	35.66
5	1702	10.19	45.72
6	1703	10.37	55.96
7	1704	10.56	66.39
8	1705	10.75	77.02
9	1706	10.94	87.83
10	1707	11.14	98.84
11	1708	11.33	110.05
12	1709	11.52	121.45
13	1710	11.72	133.04
14	1711	11.92	144.84
15	1712	12.12	156.84
16	1713	12.32	169.03
17	1714	12.52	181.43
18	1715	12.72	194.04
MAX OPERATION LEVEL 18.7	1715.7	12.86	202.99
19	1716	12.92	206.85
20	1717	13.13	219.86
21	1718	13.33	233.09
22	1719	13.54	246.52
23	1720	13.75	260.17

POND M7

Pond Depth (Ft)	EL	Area (Acres)	Cumulative Volume (AF)
0	1700	0	0
1	1701	9.63	6.49
2	1702	9.81	16.21
3	1703	10.00	26.12
4	1704	10.18	36.20
5	1705	10.36	46.48
6	1706	10.55	56.93
7	1707	10.74	67.58
8	1708	10.93	78.41
9	1709	11.12	89.43
10	1710	11.31	100.64
11	1711	11.50	112.04
12	1712	11.69	123.64
13	1713	11.89	135.43
14	1714	12.09	147.42
15	1715	12.28	159.60
16	1716	12.48	171.99
17	1717	12.68	184.57
18	1718	12.89	197.35
MAX OPERATION LEVEL 18.7	1718.7	13.03	206.42
19	1719	13.09	210.34
20	1720	13.29	223.53
21	1721	13.50	236.93
22	1722	13.71	250.53
23	1723	13.91	264.34

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	
1	07/14/11	NKB SWD
0	4/16/10	PDT SWD

DSGN R. TOWNSEND DR J. WALKER CHK P. TSCHESCHKE APVD S. DETHLOFF

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION BY APVD

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-9176

CH2MHILL

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

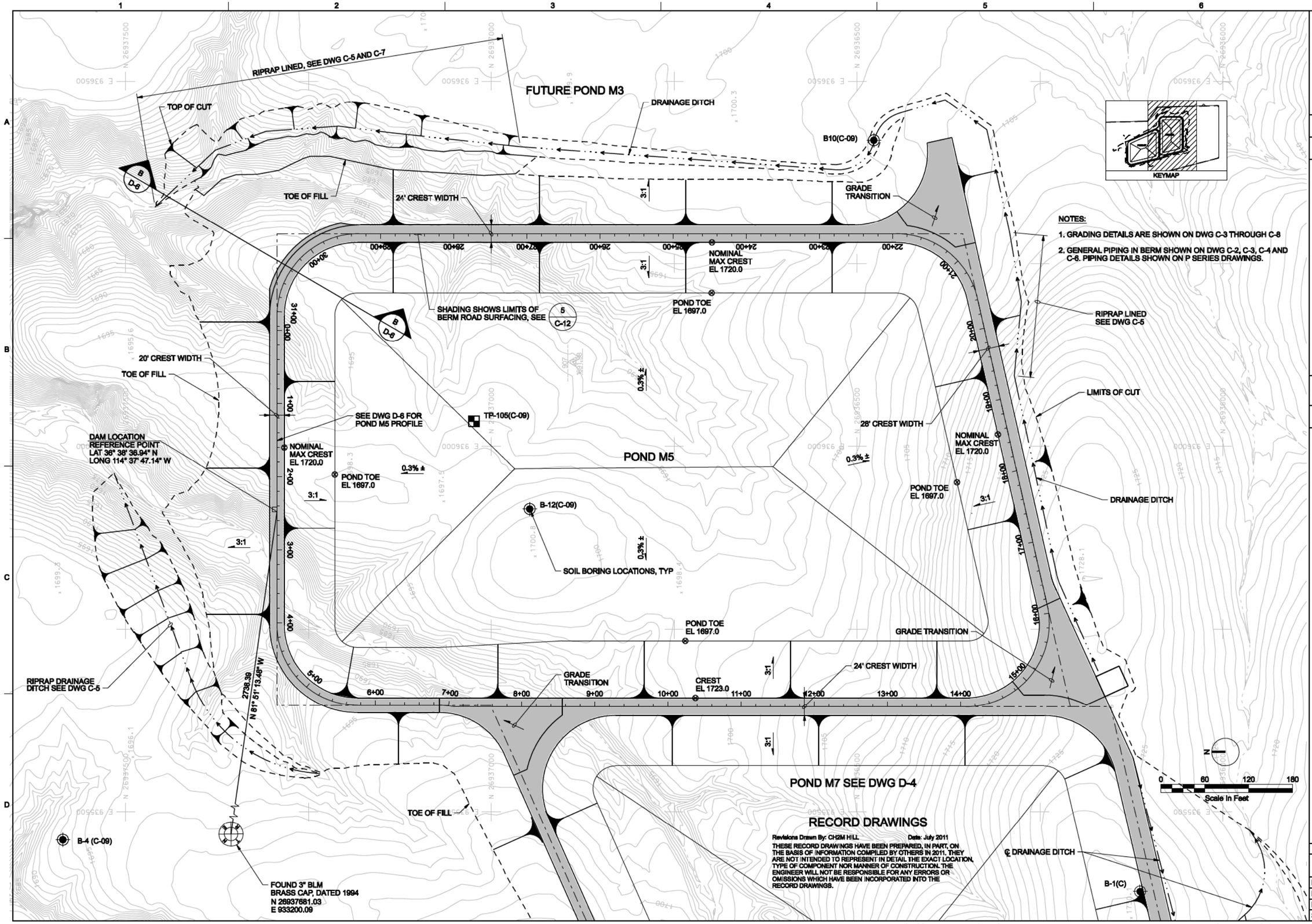
ELEVATION/CAPACITY AND ELEVATION/AREA CURVES

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	D-1
SHEET	8 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20211_401621RD.dgn PLOT DATE: 7/11/2011 PLOT TIME: 3:59:55 PM



NOTES:

1. GRADING DETAILS ARE SHOWN ON DWG C-3 THROUGH C-8
2. GENERAL PIPING IN BERM SHOWN ON DWG C-2, C-3, C-4 AND C-6. PIPING DETAILS SHOWN ON P SERIES DRAWINGS.

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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RECORD DRAWING
DRAWING REVISION
ISSUED FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD
2	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
1	4/30/10		NKB	SWD	
0	4/16/10		PDT	SWD	
			PDT	SWD	

REVISION BY APVD

2485 VILLAGE VIEW DRIVE, SUITE 350
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PHONE: (702-369-8175

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Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825850201, M7:RC171 WO#9821855101

GENERAL LAYOUT PLAN POND M5

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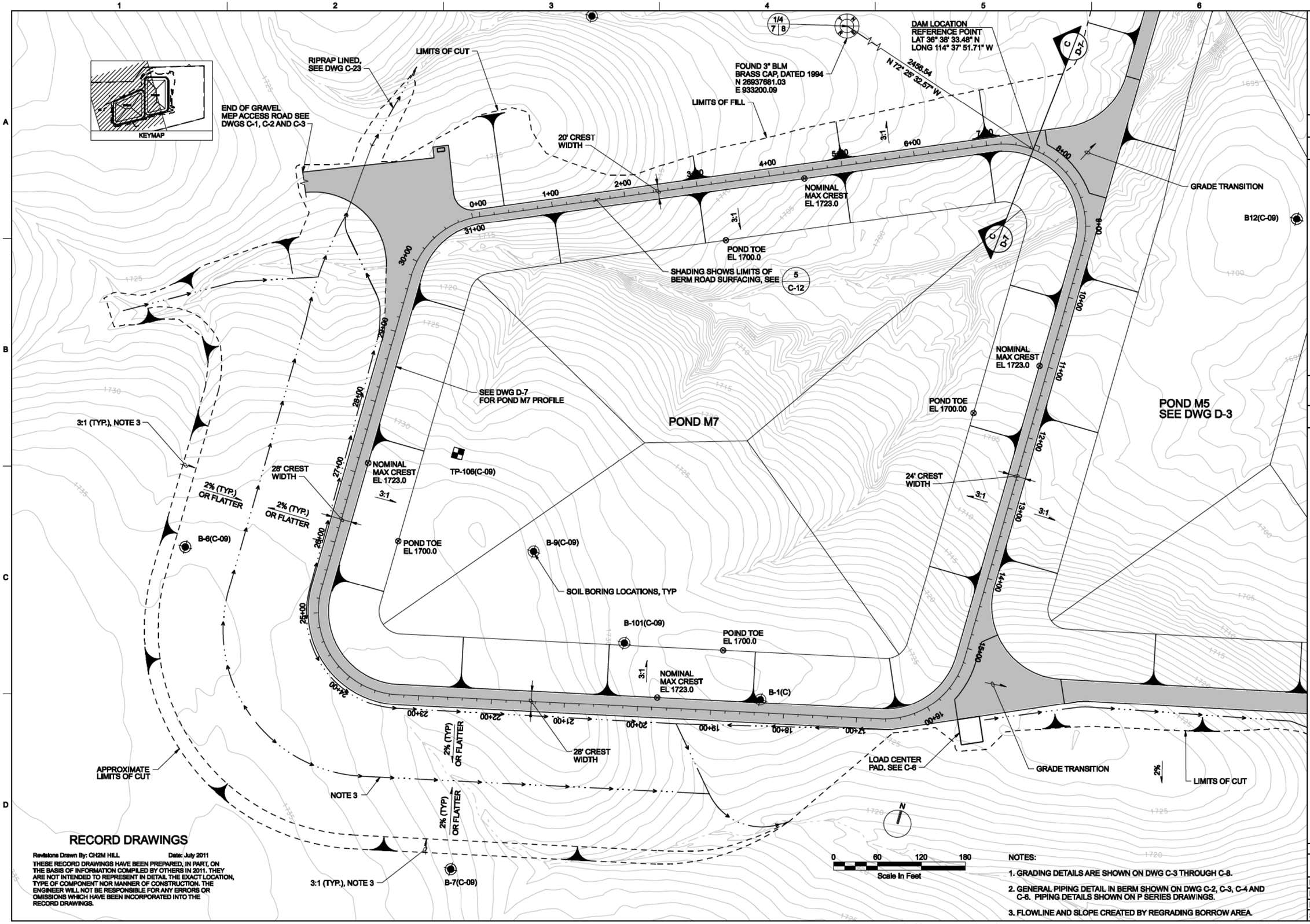
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	D-3
SHEET	9 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20213_401621RD.dgn PLOT DATE: 7/11/2011 PLOT TIME: 4:06:29 PM



RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NOTES:

1. GRADING DETAILS ARE SHOWN ON DWG C-3 THROUGH C-8.
2. GENERAL PIPING DETAIL IN BERM SHOWN ON DWG C-2, C-3, C-4 AND C-6. PIPING DETAILS SHOWN ON P SERIES DRAWINGS.
3. FLOWLINE AND SLOPE CREATED BY REGRADING BORROW AREA.

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION

REVISION	BY	APVD
	NKB	SWD
	PDT	SWD

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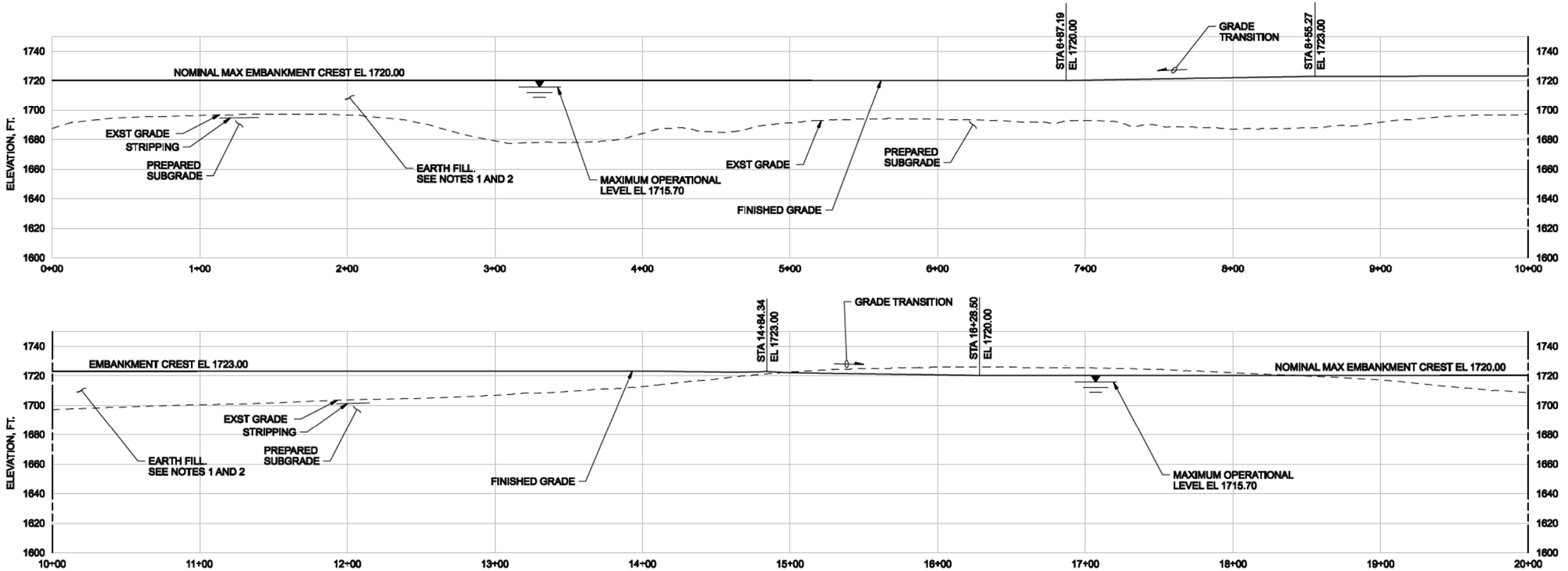
MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821865101

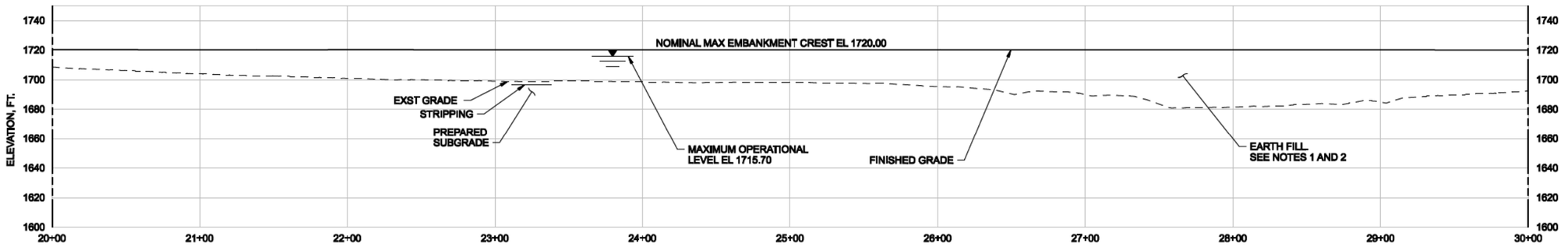
GENERAL LAYOUT PLAN POND M7

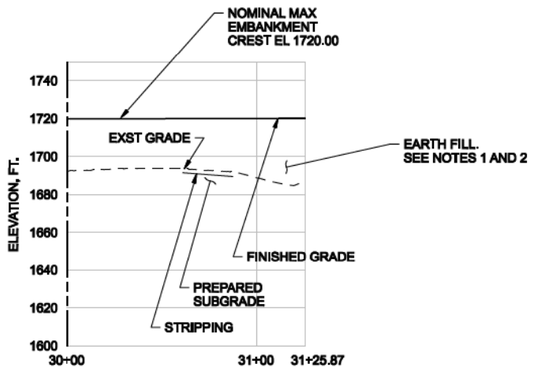
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

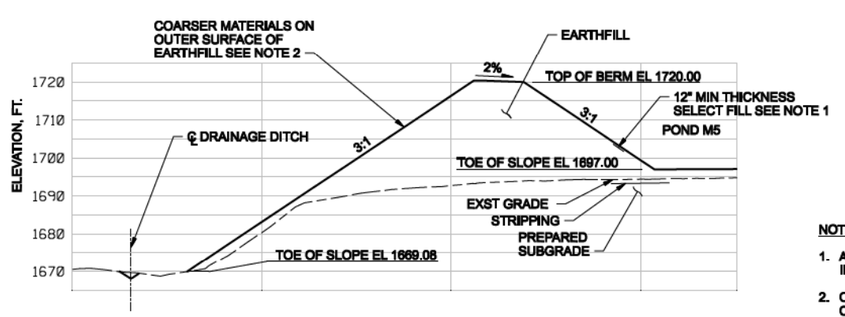
DATE	JULY 2011
PROJ	401621
DWG	D-4
SHEET	10 OF 147

RECORD DRAWING









B D-3 **SECTION**
H: 1"=40'-0"
V: 1"=20'-0"

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NOTES:

1. A MINIMUM THICKNESS OF 12 INCHES OF SELECT FILL SHALL BE PLACED IN ALL AREAS TO BE LINED WITH HDPE IN THIS CONTRACT.
2. OUTER SURFACE OF BERMS NOT TO BE LINED WITH HDPE SHALL HAVE COARSER MATERIALS EARTHFILL.

