TECHNICAL MEMORANDUM

Initial Structural Stability Assessment, Ponds M5 and M7, Reid Gardner Generating Station

PREPARED FOR:	NV Energy
PREPARED BY:	Nathan Betts, PE/CH2M
REVIEWED BY:	Dean Harris/CH2M
DATE:	October 12, 2016
CH2M PROJECT NO.:	671059.01.02

This technical memorandum contains the initial structural stability assessment for Ponds M5 and M7, which was performed to satisfy the requirements of §257.73(d) of the U.S. Environmental Protection Agency's Coal Combustion Residuals (CCR) Rule. Also, as allowed by §257.83(b)(4)(ii), this assessment serves as the second annual professional engineer's impoundment inspection.

Background

Ponds M5 and M7 are existing CCR surface impoundments at NV Energy's Reid Gardner Generating Station (Station) near Moapa, Nevada. The ponds are located on a mesa approximately 3,600 feet south of the power generating units. The ponds were constructed by excavating into the existing ground along the southern and western side of the impoundments, and building earthen embankments along the northern and eastern sides. The ponds were constructed with two layers of geomembrane and have interstitial leak detection and collection systems.

The ponds were designed, permitted, constructed and placed into service prior to the publication of the CCR Rule and in conformance with applicable State regulations. The applicable regulations included water pollution control regulations (Nevada Administrative Code [NAC] 445A), dam safety regulations (NAC 535), and the Nevada Division of Environmental Protection- Bureau of Water Pollution Control's (NDEP-BWPC) Water Technical Sheet 37 (WTS-37). WTS-37 is a guidance document for the design of lined wastewater holding ponds that contains minimum requirements for pond liner systems. The ponds are classified as existing unlined CCR surface impoundments under the CCR Rule per §257.71(a)(3)(i).

Regulatory Requirements

Ponds M5 and M7 are subject to the structural integrity requirements in the CCR Rule because the ponds are classified as existing CCR surface impoundments. The ponds meet the definition of a CCR surface impoundment because each pond is a "man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, and disposes of CCR" (§257.53). Furthermore, the ponds are classified as "existing" under the CCR Rule because they received CCR both before and after October 19, 2015. As a result, both ponds must comply with the CCR Rule and more specifically they must undergo structural stability assessments as required by §257.73(d). Per §257.73(d)(1), the Owner must conduct the assessment and "document whether the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein." This section of the CCR Rule also contains minimum requirements for documenting the structural stability assessment.

This initial assessment must be placed in the Station's operating record not later than October 17, 2016 per §257.73(f)(1) and §257.105(f)(10). Within 30 days of placement, the State Director must be notified as required by §257.106(f)(9) and §257.106(d). Also, within 30 days of placement, the assessment must be placed on a publicly accessible Internet site per §257.107(f)(9) and §257.107(d). The initial assessment must be certified by a qualified professional engineer (§257.73(d)(3)), and per §257.73(f)(3), an assessment must be performed every 5 years starting from the date that this initial assessment is placed in the operating record. Future assessments must meet the same requirements for certification, record keeping, notification, and posting on a publicly accessible Internet site.

This initial structural stability assessment also serves as the second annual professional engineer's impoundment inspection as allowed by §257.83(b)(4)(ii). The first annual professional engineer's inspection was completed in January of 2015. Because this structural stability assessment serves as the second annual inspection, the deadline for completing the third annual inspection will be one year from the date that this structural stability assessment is placed in the operating record. Future structural stability assessments may also serve as future annual professional engineer's inspections.

Assessment of Impoundment Design and Construction Documentation

This section contains an assessment of the design and construction documentation for Ponds M5 and M7, to include addressing the minimum requirements for assessment documentation listed in §257.73(d)(1)(i) thru §257.73(d)(1)(vii). Much of the design and construction documentation is contained in the Construction History for Ponds M5 and M7 (CH2M, 2016a), which includes the attachments listed below.

- U.S. Geological Survey topographic map
- Geotechnical Report used for impoundment design
- Construction Specifications
- Construction Certification Report; which includes select Record Drawings and quality control records

Foundation and Abutment Stability (§257.73(d)(1)(i))

The pond foundations and abutments were designed and constructed to be stable according to information in the Construction History for Ponds M5 and M7, (CH2M, 2016a). The design geotechnical investigation included bearing capacity and slope stability analyses of the foundation and abutment soils. The specifications set forth minimum requirements for preparation and compaction of foundation and abutment soils. The Construction Certification Report documents that during construction the foundation and abutment areas were cleared, grubbed, stripped, graded, scarified, moisture conditioned, and compacted in accordance with design requirements. In addition, the report contains the results of nuclear density tests performed to measure compaction of the foundation and abutment soils.

