Construction Certification Report

2012 Pond 3 Construction Projects
Pond 3 South Vertical Expansion &
Pond 3 North Interior Bench Construction

NPDES Permit No. 0002186
Sherburne County (Sherco) Generating Plant
Northern States Power Company (dba Xcel Energy, Inc.)
Becker, MN

Prepared for:

Xcel Energy, Inc.

November 12th, 2012

Prepared By:

Carlson McCain

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I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based upon my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Daniel J. Riggs, P.E.

Date: November 12th, 2012

License No.: 49559

Section 1 Introduction

This report presents the results of field observations and testing performed during the 2012 construction of the Pond 3 South (Pond 3S) Vertical Expansion and the Pond 3 North (Pond 3N) Interior Embankment at Xcel Energy's (Xcel) Sherburne County Generating Plant (Sherco) in Becker, Minnesota. The original phase of Pond 3 development was the construction of Pond 3N to a finished elevation of 976 (operational elevation of 970) in 2004. In 2008, Pond 3N was vertically expanded to a finished elevation of 999 (operational elevation of 993). Pond 3S was constructed in 2010 to a finished elevation of 988 (operational elevation of 982) and hydraulically connected to Pond 3N through a weir at the east end of the Pond 3 center dike. This report documents the second phase of Pond 3S development, which consists of raising Pond 3S to a finished elevation of 994 (operational elevation of 988). Future development of Pond 3 will be another vertical expansion of Pond 3S to match the operational elevation of Pond 3N, then a final vertical expansion of the entire Pond 3 footprint to an operating elevation of 1008.

The Pond 3S 2012 Vertical Expansion consisted of constructing the interior embankment, raising the existing clay barrier from an elevation of 984 to 990, and constructing the final exterior embankment four feet above the finished clay barrier for frost protection. In past projects the interior embankments (embankments constructed inside of the clay barrier) were constructed entirely of compacted bottom ash material excavated from the Bottom Ash Pond, located northwest of Pond 3. In early June of 2012, a combination of factors including decreased water usage for plant operations and increased spring rainfall amounts raised the Pond 3 water level to the maximum operating elevation of 982 ahead of the forecasted schedule. To alleviate this, installation of the clay barrier was conducted earlier than scheduled, and did not allow the necessary two to three weeks needed to dewater and excavate material from the Bottom Ash Pond. Instead, clean common borrow, or random fill, was excavated from a borrow area east of Pond 3S and used to construct the portion of the interior embankment used to support the clay barrier, known as the clay buttress. Once the buttress was completed and the clay barrier was constructed and tested to meet specifications, the water level in the Bottom Ash Pond was lowered and the remaining interior embankment (interior bench) was constructed using bottom ash material. Other activities during Pond 3S construction included piping, topsoil placement, and site restoration activities. Construction activities are more completely described in the subsequent sections of this report.

Pond 3N Interior Embankment construction consisted of raising the existing interior bench from an approximate elevation of 982 to 986 with random fill, and from 986 to 990 with bottom ash material (the Pond 3N clay buttress and clay barrier were previously constructed up to elevation of

995 in 2008). Again, random fill was used instead of bottom ash material due to increased water levels, and then constructed to final elevation using bottom ash material.

Construction was performed in accordance with NPDES Permit No. 0002186 and "Construction Documents, 2012 Ash Construction Projects" prepared by Carlson McCain and dated June 2012. The general contractor was Veit & Company, Inc. (Veit). Excavation activities began in June 2012 and construction was completed in August 2012. Deviations from the Specifications and Drawings are noted on the enclosed Record Drawings and are described in the following sections of this report.

Xcel Energy performed construction management activities and the following companies provided services to complete the 2012 Pond 3 Construction Project:

Company	Activity or Products
Carlson McCain, Inc. (Carlson McCain)	Design, QA/QC
Veit & Company, Inc. (Veit)	Earthwork
Neaton Bros.	Turf Establishment (Subcontractor to Veit)
Braun Intertec Corporation	Soil Testing
Bogart Pederson, Inc.	Survey Verification (Subcontractor to Veit)
Xcel Energy Special Construction	Sludge Pipe and Dewatering Well

Construction observation was performed during the project and consisted of observing and recording activities of the general contractor and subcontractor, answering questions and interpreting information contained in the drawings and specifications as requested by the contractor, and directing testing and quality control activities performed by independent testing firms and construction subcontractors.

Section 2 Construction Methods and Materials

The methods of construction, equipment, and materials used during Pond 3 construction are described in this section. Appendix A contains photographs illustrating the various methods and stages of construction, and the Record Drawings in Appendix F show the project as-constructed.

2.1 Topsoil Stripping and Stockpiling

Prior to construction, topsoil from the top and upper slopes of the existing Pond 3S east and south embankment was stripped and stockpiled below the construction area using a dozer and backhoe. Topsoil was also stripped from the south end of the borrow area east of Pond 3S using a dozer and backhoe and stockpiled in the topsoil stockpile southeast of Pond 3S. Topsoil on all pond slopes and embankments was a minimum of 6-inches thick, and ranged from 9-inches to 18-inches in the borrow area.

2.2 Borrow Area Development

Random fill was excavated from the borrow area located east of Pond 3S and used to construct the interior clay buttress and the exterior embankment. Prior to excavation, three soil samples from three different test pits in the borrow area were taken and tested for standard proctor density. Results from the analysis are discussed in Section 3.2.1 and complete results can be found in Appendix B.

Random fill was excavated using a backhoe, loaded into off-road trucks, and hauled to the construction area. Excavation started at the north end of the borrow area where 2010 Pond 3S construction had left off and progressed south. The borrow area was excavated down to an approximate elevation of 945 with three to one (horizontal to vertical) side slopes. Excavated material consisted primarily of poorly graded sand, with some gravel and cobbles.

2.3 Infiltration Pond Construction

An infiltration pond was constructed at the base of the Pond 3S east embankment to capture stormwater run-off from the east pond embankment slope, the northwest access ramp and the low-lying area east of the infiltration pond. Once captured by the infiltration pond, stormwater will infiltrate into the ground or flow into the existing infiltration pond located on the south side of Pond 3S. Three 18-inch corrugated metal culverts are available at the west end of the south infiltration pond for emergency overflow.

Construction began by stripping the topsoil and excavating the north end of the infiltration pond, progressing south. Topsoil was stripped and stockpiled in the topsoil stockpile southeast of Pond

3S and random fill was excavated from the pond and used to construct the random fill clay buttress. Following infiltration pond excavation, the side slopes of the infiltration pond were seeded and covered with erosion blanket.

2.4 Interior Embankment – Clay Buttress Construction

As described in Section 1, the interior embankment was originally planned to be constructed entirely of bottom ash, but was constructed out of both random fill and bottom ash to address higher than expected Pond 3 water levels. The random fill portion of the interior embankment was constructed to support the inside of the clay barrier and is known as the clay buttress.

Construction of the clay buttress began by excavating the random fill above the existing clay anchor and flipping it on to the existing interior embankment. The material was spread into 12-inch thick lifts with a dozer utilizing GPS and compacted with a vibratory smooth drum roller. Water was added during placement and compaction as needed to meet compaction requirements. The remaining random fill used to construct the clay buttress was excavated from the borrow area east of Pond 3S. Random fill was hauled to the construction area using off-road trucks, spread into 12-inch lifts by a GPS dozer, watered as needed and compacted using a vibratory smooth drum roller. Construction started in the northeast corner to the finished elevation of 990 and continued clockwise to the southwest corner. Approximately 16,800 cubic yards of random fill was used to construct the clay buttress. The exterior of the clay buttress was shaped to a 1.5 to 1 slope (horizontal to vertical) using a backhoe, in preparation for the clay barrier construction.

During construction, an independent soil testing firm retained by Xcel, Braun Intertec, performed in-place density testing to verify compliance with project specifications. Compaction testing was performed to meet the required rate of one test per 3,000 cubic yards. A summary of the field density testing performed during Pond 3S construction is presented in Table 1. Testing locations are presented in Figure 1. Complete data for Standard Proctor and field compaction testing are included in Appendix B.

2.5 Clay Barrier

The clay barrier of the Pond 3S south and east embankments was constructed with clay from the prequalified off-site borrow source. The base of the clay barrier was connected to the existing clay anchor at elevation 984 by scarifying and moistening the top of the existing clay prior to placing the first lift of clay. The clay barrier was constructed in one horizontal lift, six inches thick that ran the entire length of the vertical expansion. The subsequent lifts were constructed in this manner to an elevation of 986. Above elevation 986, lifts were limited to 500-feet in length. Each lift was maintained in a rough and moistened condition to promote bonding between lifts and provide

uniformity throughout the clay barrier. Clay was placed by belly-dump or side-dump semis. Following placement, a dozer spread the clay into 9-inch loose lifts approximately 10-feet wide (for semi travel) along the clay barrier alignment. The loose lifts were compacted to at least 97 percent Standard Proctor density at or above the optimum moisture content by a vibratory sheepsfoot roller. Once near final height, a backhoe shaped the exterior of the clay barrier by pulling up the extra clay on the sides to a final width of 8-feet at a slope of 1.5 horizontal to 1 vertical. A vibratory sheepsfoot roller followed behind to compact the clay pulled up by the backhoe. In-place density tests were taken on every lift approximately 100-feet apart.

In-place density and moisture content testing, and laboratory testing of the clay was performed by Braun Intertec. The test results for clay used in the clay barrier are summarized in Tables 2, 3 and 4, and complete clay data is located in Appendix C. Locations of tests are shown on Figure 2.

2.6 Interior Embankment - Bottom Ash Bench Construction

Following installation of the clay barrier, the Bottom Ash Pond was allowed to dewater and excavation began. Bottom ash material was excavated by a backhoe, loaded into off-road trucks, and hauled to the Pond 3S interior embankment inside of the random fill clay buttress. Once placed, the material was spread into 12-inch thick lifts by a GPS dozer, and compacted to 95% Standard Proctor density by a vibratory smooth drum roller. In general, additional water was not needed to achieve the required compaction results.

Construction of the interior bench began by starting a single lift in the northeast corner and progressing clockwise, to the southwest corner. This process allowed time for the bottom ash material to properly dry before subsequent lifts were added. Material that was too wet for construction was discarded into the pond. Once the bench was completed, two ramps were constructed to access the interior embankment in the southwest corner and on the east embankment, as shown on the Record Drawings.

In-place density and moisture content testing was performed by Braun Intertec. The test results for bottom ash used are summarized in Table 5, and complete bottom ash data is located in Appendix D. Locations of tests are shown on Figure 3.

2.7 Exterior Embankment Construction

Construction began on the exterior portion of the embankment (outside of the clay barrier) once all of the in-place clay tests had passed specification. Off-road trucks hauled random fill from the borrow area to the exterior embankment while a dozer spread the random fill into lifts taking care not to damage the clay. Once the clay was properly covered, off-road trucks placed random fill over the entire width of the exterior embankment, to the design grades shown on the Record Drawings.

Table 1 summarizes the random fill in-place density summary, the locations of each test can be found on Figure 1. Complete data can be found in Appendix B.

2.8 Dewatering System Cleanout Extension

During the 2010 construction of Pond 3S, a dewatering system was incorporated to accommodate post-closure dewatering of Pond 3. In order to clean the dewatering pipes at the base of the pond once the pond is closed, clean-out access points were installed as part of the original construction. In 2012, as the embankments were raised, the clean-outs were also raised. The cleanouts were extended from elevation 986 along the inside slope of the interior embankment to an elevation of 992. Each cleanout extension is an 8-inch SDR 17 solid wall polyethylene pipe connected to the existing cleanout pipe with an electrofusion coupling. The existing corrugated metal protective casings were salvaged and reinstalled on the extended cleanouts. Record Drawings of the cleanout extensions can be found in Appendix F.

2.9 Site Restoration

Site restoration includes final grading, topsoil placement and turf establishment, and class 5 placement access road construction.

2.9.1 Topsoil Placement and Turf Establishment

Topsoil stripped and stockpiled as described in Section 2.1 was pushed to the upper slopes and top of the exterior embankments by a backhoe and a dozer. From there, the topsoil was spread in single 6-inch lifts by a dozer utilizing GPS. The topsoiled areas were seeded and covered with an erosion blanket on the slopes or mulched on the flatter areas to minimize erosion until vegetation is fully established.

2.9.2 Access Road Construction

Class 5 aggregate salvaged from the existing roads was spread and compacted on road surfaces and ramps, as shown on the Record Drawings. No Class 5 was imported from off-site.

2.10 Pond 3N Interior Embankment Construction

The Pond 3N Interior Embankment was initially constructed out of random fill from an elevation of approximately 982 to elevation 986. The bottom ash portion of the embankment was constructed from elevation 986 to elevation 990. Construction procedures are discussed below.

2.10.1 Random Fill

Random fill used to construct the Pond 3N Interior Embankment was excavated from a stockpile located north of Pond 3N generated during the 2008 Pond 3N Vertical Expansion. One sample was taken from the stockpile and analyzed for Standard Proctor density.

The random fill stockpile was excavated by a backhoe, and loaded into off-road trucks. Random fill placed by the off-road trucks was spread into 12-inch lifts with a dozer and compacted using vibratory smooth drum roller. Water was added as needed to achieve proper compaction. In general, a single lift was started in the northwest corner and carried clockwise around the pond to the southeast corner. The subsequent lift was started again in the northwest corner and the process continued, up to an elevation of 986. A summary of the field density testing performed is presented in Table 1 and testing locations are presented in Figure 4. Complete data for Standard Proctor and field compaction testing are included in Appendix B.

2.11.1 Bottom Ash

Once the Pond 3S Interior Bench was constructed to finished elevation, the off-road haul trucks began hauling bottom ash to Pond 3N. Construction began in the northwest corner and progressed one lift at a time clockwise around the pond to the southeast corner, allowing the bottom ash material time to dry. In general, water was not needed to meet compaction requirements. Construction continued one lift at a time up to a final elevation of 990. A summary of the field density testing performed is presented in Table 5 and testing locations are presented in Figure 4. Complete data for Standard Proctor and field compaction testing are included in Appendix D.

Section 3 Testing and Quality Control

Testing and quality control activities were conducted by independent consultants, testing firms, and construction contractors. Testing and quality control activities were directed by and results were reported to the on-site Carlson McCain personnel. Testing and quality control procedures and results are presented below.

3.1 Surveying

An independent registered land surveyor, Bogart Pederson & Associates, Inc., was retained by the general contractor to provide location and grade verification as required. Earthwork verification surveying included verifying shots at grade breaks and 50-foot intervals of the clay buttress and clay barrier, and 100-foot intervals on random fill and topsoil thickness verification. Other survey data included clean-out extensions, class 5 aggregate, and a topographic survey of the borrow area. The surveyor collected data using GPS equipment, and periodically provided results of field data gathered during construction for review by Carlson McCain personnel. Complete survey data is contained in Appendix E.

3.2 Soil Testing

The following soil tests were performed during construction: embankment compaction testing, clay source permeability and index property testing, clay barrier in-place compaction and moisture content testing, clay barrier in-place permeability and index property testing, bottom ash material in-place compaction and moisture testing, and topsoil nutrient analysis. Field compaction and laboratory tests were performed by Braun Intertec. Soil testing procedures and test results are described below.

3.2.1 Random Fill Compaction Testing

Soil excavated from the borrow area or north stockpile and used in the Pond 3 embankments was referred to as random fill. Samples of random fill were collected and analyzed for Standard Proctor results. These results were used as compaction criteria for field density testing. The required compaction for embankments was 95 percent of the Standard Proctor maximum dry density. The moisture content was generally below optimum, requiring the contractor to add water during construction in order to obtain density requirements. Compaction testing was performed by Xcel's independent soil testing firm, Braun Intertec, under the direction of Carlson McCain personnel. Testing was performed using a nuclear density gauge, at a minimum frequency of one test per 3,000 cubic yards of material placed.

Samples of random fill were collected at the beginning of the project and as different material types were encountered. Each field density test result was compared to the Standard Proctor results of similar material to determine if the field density met the 95 percent compaction criteria. No density tests were below 95 percent Standard Proctor. Field compaction results are presented in Table 1. Locations of the Pond 3S field compaction tests can be found in Figure 1. Pond 3N tests can be found in Figure 4. Complete data is located in Appendix B.

3.2.2 Clay Testing

The Pond 3S clay barrier was constructed with prequalified clay from an off-site source. Quality control testing performed during construction included in-place compaction and moisture content tests, laboratory analysis of in-place permeability, and index property tests (Atterberg Limits, sieve and hydrometer analysis, and classification). Testing procedures and results are discussed below.

3.2.2.1 Clay Pre-qualification Testing

Clay used during the construction project was imported from an off-site source. The source, referred to as the Anderson pit, is located near Monticello, MN. Carlson McCain personnel collected two clay samples from the pit for pre-qualification testing prior to construction. The samples were sent to Xcel's independent laboratory (Braun Intertec) for analysis of Atterberg Limits, particle size distribution, Standard Proctor, in-place moisture content, and re-compacted permeability. All of the samples tested met the MPCA guidelines for classification, permeability, Atterberg Limits and percent fines. The permeability samples were tested at or slightly above optimum moisture content and at 97 percent of the Standard Proctor maximum dry density; higher than the 95 percent Standard Proctor density in the MPCA guidelines. This was done because two pre-qualification samples from the Anderson Pit collected and tested in 2008 did not meet the minimum permeability tests ($1x10^{-7}$ cm/s) when tested at 95 percent Standard Proctor density. When these samples were tested at greater Standard Proctor densities (99 percent in 2008, 97 percent in 2010) the permeability met or exceeded specifications. The results of the clay prequalification testing are summarized in Table 2, with complete results in Appendix C.

3.2.2.2 Clay Barrier In-place Testing

During clay construction activities, a representative from Braun Intertec was on site to perform in-place density and moisture content testing of the clay using a nuclear density gauge. Compaction testing was completed at the minimum rate of once per horizontal lift at intervals of approximately 100 feet. In order to determine passing or failing results, the contractor used 97 percent of the Standard Proctor maximum dry density at or above optimum moisture content. This was done to ensure that the clay met the permeability specification of $1x10^{-7}$ cm/s as discussed in Section 3.2.2.1. When a field density test indicated a failing result, the area received additional

compaction if the density was low, or was moistened and reworked to meet the moisture requirement. Additional testing was performed in the same location after the material had been reworked, and this procedure was repeated until passing test results were obtained. In addition to field testing of the clay, placement of the clay was constantly observed and monitored to verify that consistent processing and compaction procedures were being used, and that lift thicknesses were within tolerance. The on-site quality control personnel worked closely with the contractor during clay placement to ensure the clay was placed and compacted to meet the project requirements.

Compaction testing was distributed across the site to give complete coverage of the clay placed. Compaction test locations are shown in Figure 2 and results of clay compaction tests are summarized in Table 3. Complete testing data can be found in Appendix C.

3.2.2.3 Clay Permeability and Index Properties Testing

In addition to prequalification testing, laboratory analysis was completed on additional clay samples collected on-site. The samples were collected by pushing thin-wall tubes into the clay after placement and compaction to recover undisturbed cores of clay. Voids created in the clay barrier during sample collection were backfilled with bentonite. Two samples were collected, one from the east embankment and another from the south embankment. Approximately 3,800 cubic yards of clay were placed, resulting in one test per 1,400 cubic yards, less than the MPCA requirement of one per 3,000 cubic yards. Samples were tested for permeability, Atterberg Limits, sieve and hydrometer analysis, and classification. The coefficient of permeability of the clay samples was 1.1 x 10^{-8} and 2.7 x 10^{-8} cm/s, with an average of 1.9 x 10^{-8} cm/s, significantly slower than the required maximum rate of 1x10^{-7} cm/s. All of the soil classifications and Atterberg Limits test results met the MPCA guidelines. The percent fines in both CLTW-1 and CLTW-2 were less than the 50 percent minimum guideline (48.6% and 47.8% respectively), but the other tests for those samples met the minimum requirements. The results from clay samples collected on site are summarized in Table 4, locations are presented Figure 2, and complete results are included in Appendix C.

3.2.3 Bottom Ash Material Testing

Samples of bottom ash were collected and analyzed for Standard Proctor results, and these results were used as compaction criteria for field density testing. Specifications for bottom ash require 95 percent of the Standard Proctor maximum dry density. Compaction testing was performed by Braun under the direction of Carlson McCain personnel. Testing was performed with a nuclear density gauge at a minimum frequency of one test per 3,000 cubic yards of material placed.

Samples of bottom ash were collected at the beginning of the project and as different material types were encountered. Each field density test result was compared to the Standard Proctor results of similar material to determine if the field density met the 95 percent compaction criteria.

All the in-place density tests passed the compaction. Field compaction results are presented in Table 5. Locations of the field compaction tests can be found in Figure 3 and 4. Complete data is located in Appendix D.

3.2.4 Topsoil Testing

Two topsoil samples were taken from the southeast topsoil stockpile (TS1) and topsoil stripped from the Pond 3S exterior embankment (TS2) and sent to the University of Minnesota for nutrient analysis. Laboratory test results are included in Appendix B.

Section 4 Conclusion

Construction of the Pond 3S Vertical Expansion and the Pond 3 North Interior Embankment at Xcel Energy's Sherburne County Generating Plant has been completed in material conformance with the "Construction Documents, 2012 Ash Construction Projects" prepared by Carlson McCain and in compliance with the requirements for notification, construction, materials, and testing contained in NPDES Permit No. 0002186. This report presents the results of all observation, documentation, and testing performed during the course of construction of this facility.

Tables

Table 1
Random Fill In-Place Density Testing Summary
2012 Pond 3 Construction

	Test No.	Date	Northing	Easting	Elevation	In-Place Density (pcf)	In-Place Moisture (%)	Max Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction
Pond 3 South Tests	RF-1	6/13/12	862,443	2,031,347	985.2	110.8	9.3	116.6	11.2	95%
	RF-2	6/13/12	862,780	2,031,982	984.7	101.4	11.8	106.2	14.5	95%
	RF-3	6/15/12	862,429	2,031,254	988.4	112.2	10.4	112.3	14.3	100%
	RF-4	6/15/12	862,516	2,031,950	989.8	113.3	8.4	112.3	14.3	101%
	RF-5	6/15/12	862,727	2,031,987	988.5	115.1	5.6	112.3	14.3	102%
	RF-6	6/15/12	862,989	2,031,984	989.9	111.1	13.4	112.3	14.3	99%
	RF-7	6/22/12	862,485	2,030,896	984.1	113.2	4.2	112.3	14.3	101%
	RF-8	6/22/12	863,368	2,031,912	984.0	112.3	3.0	112.3	14.3	100%
	RF-9	6/22/12	862,525	2,031,794	983.4	110.9	4.1	111.3	12.6	100%
	RF-10	6/27/12	863,062	2,032,021	987.8	110.8	4.7	111.3	12.6	100%
	RF-11	6/28/12	862,357	2,031,102	988.2	109.5	2.3	109.7	12.5	100%
Pond 3 North Tests	RF-12	6/29/12	865,296	2,031,145	984.1	123.5	6.9	121.3	11.7	102%
	RF-13	6/29/12	865,296	2,031,247	984.2	117.6	9.4	121.3	11.7	97%
	RF-14	7/2/12	865,296	2,031,247	985.6	121.6	10.2	121.3	11.7	100%
	RF-15	7/2/12	865,265	2,031,906	985.3	118.1	11.9	121.3	11.7	97%
	RF-16	7/2/12	864,173	2,031,930	984.1	124.7	7.3	121.3	11.7	103%
	RF-17	7/3/12	865,291	2,030,988	986.1	115.8	6.0	121.3	11.7	95%
	RF-18	7/3/12	865,149	2,031,929	986.1	123.4	7.9	121.3	11.7	102%
Pond 3 South Tests	RF-19	7/3/12	862,923	2,032,041	989.5	113.0	5.6	112.3	14.3	101%
	RF-20	7/5/12	862,376	2,031,247	990.6	112.7	9.5	112.3	14.3	100%
	RF-21	7/5/12	862,386	2,030,944	989.3	112.9	3.7	112.3	14.3	101%
	RF-22	7/5/12	862,409	2,031,944	991.7	106.1	4.9	106.2	14.9	100%
	RF-23	7/5/12	862,470	2,032,039	989.6	110.3	5.2	111.3	12.6	99%
	RF-24	7/6/12	863,251	2,032,049	990.3	114.4	5.9	112.3	14.3	102%
	RF-25	7/6/12	862,395	2,031,033	991.4	111.3	7.9	111.3	12.6	100%
	RF-26	7/6/12	862,409	2,031,772	993.0	110.7	5.9	109.7	12.5	101%
	RF-27	7/6/12	862,394	2,031,161	992.7	114.0	5.0	112.3	14.3	102%
	RF-28	7/6/12	862,408	2,031,513	994.1	115.5	3.1	112.3	14.3	103%
	RF-29	7/9/12	863,377	2,032,038	991.9	119.2	5.9	120.1	10.3	99%
	RF-30	7/9/12	863,195	2,032,033	991.7	111.1	3.8	111.3	12.6	100%
	RF-31	7/10/12	862,623	2,032,000	992.5	111.3	4.1	111.3	12.6	100%
	RF-32	7/11/12	862,861	2,032,009	993.9	112.7	7.0	112.3	14.3	100%

Note:

Specifications: Minimum 95% Compaction

Complete laboratory test data (passing tests only) is located in Appendix B.

Table 2
Clay Prequalification Testing Summary
2012 Pond 3 South Vertical Expansion

Sample No.	Soil Classification	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Atterberg Limits			% Passing No. 200	Field Moisture Content (%)	Permeability[1] (cm/sec)
				Liquid Limit	Plastic Limit	Plasticity Index			
CS-1	CL/SC	115.9	13.3	31.0	16.0	15.0	52.0	15.4	1.26×10^{-8}
CS-2	CL/SC	118.7	13	29.0	17.0	12.0	52.0	14.4	1.0×10^{-8}
MPCA Guidelines	CL, CH, SC	NA	NA	$\geq$ 25	$\geq$ 13	$\geq$ 12	$\geq$ 50	NA	$\leq 1.0 \times 10^{-7}$

Notes:

[1] Permeability Tested at 97% compaction and optimum moisture content

Complete laboratory test data is located in Appendix C

Table 3
Clay In-Place Density Testing Summary
2012 Pond 3 South Vertical Expansion

Test No.	Date	Northing	Easting	Elevation	In-Place Density (pcf)	In-Place Moisture (%)	Max Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction
CL-01	6/22/12	863,331.3	2,032,015.7	985.2	117.6	13.6	115.9	13.3	101%
CL-02	6/22/12	862,823.6	2,032,014.3	984.8	114.3	15.6	115.9	13.3	99%
CL-03	6/22/12	863,081.3	2,032,015.1	986.1	115.3	14.7	115.9	13.3	99%
CL-04	6/22/12	862,470.0	2,031,966.3	986.1	114.5	14.9	115.9	13.3	99%
CL-05	6/22/12	862,391.7	2,030,989.6	985.7	***111.0***	13.7	115.9	13.3	***96%***
CL-05A	Restest of CL-05				116.8	13.9	115.9	13.3	101%
CL-06	6/23/12	862,430.4	2,031,737.9	984.9	113.6	15.0	115.9	13.3	98%
CL-07	6/23/12	862,410.0	2,031,302.9	986.3	113.9	14.4	115.9	13.3	98%
CL-08	6/23/12	862,399.1	2,031,109.6	987.0	117.0	13.9	115.9	13.3	101%
CL-09	6/23/12	862,376.8	2,031,108.2	987.0	115.3	15.2	115.9	13.3	99%
CL-10	6/23/12	862,421.7	2,031,528.1	986.9	114.8	15.1	115.9	13.3	99%
CL-11	6/23/12	862,407.1	2,031,241.3	987.6	119.0	13.6	118.7	13.0	100%
CL-12	6/23/12	862,408.5	2,031,259.7	987.9	117.9	13.4	118.7	13.0	99%
CL-13	6/23/12	862,432.2	2,031,665.3	988.5	112.6	14.7	115.9	13.3	97%
CL-14	6/23/12	862,513.6	2,031,980.3	988.5	117.0	13.5	115.9	13.3	101%
CL-15	6/23/12	863,370.2	2,032,010.6	987.2	***108.2***	14.5	115.9	13.3	***93%***
CL-15A	Retest of CL-15				***109.3***	15.5	115.9	13.3	***94%***
CL-15B	Retest of CL-15A				***111.6***	15.1	115.9	13.3	***96%***
CL-15C	Retest of CL-15B				117.6	13.5	115.9	13.3	101%
CL-16	6/25/12	862,697.1	2,032,011.9	986.5	***109.2***	13.8	115.9	13.3	***94%***
CL-16A	Retest of CL-16				112.9	14.0	115.9	13.3	97%
CL-17	6/25/12	862,913.4	2,032,010.3	986.7	119.5	13.5	118.7	13.0	101%
CL-18	6/25/12	863,410.4	2,032,009.2	987.9	117.0	***12.8***	118.7	13.0	99%
CL-18A	Retest of CL-18				117.0	***12.4***	118.7	13.0	99%
CL-18B	Retest of CL-18A				119.5	13.5	118.7	13.0	101%
CL-19	6/25/12	862,685.4	2,032,011.7	987.4	***107.8***	13.3	118.7	13.0	***91%***
CL-19A	Retest of CL-19				***114.4***	13.1	118.7	13.0	***96%***
CL-19B	Retest of CL-19A				117.2	13.3	118.7	13.0	99%
CL-20	6/25/12	862,892.1	2,032,010.3	987.9	113.9	13.9	115.9	13.3	98%
CL-21	6/25/12	863,197.5	2,032,009.1	988.4	114.9	14.2	115.9	13.3	99%
CL-22	6/25/12	863,252.8	2,032,009.2	988.9	118.1	13.2	118.7	13.0	99%
CL-23	6/25/12	862,598.6	2,032,009.6	988.5	114.7	14.7	115.9	13.3	99%
CL-24	6/26/12	863,362.8	2,031,989.1	989.9	***107.4***	14.6	115.9	13.3	***93%***
CL-24A	Restest of CL-24				113.7	14.0	115.9	13.3	98%
CL-25	6/26/12	862,790.5	2,031,989.1	990.0	112.7	15.5	115.9	13.3	97%
CL-26	6/26/12	862,464.3	2,031,702.4	990.0	113.3	14.7	115.9	13.3	98%
CL-27	6/26/12	862,464.3	2,031,302.4	990.0	118.4	14.1	118.7	13.0	100%

Note:

Specifications: Minimum 97% compaction and optimum moisture content (failing tests are noted in bold italics)
Complete laboratory test data (passing tests only) is located in Appendix C.