NO.	DATE	DSGN	DR	CHK	APVD	BY
1	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	APVD	S. DETHLOFF
0	4/16/10					

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

NKB SWD
PDT SWD

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-8176

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

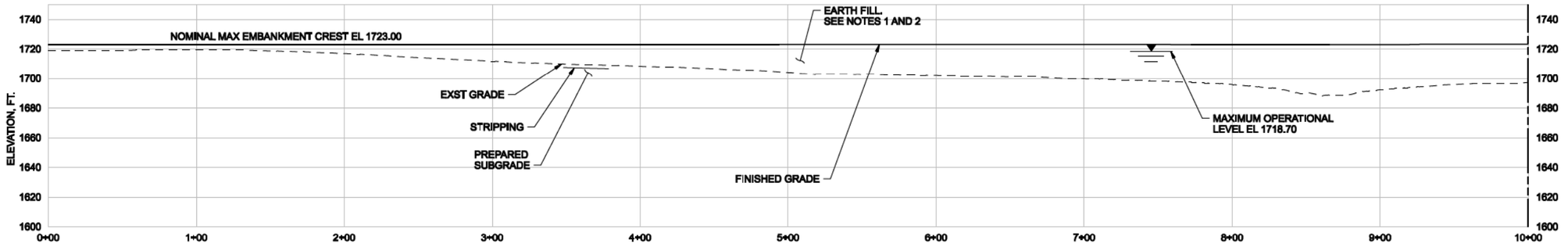
BERM PROFILE POND M5

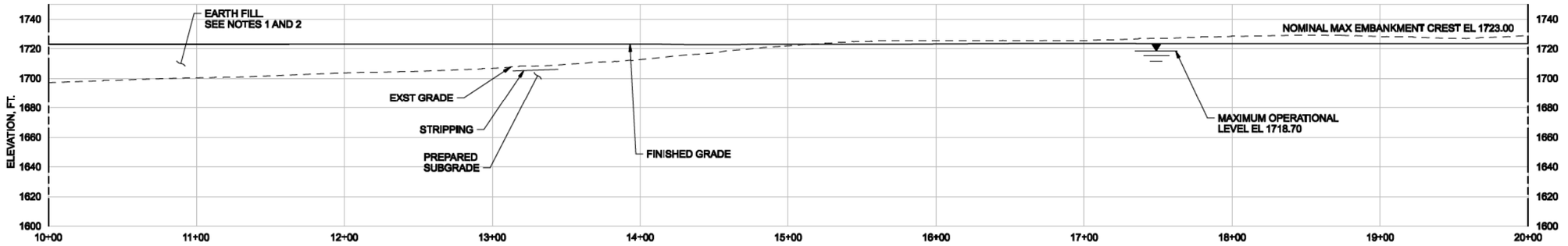
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

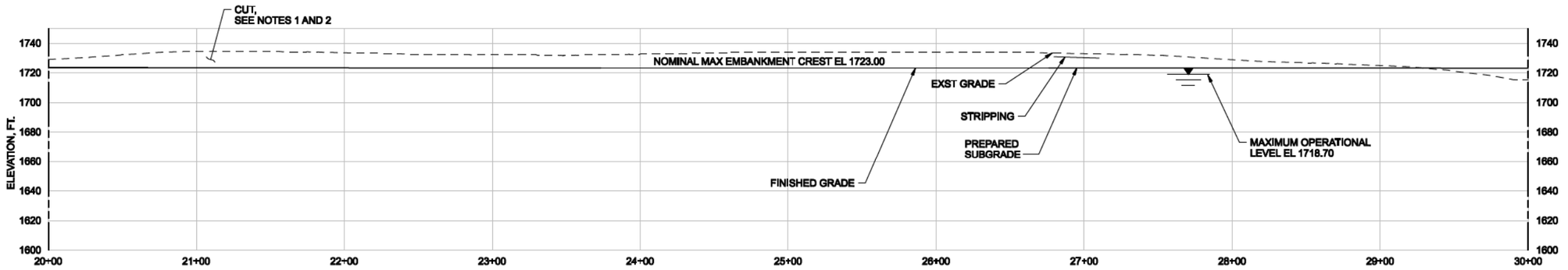
DATE	JULY 2011
PROJ	401621
DWG	D-6
SHEET	11 OF 147

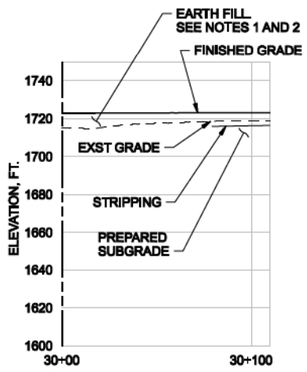
REUSE OF DOCUMENTS: THIS DOCUMENT, AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE PROPERTY OF CH2M HILL AND IS NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CH2MHILL

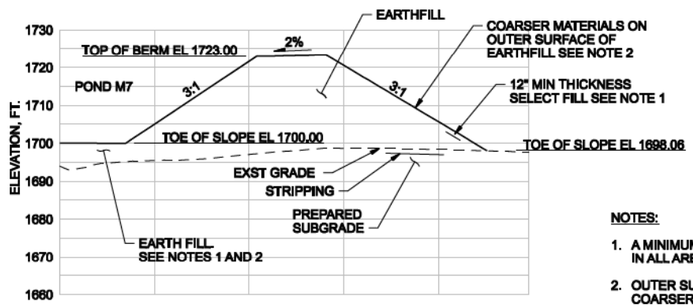
RECORD DRAWING











C SECTION
D-4
H: 1"=40'-0"
V: 1"=20'-0"

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NOTES:

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RECORD DRAWING
ISSUED FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
0	4/16/10				

REVISION BY: NKB PDT SWD / APVD SWD

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-5175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

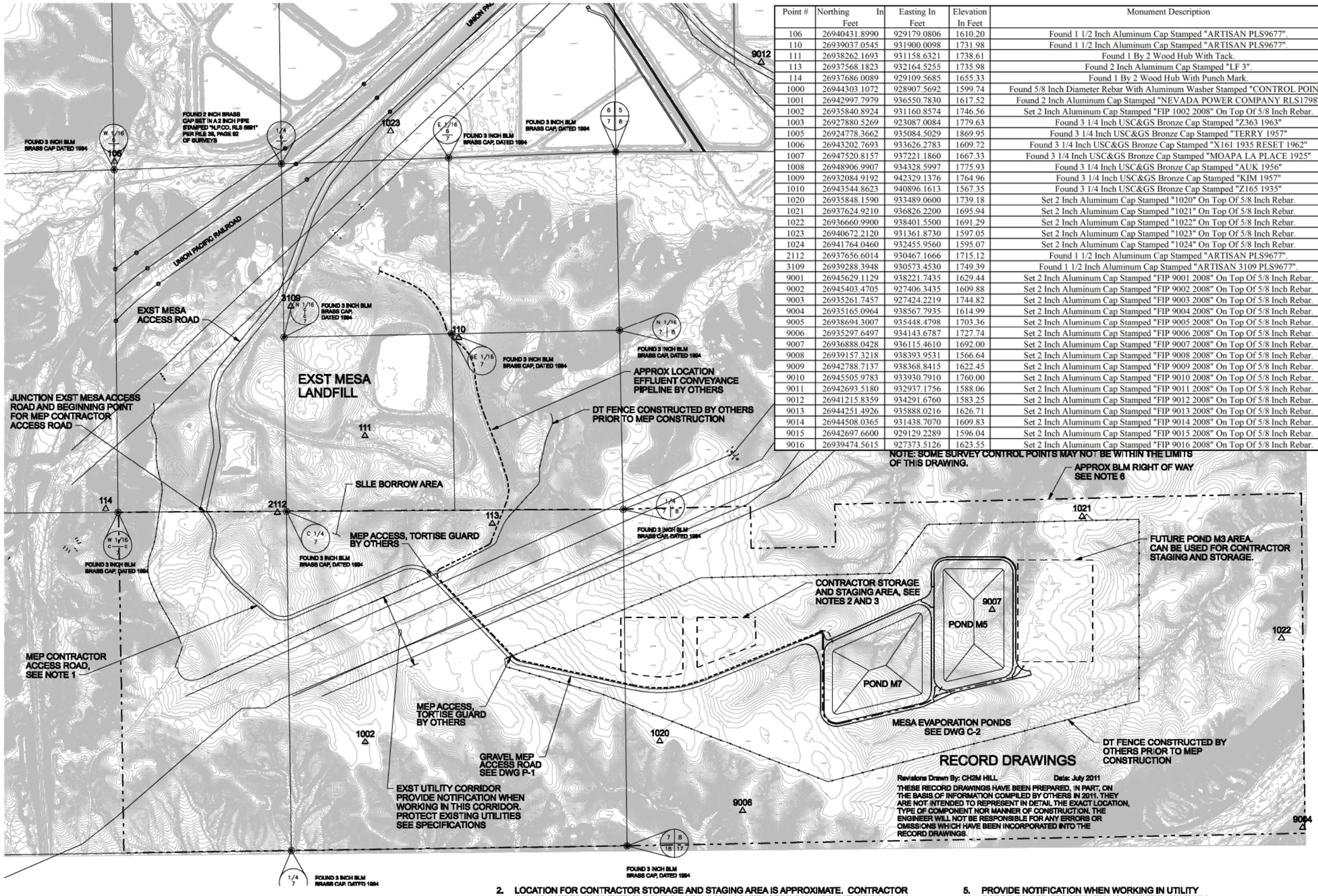
MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

BERM PROFILE POND M7

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	D-7
SHEET	12 OF 147

RECORD DRAWING



SURVEY CONTROL POINTS

Point #	Northing In Feet	Easting In Feet	Elevation In Feet	Monument Description
106	26940431.8990	929179.0806	1610.20	Found 1 1/2 Inch Aluminum Cap Stamped "ARTISAN PLS9677".
110	26939037.0545	931900.0098	1731.98	Found 1 1/2 Inch Aluminum Cap Stamped "ARTISAN PLS9677".
111	26938262.1693	931158.6321	1738.61	Found 1 By 2 Wood Hub With Tack.
113	26937568.1823	932164.5255	1735.98	Found 2 Inch Aluminum Cap Stamped "LF 3".
114	26937686.0089	929109.5685	1655.33	Found 1 By 2 Wood Hub With Punch Mark.
1000	26944303.1072	928907.5692	1599.74	Found 5/8 Inch Diameter Rebar With Aluminum Washer Stamped "CONTROL POINT"
1001	26942997.7979	936550.7830	1617.52	Found 2 Inch Aluminum Cap Stamped "NEVADA POWER COMPANY RLS1798"
1002	26935840.8924	931160.8574	1746.56	Set 2 Inch Aluminum Cap Stamped "FIP 1002 2008" On Top Of 5/8 Inch Rebar.
1003	26927880.5269	923087.0084	1779.63	Found 3 1/4 Inch USC&GS Bronze Cap Stamped "Z363 1963"
1005	26924778.3662	935084.5029	1869.95	Found 3 1/4 Inch USC&GS Bronze Cap Stamped "TERRY 1957"
1006	26943202.7693	933626.2783	1609.72	Found 3 1/4 Inch USC&GS Bronze Cap Stamped "X161 1935 RESET 1962"
1007	26947520.8157	937221.1860	1667.33	Found 3 1/4 Inch USC&GS Bronze Cap Stamped "MOAPA LA PLACE 1925"
1008	26948906.9907	934328.5997	1775.93	Found 3 1/4 Inch USC&GS Bronze Cap Stamped "AUK 1956"
1009	26932084.9192	942329.1376	1764.96	Found 3 1/4 Inch USC&GS Bronze Cap Stamped "KIM 1957"
1010	26943544.8623	940896.1613	1567.35	Found 3 1/4 Inch USC&GS Bronze Cap Stamped "Z165 1935"
1020	26935848.1590	933489.0600	1739.18	Set 2 Inch Aluminum Cap Stamped "1020" On Top Of 5/8 Inch Rebar.
1021	26937624.9210	936826.2200	1695.94	Set 2 Inch Aluminum Cap Stamped "1021" On Top Of 5/8 Inch Rebar.
1022	26936660.9900	938401.5500	1691.29	Set 2 Inch Aluminum Cap Stamped "1022" On Top Of 5/8 Inch Rebar.
1023	26940672.2120	931361.8730	1597.05	Set 2 Inch Aluminum Cap Stamped "1023" On Top Of 5/8 Inch Rebar.
1024	26941764.0460	932455.9560	1595.07	Set 2 Inch Aluminum Cap Stamped "1024" On Top Of 5/8 Inch Rebar.
2112	26937656.6014	930467.1666	1715.12	Found 1 1/2 Inch Aluminum Cap Stamped "ARTISAN PLS9677".
3109	26939288.3948	930573.4530	1749.39	Found 1 1/2 Inch Aluminum Cap Stamped "ARTISAN 3109 PLS9677".
9001	26945629.1129	938221.7435	1629.44	Set 2 Inch Aluminum Cap Stamped "FIP 9001 2008" On Top Of 5/8 Inch Rebar.
9002	26945403.4705	927406.3435	1609.88	Set 2 Inch Aluminum Cap Stamped "FIP 9002 2008" On Top Of 5/8 Inch Rebar.
9003	26935261.7457	927424.2219	1744.82	Set 2 Inch Aluminum Cap Stamped "FIP 9003 2008" On Top Of 5/8 Inch Rebar.
9004	26935165.0964	938567.7935	1614.99	Set 2 Inch Aluminum Cap Stamped "FIP 9004 2008" On Top Of 5/8 Inch Rebar.
9005	26938694.3007	935448.4798	1703.36	Set 2 Inch Aluminum Cap Stamped "FIP 9005 2008" On Top Of 5/8 Inch Rebar.
9006	26935297.6497	934143.6787	1727.74	Set 2 Inch Aluminum Cap Stamped "FIP 9006 2008" On Top Of 5/8 Inch Rebar.
9007	26936888.0428	936115.4610	1692.00	Set 2 Inch Aluminum Cap Stamped "FIP 9007 2008" On Top Of 5/8 Inch Rebar.
9008	26939157.3218	938393.9531	1566.64	Set 2 Inch Aluminum Cap Stamped "FIP 9008 2008" On Top Of 5/8 Inch Rebar.
9009	26942788.7137	938368.8415	1622.45	Set 2 Inch Aluminum Cap Stamped "FIP 9009 2008" On Top Of 5/8 Inch Rebar.
9010	26945505.9783	933930.7910	1760.00	Set 2 Inch Aluminum Cap Stamped "FIP 9010 2008" On Top Of 5/8 Inch Rebar.
9011	26942693.5180	932937.1756	1588.06	Set 2 Inch Aluminum Cap Stamped "FIP 9011 2008" On Top Of 5/8 Inch Rebar.
9012	26941215.8359	934291.6760	1583.25	Set 2 Inch Aluminum Cap Stamped "FIP 9012 2008" On Top Of 5/8 Inch Rebar.
9013	26944251.4926	935888.0216	1626.71	Set 2 Inch Aluminum Cap Stamped "FIP 9013 2008" On Top Of 5/8 Inch Rebar.
9014	26944508.0365	931438.7070	1609.83	Set 2 Inch Aluminum Cap Stamped "FIP 9014 2008" On Top Of 5/8 Inch Rebar.
9015	26942697.6600	929129.2289	1596.04	Set 2 Inch Aluminum Cap Stamped "FIP 9015 2008" On Top Of 5/8 Inch Rebar.
9016	26939474.5615	927373.5126	1623.55	Set 2 Inch Aluminum Cap Stamped "FIP 9016 2008" On Top Of 5/8 Inch Rebar.