Slope Protection (§257.73(d)(1)(ii))

The ponds were designed and built with "adequate slope protection to protect against surface erosion, wave action, and adverse effects of sudden drawdown" according to information in the Construction History for Ponds M5 and M7, (CH2M, 2016a). The record drawings show that the interior pond slopes are protected by two layers of 80-mil-thick high-density polyethylene (HDPE) geomembrane liner and a leak detection and collection system. This liner system protects the interior slopes from surface erosion and waves, and when properly operated virtually eliminates the possibility of the interior slopes being affected by the sudden drawdown of impounded water. The specifications and record drawings show that the exterior pond slopes were constructed of material which was coarser, and more erosion resistant, than the general embankment fill material. Wave action and sudden drawdown are not a concern for the exterior slopes because they are not near bodies of water. The embankment crest is protected from surface erosion and wave action by a road paved with asphalt concrete.

Compaction (§257.73(d)(1)(iii))

The ponds were designed and constructed with sufficient mechanical compaction to withstand the range of loading conditions according to the information in the Construction History for Ponds M5 and M7 (CH2M, 2016a). The design geotechnical investigation recommended that fill be compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557 (ASTM International, 2003). The same relative compaction was required in the specifications. The Construction Certification Report documents that the soil was mechanically compacted during construction to a minimum of 95 percent relative compaction. The relative compaction was measured with a nuclear density gauge.

Vegetated Slopes (§257.73(d)(1)(iv))

The requirement for vegetated slopes does not apply to Ponds M5 and M7 because the embankment slopes are protected by alternate forms of slope protection: a geomembrane lining system on the interior face and coarser embankment fill material on the exterior face.

Spillway (§257.73(d)(1)(v))

The ponds were constructed without spillways as allowed by State dam regulations (NAC 535.240) and as described in State dam safety guidelines published by from the Nevada Division of Water Resources (State of Nevada, 2013). The guidelines state that "most effluent, process fluid and tailing impoundments are exempt from having a spillway, however, there must be diversion channels to route flood flows around the structure and/or sufficient freeboard designed into the structure to accommodate the required precipitation event." As a result, the ponds were originally designed, constructed, and permitted with sufficient freeboard to accommodate, without overtopping, the water falling directly into the pond from the probable maximum precipitation (PMP) (CH2M HILL, 2010). The PMP is the precipitation event which causes the probable maximum flood (PMF). The ponds were also originally designed, constructed, and permitted with stormwater control measures to divert floodwater from the 100-year 24-hour precipitation event around the ponds.

In order to meet the requirements of §257.73(d)(1)(v)(B) and §257.73(d)(1)(v)(B)(1) of the CCR Rule, "the combined capacity of all spillways [for Ponds M5 and M7] must adequately manage flow during and following the peak discharge from a probable maximum flood (PMF)". In order to meet this CCR Rule requirement without using spillways, the ponds were originally designed and constructed to accommodate water falling directly into the pond from the PMP, and additional stormwater control measures were built in 2016 to divert floodwater from the PMF around the ponds.

Calculations in the Design Report for Ponds M5 and M7 (CH2M HILL, 2010) demonstrate that the ponds were designed to accommodate direct precipitation from the PMP. The design report was submitted to the Nevada Division of Water Resources on May 7, 2010 as part of the Application for Approval of the Plans and Specifications for the Construction of Ponds M5 and M7. The record drawings in the Construction Completion Report show that the ponds were constructed as designed and that markers were installed on the liner surface at the permitted freeboard elevation (CH2M, 2016a). As demonstrated by analysis in the Inflow Design Flood Control System Plan (CH2M, 2016b), the additional stormwater control measures built around the perimeter of Pond M7 in 2016 were designed and constructed to divert floodwater from the PMF around the ponds. The water surface elevation in the ponds and the stormwater control measures are checked regularly as part of an ongoing operations and maintenance program.

Hydraulic Structures (§257.73(d)(1)(vi))

The hydraulic structures passing through the pond dikes were designed and constructed to maintain structural integrity according to information in the Design Report for Ponds M5 and M7 (CH2M HILL, 2010) and the Construction History for Ponds M5 and M7, (CH2M, 2016a). Two underground 8-inch diameter HDPE pipes convey effluent into the ponds from a valve station at the northwest corner of

Pond M7 (the valve station feeds both ponds). The valve station can route water to either or both ponds. Per the Design Report, "no valves are provided in the pipeline downstream of the valve station, so that all flow in the pipeline segments around the ponds is essentially low pressure gravity flow". Even though the pipes are not pressurized during operation, the pipes were pressure tested during construction as documented in the Construction Completion Report. There are no hydraulic structures underlying the base of the pond. In addition, there is an inactive, partially completed underground HDPE pipeline in the western embankment of Pond M7 and the southern embankments of both ponds. Built to facilitate potential pond buildouts in the future, the partially completed pipeline has never been used and cannot carry wastewater because it is hydraulically disconnected from the CCR conveyance system at an upstream valve station.

