LANDFILL OPERATION AND MAINTENANCE PLAN

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Prepared for:

OUC The Reliable One®

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

February 3, 2017

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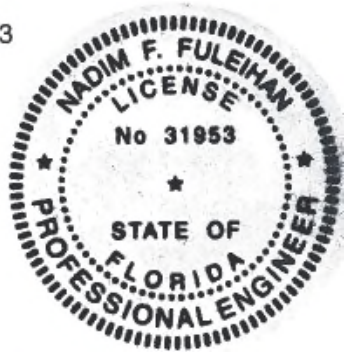


TABLE OF CONTENTS

Section	Title	Page
1.0	**INTRODUCTION**	1
2.0	**BACKGROUND INFORMATION**	1
2.1	Site Location	1
2.2	Facility Description	1
2.3	Conditions of Certification	2
2.4	Original Landfill Design and Operation/Management Plan	3
2.5	Actual Sequence of Landfilling	5
2.6	Vertical Expansion of Original CWSA	6
2.7	Design of Horizontal Expansion	6
	2.7.1 Design of Bottom Liner System	6
	2.7.2 Design of Landfill Cells	8
2.8	Landfill Topographic Surveys	9
3.0	**RESPONSIBILITIES FOR OPERATION AND MAINTENANCE**	9
4.0	**WASTE STREAMS**	10
4.1	SEC Fly Ash	10
4.2	Imported Fly Ash/Lime Substitute	10
4.3	FGD Sludge	11
4.4	Bottom Ash	11
4.5	Brine Concentrator and Crystallizer Solids	11
4.6	Miscellaneous Power Plant Wastes	11
4.7	Construction and Demolition Debris	12
4.8	Disposal of Waste from Other OUC Sites	12
5.0	**WASTE RECORDS**	12
6.0	**CONTROL OF ACCESS AND DISPOSAL**	13
7.0	**MONITORING OF WASTE**	13
8.0	**COMBUSTION WASTE PROCESSING**	13
9.0	**OPERATIONS PERFORMED ON STACK OUT PAD**	15
10.0	**OPERATIONS PERFORMED IN DECANT CELL**	16
11.0	**EQUIPMENT AND OPERATION FEATURES**	17
11.1	Landfill and Stack Out Pad Operating Equipment	17
11.2	Haul Roads	17
11.3	Communications	18
12.0	**LANDFILL DISPOSAL OPERATION**	18
12.1	Handling and Placement of Fixated Material	18
12.2	Handling and Placement of Bottom Ash	19

(continued)

TABLE OF CONTENTS
(continued)

Section	Title	Page
12.3	Handling and Placement of Brine Concentrator and Crystallizer Solids	19
12.4	Handling and Placement of Miscellaneous Power Plant Wastes	20
12.5	Handling and Placement of Spent Water Treatment Resin	20
12.6	Disposal of C&D Debris	20
12.7	Sequence of Waste Placement	20
	12.7.1 Original CWSA	20
	12.7.2 Vertical Expansion	21
	12.7.3 Lined Horizontal Expansion Cell 1	22
12.8	Placement of Intermediate Soil Cover	24
13.0	**WATER QUALITY MONITORING**	24
14.0	**LEACHATE MANAGEMENT**	25
14.1	Leachate Generation	25
14.2	Leachate Collection	25
14.3	Leachate Flow Measurement	26
14.4	Leachate Storage	26
14.5	Leachate Treatment	26
14.6	Leachate Sampling	27
14.7	Leachate Collection System Maintenance	27
15.0	**STORMWATER MANAGEMENT/EROSION CONTROL**	28
15.1	Stormwater Management	28
15.2	Erosion and Sedimentation Control	29
15.3	Fugitive Dust Control	29
16.0	**CLOSURE PLANS**	30
16.1	Landfill Closure	30
	16.1.1 Specifications for Seeding of the Landfill Cells at Closure	30
16.2	Closure of the Combustion Waste Processing Facility/Area	32
16.3	Closure of the CWSA Runoff Pond	32
17.0	**EMERGENCY RESPONSE PROCEDURES AND CONTINGENCY OPERATIONS**	32
17.1	Emergency Response Procedures	32
17.2	Contingency Operations	33
	17.2.1 Wet Weather Operation	33
	17.2.2 High Water Levels in the CWSA Runoff Pond	34
	17.2.3 Unscheduled Downtime in Combustion Waste Processing Facility	34
	17.2.4 Landfill and Stack Out Pad Equipment Breakdowns and Maintenance	34
	17.2.5 Interruptions of Discharge to the Wastewater Treatment Facility	34