NOTE: SOME SURVEY CONTROL POINTS MAY NOT BE WITHIN THE LIMITS OF THIS DRAWING.

NOTES:

1. CONTRACTOR ACCESS ROAD LOCATIONS ARE APPROXIMATE. CONTRACTOR TO IMPROVE AND MAINTAIN AS NEEDED APPROXIMATELY 1,000-FT OF EXISTING MESA ACCESS ROAD NORTH OF THE JUCNTION WITH MEP CONTRACTOR ACCESS ROAD, IN SECTIONS WHERE ROAD PASSES OVER THE EXISTING LANDFILL. MINIMUM ROAD IMPROVEMENTS ON EXISTING LANDFILL TO INCLUDE GRADING AND COMPACTION AS NEEDED FOR VEHICLE PASSAGE AND DUST CONTROL. CONTRACTOR TO IMPROVE AND MAINTAIN MEP CONTRACTOR ACCESS ROAD AS NEEDED TO COMPLETE WORK. FOR ALL ROAD IMPROVEMENTS, HORIZONTAL AND VERTICAL ALIGNMENTS TO BE SUITABLE FOR FUTURE CHEMICAL DELIVERY TO PONDS BY OWNER. DESIGN CHEMICAL DELIVERY TRUCK SIZE SHALL BE WB-62. CONTRACTOR ACCESS ROAD SHALL FOLLOW EXISTING ROADS AND TRACKS. CROSS UTILITY CORRIDOR AT EXISTING LOCATIONS ESTABLISHED AT TORTOISE GUARD ACCESS POINTS. COORDINATE ACCESS ROAD IMPROVEMENT AND MAINTENANCE WITH SLLE BORROW WORK.
2. LOCATION FOR CONTRACTOR STORAGE AND STAGING AREA IS APPROXIMATE. CONTRACTOR CAN ADJUST TO FACILITATE EXECUTION OF WORK. CONTRACTOR CAN USE FUTURE POND M3 FOR ADDITIONAL STAGING ACCESS. MINIMIZE DISTURBANCE AREA AND RESTORE PER SPECIFICATIONS.
3. CONTRACTOR TO STOCKPILE SURPLUS EXCAVATION MATERIALS IN AREA ADJACENT TO MEP ACCESS ROAD FOR OWNERS FUTURE USE. AREAS SHOWN ARE APPROXIMATE AND TO BE DETERMINED BY CONTRACTOR. GET OWNER APPROVAL PRIOR TO START OF CLEARING. AREA SHALL BE CLEARED, GRUBBED AND PREPARED PER SPECIFICATIONS.
4. PRESERVE AND PROTECT DESERT TORTOISES PER SPECIFICATIONS. ALL PERSONNEL WORKING ON THIS PROJECT MUST ATTEND OWNER'S TORTOISE TRAINING CLASS.
5. PROVIDE NOTIFICATION WHEN WORKING IN UTILITY CORRIDOR PER SPECIFICATIONS. MAINTAIN MINIMUM SAFE CLEARANCE FROM OVERHEAD POWER LINES.
6. SPECIAL REQUIREMENTS APPLY TO WORK ON BLM PROPERTY. REFER TO SPECIFICATIONS FOR REQUIREMENTS.

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	P. TSCHESCHKE	J. WALKER	J. SCHNEIDER	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION

REVISION BY: NKB PDT APVD

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-5175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

CH2MHILL

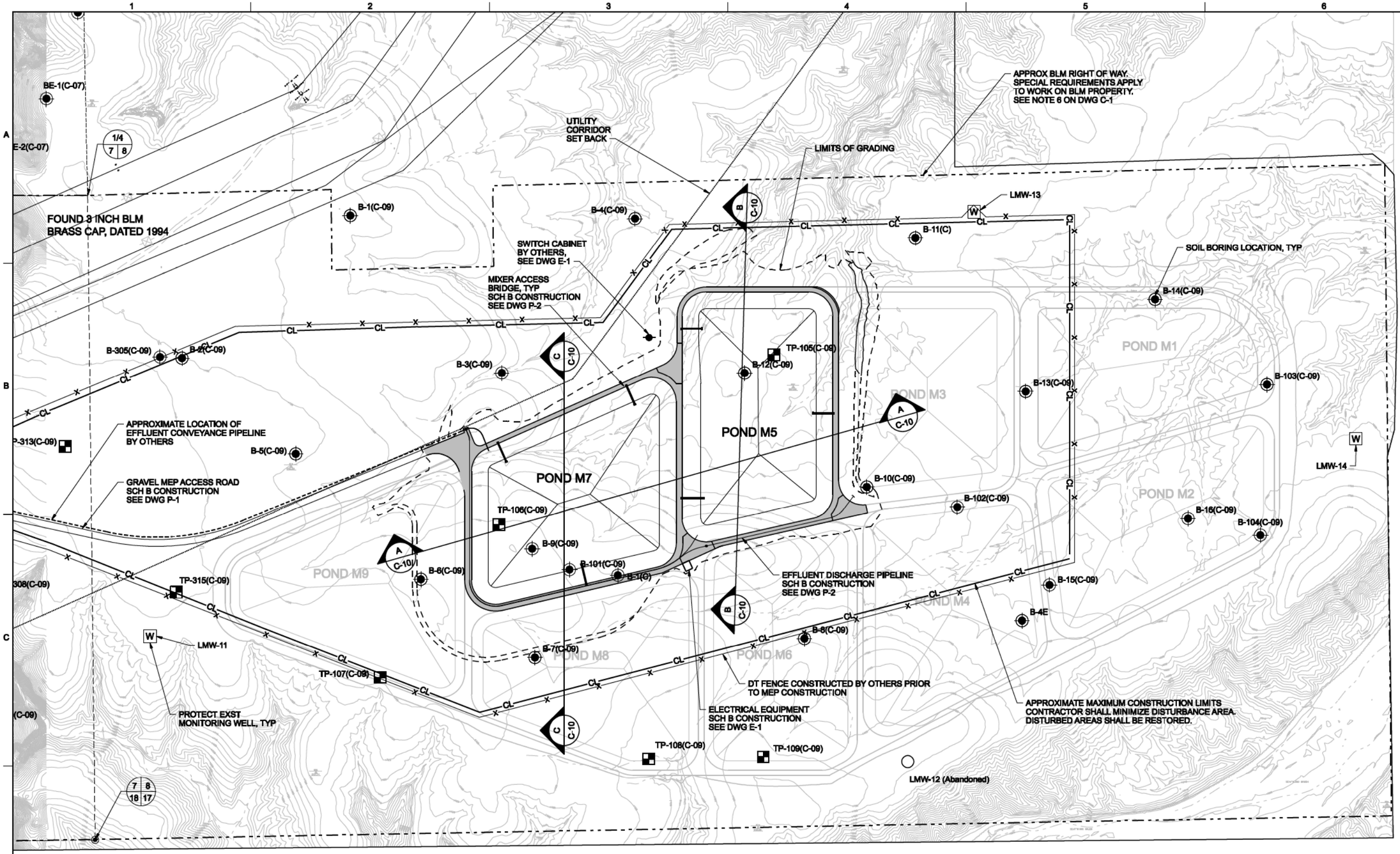
MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9825650201 M7: RC171 WO# 9821665101

GENERAL SITE PLAN

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-1
SHEET	13 OF 147

RECORD DRAWING



RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD
2	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
1	9/7/10				
0	4/16/10				

RECORD DRAWING
DRAWING REVISION - MIXER ACCESS BRIDGES
ISSUED FOR CONSTRUCTION

REVISION BY APVD
NKB SWD
PDT SWD
PDT SWD

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-9175

CH2MHILL

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 982565201 M7: RC171 WO# 982185101

GENERAL POND SITE PLAN

REID GARDNER STATION
Wastewater System
Improvement Projects
Moapa, Nevada

NVEnergy.

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-2
SHEET	14 OF 147

RECORD DRAWING

DESERT TORTOISE FENCE
AND MAINTENANCE ROAD
CONSTRUCTED BY OTHERS
PRIOR TO MEP CONSTRUCTION

KEYMAP

BLOWER PAD

ELECTRICAL PAD

LDRS SUMP PAD

LIMITS OF GRADING, TYP

MATCHLINE SEE DWG C-5

EFFLUENT CONVEYANCE PIPELINE
TO POND EFFLUENT DISCHARGE
PIPELINES INTERFACE.
SEE DWG P-2

℄ POND BERM, TYP
SEE 4 C-12

EFFLUENT PIPELINE
VALVE STATION
SCH B CONSTRUCTION
SEE DWG P-2

20' BERM WIDTH

DRAINAGE DITCH
N 26936815.17
E 934700.25
EL 1716.7±
MATCH TO
EXST FLOWLINE

℄ DRAINAGE DITCH
3:1 SIDE SLOPES
SEE DWG C-23

GROUND SURFACE AT VALVE STATION
SLOPED TO DRAIN TO POND M7

CULVERT
N 26936693.77
E 934670.83
INV EL 1717.99

ELECTRICAL PAD

BLOWER PAD

18" CULVERT

EFFLUENT CONVEYANCE PIPELINE,
BY OTHERS

SHADING SHOWS
LIMITS OF BERM
ROAD SURFACING

EL 1723.00

POND TOE
EL 1700.00

MATCHLINE SEE DWG C-6

PI
N 26936612.19
E 934772.00

MIXER ACCESS BRIDGE, TYP
SCH B CONSTRUCTION
SEE DWG P-2

CULVERT
N 26936596.91
E 934663.65
INV EL 1719.48

LIMITS OF BERM
ROAD SURFACING, SEE 5 C-12

GRAVEL MEP ACCESS ROAD
SCH B CONSTRUCTION
SEE DWG P-1

DRAINAGE DITCH
N 26936567.32
E 934673.71
EL 1719.80

POND M7

DRAINAGE SWALE
N 26936464.16
E 934543.32
EL 1722.21

EFFLUENT
DISCHARGE PIPELINES,
SCH B CONSTRUCTION
2 EA 8" DIA HDPE,
SEE DWG P-2

MATCHLINE SEE DWG C-4

DRAINAGE DITCH
N 26936523.52
E 934712.81
EL 1720.38

DRAINAGE DITCH
N 26936500.55
E 934733.31
EL 1720.69

DRAINAGE DITCH
N 26936479.57
E 934744.47
EL 1720.93

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL. Date: July 2011

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N

0 40 80 120
Scale in Feet

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION

REVISION	BY	APVD
	NKB	SWD
	PDT	SWD

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PHONE: 702-369-5175

CH2MHILL

REID GARDNER STATION
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Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9822565O201, M7:RC171 WO#9821855101

POND SITE PLAN - AREA 1

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-3
SHEET	15 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20202_401621RD.dgn

PLOT DATE: 7/12/2011 PLOT TIME: 8:56:39 AM

MATCHLINE SEE DWG C-3

KEYMAP

1% MIN

℄ DRAINAGE SWALE

DRAINAGE SWALE
N 26936383.58
E 934406.04
EL 1723.81

N 26936441.07
E 934758.00
EL 1723.56

2% OR FLATTER

2% OR FLATTER

3:1

28' BERM WIDTH

2%

3:1

R 128'

R 100'

PI
N 26935949.86
E 934772.00

EFFLUENT DISCHARGE PIPELINES,
SCH B CONSTRUCTION
2 EA 8" DIA HDPE,
SEE DWG P-2

℄ DRAINAGE DITCH
3:1 SIDE SLOPES OR
FLATTER, TYP

N 26935968.89
E 934915.10
EL 1723.56

2% OR FLATTER

3:1

APPROXIMATE
LIMITS OF GRADING, TYP

0.3% ±

N 26936406.85
E 935142.00
EL 1700.90

POND M7

0.3% ±

N 26936448.32
E 935276.00
EL 1700.90

MIXER ACCESS BRIDGE, TYP
SCH B CONSTRUCTION
SEE DWG P-2

POND TOE
EL 1700.00

MATCHLINE SEE DWG C-6

℄ EL 1723.00

BLOWER PAD

ELECTRICAL PAD

℄ POND BERM, TYP
SEE 1 C-12

2% OR FLATTER

DRAINAGE DITCH
N 26936049.35
E 935289.58
EL 1719.99

℄ DRAINAGE DITCH
3:1 SIDE SLOPES OR
FLATTER, TYP

DRAINAGE DITCH
N 26935970.03
E 935359.39
EL 1719.46

DRAINAGE DITCH
N 26935955.64
E 935462.77
EL 1718.90

DRAINAGE DITCH
N 26935963.24
E 935474.58
EL 1718.8±
MATCH TO
EXST FLOWLINE

2% OR FLATTER

N

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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0 40 80 120
Scale In Feet

NO.	DATE	DSGN	DR	CHK	APVD	BY
2	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF	NKB SWD
1	5/04/10					PDT SWD
0	4/16/10					PDT SWD

RECORD DRAWING
DRAWING REVISION
ISSUED FOR CONSTRUCTION
REVISION

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-369-5175

REID GARDNER STATION
Wastewater System
Improvement Projects
Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 8925650201 M7: RC171 WO# 8921655101

POND SITE PLAN - AREA 2

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-4
SHEET	16 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20203_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 9:01:06 AM

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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DESERT TORTOISE FENCE BY OTHERS