Table 4
Clay In-Place Index Properties and Permeability Testing Summary
2012 Pond 3 South Vertical Expansion

Sample No. [1]		Soil Classification	In-place Dry Density (pcf)	In-place Moisture Content (%)	Atterberg Limits			% Passing No. 200 [2]	In-place Permeability (cm/sec)
					Liquid Limit	Plastic Limit	Plasticity Index		
Thinwall:	CLTW-1	SC/CL	119.7	15.9	-----	-----	-----	-----	1.06×10^{-8}
Bulk:	CLTW-1	SC/CL	-----	16.4	29.0	15.0	14.0	48.6	-----
Thinwall:	CLTW-2	SC/CL	116.1	16	-----	-----	-----	-----	2.73×10^{-8}
Bulk:	CLTW-2	SC/CL	-----	15.6	31.0	14.0	17.0	47.8	-----
MPCA Guidelines		CL, CH, SC	NA	NA	$\geq$ 25	$\geq$ 13	$\geq$ 12	$\geq$ 50	$\leq 1.0 \times 10^{-7}$
Average									1.89×10^{-8}

Notes:

[1] At each sample location, a bulk sample and thinwall sample was collected

[2] Soils with less than min. P_{200} have been used successfully when permeability guideline is met

Complete laboratory test data is located in Appendix C

Table 5
Bottom Ash In-Place Density Testing Summary
2012 Pond 3 Construction

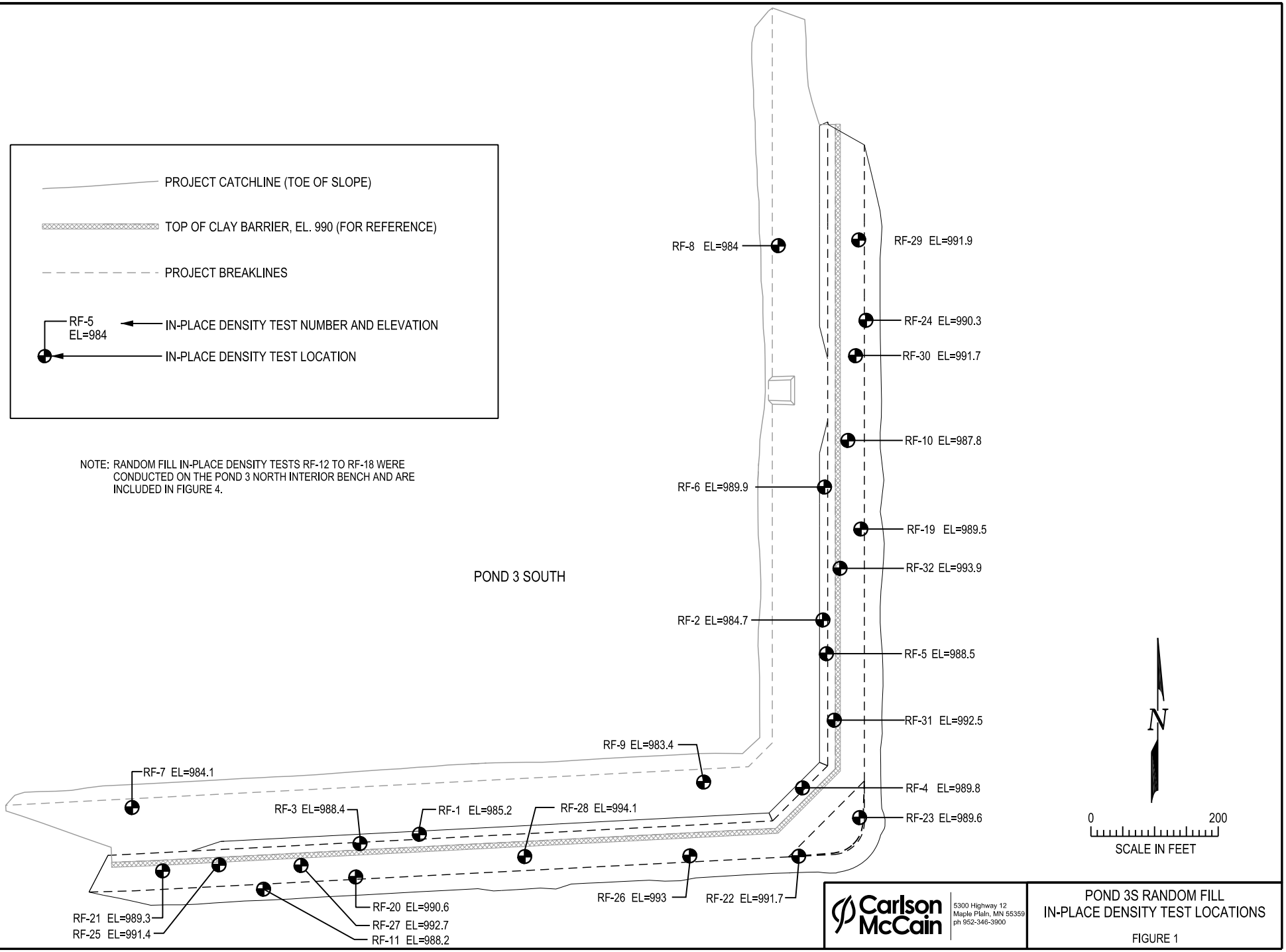
	Test No.	Date	Northing	Easting	Elevation	In-Place Density (pcf)	In-Place Moisture (%)	Max Dry Density (pcf)	Optimum Moisture (%)	Percent Compaction
Pond 3 South	BA-1	7/17/12	863,459	2,031,929	985.5	82.4	13.8	83.0	30.4	99%
	BA-2	7/23/12	863,265	2,031,919	987.5	85.3	3.0	87.6	26.9	97%
	BA-3	7/23/12	862,525	2,031,842	986.1	95.4	3.0	94.2	20.8	101%
	BA-4	7/23/12	862,477	2,031,194	986.2	86.0	12.6	87.6	26.9	98%
	BA-5	7/24/12	863,406	2,031,936	988.4	88.3	12.6	87.6	26.9	101%
	BA-6	7/25/12	862,923	2,031,920	988.1	82.5	18.3	83.0	30.4	99%
	BA-7	7/25/12	863,359	2,031,947	989.5	92.0	3.2	94.2	20.8	98%
	BA-8	7/26/12	863,079	2,031,919	989.3	94.9	1.7	94.2	20.8	101%
	BA-9	7/26/12	862,586	2,031,957	989.7	95.1	2.6	94.2	20.8	101%
	BA-10	7/26/12	862,527	2,031,822	987.3	96.5	8.4	94.2	20.8	102%
	BA-11	7/26/12	862,487	2,031,717	988.4	95.4	5.5	94.2	20.8	101%
	BA-12	7/26/12	862,473	2,031,389	988.6	89.2	12.3	87.6	26.9	102%
	BA-13	7/26/12	862,493	2,031,074	987.0	82.7	18.4	83.0	30.4	100%
	BA-14	7/26/12	862,477	2,030,886	988.4	91.2	6.1	94.2	20.8	97%
	BA-15	7/27/12	862,493	2,031,624	989.6	102.7	2.4	94.2	20.8	109%
	BA-16	7/27/12	862,498	2,031,256	989.2	93.9	6.4	94.2	20.8	100%
Pond 3 North	BA3N-1	7/30/12	865,291	2,031,156	987.1	95.4	7.8	94.2	20.8	101%
	BA3N-2	7/30/12	865,298	2,031,783	987.0	105.6	10.4	100.0	20.9	106%
	BA3N-3	7/31/12	863,918	2,031,935	987.3	103.3	5.9	100.0	20.9	103%
	BA3N-4	7/31/12	864,536	2,031,937	988.0	100.0	3.9	100.0	20.9	100%
	BA3N-5	7/31/12	865,283	2,031,919	988.7	109.0	4.2	100.0	20.9	109%
	BA3N-6	7/31/12	865,293	2,031,330	987.9	88.5	10.7	87.6	26.9	101%
	BA3N-7	8/1/12	865,318	2,031,261	989.3	102.8	5.9	100.0	20.9	103%
	BA3N-8	8/1/12	865,323	2,031,428	990.2	95.5	6.0	94.2	20.8	101%
	BA3N-9	8/1/12	865,285	2,031,916	989.0	108.9	4.8	100.0	20.9	109%
	BA3N-10	8/1/12	865,131	2,031,945	990.0	102.4	8.4	100.0	20.9	102%
	BA3N-11	8/1/12	864,402	2,031,949	989.2	87.6	16.8	87.6	26.9	100%
	BA3N-12	8/1/12	864,036	2,031,942	990.0	98.2	5.1	100.0	20.9	98%

Note:

Specifications: Minimum 95% compaction

Complete laboratory test data is located in Appendix D.

Figures

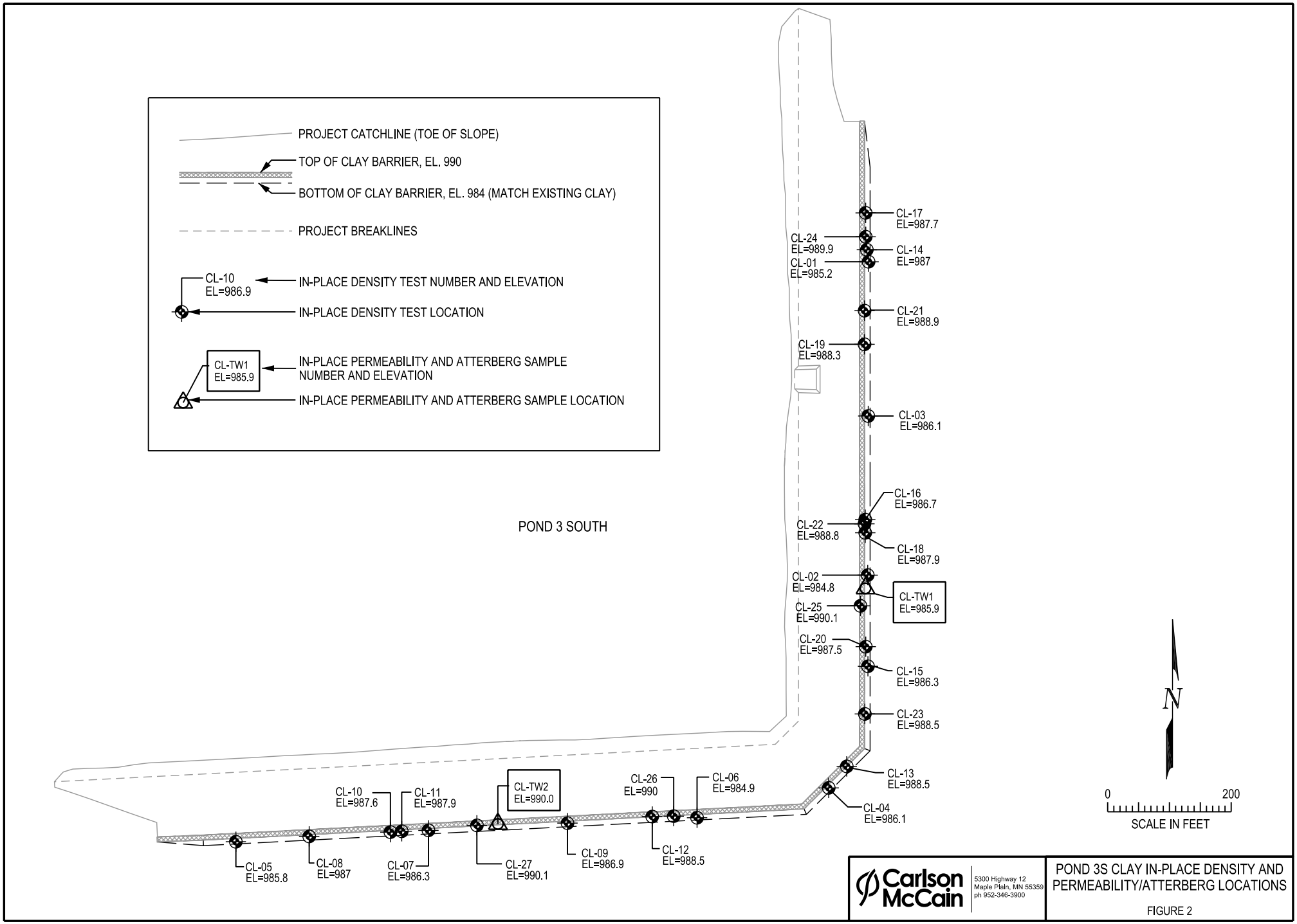


Carlson McCain
5300 Highway 12
Maple Plain, MN 55359
ph 952-346-3900

POND 3S RANDOM FILL IN-PLACE DENSITY TEST LOCATIONS

FIGURE 1

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Cert Report\Figures\Figure 1 - RF density testing locations.dgn



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5300 Highway 12
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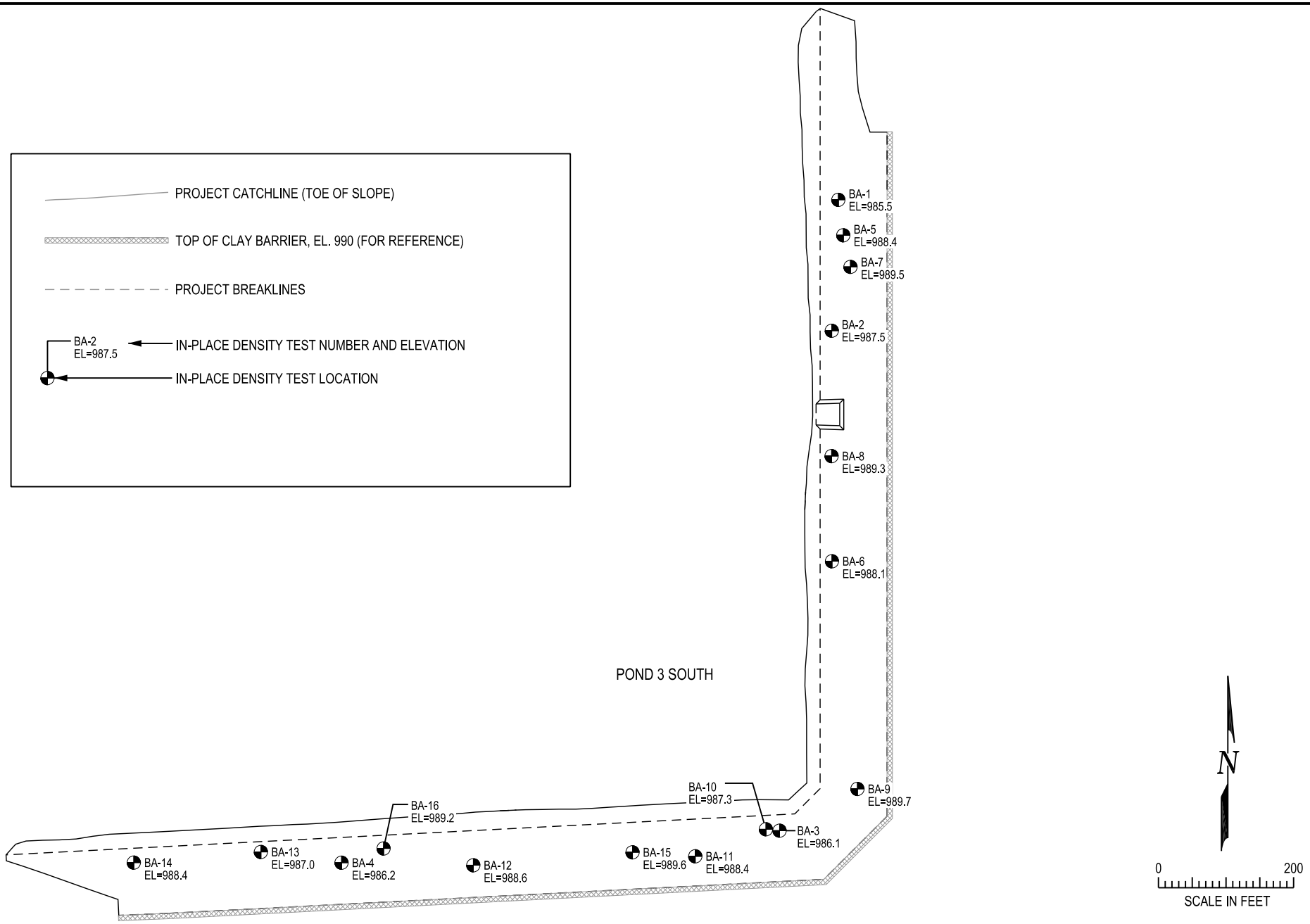
POND 3S CLAY IN-PLACE DENSITY AND PERMEABILITY/ATTERBERG LOCATIONS

FIGURE 2

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Cert Report\Figures\Figure 2 - Clay density testing locations.dgn



File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Cert Report\Figures\Figure 3 - BA density testing locations.dgn

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Maple Plain, MN 55359
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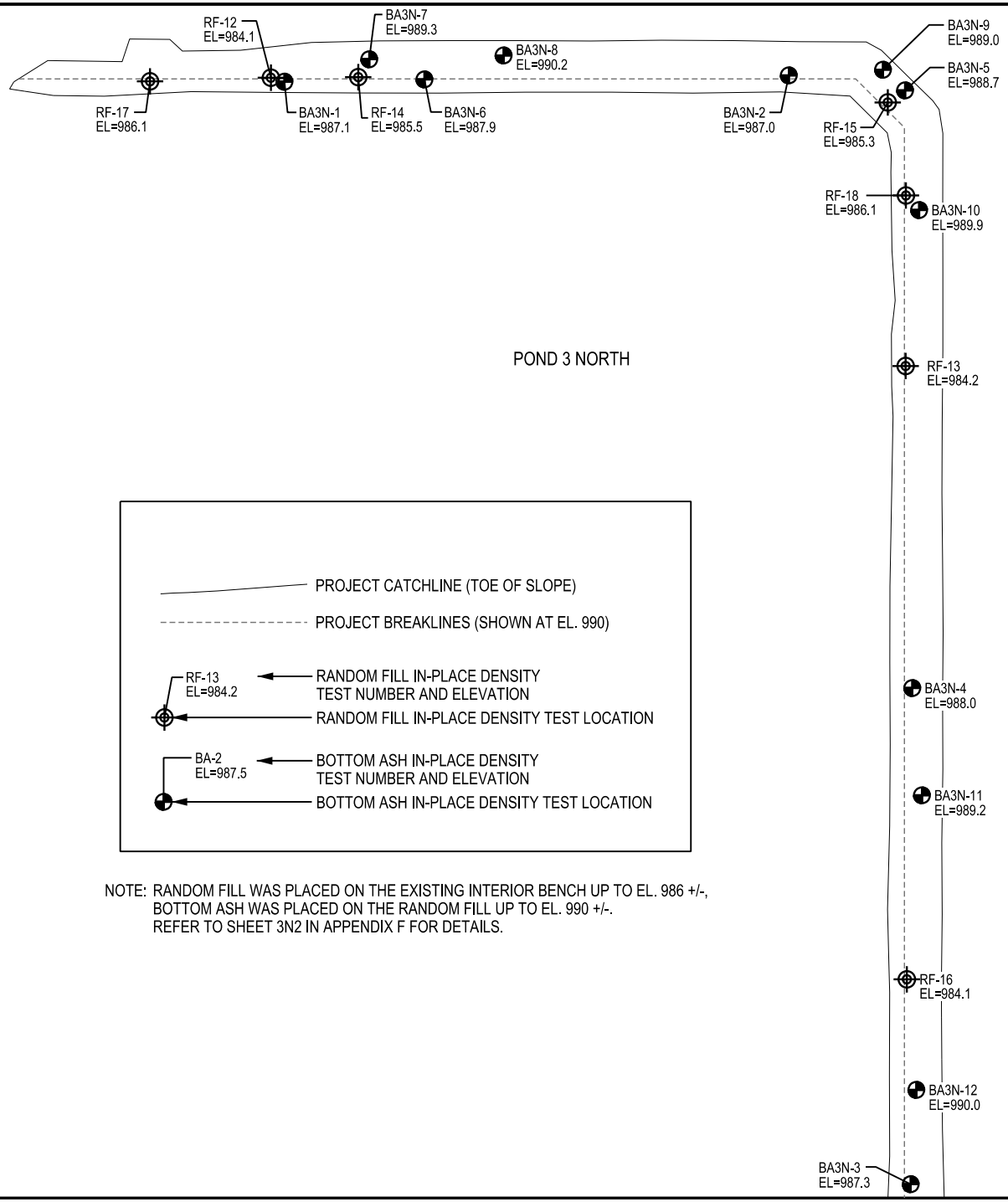
POND 3S BOTTOM ASH
IN-PLACE DENSITY TEST LOCATIONS

FIGURE 3



NOTE: RANDOM FILL WAS PLACED ON THE EXISTING INTERIOR BENCH UP TO EL. 986 +/-, BOTTOM ASH WAS PLACED ON THE RANDOM FILL UP TO EL. 990 +/-. REFER TO SHEET 3N2 IN APPENDIX F FOR DETAILS.

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POND 3N RANDOM FILL & BOTTOM ASH IN-PLACE DENSITY TEST LOCATIONS

FIGURE 4

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Cert Report\Figures\Figure 4 - Pond 3N RF and BA testing locations.dgn

Construction Photographs

2012 Pond 3 Construction Projects

Photo 1 6/12/2012	GPS dozer stripping topsoil from the top of the existing Pond 3 South East embankment, looking south.

Photo 2 6/13/2012	Middle: Dozer spreading lifts of random fill for the clay barrier buttress. Left: Smooth-drum vibratory roller compacting lifts. Right: Exposed existing clay anchor. Looking east.

2012 Pond 3 Construction Projects

Photo 3 6/18/2012	Middle: Dozer and backhoe shaping 1.5 to 1 (horizontal to vertical) outside slope of the random fill buttress (inside slope of future clay barrier). Left: Exposed existing clay anchor. Looking west.

Photo 4 6/19/2012	Random fill clay barrier buttress after final shaping and survey verification, looking south.

2012 Pond 3 Construction Projects

Photo 5 6/25/2012	Right: Dozer spreading clay placed by belly dump trucks into lifts. Middle: Laborer checking for rocks larger than 3 inches in diameter. Left: Vibratory sheepsfoot roller compacting clay lifts. Looking southwest.

Photo 6 6/22/2012	Left: Truck applying water to clay to raise moisture levels to optimum. Right: Sheepsfoot roller compacting clay. Looking northwest.

2012 Pond 3 Construction Projects

Photo 7 6/22/2012	Soil testing technician using nuclear gage used to determine clay in-place density and moisture.

Photo 8 6/22/2012	Skidloader extracting thin-wall tube sample to be tested for in-place permeability and index properties. Void created by extracted sample was filled in with granular bentonite.

2012 Pond 3 Construction Projects

Photo 9	Dozer placing random fill over clay barrier, looking east. Note: random fill was not placed over clay barrier until the in-place permeability tests had passed the required specifications.
6/28/2012	

Photo 10	Foreground: Off-road trucks hauling and smooth roller compacting random fill to construct the embankment over clay barrier. Background: Dozer spreading random fill placed by the off-road trucks. Looking, south.
7/2/2012	

2012 Pond 3 Construction Projects

Photo 11 7/12/2012	Background: Backhoe placing topsoil on the constructed random fill embankment. Foreground: Dozer spreading topsoil in 6-inch lifts. Looking south.

Photo 12 7/20/2012	Left: Laborers placing erosion blanket on topsoil placed in photo 11. Right: Mulch anchored in to the top of the embankment. Looking south.

2012 Pond 3 Construction Projects

Photo 13 7/25/12	Backhoe excavating bottom ash to be hauled from the Bottom Ash Pond to Pond 3 South, looking south.

Photo 14 7/17/12	Dozer spreading bottom ash into lifts on the interior bench of Pond 3 South, looking south.

2012 Pond 3 Construction Projects

Photo 15 7/26/12	Compacted bottom ash on the south end of the interior bench, looking east.

Photo 16 7/27/12	Laborers using electrofusion coupler to extend existing 8-inch high density polyethylene cleanout pipe on the east side of Pond 3 South, looking southwest.

2012 Pond 3 Construction Projects

Photo 17 6/29/12	Background: Dozer spreading random fill into lifts on the Pond 3 North interior bench. Foreground: Smooth drum roller compacting lifts. Looking southeast.

Photo 18 7/27/2012	Dozer spreading a lift of bottom ash material onto a compacted lift of random fill on the east side of the Pond 3 North interior bench, looking north.

Random Fill and Topsoil Test Reports

Pond 3 South Random Fill Standard Proctor Test Reports
Pond 3 North Random Fill Standard Proctor Test Reports
Pond 3 In-place Density Test Reports
Pond 3 Topsoil Nutrient Analysis

Pond 3 South Random Fill Standard Proctor Test Reports

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-002444-S1
Issue No: 1

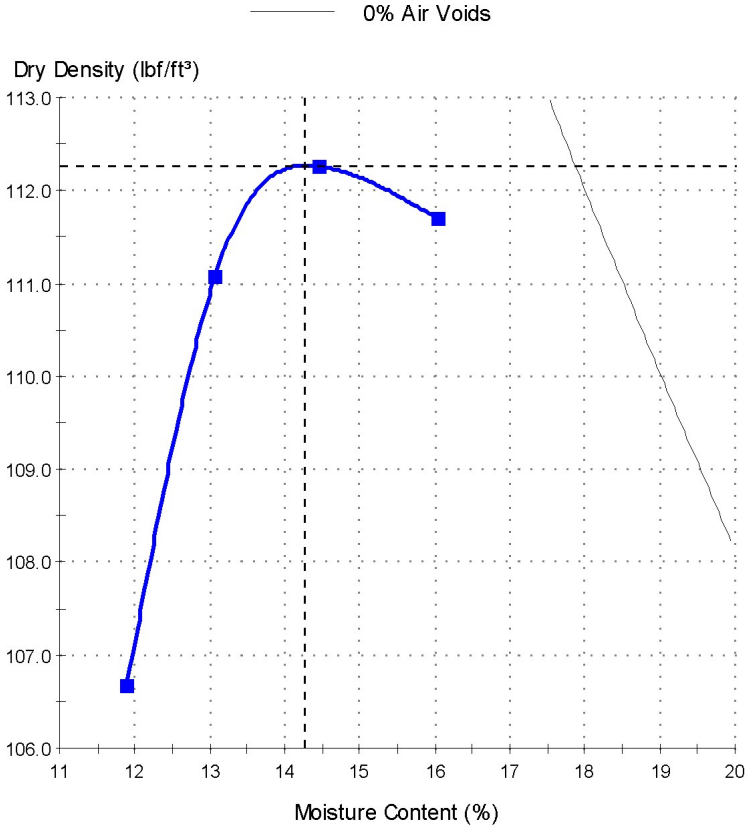
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Mike Kelly
Laboratory Technician II
Date of Issue: 6/13/2012

Sample Details

Sample ID:	W12-002444-S1	**Alternate Sample ID:**	RFP-1
Date Sampled:	6/12/2012	**Sampled By:**	Client
Sampling Method:			
Source:			
Material:	Poorly Graded Sand		
Specification:			
Location:	Onsite Stockpile		
Tested By:	Mike Kelly	**Date Tested:**	6/13/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	**112.3**
Corrected Maximum Dry Density (lbf/ft³):	**112.3**
Optimum Moisture Content (%):	**14.3**
Corrected Optimum Moisture Content (%):	**14.3**
Method:	A
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	3
Passing Sieve No 4 (4.75mm) (%):	97
Visual Description:	SP Poorly Graded Sand, fine-medium grained, brown

Comments

The 200 wash value equals 1.5%.

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-002444-S2
Issue No: 1

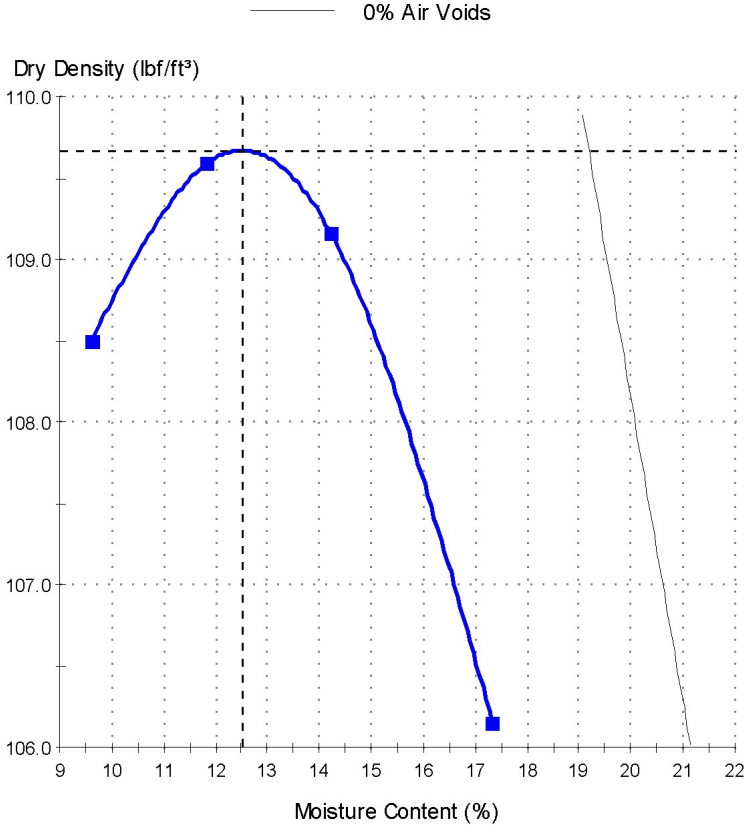
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Mike Kelly
Laboratory Technician II
Date of Issue: 6/13/2012

Sample Details

Sample ID:	W12-002444-S2	Alternate Sample ID:	RFP-2
Date Sampled:		Sampled By:	Client
Sampling Method:	ASTM D75/AASHTO T2/MnDOT 1002 Stockpile		
Source:			
Material:	Poorly Graded Sand		
Specification:			
Location:	Onsite Stockpile		
Tested By:	Mike Kelly	Date Tested:	6/13/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	109.7
Corrected Maximum Dry Density (lbf/ft³):	109.7
Optimum Moisture Content (%):	12.5
Corrected Optimum Moisture Content (%):	12.5
Method:	A
Preparation Method:	Moist
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	2
Passing Sieve No 4 (4.75mm) (%):	98
Visual Description:	SP Poorly Graded Sand, fine-medium grained, brown

Comments

The 200 wash value equals 1.6%.

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Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-002444-S3
Issue No: 1

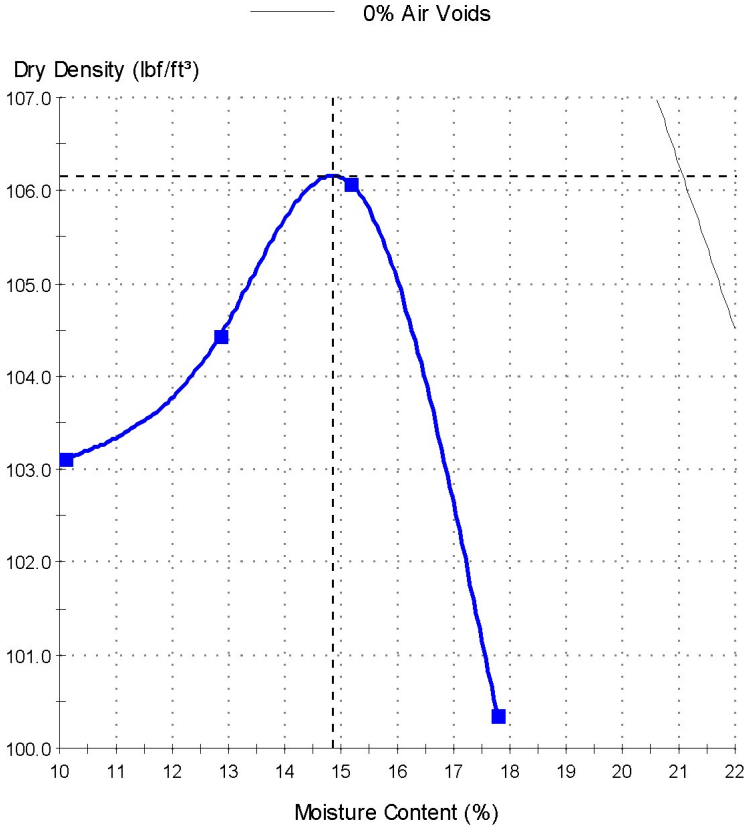
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Mike Kelly
Laboratory Technician II
Date of Issue: 6/13/2012

Sample Details

Sample ID:	W12-002444-S3	Alternate Sample ID:	RFP-3
Date Sampled:		Sampled By:	Client
Sampling Method:	ASTM D75/AASHTO T2/MnDOT 1002 Stockpile		
Source:			
Material:	Poorly Graded Sand		
Specification:			
Location:	Onsite Stockpile		
Tested By:	Mike Kelly	Date Tested:	6/13/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	106.2
Corrected Maximum Dry Density (lbf/ft³):	106.2
Optimum Moisture Content (%):	14.9
Corrected Optimum Moisture Content (%):	14.9
Method:	A
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	1
Passing Sieve No 4 (4.75mm) (%):	99
Visual Description:	SP Poorly Graded Sand, fine-medium grained, brown

Comments

The 200 wash value equals 0.8%.

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-002875-S1
Issue No: 1

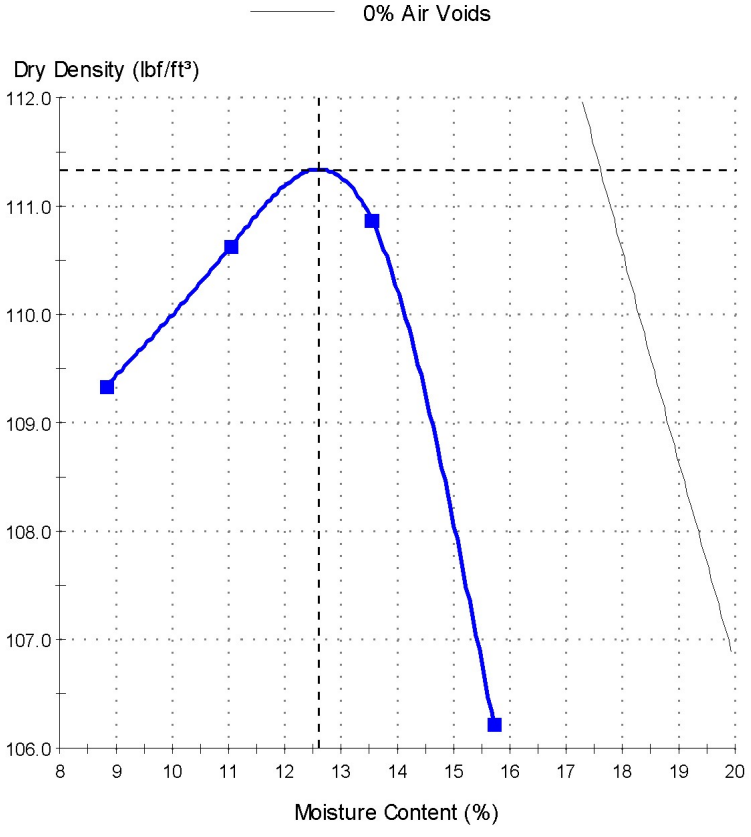
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Mike Kelly
Laboratory Technician II
Date of Issue: 7/11/2012

Sample Details

Sample ID:	W12-002875-S1	Alternate Sample ID:	RFP-5
Date Sampled:	6/22/2012	Sampled By:	John Blenker
Sampling Method:			
Source:	Barrow Pit		
Material:	Poorly Graded Sand		
Specification:			
Location:	Elev: 983.36, N: 862525.26, E: 2031794.21		
Tested By:	Kanhai Seokaran	Date Tested:	6/25/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	111.3
Corrected Maximum Dry Density (lbf/ft³):	111.3
Optimum Moisture Content (%):	12.6
Corrected Optimum Moisture Content (%):	12.6
Method:	A
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.60
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	2
Passing Sieve No 4 (4.75mm) (%):	98
Visual Description:	SP Poorly Graded Sand, fine grained, brown

Comments

The 200 wash value equals 3.3%.