(continued)

TABLE OF CONTENTS
(continued)

Section	Title	Page
	17.2.6 Leachate Accumulation in Lined Cells	34
17.3	Notification Requirements	35
18.0	**QUALITY CONTROL TESTING**	35
18.1	Initial Operation Testing Program	35
18.2	Long-Term Testing Program	36
	18.2.1 Stockpiled Processed Material	36
	18.2.2 In-Place Density Testing	36
19.0	**RECORDKEEPING**	37
19.1	Regulatory Records	37
19.2	Waste Quantities and Landfill Operation Records	37
19.3	On-Site Rainfall Data	38
19.4	Leachate Quantities	38
19.5	Landfill Capacity and Life	38

LIST OF FIGURES

Figure	Title
1	Site Location Map
2	Site Plan
3	Combustion Waste Processing Facility/Area Site Plan
4	Schematic of Material Flows in the FGD Combustion Waste Processing Facility
5	Alignments of Haul Roads for Cell 1
6	Surface Water Monitoring Locations per NPDES Permit
7	Wastewater Piping Plan
8	Stormwater Conceptual Design
9	Stormwater Drainage for Landfill Area

LIST OF APPENDICES

Appendix	Content
1	Boundary Survey of Curtis H. Stanton Energy Center
2	Conversion Systems, Inc. (CSI) 1987 Drawings for Combustion Waste Storage Landfill
3	Landfill Development Plan for Vertical Expansion of Combustion Waste Storage Area
4	Selected Construction Drawings for Horizontal Expansion of Combustion Waste Storage Area Cell 1, CWSA Runoff Pond, and Decant Cell
5	Mikon Corporation 2013, 2014, 2015, and 2016 Annual Topographic Surveys for Combustion Waste Storage Landfill
6	Screen Displays from FGD Sludge Conditioning Facility Control Room
7	Survey of the Stack Out Pad Area
8	Drawings Showing Conceptual Sequence of Landfilling
9	Stormwater Management System Inspection Instructions and Checklist
10	Fugitive Dust Control Plan
11	Closure Drawings for Original CWSA Including Vertical Expansion
12	Excerpts from SEC Contractor Orientation Information Guide
13	Excerpts from OUC Operational Guide, Emergency Plan Procedures
14	SEC Fire Emergency Procedures
15	Quality Control Test Procedures
16	Headwaters Month-End Detailed Report for December 2014
17	Summaries of Waste Quantities from January 2005 through October 2016

1.0 INTRODUCTION

The "Management Plan for the Combustion Waste Storage Area of Orlando Utilities Commission Stanton Energy Center," prepared by Conversion Systems, Inc. (CSI) during the site certification process prior to operation of the first unit at the Stanton Energy Center (SEC), was issued in March 1987. A document titled "Operation Plan for Combustion Waste Management Areas, Orlando Utilities Commission Stanton Energy Center, Orange County, Florida," dated May 5, 2011, was prepared by Tetra Tech to update the CSI Management Plan and respond to comments by the Florida Department of Environmental Protection (FDEP). The May 5, 2011 Operation Plan was approved by FDEP in a letter to the Orlando Utilities Commission (OUC) dated November 1, 2011.

The May 5, 2011 Operation Plan covered the operations of the original 90-acre combustion waste storage area (CWSA) and the combustion waste processing facility/area, which were collectively referred to as "combustion waste management areas" (CWMAs). The Operation Plan provided some background information and described waste materials handled at the SEC, development of the CWSA to-date, and procedures for operation of the CWMAs through a transitional period until design and permitting of the horizontal expansion of the CWSA was complete. It also included water quality monitoring, quality control, and recordkeeping programs.

The design of the 90-acre lined horizontal expansion of the CWSA, which comprises Cells 1, 2, and 3, was approved by FDEP on March 16, 2012. Construction of Cell 1 was completed on December 31, 2012. The certification of construction completion report prepared by Tetra Tech was submitted to the Siting Coordination Office on October 16, 2013, and approved by FDEP on October 7, 2015. The purpose of this document is to update the Operation Plan for the CWMAs to include changes that have occurred since landfilling commenced in the lined Cell 1 of the CWSA horizontal expansion on May 28, 2015.