N 26937410.84
E 935682.29
EL 1686.72

PI
N 26937293.00
E 935644.00

N 26937234.19
E 935552.54
EL 1691.4±
MATCH TO EXST FLOWLINE
BEGIN RIPRAP DITCH
SEE A C-9

MATCHLINE SEE DWG C-3

SWITCH CABINET BY OTHERS, SEE DWG E-1

PI
N 26937000.16
E 935644.00

N 26937515.92
E 935963.70
EL 1669.5±
MATCH EXST FLOWLINE
END RIPRAP DITCH

LIMITS OF GRADING, TYP

PI
N 26937293.00
E 936291.00

DRAINAGE DITCH
N 26937459.91
E 936327.64
EL 1667.0±
MATCH EXST FLOWLINE
END RIPRAP DITCH

KEYMAP

GRADE BREAK
N 26937393.01
E 936343.35
EL 1673.82

℄ POND BERM
SEE 4 C-12

20' BERM WIDTH

EL 1720.00

20' BERM WIDTH

BLOWER PAD

MIXER ACCESS BRIDGE, TYP
SCH B CONSTRUCTION
SEE DWG P-2

ELECTRICAL PAD

N 26936967.88
E 935969.50
EL 1697.74

LDRS SUMP PAD

POND TOE
EL 1697.00

24' BERM WIDTH

EL 1723.00

GRADE BREAK

N 26937000.16
E 935646.00

GRADE BREAK

24' BERM WIDTH

POND M7

POND M5

℄ POND BERM
SEE 2 C-12

POND WATER TRANSFER AREA
SEE DWG C-15 & C-16
FOR SPECIAL LINER
CONSTRUCTION DETAILS

MATCHLINE SEE DWG C-6

℄ POND BERM
SEE 3 C-12

ELECTRICAL PAD

GRADE BREAK
N 26937368.56
E 936365.45
EL 1675.13

DRAINAGE DITCH
N 26937377.14
E 936405.46
EL 1671.76

GRADE BREAK
N 26937349.17
E 936371.72
EL 1678.05

GRADE BREAK
N 26937319.95
E 936372.43
EL 1683.92

GRADE BREAK
N 26937290.44
E 936377.71
EL 1687.75

GRADE BREAK
N 26937256.08
E 936394.46
EL 1687.42

GRADE BREAK
N 26937247.53
E 936397.03
EL 1687.49

GRADE BREAK
N 26937221.30
E 936396.88
EL 1689.72

GRADE BREAK
N 26937137.19
E 936378.92
EL 1695.17

MATCHLINE SEE DWG C-7

GRADE BREAK
N 26937010.02
E 936370.80
EL 1697.98

GRADE BREAK
N 26936967.05
E 936373.24
EL 1697.07

DRAINAGE DITCH
N 26936960.37
E 936409.89
EL 1694.76
BEGIN RIPRAP DITCH
SEE A C-9

℄ DRAINAGE DITCH
3:1 SIDE SLOPES
SEE B C-9 ,TYP

6' OFFSET

0 40 80 120
Scale In Feet

NO.	DATE	DSGN
2	07/14/11	R. TOWNSEND
1	4/30/10	
0	4/16/10	

RECORD DRAWING
DRAWING REVISION
ISSUED FOR CONSTRUCTION

BY	CHK	DR
NKB	P. TSCHESCHKE	J. WALKER
PDT	APVD	
PDT	S. DETHLOFF	
SWD		
SWD		

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-388-8175

REID GARDNER STATION
Wastewater System
Improvement Projects
Moapa, Nevada

NVEnergy

CH2MHILL

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9025660201 M7: RC171 WO# 9021655101

POND SITE PLAN - AREA 3

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-5
SHEET	17 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20204_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 9:03:21 AM

MATCHLINE SEE DWG C-5

MATCHLINE SEE DWG C-3

MATCHLINE SEE DWG C-8

POND M7

POND M5

24' BERM WIDTH

℄ POND BERM SEE 2 C-12

0.3% ±

MIXER ACCESS BRIDGE, TYP SCH B CONSTRUCTION SEE DWG P-2

BLOWER PAD

ELECTRICAL PAD

N 26936614.79
E 935972.37
EL 1697.74

℄ POND BERM SEE 3 C-12

PI
N 26936375.04
E 936291.00

℄ DRAINAGE DITCH 3:1 SIDE SLOPES

DRAINAGE DITCH
N 26936529.02
E 936376.65
EL 1699.09

POND TOE
EL 1700.00

POND TOE
EL 1697.00

GRADE BREAK

EFFLUENT DISCHARGE PIPELINE
8" DIA HDPE,
SEE DWG P-2

EFFLUENT DISCHARGE PIPELINES,
SCH B CONSTRUCTION
2 EA 8" DIA HDPE,
SEE DWG P-2

EL 1723.00

EL 1720.00

R 100'-0"

R 126'-0"

24'-0"

28'-0"

2.79%

1.49%

3:1

℄ POND BERM SEE 1 C-12

LIMITS OF GRADING, TYP

℄ DRAINAGE DITCH 3:1 SIDE SLOPES SEE B C-9 , TYP

28' BERM WIDTH

DRAINAGE DITCH
N 26936227.50
E 935826.86
EL 1719.11

N 26936246.26
E 935810.28

PI
N 26936208.47
E 935644.00

DRAINAGE DITCH
N 26936221.64
E 935808.71
EL 1719.34

DRAINAGE DITCH
N 26936170.69
E 935693.13
EL 1720.61

PI
N 26936153.44
E 935644.00

N 26936129.35
E 935672.45

N 26936122.62
E 935573.58

TRANSFORMER AND LOAD CENTER PAD SEE DWG E-1

N 26936141.83
E 935699.73

DRAINAGE DITCH
N 26936291.35
E 936292.83
EL 1704.26
END RIPRAP DITCH

PI
N 26936355.52
E 936291.00

EFFLUENT DISCHARGE PIPELINE
SCH B CONSTRUCTION
8" DIA HDPE,
SEE DWG P-2

DRAINAGE DITCH
N 26936275.50
E 936197.71
EL 1706.12

DRAINAGE DITCH
N 26936284.96
E 936096.82
EL 1716.22
BEGIN RIPRAP DITCH
SEE A C-9

KEYMAP

N

0 40 80 120
Scale In Feet

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS IN 2011. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
3	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF	NKB	RECORD DRAWING
2	6/9/10					PDT	DRAWING REVISION
1	4/30/10					PDT	DRAWING REVISION
0	4/16/10					PDT	ISSUED FOR CONSTRUCTION

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-4175

CH2MHILL

REID GARDNER STATION
Wstewater System Improvement Projects
Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9825650201 M7: RC171 WO# 9821855101

POND SITE PLAN - AREA 4

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-6
SHEET	18 OF 147

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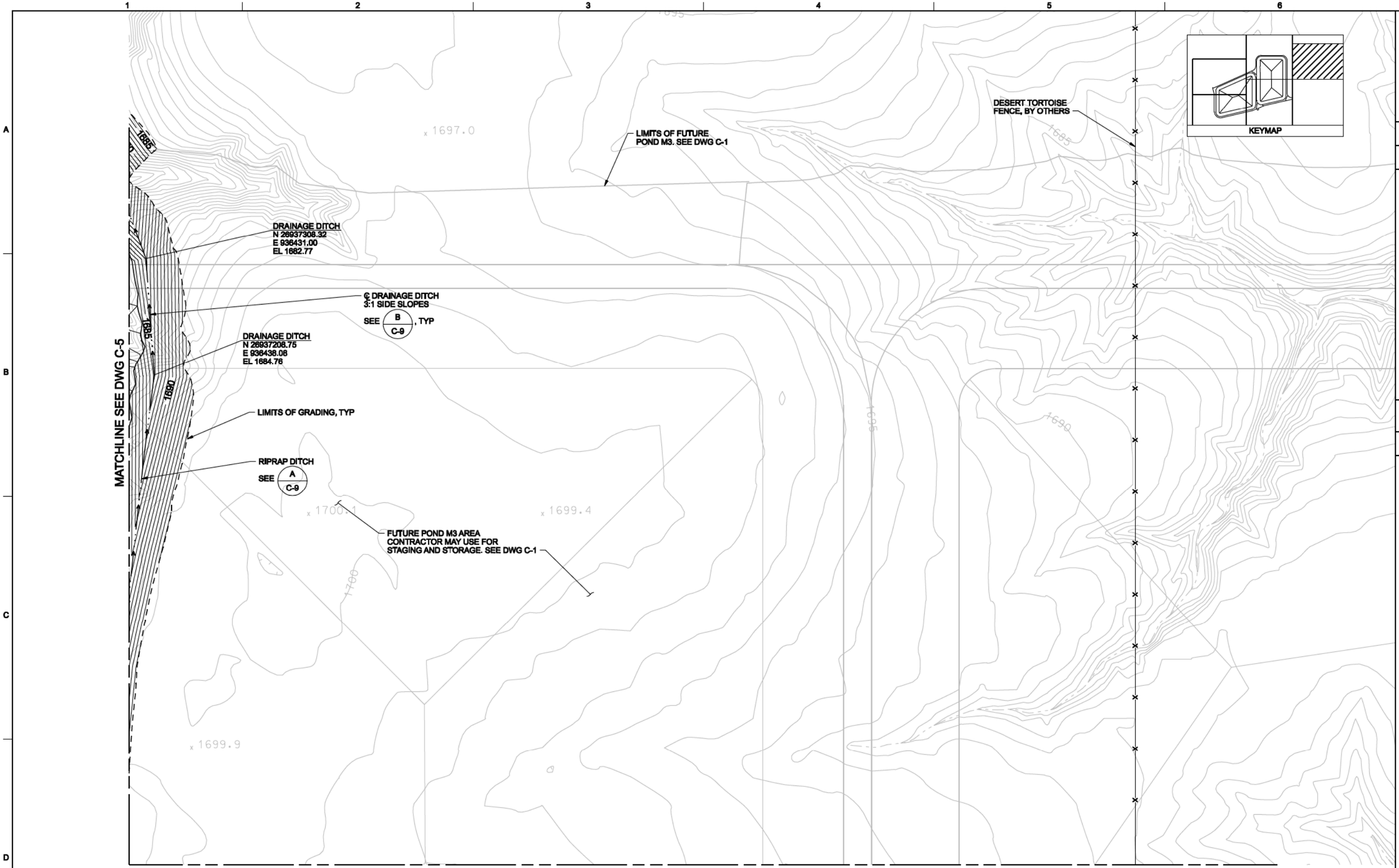
RECORD DRAWING



RECORD DRAWINGS

Revisions Drawn By: CH2M HILL. Date: July 2011

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0 40 80 120
Scale In Feet

NO.	DATE	DSGN	DR	CHK	APVD	BY
2	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF	NKB SWD
1	4/30/10					PDT SWD
0	4/16/10					PDT SWD

RECORD DRAWING
DESIGN REVISION
ISSUED FOR CONSTRUCTION
REVISION

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-369-5175

CH2MHILL

REID GARDNER STATION
Wastewater System
Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825550201, M7:RC171 WO#9821855101

POND SITE PLAN - AREA 5

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-7
SHEET	19 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20206_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 9:11:34 AM

MATCHLINE SEE DWG C-7

MATCHLINE SEE DWG C-5

FUTURE POND M3 AREA
CONTRACTOR MAY USE FOR
STAGING AND STORAGE SEE DWG C-1

KEYMAP

DRAINAGE DITCH
N 26936441.50
E 936456.17
EL 1700.35

R 50'-0"

LIMITS OF GRADING

℄ DRAINAGE DITCH
3:1 SIDE SLOPES

SEE B/C-9, TYP

LIMITS OF GRADING, TYP

DRAINAGE DITCH
N 26936379.62
E 936474.21
EL 1700.99

DRAINAGE DITCH
N 26936322.69
E 936433.42
EL 1702.10

DESERT TORTOISE FENCE, BY OTHERS

x 1700.3

x 1690.9

1715

1700

1695

1690

1685

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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N

0 40 80 120
Scale In Feet

NO.	DATE	DSGN	DR	CHK	APVD	BY
1	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF	NKB SWD
0	4/16/10					PDT SWD

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

CH2MHILL
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HENDERSON, NEVADA 89074
PHONE: 702-369-5175

REID GARDNER STATION
Wastewater System
Improvement Projects
Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#8225650201, M7:RC171 WO#8221855101

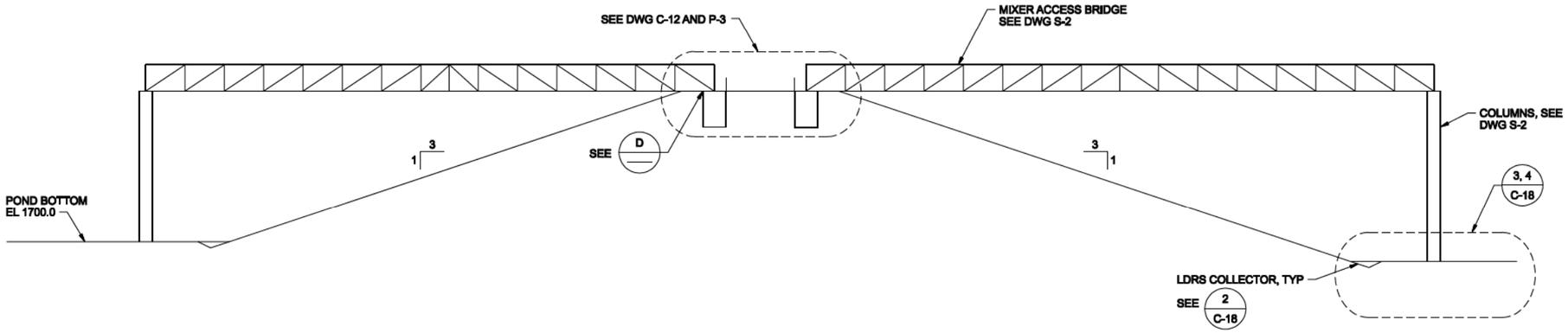
POND SITE PLAN - AREA 6

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-8
SHEET	20 OF 147

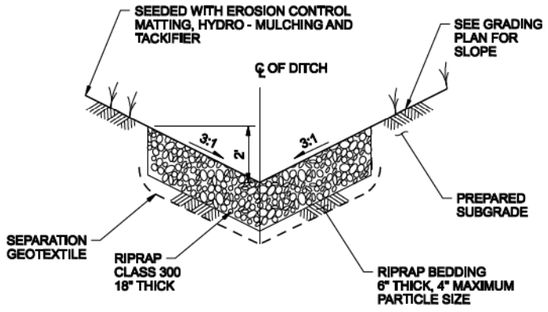
RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20207_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 9:13:57 AM



C CONCEPTUAL BERM SECTION

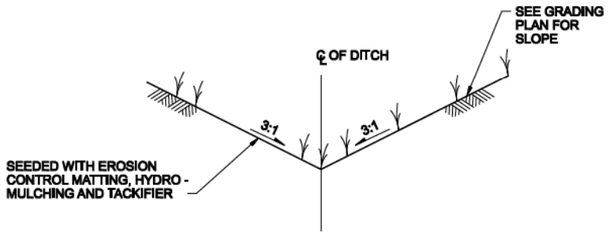
1"=10'



A RIPRAP DITCH TYPICAL SECTION

NTS

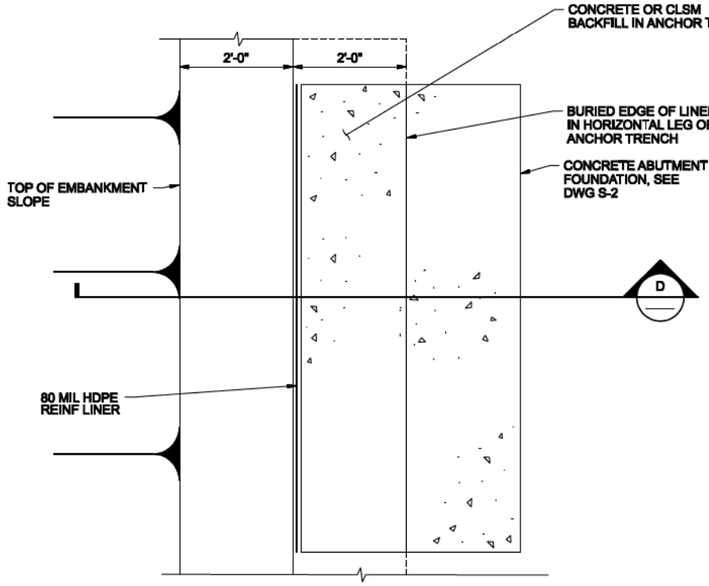
C-5
C-6
C-7



B DITCH TYPICAL SECTION

NTS

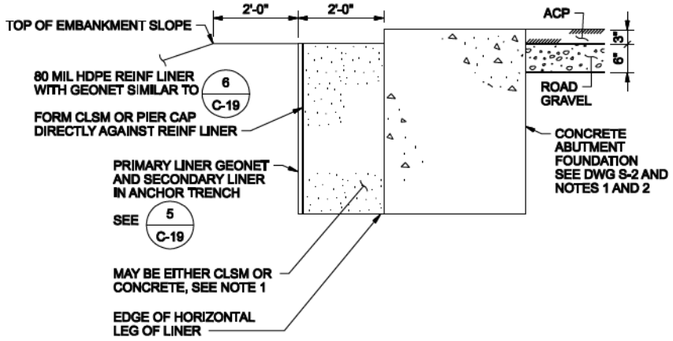
C-3
C-4
C-5
C-7
C-8



ANCHOR TRENCH AT BRIDGE

PLAN

NTS



NOTES:

1. THE FINAL DESIGN OF THE BRIDGE FOUNDATION SHALL BE BY THE CONTRACTOR. THE CONCEPT SHOWN IS FOR A SINGLE PIER SUPPORT. FINAL DESIGN TO BE APPROVED BY OWNER.
2. CONCEPTUAL SECTION SHOWN IS TYPICAL OF ALL BRIDGE PIERS.