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BRAUN INTERTEC

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-003425-S2
Issue No: 1

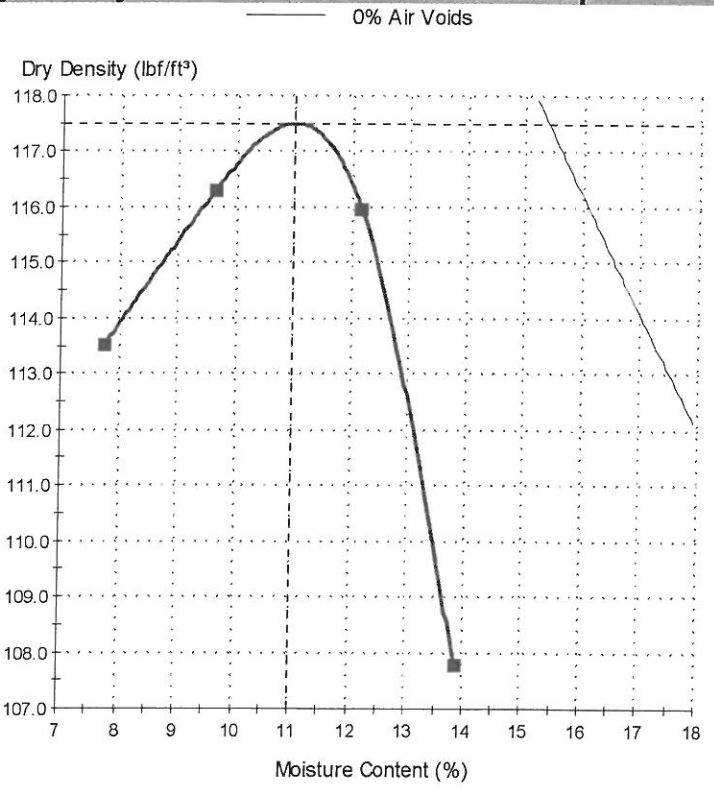
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Kanhai Seokaran
Proctor Supervisor
Date of Issue: 7/10/2012

Sample Details

Sample ID:	W12-003425-S2	**Alternate Sample ID:**	RFP-6
Date Sampled:	7/9/2012	**Sampled By:**	Bill McCain
Sampling Method:			
Source:	Onsite material		
Material:	Poorly Graded Sand		
Specification:			
Location:	Onsite		
Tested By:	Kanhai Seokaran	**Date Tested:**	7/10/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	**117.5**
Corrected Maximum Dry Density (lbf/ft³):	**120.1**
Optimum Moisture Content (%):	**11.0**
Corrected Optimum Moisture Content (%):	**10.3**
Method:	B
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%):	7
Passing Sieve 3/8" (9.5mm) (%):	93
Specific Gravity (Oversize):	2.75
Excluded Oversize Retained Sieve 3/8" (9.5mm) (%):	7
Visual Description:	SP Poorly Graded Sand, fine-medium grained, gray

Comments

The 200 wash value equals 3.4%.

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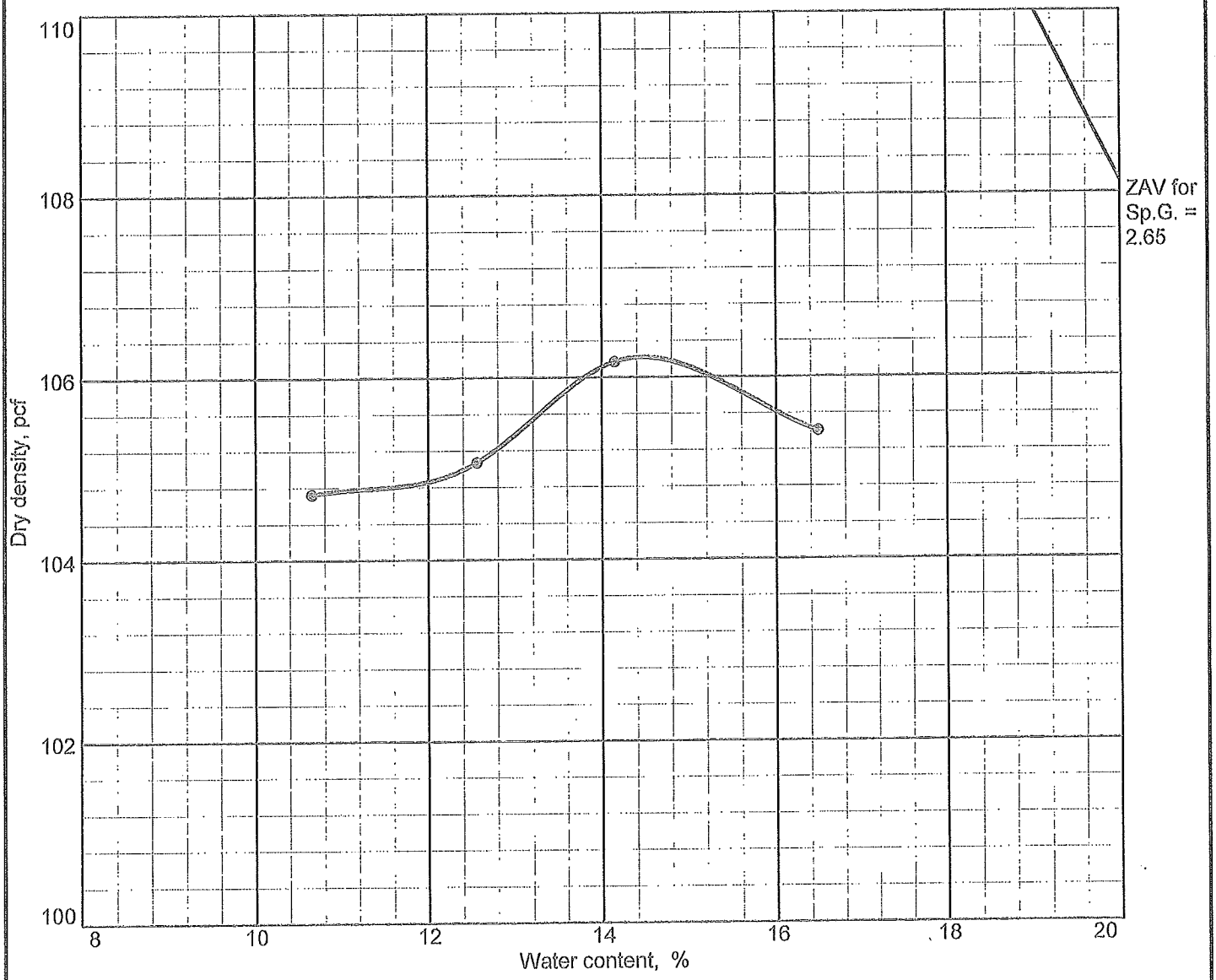
Moisture-Density Relationship



Test specification: ASTM D 698-07e1 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SP		4.3	2.65	N/A	N/A	1.3	1.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 106.2 pcf Optimum moisture = 14.5 %	SP - POORLY GRADED SAND, fine-to medium-grained, with a trace of Gravel, brown

Project No.: SC-09-01367B **Client:** Xcel Energy Services, Inc.

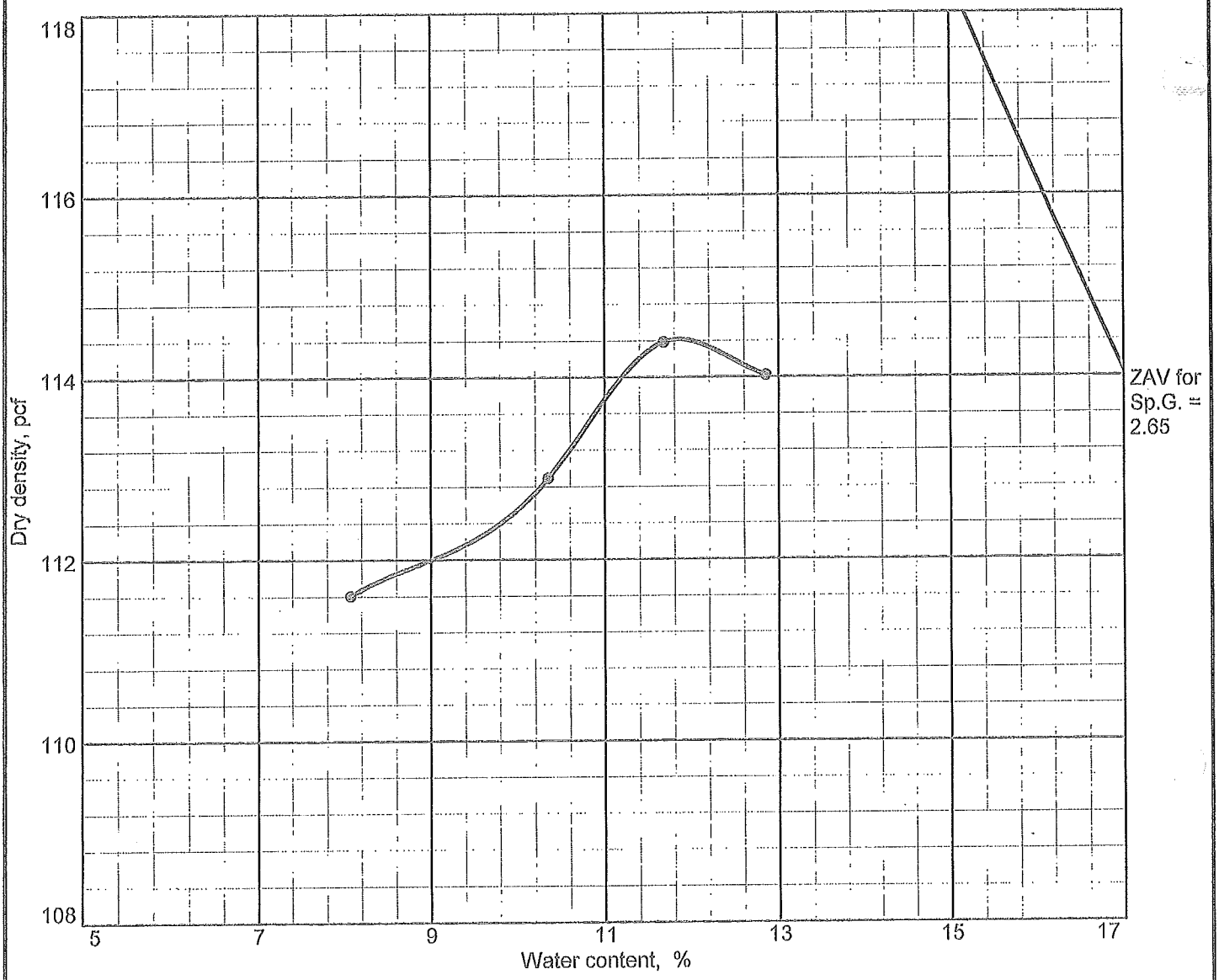
Project: Pond 3 South Construction

Source: **Sample No.:** RFP-12 (2010)

Remarks:
Onsite Stockpile

BRAUN INTERTEC

Moisture-Density Relationship



Test specification: ASTM D 698-07e1 Method B Standard
Oversize correction applied to final results

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
	SP		10.1	2.65	N/A	N/A	6.1	

TEST RESULTS

Maximum dry density = 116.6 pcf

Optimum moisture = 11.2 %

MATERIAL DESCRIPTION

SP - POORLY GRADED SAND, fine-to medium-grained, with a little Gravel, brown

Project No.: SC-09-01367B **Client:** Xcel Energy Services, Inc.

Project: Pond 3 South Construction

Source: **Sample No.:** RFP-18 (2010)

Remarks:

N. 862689 E. 2031914
Elev. 953.5

BRAUN INTERTEC

Pond 3 North Random Fill Standard Proctor Test Reports

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-002759-S1
Issue No: 1

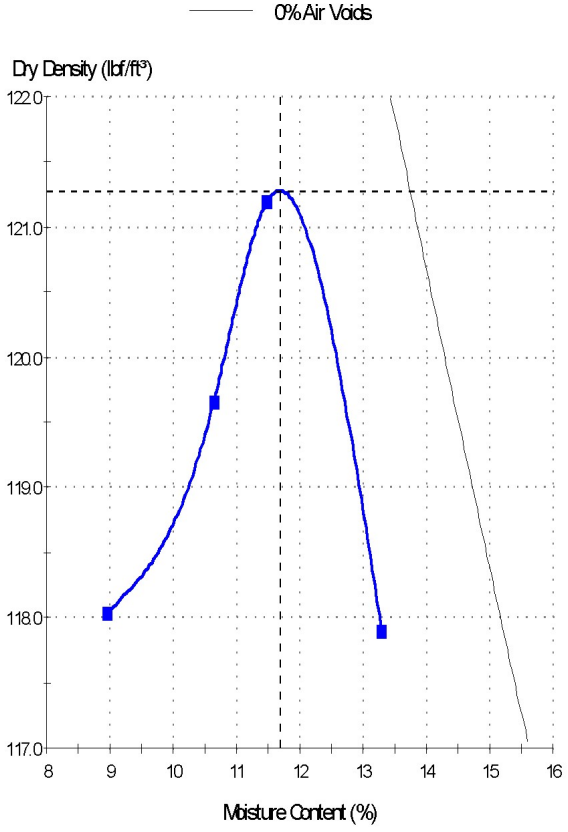
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Dallas Miner
Laboratory Supervisor
Date of Issue: 6/21/2012

Sample Details

Sample ID:	W12-002759-S1	Alternate Sample ID:	RFP-4
Date Sampled:		Sampled By:	
Sampling Method:			
Source:	Onsite material		
Material:	Poorly Graded Sand with Silt		
Specification:			
Location:	Becker		
Tested By:	John Blenker	Date Tested:	6/21/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	121.3
Corrected Maximum Dry Density (lbf/ft³):	121.3
Optimum Moisture Content (%):	11.7
Corrected Optimum Moisture Content (%):	11.7
Method:	A
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	4
Passing Sieve No 4 (4.75mm) (%):	96
Visual Description:	SP-SM Poorly Graded Sand with Silt

Comments

The 200 wash value equals 8.5%.

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Pond 3 In-place Density Test Reports

BRAUN
INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
Fax: 320.253.3054
Web: brauninterteC.com

Report of Field Compaction Tests

Date: July 10, 2012 **Project:** SC-12-02255 **Report:** 1

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

POND 3S

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
RF-1	6/13/12	N	RFP-18	11.2	116.6	9.3	110.8	95	95	A
RF-2	6/13/12	N	RFP-12	14.5	106.2	11.8	101.4	95	95	A
RF-3	6/15/12	N	RFP-1	14.3	112.3	10.4	112.2	100	95	A
RF-4	6/15/12	N	RFP-1	14.3	112.3	8.4	113.3	101	95	A
RF-5	6/15/12	N	RFP-1	14.3	112.3	5.6	115.1	102	95	A
RF-6	6/15/12	N	RFP-1	14.3	112.3	13.4	111.1	99	95	A
RF-7	6/22/12	N	RFP-1	14.3	112.3	4.2	113.2	101	95	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
RF-1	N: 862443.32 E: 2031347.38	985.2
RF-2	N: 862780.02 E: 2031981.65	984.7
RF-3	N: 862428.70 E: 2031254.08	988.4
RF-4	N: 862516.10 E: 2031949.60	989.8
RF-5	N: 862727.07 E: 2031987.20	988.5
RF-6	N: 862988.90 E: 2031984.20	989.9
RF-7	N: 862485.34 E: 2030895.80	984.1

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
Fax: 320.253.3054
Web: braunintertec.com

Report of Field Compaction Tests

Date: July 10, 2012 **Project:** SC-12-02255 **Report:** 2

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
RF-8	6/22/12	N	RFP-1	14.3	112.3	3.0	112.3	100	95	A
RF-9	6/22/12	N	RFP-5	12.6	111.3	4.1	110.9	100	95	A
RF-10	6/27/12	N	RFP-5	12.6	111.3	4.7	110.8	100	95	A
RF-11	6/28/12	N	RFP-2	12.5	109.7	2.3	109.5	100	95	A
RF-12	6/29/12	N	RFP-4	11.7	121.3	6.9	123.5	102	95	A
RF-13	6/29/12	N	RFP-4	11.7	121.3	9.4	117.6	97	95	A
RF-14	7/2/12	N	RFP-4	11.7	121.3	10.2	121.6	100	95	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
RF-8	N: 863368.34 E: 2031911.55	984.0
RF-9	N: 862525.26 E: 2031794.21	983.4
RF-10	N: 863062.23 E: 2032020.91	987.8
RF-11	N: 862357.00 E: 2031102.48	988.2
RF-12	N: 865295.56 E: 2031144.68	984.1
RF-13	N: 865296.25 E: 2031247.46	984.2
RF-14	N: 865296.25 E: 2031247.46	985.6

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
Fax: 320.253.3054
Web: brauninterlec.com

Report of Field Compaction Tests

Date:

Project: SC-12-02255

Report: 3

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
RF-15	7/2/12	N	RFP-4	11.7	121.3	11.9	118.1	97	95	A
RF-16	7/2/12	N	RFP-4	11.7	121.3	7.3	124.7	103	95	A
RF-17	7/3/12	N	RFP-4	14.3	121.3	6.0	115.8	95	95	A
RF-18	7/3/12	N	RFP-4	14.3	121.3	7.9	123.4	102	95	A
RF-19	7/3/12	N	RFP-1	14.3	112.3	5.6	113.0	101	95	A
RF-20	7/5/12	N	RFP-1	14.3	112.3	9.5	112.7	100	95	A
RF-21	7/5/12	N	RFP-1	14.3	112.3	3.7	112.9	101	95	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
RF-15	N: 865264.79 E: 2031906.40	985.3
RF-16	N: 864173.29 E: 2031930.16	984.1
RF-17	N: 865291.02 E: 2030988.35	986.1
RF-18	N: 865148.97 E: 2031929.04	986.1
RF-19	N: 862923.01 E: 2032041.27	989.5
RF-20	N: 862376.10 E: 2031247.41	990.6
RF-21	N: N862385.71 E: 2030943.84	989.3

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
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Web: brauninterteo.com

Report of Field Compaction Tests

Date: July 10, 2012 **Project:** SC-12-02255 **Report:** 4

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
RF-22	7/5/12	N	RFP-3	14.9	106.2	4.9	106.1	100	95	A
RF-23	7/5/12	N	RFP-5	12.6	111.3	5.2	110.3	99	95	A
RF-24	7/6/12	N	RFP-1	14.3	112.3	5.9	114.4	102	95	A
RF-25	7/6/12	N	RFP-5	12.6	111.3	7.9	111.3	100	95	A
RF-26	7/6/12	N	RFP-2	12.5	109.7	5.9	110.7	101	95	A
RF-27	7/6/12	N	RFP-1	14.3	112.3	5.0	114.0	102	95	A
RF-28	7/6/12	N	RFP-1	14.3	112.3	3.1	115.5	103	95	A

POND 3S

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
RF-22	N: 862408.81 E: 2031943.59	991.7
RF-23	N: 862469.51 E: 2032039.31	989.6
RF-24	N: 863251.04 E: 2032049.31	990.3
RF-25	N: 862395.28 E: 2031032.54	991.4
RF-26	N: 862409.35 E: 2031772.46	993
RF-27	N: 862394.26 E: 2031161.39	992.7
RF-28	N: 862408.24 E: 2031513.03	994.1

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
Fax: 320.253.3054
Web: braunintertec.com

Report of Field Compaction Tests

Date: July 10, 2012

Project: SC-12-02255

Report: 5

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
RF-29	7/9/12	N	RFP-6	10.3	120.1	5.9	119.2	99	95	A
RF-30	7/9/12	N	RFP-5	12.6	111.3	3.8	111.1	100	95	A
RF-31	7/10/12	N	RFP-5	12.6	111.3	4.1	111.3	100	95	A
RF-32	7/11/12	N	RFP-1	14.3	112.3	7.0	112.7	100	95	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
RF-29	N: 863377.35 E: 2032037.85	991.9
RF-30	N: 863195.28 E: 2032032.94	991.7
RF-31	N: 862622.58 E: 2031999.50	992.5
RF-32	N: 862861.21 E: 2032008.60	993.9

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

Pond 3 Topsoil Nutrient Analysis

University of Minnesota
Soil Testing Laboratory

SOIL TEST REPORT
Lawn and Garden

Client Copy

Department of Soil, Water, and Climate
Minnesota Extension Service
Agricultural Experiment Station

BRAUN INTERTEC - ST CLOUD
TOM HENKEMEYER
3900 ROOSEVELT RD STE 113
ST CLOUD MN 56301

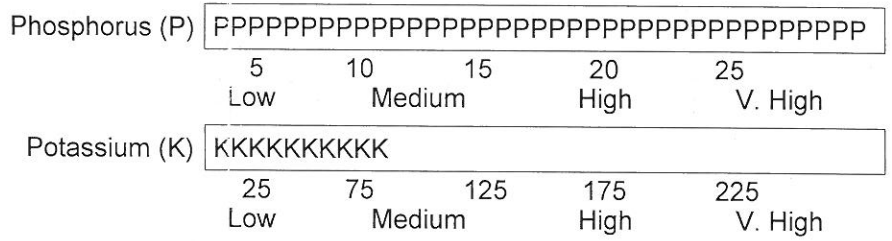
Page	**1**
Report No.	**54025**
Laboratory No.	**112159**
Date Received	**07/19/12**
Date Reported	**07/27/12**

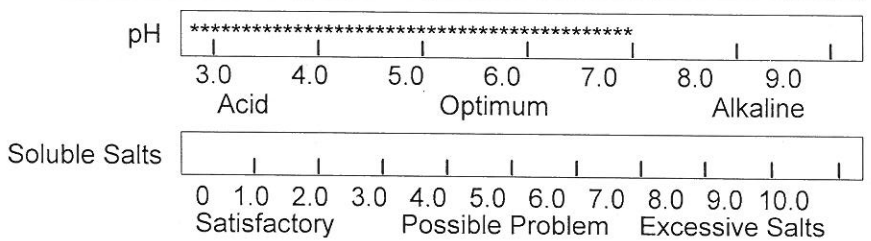
Sample/Field Number: TS01

SOIL TEST RESULTS

Estimated Soil Texture	Organic Matter %	Soluble Salts mmhos/cm	pH	Buffer Index	Nitrate NO3-N ppm	Olsen Phosphorus ppm P	Bray 1 Phosphorus ppm P	Potassium ppm K	Sulfur SO4 -S ppm	Zinc ppm	Iron ppm	Manganese ppm	Copper ppm	Boron ppm	Calcium ppm	Magnesium ppm	Lead ppm
Coarse	**1.5**		**7.1**				**66**	**85**									

INTERPRETATION OF SOIL TEST RESULTS





RECOMMENDATIONS FOR: Before seeding or sodding

LIME RECOMMENDATION: 0 LBS/1,000 SQ.FT.

Grass not watered Clippings not removed

TOTAL AMOUNT OF EACH NUTRIENT TO APPLY PER YEAR:*

NITROGEN	PHOSPHATE	POTASH
1 LBS/1,000 SQ.FT.	1 LBS/1,000 SQ.FT.	4 LBS/1,000 SQ.FT.
44 LBS/ACRE	45 LBS/ACRE	175 LBS/ACRE

THE APPROXIMATE RATIO OR PROPORTION OF THESE NUTRIENTS IS: 5-5-20

During preparation of the seedbed and prior to seeding, till into the top 4-6 inches of soil a fertilizer that supplies the recommended amount of phosphate and potash (ie. a fertilizer that contains little or no nitrogen). Much of the nitrogen applied to this depth will be lost through leaching.

Next, rake into the surface prior to seeding an amount of fertilizer that contains only nitrogen such as 34-0-0 or 46-0-0, or a grade that is high in nitrogen but low in phosphate and potash, that will result in 0.5 lb. of nitrogen per 1000 sq. ft. (22 lb./acre) being applied.

An additional 0.5 lb. N/1000 sq. ft. (22 lb./ acre) should be applied two weeks after seedling emergence or sodding and watered in. After this, the rates and timing of N fertilization are based on the cultural practices that are used. Contact your county extension educator for more information. Water frequently the first year. Retest soil after one year to determine maintenance recommendations. It is recommended that clippings not be removed.

*CAUTION! Do not apply more that 1 lb. nitrogen per 1000 sq. ft. in one application to avoid burning the grass. Additional information is provided on the back side of this form.

County: SHERBURNE. Additional information on the website http://soiltest.cfans.umn.edu/intro.htm or call Yard & Garden Desk 952-443-1426

University of Minnesota
Soil Testing Laboratory

SOIL TEST REPORT
Lawn and Garden

Client Copy
Department of Soil, Water, and Climate
Minnesota Extension Service
Agricultural Experiment Station

BRAUN INTERTEC - ST CLOUD
TOM HENKEMEYER
3900 ROOSEVELT RD STE 113
ST CLOUD MN 56301

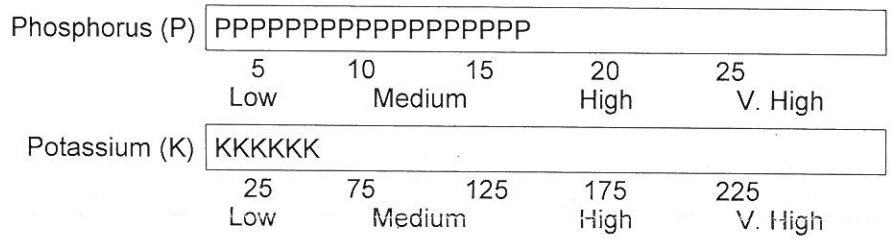
Page **2**
Report No. **54025**
Laboratory No. **112160**
Date Received **07/19/12**
Date Reported **07/27/12**

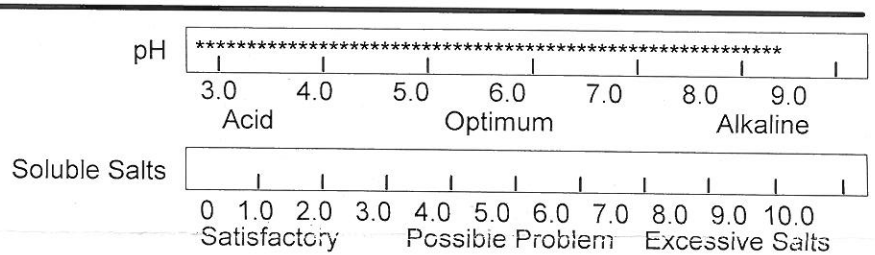
Sample/Field Number: TS2

SOIL TEST RESULTS

Estimated Soil Texture	Organic Matter %	Soluble Salts mmhos/cm	pH	Buffer Index	Nitrate NO3-N ppm	Olsen Phosphorus ppm P	Bray 1 Phosphorus ppm P	Potassium ppm K	Sulfur SO4 -S ppm	Zinc ppm	Iron ppm	Manganese ppm	Copper ppm	Boron ppm	Calcium ppm	Magnesium ppm	Lead ppm
Coarse	**1.2**		**8.4**			**16**	**28**	**46**									

INTERPRETATION OF SOIL TEST RESULTS





RECOMMENDATIONS FOR: Before seeding or sodding

LIME RECOMMENDATION: 0 LBS/1,000 SQ.FT.

TOTAL AMOUNT OF EACH NUTRIENT TO APPLY PER YEAR:*

Grass not watered Clippings not removed

NITROGEN	PHOSPHATE	POTASH
1 LBS/1,000 SQ.FT.	2 LBS/1,000 SQ.FT.	6 LBS/1,000 SQ.FT.
44 LBS/ACRE	90 LBS/ACRE	260 LBS/ACRE

THE APPROXIMATE RATIO OR PROPORTION OF THESE NUTRIENTS IS: 5-10-30

During preparation of the seedbed and prior to seeding, till into the top 4-6 inches of soil a fertilizer that supplies the recommended amount of phosphate and potash (ie. a fertilizer that contains little or no nitrogen). Much of the nitrogen applied to this depth will be lost through leaching.

Next, rake into the surface prior to seeding an amount of fertilizer that contains only nitrogen such as 34-0-0 or 46-0-0, or a grade that is high in nitrogen but low in phosphate and potash, that will result in 0.5 lb. of nitrogen per 1000 sq. ft. (22 lb./acre) being applied.

An additional 0.5 lb. N/1000 sq. ft. (22 lb./ acre) should be applied two weeks after seedling emergence or sodding and watered in. After this, the rates and timing of N fertilization are based on the cultural practices that are used. Contact your county extension educator for more information. Water frequently the first year. Retest soil after one year to determine maintenance recommendations. It is recommended that clippings not be removed.

*CAUTION! Do not apply more that 1 lb. nitrogen per 1000 sq. ft. in one application to avoid burning the grass. Additional information is provided on the back side of this form.

County: SHERBURNE. Additional information on the website http://soiltest.cfans.umn.edu/intro.htm or call Yard & Garden Desk 952-443-1426

Clay Test Reports

Clay Source Prequalification Test Reports
Clay Source Standard Proctor Test Reports
Clay In-place Density Test Reports
Clay In-place Permeability and Index Property Test Reports

Clay Source Prequalification Test Reports

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Material Test Report

Report No: MAT:W12-002341-S1
Issue No: 2

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/11/2012

Sample Details

Sample ID: W12-002341-S1
Alternate Sample ID: CS-1
Sampled By: Dan Riggs
Sampling Method:
Date Sampled: 6/1/2012
Date Submitted: 6/4/2012
Specification: Hydrometer ASTM D 422
Source:
Material Type: CL Sandy Lean Clay
Sample Location:

Other Test Results

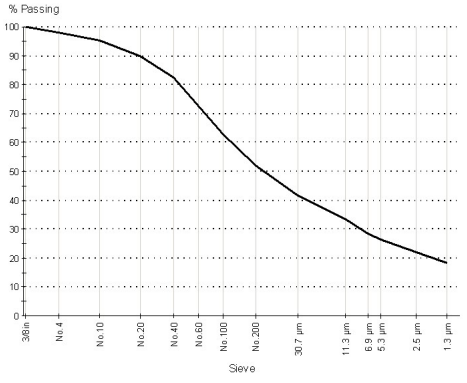
Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	31	
Method		Method B	
Plastic Limit		16	
Plasticity Index		15	
Sample history			
Material retained on 425µm (No. 40) (%)		0.0	
Date Tested		6/13/2012	
Temperature (ºC)	ASTM D 5084 - 03	22.0	
Cell Pressure (lb/in²)		99.0	
Top Pressure (lb/in²)		91.0	
Bottom Pressure (lb/in²)		94.0	
Effective Pressure (lb/in²)		5.0	
Pressure Differential (lb/in²)		3.0	
Permeant		De-aired tap water	
Assumed Specific Gravity		2.700	
Initial Sample Height (in)		2.192	
Final Sample Height (in)		2.192	
Initial Sample Diameter (in)		2.803	
Final Sample Diameter (in)		2.803	
Initial Sample Cross-Section Area (in²)		6.171	
Final Sample Cross-Section Area (in²)		6.171	
Initial Sample Volume (in³)		13.53	
Final Sample Volume (in³)		13.53	
Initial Sample Mass (g)		399.5	
Final Sample Mass (g)		399.5	
Maximum Dry Density (lb/ft³)		115.9	

Particle Size Distribution

Method: ASTM D 422 - 07
Drying by:
Date Tested: 6/13/2012

Sieve Size	% Passing	Limits
3/8in (9.5mm)	100	
No.4 (4.75mm)	98	
No.10 (2.0mm)	95	
No.20 (850µm)	90	
No.40 (425µm)	82	
No.60 (250µm)	73	
No.100 (150µm)	63	
No.200 (75µm)	52	
30.7 µm	41.7	
11.3 µm	33.4	
6.9 µm	28.5	
5.3 µm	26.2	
2.5 µm	22.0	
1.3 µm	18.4	

Chart



Comments

N/A

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Material Test Report

Report No: MAT:W12-002341-S1
Issue No: 2

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/11/2012

Sample Details

Sample ID: W12-002341-S1
Alternate Sample ID: CS-1
Sampled By: Dan Riggs
Sampling Method:
Date Sampled: 6/1/2012
Date Submitted: 6/4/2012
Specification: Hydrometer ASTM D 422
Source:
Material Type: CL Sandy Lean Clay
Sample Location:

Other Test Results

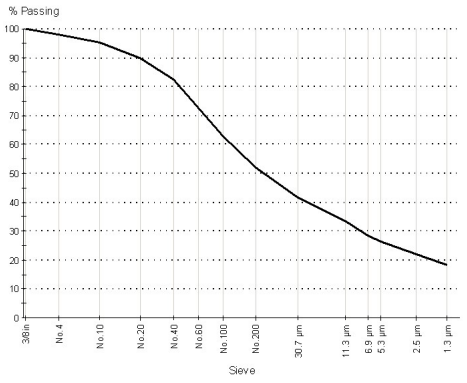
Description	Method	Result	Limits
Optimum Moisture Content (%)		13.3	
Relative Compaction (%)		97	
Moisure Content		2.1 % above optimum	
Dry Density (lb/ft³)		112.5	
Initial Moisture Content (%)		15.4	
Final Moisture Content (%)		18.4	
Initial Saturation (%)		83	
Final Saturation (%)		100	
Initial Hydraulic Gradient		34.4	
Ending Hydraulic Gradient		39.4	
Hydraulic Conductivity (cm/s)		1.32E-08	
Corrected Hydraulic Conductivity (cm/s)		1.26E-08	
Date Tested		6/13/2012	

Particle Size Distribution

Method: ASTM D 422 - 07
Drying by:
Date Tested: 6/13/2012

Sieve Size	% Passing	Limits
3/8in (9.5mm)	100	
No.4 (4.75mm)	98	
No.10 (2.0mm)	95	
No.20 (850µm)	90	
No.40 (425µm)	82	
No.60 (250µm)	73	
No.100 (150µm)	63	
No.200 (75µm)	52	
30.7 µm	41.7	
11.3 µm	33.4	
6.9 µm	28.5	
5.3 µm	26.2	
2.5 µm	22.0	
1.3 µm	18.4	

Chart



Comments

N/A

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Material Test Report

Report No: MAT:W12-002341-S2
Issue No: 2

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/11/2012

Sample Details

Sample ID:	W12-002341-S2
Alternate Sample ID:	CS-2
Sampled By:	Dan Riggs
Sampling Method:	
Date Sampled:	6/1/2012
Date Submitted:	6/4/2012
Specification:	Hydrometer ASTM D 422
Source:	
Material Type:	CL Sandy Lean Clay
Sample Location:	

Other Test Results

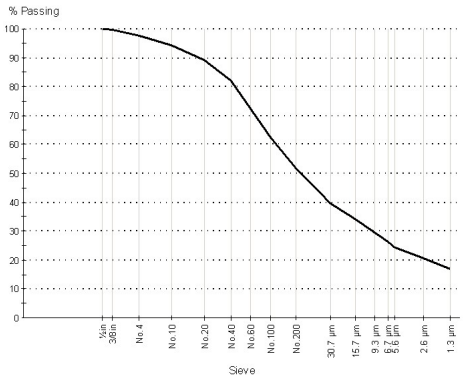
Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	29	
Method		Method B	
Plastic Limit		17	
Plasticity Index		12	
Sample history			
Material retained on 425µm (No. 40) (%)		0.0	
Date Tested		6/13/2012	
Temperature (ºC)	ASTM D 5084 - 03	22.0	
Cell Pressure (lb/in²)		99.0	
Top Pressure (lb/in²)		91.0	
Bottom Pressure (lb/in²)		94.0	
Effective Pressure (lb/in²)		5.0	
Pressure Differential (lb/in²)		3.0	
Permeant		De-aired tap water	
Assumed Specific Gravity		2.700	
Initial Sample Height (in)		2.214	
Final Sample Height (in)		2.214	
Initial Sample Diameter (in)		2.803	
Final Sample Diameter (in)		2.803	
Initial Sample Cross-Section Area (in²)		6.171	
Final Sample Cross-Section Area (in²)		6.171	
Initial Sample Volume (in³)		13.66	
Final Sample Volume (in³)		13.66	
Initial Sample Mass (g)		417.8	
Final Sample Mass (g)		417.7	
Maximum Dry Density (lb/ft³)		118.7	