Stability of Wet Downstream Slope (§257.73(d)(1)(vii))

This requirement does not apply to Ponds M5 and M7 because they do not have "downstream slopes which can be inundated by the pool of an adjacent water body, such as a river, stream, or lake".

Impoundment Inspection

Nathan Betts, a qualified Nevada-registered professional engineer employed by CH2M, inspected Ponds M5 and M7 on September 19, 2016. The inspection included a review of available information, a visual inspection of the impoundments, a visual inspection of hydraulic structures underlying the impoundments, and discussions with Station personnel. This section of the assessment is organized to be consistent with §257.83(b) of the CCR Rule.

Available Information

The information available regarding the status and condition of Ponds M5 and M7 was reviewed on and before September 19, 2016. No discrepancies, deficiencies, or significant items were found during the review of available information. Information from the operating record and other sources was reviewed as part of this inspection, including the following items:

- Forms documenting the 7-day impoundment inspections by qualified persons
- The previous annual impoundment inspection (document dated January 15, 2016)
- Pond operation records showing historical instrument readings and water levels
- The Construction History for Ponds M5 and M7, (CH2M, 2016a)
- Annual level loop surveys of pond settlement monuments

Visual Inspection of CCR Units

Ponds M5 and M7 were visually inspected on the morning of September 19, 2016. The inspection occurred in sunny, calm conditions with temperatures between 61 to 77 degrees Fahrenheit, 14 to 20 percent humidity, and a barometric pressure of 30.16 to 30.20 inches.[1]

No signs of distress or malfunctions were observed during the visual inspection of Ponds M5 and M7. The visual inspection is documented on the attached CCR Impoundment Annual Inspection Forms.

Visual Inspection of Hydraulic Structures

Visible portions of the hydraulic structures running through Ponds M5 and M7 were visually inspected as part of the inspection of the CCR unit. The hydraulic structures running through the embankments were an active underground HDPE pipeline that carries CCR and non-CCR wastewater into the southwest corner of Pond M5, an active underground HDPE pipeline that carries CCR and non-CCR wastewater into

[1] Data for the St. George Airport per Weather Underground website, https://www.wunderground.com/history/airport/KSGU/2016/9/19/DailyHistory.html?req_city=Mesquite&req_state=NV&req_statename=Nevada&reqdb.zip=89024&reqdb.magic=1&reqdb.wmo=99999, accessed on September 26, 2016.

the northwest corner of Pond M7, and an inactive, partially completed underground HDPE pipeline in the western embankment of Pond M7 and the southern embankments of both ponds. Built to facilitate potential pond buildouts in the future, the partially completed pipeline has never been used and cannot carry wastewater because it is hydraulically disconnected from the CCR conveyance system at an upstream valve station. There are no hydraulic structures underlying the base of the ponds.

The visual inspection of the Ponds M5 and M7 hydraulic structures revealed no indications that the structural integrity or continued safe and reliable operation of the pond has been adversely affected. The visual inspection is documented on the attached CCR Impoundment Annual Inspection Forms.

Changes in Geometry

This section describes the observations supporting the finding that no changes in geometry of Ponds M5 and M7 have occurred since the previous annual inspection. Visual inspection and comparisons with the record drawings and the previous annual impoundment inspection indicates that the ponds' geometries have not been altered since they were constructed, or since the previous annual inspection.

In addition, data from the 2015 annual level loop survey, performed on October 16 by Forsgren Associates, Inc., revealed that vertical variations of the seven settlement monuments around Pond M5 ranged from 0.003 to 0.006 feet downward relative to the baseline survey elevations. The survey found that vertical variations of the three settlement monuments around Pond M7 ranged from 0.002 upward to 0.006 feet downward relative to the baseline survey elevations. These differences in elevation measurements are below the limits of precision for these survey methods because they are below the range of acceptable error for a First Order, Class I survey as defined by the U.S. Army Corps of Engineers. The survey corroborates the observation that the pond's geometries have not changed over time.

Minor, localized settlement has been noted in one area around Pond M7, and this appears to be related to anchor trench backfill and other minor surface conditions. Minor, localized cracking has been noted in two areas around Pond M7, and this appears to be related to pipe backfill, influence from a former surface-laid process water pipe, and other minor surface conditions. Minor, localized cracking has been noted in one area around Pond M5, and based on color this appears to be related to a construction joint in the asphalt concrete pavement. This settlement and cracking have not resulted in changes to the overall embankment geometry. The approximate locations are documented on the attached CCR Impoundment Annual Inspection Forms for Ponds M5 and M7.