ANCHOR TRENCH AT BRIDGE

D SECTION

NTS

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD
2	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
1	6/9/10				
0	04/16/10				

RECORD DRAWING
DRAWING REVISION
ISSUED FOR CONSTRUCTION

REVISION	BY	APVD
	NKB	SWD
	PDT	SWD
	PDT	SWD

APRIL 2010

C-6

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-9175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M8
M5: RC171 WO# 9825650201 M7: RC171 WO# 9821855101

DRAINAGE DITCH DETAILS

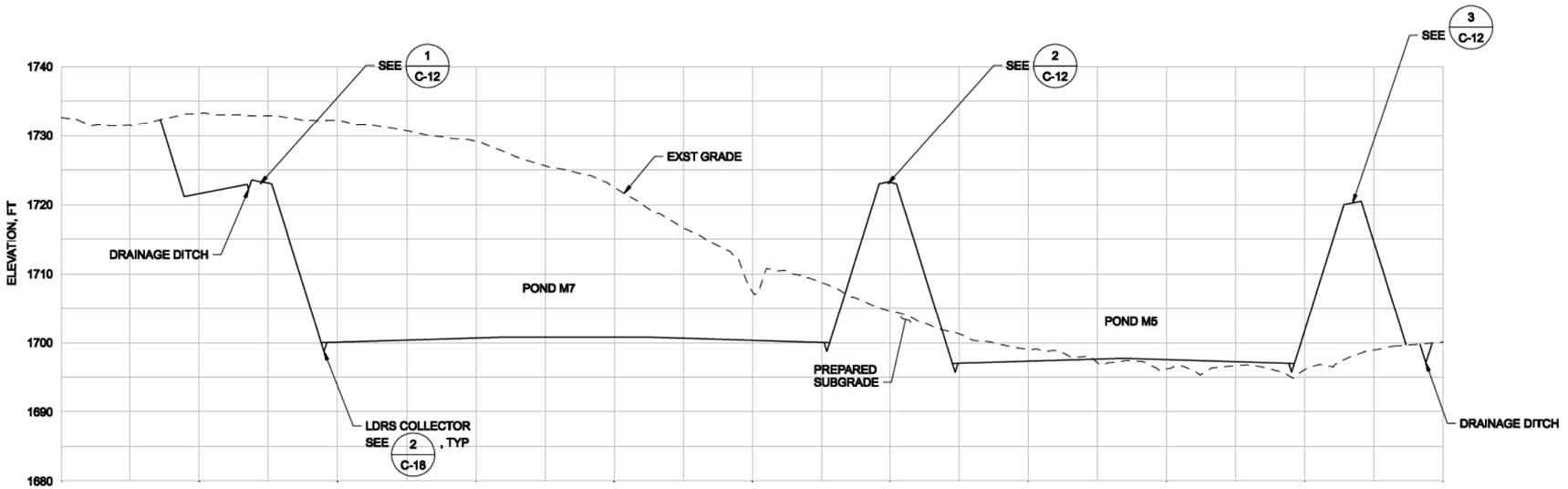
VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

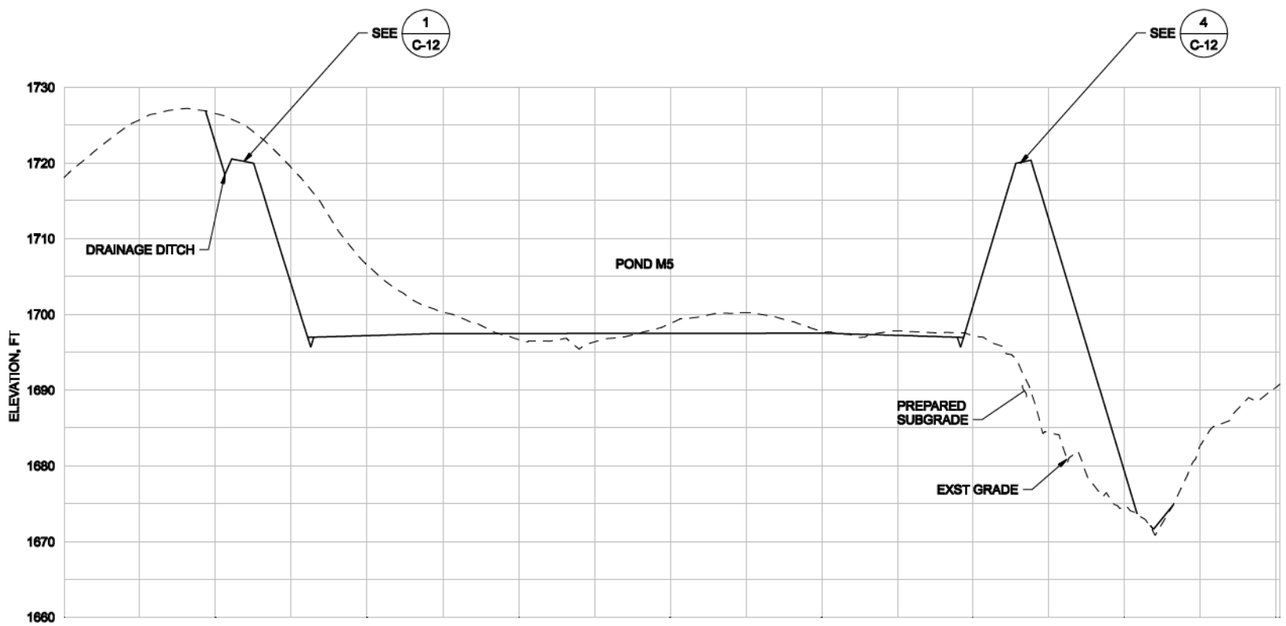
DATE	JULY 2011
PROJ	401621
DWG	C-9
SHEET	21 OF 147

RECORD DRAWING

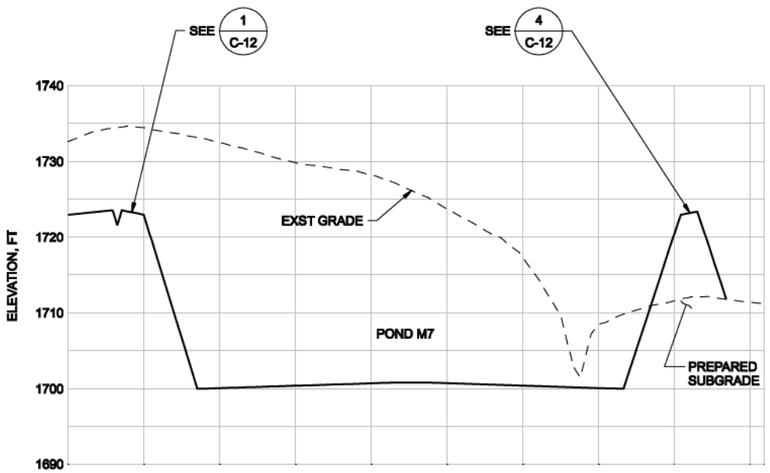
NDM-LAS:RGS Mesa Facility IDP\ 200-C-50203_401621RD.dgn PLOT DATE: 7/13/2011 PLOT TIME: 8:13:27 AM



A SECTION
1"=100'-0"
C-2



B SECTION
1"=100'-0"
C-2



C SECTION
1"=100'-0"
C-2

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NDM-LAS:RGS Mesa Facility IDP\ 200-C-30202_401621RD.dgn PLOT DATE: 7/13/2011 PLOT TIME: 8:16:17 AM

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	R. TOWNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION

REVISION	BY	APVD
	NKB	SWD
	PDT	SWD
	BY	APVD

2485 VILLAGE VIEW DRIVE, SUITE 350
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CH2MHILL

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

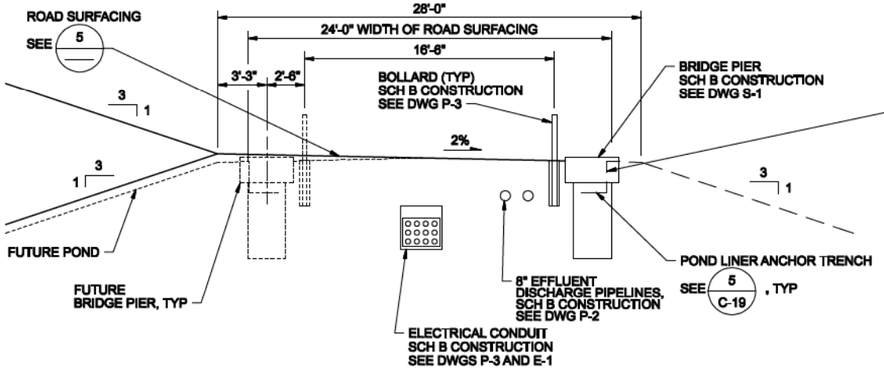
MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

POND SECTIONS

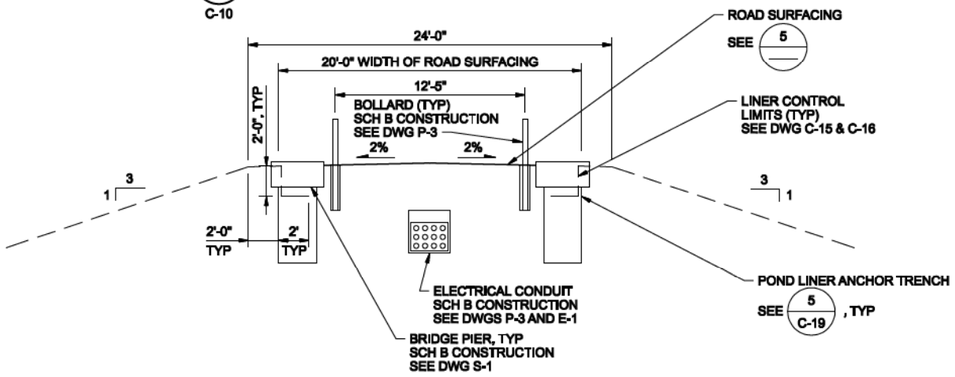
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-10
SHEET	22 OF 147

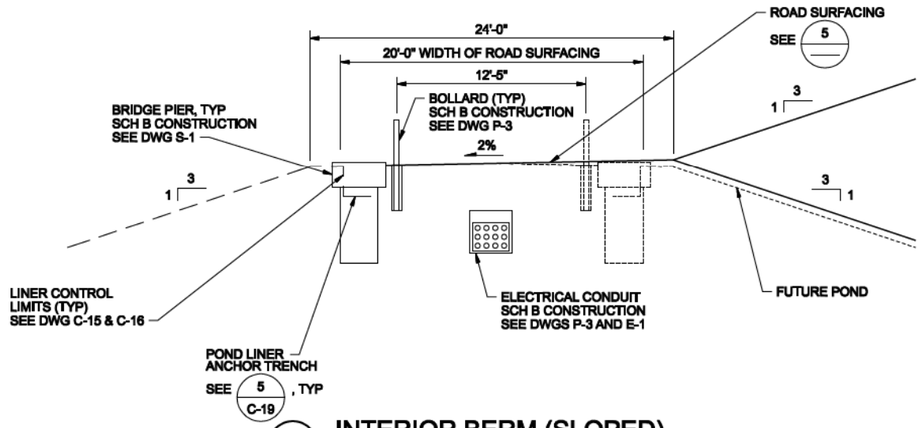
RECORD DRAWING



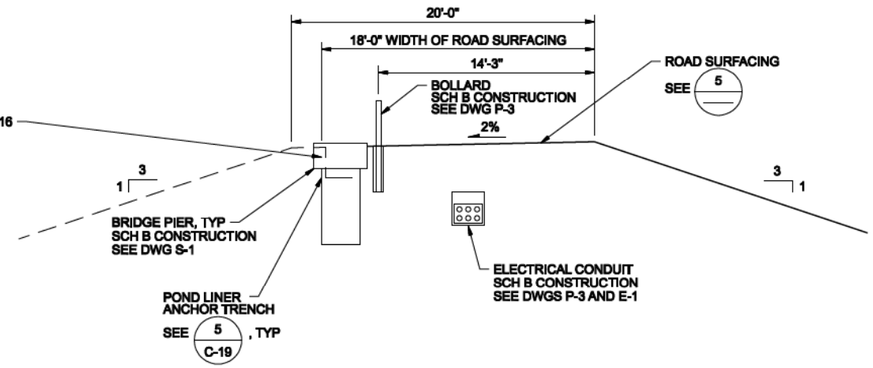
1 CENTRAL INTERIOR BERM
1"=5'-0"
C-10



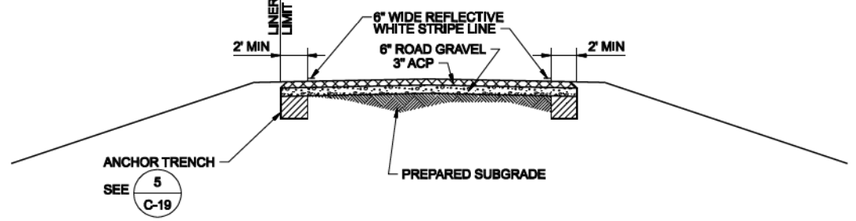
2 INTERIOR BERM (CROWNED)
1"=5'-0"
C-10



3 INTERIOR BERM (SLOPED)
1"=5'-0"
C-10



4 EXTERIOR BERM
1"=5'-0"
C-10



NOTES:

1. TOP SEAL ASPHALT EMULSION COATING TO SEAL ANCHOR TRENCH AND CONVEY RUNOFF FROM ROAD TO POND.
2. PAINT WHITE STRIPE LINE FOR TRAVEL WAYS, BOTH SIDES OF ALL ROADS PER NVDOT STDS.