The Landfill Operation and Maintenance Plan (Landfill O&M Plan) should be reviewed and updated every 5 years or whenever significant operational changes take effect. The protocols described in the Landfill O&M Plan should be followed for waste handling, processing, and disposal at the SEC.

2.0 BACKGROUND INFORMATION

2.1 Site Location

The SEC is located in southeastern Orange County, Florida in the watershed of the Econlockhatchee River, about 12 miles southeast of downtown Orlando and 6 miles northeast of Orlando International Airport. The location of the SEC site is shown in Figure 1. The site is located within Sections 13, 14, 23, and 24 of Township 23 South, Range 31 East, and Sections 7, 18, and 19 of Township 23 South, Range 32. The address of the facility is 5100 South Alafaya Trail, Orlando, Florida. Alafaya Trail ends at the site entrance. The site is north of the Beach Line Expressway (State Road 528) and east of Innovation Way, which provides access from Alafaya Trail to State Road 528. The site boundary shown on the survey in Appendix 1 encompasses an area of approximately 3,290 acres.

2.2 Facility Description

Figure 2 is an annotated January 2016 aerial photograph of the SEC site. The SEC includes two coal-fired generating units, designated Unit 1 and Unit 2, with capacities of 480 and 468 megawatts (MW), respectively, and two natural gas-fired combined cycle units designated Unit A

and Unit B, with capacities of 633 and 300 MW, respectively. The coal-fired units are equipped with a wet flue gas desulfurization (FGD) system for air pollution control. A solar farm consisting of a 35-acre array of photovoltaic panels, which generates approximately 6 MW, was dedicated at the SEC site in December 2011.

Fixated coal combustion products (CCPs) and other plant wastes have been landfilled in the CWSA since the start of commercial operation of Unit 1 in 1987. As shown in Figure 2, the CWSA and the lined horizontal expansion are located near the western boundary of the site. Until the lined Cell 1 started to receive waste on May 28, 2015, landfilling of fixated combustion waste occurred in the original CWSA and the vertical expansion on top of the original CWSA.

Runoff that comes in contact with coal combustion waste is directed to the CWSA Runoff Pond from which it is conveyed by a 24-inch diameter pipeline to the lined Recycle Pond and used for FGD system makeup water. In conjunction with the 2014 expansion of the CWSA Runoff Pond, a Decant Cell was constructed south of the CWSA Runoff Pond and is used for dewatering (1) CCP materials that are unable to pass the Paint Filter Liquids Test, (2) sediments excavated from onsite ponds, and (3) miscellaneous wet waste materials. The footprints of the expanded CWSA Runoff Pond and the Decant Cell are shown in Figure 2.

SEC obtains its makeup water for cooling purposes primarily from the Orange County Eastern Water Reclamation Facility and stormwater from the adjacent Orange County Class I Landfill site. The SEC is operated as a zero liquid discharge facility.

2.3 **Conditions of Certification**

Construction and operation of the SEC are governed by the Conditions of Certification (COC) approved under the Electrical Power Plant Siting Act (403.501-403.518, Florida Statutes) in accordance with the supporting regulations contained in 62-17, Part I, F.A.C. The certification supersedes and encompasses all state and local permits and approvals, but does not supersede the federal permitting processes. SEC Unit 1 was certified on December 15, 1982 and Unit 2 was granted a supplemental certification on December 17, 1991. The Conditions of Certification have been modified or supplemented a number of times since the original certification. The latest version is “Conditions of Certification, Orlando Utilities Commission Curtis H. Stanton Energy Center, PA 81-14M.”

The COC cover construction and operation of the CWSA area, which is referred to as the “solid waste landfill.” Previous versions of the COC required at least one of the following mitigation measures for protecting groundwater quality beneath the landfill:

- Use of an adequate chemical fixation process on the solid wastes to achieve a uniform layer at least 18 inches thick across the cell bottom with a permeability of $1x10^{-7}$ cm/sec or less.

- Use of an adequate chemical fixation process on the solid wastes to achieve a permeability of $5x10^{-6}$ cm/sec or less. The top of each completed cell shall be constructed with a slope of 0.75 percent and an effort will be made to decrease the permeability of the top layer of fixed FGD material to less than $5x10^{-6}$ cm/sec.

Use of an adequate chemical fixation process on the solid wastes to achieve a uniform layer at least 18 inches thick across the cell bottom with a permeability of $1x10^{-7}$ cm/sec or less is the mitigation measure that has been used for the original CWSA. In PA 81-14 Modification M the

permeability and associated testing requirements have been eliminated for wastes that are placed within the lined horizontal expansion of the CWSA. However, the operator should continue to fixate the waste so that the wastes can be hauled from the processing facility to the landfill.