Instrumentation

This section describes the existing instrumentation in Ponds M5 and M7 and the maximum readings since the previous annual inspection. The only instruments at the ponds are liquid level sensors that measure the depth of liquid in the interstitial leak detection and collection systems and a flowmeter that measures the volume of liquid pumped out of the interstitial leak detection and collection systems and back into the pond. In Pond M5 the highest liquid level reading since the last annual inspection was 2.90 inches above the sensor and the flowmeter totalizer reading was zero gallons. Based on the flowmeter totalizer readings, no liquid was collected by Pond M5's leak detection and collection system and pumped back into the pond since the last annual inspection. In Pond M7 the values were 1.40 inches for the sensor and 194,029 gallons for the totalizer. Based on the flowmeter totalizer reading from the last annual inspection, 193,885 gallons, approximately 144 gallons of liquid was collected by Pond M7's the leak detection and collection system and pumped back into the pond since the last annual inspection. The totalizer values were recorded in the field and checked against records provided by NV Energy. The liquid level sensor values were taken from records provided by NV Energy.

Approximate Impounded Water Levels

The approximate depths and elevations of water in Ponds M5 and M7 at the time of inspection, and the maximum and minimum depths and elevations since the previous annual inspection are shown in Table 1.

Table 1. Approximate Impounded Water Levels[a]
Initial Annual Coal Combustion Residuals Surface Impoundment Inspection Report, Pond M5, Reid Gardner Generating Station

Impoundment	Description	Water Surface Elevation (feet[a])	Pond Bottom Elevation[b] (feet[a])	Depth of Water (feet)	Available Storage Capacity[c] (gallons)	Impounded and CCR Water[c] (gallons)	Data Date
Pond M5	Maximum[c]	1,706.6	1,697.0	9.6	Not required	Not required	January 28 – February 18, 2016
Pond M5	Minimum[c]	1,705.2	1,697.0	8.2	Not required	Not required	June 23 and July 21, 2016
Pond M5	At time of inspection[d]	1,706.2	1,697.0	9.2	36,800,000	29,340,000	September 19, 2016
Pond M7	Maximum[c]	1,708.4	1,700.0	8.4	Not required	Not required	January 20 – 28, 2016
Pond M7	Minimum[c]	1,706.1	1,700.0	6.1	Not required	Not required	September 1, 2016
Pond M7	At time of inspection[d]	1,707.2	1,700.0	7.2	44,500,000	22,730,000	September 19, 2016

[a] Elevations based on North American Vertical Datum of 1988.
[b] Data source: Record drawing D-1, created by CH2M HILL, dated July 14, 2011.
[c] Data source for water surface elevations is station records provided by NV Energy. Volumes and capacities for Pond M5 are based on an approximate impoundment capacity of 66,140,000 gallons, or 202.99 acre-feet, at the permitted maximum operational water level, and 67,260,000 gallons, or 206.42 acre-feet, at the permitted maximum operational water level for Pond M7.
[d] Data source: Visual staff gauge reading for Pond M5 of approximately 9.5 at time of annual impoundment inspection. Visual staff gauge reading for Pond M7 of approximately 11.5 at time of annual impoundment inspection. The station records provided by NV Energy was used to convert staff gauge readings to water surface elevations.

Storage Capacity

The approximate storage capacities of Ponds M5 and M7 at the time of inspection is shown in Table 1.

Approximate Volume of CCR

The approximate volume of water and CCR in Ponds M5 and M7 at the time of inspection is shown in Table 1.

Structural Weaknesses

No actual or potential structural weaknesses were observed during the visual inspection of Ponds M5 and M7. Also, no conditions were observed that were disrupting or have the potential to disrupt the operation and safety of the ponds and appurtenant structures. The visual inspection is documented on the attached CCR Impoundment Annual Inspection Forms.

Changes

This section describes changes to Ponds M5 and M7 since the previous annual inspection. As documented in the Inflow Design Flood Control System Plan (CH2M, 2016b), additional stormwater control measures have been installed on the west and south sides of Pond M7. These structures are not expected to adversely affect pond stability or operations. Additionally, runnels along the outer embankment faces and pavement cracks have somewhat increased in length and frequency, but will not

adversely affect pond stability or operations. Otherwise, no significant changes were identified and no changes were identified that may affect the stability or operation of the pond.

Structural Deficiencies and Corrective Measures

This section describes structural stability deficiencies and recommended corrective measures as required by §257.73(d)(2). No structural stability deficiencies were identified as part of this assessment.

Closing

Based on the records review and observations made during the inspection, the operations and maintenance of the ponds is "consistent with generally accepted good engineering practices for the maximum volume of CCR and CCR wastewater which can be impounded therein" (§257.73(d)(1)). The operations and maintenance is also consistent with the original pond design. No signs of "significant deterioration, deformation, distortion, bedding deficiencies, sedimentation, and debris which may negatively affect the operation" of hydraulic structures was observed ((§257.73(d)(1)(vi)). In addition, no signs of distress or malfunctions were observed during the site visit. No corrective actions are recommended at this time. Observations made during the inspection are documented on the attached CCR Impoundment Site Visit Forms.