Particle Size Distribution

Method: ASTM D 422 - 07
Drying by:
Date Tested: 6/13/2012

Sieve Size	% Passing	Limits
½in (12.5mm)	100	
3/8in (9.5mm)	100	
No.4 (4.75mm)	98	
No.10 (2.0mm)	94	
No.20 (850µm)	89	
No.40 (425µm)	82	
No.60 (250µm)	72	
No.100 (150µm)	62	
No.200 (75µm)	52	
30.7 µm	39.6	
15.7 µm	34.0	
9.3 µm	29.4	
6.7 µm	26.3	
5.6 µm	24.4	
2.6 µm	20.7	
1.3 µm	17.0	

Chart



Comments

N/A

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Material Test Report

Report No: MAT:W12-002341-S2
Issue No: 2

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/11/2012

Sample Details

Sample ID: W12-002341-S2
Alternate Sample ID: CS-2
Sampled By: Dan Riggs
Sampling Method:
Date Sampled: 6/1/2012
Date Submitted: 6/4/2012
Specification: Hydrometer ASTM D 422
Source:
Material Type: CL Sandy Lean Clay
Sample Location:

Other Test Results

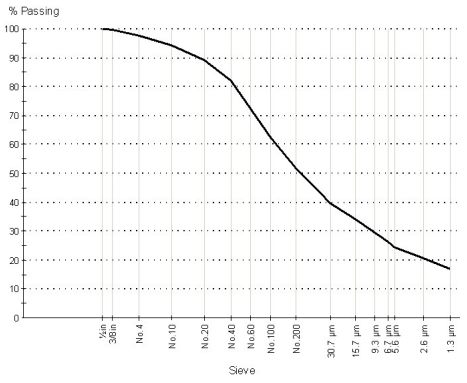
Description	Method	Result	Limits
Optimum Moisture Content (%)		13.0	
Relative Compaction (%)		98	
Moisure Content		1.4 % above optimum	
Dry Density (lb/ft³)		116.5	
Initial Moisture Content (%)		14.4	
Final Moisture Content (%)		16.5	
Initial Saturation (%)		87	
Final Saturation (%)		100	
Initial Hydraulic Gradient		36.8	
Ending Hydraulic Gradient		37.5	
Hydraulic Conductivity (cm/s)		1.04E-08	
Corrected Hydraulic Conductivity (cm/s)		9.95E-09	
Date Tested		6/13/2012	

Particle Size Distribution

Method: ASTM D 422 - 07
Drying by:
Date Tested: 6/13/2012

Sieve Size	% Passing	Limits
½in (12.5mm)	100	
3/8in (9.5mm)	100	
No.4 (4.75mm)	98	
No.10 (2.0mm)	94	
No.20 (850µm)	89	
No.40 (425µm)	82	
No.60 (250µm)	72	
No.100 (150µm)	62	
No.200 (75µm)	52	
30.7 µm	39.6	
15.7 µm	34.0	
9.3 µm	29.4	
6.7 µm	26.3	
5.6 µm	24.4	
2.6 µm	20.7	
1.3 µm	17.0	

Chart



Comments

N/A

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Clay Source Standard Proctor Test Reports

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-002072-S1
Issue No: 1

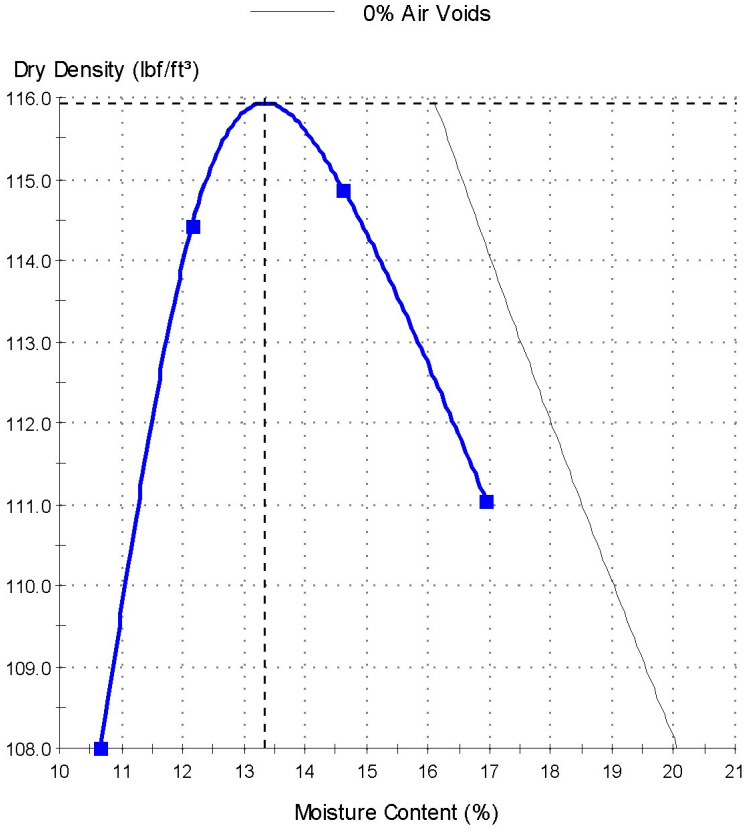
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Mike Kelly
Laboratory Technician II
Date of Issue: 6/5/2012

Sample Details

Sample ID:	W12-002072-S1	Alternate Sample ID:	CS-1
Date Sampled:	6/1/2012	Sampled By:	Dan Riggs
Sampling Method:			
Source:			
Material:	Clayey Sand		
Specification:			
Location:			
Tested By:	Mike Kelly	Date Tested:	6/4/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	115.9
Corrected Maximum Dry Density (lbf/ft³):	115.9
Optimum Moisture Content (%):	13.3
Corrected Optimum Moisture Content (%):	13.3
Method:	A
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	5
Passing Sieve No 4 (4.75mm) (%):	95
Visual Description:	SC Clayey Sand, fine-medium grained, brown

Comments

The 200 wash value equals 49.3%.

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Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-002076-S1
Issue No: 1

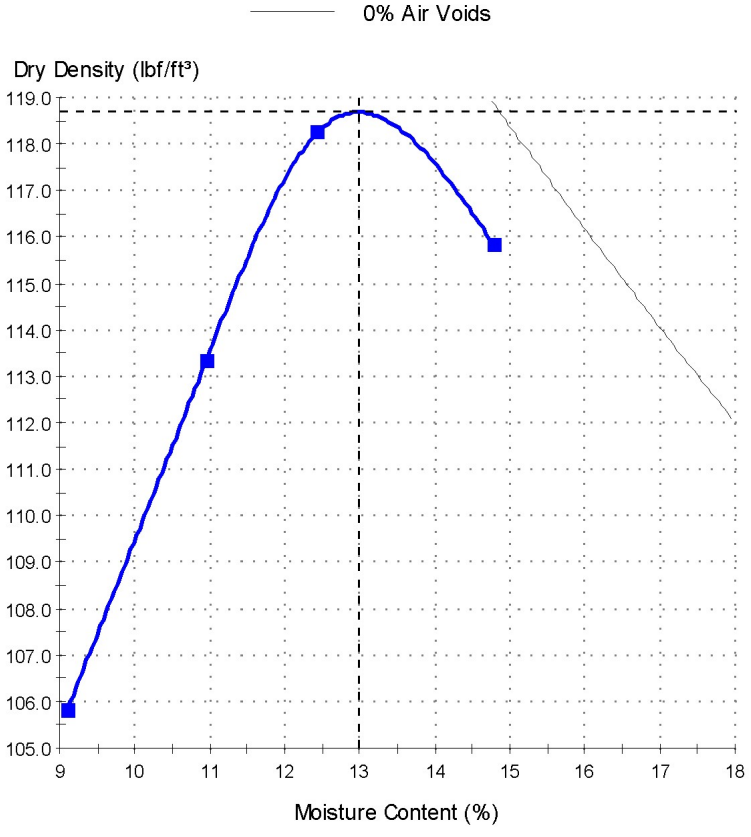
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Mike Kelly
Laboratory Technician II
Date of Issue: 6/5/2012

Sample Details

Sample ID:	W12-002076-S1	Alternate Sample ID:	CS-2
Date Sampled:	6/1/2012	Sampled By:	Dan Riggs
Sampling Method:			
Source:			
Material:	CL Sandy Lean Clay		
Specification:			
Location:			
Tested By:	Mike Kelly	Date Tested:	6/4/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	118.7
Corrected Maximum Dry Density (lbf/ft³):	118.7
Optimum Moisture Content (%):	13.0
Corrected Optimum Moisture Content (%):	13.0
Method:	B
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%):	2
Passing Sieve 3/8" (9.5mm) (%):	98
Visual Description:	CL Sandy Lean Clay, brown

Comments

The 200 wash value equals 51.1%.

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Clay In-place Density Test Reports

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

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Web: brauninterlec.com

Report of Field Compaction Tests

Date: July 10, 2012 **Project:** SC-12-02255 **Report:** 1

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
CL-01	6/22/12	N	CS-1	13.3	115.9	13.6	117.6	101	97	A
CL-02	6/22/12	N	CS-1	13.3	115.9	15.6	114.3	99	97	A
CL-03	6/22/12	N	CS-1	13.3	115.9	14.7	115.3	99	97	A
CL-04	6/22/12	N	CS-1	13.3	115.9	14.9	114.5	99	97	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
CL-01	N: 86331.31 E: 2032015.61	985.2
CL-02	N: 862823.56 E: 2032014.32	984.8
CL-03	N: 863081.35 E: 2032015.12	986.1
CL-04	N: 862470.01 E: 2031966.27	986.1

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
Fax: 320.253.3054
Web: brauninterlec.com

Report of Field Compaction Tests

Date: July 10, 2012 **Project:** SC-12-02255 **Report:** 1

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
CL-01	6/22/12	N	CS-1	13.3	115.9	13.6	117.6	101	97	A
CL-02	6/22/12	N	CS-1	13.3	115.9	15.6	114.3	99	97	A
CL-03	6/22/12	N	CS-1	13.3	115.9	14.7	115.3	99	97	A
CL-04	6/22/12	N	CS-1	13.3	115.9	14.9	114.5	99	97	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
CL-01	N: 86331.31 E: 2032015.61	985.2
CL-02	N: 862823.56 E: 2032014.32	984.8
CL-03	N: 863081.35 E: 2032015.12	986.1
CL-04	N: 862470.01 E: 2031966.27	986.1

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
Fax: 320.253.3054
Web: braunintertec.com

Report of Field Compaction Tests

Date: July 10, 2012

Project: SC-12-02255

Report: 2

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
CL-05	6/22/12	N	CS-1	13.3	115.9	13.9	116.8	101	97	A
CL-06	6/23/12	N	CS-1	13.3	115.9	15.0	113.6	98	97	A
CL-07	6/23/12	N	CS-1	13.3	115.9	14.4	113.9	98	97	A
CL-08	6/23/12	N	CS-1	13.3	115.9	13.9	117.0	101	97	A
CL-09	6/23/12	N	CS-1	13.3	115.9	15.2	115.3	99	97	A
CL-10	6/23/12	N	CS-1	13.3	115.9	15.1	114.8	99	97	A
CL-11	6/23/12	N	CS-2	13.0	118.7	13.6	119.0	100	97	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
CL-05	N: 862391.49 E: 2030991.01	985.8
CL-06	N: 862430.42 E: 2031737.93	984.9
CL-07	N: 862409.97 E: 2031302.93	986.3
CL-08	N: 862376.81 E: 2031108.20	987.0
CL-09	N: 862421.66 E: 2031528.06	986.9
CL-10	N: 862407.06 E: 2031241.31	987.6
CL-11	N: 862408.49 E: 2031259.72	987.9

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

AA/EOE

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
Fax: 320.253.3054
Web: braunintertec.com

Report of Field Compaction Tests

Date:

Project: SC-12-02255

Report: 3

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
CL-12	6/23/12	N	CS-2	13.0	118.7	13.4	117.9	99	97	A
CL-13	6/23/12	N	CS-1	13.3	115.9	14.7	112.6	97	97	A
CL-14	6/23/12	N	CS-1	13.3	115.9	13.5	117.0	101	97	A
CL-15	6/23/12	N	CS-1	13.3	115.9	14.3	116.1	100	97	A
CL-16	6/25/12	N	CS-1	13.3	115.9	14.0	112.9	97	97	A
CL-17	6/25/12	N	CS-2	13.0	118.7	13.5	119.5	101	97	A
CL-18	6/25/12	N	CS-2	13.0	118.7	13.4	118.0	99	97	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
CL-12	N: 862432.34 E: 2031665.31	988.5
CL-13	N: 862513.59 E: 2031980.33	988.5
CL-14	N: 863350.72 E: 2032012.88	987.0
CL-15	N; 862675.84 E: 2032014.67	986.3
CL-16	N: 862913.41 E: 2032010.27	986.7
CL-17	N: 863410.46 E: 2032010.97	987.7
CL-18	N: 862892.12 E: 2032010.30	987.9

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

AA/EOE

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
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Saint Cloud, MN 56301

Phone: 320.253.9940
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Report of Field Compaction Tests

Date: July 10, 2012

Project: SC-12-02255

Report: 4

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
CL-19	6/25/12	N	CS-2	13.0	118.7	13.3	117.2	99	97	A
CL-20	6/25/12	N	CS-1	13.3	115.9	13.9	113.9	98	97	A
CL-21	6/25/12	N	CS-1	13.3	115.9	14.2	114.9	99	97	A
CL-22	6/25/12	N	CS-2	13.0	118.7	13.2	118.1	99	97	A
CL-23	6/25/12	N	CS-1	13.3	115.9	14.7	114.7	99	97	A
CL-24	6/26/12	N	CS-1	13.3	115.9	14.0	113.7	98	97	A
CL-25	6/26/12	N	CS-1	13.3	115.9	15.5	112.7	97	97	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
CL-19	N: 863197.51 E: 2032009.09	988.3
CL-20	N: 862707.55 E: 2032011.09	987.5
CL-21	N: 863252.03 E: 2032009.17	988.9
CL-22	N: 862906.67 E: 2032009.06	988.8
CL-23	N: 862598.58 E: 2032009.61	988.5
CL-24	N: 863362.83 E: 2031989.10	989.9
CL-25	N: 862790.46 E: 2031989.10	990.1

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

BRAUN INTERTEC

Braun Intertec Corporation
3900 Roosevelt Road
Suite 113
Saint Cloud, MN 56301

Phone: 320.253.9940
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Web: brauninterlec.com

Report of Field Compaction Tests

Date: July 10, 2012 **Project:** SC-12-02255 **Report:** 5

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
CL-26	6/26/12	N	CS-1	13.3	115.9	14.7	113.3	98	97	A
CL-27	6/26/12	N	CS-2	13.0	118.7	14.1	118.4	100	97	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
CL-26	N: 862464.27 E: 2031702.44	990.0
CL-27	N: 862464.27 E: 2031302.44	990.1

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

Clay In-place Permeability and Index Property Test Reports

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Material Test Report

Report No: MAT:W12-003498-S1
Issue No: 1

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

James Streier

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/11/2012

Sample Details

Sample ID:	W12-003498-S1
Alternate Sample ID:	CLTW-1
Sampled By:	John Blenker
Sampling Method:	Soil Boring Shelby Tube
Date Sampled:	6/22/2012
Date Submitted:	6/28/2012
Specification:	
Source:	Monticello, MN
Material Type:	Clayey Sand
Sample Location:	N:862813.03 E:2032010.56 Elev=985.93

Other Test Results

Description	Method	Result	Limits
Temperature (°C)	ASTM D 5084 - 03	22.0	
Cell Pressure (lb/in²)		99.0	
Top Pressure (lb/in²)		91.0	
Bottom Pressure (lb/in²)		94.0	
Effective Pressure (lb/in²)		5.0	
Pressure Differential (lb/in²)		3.0	
Permeant		De-aired tap water	
Assumed Specific Gravity		2.750	
Initial Sample Height (in)		2.876	
Final Sample Height (in)		2.876	
Initial Sample Diameter (in)		2.828	
Final Sample Diameter (in)		2.828	
Initial Sample Cross-Section Area (in²)		6.281	
Final Sample Cross-Section Area (in²)		6.281	
Initial Sample Volume (in³)		18.06	
Final Sample Volume (in³)		18.06	
Initial Sample Mass (g)		567.5	
Final Sample Mass (g)		567.5	
Initial Dry Density (lb/ft³)		119.7	
Final Dry Density (lb/ft³)		119.7	
Initial Moisture Content (%)		15.9	
Final Moisture Content (%)		15.8	
Initial Saturation (%)		100	
Final Saturation (%)		100	
Initial Hydraulic Gradient		27.8	
Ending Hydraulic Gradient		28.3	
Hydraulic Conductivity (cm/s)		1.11E-08	
Corrected Hydraulic Conductivity (cm/s)		1.06E-08	
Date Tested		7/11/2012	

Particle Size Distribution

Method:
Drying by:
Date Tested:

Sieve Size	% Passing	Limits

Chart

Comments

N/A

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Material Test Report

Report No: MAT:W12-003498-S2
Issue No: 1

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

James Streier

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/11/2012

Sample Details

Sample ID: W12-003498-S2
Alternate Sample ID: CLTW-2
Sampled By: John Blenker
Sampling Method: Soil Boring Shelby Tube
Date Sampled: 6/22/2012
Date Submitted: 6/28/2012
Specification:
Source: Monticello, MN
Material Type: Clayey Sand
Sample Location: N:862464.27 E:2031302.44 Elev=990.1

Other Test Results

Description	Method	Result	Limits
Temperature (°C)	ASTM D 5084 - 03	22.0	
Cell Pressure (lb/in²)		99.0	
Top Pressure (lb/in²)		91.0	
Bottom Pressure (lb/in²)		94.0	
Effective Pressure (lb/in²)		5.0	
Pressure Differential (lb/in²)		3.0	
Permeant		De-aired tap water	
Assumed Specific Gravity		2.750	
Initial Sample Height (in)		2.729	
Final Sample Height (in)		2.729	
Initial Sample Diameter (in)		2.862	
Final Sample Diameter (in)		2.862	
Initial Sample Cross-Section Area (in²)		6.433	
Final Sample Cross-Section Area (in²)		6.433	
Initial Sample Volume (in³)		17.56	
Final Sample Volume (in³)		17.56	
Initial Sample Mass (g)		535.0	
Final Sample Mass (g)		535.0	
Initial Dry Density (lb/ft³)		116.1	
Final Dry Density (lb/ft³)		116.1	
Initial Moisture Content (%)		16.0	
Final Moisture Content (%)		17.4	
Initial Saturation (%)		92	
Final Saturation (%)		100	
Initial Hydraulic Gradient		28.6	
Ending Hydraulic Gradient		29.1	
Hydraulic Conductivity (cm/s)		2.86E-08	
Corrected Hydraulic Conductivity (cm/s)		2.73E-08	
Date Tested		7/11/2012	

Particle Size Distribution

Method:
Drying by:
Date Tested:

Sieve Size	% Passing	Limits

Chart

Comments

N/A

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Material Test Report

Report No: MAT:W12-003246-S1
Issue No: 1

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

James Streier

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/3/2012

Sample Details

Sample ID:	W12-003246-S1
Alternate Sample ID:	CLTW-1
Sampled By:	John Blenker
Sampling Method:	
Date Sampled:	6/22/2012
Date Submitted:	6/28/2012
Specification:	ASTM D 422
Source:	
Material Type:	Clayey Sand
Sample Location:	N:862813.03 E:2032010.56

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	29	
Method		Method B	
Plastic Limit		15	
Plasticity Index		14	
Sample history			
Material retained on 425µm (No. 40) (%)		0.0	
Date Tested		7/3/2012	

Comments

N/A

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Material Test Report

Report No: MAT:W12-003246-S1
Issue No: 1

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

James Streier

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/3/2012

Sample Details

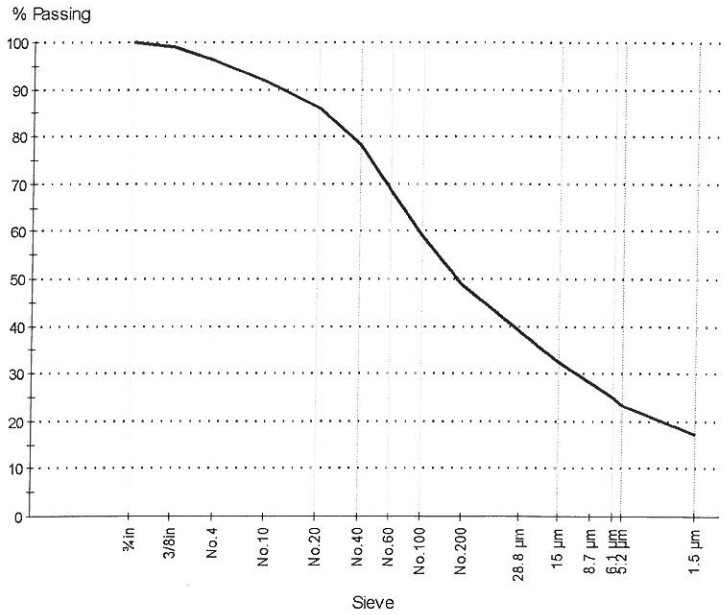
Sample ID:	W12-003246-S1
Alternate Sample ID:	CLTW-1
Sampled By:	John Blenker
Sampling Method:	
Date Sampled:	6/22/2012
Date Submitted:	6/28/2012
Specification:	ASTM D 422
Source:	
Material Type:	Clayey Sand
Sample Location:	N:862813.03 E:2032010.56

Atterberg Limit:

Liquid Limit:	29
Plastic Limit:	15
Plasticity Index:	14
Linear Shrinkage (%):	N/A

Sample Description:

Particle Size Distribution



Grading: ASTM D 422 - 07

Drying by:
Date Tested: 7/3/2012

Sieve Size	% Passing	Limits
¾in (19.0mm)	100	
3/8in (9.5mm)	99	
No.4 (4.75mm)	96	
No.10 (2.0mm)	92	
No.20 (850µm)	86	
No.40 (425µm)	78	
No.60 (250µm)	69	
No.100 (150µm)	59	
No.200 (75µm)	49	
28.8 µm	39.0	
15.0 µm	32.5	
8.7 µm	28.1	
6.1 µm	25.1	
5.2 µm	23.2	
1.5 µm	17.1	

COBBLES	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
(0.0%)	(0.0%)	(3.9%)	(4.6%)	(13.1%)	(29.8%)	(25.7%)	(22.9%)

D85: 0.7698 **D60:** 0.1584 **D50:** 0.0825
D30: 0.0110 **D15:** 0.0010 **D10:** 0.0004

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Material Test Report

Report No: MAT:W12-003246-S2
Issue No: 1

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

James Streier

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/3/2012

Sample Details

Sample ID: W12-003246-S2
Alternate Sample ID: CLTW-2
Sampled By: John Blenker
Sampling Method:
Date Sampled: 6/26/2012
Date Submitted: 6/28/2012
Specification: ASTM D 422
Source:
Material Type: Clayey Sand
Sample Location: N:862464.27 E:2031302.44

Other Test Results

Description	Method	Result	Limits
Dispersion device	ASTM D 422 - 07		
Dispersion time (min)			
Shape			
Hardness			
Liquid Limit	ASTM D 4318 - 05	31	
Method		Method B	
Plastic Limit		14	
Plasticity Index		17	
Sample history			
Material retained on 425µm (No. 40) (%)		0.0	
Date Tested		7/3/2012	

Comments

N/A

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Material Test Report

Report No: MAT:W12-003246-S2
Issue No: 1

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Jim Streier
Geotechnical Laboratory
Date of Issue: 7/3/2012

Sample Details

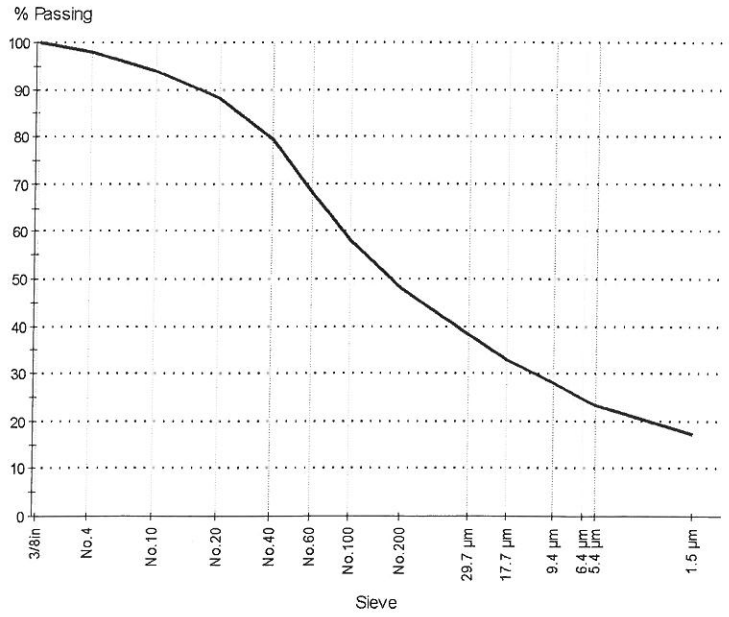
Sample ID:	W12-003246-S2
Alternate Sample ID:	CLTW-2
Sampled By:	John Blenker
Sampling Method:	
Date Sampled:	6/26/2012
Date Submitted:	6/28/2012
Specification:	ASTM D 422
Source:	
Material Type:	Clayey Sand
Sample Location:	N:862464.27 E:2031302.44

Atterberg Limit:

Liquid Limit:	31
Plastic Limit:	14
Plasticity Index:	17
Linear Shrinkage (%):	N/A

Sample Description:

Particle Size Distribution



Grading: ASTM D 422 - 07

Drying by:
Date Tested: 7/3/2012

Sieve Size	% Passing	Limits
3/8in (9.5mm)	100	
No.4 (4.75mm)	98	
No.10 (2.0mm)	94	
No.20 (850µm)	88	
No.40 (425µm)	79	
No.60 (250µm)	68	
No.100 (150µm)	58	
No.200 (75µm)	48	
29.7 µm	38.2	
17.7 µm	32.9	
9.4 µm	28.2	
6.4 µm	24.7	
5.4 µm	23.2	
1.5 µm	17.2	

COBBLES	GRAVEL		SAND			FINES	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
(0.0%)	(0.0%)	(2.0%)	(4.0%)	(14.6%)	(31.6%)	(25.2%)	(22.6%)

D85: 0.6625 **D60:** 0.1637 **D50:** 0.0867
D30: 0.0120 **D15:** 0.0009 **D10:** 0.0003

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Bottom Ash Test Reports

Bottom Ash Standard Proctor Test Reports
Bottom Ash In-place Density Test Reports (Pond 3S)
Bottom Ash In-place Density Test Reports (Pond 3N)

Bottom Ash Standard Proctor Test Reports

BRAUN INTERTEC

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-003435-S1
Issue No: 1

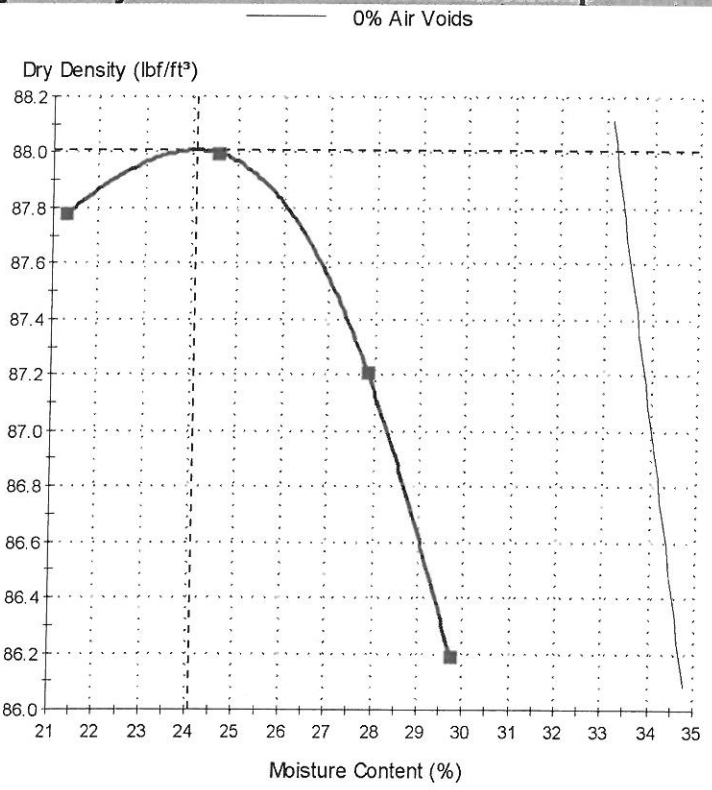
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Kanhai Seokaran
Proctor Supervisor
Date of Issue: 7/10/2012

Sample Details

Sample ID:	W12-003435-S1	**Alternate Sample ID:**	BAP-01
Date Sampled:	7/9/2012	**Sampled By:**	Client
Sampling Method:			
Source:	Onsite material		
Material:			
Specification:			
Location:	Onsite		
Tested By:	Kanhai Seokaran	**Date Tested:**	7/10/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	**88.0**
Corrected Maximum Dry Density (lbf/ft³):	**94.2**
Optimum Moisture Content (%):	**24.1**
Corrected Optimum Moisture Content (%):	**20.8**
Method:	B
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%):	14
Passing Sieve 3/8" (9.5mm) (%):	86
Specific Gravity (Oversize):	2.65
Excluded Oversize Retained Sieve 3/8" (9.5mm) (%):	14
Visual Description:	Bottom Ash

Comments

The 200 wash value equals 1.4%.

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Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-003425-S1
Issue No: 1

Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800

Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308

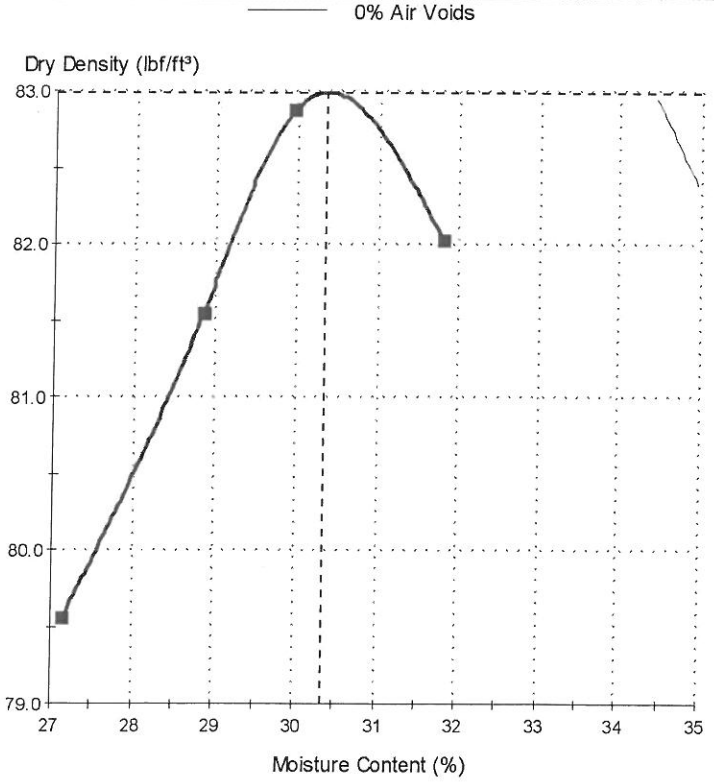
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Kanhai Seokaran
Proctor Supervisor
Date of Issue: 7/10/2012

Sample Details

Sample ID:	W12-003425-S1	**Alternate Sample ID:**	BAP-02
Date Sampled:	7/9/2012	**Sampled By:**	Client
Sampling Method:			
Source:	Onsite material		
Material:			
Specification:			
Location:	Onsite		
Tested By:	Kanhai Seokaran	**Date Tested:**	7/10/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	**83.0**
Corrected Maximum Dry Density (lbf/ft³):	**83.0**
Optimum Moisture Content (%):	**30.4**
Corrected Optimum Moisture Content (%):	**30.4**
Method:	B
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.45
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%):	3
Passing Sieve 3/8" (9.5mm) (%):	97
Specific Gravity (Oversize):	2.45
Excluded Oversize Retained Sieve 3/8" (9.5mm) (%):	3
Visual Description:	Bottom Ash

Comments

The 200 wash value equals 6.0%.