2.4 Original Landfill Design and Operation/Management Plan

The original design and management plan for the combustion waste storage area, including recommended operating procedures and sequencing/phasing, were presented in the March 1987 management plan prepared by CSI. The management plan included six drawings to depict landfilling sequences and phases, the final grading plan, cross sections, and details.[1] Copies of the six drawings are included in Appendix 2. The CWSA was referred to as the "Combustion Waste Storage Landfill" in the CSI drawings.

Per the CSI drawings, the ultimate limit of the landfill occupies an area of approximately 312 acres. The proposed landfill area measures approximately 6,910 feet in the north-south direction by 1,970 feet in the east-west direction.

According to the CSI management plan:

- Prior to landfill construction, the southern three-quarters of the entire landfill area was cleared and grubbed and used as a borrow area for construction of the plant.

- The borrow area was surrounded by dikes varying from 5 to 8 feet in height.

- After the borrow operation, the area had been graded from a high of elevation +84 feet mean sea level (MSL) along the west edge to a low of elevation +80 feet (MSL) at or near the northeastern corner of the prepared area.

- At the time of initial landfill construction, drainage channels extended around the perimeter of the landfill, outside of the earth dikes, to direct stormwater runoff around the landfill, and to lower the groundwater level inside the solid waste disposal area.

- The landfill area within the dikes was designed to drain to one of four outlets: 1) an outlet channel at approximately three-quarters of the planned landfill length north of the southeastern corner, 2) pipes leading to the CWSA Runoff Pond, 3) an outlet channel near the northeastern corner of the planned landfill area, and 4) an outlet channel near the southeastern corner of the original landfill area. A drainage channel along the western side of the landfill area conveyed water to the outlet channel in the northeastern corner of the planned landfill area. These channels are highlighted on Drawing Number F198T-L01 in Appendix 2

The CSI management plan was based on landfilling primarily fixated flue gas desulfurization (FGD) sludge, which consists of raw FGD sludge mixed with fly ash and lime. This material was referred to by CSI as fixated waste, Poz-O-Tec, or P-O-T, and is currently referred to as ProMat. The management of bottom ash, brine residues[2], and other miscellaneous power plant wastes were also discussed in the plan.

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[1] The CSI drawings are referenced to the Florida State Plane Coordinate System, North American Datum of 1927 (NAD27).

[2] Brine concentrator and crystallizer solids from the brine plant.

The final grading plan for the landfill (CSI Drawing No. F198T-L01) showed the top of the landfill divided into 16 cells with typical dimensions of approximately 785 feet from north to south by 665 feet from east to west and an area of approximately 12 acres. The top area of all but one of the cells was proposed to be surrounded on all four sides by a 20-foot wide soil berm at an elevation of +155 feet (MSL)[3] to control runoff. The design concept shown on the drawings was for these 15 cells to be graded at a slope of 1 percent to an elevation of approximately +149 feet (MSL) at an outside corner of the cell inside the berm. After the cell was capped with 2 feet of soil cover and seeded, runoff was proposed to be conveyed from the low point of the cell down the slope to the perimeter drainage channel via fabriform-lined flumes. In order to provide for a permanent access/maintenance road at a grade of 8 percent to the top of the landfill, the remaining cell does not have a berm on its east side and its eastern side slope is flatter than 4H:1V.

The cross sections (CSI Drawing No. F198T-L06) show final landfill side slopes of 4 horizontal to 1 vertical (4H:1V) with a 24-foot wide bench at average elevations of approximately +120 to +122 feet (MSL). Based on the final grading plan, the benches were proposed to slope into the landfill with invert elevations of +118 to +124 feet (MSL) and to be graded at a slope of 0.5 percent along the bench toward the points where the fabriform flumes would intercept the runoff from the bench. The fabriform was designed to be anchored into the fixated waste under the soil cover.

In the CSI management plan, a distinction is made between “contact runoff,” which is stormwater runoff from the surface of fixated and non-fixated waste in active disposal areas, and “non-contact runoff,” which is runoff from natural ground and non-landfilled areas and from landfilled areas with temporary or final soil cover in place. According to the management plan, non-contact runoff would be directly discharged to natural surface water bodies, but contact runoff would be conveyed in ditches lined with fixated waste to the CWSA Runoff Pond.