Certification

This section contains the written certification by a qualified professional engineer as required by §257.73(d)(3) of the CCR Rule.

This initial structural stability assessment was conducted in accordance with the requirements of §257.73(d) of the CCR Rule.

References

ASTM International. 2003. *D 1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ ((2,700 kN-m/m³))*. January.

CH2M. 2016a. *Construction History, Ponds M5 and M7, Reid Gardner Generating Station*. Technical Memorandum. August 26.

CH2M. 2016b. *Inflow Design Flood Control System Plan, Ponds M5 and M7, Reid Gardner Generating Station*. Technical Memorandum. October.

CH2M HILL. 2010. *Design Report, Mesa Evaporation Ponds M5 and M7, NV Energy, Reid Gardner Station, Moapa, NV*. April 30.

State of Nevada. 2013. *Dam Safety Gu*idelines – Spillway Design website. http://water.nv.gov/programs/dams/guidelines/spillway.cfm. Division of Water Resources Dam Safety Program. Last updated March 21.

Attachment
CCR Impoundment Annual Inspection Forms

NVEnergy

Reid Gardner Generating Station
CCR Impoundment Annual Inspection Form (Reference: 40 CFR 257.83)

General Information					
Date of Inspection:	19-SEP-16	**Start/End Time:**	0800-1100	**Impoundment:**	M5
Name/Company of Qualified Prof. Engr. Conducting Inspection (Print):	Nathan Betts, PE/CH2M				

Sec	#	Inspected Item	Inspection Result
	1	Has the previous seven day inspection form been reviewed and is a copy on-hand?	☒YES ☐NO
	2	Has the previous annual inspection report been reviewed and is a copy on-hand?	☒YES ☐NO
OUTSIDE BERM FACE, TOE, AND PERIMTER	3	Does the outside berm face or toe have wet spots, seepage, salt, or other indicators of leakage?	☐YES ☒NO
	4	Does the outside berm face or toe have boils, sediment piles or other indications of piping and internal erosion?	☐YES ☒NO
	5	Does the outside berm face have depressions, slides, bulges, sloughs or other signs of slope movement?	☐YES ☒NO
	6	Does the outside berm face exhibit signs of burrowing animals or other animal traffic?	☐YES ☒NO
	7	Is there vegetation that extends more than 6 inches above the outside berm face over a significant portion of the face?	☐YES ☒NO
	8	Does the outside berm face exhibit runnels or other signs of erosion?	☒YES ☐NO
	9	Does the outside berm face exhibit transverse, longitudinal, or desiccation cracking?	☐YES ☒NO
	10	~~Is the 18-in-dia drainage culvert near Pond M7 clogged, deteriorated, or otherwise abnormal?~~ NA	~~☐YES ☐NO~~
	11	Are the perimeter storm water ditches showing signs or erosion being filled with sediment?	☒YES ☐NO
CREST	12	Does the crest/road exhibit transverse, longitudinal, or desiccation cracking?	☒YES ☐NO
	13	Does the crest/road have any depressions indicating settlement or subsidence?	☐YES ☒NO
	14	Does the liner anchor trench have signs of tearing, high tension, or being pulled out?	☐YES ☒NO
	15	Do dam survey monuments appear to be damaged?	☐YES ☒NO
INSIDE BERM	16	Are there cuts, punctures, tears, or other defects visible in the liner?	☐YES ☒NO
	17	Does the inside (lined) berm face have depressions, slides, bulges, sloughs or other signs of slope movement?	☐YES ☒NO
	18	Is the water level in Pond M5 above the max permitted water surface level?	☐YES ☒NO
	19	~~Is the water level in Pond M7 above the max permitted water surface level?~~ - NA	~~☐YES ☐NO~~
	20	Does the wastewater inlet pipe in Pond M5 appear to be clogged or abnormal?	☒YES ☐NO
	21	~~Does the wastewater inlet pipe in Pond M7 appear to be clogged or abnormal?~~ - NA	~~☐YES ☐NO~~
CCR RULE	22	Based on the items above, are there any visible signs of actual or potential structural weakness?	☐YES ☒NO
	23	Are there visible conditions which are or have the potential to disrupt operations?	☐YES ☒NO
	24	Are there visible conditions which are or have the potential to disrupt safety?	☐YES ☒NO
INS TR.	25	Record the Pond M5 interstitial pump totalizer reading.	**Reading:** 0
	26	~~Record the Pond M7 interstitial pump totalizer reading.~~ NA	~~**Reading:**~~ NA