5 BERM ROAD SURFACING AND MARKING
NTS
C-19

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	R. TOSNSEND	J. WALKER	P. TSCHESCHKE	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION

REVISION	BY	APVD
	NKB	SWD
	PDT	SWD

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-9175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

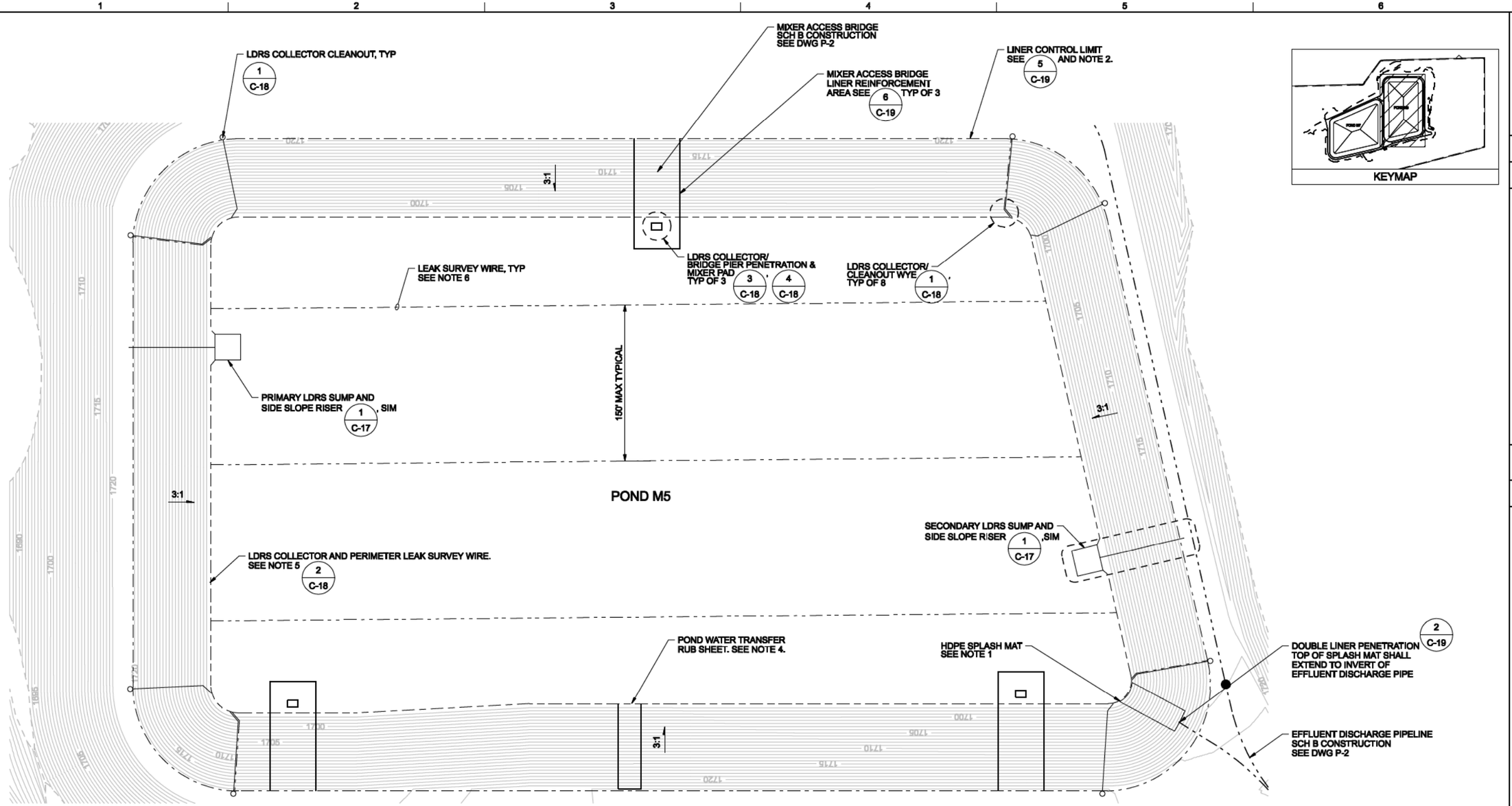
POND BERM TYPICAL SECTIONS

RECORD DRAWING

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-12
SHEET	23 OF 147

NDM-LAS:RGS Mesa Facility IDP\ 200-C-30201_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 10:47:18 AM



NOTES:

1. INSTALL HDPE SPASH MAT TO PROTECT PRIMARY LINER FROM EFFLUENT DISCHARGE. MAT TO EXTEND FROM EFFLUENT DISCHARGE PIPE TO TOE OF SLOPE. MAT TO BE 22' MIN WIDTH, 80 – MIL HDPE LINER, EXTRUSION WELDED TO PRIMARY LINER AROUND PERIMETER. PLACE CUSHION GEOTEXTILE BENEATH SPASH MAT SIMILAR TO 6 C-19
2. LINER CONTROL LIMIT IS LOCATION WHERE GEOMEMBRANE DROPS INTO ANCHOR TRENCH. SEE DWG C-12. ANCHOR TRENCH ALIGNMENT SHALL BE STRAIGHT AND SMOOTH.
3. LINER SEAMS SHALL EXTEND THROUGH THE ANCHOR TRENCH TO THE END OF THE GEOMEMBRANE PANEL.
4. POND WATER TRANSFER RUB SHEET LOCATIONS APPROXIMATE, SEE DWG C-5. COORDINATE WITH OWNER ON FINAL POSITION. RUB SHEET TO BE 22' MIN WIDTH, 80- MIL HDPE LINER EXTRUSION WELDED TO PRIMARY LINER AROUND PERIMETER. INSTALL WHITE 60-MIL TEXTURED HDPE ALONG EDGES OF SHEET. PLACE GEONET BENEATH RUB SHEET SIMILAR TO 6 C-19
5. LEAK SURVEY WIRES SHALL BE CONTINUOUS 8 GA COPPER, SPLICED ONLY AT INTERSECTION POINTS. SEE SPLICE DETAIL 4 C-19
6. LEAK SURVEY WIRE SHALL ALSO RUN IN A LOOP AROUND THE BASE OF THE POND IN THE LDRS COLLECTOR TRENCH. WIRES SHALL EXTEND TO THE TOP OF DIKE AT ONE OF THE CLEANOUTS AT EACH OF THE FOUR CORNERS.

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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SHEET LEGEND

- LDRS CLEANOUT
- LDRS COLLECTOR AND PERIMETER LEAK SURVEY WIRE
- LINER CONTROL LIMITS
- LEAK SURVEY WIRE

N

50 0 50 100
SCALE IN FEET

NO.	DATE	DSGN	DR	CHK	APVD
1	07/14/11	T. PYLE	M. RARDIN	P. TSCHESCHKE	S. DETHLOFF
0	4/16/10				

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

NKB SWD
PDT SWD
BY APVD

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-369-5176

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M9
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

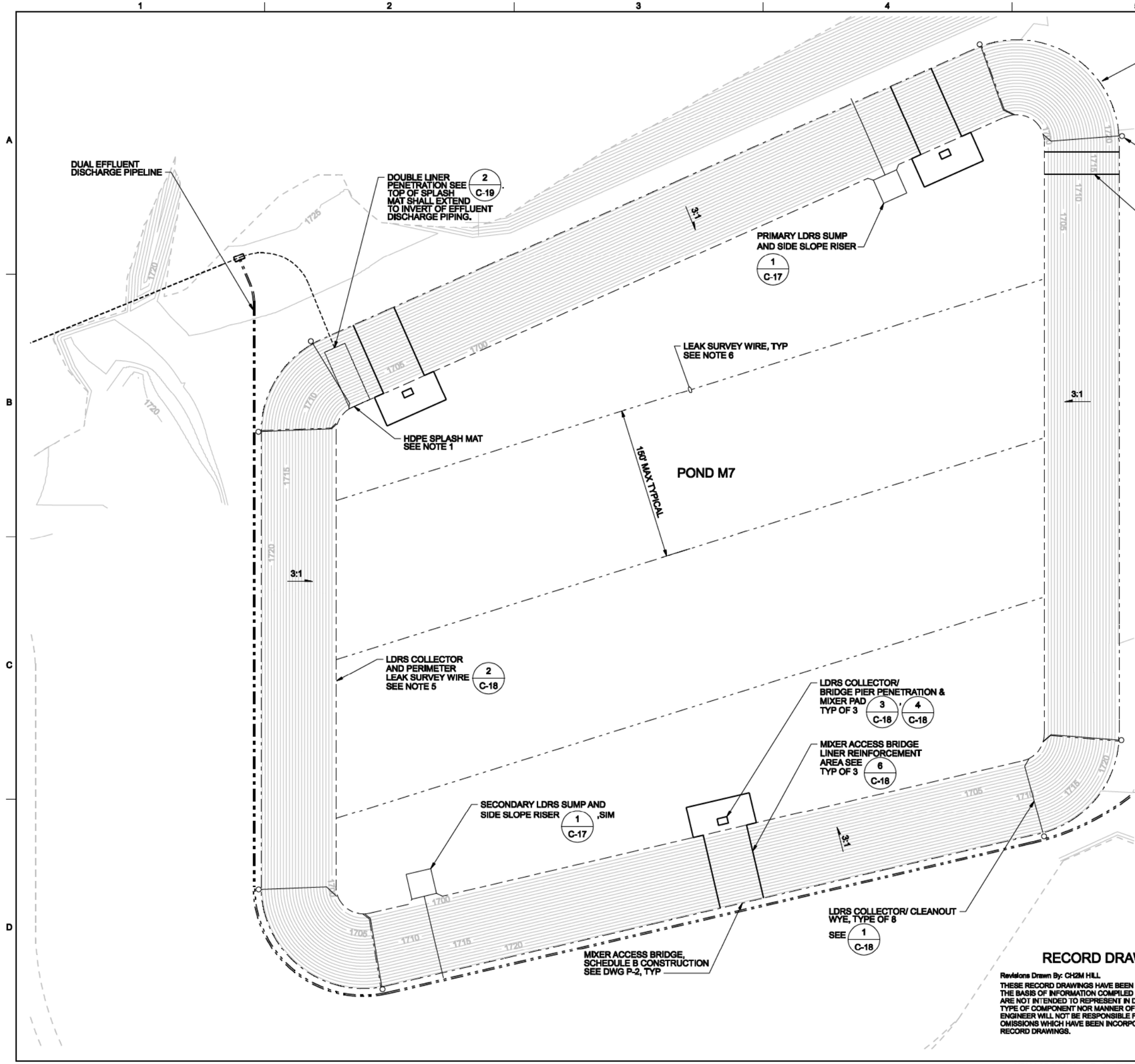
POND M5 LINER PLAN

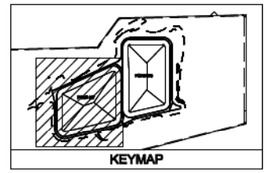
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-15
SHEET	24 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-20209_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 10:49:57 AM





NOTES:

1. INSTALL HDPE SPASH MAT TO PROTECT PRIMARY LINER FROM EFFLUENT DISCHARGE. MAT TO EXTEND FROM EFFLUENT DISCHARGE PIPE TO TOE OF SLOPE. MAT TO BE 22' MIN WIDTH 80 – MIL HDPE LINER EXTRUSION WELDED TO PRIMARY LINER AROUND PERIMETER. PLACE CUSHION GEOTEXTILE BENEATH SPASH MAT SIMILAR TO 6/C-19
2. LINER CONTROL LIMIT IS LOCATION WHERE GEOMEMBRANE DROPS INTO ANCHOR TRENCH. SEE C-12. ANCHOR TRENCH ALIGNMENT SHALL BE STRAIGHT AND SMOOTH.
3. LINER SEAMS SHALL EXTEND THROUGH THE ANCHOR TRENCH TO THE END OF THE GEOMEMBRANE PANEL.
4. POND WATER TRANSFER RUB SHEET LOCATIONS APPROXIMATE. COORDINATE WITH OWNER ON FINAL POSITION. RUB SHEET TO BE 22' MIN WIDTH, 80- MIL HDPE LINER EXTRUSION WELDED TO PRIMARY LINER AROUND PERIMETER. INSTALL WHITE 60-MIL TEXTURE HDPE ALONG EDGE OF SHEET. PLACE GEONET BENEATH RUB SHEET SIMILAR TO 6/C-19
5. LEAK SURVEY WIRE SHALL BE CONTINUOUS 8 GA COPPER, SPLICED ONLY AT INTERECTION POINTS. SEE SPLICE DETAIL 4/C-19
6. LEAK SURVEY WIRE SHALL ALSO RUN IN A LOOP AROUND THE BASE OF THE POND IN THE LDRS COLLECTOR TRENCH. WIRES SHALL EXTEND TO THE TOP OF DIKE AT ONE OF THE CLEANOUTS AT EACH OF THE FOUR CORNERS.

SHEET LEGEND

- LDRS CLEANOUT
- LDRS COLLECTOR AND PERIMETER LEAK SURVEY WIRE
- LINER CONTROL LIMITS
- LEAK SURVEY WIRE

N

50 0 50 100
SCALE IN FEET

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
1	07/14/11	T. PYLE	M. RARDIN	P. TSCHESCHKE	S. DETHLOFF	NKB	SWD
0	4/16/10					PDT	SWD

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-369-5175

CH2MHILL

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy.

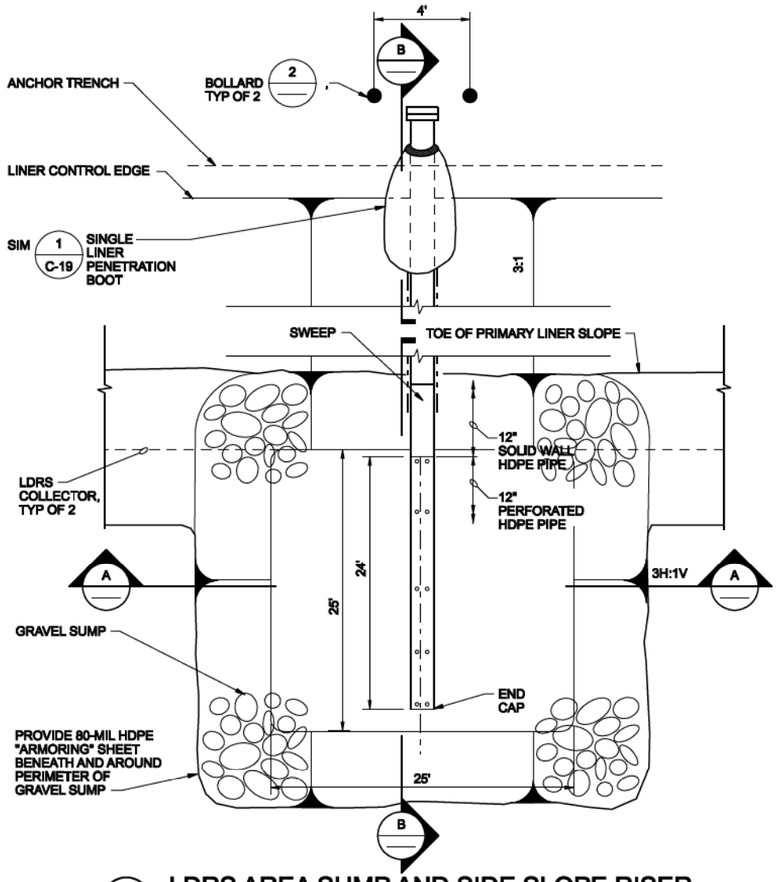
MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

POND M7 LINER PLAN

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

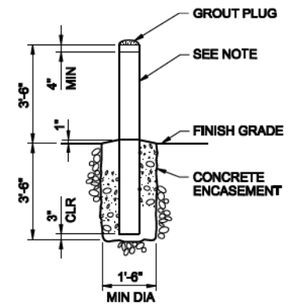
DATE	JULY 2011
PROJ	401621
DWG	C-16
SHEET	25 OF 147

RECORD DRAWING



1 LDRS AREA SUMP AND SIDE SLOPE RISER
NTS

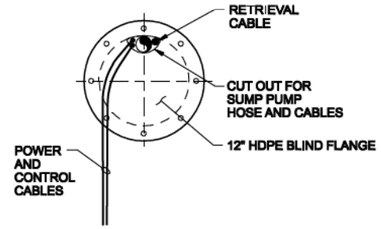
C-15, C-16



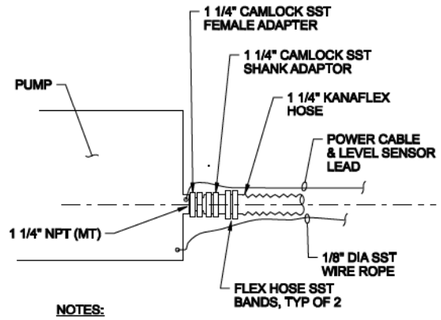
NOTE:
8" DIA SCHED 40 STEEL PIPE, GRIND SMOOTH FILL WITH CONC AND COVER WITH PREMANUFACTURED BOLLARD COVER. COVER SHALL BE REFLECTIVE YELLOW

2 BOLLARD
NTS

NOTES:
1. PROPERLY SECURE 1-1/2" KANAFLEX HOSE (AND CABLE) AT TERMINATION POINT SO THEY DO NOT SLIP DOWN THE RISER PIPE OR PULL ON THE CONDUIT CONNECTION.