The phasing plan presented on CSI Drawing Nos. F198T-L02 through L05 was based on limiting the active disposal operations to an area of approximately 10 acres. According to the phasing plan, preparation of a new disposal area was supposed to begin with a base layer of fixated material approximately 5 feet thick with a hydraulic conductivity no greater than $5x10^{-6}$ cm/sec. The interceptor channels of the surface water runoff collection system were to be constructed in this base layer. The active disposal area was to be closed by capping with soil cover and vegetation as a new disposal area was being prepared and the closed areas would then be directed toward natural drainage.

According to CSI Drawing No. F198T-L02, development of the landfill was supposed to begin with an area at the southwestern corner of the landfill. A haulway/drainageway constructed of fixated waste was proposed to connect this area to the haul road on the eastern side of the landfill and convey stormwater runoff to the CWSA Runoff Pond. Once a temporary or final soil cover was placed on the outside slopes, runoff from these areas could be discharged to natural drainage and would not have to be routed to the CWSA Runoff Pond. The initial development plan also included a 200 foot by 400 foot start-up area lined with soil cement or a mix of fly ash and lime, and a temporary brine residue storage facility lined with soil cement. The temporary brine residue storage facility was only needed until there was sufficient disposal area available to incorporate the brine residue disposal. A soil diversion berm was proposed to be constructed to divert non-contact runoff from the undeveloped landfill area that drains toward the lined drainageway, the start-up area, and the temporary brine residue storage facility.

[3] The mean sea level datum used by CSI in their management plan of 1987 is approximately equivalent to the National Geodetic Vertical Datum of 1929 (NGVD). Elevations relative to NGVD are 1.05 feet higher than elevations relative to NAVD88.

Phase 1 of the CSI development plan (Drawing No. F198T-L03) expanded the landfill to the east and north contiguous to the initial development area until it covered the southernmost four cells. Cells were to be closed progressively as the landfill expanded and closed areas were connected to the perimeter ditch via fabriform flumes. Four such flumes, two draining to the south and one each draining to the east and west would be in place at the end of Phase 1. As for the initial development plan, temporary soil cover and soil diversion berms were proposed to minimize the amount of contact runoff.

Phase 2 of the CSI development plan (Drawing No. F198T-L04) further expanded the landfill to the east and north contiguous to Phase 1 until the landfill covered a total area extending to the north of the southernmost eight cells. As for Phase 1, cells were to be closed progressively as the landfill reached final grade and closed areas were connected to the perimeter ditch via fabriform flumes. Nine flumes, two draining to the south, three draining to the east, and four draining to the west would be in place at the end of Phase 2. The start-up area and the temporary brine residue storage facility, constructed as part of the initial development, are incorporated into the landfill during this phase. Because the pre-development ground surface sloped to the north and east and the cells were to be developed from west to east and south to north, the soil diversion berms from previous phases would no longer be needed as the landfill advanced to the north of the CWSA Runoff pond. Temporary soil cover was proposed to minimize the amount of contact runoff that had to be handled.

Phase 3 of the CSI development plan (Drawing No. F198T-L05) expanded the landfill to the remaining cells. At the end of Phase 3 as shown on the drawing, all but three of the 16 cells would be complete. The remaining three cells would still need to achieve final closure grades and two fabriform flumes and the permanent access/maintenance road would have to be constructed to complete the landfill.

According to the CSI management plan, the original CWSA Runoff Pond was designed to retain stormwater runoff from a 15-acre active disposal area from a 100-year frequency storm of 24-hour duration.

2.5 **Actual Sequence of Landfilling**

CSI was responsible for landfill operation from the spring of 1987 through approximately May 1995 at which time VFL took over landfill operations. Headwaters Resources (Headwaters) bought out VFL in April 2004. According to Headwaters, the actual sequence of landfilling operations differed from the original (CSI) management plan. The placement of waste and cover material is currently recorded on a site grid diagram, which is included in the monthly reports submitted to OUC. Based on the reports and information provided by Headwaters, the sequence of landfilling started with base lifts placed in the southeastern corner of the landfill around November 1987 and proceeded along the eastern tier of cells from south to north as follows:

- Prior to the lined horizontal expansion, waste was only placed in the four southernmost cells of the eastern tier.

- The northernmost of the four cells was initially split into north and south fill areas with a west to east stormwater conveyance channel and culverts under the haul road to allow contact runoff to flow to the CWSA Runoff Pond. This channel was filled in June 2010, and this division no longer exists.