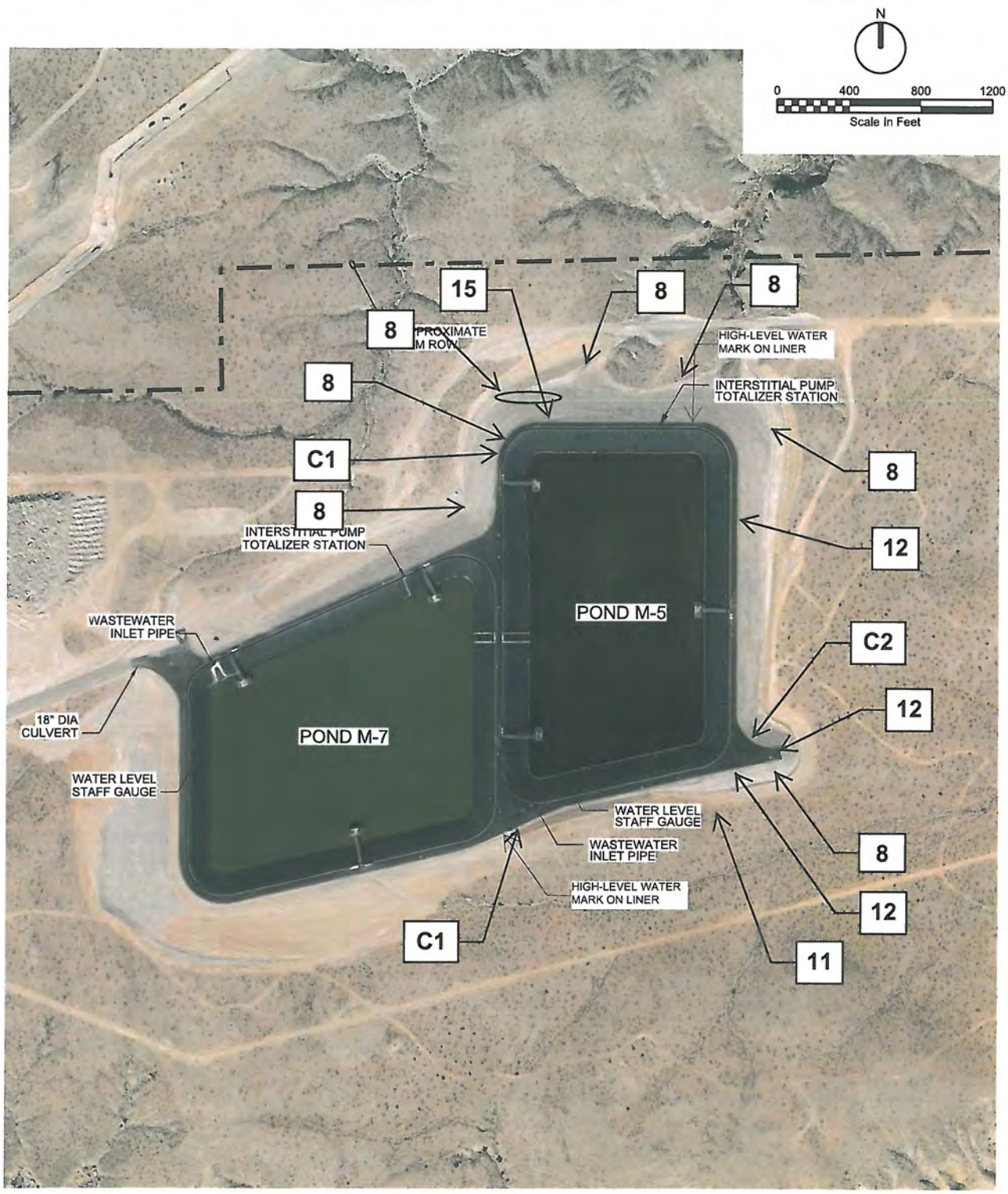
Explanations and Notes

Except for items #s 1 and 2, explain and describe any "Yes" responses. Reference the item #, note the location and extent, and mark the location on the included site plan. NA = Not applicable.

8. Runnels are present on north side of pond, especially at the concave corner formed by northern intersection of Pond M5 and Pond M7. Runnels on M5 are generally less than 6 inches deep and spaced at 15-30 yard intervals. Runnels occasionally extend the full length of slope and have broken through some small bumps/windrows that appear to have been created by equipment tracks. See figure for areas with most significant runnels.