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BRAUN INTERTEC

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-003425-S3
Issue No: 1

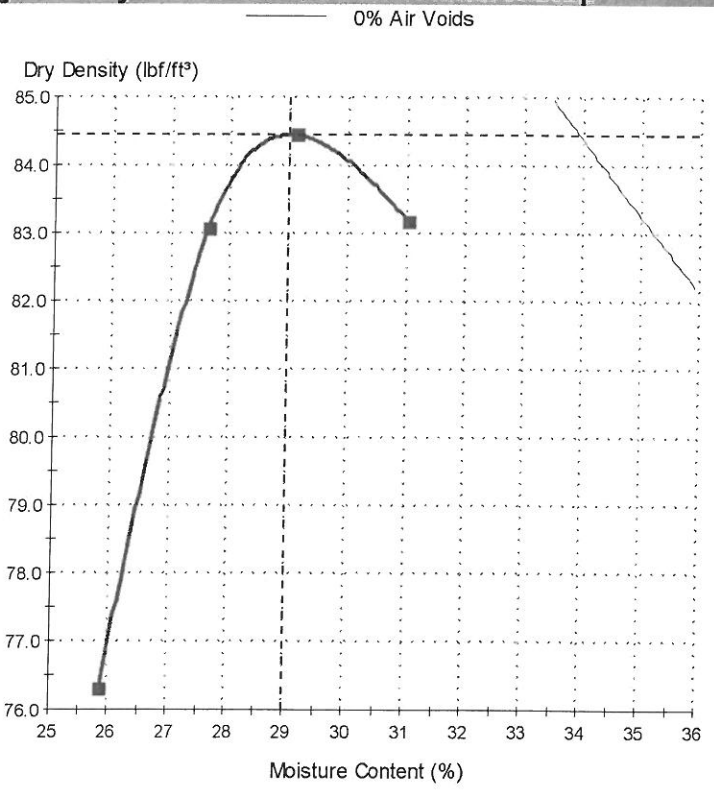
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Kanhai Seokaran
Proctor Supervisor
Date of Issue: 7/10/2012

Sample Details

Sample ID:	W12-003425-S3	**Alternate Sample ID:**	BAP-03
Date Sampled:	7/9/2012	**Sampled By:**	Client
Sampling Method:			
Source:	Onsite material		
Material:			
Specification:			
Location:	Onsite		
Tested By:	Kanhai Seokaran	**Date Tested:**	7/10/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	**84.4**
Corrected Maximum Dry Density (lbf/ft³):	**87.6**
Optimum Moisture Content (%):	**29.0**
Corrected Optimum Moisture Content (%):	**26.9**
Method:	B
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.50
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%):	7
Passing Sieve 3/8" (9.5mm) (%):	93
Specific Gravity (Oversize):	2.65
Excluded Oversize Retained Sieve 3/8" (9.5mm) (%):	7
Visual Description:	Bottom Ash

Comments

The 200 wash value equals 5.5%.

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BRAUN INTERTEC

Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-003435-S2
Issue No: 1

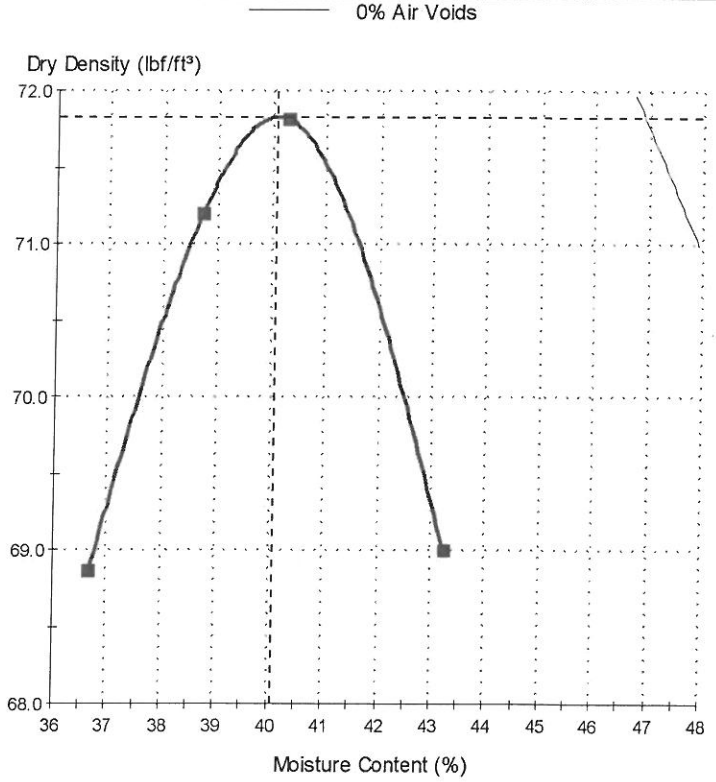
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Kanhai Seokaran
Proctor Supervisor
Date of Issue: 7/10/2012

Sample Details

Sample ID:	W12-003435-S2	**Alternate Sample ID:**	BAP-04
Date Sampled:	7/9/2012	**Sampled By:**	Client
Sampling Method:			
Source:	Onsite material		
Material:			
Specification:			
Location:	Onsite		
Tested By:	Kanhai Seokaran	**Date Tested:**	7/10/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	**71.8**
Corrected Maximum Dry Density (lbf/ft³):	**71.8**
Optimum Moisture Content (%):	**40.1**
Corrected Optimum Moisture Content (%):	**40.1**
Method:	A
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.50
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	3
Passing Sieve No 4 (4.75mm) (%):	97
Specific Gravity (Oversize):	2.50
Excluded Oversize Retained Sieve No 4 (4.75mm) (%):	3
Visual Description:	Bottom Ash

Comments

The 200 wash value equals 9.4%.

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-004162-S1
Issue No: 1

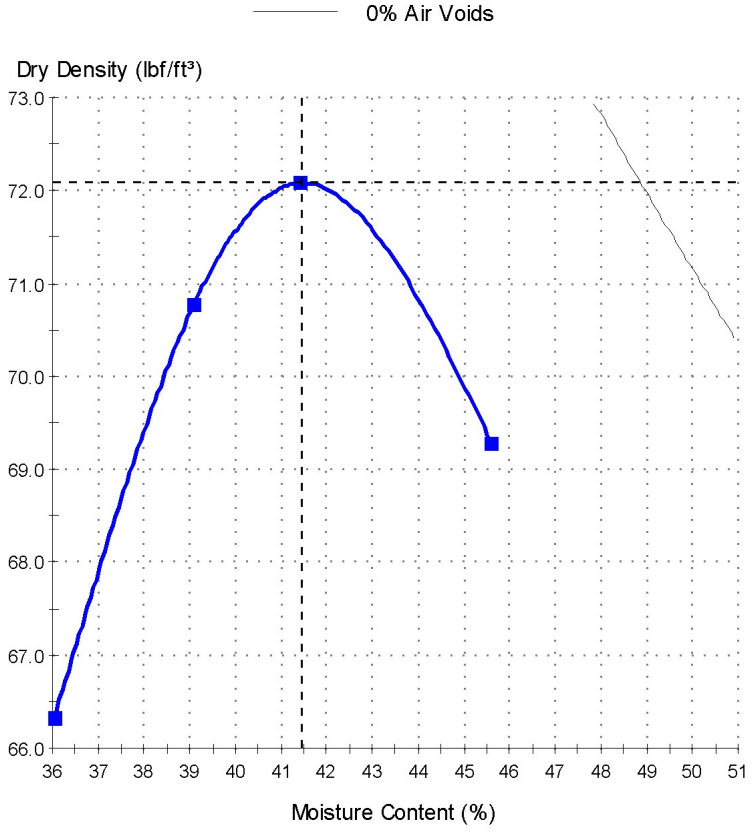
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Kanhai Seokaran
Proctor Supervisor
Date of Issue: 7/26/2012

Sample Details

Sample ID:	W12-004162-S1	Alternate Sample ID:	BAP-5
Date Sampled:	7/25/2012	Sampled By:	John Blenker
Sampling Method:			
Source:	Onsite material		
Material:	Bottom Ash		
Specification:			
Location:	N: 862923.44 E:2031919.59		
Tested By:	Kanhai Seokaran	Date Tested:	7/26/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	72.1
Corrected Maximum Dry Density (lbf/ft³):	72.1
Optimum Moisture Content (%):	41.5
Corrected Optimum Moisture Content (%):	41.5
Method:	A
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve No 4 (4.75mm) (%):	2
Passing Sieve No 4 (4.75mm) (%):	98
Visual Description:	Bottom Ash

Comments

The 200 wash value equals 32.8%.

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Minneapolis Laboratory
Braun Intertec Corporation
Phone: (320) 253-9940

Proctor Report

Report No: PTR:W12-004331-S1
Issue No: 1

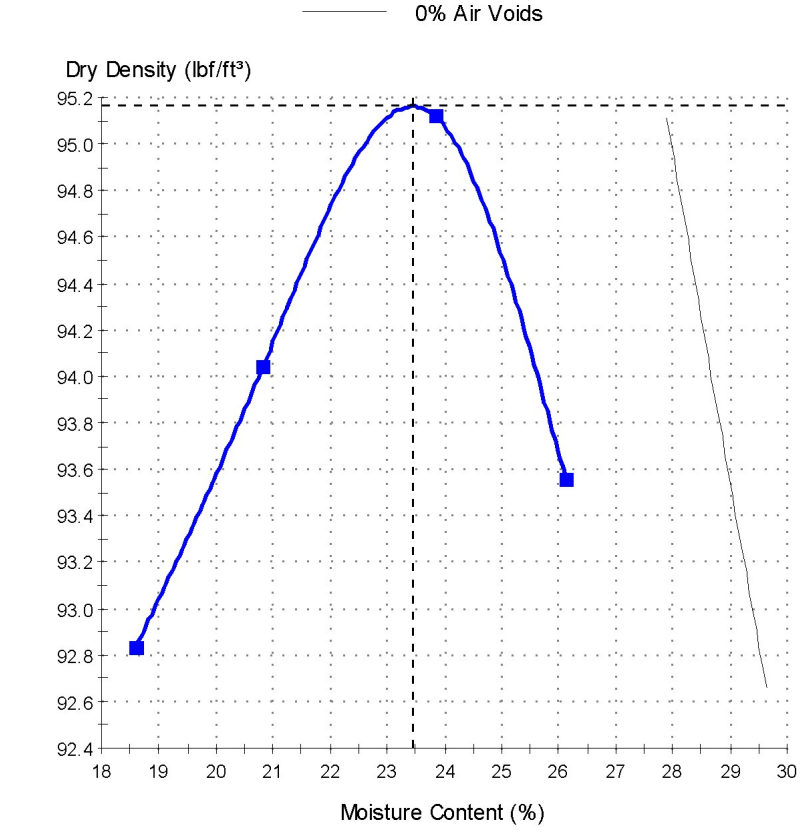
Client: Travis Peterson
Xcel Energy Services, Inc.
Sherburn County Generating Facility
Becker, MN, 55308-8800
Project: SC-12-02255
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, MN, 55308
PM: Thomas L Henkemeyer, thenkemeyer@BraunIntertec.com

Kanhai Seokaran
Proctor Supervisor
Date of Issue: 7/31/2012

Sample Details

Sample ID:	W12-004331-S1	Alternate Sample ID:	BAP-06
Date Sampled:	7/30/2012	Sampled By:	John Blenker
Sampling Method:			
Source:	On-site		
Material:	Bottom Ash		
Specification:			
Location:	N:865298.43 E:2031783.24		
Tested By:	Kanhai Seokaran	Date Tested:	7/31/2012

Dry Density - Moisture Content Relationship



Test Results

ASTM D 698 - 07

Maximum Dry Density (lbf/ft³):	95.2
Corrected Maximum Dry Density (lbf/ft³):	100.0
Optimum Moisture Content (%):	23.4
Corrected Optimum Moisture Content (%):	20.9
Method:	B
Preparation Method:	Moist
Rammer Type:	Hand round
Specific Gravity (Fines):	2.65
Specific Gravity Method:	Assumed
Retained Sieve 3/8" (9.5mm) (%):	11
Passing Sieve 3/8" (9.5mm) (%):	89
Specific Gravity (Oversize):	2.65
Excluded Oversize Retained Sieve 3/8" (9.5mm) (%):	11
Visual Description:	Bottom Ash

Comments

The 200 wash value equals 15.5%.

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Bottom Ash In-place Density Test Reports (Pond 3S)

BRAUN INTERTEC

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Saint Cloud, MN 56301

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Fax: 320.253.3054
Web: braunintertec.com

Report of Field Compaction Tests

Date: July 31, 2012 **Project:** SC-12-02255 **Report:** 1

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
BA-1	7/17/12	N	BAP-2	30.4	83.0	13.8	82.4	99	95	A
BA-2	7/23/12	N	BAP-3	26.9	87.6	3.0	85.3	97	95	A
BA-3	7/23/12	N	BAP-1	20.8	94.2	3.0	95.4	101	95	A
BA-4	7/23/12	N	BAP-3	26.9	87.6	12.6	86.0	98	95	A
BA-5	7/24/12	N	BAP-3	26.9	87.6	12.6	88.3	101	95	A
BA-6	7/25/12	N	BAP-2	30.4	83.0	18.3	82.5	99	95	A
BA-7	7/25/12	N	BAP-1	20.8	94.2	3.2	92.0	98	95	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
BA-1	N: 863458.56 E: 2031929.07	985.46
BA-2	N: 863264.24, E: 2031919.35	987.52
BA-3	N: 862524.59, E: 2031842.03	986.12
BA-4	N: 862477.15, E: 2031193.72	986.23
BA-5	N: 863406.08, E: 2031936.38	988.42
BA-6	N: 862923.44, E: 2031919.39	988.08
BA-7	N: 863359.24, E: 2031947.03	989.50

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

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Report of Field Compaction Tests

Date: July 31, 2012 **Project:** SC-12-02255 **Report:** 2

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
BA-8	7/26/12	N	BAP-1	20.8	94.2	1.7	94.9	101	95	A
BA-9	7/26/12	N	BAP-1	20.8	94.2	2.6	95.1	101	95	A
BA-10	7/26/12	N	BAP-1	20.8	94.2	8.4	96.5	102	95	A
BA-11	7/26/12	N	BAP-1	20.8	94.2	5.5	95.4	101	95	A
BA-12	7/26/12	N	BAP-3	26.9	87.6	12.3	89.2	102	95	A
BA-13	7/26/12	N	BAP-2	30.4	83.0	18.4	82.7	100	95	A
BA-14	7/26/12	N	BAP-1	20.8	94.2	6.1	91.2	97	95	A

Key: N = Nuclear, ASTM D 2922
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* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
BA-8	N: 863079.14, E: 2031919.09	989.26
BA-9	N: 862586.38, E: 2031957.32	989.65
BA-10	N: 862526.65, E: 2031821.85	987.32
BA-11	N: 862486.64, E: 2031717.31	988.43
BA-12	N: 862473.37, E: 2031388.80	988.59
BA-13	N: 862493.01, E: 2031074.37	987.01
BA-14	N: 862477.30, E: 2030886.30	988.37

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

AA/EOE

BRAUN INTERTEC

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Report of Field Compaction Tests

Date: July 31, 2012

Project: SC-12-02255

Report: 3

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
BA-15	7/27/12	N	BAP-1	20.8	94.2	2.4	102.7	109	95	A
BA-16	7/27/12	N	BAP-1	20.8	94.2	6.4	93.9	100	95	A

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A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
BA-15	N: 862492.56, E: 2031624.42	989.60
BA-16	N: 862498.20, E: 2031255.47	989.23

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Heikemeyer
Project Manager

AA/EOE

Bottom Ash In-place Density Test Reports (Pond 3N)

BRAUN INTERTEC

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Saint Cloud, MN 56301

Phone: 320.253.9940
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Web: braunintertec.com

Report of Field Compaction Tests

Date: July 31, 2012 **Project:** SC-12-02255 **Report:** 1

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
BA3N-1	7/30/12	N	BAP-1	20.8	94.2	7.8	95.4	101	95	A
BA3N-2	7/30/12	N	BAP-6	20.9	100.0	10.4	105.6	106	95	A
BA3N-3	7/31/12	N	BAP-6	20.9	100.0	5.9	103.3	103	95	A
BA3N-4	7/31/12	N	BAP-6	20.9	100.0	3.9	100.0	100	95	A
BA3N-5	7/31/12	N	BAP-6	20.9	100.0	4.2	109.0	109	95	A
BA3N-6	7/31/12	N	BAP-3	26.9	87.6	10.7	88.5	101	95	A

Key: N = Nuclear, ASTM D 2922
SC = Sand Cone, ASTM D 1556
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A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
BA3N-1	N: 865290.64, E: 2031155.59	987.07
BA3N-2	N: 865298.43, E: 2031783.24	987.04
BA3N-3	N: 863918.31, E: 2031934.96	987.34
BA3N-4	N: 864535.88, E: 2031936.91	988.01
BA3N-5	N: 865283.19, E: 2031919.16	988.70
BA3N-6	N: 865293.42, E: 2031329.83	987.93

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

AA/EOE

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Report of Field Compaction Tests

Date: August 2, 2012

Project: SC-12-02255

Report: 2

Client:
Travis Peterson
Xcel Energy Services, Inc.
Sherburne Cty. Generating Facility
Becker, MN 55308-8800

Project Description:
Sherco 2012 Ash Construction
Pond 3S Vertical Expansion
Becker, Minnesota

Test	Date	Type	Soil ID and Classification	Optimum Moisture* (%)	Max. Lab Dry Density* (pcf)	Inplace Moisture (%)	Inplace Dry Density (pcf)	Relative Compaction (%)	Specified Minimum Compact. (%)	Comments
BA3N-7	8/1/12	N	BAP-06	20.9	100.0	5.9	102.8	103	95	A
BA3N-8	8/1/12	N	BAP-01	20.8	94.2	6.0	95.5	101	95	A
BA3N-9	8/1/12	N	BAP-06	20.9	100.0	4.8	108.9	109	95	A
BA3N-10	8/1/12	N	BAP-06	20.9	100.0	8.4	102.4	102	95	A
BA3N-11	8/1/12	N	BAP-03	26.9	87.6	16.8	87.6	100	95	A
BA3N-12	8/1/12	N	BAP-06	20.9	100.0	5.1	98.2	98	95	A

Key: N = Nuclear, ASTM D 2922
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* = O.M. and M.L.D.D. rounded to nearest 0.1

A = Test results comply with specifications.
B = Test results do not comply with specifications.
C = Test results comply with air-voids specifications.

Test	Test Location	Elevation
BA3N-7	N: 865318.49, E: 2031361.15	989.29
BA3N-8	N: 865323.25, E: 2031428.33	980.16
BA3N-9	N: 865285.37, E: 2031916.18	989.04
BA3N-10	N: 865130.82, E: 2031945.40	989.98
BA3N-11	N: 864402.39, E: 2031948.93	989.15
BA3N-12	N: 864035.73, E: 2031941.96	989.99

Elevation Reference:

c:

Braun Intertec Corporation

Thomas L. Henkemeyer
Project Manager

Survey Verification Data

Survey Verification Data Tabulation
Survey Verification Drawings

Survey Verification Data Tabulation

Pond 3 South 2012 Construction - Survey Tabulation

Verification Point No.	Northing	Easting	(A)	(B)	(C)	(D)	(E)	(F)
			Finshed Grade Design Elevation	Subgrade	Finished Grade			
				As-Built Elevation	As-Built Elevation	Difference From Design Elevation (C-A)	Material Thickness, ft (C-B)	Finished Grade Description
200	862,354.39	2,030,899.58	995.00	994.44	994.99	-0.01	0.55	Topsoil
201	862,359.25	2,030,993.03	995.00	994.42	994.93	-0.07	0.51	Topsoil
202	862,364.10	2,031,086.49	995.00	994.36	994.91	-0.09	0.55	Topsoil
203	862,368.95	2,031,179.94	995.00	994.37	994.94	-0.06	0.57	Topsoil
204	862,373.80	2,031,273.40	995.00	994.33	994.95	-0.05	0.61	Topsoil
205	862,378.66	2,031,366.85	995.00	994.36	994.98	-0.02	0.62	Topsoil
206	862,383.51	2,031,460.30	995.00	994.35	994.92	-0.08	0.57	Topsoil
207	862,388.36	2,031,553.76	995.00	994.37	994.93	-0.07	0.56	Topsoil
208	862,393.22	2,031,647.21	995.00	994.35	994.91	-0.09	0.56	Topsoil
209	862,398.07	2,031,740.67	995.00	994.48	994.98	-0.02	0.50	Topsoil
210	862,402.92	2,031,834.12	995.00	994.38	994.94	-0.06	0.56	Topsoil
211	862,407.77	2,031,927.57	995.00	994.54	995.05	0.05	0.51	Topsoil
212	862,467.40	2,031,987.20	995.00	994.40	995.02	0.02	0.63	Topsoil
213	862,527.02	2,032,046.82	995.00	994.51	995.02	0.02	0.51	Topsoil
214	862,462.39	2,032,046.82	995.00	994.42	995.09	0.09	0.67	Topsoil
215	862,427.27	2,032,032.81	995.00	994.36	995.05	0.05	0.68	Topsoil
216	862,411.45	2,031,998.46	995.00	994.35	994.90	-0.10	0.56	Topsoil
217	862,627.02	2,032,046.82	995.00	994.43	995.00	0.00	0.58	Topsoil
218	862,727.02	2,032,046.82	995.00	994.46	994.95	-0.05	0.50	Topsoil
219	862,827.02	2,032,046.82	995.00	994.52	995.03	0.03	0.51	Topsoil
220	862,927.02	2,032,046.82	995.00	994.47	995.04	0.04	0.57	Topsoil
221	863,027.02	2,032,046.82	995.00	994.40	994.90	-0.10	0.50	Topsoil
222	863,127.02	2,032,046.82	995.00	994.47	994.97	-0.03	0.51	Topsoil
223	863,227.02	2,032,046.82	995.00	994.41	994.91	-0.09	0.50	Topsoil
224	863,327.02	2,032,046.82	995.00	994.44	994.96	-0.04	0.52	Topsoil
225	863,427.02	2,032,046.82	995.00	994.50	995.00	0.00	0.50	Topsoil
226	863,526.67	2,032,046.82	995.00	994.41	995.04	0.04	0.63	Topsoil
227	862,410.03	2,030,857.91	994.00	993.55	994.05	0.05	0.51	Class 5
228	862,411.67	2,030,889.43	994.00	993.42	994.03	0.03	0.61	Class 5
229	862,414.26	2,030,939.37	994.00	993.44	993.97	-0.03	0.53	Class 5
230	862,416.85	2,030,989.30	994.00	993.37	994.06	0.06	0.69	Class 5
231	862,391.89	2,030,990.60	994.43	993.87	994.45	0.02	0.58	Class 5
232	862,389.29	2,030,940.66	994.43	993.93	994.45	0.02	0.52	Class 5
233	862,386.70	2,030,890.73	994.43	994.04	994.56	0.13	0.51	Class 5
234	862,384.30	2,030,844.59	994.43	994.18	994.73	0.30	0.55	Class 5
235	862,352.39	2,030,828.06	995.00	994.96	995.81	0.81	0.85	Topsoil
236	862,421.59	2,031,080.61	994.00	993.40	993.90	-0.10	0.50	Topsoil
237	862,426.33	2,031,171.93	994.00	993.39	993.93	-0.07	0.54	Topsoil
238	862,431.08	2,031,263.24	994.00	993.43	993.98	-0.02	0.54	Topsoil
239	862,435.82	2,031,354.55	994.00	993.43	993.99	-0.01	0.56	Topsoil
240	862,440.56	2,031,445.87	994.00	993.40	993.94	-0.06	0.54	Topsoil
241	862,445.30	2,031,537.18	994.00	993.51	994.02	0.02	0.51	Topsoil
242	862,450.04	2,031,628.50	994.00	993.55	994.07	0.07	0.51	Topsoil
243	862,454.78	2,031,719.81	994.00	993.41	993.93	-0.07	0.52	Topsoil
244	862,459.52	2,031,811.12	994.00	993.57	994.09	0.09	0.51	Topsoil
245	862,464.27	2,031,902.44	994.00	993.53	994.04	0.04	0.52	Topsoil
246	862,507.60	2,031,945.77	994.00	993.41	993.95	-0.05	0.54	Topsoil
247	862,550.93	2,031,989.10	994.00	993.57	994.09	0.09	0.51	Topsoil
248	862,641.36	2,031,989.10	994.00	993.48	994.00	0.00	0.52	Topsoil
249	862,731.80	2,031,989.10	994.00	993.43	993.93	-0.07	0.50	Topsoil
250	862,822.23	2,031,989.10	994.00	993.40	993.89	-0.11	0.50	Topsoil
251	862,912.67	2,031,989.10	994.00	993.42	993.95	-0.05	0.53	Topsoil
252	863,003.10	2,031,989.10	994.00	993.40	993.92	-0.08	0.53	Topsoil
253	863,093.54	2,031,989.10	994.00	993.41	993.96	-0.04	0.54	Class 5
254	863,093.54	2,032,014.10	994.43	993.85	994.38	-0.05	0.53	Class 5

Elevation Tolerances:
SG: +/-0.1 foot.
Thickness Tolerances:
Topsoil: -0.0, to +0.1 feet
Random Fill: +/- 0.1
Class 5: -0.0 to +0.1 feet

Pond 3 South 2012 Construction - Survey Tabulation

Verification Point No.	Northing	Easting	(A)	(B)	(C)	(D)	(E)	(F)
			Finshed Grade Design Elevation	Subgrade	Finished Grade			
				As-Built Elevation	As-Built Elevation	Difference From Design Elevation (C-A)	Material Thickness, ft (C-B)	Finished Grade Description
255	863,142.00	2,032,014.10	994.43	993.90	994.41	-0.02	0.51	Class 5
256	863,142.00	2,031,989.10	994.00	993.42	994.00	0.00	0.58	Class 5
257	863,190.46	2,031,989.10	994.00	993.43	993.97	-0.03	0.54	Class 5
258	863,190.46	2,032,014.10	994.43	993.85	994.36	-0.07	0.51	Class 5
259	863,236.45	2,032,014.10	994.43	993.94	994.45	0.02	0.51	Class 5
260	863,236.45	2,031,989.10	994.00	993.44	994.06	0.06	0.62	Class 5
261	863,282.44	2,031,989.10	994.00	993.46	993.99	-0.01	0.52	Class 5
262	863,282.44	2,032,014.10	994.43	993.84	994.37	-0.06	0.53	Class 5
263	863,328.43	2,032,014.10	994.43	993.98	994.48	0.05	0.50	Class 5
264	863,328.43	2,031,989.10	994.00	993.45	993.98	-0.02	0.53	Class 5
265	863,374.42	2,031,989.10	994.00	993.54	994.05	0.05	0.52	Class 5
266	863,374.42	2,032,014.10	994.43	993.84	994.43	0.00	0.60	Class 5
267	863,420.41	2,032,014.10	994.43	993.86	994.38	-0.05	0.52	Class 5
268	863,420.41	2,031,989.10	994.00	993.41	993.92	-0.08	0.51	Class 5
269	863,466.40	2,031,989.10	994.00	993.40	993.91	-0.09	0.51	Class 5
270	863,466.40	2,032,014.10	994.43	993.88	994.40	-0.03	0.52	Class 5
271	863,512.39	2,032,014.10	994.43	993.95	994.45	0.02	0.50	Class 5
272	863,512.39	2,031,989.10	994.00	993.45	994.07	0.07	0.62	Class 5
273	863,558.40	2,031,989.10	994.00	993.40	993.89	-0.11	0.49	Class 5
274	863,558.40	2,032,014.10	994.43	993.66	994.47	0.04	0.81	Class 5
11275	863,556.94	2,031,977.94	990.29	989.87	990.41	0.11	0.54	Topsoil
11276	863,478.31	2,031,977.78	990.29	989.74	990.32	0.03	0.58	Topsoil
11277	863,399.38	2,031,977.97	990.29	989.82	990.41	0.11	0.58	Topsoil
11278	863,320.53	2,031,977.91	990.29	989.82	990.33	0.03	0.51	Topsoil
11279	863,241.70	2,031,977.85	990.29	989.74	990.26	-0.03	0.52	Topsoil
11280	863,042.13	2,031,977.88	990.29	989.69	990.32	0.03	0.63	Topsoil
11281	862,945.17	2,031,977.82	990.29	989.79	990.31	0.02	0.52	Topsoil
11282	862,847.72	2,031,977.93	990.29	989.77	990.28	-0.01	0.52	Topsoil
11283	862,750.75	2,031,977.88	990.29	989.79	990.30	0.01	0.51	Topsoil
11284	862,653.26	2,031,977.88	990.29	989.72	990.27	-0.02	0.55	Topsoil
11285	862,556.36	2,031,977.86	990.29	989.75	990.27	-0.03	0.52	Topsoil
11286	862,515.38	2,031,938.09	990.29	989.84	990.35	0.06	0.51	Topsoil
11287	862,475.53	2,031,897.57	990.29	989.85	990.44	0.15	0.59	Topsoil
11288	862,470.26	2,031,800.99	990.29	989.81	990.43	0.13	0.62	Topsoil
11289	862,465.26	2,031,705.30	990.29	989.71	990.27	-0.02	0.56	Topsoil
11290	862,460.42	2,031,609.52	990.29	989.74	990.32	0.02	0.57	Topsoil
11291	862,455.35	2,031,513.65	990.29	989.77	990.45	0.15	0.68	Topsoil
11292	862,450.42	2,031,417.89	990.29	989.74	990.29	0.00	0.55	Topsoil
11293	862,445.45	2,031,322.06	990.29	989.73	990.25	-0.05	0.52	Topsoil
11294	862,440.38	2,031,226.36	990.29	989.76	990.28	-0.01	0.52	Topsoil
11295	862,435.43	2,031,130.48	990.29	989.77	990.29	0.00	0.52	Topsoil
11296	862,430.50	2,031,034.81	989.77	989.69	990.26	0.50	0.57	Topsoil
333	862,334.71	2,030,911.93	988.00	987.40	988.01	0.01	0.61	Topsoil
334	862,340.32	2,031,020.06	988.00	987.53	988.04	0.04	0.51	Topsoil
335	862,345.57	2,031,121.15	988.00	987.56	988.08	0.08	0.52	Topsoil
336	862,350.62	2,031,218.31	988.00	987.43	988.07	0.07	0.65	Topsoil
337	862,355.71	2,031,316.40	988.00	987.56	988.06	0.06	0.50	Topsoil
338	862,360.75	2,031,413.42	988.00	987.46	987.98	-0.02	0.52	Topsoil
339	862,363.33	2,031,463.16	988.00	987.41	988.06	0.06	0.66	Topsoil
340	862,368.44	2,031,561.64	988.00	987.58	988.08	0.08	0.50	Topsoil
341	862,373.54	2,031,659.80	988.00	987.57	988.06	0.06	0.49	Topsoil
342	862,378.59	2,031,757.00	988.00	987.49	988.04	0.04	0.55	Topsoil
343	862,383.68	2,031,855.07	988.00	987.48	987.98	-0.02	0.50	Topsoil
344	862,388.56	2,031,947.52	988.00	987.40	988.07	0.07	0.67	Topsoil

Elevation Tolerances:
SG: +/-0.1 foot.
Thickness Tolerances:
Topsoil: -0.0, to +0.1 feet
Random Fill: +/- 0.1
Class 5: -0.0 to +0.1 feet

Pond 3 South 2012 Construction - Survey Tabulation

Verification Point No.	Northing	Easting	(A)	(B)	(C)	(D)	(E)	(F)
			Finshed Grade Design Elevation	Subgrade	Finished Grade			
				As-Built Elevation	As-Built Elevation	Difference From Design Elevation (C-A)	Material Thickness, ft (C-B)	Finished Grade Description
345	862,391.42	2,032,001.88	988.00	987.34	987.90	-0.10	0.55	Topsoil
346	862,405.44	2,032,038.70	988.00	987.33	987.90	-0.10	0.57	Topsoil
347	862,429.91	2,032,059.25	988.00	987.43	988.01	0.01	0.58	Topsoil
348	862,483.29	2,032,067.13	988.00	987.41	988.07	0.07	0.67	Topsoil
349	862,576.34	2,032,067.12	988.00	987.45	988.04	0.04	0.59	Topsoil
350	862,676.04	2,032,067.12	988.00	987.54	988.09	0.09	0.55	Topsoil
351	862,775.39	2,032,067.12	988.00	987.53	988.07	0.07	0.54	Topsoil
352	862,875.23	2,032,067.12	988.00	987.44	987.96	-0.04	0.52	Topsoil
353	862,974.18	2,032,067.12	988.00	987.41	988.09	0.09	0.68	Topsoil
354	863,074.42	2,032,067.12	988.00	987.43	987.95	-0.05	0.52	Topsoil
355	863,173.77	2,032,067.12	988.00	987.47	987.97	-0.03	0.51	Topsoil
356	863,273.72	2,032,067.12	988.00	987.49	988.05	0.05	0.56	Topsoil
357	863,373.01	2,032,067.12	988.00	987.59	988.10	0.10	0.51	Topsoil
275*	863,557.00	2,031,976.35	989.75	989.82	989.80			Topsoil
276*	863,478.19	2,031,976.35	989.75	989.60	989.82			Topsoil
277*	863,399.38	2,031,976.35	989.75		989.85			Topsoil
278*	863,320.57	2,031,976.35	989.75	989.58	989.74			Topsoil
279*	863,241.76	2,031,976.35	989.75	989.74	989.81			Topsoil
280*	863,042.25	2,031,976.35	989.75	989.72	989.81			Topsoil
281*	862,945.04	2,031,976.35	989.75	989.71	989.74			Topsoil
282*	862,847.84	2,031,976.35	989.75	989.71	989.67			Topsoil
283*	862,750.63	2,031,976.35	989.75	989.82	989.77			Topsoil
284*	862,653.42	2,031,976.35	989.75	989.70	989.70			Topsoil
285*	862,556.21	2,031,976.35	989.75	989.64	989.83			Topsoil
286*	862,516.61	2,031,936.75	989.75	989.79	989.79			Topsoil
287*	862,476.75	2,031,896.89	989.75	989.73	989.77			Topsoil
288*	862,471.77	2,031,801.09	989.75	989.76	989.78			Topsoil
289*	862,466.80	2,031,705.30	989.75	989.74	989.68			Topsoil
290*	862,461.82	2,031,609.51	989.75	989.71	989.79			Topsoil
291*	862,456.85	2,031,513.72	989.75	989.66	989.73			Topsoil
292*	862,451.88	2,031,417.93	989.75	989.72	989.81			Topsoil
293*	862,446.90	2,031,322.14	989.75	989.64	989.78			Topsoil
294*	862,441.93	2,031,226.35	989.75	989.72	989.72			Topsoil
295*	862,436.95	2,031,130.56	989.75	989.78	989.79			Topsoil
296*	862,431.98	2,031,034.77	989.75	989.68	989.76			Topsoil

***Original survey points. Refer to points 11275 to 11296 for the correct surveyed location.**

Elevation Tolerances:
SG: +/-0.1 foot.
Thickness Tolerances:
Topsoil: -0.0, to +0.1 feet
Random Fill: +/- 0.1
Class 5: -0.0 to +0.1 feet

Pond 3 South Clay Verification Survey Tabulation
2012 Vertical Expansion

Verification Point No.	Design			Location Description	As-Built Subgrade Survey			As-Built Finished Grade Survey			Clay Thickness (6' MIN*) (FIN1-SG1 or SG2)	Clay Width (8' MIN)
	Northing	Easting	Elevation		Northing	Easting	Elevation	Northing	Easting	Elevation		
1	862,394.53	2,030,964.44	984	SG2	862,394.55	2,030,964.40	983.81					
2	862,395.53	2,030,964.39	990	FIN1				862,395.53	2,030,964.41	990.02		
3	862,386.54	2,030,964.85	984	SG1	862,386.57	2,030,964.81	983.84					
4	862,403.52	2,030,963.98	990	SG3/FIN2	862,403.50	2,030,963.96	989.88	862,403.51	2,030,963.95	990.11	6.18	8.0
5	862,393.21	2,030,938.94	984	SG2	862,393.17	2,030,939.03	984.01					
6	862,394.17	2,030,938.25	990	FIN1				862,394.17	2,030,938.31	990.09		
7	862,385.18	2,030,938.66	984	SG1	862,385.15	2,030,938.69	983.98					
8	862,402.17	2,030,937.89	990	SG3/FIN2	862,402.27	2,030,938.01	989.63	862,402.14	2,030,937.84	990.11	6.11	8.0
9	862,406.11	2,031,013.91	990	SG3/FIN2	862,406.12	2,031,013.89	989.89	862,406.13	2,031,013.90	990.20		
10	862,397.13	2,031,014.37	984	SG2	862,397.14	2,031,014.39	983.83					
11	862,398.12	2,031,014.32	990	FIN1				862,398.18	2,031,014.30	990.16		
12	862,389.14	2,031,014.78	984	SG1	862,389.16	2,031,014.92	983.83				6.33	8.0
13	862,408.71	2,031,063.85	990	SG3/FIN2	862,408.75	2,031,063.82	989.73	862,408.77	2,031,063.80	990.07		
14	862,399.72	2,031,064.31	984	SG2	862,399.70	2,031,064.30	983.80					
15	862,400.72	2,031,064.26	990	FIN1				862,400.67	2,031,064.32	990.03		
16	862,391.73	2,031,064.72	984	SG1	862,391.73	2,031,064.69	983.90				6.13	8.1
17	862,411.30	2,031,113.78	990	SG3/FIN2	862,411.38	2,031,113.72	989.67	862,411.33	2,031,113.78	990.22		
18	862,402.31	2,031,114.24	984	SG2	862,402.40	2,031,114.15	983.74					
19	862,403.31	2,031,114.19	990	FIN1				862,403.32	2,031,114.18	990.26		
20	862,394.32	2,031,114.65	984	SG1	862,394.30	2,031,114.61	984.09				6.16	8.0
21	862,413.89	2,031,163.71	990	SG3/FIN2	862,413.87	2,031,163.72	989.95	862,413.89	2,031,163.68	990.16		
22	862,404.90	2,031,164.17	984	SG2	862,404.86	2,031,164.20	983.81					
23	862,405.90	2,031,164.12	990	FIN1				862,405.90	2,031,164.13	990.08		
24	862,396.91	2,031,164.58	984	SG1	862,396.96	2,031,164.57	983.90				6.18	8.0
25	862,416.48	2,031,213.64	990	SG3/FIN2	862,416.54	2,031,213.58	989.78	862,416.50	2,031,213.68	990.10		
26	862,407.50	2,031,214.11	984	SG2	862,407.55	2,031,214.07	983.77					
27	862,408.50	2,031,214.05	990	FIN1				862,408.53	2,031,214.06	990.05		
28	862,399.51	2,031,214.52	984	SG1	862,399.55	2,031,214.59	983.84				6.21	8.0
29	862,419.08	2,031,263.58	990	SG3/FIN2	862,419.09	2,031,263.55	989.63	862,419.12	2,031,263.55	990.11		
30	862,410.09	2,031,264.04	984	SG2	862,410.04	2,031,264.07	983.85					
31	862,411.09	2,031,263.99	990	FIN1				862,411.12	2,031,263.93	990.04		
32	862,402.10	2,031,264.45	984	SG1	862,402.14	2,031,264.41	984.04				6.00	8.0
33	862,421.67	2,031,313.51	990	SG3/FIN2	862,421.72	2,031,313.51	989.91	862,421.69	2,031,313.49	990.14		
34	862,412.68	2,031,313.97	984	SG2	862,412.71	2,031,313.98	983.93					
35	862,413.68	2,031,313.92	990	FIN1				862,413.68	2,031,313.88	990.17		
36	862,404.69	2,031,314.38	984	SG1	862,404.71	2,031,314.37	983.73				6.44	8.0

Tolerance:
Thickness: -0.0 to +0.2 feet
*Clay Thicknesses less than 6.0 feet are from existing points constructed higher than elevation 984. Rather than excavate good clay to design, an As-built elevation was used.