- Filling of unstabilized brine concentrator/crystallizer solids (BCCS) was discontinued in the late 1990s. Initially, BCCS, which result from the treatment of the cooling tower blowdown, were stored within the area of the third and fourth cells. BCCS were placed on an area lined with at least 5 feet of fixated material and were covered daily with fixated material.

- Parts of the three southeasternmost cells had received final cover and vegetation by September 2009. The cover on the top of the landfill was removed in stages to allow the top of the landfill to be raised to the permitted design elevation and to facilitate a possible vertical expansion.

2.6 **Vertical Expansion of Original CWSA**

OUC met with representatives of the FDEP Central District Waste Program on March 17, 2010 to discuss the need for a vertical expansion to provide additional landfill airspace for ongoing operation while OUC planned, permitted, and prepared the next cell within the original landfill footprint to receive waste. The engineering approach was also discussed at this meeting. On September 10, 2010, Golder Associates, Inc., on behalf of OUC, submitted a request for a post-certification amendment to the Conditions of Certification to the Program Administrator of the FDEP Office of Siting Coordination. The request was submitted in accordance with Section 403.5113 of the Florida Statutes and Rule 62-17.205 of the Florida Administrative Code. The purpose of the amendment was to allow OUC to expand the CWSA vertically by approximately 20 feet to a maximum elevation of +175 feet (NAVD88). The report, "Slope Stability Analyses for Vertical Expansion of Coal Combustion Product Landfill," dated August 2, 2010, prepared by Tetra Tech, was submitted with the request for amendment of the Conditions of Certification. A document titled "Responses to FDEP Comments on Amendment Request for Vertical Expansion of the Combustion Waste Storage Area," dated March 7, 2011 was submitted by OUC in response to FDEP comments on the amendment request. The responses included a revised version of the slope stability analyses report, dated March 7, 2011.

The landfill development plan for the vertical expansion, which was approved by FDEP on April 8, 2011, is included in Appendix 3. The landfill development plan shows the extent and grading of the vertical expansion, sequencing of fill, and flow paths for contact and noncontact water for each development sequence.

2.7 **Design of Horizontal Expansion**

Selected construction drawings for the horizontal expansion of the CWSA Cell 1 are included in Appendix 4. The latest version of the drawings and the as-built drawings are available on site for reference. The proposed construction for future Cells 2 and 3 is similar to that for Cell 1.

2.7.1 Design of Bottom Liner System

Although a bottom liner system for the horizontal expansion of the CWSA was not specifically required by the COC, OUC provided a bottom liner system with leachate collection and leak detection components, both with leachate removal systems. This is consistent with applicable requirements of Rule 62-701, F.A.C., which governs design, construction, and operation of solid waste management facilities in Florida.

Under Rule 62-701, F.A.C., all Class I landfills are required to have a composite liner or a double liner system, as well as a leachate collection and removal system. A composite liner system consists of a geomembrane liner on top of a compacted soil liner. A double liner system consists

of two geomembrane liners with a leak detection system between the primary (top) and secondary (bottom) geomembrane liners, and either a soil subbase or a GCL below the secondary geomembrane liner. A double liner system was selected to be the bottom liner design alternative for the proposed horizontal landfill expansion. Because laboratory testing performed by Ardaman on selected GCL products indicated that the bentonite in the GCL was not compatible with the landfill leachate at the SEC, a 6-inch thick compacted soil subbase was selected as the bottom component of the double liner system. For waste disposal on top of the side slope of an existing unlined landfill, 62-701, F.A.C., requires the installation of a single geomembrane slope liner, along with a leachate collection and removal system.

Based on 62-701, F.A.C., requirements and discussions with OUC, Tetra Tech selected the following bottom liner and leachate collection system for the base of the horizontal landfill expansion area. The system consists of the following key components in descending order:

- A 2-foot thick layer of drainage sand with a minimum saturated hydraulic conductivity of $1.0x10^{-4}$ cm/sec to provide protection for the liners and drainage for the leachate.

- A geocomposite to provide conveyance for the leachate and to reduce the leachate head on top of the primary liner.

- A 60-mil thick textured HDPE geomembrane liner to serve as the primary seepage barrier.

- A geocomposite or geonet to detect and convey any leachate that passes through any defects in the primary HDPE liner and to minimize the leachate head on top of the secondary liner.

- A 60-mil thick textured HDPE geomembrane liner to serve as the secondary seepage barrier.