11. Lower reach of riprap ditch is starting to fill with sediment. Riprap on bottom of channel is becoming less visible.

12. 10-foot long x 1/8-inch wide crack in asphalt concrete pavement (ACP) at SE corner. <12-inch piece of asphalt has broken away from road on the east side (no change from previous annual inspection). ACP being undermined on SE corner. /// 15. Two delineators around the settlement monument near northwest corner of Pond M5 are broken, one is lying on the ground. /// 20. Bottom half of pipe is filled with Glauber's salt. /// C1. There is no cap/cover on the riser pipes, used to clean out the interstitial leak detection and collection system, near the northwest and southwest corners of Pond M5. /// C2. The stubbed-out and blind-flanged end of the partially completed underground HDPE pipe near the southeast corner of Pond M5 has been gouged and the associated detection wire is broken. The pipe has never been used and is hydraulically isolated (no change from previous annual inspection). -----END OF FORM----------



CCR IMPOUNDMENT INSPECTION FIGURE

REID GARDNER STATION

ch2m:

NOTES: SEE FRONT SIDE OF INSPECTION FORM

BASE FIGURE CREATED: 09/22/15

CCR_Impoundment_661465.dgn

NVEnergy

Reid Gardner Generating Station
CCR Impoundment Annual Inspection Form (Reference: 40 CFR 257.83)

General Information					
Date of Inspection:	19-SEP-16	**Start/End Time:**	0800-1100	**Impoundment:**	M7
Name/Company of Qualified Prof. Engr. Conducting Inspection (Print):		Nathan Betts, PE/CH2M			

Sec	#	Inspected Item	Inspection Result
	1	Has the previous seven day inspection form been reviewed and is a copy on-hand?	☒YES ☐NO
	2	Has the previous annual inspection report been reviewed and is a copy on-hand?	☒YES ☐NO
OUTSIDE BERM FACE, TOE, AND PERIMTER	3	Does the outside berm face or toe have wet spots, seepage, salt, or other indicators of leakage?	☐YES ☒NO
	4	Does the outside berm face or toe have boils, sediment piles or other indications of piping and internal erosion?	☐YES ☒NO
	5	Does the outside berm face have depressions, slides, bulges, sloughs or other signs of slope movement?	☐YES ☒NO
	6	Does the outside berm face exhibit signs of burrowing animals or other animal traffic?	☐YES ☒NO
	7	Is there vegetation that extends more than 6 inches above the outside berm face over a significant portion of the face?	☐YES ☒NO
	8	Does the outside berm face exhibit runnels or other signs of erosion?	☒YES ☐NO
	9	Does the outside berm face exhibit transverse, longitudinal, or desiccation cracking?	☐YES ☒NO
	10	Is the 18-in-dia drainage culvert near Pond M7 clogged, deteriorated, or otherwise abnormal?	☐YES ☒NO
	11	Are the perimeter storm water ditches showing signs or erosion being filled with sediment?	☐YES ☒NO
CREST	12	Does the crest/road exhibit transverse, longitudinal, or desiccation cracking?	☒YES ☐NO
	13	Does the crest/road have any depressions indicating settlement or subsidence?	☒YES ☐NO
	14	Does the liner anchor trench have signs of tearing, high tension, or being pulled out?	☐YES ☒NO
	15	Do dam survey monuments appear to be damaged?	☐YES ☒NO
INSIDE BERM	16	Are there cuts, punctures, tears, or other defects visible in the liner?	☐YES ☒NO
	17	Does the inside (lined) berm face have depressions, slides, bulges, sloughs or other signs of slope movement?	☐YES ☒NO
	18	~~Is the water level in Pond M5 above the max permitted water surface level?~~ -NA	☐~~YES~~ ☐~~NO~~
	19	Is the water level in Pond M7 above the max permitted water surface level?	☐YES ☒NO
	20	~~Does the wastewater inlet pipe in Pond M5 appear to be clogged or abnormal?~~ - NA	☐~~YES~~ ☐~~NO~~
	21	Does the wastewater inlet pipe in Pond M7 appear to be clogged or abnormal?	☒YES ☐NO
CCR RULE	22	Based on the items above, are there any visible signs of actual or potential structural weakness?	☐YES ☒NO
	23	Are there visible conditions which are or have the potential to disrupt operations?	☐YES ☒NO
	24	Are there visible conditions which are or have the potential to disrupt safety?	☐YES ☒NO
INS TR.	25	~~Record the Pond M5 interstitial pump totalizer reading.~~ - NA	~~**Reading:**~~ NA
	26	Record the Pond M7 interstitial pump totalizer reading.	**Reading:** 194,029

Explanations and Notes

Except for items #s 1 and 2, explain and describe any "Yes" responses. Reference the item #, note the location and extent, and mark the location on the included site plan. NA = Not applicable.

8. Runnels are present on north side of pond, especially at the concave corner formed by northern intersection of Pond M5 and Pond M7. Runnels on M7 are generally less than 6 inches deep and spaced at 15-30 yard intervals. Runnels occasionally extend the full length of slope and have broken through some small bumps/windrows that appear to have been created by equipment tracks. See figure for areas with most significant runnels.