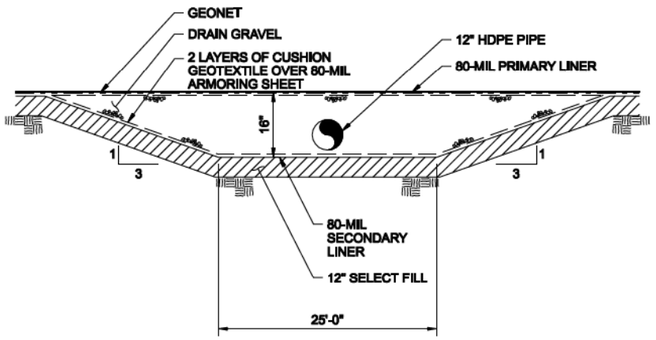
3 LDRS SIDE SLOPE RISER TERMINATION
NTS (END VIEW)



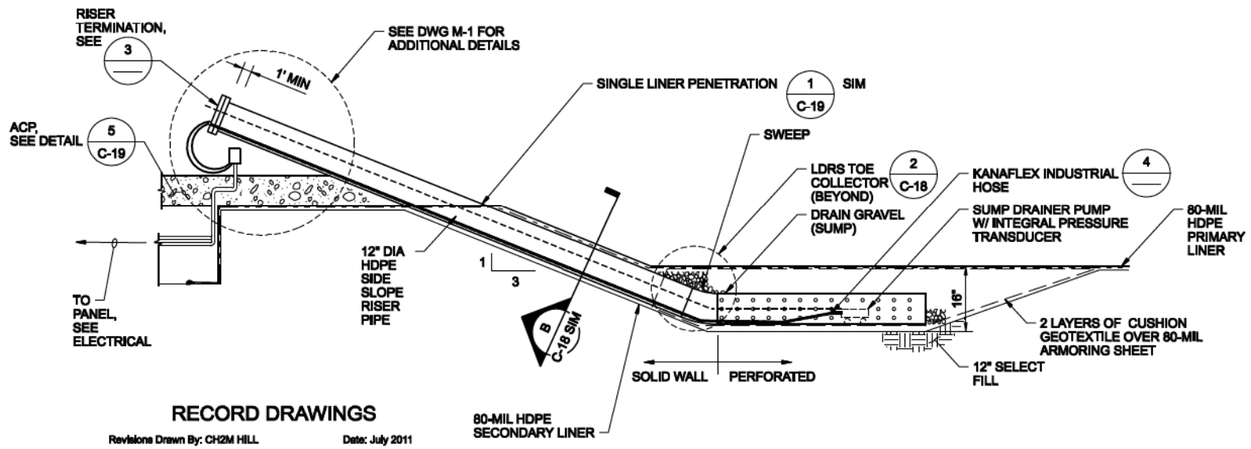
NOTES:
1. ZIP-TIE CAMLOCKS W/ INDUSTRIAL GRADE TIES.
2. ZIP-TIE LEADS AND WIRE ROPE TO KANAFLEX HOSE.

4 LDRS SUMP PUMP DISCHARGE PIPE/PUMP CONNECTION CONCEPT
NTS

SCH B CONSTRUCTION SEE DWG M-2



SECTION A
NTS



SECTION B
NTS

NOTE: SEE DWG M-2 (SCH B CONSTRUCTION) FOR LDRS PUMP AND DISCHARGE PUMP TO BE INSTALLED IN THE PRIMARY LDRS SUMP ONLY.

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD	BY
1	07/14/11	T. PYLE	M. RARDIN	P. TSCHESCHKE	APVD	S. DETHLOFF
0	4/16/10				NKB	SWD
					PDT	SWD

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-368-9175

CH2MHILL

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9825650201 M7: RC171 WO# 9821855101

LEAK DETECTION AND RECOVERY SYSTEM
CIVIL DETAILS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-17
SHEET	26 OF 147

RECORD DRAWING

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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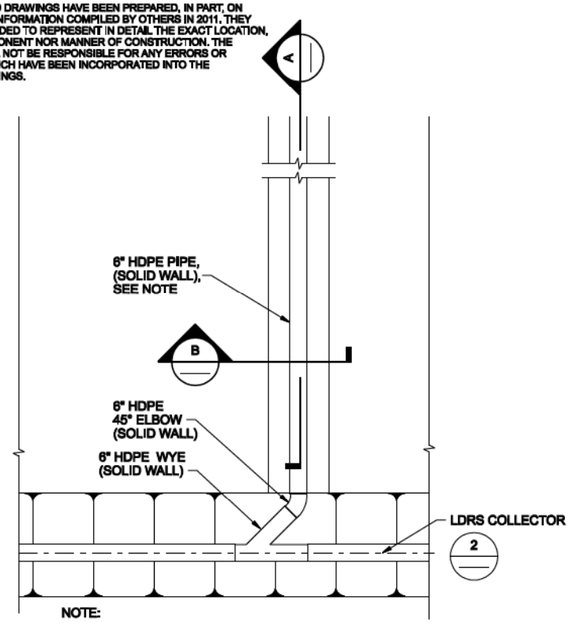


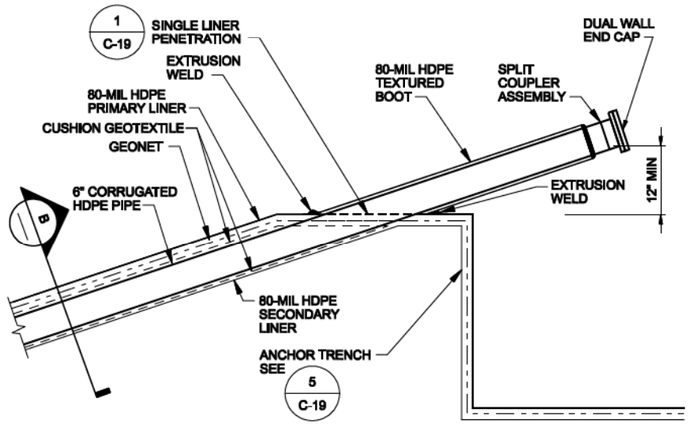
NOTE:

HDPE PIPE IS CORRUGATED. CLEAN OUTS ON NORTHEAST AND SOUTHEAST CORNERS OF POND M5 ARE PERFORATED.

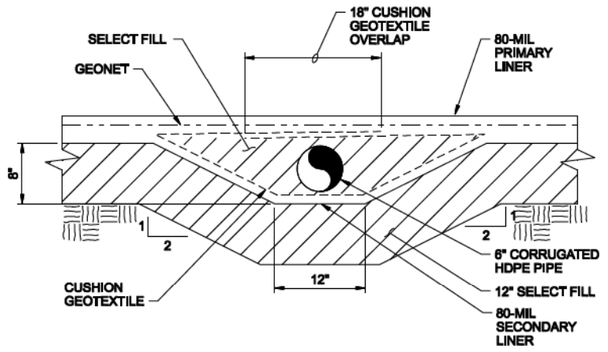
1 LDRS COLLECTOR CLEANOUT WYE
NTS

NOTE:

PROVIDE BOLLARDS SIMILAR TO THOSE SHOWN FOR LDRS SUMP (1 / C-17)



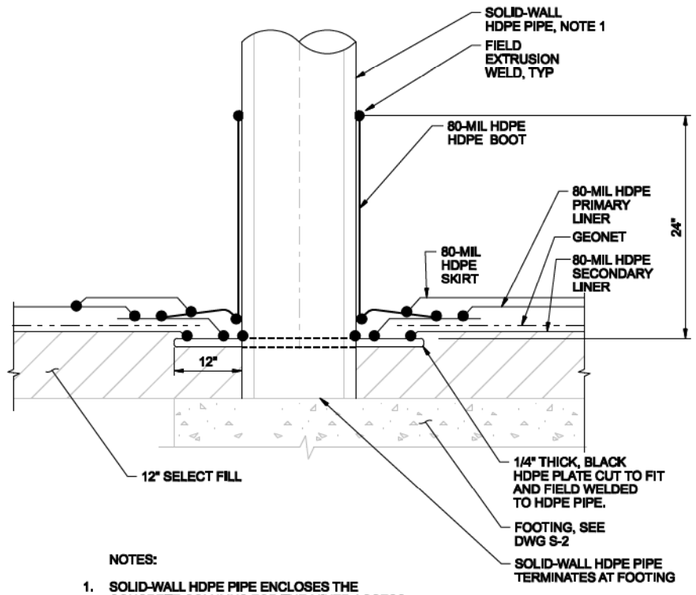
A LDRS COLLECTOR CLEANOUT
NTS



B LDRS COLLECTOR CLEANOUT
NTS

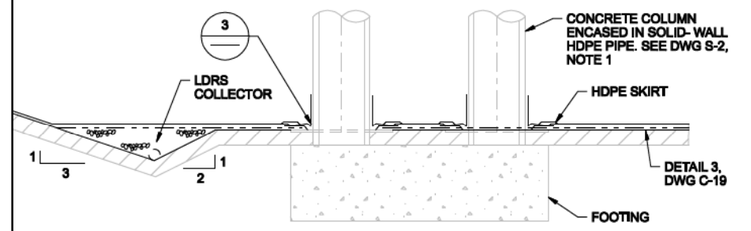
NOTES:
1. LDRS SURVEY WIRE: 8GA COPPER. TAPE TO TOP OF LDRS COLLECTOR PIPE @ 24" OC.

2 LDRS COLLECTOR
NTS

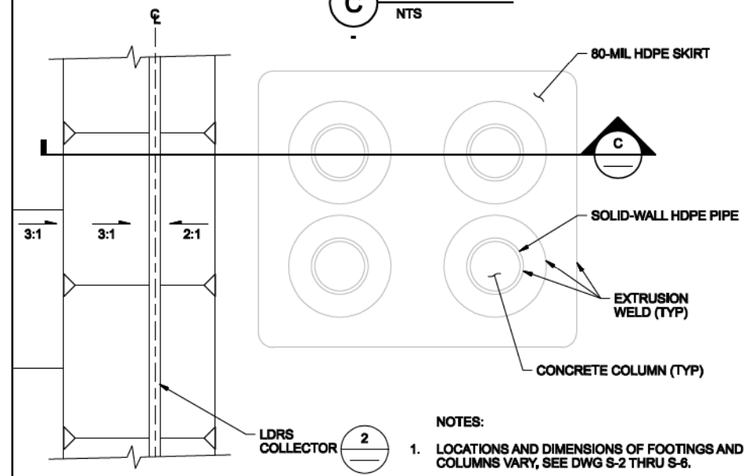


NOTES:
1. SOLID-WALL HDPE PIPE ENCLOSES THE CONCRETE COLUMNS FOR THE MIXER ACCESS WALKWAY PIER. SEE DRAWING S-2.
2. THIS DETAIL REPRESENTS THE MINIMUM DESIGN REQUIREMENTS FOR THIS PENETRATION. CONTRACTOR CAN ALTER OR ADJUST AS NEEDED TO MATCH BRIDGE PIER DESIGN, AND TO MEET PERFORMANCE REQUIREMENTS FOR PROJECT.
3. LINER FOR PROTECTION OF MAT FOOTING IS NOT SHOWN ON THIS DETAIL, SEE DWG S-11B. REINFORCED LINER LAYER (NOT SHOWN) INSTALLED OVER PENETRATION AND SKIRT, SEE DWG C-19.

3 BRIDGE PIER LINER PENETRATION MINIMUM REQUIREMENTS
NTS



C SECTION
NTS



NOTES:
1. LOCATIONS AND DIMENSIONS OF FOOTINGS AND COLUMNS VARY, SEE DWG S-2 THRU S-6.
2. SEAMS ARE CUT AND WELDED BETWEEN THE COLUMNS AND FROM THE COLUMNS TO THE EDGE AS NECESSARY.

4 LDRS COLLECTOR / BRIDGE PIER LINER PENETRATION
NTS

NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
1	07/14/11	T. PYLE	M. RARDIN	P. TSCHESCHKE	S. DETHLOFF	NKB	SWD
0	4/16/10					PDT	SWD

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

2485 VILLAGE VIEW DRIVE, SUITE 350
HENDERSON, NEVADA 89074
PHONE: 702-369-5175

CH2MHILL

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

MESA EVAPORATION PONDS M5 AND M7
M5: RC171 WO# 9025650201 M7: RC171 WO# 9021655101

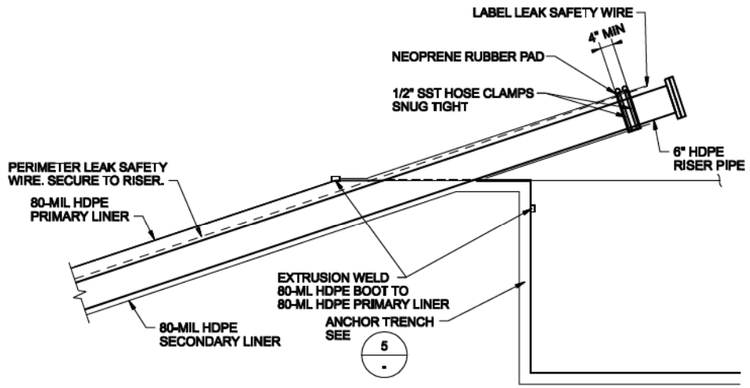
LEAK DETECTION AND RECOVERY SYSTEM LINER SYSTEM DETAILS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	401621
DWG	C-18
SHEET	27 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-50205_401621RD.dgn PLOT DATE: 7/13/2011 PLOT TIME: 8:44:14 AM



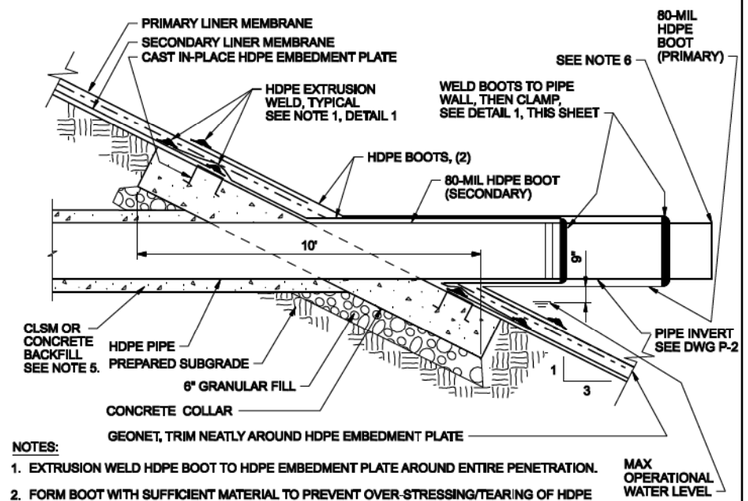
NOTES:

1. CUT HOLE TO PASS 6" HDPE PIPE TO FIT TIGHT WITH PRIMARY HDPE LINER.
2. EXTRUSION WELD HDPE BOOT TO PRIMARY LINER AROUND ENTIRE PENETRATION. ADJUST PRIMARY LINER IN ANCHOR TRENCH AS NEEDED TO PROPERLY BOOT AND SEAL.
3. FORM BOOT WITH SUFFICIENT MATERIAL TO PREVENT OVER-STRESSING DURING CONSTRUCTION AND OPERATION.