- A 6-inch thick layer of compacted soil subbase with a maximum saturated hydraulic conductivity of $1.0x10^{-5}$ cm/sec to further curtail migration of any leachate that may pass through the secondary HDPE liner. (Based on construction quality assurance results, the soil subbase has a hydraulic conductivity of less than $1.0x10^{-7}$ cm/sec.)

- A prepared liner subgrade that is free of deleterious materials and meets the compaction requirements in the technical specifications.

The drainage sand and geosynthetic drainage layer in the leachate collection system are designed to limit the hydraulic head on the primary HDPE liner to less than 12 inches, and the geosynthetic drainage layer in the leak detection layer is designed to limit the hydraulic head on the secondary HDPE liner to less than 1 inch. The liner subgrade is designed to allow positive gravity drainage of leachate to the collection sumps, with minimum post-settlement slopes of 1.0 percent for areas that drain to the leachate collection pipe trench and 0.3 percent along the leachate collection pipe trench into the sumps.

To provide increased frictional resistance against sliding along the bottom liner system by eliminating “plastic to plastic” interface, the geocomposite in the leachate collection system consists of a double-sided geocomposite beneath the projected side slope area for a distance of approximately 250 feet from the toe of the landfill with a single-sided geocomposite within more interior portions of the landfill. For the same reason, a double-sided geocomposite was used

beneath the side slope area in the leak detection system, whereas a geonet was used in the more interior portions of the landfill.

The liner system on the west slope of the original CWSA consists of the following key components in descending order:

- A 2-foot thick layer of drainage sand with a minimum saturated hydraulic conductivity of $1.0x10^{-4}$ cm/sec to provide protection for the liners and drainage for the leachate.

- A double-sided geocomposite to provide conveyance for the leachate and to reduce the leachate head on top of the slope liner.

- A 60-mil thick textured HDPE geomembrane liner to serve as the seepage barrier.

- An 18-inch thick bedding soil layer that is free of deleterious materials and meets the compaction requirements in the technical specifications.

The Cell 1 expansion area was not activated immediately after construction completion. Therefore, a rain tarp was installed to cover the entire side slope cover/drainage sand in order to limit erosion due to storm events. The location of the rain tarp along with the wind ballast is shown on Drawing Number CS-7A, which is included in Appendix 4. The rain tarp was removed shortly after waste was placed in the Cell 1 expansion area, and 6 inches of topsoil was placed over the entire slope and hydroseeded to reduce erosion.

2.7.2 Design of Landfill Cells

Based on the July 2011 topographic survey, the land surface elevations along the west and east sides of the landfill expansion area were typically at +83 and +82 feet (NAVD88), respectively. The seasonal high water table elevations were judged to be close to land surface elevations.

Cells 1 through 3 in the horizontal expansion area are each divided into four subcells each with its own leachate collection sump. The cells are designed to have liner base grade elevations (i.e., the bottom elevations of the 6-inch thick, $1x10^{-7}$ cm/sec compacted soil subbase) that vary from approximately +81 feet (NAVD88) just outside the leachate collection sumps located on the west side of each landfill cell to approximately +89 feet (NAVD88) along the toe of the west slope of the original CWSA. The liner base grade elevation at the bottom of each leachate collection sump is established at approximately +77.5 feet (NAVD88).

Cells 1 through 3 are surrounded by a containment dike with a crest width of 20 feet and a crest elevation of +97 feet (NAVD88). A stormwater runoff ditch with a bottom width of 10 feet on the north and west and 5 feet on the south, and an invert elevation of +85 feet (NAVD88) was constructed outside the containment dike and inside an outermost perimeter dike with a crest width of 18 feet and a crest elevation of +93 feet (NAVD88). The containment and perimeter dikes have side slopes of 3.0H:1.0V. Cells 1 through 3 will be separated by divider dikes with a crest width of 25 feet and a crest elevation of +97 feet (NAVD88).

Cells 1 through 3 are proposed to be raised using a side slope of 3H:1.0V to a maximum crest elevation of +175 feet (NAVD88), with one 20-foot wide setback at an approximate elevation of +140 feet (NAVD88). The top of the landfill will be surrounded by an approximately 5-foot high and 20-foot wide perimeter berm. The top of the landfill will have an average grade of

approximately 0.65 percent to promote surface drainage towards the lined flume. At final design elevation, Cells 1 through 3 will have an average height of approximately 90 feet above natural grade.