Pond 3 South Clay Verification Survey Tabulation
2012 Vertical Expansion

Verification Point No.	Design			Location Description	As-Built Subgrade Survey			As-Built Finished Grade Survey			Clay Thickness (6' MIN*) (FIN1-SG1 or SG2)	Clay Width (8' MIN)
	Northing	Easting	Elevation		Northing	Easting	Elevation	Northing	Easting	Elevation		
37	862,424.26	2,031,363.44	990	SG3/FIN2	862,424.24	2,031,363.48	989.86	862,424.26	2,031,363.45	990.23		
38	862,415.27	2,031,363.90	984	SG2	862,415.35	2,031,363.95	983.98					
39	862,416.27	2,031,363.85	990	FIN1				862,416.25	2,031,363.80	990.00		
40	862,407.29	2,031,364.31	984	SG1	862,407.22	2,031,364.37	984.08				5.92	8.0
41	862,426.72	2,031,410.74	990	SG3/FIN2	862,426.76	2,031,410.72	990.00	862,426.73	2,031,410.71	990.15		
42	862,417.73	2,031,411.20	984	SG2	862,417.81	2,031,411.13	984.26					
43	862,418.73	2,031,411.15	990	FIN1				862,418.77	2,031,411.21	990.03		
44	862,409.74	2,031,411.61	984	SG1	862,409.74	2,031,411.63	983.99				6.04	8.0
45	862,429.45	2,031,463.31	990	SG3/FIN2	862,429.47	2,031,463.29	990.00	862,429.38	2,031,463.32	990.03		
46	862,420.46	2,031,463.77	984	SG2	862,420.46	2,031,463.76	983.99					
47	862,421.46	2,031,463.72	990	FIN1				862,421.44	2,031,463.66	990.02		
48	862,412.47	2,031,464.18	984	SG1	862,412.44	2,031,464.26	984.39				5.64	8.0
49	862,432.04	2,031,513.24	990	SG3/FIN2	862,432.07	2,031,513.18	989.90	862,432.04	2,031,513.27	990.08		
50	862,423.05	2,031,513.70	984	SG2								
51	862,424.05	2,031,513.65	990	FIN1				862,424.07	2,031,513.73	990.07		
52	862,415.06	2,031,514.11	984	SG1	862,415.10	2,031,514.20	984.08				5.99	8.0
53	862,434.63	2,031,563.17	990	SG3/FIN2	862,434.58	2,031,563.13	989.88	862,434.61	2,031,563.10	990.20		
54	862,425.65	2,031,563.63	984	SG2	862,425.63	2,031,563.57	984.23					
55	862,426.64	2,031,563.58	990	FIN1				862,426.62	2,031,563.56	990.02		
56	862,417.66	2,031,564.04	984	SG1	862,417.65	2,031,563.98	984.22				5.80	8.0
57	862,437.23	2,031,613.11	990	SG3/FIN2	862,437.26	2,031,613.15	989.94	862,437.22	2,031,613.07	990.07		
58	862,428.24	2,031,613.57	984	SG2	862,428.28	2,031,613.52	983.91					
59	862,429.24	2,031,613.52	990	FIN1				862,429.23	2,031,613.50	990.06		
60	862,420.25	2,031,613.98	984	SG1	862,420.24	2,031,613.98	984.03				6.02	8.0
61	862,439.82	2,031,663.04	990	SG3/FIN2	862,439.85	2,031,663.02	989.93	862,439.86	2,031,663.05	990.16		
62	862,430.83	2,031,663.50	984	SG2	862,430.82	2,031,663.38	984.01					
63	862,431.83	2,031,663.45	990	FIN1				862,431.90	2,031,663.49	990.26		
64	862,422.84	2,031,663.91	984	SG1	862,422.78	2,031,663.87	983.95				6.30	8.0
65	862,442.41	2,031,712.97	990	SG3/FIN2	862,442.44	2,031,712.99	989.95	862,442.39	2,031,712.90	990.10		
66	862,433.42	2,031,713.43	984	SG2	862,433.42	2,031,713.48	983.90					
67	862,434.42	2,031,713.38	990	FIN1				862,434.42	2,031,713.33	990.05		
68	862,425.43	2,031,713.84	984	SG1	862,425.37	2,031,713.83	983.88				6.18	8.0
69	862,445.01	2,031,762.90	990	SG3/FIN2	862,444.99	2,031,762.89	989.81	862,444.99	2,031,762.87	990.24		
70	862,436.02	2,031,763.37	984	SG2	862,436.03	2,031,763.42	983.89					
71	862,437.02	2,031,763.31	990	FIN1				862,437.04	2,031,763.32	990.14		
72	862,428.03	2,031,763.78	984	SG1	862,428.06	2,031,763.66	983.79				6.35	8.0

Tolerance:
Thickness: -0.0 to +0.2 feet
*Clay Thicknesses less than 6.0 feet are from existing points constructed higher than elevation 984. Rather than excavate good clay to design, an As-built elevation was used.

Pond 3 South Clay Verification Survey Tabulation
2012 Vertical Expansion

Verification Point No.	Design			Location Description	As-Built Subgrade Survey			As-Built Finished Grade Survey			Clay Thickness (6' MIN*) (FIN1-SG1 or SG2)	Clay Width (8' MIN)
	Northing	Easting	Elevation		Northing	Easting	Elevation	Northing	Easting	Elevation		
73	862,447.60	2,031,812.84	990	SG3/FIN2	862,447.55	2,031,812.82	990.10	862,447.60	2,031,812.87	990.29		
74	862,438.61	2,031,813.30	984	SG2	862,438.64	2,031,813.27	983.97					
75	862,439.61	2,031,813.25	990	FIN1				862,439.54	2,031,813.29	990.18		
76	862,430.62	2,031,813.71	984	SG1	862,430.64	2,031,813.76	983.63				6.55	8.1
77	862,450.19	2,031,862.77	990	SG3/FIN2	862,450.17	2,031,862.74	989.99	862,450.18	2,031,862.81	990.19		
78	862,441.20	2,031,863.23	984	SG2	862,441.27	2,031,863.28	983.79					
79	862,442.20	2,031,863.18	990	FIN1				862,442.23	2,031,863.23	990.13		
80	862,433.21	2,031,863.64	984	SG1	862,433.21	2,031,863.58	983.66				6.48	8.0
81	862,452.52	2,031,907.67	990	SG3/FIN2	862,452.55	2,031,907.66	989.84	862,452.55	2,031,907.66	990.31		
82	862,443.71	2,031,911.58	984	SG2	862,443.69	2,031,911.53	983.87					
83	862,444.69	2,031,911.15	990	FIN1				862,444.72	2,031,911.22	990.18		
84	862,435.88	2,031,915.07	984	SG1	862,435.93	2,031,915.07	983.84				6.33	8.6
85	862,489.64	2,031,944.78	990	SG3/FIN2	862,489.63	2,031,944.74	989.74	862,489.67	2,031,944.75	990.09		
86	862,483.27	2,031,951.14	984	SG2	862,483.40	2,031,951.28	983.94					
87	862,483.98	2,031,950.44	990	FIN1				862,484.02	2,031,950.37	990.09		
88	862,477.62	2,031,956.80	984	SG1	862,477.64	2,031,956.93	983.50				6.59	8.0
89	862,528.04	2,031,983.18	990	SG3/FIN2	862,528.03	2,031,983.17	989.65	862,528.11	2,031,983.20	990.11		
90	862,521.68	2,031,989.55	984	SG2	862,521.61	2,031,989.60	983.70					
91	862,522.38	2,031,988.84	990	FIN1				862,522.33	2,031,988.91	990.06		
92	862,516.02	2,031,995.20	984	SG1	862,515.95	2,031,995.14	983.25				6.80	8.1
93	862,570.62	2,032,001.10	990	SG3/FIN2	862,570.62	2,032,001.06	989.71	862,570.65	2,032,001.10	990.29		
94	862,570.62	2,032,010.10	984	SG2	862,570.55	2,032,010.08	983.95					
95	862,570.62	2,032,009.10	990	FIN1				862,570.66	2,032,009.06	990.06		
96	862,570.62	2,032,018.10	984	SG1	862,570.57	2,032,018.10	983.72				6.34	8.0
97	862,620.62	2,032,001.10	990	SG3/FIN2	862,620.57	2,032,001.08	989.65	862,620.61	2,032,001.09	990.30		
98	862,620.62	2,032,010.10	984	SG2	862,620.64	2,032,010.07	984.12					
99	862,620.62	2,032,009.10	990	FIN1				862,620.58	2,032,009.09	990.24		
100	862,620.62	2,032,018.10	984	SG1	862,620.64	2,032,018.05	983.93				6.31	8.0
101	862,670.62	2,032,001.10	990	SG3/FIN2	862,670.58	2,032,001.19	989.68	862,670.60	2,032,001.10	990.25		
102	862,670.62	2,032,010.10	984	SG2	862,670.67	2,032,010.11	984.00					
103	862,670.62	2,032,009.10	990	FIN1				862,670.63	2,032,009.10	990.15		
104	862,670.62	2,032,018.10	984	SG1	862,670.67	2,032,018.08	983.83				6.32	8.0
105	862,720.62	2,032,001.10	990	SG3/FIN2	862,720.51	2,032,001.09	989.51	862,720.67	2,032,001.14	990.19		
106	862,720.62	2,032,010.10	984	SG2	862,720.59	2,032,010.10	983.63					
107	862,720.62	2,032,009.10	990	FIN1				862,720.61	2,032,009.13	990.06		
108	862,720.62	2,032,018.10	984	SG1	862,720.58	2,032,018.07	983.32				6.74	8.0

Tolerance:
Thickness: -0.0 to +0.2 feet
*Clay Thicknesses less than 6.0 feet are from existing points constructed higher than elevation 984. Rather than excavate good clay to design, an As-built elevation was used.

Pond 3 South Clay Verification Survey Tabulation
2012 Vertical Expansion

Verification Point No.	Design			Location Description	As-Built Subgrade Survey			As-Built Finished Grade Survey			Clay Thickness (6' MIN*) (FIN1-SG1 or SG2)	Clay Width (8' MIN)
	Northing	Easting	Elevation		Northing	Easting	Elevation	Northing	Easting	Elevation		
109	862,770.62	2,032,001.10	990	SG3/FIN2	862,770.65	2,032,001.01	989.54	862,770.57	2,032,001.05	990.11		
110	862,770.62	2,032,010.10	984	SG2	862,770.59	2,032,010.13	983.76					
111	862,770.62	2,032,009.10	990	FIN1				862,770.63	2,032,009.08	990.14		
112	862,770.62	2,032,018.10	984	SG1	862,770.53	2,032,018.12	983.34				6.80	8.0
113	862,820.62	2,032,001.10	990	SG3/FIN2	862,820.56	2,032,001.11	989.74	862,820.59	2,032,001.07	990.16		
114	862,820.62	2,032,010.10	984	SG2	862,820.61	2,032,010.07	983.70					
115	862,820.62	2,032,009.10	990	FIN1				862,820.61	2,032,009.08	990.18		
116	862,820.62	2,032,018.10	984	SG1	862,820.63	2,032,018.06	983.70				6.47	8.0
117	862,870.62	2,032,001.10	990	SG3/FIN2	862,870.58	2,032,001.08	989.86	862,870.67	2,032,001.11	990.04		
118	862,870.62	2,032,010.10	984	SG2	862,870.60	2,032,010.10	983.97					
119	862,870.62	2,032,009.10	990	FIN1				862,870.65	2,032,009.15	990.20		
120	862,870.62	2,032,018.10	984	SG1	862,870.55	2,032,018.01	983.97				6.23	8.0
121	862,920.62	2,032,001.10	990	SG3/FIN2	862,920.59	2,032,001.01	989.67	862,920.58	2,032,001.09	990.11		
122	862,920.62	2,032,010.10	984	SG2	862,920.68	2,032,010.12	983.98					
123	862,920.62	2,032,009.10	990	FIN1				862,920.61	2,032,009.12	990.04		
124	862,920.62	2,032,018.10	984	SG1	862,920.56	2,032,018.01	983.95				6.09	8.0
125	862,970.62	2,032,001.10	990	SG3/FIN2	862,970.67	2,032,001.14	989.72	862,970.59	2,032,001.12	990.12		
126	862,970.62	2,032,010.10	984	SG2	862,970.65	2,032,010.11	984.00					
127	862,970.62	2,032,009.10	990	FIN1				862,970.63	2,032,009.15	990.15		
128	862,970.62	2,032,018.10	984	SG1	862,970.70	2,032,018.11	984.03				6.12	8.0
129	863,020.62	2,032,001.10	990	SG3/FIN2	863,020.61	2,032,001.14	989.87	863,020.60	2,032,001.12	990.05		
130	863,020.62	2,032,010.10	984	SG2	863,020.68	2,032,010.08	983.83					
131	863,020.62	2,032,009.10	990	FIN1				863,020.64	2,032,009.15	989.98		
132	863,020.62	2,032,018.10	984	SG1	863,020.55	2,032,018.07	984.10				5.87	8.0
133	863,070.62	2,032,001.10	990	SG3/FIN2	863,070.58	2,032,001.11	989.86	863,070.59	2,032,001.16	990.22		
134	863,070.62	2,032,010.10	984	SG2	863,070.60	2,032,010.09	983.96					
135	863,070.62	2,032,009.10	990	FIN1				863,070.57	2,032,009.15	990.25		
136	863,070.62	2,032,018.10	984	SG1	863,070.62	2,032,018.12	983.98				6.27	8.0
137	863,120.62	2,032,001.10	990	SG3/FIN2	863,120.56	2,032,001.18	989.96	863,120.63	2,032,001.06	990.17		
138	863,120.62	2,032,010.10	984	SG2	863,120.56	2,032,010.09	983.97					
139	863,120.62	2,032,009.10	990	FIN1				863,120.63	2,032,009.12	990.15		
140	863,120.62	2,032,018.10	984	SG1	863,120.61	2,032,018.04	983.97				6.17	8.1
141	863,170.62	2,032,001.10	990	SG3/FIN2	863,170.60	2,032,001.12	989.94	863,170.60	2,032,001.14	990.22		
142	863,170.62	2,032,010.10	984	SG2	863,170.50	2,032,010.14	984.10					
143	863,170.62	2,032,009.10	990	FIN1				863,170.57	2,032,009.13	990.20		
144	863,170.62	2,032,018.10	984	SG1	863,170.54	2,032,018.11	984.02				6.18	8.0

Tolerance:
Thickness: -0.0 to +0.2 feet
*Clay Thicknesses less than 6.0 feet are from existing points constructed higher than elevation 984. Rather than excavate good clay to design, an As-built elevation was used.

Pond 3 South Clay Verification Survey Tabulation
2012 Vertical Expansion

Verification Point No.	Design			Location Description	As-Built Subgrade Survey			As-Built Finished Grade Survey			Clay Thickness (6' MIN*) (FIN1-SG1 or SG2)	Clay Width (8' MIN)
	Northing	Easting	Elevation		Northing	Easting	Elevation	Northing	Easting	Elevation		
145	863,220.62	2,032,001.10	990	SG3/FIN2	863,220.60	2,032,001.05	989.99	863,220.65	2,032,001.12	990.19		
146	863,220.62	2,032,010.10	984	SG2	863,220.61	2,032,010.13	983.99					
147	863,220.62	2,032,009.10	990	FIN1				863,220.63	2,032,009.09	990.22		
148	863,220.62	2,032,018.10	984	SG1	863,220.67	2,032,018.04	983.98				6.24	8.0
149	863,270.62	2,032,001.10	990	SG3/FIN2	863,270.60	2,032,001.13	989.97	863,270.60	2,032,001.11	990.35		
150	863,270.62	2,032,010.10	984	SG2	863,270.58	2,032,010.07	984.00					
151	863,270.62	2,032,009.10	990	FIN1				863,270.64	2,032,009.15	990.19		
152	863,270.62	2,032,010.10	984	SG1	863,270.63	2,032,018.13	983.99				6.20	8.0
153	863,320.62	2,032,001.10	990	SG3/FIN2	863,320.65	2,032,001.06	989.91	863,320.60	2,032,001.16	990.33		
154	863,320.62	2,032,010.10	984	SG2	863,320.67	2,032,010.10	983.98					
155	863,320.62	2,032,009.10	990	FIN1				863,320.67	2,032,009.17	990.23		
156	863,320.62	2,032,018.10	984	SG1	863,320.54	2,032,018.00	983.98				6.25	8.0
157	863,370.62	2,032,001.10	990	SG3/FIN2	863,370.67	2,032,001.09	989.68	863,370.65	2,032,001.12	990.29		
158	863,370.62	2,032,010.10	984	SG2	863,370.91	2,032,010.49	984.00					
159	863,370.62	2,032,009.10	990	FIN1				863,370.64	2,032,009.12	990.14		
160	863,370.62	2,032,018.10	984	SG1	863,370.58	2,032,018.11	983.99				6.15	8.0
161	863,420.62	2,032,001.10	990	SG3/FIN2	863,420.63	2,032,001.10	989.92	863,420.61	2,032,001.09	990.36		
162	863,420.62	2,032,010.10	984	SG2	863,420.66	2,032,010.05	983.95					
163	863,420.62	2,032,009.10	990	FIN1				863,420.59	2,032,009.07	990.13		
164	863,420.62	2,032,018.10	984	SG1	863,420.58	2,032,018.11	983.98				6.16	8.0
165	863,470.62	2,032,001.10	990	SG3/FIN2	863,470.60	2,032,001.04	989.60	863,470.59	2,032,001.14	990.19		
166	863,470.62	2,032,010.10	984	SG2	863,470.65	2,032,010.07	983.99					
167	863,470.62	2,032,009.10	990	FIN1				863,470.63	2,032,009.16	990.08		
168	863,470.62	2,032,018.10	984	SG1	863,470.67	2,032,018.04	984.32				5.77	8.0
169	863,484.32	2,032,001.10	990	SG3/FIN2	863,484.34	2,032,001.09	989.97	863,484.34	2,032,001.11	990.21		
170	863,484.32	2,032,010.10	984	SG2	863,484.26	2,032,010.02	984.36					
171	863,484.32	2,032,009.10	990	FIN1				863,484.33	2,032,009.16	990.11		
172	863,484.32	2,032,018.10	984	SG1	863,484.19	2,032,017.97	985.02				5.09	8.0

Tolerance:
Thickness: -0.0 to +0.2 feet
*Clay Thicknesses less than 6.0 feet are from existing points constructed higher than elevation 984. Rather than excavate good clay to design, an As-built elevation was used.

Survey Verification Drawings

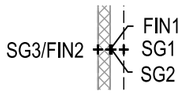
PROJECT CATCHLINE (TOE OF SLOPE)

TOP OF CLAY BARRIER, EL. 990

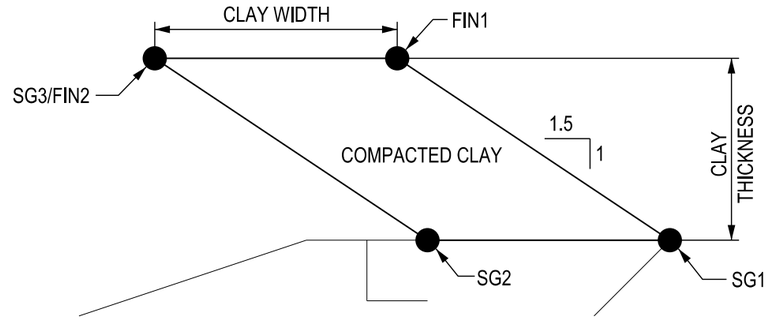
BOTTOM OF CLAY BARRIER, EL. 984 (MATCH EXISTING CLAY)

PROJECT BREAKLINES

SOUTH EMBANKMENT VERIFICATION POINTS
SEE SECTION 2



EAST EMBANKMENT VERFICATION POINTS
SEE SECTION 2



SECTION: CLAY BARRIER SURVEY VERIFICATION 2/1

N

0 75 150
SCALE IN FEET

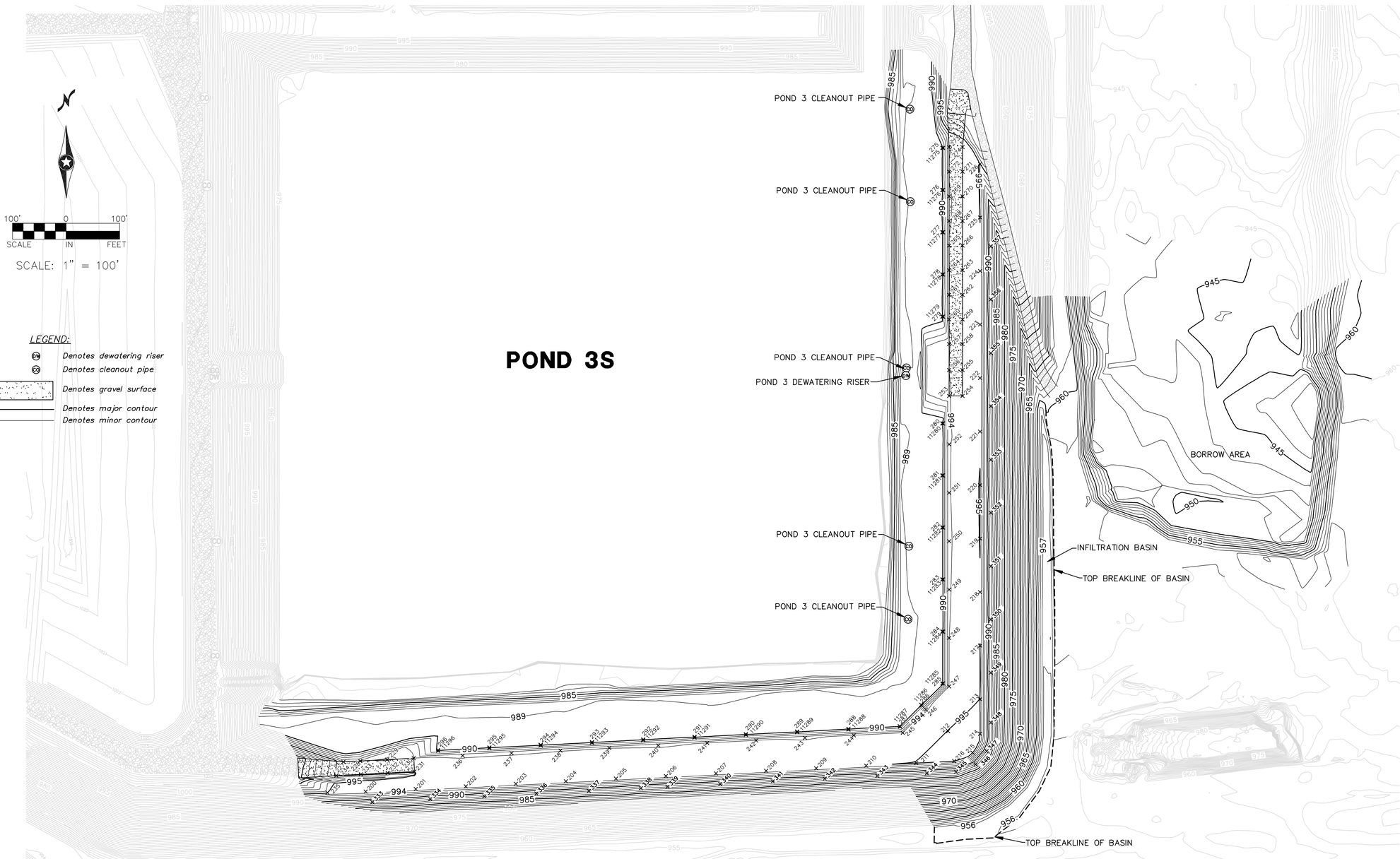
NOTE: REFER TO APPENDIX E FOR AS-BUILT CLAY BARRIER VERIFCATION POINT TABULATION

Carlson McCain
5300 Highway 12
Maple Plain, MN 55359
ph 952-346-3900

CLAY BARRIER VERIFICATION SURVEY POINT NUMBERS

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Cert Report\Appendix E - Survey Verification\Clay Survey Pt Locations.dgn

AS-BUILT SURVEY
POND 3 SOUTH VERTICAL EXPANSION
SHERCO GENERATING PLANT BECKER, MN



REV NO.	DATE	DESCRIPTION

DATE: 8/03/12
DESIGN BY:
DRAWN BY: CAW
CHECKED BY: LAB
DWG FILE: FNL ASBLT
FILE NO.: 12-0097.00

I hereby certify that this survey, plan, or report was prepared by me or under my direct supervision, and that I am a duly Licensed Land Surveyor under the laws of the State of Minnesota.

Signed: Craig Wensmann
CRAIG A. WENSMANN
Date: 8-3-12 Reg. No. 47466

BOGART, PEDERSON & ASSOCIATES, INC.
LAND SURVEYING
CIVIL ENGINEERING
MAPPING
13076 FIRST STREET BECKER, MN 55308-9322
TEL: 763-262-8822 FAX: 763-262-8844

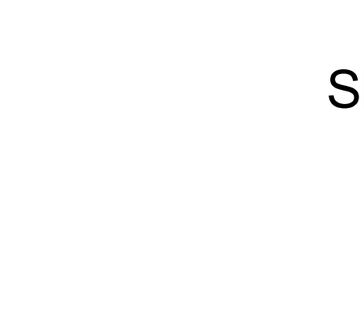
VEIT & COMPANY, INC.
SHERCO PLANT
POND 3S VERT. EXPANSION
BECKER, MN

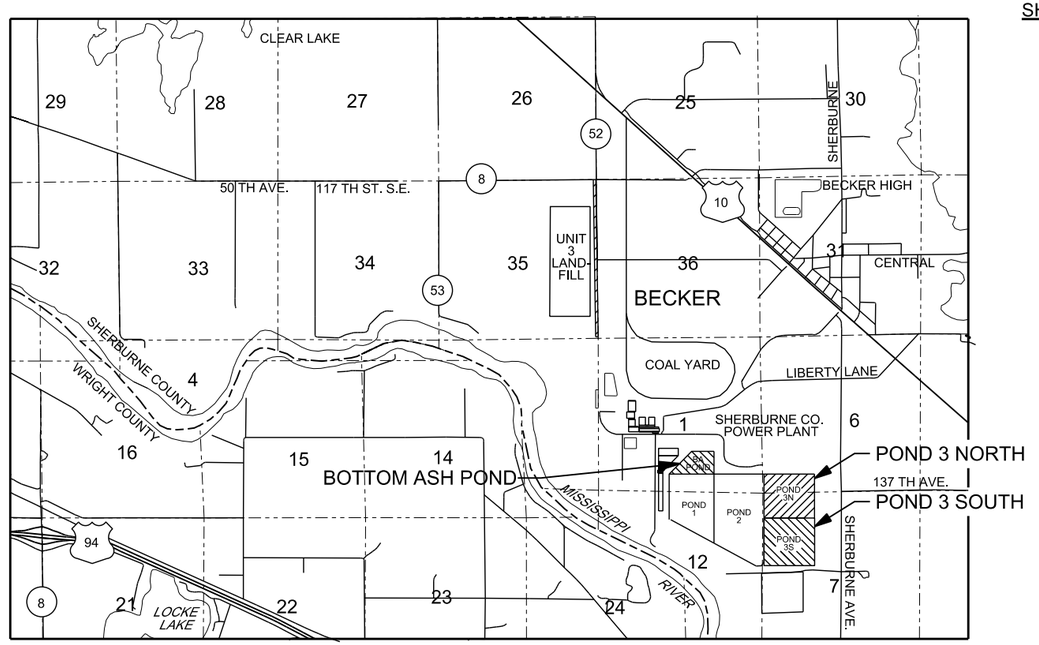
SHEET NO.
1
1

Record Drawings

RECORD DRAWINGS
SHERBURNE COUNTY (SHERCO) GENERATING PLANT
2012 ASH CONSTRUCTION PROJECTS

NPDES PERMIT No. 0002186
BECKER, MINNESOTA
NORTHERN STATES POWER COMPANY
dba XCEL ENERGY, INC.