1 SINGLE LINER PENETRATION MINIMUM REQUIREMENTS

NTS

C-18



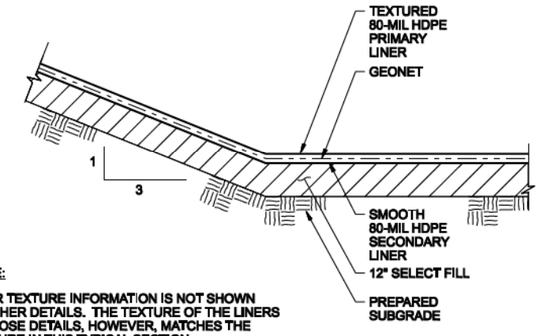
NOTES:

1. EXTRUSION WELD HDPE BOOT TO HDPE EMBEDMENT PLATE AROUND ENTIRE PENETRATION.
2. FORM BOOT WITH SUFFICIENT MATERIAL TO PREVENT OVER-STRESSING/TEARING OF HDPE LINING, BUT WITHOUT FOLDS OR WRINKLES OF HDPE GEOMEMBRANE.
3. PROVIDE 5' WIDE BY 10' LONG BY 6" THICK REINFORCED CONCRETE PAD (COLLAR). CENTER REINFORCEMENT MAT IN CENTER OF PAD. ALSO CENTER PIPE PENETRATION IN CENTER OF PAD (ALL DIRECTIONS). PROVIDE SMOOTH SURFACE FINISH ON PAD. REINFORCE WITH NO. 4 BAR @ 12" OC EA. MIN COVER 1-1/2".
4. THIS DETAIL REPRESENTS THE MINIMUM DESIGN REQUIREMENTS FOR THIS PENETRATION. CONTRACTOR CAN ALTER OR ADJUST AS NEEDED TO MEETPERFORMANCE REQUIREMENTS FOR PROJECT.
5. INSTALL 30 LINEAR FEET OF CLSM OR CONCRETE BACKFILL . CLSM OR CONCRETE BACKFILL TO FILL ENTIRE EXCAVATED TRENCH BEDDING AND PIPE ZONE AREAS TO A LEVEL 12 INCHES ABOVE TOP OF PIPE.
6. PROVIDE TEMPORARY RESTRAINED FITTINGS AS RECOMMENDED BY PIPING MANUFACTURER FOR END CAPS OR PLUGS TO PERFORM SPECIFIED 300 PSI PRESSURE TEST.

2 DOUBLE LINER PENETRATION MINIMUM REQUIREMENTS

NTS

C-15
C-16



NOTE:

LINER TEXTURE INFORMATION IS NOT SHOWN IN OTHER DETAILS. THE TEXTURE OF THE LINERS IN THOSE DETAILS, HOWEVER, MATCHES THE TEXTURE IN THIS TYPICAL SECTION.

3 TYPICAL LINER SECTION

NTS

-

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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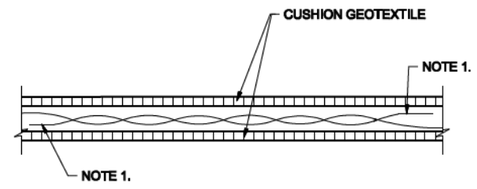


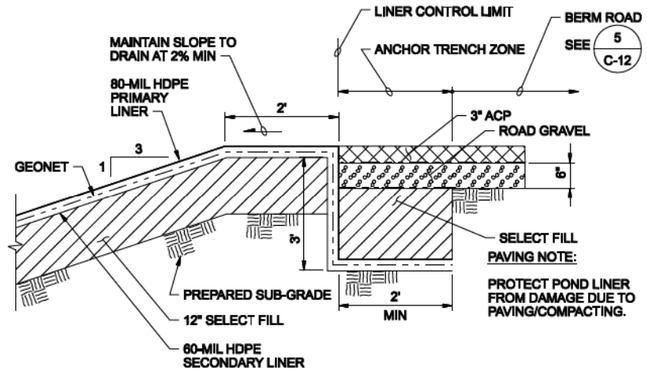
NOTES:

1. TIGHTLY TWIST WIRES TOGETHER MAKING SURE THE ENDS LAY FLAT. DO NOT ALLOW WIRE ENDS TO STICK UP.
2. LEAVE THE ENDS OF THE SPLICED WIRE LONG (MIN 6" EACH) TO LAY FLAT. TRIM SHARP EDGES FROM ENDS.
3. WRAP JOINT THROUGHOUT ITS LENGTH WITH ELECTRICAL TAPE.
4. PLACE CUSHION GEOTEXTILE ABOVE AND BELOW SPLICE LENGTH.

4 LEAK SURVEY WIRE SPLICE

NTS

C-15
C-16



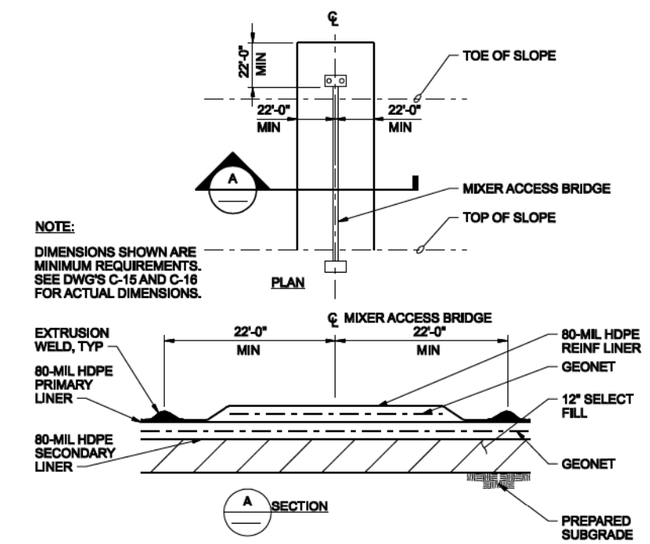
NOTES:

1. LINER SYSTEM COMPONENT SPACING IS EXAGGERATED FOR CLARITY.
2. PROVIDE PROTECTION OF 80-MIL PRIMARY LINER DURING COMPACTION OF ROAD GRAVEL AND INSTALLATION OF ROAD SURFACING.

5 ANCHOR TRENCH

NTS

C-12



6 MINIMUM REQUIREMENTS FOR MIIXER ACCESS BRIDGE LINER REINF AREA

NTS

C-15
C-16

NO.	DATE	DSGN
1	07/14/11	R. WARD
0	4/16/10	DR

RECORD DRAWING
ISSUED FOR CONSTRUCTION

REVISION	BY	CHK
	APVD	P. TSCHESCHKE
	PDT	M. RARDIN
	NKB	SWD
	APVD	SWD
	BY	S DETHLOFF

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2485 VILLAGE VIEW DRIVE, SUITE 300
HENDERSON, NEVADA 89074
PHONE: 702-369-5175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy.

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#9825650201, M7:RC171 WO#9821855101

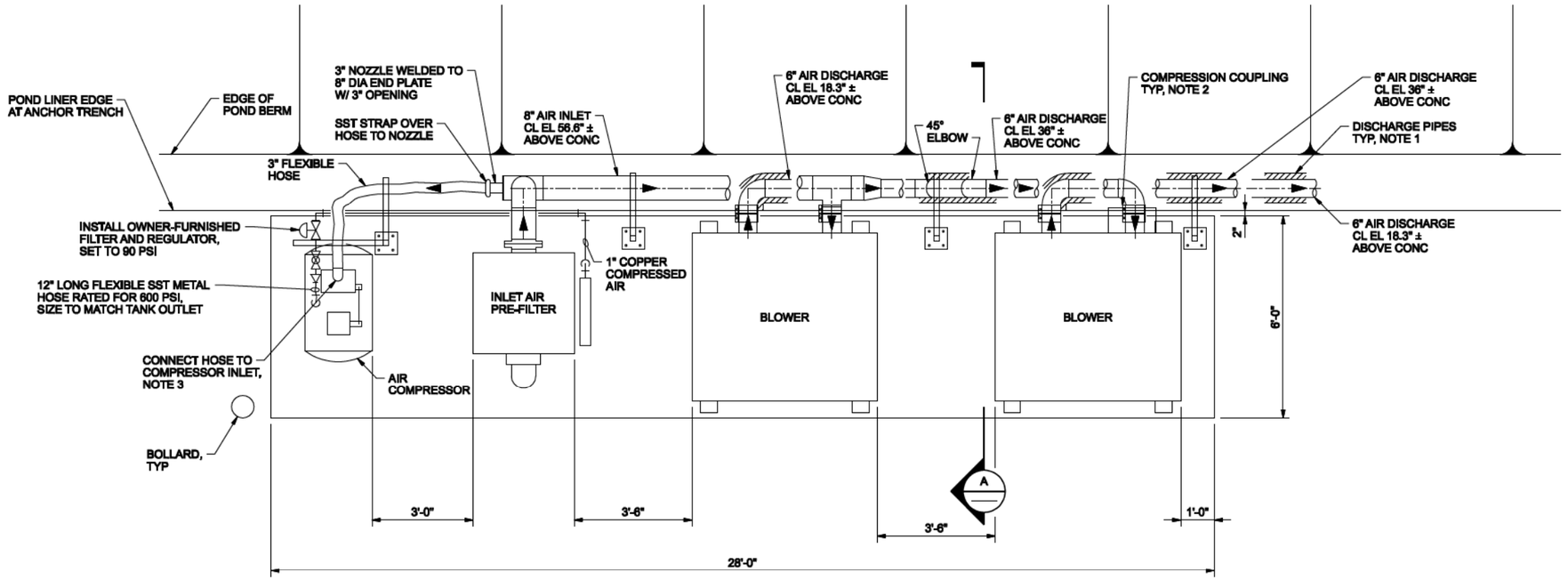
LINER SYSTEM DETAILS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

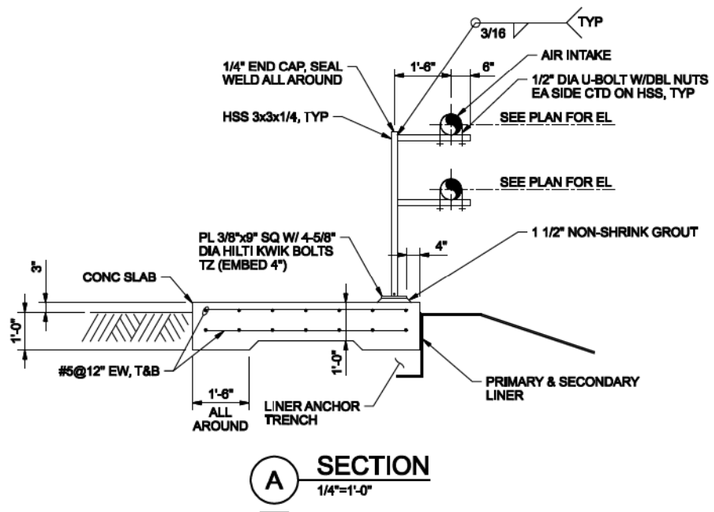
DATE	JULY 2011
PROJ	401621
DWG	C-19
SHEET	28 OF 147

RECORD DRAWING

NDM-LAS:RGS Mesa Facility IDP\ 200-C-50206_401621RD.dgn PLOT DATE: 7/12/2011 PLOT TIME: 11:31:52 AM



PLAN
1/4"=1'-0"



A SECTION
1/4"=1'-0"

NOTES:

1. PIPE SHALL BE UNPAINTED SCH 5S TYPE 316 SST.
2. USE 3-BOLT COMPRESSION COUPLING TO CONNECT BOTH PLAIN END PIPES. LEAVE 1/4" GAP BETWEEN PIPE ENDS. COMPRESSION COUPLING SHALL BE MORRIS CODE 6-3C W/ GASKET RATED FOR 400 DEGREES F.
3. REMOVE FILTER ASSEMBLY FROM COMPRESSOR INLET. PROVIDE SCREWED FITTINGS AND HOSE ADAPTER TO CONNECT TO FLEX HOSE.
4. COPPER PIPE SHALL BE TYPE K, SEAMLESS PER ASTM B88. FITTINGS SHALL BE SOLDER TYPE AND NPT AT EQUIPMENT. PROVIDE UNIONS AT CONNECTION TO INLET AIR PRE-FILTER AND AT AIR COMPRESSOR.

RECORD DRAWINGS

Revisions Drawn By: CH2M HILL Date: July 2011

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NO.	DATE	DSGN	DR	CHK	APVD	BY	APVD
1	07/14/11	W MISSLIN	C MCCOY	M RIESS		NKB	SWD
0	3/16/11					WVM	SWD
						BY	APVD

RECORD DRAWING
ISSUED FOR CONSTRUCTION
REVISION

S DETHLOFF

CH2MHILL
2485 VILLAGE VIEW DRIVE, SUITE 350
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PHONE: 702-368-5175

REID GARDNER STATION
Wastewater System Improvement Projects
Moapa, Nevada

NVEnergy

MESA EVAPORATION PONDS M5 AND M7
M5:RC171 WO#8625850201, M7:RC171 WO#8621655101

BLOWER PAD

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VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2011
PROJ	387530
DWG	M-6
SHEET	135 OF 147

RECORD DRAWING

Appendix C
Forms and Reports

Emergency Response Event Log

Reid Gardner Station Mesa Ponds M5 and M7

(To be completed during the emergency)

Name: _____ Position: _____

Event Start Date: _____ Event Start Time: _____

Event Description: _____

_____

Initial Event Level: _____

_____

When and how was the event detected? _____

_____

Weather conditions: _____

_____

General description of the unusual or emergency event: _____

_____

_____

Log all Notifications and Activity in the table below:

Date	Time	Action/Event Progression	Taken by

Report prepared by: _____

Date: _____

Event Termination Log

Reid Gardner Mesa Ponds M5 and M7

(To be completed during the emergency)

Date: _____ Time:_____

Weather conditions: _____

_____

General description of emergency situation: _____

_____

_____

_____

Area(s) of Ponds affected: _____

_____

_____

_____

Extent of damage: _____

_____

_____

Possible cause(s): _____

_____

_____

Effect on Pond's operation: _____

_____

Initial reservoir elevation: _____ Time: _____

Maximum Reservoir elevation: _____ Time: _____

Final Reservoir elevation: _____ Time: _____

Description of area flooded downstream/damages/injuries/loss of life: _____

_____

_____

_____

_____

Other data and comments: _____

_____

_____

Observer's name and telephone number: _____

_____

Report prepared by: _____ Date: _____