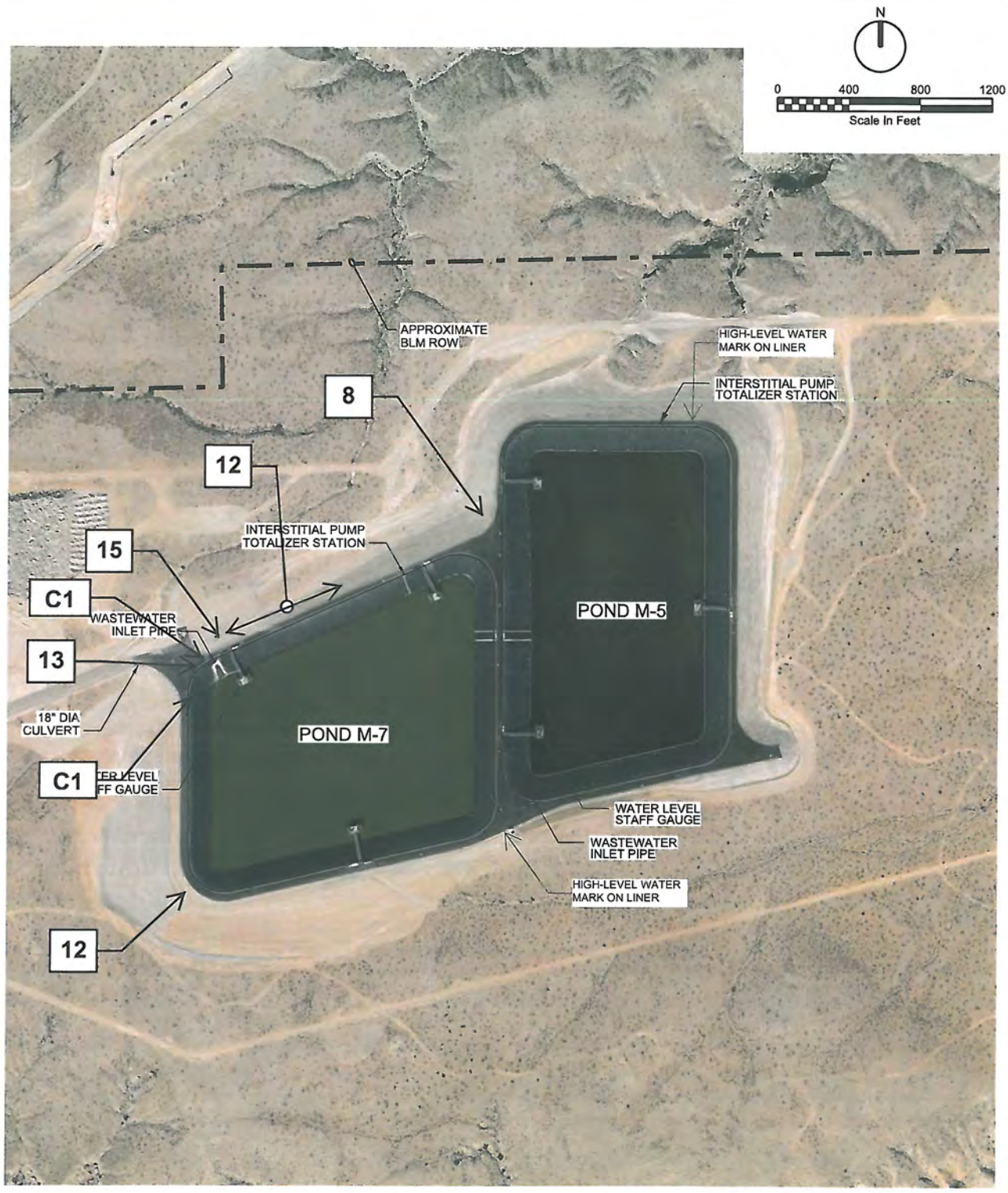
12. Along a portion of the north berm there are transverse and longitudinal cracks along the inboard edge of pavement and it appears that the cracks were formed by asphalt pavement being pushed upward. No change from previous annual inspection. At the southwest corner of pond, where the slope is incised, there are also approximately 8-10 longitudinal cracks forming on the outboard edge to the centerline of the pavement; otherwise no change from previous annual inspection.

13. The anchor trench along the northwest corner of M7 has settled, no change from previous annual inspection.

15. A delineator around the settlement monument near northwest corner of Pond M7 is broken and lying of the ground.

21. Bottom half of pipe is filled with Glauber's salt, but liquid is flowing through the pipe and into the pond without restriction.

C1. There is no cap/cover on two riser pipes, used to clean out the interstitial leak detection and collection system, near the northwest corner of Pond M7.----------END OF FORM----------



LEGEND

APPROXIMATE BLM ROW

CCR IMPOUNDMENT INSPECTION FIGURE

REID GARDNER STATION

ch2m:

NOTES: SEE FRONT SIDE OF INSPECTION FORM

BASE FIGURE CREATED: 09/22/15

CCR_Impoundment_661465.dgn