SITE LOCATION MAP

SHEET	DRAWING TITLE	XCEL DRAWING NO.
	GENERAL	
G1	INDEX SHEET	NH-194808-301
G2	PLANT LAYOUT AND PROJECT AREAS	
G3	POND PROJECTS LAYOUT	
	BOTTOM ASH POND EXCAVATION	
BA1	EXISTING CONDITIONS (APPROXIMATE)	
BA2	BASE GRADES AND EXCAVATION LIMITS	
	POND 3 NORTH	
3N1	DEWATERING WELL CONNECTION	
3N2	INTERIOR BENCH AS-BUILT PLAN AND SECTION	
	POND 3S VERTICAL EXPANSION	
P1	PRE-CONSTRUCTION CONDITIONS	
P2	CLAY BARRIER AND BOTTOM ASH GRADING PLAN	NH-194808-302
P3	FINISHED GRADING PLAN	
P3A	AS-BUILT FINISHED GRADING PLAN	NH-194808-303
P4	SURVEY DATA	NH-194808-304
P5	RESTORATION PLAN	NH-194808-305
P6	EMBANKMENT SECTIONS	NH-194808-306
P7	SECTIONS AND DETAILS	NH-194808-307
	POND SCRUBBER SOLIDS PIPELINE CONSTRUCTION	
SS1	PIPELINE ALIGNMENT DATA	NH-91542-751
SS2	SECTIONS AND DETAILS	NH-91542-752

NO	REVISION	ZONE	DATE	BY	CHK	ENG
A	ISSUED FOR BIDDING		3/1/2012	DJR	XCEL	DJR
0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS; 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

Carlson McCain
• ENVIRONMENTAL
• ENGINEERING
• SURVEYING
5300 Highway 12, Maple Plain, MN 55369
Tel | (952) 346-3900 Fax | (952) 346-3901
www.CarlsonMcCain.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

FIRST NAME: DANIEL J. RIGGS
SIGNATURE:
DATE: 10/24/2012 LICENSE# 49559

Xcel Energy®
NORTHERN STATES POWER COMPANY
SHERCO GENERATING PLANT
BECKER, MINNESOTA

DWN: DJR	DATE:10/24/2012	CHK: XCEL	DATE:10/24/2012
ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

THIS MAP/DOCUMENT IS A TOOL TO ASSIST EMPLOYEES IN THE PERFORMANCE OF THEIR JOBS. YOUR PERSONAL SAFETY IS PROVIDED FOR BY USING SAFETY PRACTICES, PROCEDURES, AND EQUIPMENT AS DESCRIBED IN THE SAFETY TRAINING PROGRAMS AND MANUALS.

ENERGY SUPPLY
ENGINEERING & CONSTRUCTION

DRAWING NUMBER				
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS

INDEX SHEET

G1 REV ▲

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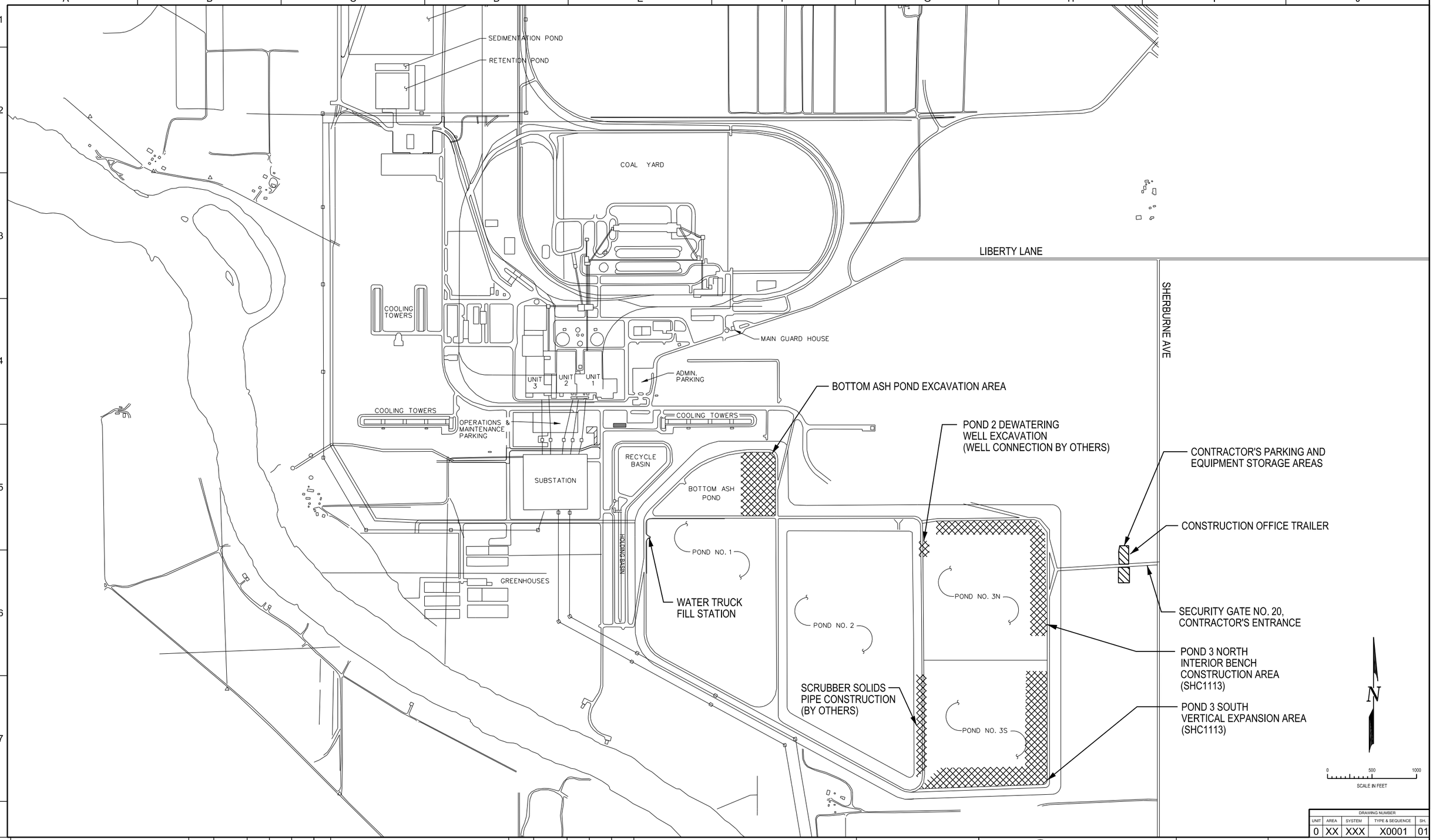

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NO	REVISION	ZONE	DATE	BY	CHK	ENG
A	ISSUED FOR BIDDING		3/1/2012	DJR	XCEL	DJR
0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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Xcel Energy®
NORTHERN STATES POWER COMPANY
SHERCO GENERATING PLANT
BECKER, MINNESOTA

DWN: DJR	DATE:10/24/2012	CHK: XCEL	DATE:10/24/2012
ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

ENERGY SUPPLY
ENGINEERING & CONSTRUCTION

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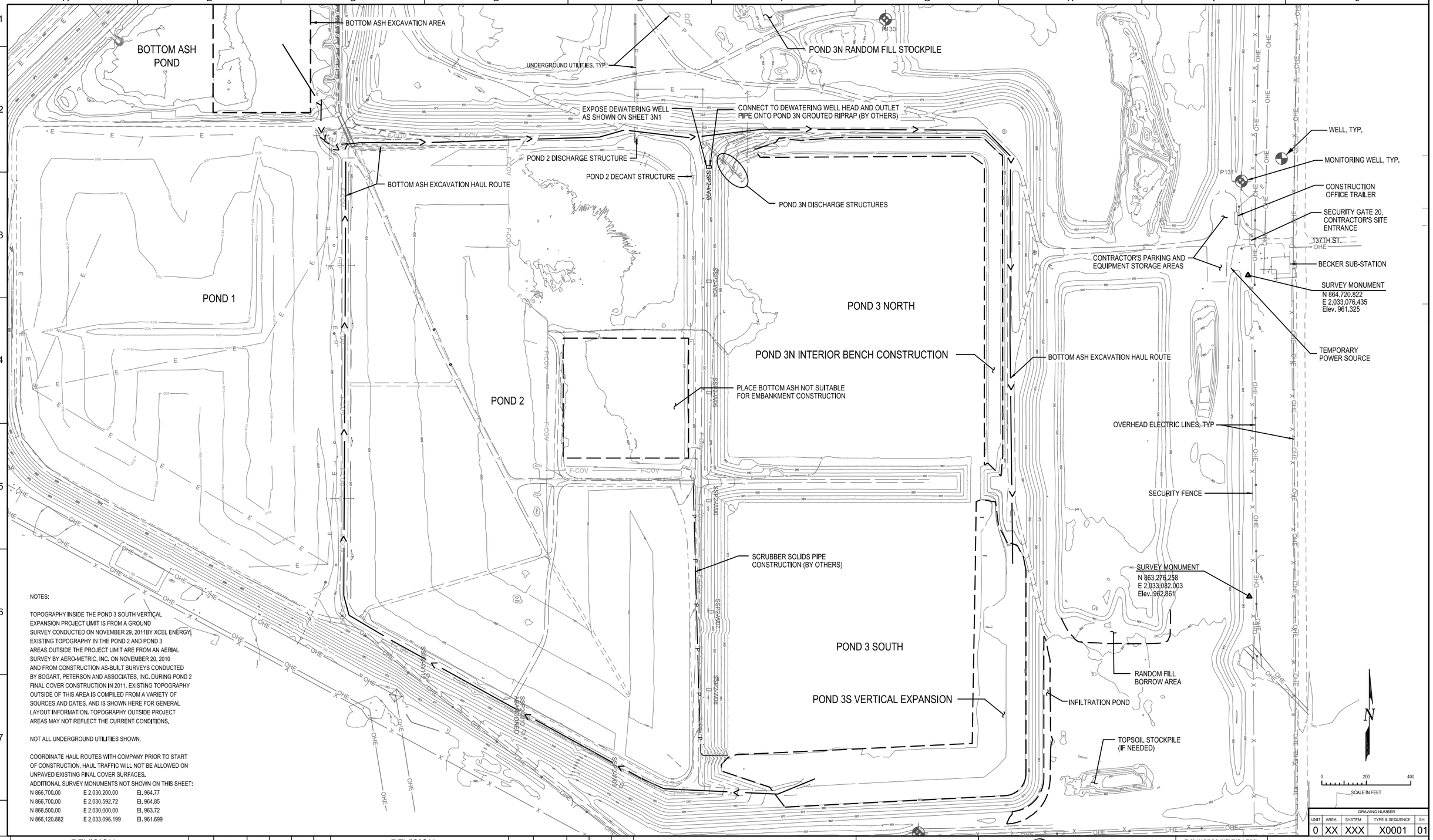
UNIT 0
2012 ASH CONSTRUCTION PROJECTS

PLANT LAYOUT AND PROJECT AREAS

G2 ▲ REV

DRAWING NUMBER				
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01



NOTES:

TOPOGRAPHY INSIDE THE POND 3 SOUTH VERTICAL EXPANSION PROJECT LIMIT IS FROM A GROUND SURVEY CONDUCTED ON NOVEMBER 29, 2011BY XCEL ENERGY. EXISTING TOPOGRAPHY IN THE POND 2 AND POND 3 AREAS OUTSIDE THE PROJECT LIMIT ARE FROM AN AERIAL SURVEY BY AERO-METRIC, INC. ON NOVEMBER 20, 2010 AND FROM CONSTRUCTION AS-BUILT SURVEYS CONDUCTED BY BOGART, PETERSON AND ASSOCIATES, INC. DURING POND 2 FINAL COVER CONSTRUCTION IN 2011. EXISTING TOPOGRAPHY OUTSIDE OF THIS AREA IS COMPILED FROM A VARIETY OF SOURCES AND DATES, AND IS SHOWN HERE FOR GENERAL LAYOUT INFORMATION. TOPOGRAPHY OUTSIDE PROJECT AREAS MAY NOT REFLECT THE CURRENT CONDITIONS.

NOT ALL UNDERGROUND UTILITIES SHOWN.

COORDINATE HAUL ROUTES WITH COMPANY PRIOR TO START OF CONSTRUCTION. HAUL TRAFFIC WILL NOT BE ALLOWED ON UNPAVED EXISTING FINAL COVER SURFACES.

ADDITIONAL SURVEY MONUMENTS NOT SHOWN ON THIS SHEET:

N 866,700.00	E 2,030,200.00	El. 964.77
N 866,700.00	E 2,030,592.72	El. 964.85
N 866,500.00	E 2,030,000.00	El. 963.72
N 866,120.882	E 2,033,096.199	El. 961.699

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NO	REVISION	ZONE	DATE	BY	CHK	ENG
A	ISSUED FOR BIDDING		3/1/2012	DJR	XCEL	DJR
0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS; 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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FIRST NAME: DANIEL J. RIGGS
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SHERCO GENERATING PLANT
BECKER, MINNESOTA

DWN: DJR	DATE:10/24/2012	CHK: XCEL	DATE:10/24/2012
ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

ENERGY SUPPLY
ENGINEERING & CONSTRUCTION

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UNIT 0
2012 ASH CONSTRUCTION PROJECTS

POND PROJECTS LAYOUT

G3

REV ▲

DRAWING NUMBER

UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

RECYCLE BASIN

866,000 N

865,750 N

DISCHARGE STRUCTURE

SHEET PILE
WING WALLS

APPROXIMATE
EXCAVATION
AREA

℄ DIRT ROAD

#31 BAL PIPE

#32 BAL PIPE

#1 BAL PIPE

#2 BAL PIPE

EXIST. 4" P.E. DEWATERING
DISCHARGE PIPE

2,028,000 E

2,028,250 E

0 50 100

N

NOTES:

1. EASTERN LIMIT OF EXCAVATION MUST LEAVE ADEQUATE ASH ADJACENT TO PIPE SUPPORTS FOR STABILITY OF PIPE.

2. EXISTING TOPOGRAPHY IS COMPILED FROM PREVIOUS SURVEYS TO APPROXIMATE THE EXISTING CONDITIONS AT THE TIME OF CONSTRUCTION, AND ARE SHOWN HERE FOR GENERAL LAYOUT INFORMATION, BUT SHOULD NOT BE USED FOR QUANTITY TAKE-OFF.

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_BA1_RD.dgn
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NO	REVISION	ZONE	DATE	BY	CHK	ENG
A	ISSUED FOR BIDDING		3/1/2012	DJR	XCEL	DJR
0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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FIRST NAME: DANIEL J. RIGGS

SIGNATURE:

DATE: 10/24/2012 LICENSE# 49559

Xcel Energy®
NORTHERN STATES POWER COMPANY
SHERCO GENERATING PLANT
BECKER, MINNESOTA

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DRAWING NUMBER

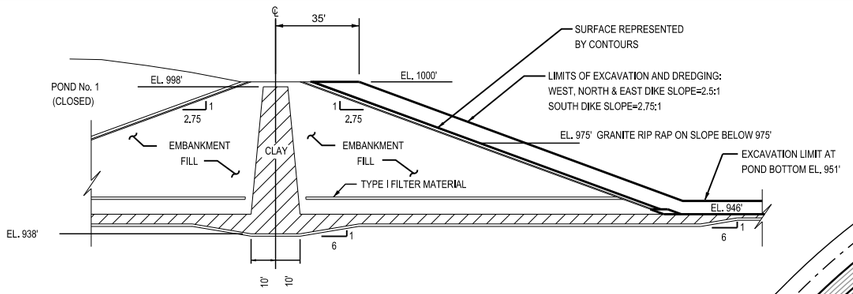
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
BOTTOM ASH POND EXCAVATION

EXISTING CONDITIONS (APPROXIMATE)

BA1

REV ▲



TYPICAL DIKE CROSS SECTION
(SOUTH DIKE LOOKING WEST)

NOTES:

1. CONTRACTOR SHALL NOT EXCAVATE BELOW LIMITS OF EXCAVATION.

2. EASTERN LIMIT OF EXCAVATION MUST LEAVE ADEQUATE ASH ADJACENT TO PIPE SUPPORTS FOR STABILITY OF PIPE.

0 50 100
SCALE IN FEET

N

NOTE:

CONTOURS REPRESENT THE POND BOTTOM AND SIDE SLOPE SURFACES. ASH SHALL NOT BE EXCAVATED WITHIN 5 FEET OF THIS SURFACE (MEASURED PERPENDICULAR TO THE SURFACE) AS SHOWN IN THE TYPICAL SECTION AT THE UPPER LEFT OF THIS SHEET.

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NO	REVISION	ZONE	DATE	BY	CHK	ENG
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▲	RECORD DRAWINGS (ADDED SHEETS; 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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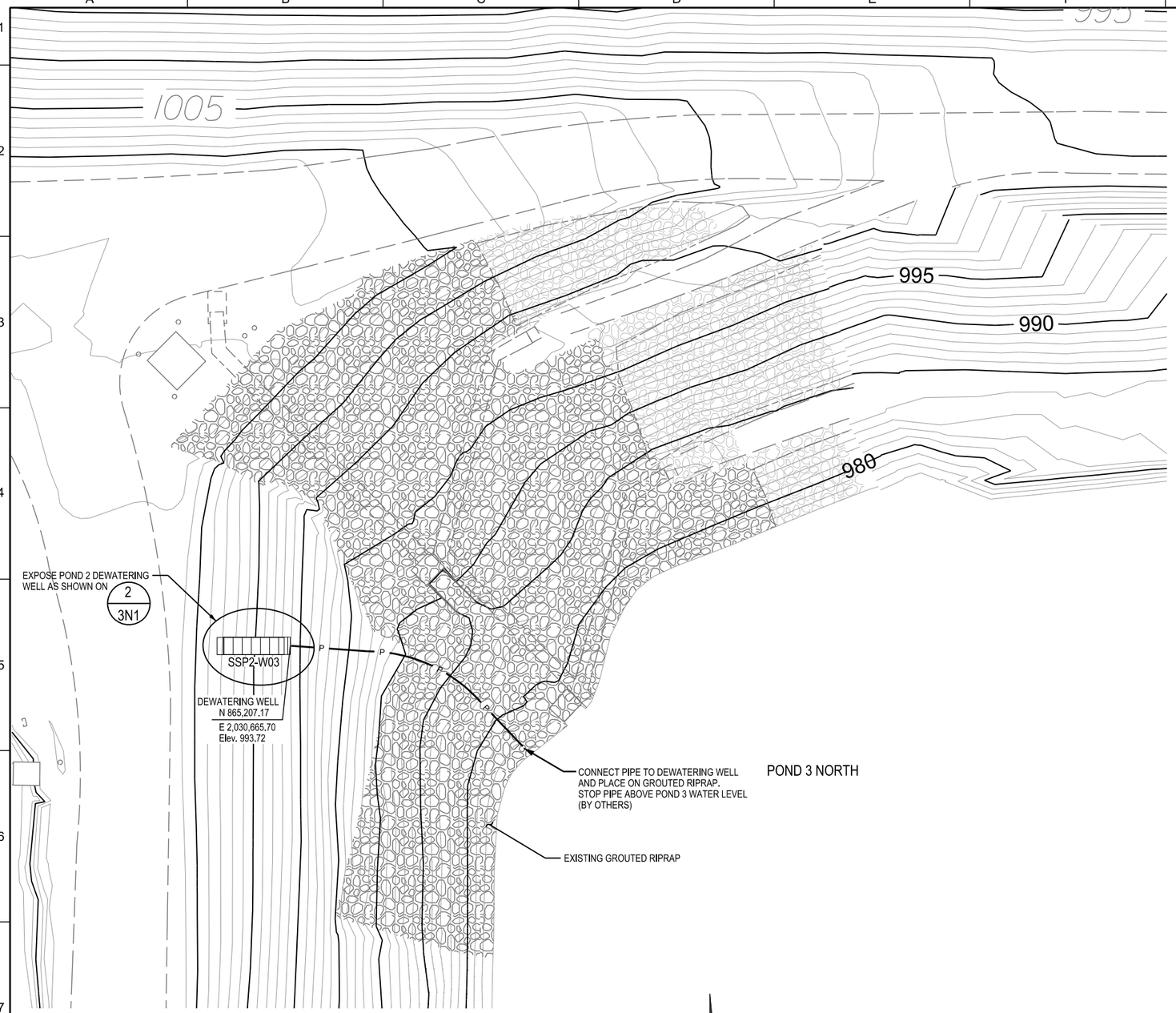
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
BOTTOM ASH POND EXCAVATION

BASE GRADES AND EXCAVATION LIMITS

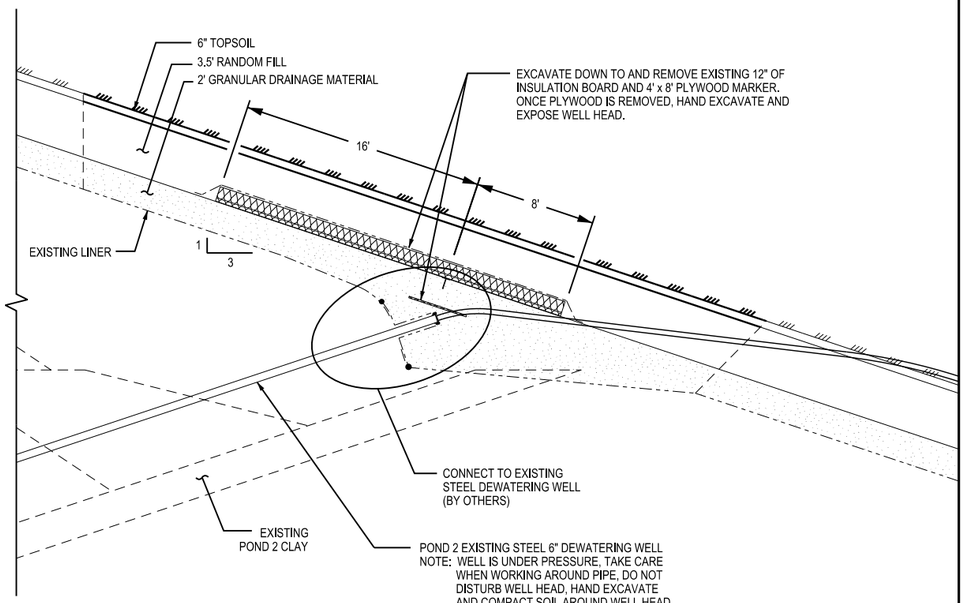
BA2

REV ▲



PLAN: POND 2 DEWATERING WELL CONNECTION (1 / 3N1)

0 20 40
SCALE IN FEET



SECTION: POND 2 DEWATERING WELL CONNECTION (2 / 3N1)

0 5 10
SCALE IN FEET

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NO	REVISION	ZONE	DATE	BY	CHK	ENG
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▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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ENGINEERING & CONSTRUCTION

DRAWING NUMBER				
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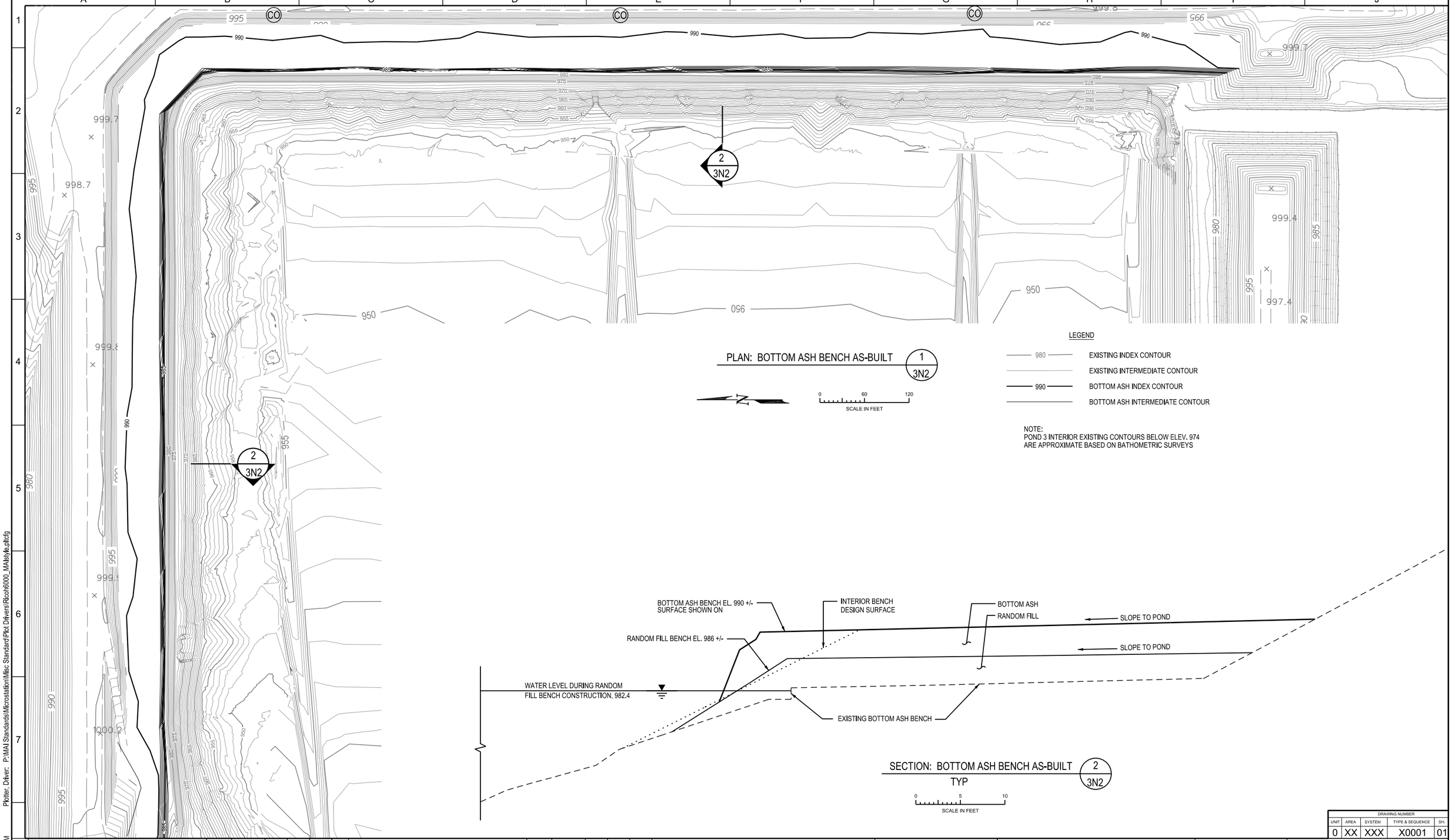
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3 NORTH
DEWATERING WELL CONNECTION

3N1 REV ▲



PLAN: BOTTOM ASH BENCH AS-BUILT 1 / 3N2

0 60 120
SCALE IN FEET

LEGEND

- 980 — EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- 990 — BOTTOM ASH INDEX CONTOUR
- BOTTOM ASH INTERMEDIATE CONTOUR

NOTE:
POND 3 INTERIOR EXISTING CONTOURS BELOW ELEV. 974
ARE APPROXIMATE BASED ON BATHOMETRIC SURVEYS

SECTION: BOTTOM ASH BENCH AS-BUILT 2 / 3N2
TYP

0 5 10
SCALE IN FEET

NO	REVISION	ZONE	DATE	BY	CHK	ENG
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3 NORTH
INTERIOR BENCH AS-BUILT PLAN AND SECTION

3N2 REV ▲

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_3N2_RD.dgn
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Plotted: 11/12/2012 6:27:48 AM

EXISTING STAINLESS STEEL SCRUBBER SOLIDS PIPE

SCRUBBER SOLIDS PIPE CONSTRUCTION (BY OTHERS)

STRIP EXISTING CLASS 5 AGGREGATE WITHIN PROJECT BASELINE

EXISTING DEWATERING RISER

EXISTING CLEANOUT

POND 3S

STRIP EXISTING CLASS 5 AGGREGATE WITHIN PROJECT BASELINE

TOP OF EXISTING CLAY ANCHOR

POND 3S CONSTRUCTION BORROW AREA

POND 3S CONSTRUCTION BORROW AREA LIMITS

TOPSOIL STOCKPILE

N

0 100 200
SCALE IN FEET

- EXISTING/PROPOSED CLEANOUT PIPE
- EXISTING DEWATERING RISER
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROJECT BASELINE AND STATIONING
- EXISTING CLAY ANCHOR
- MINNESOTA ENVIRONMENTAL QUALITY BORDER (STORMWATER BOUNDARY)

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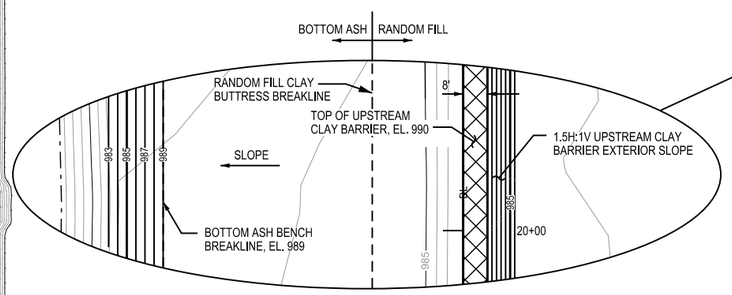
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION
PRE-CONSTRUCTION CONDITIONS

P1 ▲

POND 3S



DETAIL: CLAY BARRIER AND BOTTOM ASH GRADING PLAN — 1 / P2 — TYP

SCALE IN FEET: 0, 25, 50

SEE SHEET P3A FOR AS-BUILT BOTTOM ASH BENCH GRADES

RANDOM FILL CLAY BUTTRESS BREAKLINE

SLOPE

N 863,344.89
E 2,032,271.73
Elev. 941.00
BOTTOM OF BORROW

N 863,341.89
E 2,032,662.52
Elev. 940.00
BOTTOM OF BORROW

N 863,115.69
E 2,032,238.02
Elev. 942.00
BOTTOM OF BORROW

N 863,121.69
E 2,032,662.52
Elev. 940.00
BOTTOM OF BORROW

N 863,041.61
E 2,032,163.44
Elev. 957.00
EAST INF POND BOTTOM

STRIP TOPSOIL WITHIN BORROW AREA EXCAVATION LIMITS AND PLACE IN TOPSOIL STOCKPILE

N 862,987.05
E 2,032,176.94
Elev. 957.00
EAST INF POND BOTTOM

RESTORE ALL DISTURBED BORROW AREA SLOPES TO A 3H:1V

SEE SHEET P3A FOR AS-BUILT BORROW AREA GRADES

EAST INFILTRATION POND

N 862,581.85
E 2,032,166.44
Elev. 956.00
EAST INF POND BOTTOM

N 862,581.85
E 2,032,179.94
Elev. 956.00
EAST INF POND BOTTOM

EXISTING POND 3S EMBANKMENT

EROSION BLANKET

EXISTING GROUND

INSTALL EROSION BLANKET BEYOND BREAKLINE

6" TOPSOIL

13.5'

SECTION: EAST INFILTRATION POND — 2 / P2 — TYP

SCALE IN FEET: 0, 5, 10

TOPSOIL STOCKPILE

N

SCALE IN FEET: 0, 100, 200

EXISTING/PROPOSED CLEANOUT PIPE
EXISTING DEWATERING RISER
EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
PROJECT BASELINE AND STATIONING
GRADE BREAKLINE
GRADE CATCHLINE
PROPOSED CLAY BARRIER
EXISTING CLAY ANCHOR
PROPOSED INDEX CONTOUR (10' ON 100'/" SCALE, 5' ON 25'/" SCALE)
PROPOSED INTERMEDIATE CONTOUR (2' ON 100'/" SCALE, 1' ON 25'/" SCALE)
MEQB — MINNESOTA ENVIRONMENTAL QUALITY BORDER (STORMWATER BOUNDARY)

▲ THIS SHEET REPRESENTS DESIGN DATA. REFER TO APPENDIX E FOR FINISHED GRADE AS-BUILT GRID POINT DRAWINGS AND TABULATIONS. ALL POINTS WERE CONSTRUCTED WITHIN TOLERANCE UNLESS OTHERWISE NOTED.

NO	REVISION	ZONE	DATE	BY	CHK	ENG
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ENGINEERING & CONSTRUCTION

DRAWING NUMBER

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0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION
CLAY BARRIER AND BOTTOM ASH GRADING PLAN

P2 — REV ▲

File: P:\Projects\XCELSHC0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_P2_RD.dgn
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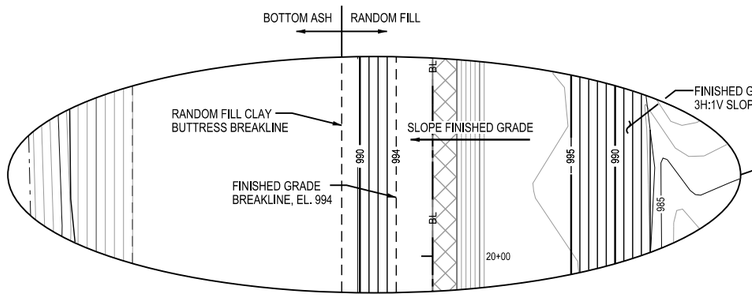
POND 3S



DETAIL: FINISHED GRADE GRADING PLAN — TYP — 1/P3

0 25 50
SCALE IN FEET

1/P7

2/P6

1/P6

TOPSOIL STOCKPILE

N

0 100 200
SCALE IN FEET

EX EXISTING/PROPOSED CLEANOUT PIPE
DW EXISTING DEWATERING RISER
990 EXISTING INDEX CONTOUR
EXISTING INTERMEDIATE CONTOUR
BL 18+00 PROJECT BASELINE AND STATIONING
GRADE BREAKLINE
GRADE CATCHLINE
PROPOSED CLAY BARRIER
980 PROPOSED INDEX CONTOUR (10' ON 100'/" SCALE, 5' ON 25'/" SCALE)
PROPOSED INTERMEDIATE CONTOUR (2' ON 100'/" SCALE, 1' ON 25'/" SCALE)
MEQB MINNESOTA ENVIRONMENTAL QUALITY BORDER (STORMWATER BOUNDARY)

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DRAWING NUMBER				
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

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ENERGY SUPPLY
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UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION

FINISHED GRADING PLAN

P3 ▲

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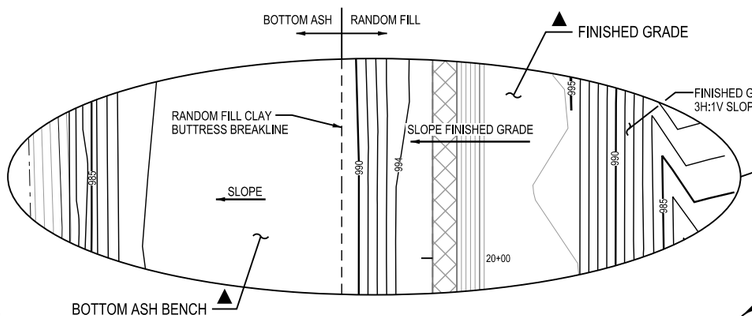
POND 3S



DETAIL: AS-BUILT FINISHED GRADING PLAN (1 / P3)

TYP

0 25 50
SCALE IN FEET

1 / P7

2 / P6

1 / P6

BORROW AREA

INFILTRATION POND

BOTTOM ASH BENCH

TOPSOIL STOCKPILE

N

0 100 200
SCALE IN FEET

- EXISTING/PROPOSED CLEANOUT PIPE
- EXISTING DEWATERING RISER
- EXISTING INDEX CONTOUR
- EXISTING INTERMEDIATE CONTOUR
- PROJECT BASELINE AND STATIONING
- GRADE BREAKLINE
- GRADE CATCHLINE
- PROPOSED CLAY BARRIER
- AS-BUILT INDEX CONTOUR (10' ON 100'/" SCALE, 5' ON 25'/" SCALE)
- AS-BUILT INTERMEDIATE CONTOUR (2' ON 100'/" SCALE, 1' ON 25'/" SCALE)
- MINNESOTA ENVIRONMENTAL QUALITY BORDER (STORMWATER BOUNDARY)

NO	REVISION	ZONE	DATE	BY	CHK	ENG
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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FIRST NAME: DANIEL J. RIGGS
SIGNATURE:
DATE: 10/24/2012 LICENSE# 49559

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SHERCO GENERATING PLANT
BECKER, MINNESOTA

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ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

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DRAWING NUMBER				
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION

AS-BUILT FINISHED GRADING PLAN

P3A REV ▲

File: P:\Projects\XCELSHC\0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_P3A_RD.dgn
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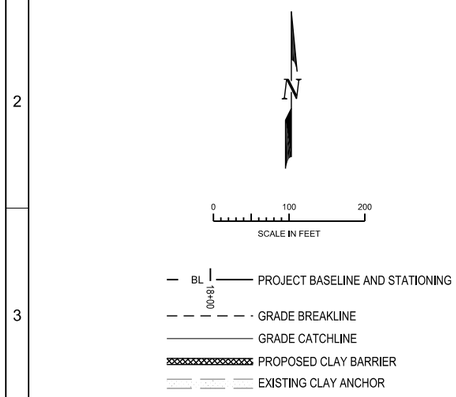
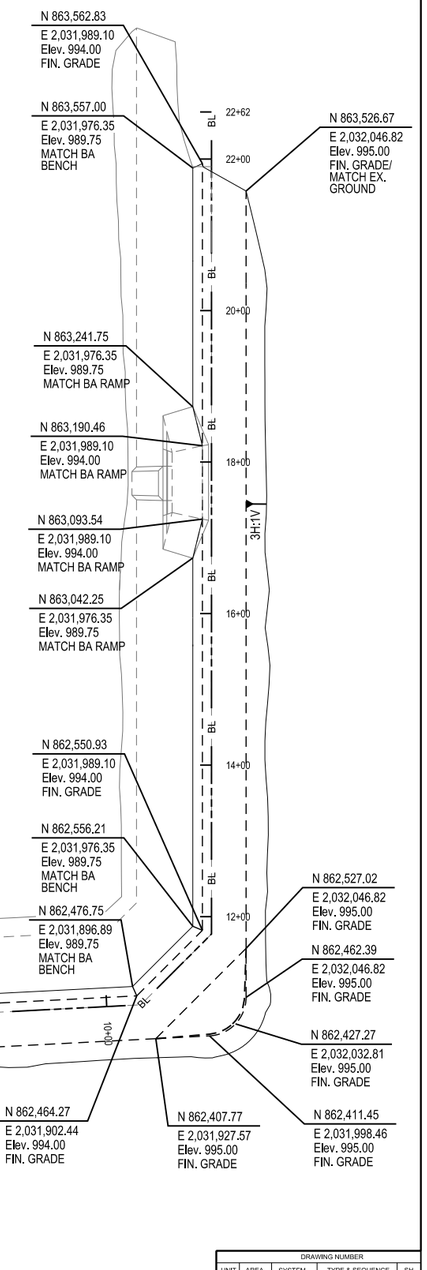


▲ THIS SHEET REPRESENTS DESIGN DATA. REFER TO APPENDIX E FOR FINISHED GRADE AS-BUILT GRID POINT DRAWINGS AND TABULATIONS. ALL POINTS WERE CONSTRUCTED WITHIN TOLERANCE UNLESS OTHERWISE NOTED.

PLAN: CLAY BARRIER AND BOTTOM ASH SURVEY DATA (1 / P4)



PLAN: FINISHED GRADE SURVEY DATA (2 / P4)

NO	REVISION	ZONE	DATE	BY	CHK	ENG
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0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

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ENERGY SUPPLY
ENGINEERING & CONSTRUCTION

DRAWING NUMBER

UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION
SURVEY DATA

P4 REV ▲

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_P4_RD.dgn
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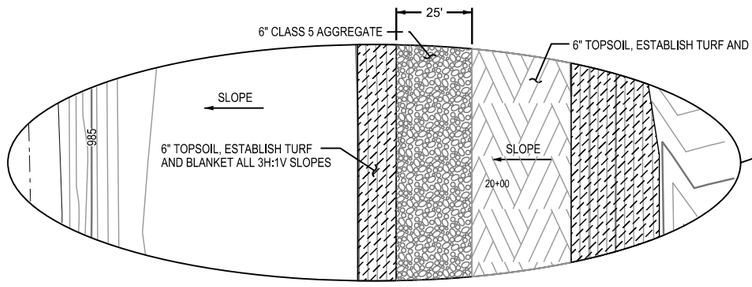
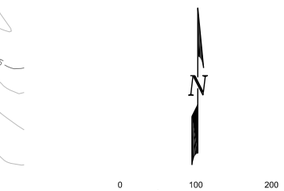


DETAIL: RESTORATION PLAN 1/P5

TYP

0 25 50

SCALE IN FEET



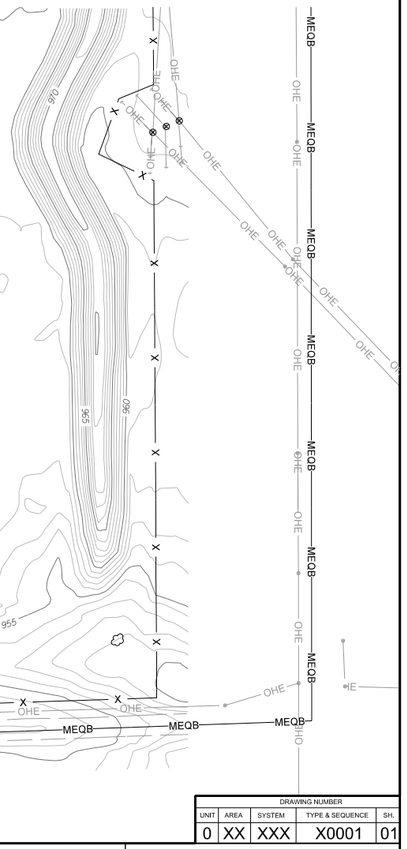
6" CLASS 5 AGGREGATE

6" TOPSOIL, ESTABLISH TURF, EROSION BLANKET

6" TOPSOIL, ESTABLISH TURF, MULCH

NOTE:
CONTRACTOR SHALL RESTORE ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES

RESTORE TOPSOIL STOCKPILE WITHIN 14 DAYS OF USE.



DRAWING NUMBER				
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

NO	REVISION	ZONE	DATE	BY	CHK	ENG
A	ISSUED FOR BIDDING		3/1/2012	DJR	XCEL	DJR
0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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BECKER, MINNESOTA

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ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

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UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION

RESTORATION PLAN

P5 ▲

File: P:\Projects\XCEL\SHC0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_P5_RD.dgn
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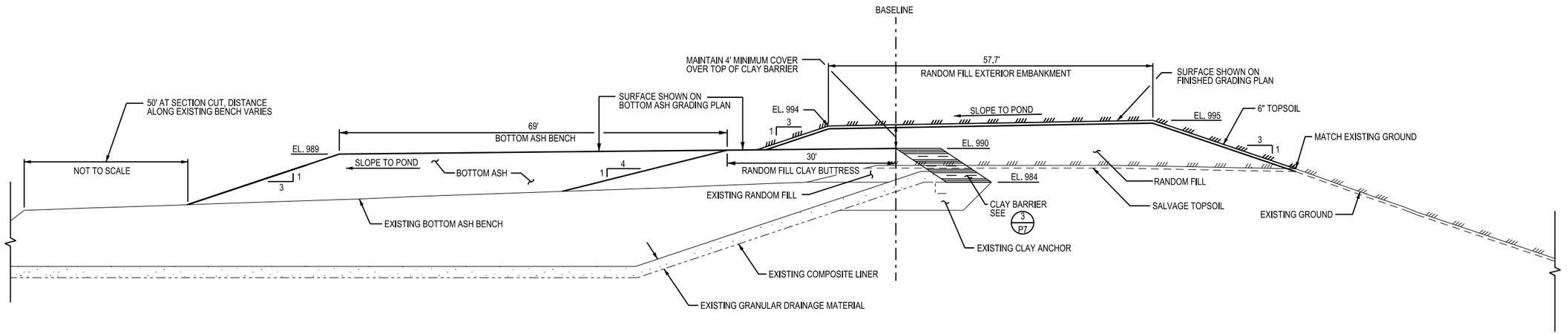
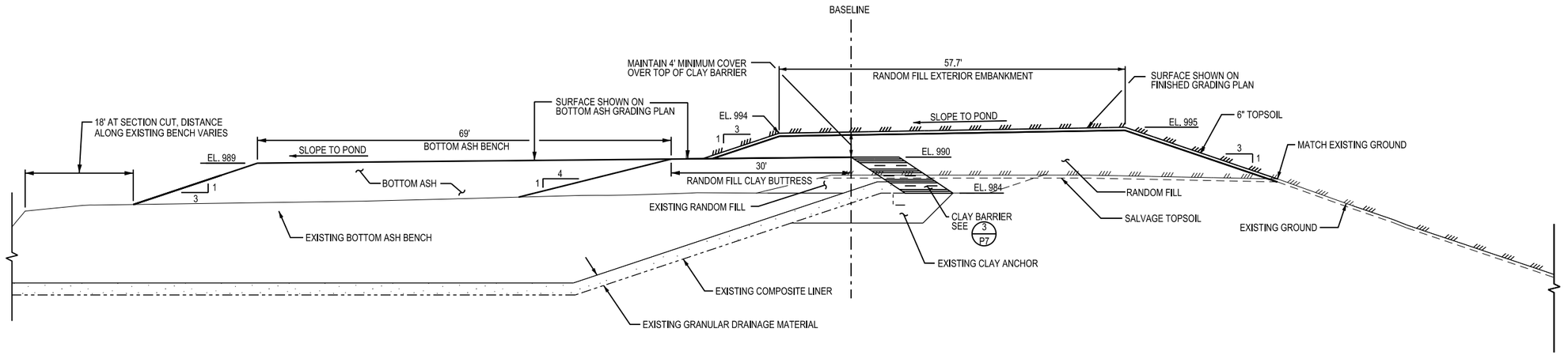


SECTION: SOUTH EMBANKMENT 1
STA 00+00 TO STA 10+45 P2,P3

0 10 20
SCALE IN FEET

NOTE: INSTALL EROSION BLANKET ON ALL NEW OR DISTURBED 3H:1V SLOPES



SECTION: EAST EMBANKMENT 2
STA 11+77 TO STA 22+62 P2,P3

0 10 20
SCALE IN FEET

NOTE: INSTALL EROSION BLANKET ON ALL NEW OR DISTURBED 3H:1V SLOPES

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NO	REVISION	ZONE	DATE	BY	CHK	ENG
A	ISSUED FOR BIDDING		3/1/2012	DJR	XCEL	DJR
0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

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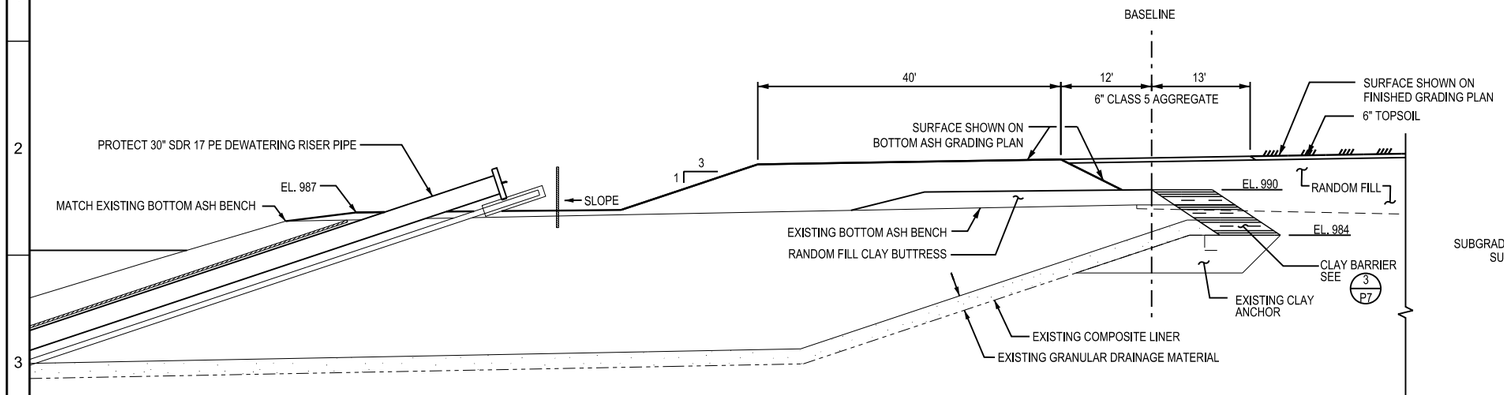
DRAWING NUMBER

UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION
EMBANKMENT SECTIONS

P6 REV ▲

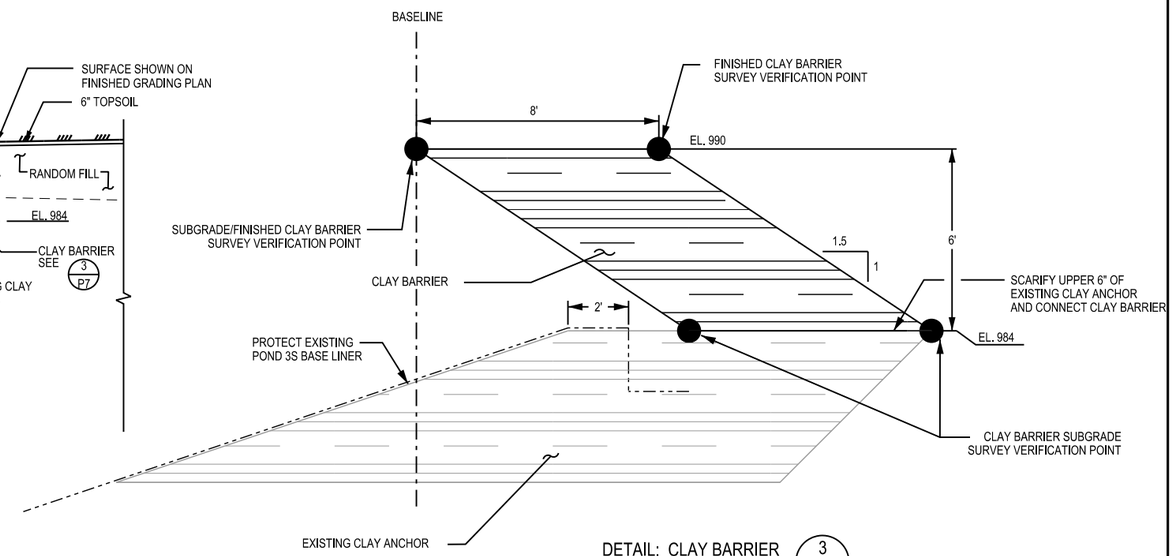


SECTION: EAST EMBANKMENT DEWATERING RISER, CLEANOUT AND BOTTOM ASH RAMP (1 P2,P3)

STA 17+72

0 10 20

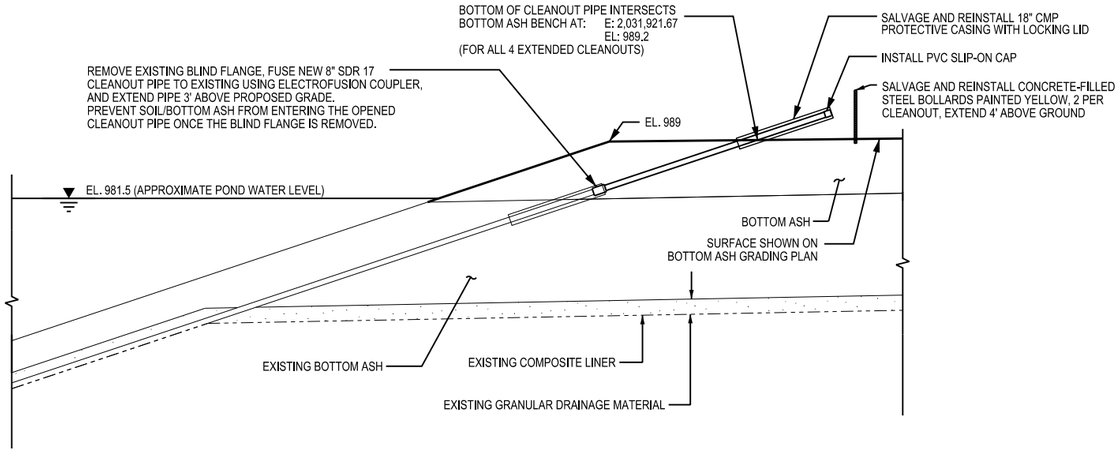
SCALE IN FEET



DETAIL: CLAY BARRIER (3 P6,P7) TYP

0 2.5 5

SCALE IN FEET

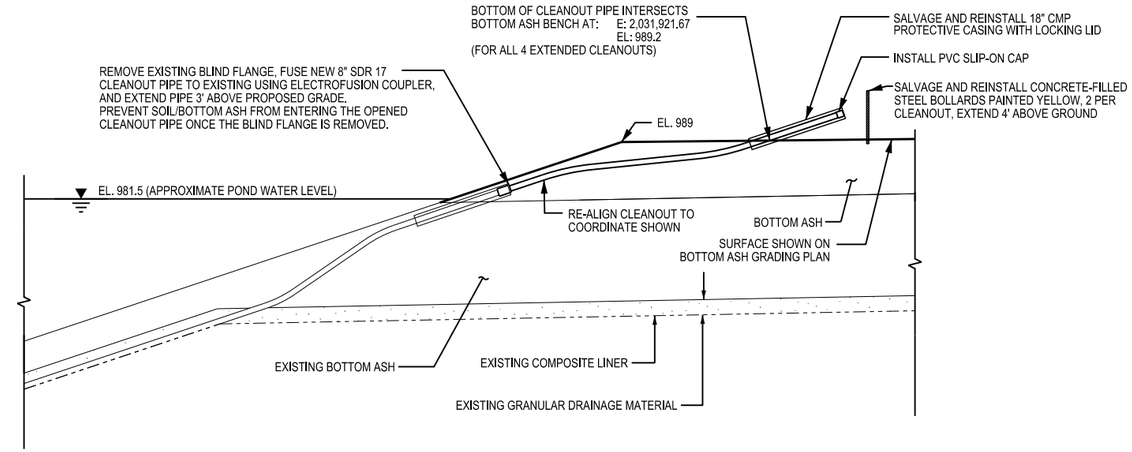


SECTION: EAST EMBANKMENT CLEANOUT EXTENSION (2 TOTAL) (2 P2,P3)

STA 13+09 & STA 14+46

0 10 20

SCALE IN FEET



SECTION: EAST EMBANKMENT CLEANOUT REALIGNMENT AND EXTENSION (2 TOTAL) (4 P2,P3)

STA 20+90, STA 22+62

0 10 20

SCALE IN FEET

NO	REVISION	ZONE	DATE	BY	CHK	ENG
A	ISSUED FOR BIDDING		3/1/2012	DJR	XCEL	DJR
0	ISSUED FOR CONSTRUCTION		6/12/2012	DJR	XCEL	DJR
1	RAISED CLAY AND BOTTOM ASH TO ELEV. 990 (SHEETS P1-P7)		6/14/2012	DJR	XCEL	DJR
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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BECKER, MINNESOTA

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PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

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ENERGY SUPPLY
ENGINEERING & CONSTRUCTION

DRAWING NUMBER

UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND 3S VERTICAL EXPANSION

SECTIONS AND DETAILS

P7

REV ▲

File: P:\Projects\XCELLSHC\0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_P7_RD.dgn
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Plotted: 11/12/2012 9:06:06 AM

P.C. STA 24+71.67
N 863,800.00
E 2,030,576.92

P.T. STA 24+79.39
N 863,795.14
E 2,030,581.92

EAST PIPE ANCHOR,
RE-USE EXISTING SS PIPE BENDS

STA. 36+60, END S.S.
SCRUBBER SOLIDS PIPES
N 862,614.95
E 2,030,613.79

SOUTHEAST PIPE ANCHOR

INSTALL AIR RELEASE/VACUM BREAKER VALVES AT PIPELINE HIGH POINT,
APPROXIMATELY STATION 18+00, FIELD VERIFY LOCATION OF HIGH POINT

WEST PIPE ANCHOR

P.T. STA 16+57.39
N 863,800.00
E 2,029,762.64

℄ NEW TWIN 6" S.S. SCRUBBER SOLIDS PIPES

P.C. STA 16+53.02
N 863,802.15
E 2,029,759.09

CURVE DATA
RAD. = 2,750 FT
Δ = 4.1737°

LIMIT OF PROP. FINAL COVER CONSTRUCTION

P.T. STA 11+03.43
N 864,289.62
E 2,029,505.25

P.C. STA 9+03.11
N 864,470.50
E 2,029,419.28

GRAVEL ROAD

START INSTALLATION AT STA. 2+50, COMPLETE INSTALLATION
NORTH OF STA. 2+50 AFTER FINAL COVER IS COMPLETED

STA. 0+00, BEGIN S.S. SCRUBBER SOLIDS PIPES AT CONC. WALL
N 865,299.75
E 2,029,061.57

0 100 200
SCALE IN FEET

▲ THIS SHEET REPRESENTS DESIGN DATA. ALL POINTS WERE CONSTRUCTED WITHIN TOLERANCE UNLESS OTHERWISE NOTED.

THE SCRUBBER SOLIDS PIPELINE WAS CONSTRUCTED FROM STA 0+00 TO STA 24+80 IN 2011, AND FROM STA 24+80 TO STA 37+00 IN 2012.

DRAWING NUMBER				
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

NO	REVISION	ZONE	DATE	BY	CHK	ENG
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

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ENERGY SUPPLY
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UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND SCRUBBER SOLIDS PIPELINE CONSTRUCTION
PIPELINE ALIGNMENT DATA

SS1 REV ▲

File: P:\Projects\XCELLSHC\0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_SS1_RD.dgn
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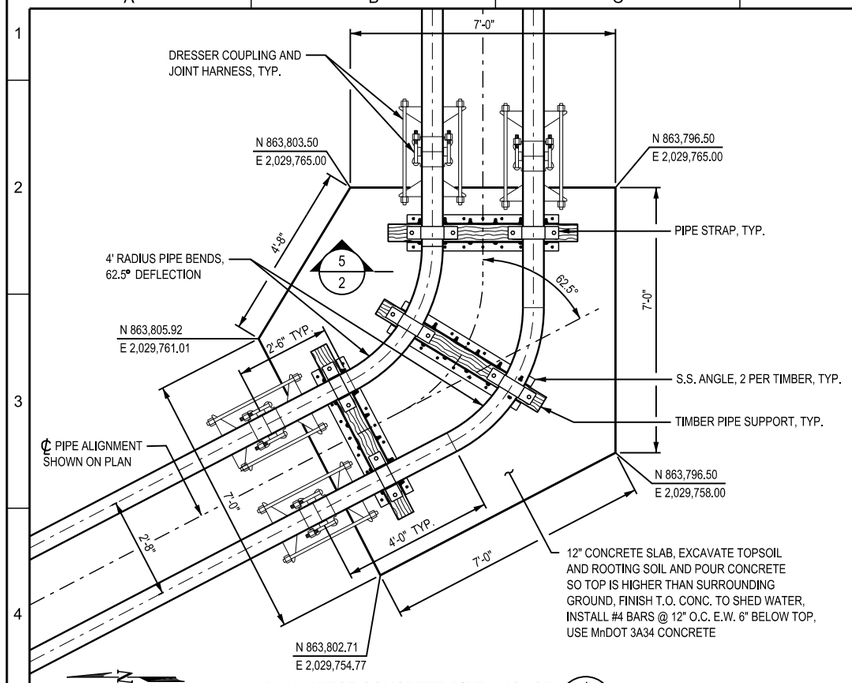
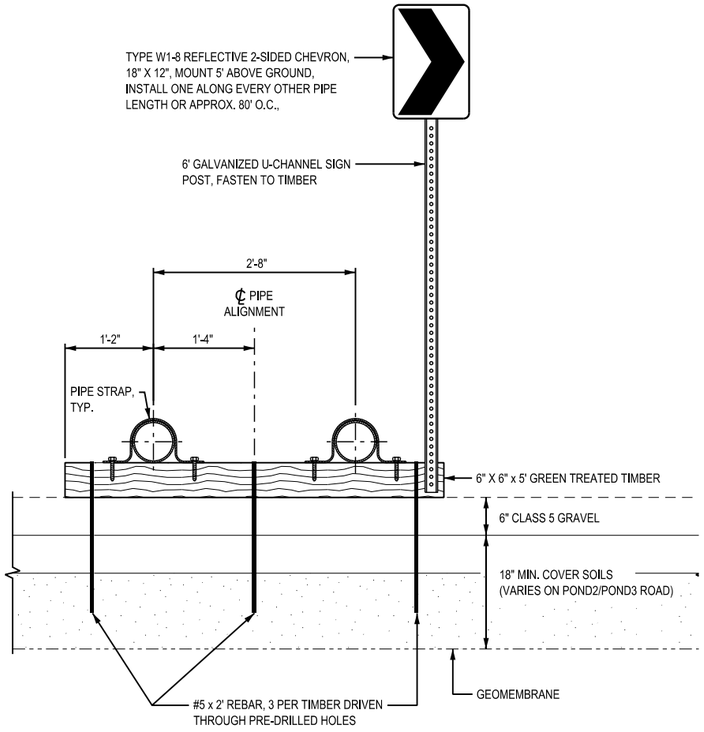


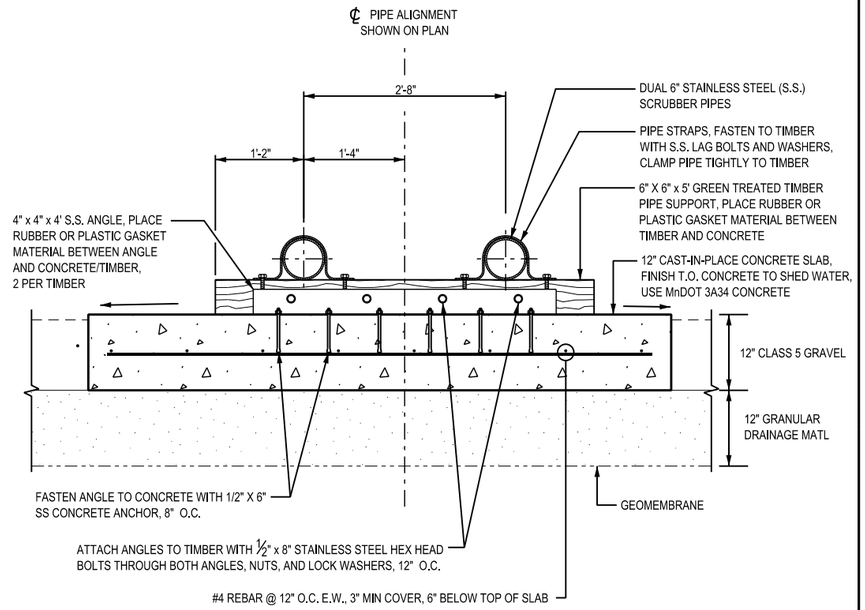
PLAN: WEST CONCRETE PIPE ANCHOR 1/1

0 1' 2' 4'
SCALE IN FEET



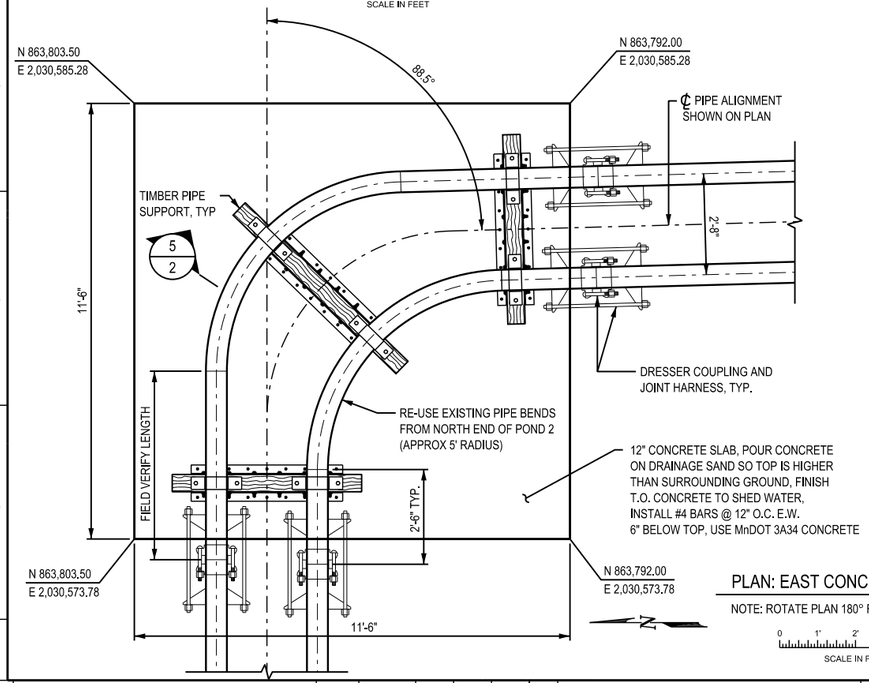
SECTION: ANCHORED TIMBER PIPE SUPPORT 3/1

0 3" 6" 12"
SCALE IN INCHES



SECTION: CONCRETE PIPE ANCHOR AND TIMBER PIPE SUPPORT 5/2

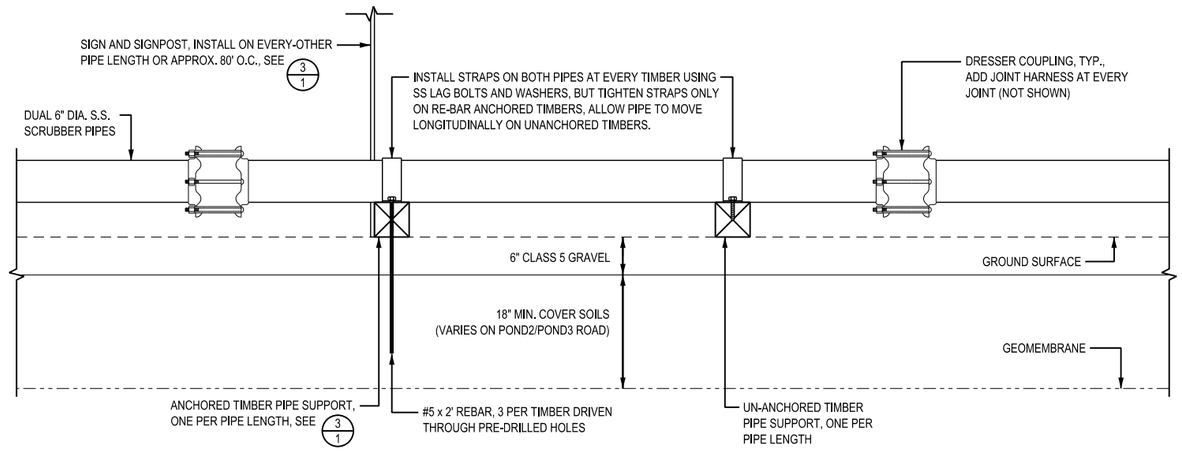
0 3" 6" 12"
SCALE IN INCHES



PLAN: EAST CONCRETE PIPE ANCHORS 2/1

NOTE: ROTATE PLAN 180° FOR SOUTHEAST PIPE ANCHOR

0 1' 2' 4'
SCALE IN FEET



SECTION: LONGITUDINAL PIPE SECTION AND TIMBER PIPE SUPPORTS 4/1

NOT TO SCALE

NO	REVISION	ZONE	DATE	BY	CHK	ENG
▲	RECORD DRAWINGS (ADDED SHEETS: 3N2, P3A, SS1 & SS2)		10/24/2012	DJR	XCEL	DJR

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I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

FIRST NAME: DANIEL J. RIGGS
SIGNATURE:
DATE: 10/24/2012 LICENSE# 49559

Xcel Energy®
NORTHERN STATES POWER COMPANY
SHERCO GENERATING PLANT
BECKER, MINNESOTA

DWN: DJR	DATE:10/24/2012	CHK: XCEL	DATE:10/24/2012
ENG: DJR	DATE:10/24/2012	CHK:	DATE:
PM:	DATE:	PROJ. NO: SHC1113	
APVD:	DATE:	SCALE: SEE DRAWING	

THIS MAP/DOCUMENT IS A TOOL TO ASSIST EMPLOYEES IN THE PERFORMANCE OF THEIR JOBS. YOUR PERSONAL SAFETY IS PROVIDED FOR BY USING SAFETY PRACTICES, PROCEDURES, AND EQUIPMENT AS DESCRIBED IN THE SAFETY TRAINING PROGRAMS AND MANUALS.

ENERGY SUPPLY
ENGINEERING & CONSTRUCTION

DRAWING NUMBER				
UNIT	AREA	SYSTEM	TYPE & SEQUENCE	SH.
0	XX	XXX	X0001	01

UNIT 0
2012 ASH CONSTRUCTION PROJECTS
POND SCRUBBER SOLIDS PIPELINE CONSTRUCTION
SECTIONS AND DETAILS

SS2 REV ▲

File: P:\Projects\XCELLSHC0601 Pond 3S General Services\2012 construction\Drawings\Record\2012 Pond 3S Const_SS2_RD.dgn
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Plotted: 11/12/2012 9:12:52 AM