Parts of the landfill at final grade will be closed with a 6-inch soil buffer layer, a geomembrane liner, and 2 feet of protective cover soil including 6 inches of topsoil or amended soil.

2.8 Landfill Topographic Surveys

The pre-construction topography of the landfill area, based on a topographic survey prepared by Tetra Tech Geomatic Technologies, Inc., is shown on Drawing Number G-5 in Appendix 4. The topography was obtained by photogrammetric methods from aerial photography acquired on July 19, 2011. The locations, dimensions, and invert elevations of ditches, culverts and other features and additional spot elevations were added based on field surveys performed by Tetra Tech Orlando and MACTEC. The coordinate system for the surveys is Florida State Plane Coordinates, 2007 adjustment to the North American Datum of 1983. Elevations are relative to the North American Vertical Datum of 1988 (NAVD88).

Mikon Corporation performs an annual topographic survey[4] of the combustion waste storage area, which they refer to as the "ash landfill," for OUC. The survey is limited to the actual extent of the active and closed landfill areas. The Mikon surveys for 2013, 2014, 2015, and 2016 are presented in Appendix 5. The series of annual topographic surveys prepared by Mikon Corporation shows the original landfill footprint had areas of 61.4 acres in October 2004, 65.7 acres in September 2005, 75.2 acres in September 2006, 84.7 acres in September 2007, 86.5 acres in September 2008, and 90.8 acres in 2009 through 2014. The series of topographic maps also shows a ramp for access to the top of the landfill that shortened as the landfill advanced to the north and successive areas achieved their final elevations. The Mikon survey, dated December 10-12, 2015 shows a total landfilled area of 106.4 acres, 93.4 acres of which Mikon classified as "belonging to the vertical expansion area, and 13.0 acres of which they classified as belonging to the horizontal expansion area. The latest Mikon survey, dated September 12, 2016, covers only the horizontal expansion.

3.0 RESPONSIBILITIES FOR OPERATION AND MAINTENANCE

The OUC-approved contractor operates and maintains the combustion waste processing facility/area and the combustion waste storage area (landfill). The combustion waste processing facility has historically been referred to as the FGD sludge conditioning facility. Overall management of operations for the contractor is performed by the Plant Director and the Operations Manager. The landfill contractor is responsible only for the equipment involved in the flue gas scrubber sludge stabilization process. This includes all fly ash conveying equipment (screw conveyors) on the discharge side of the silos, all vacuum filtration equipment, belts for conveying dewatered scrubber sludge and final product, all pug mill mixers and associated dust collectors, and equipment used in the loading of the fly ash into tanker trucks for sale. Operation hours for the combustion waste processing facility/area are based on the operation of the power plant units and vary from week to week. Because of the almost around-the-clock operation of the SEC, there are two daytime supervisors and two nighttime supervisors for the combustion waste processing facility. Landfill operations are directed and overseen by the OUC Engineer. Landfill operation hours vary with the plant operations; typically, Tuesday, Wednesday, Friday, and

[4] The vertical datum is NGVD and the Florida State Plane Coordinate System horizontal datum is NAD27.

Saturday from 6:30 am to 4:30 pm. The landfill contractor has a senior technician in charge of sampling and quality control testing.

In addition to the power generating units, OUC owns and is responsible for maintenance of (i) earthmoving equipment used in the landfill and Stack Out Pad operations, (ii) the ball mills for pulverizing limestone for use in the FGD system, and (iii) the bottom ash dewatering equipment. Dewatering is initiated at the request of OUC and is usually performed two times per week.

In addition, OUC is responsible for environmental monitoring and compliance of the SEC facility, including the combustion waste storage area/landfill and the combustion waste processing facility/area.

4.0 **WASTE STREAMS**

The major coal combustion wastes that are generated by the SEC and disposed of in the on-site landfill consist of fly ash and FGD sludge. In addition, significant quantities of bottom ash and brine concentrator/crystallizer solids (BCCS) are generated. Unsold bottom ash and BCCS are disposed in the landfill. In addition to the major coal combustion wastes, miscellaneous power plant wastes in relatively smaller quantities are also disposed of in the on-site landfill.

The quantity and characteristics of fly ash and FGD sludge generated by the SEC depend primarily on the properties of coal that is burned. The average ash and sulfur contents of the coal vary; therefore, specific operating ratios are developed for the coal that is actually used in the generating plant.

The fly ash from SEC Unit 1 and Unit 2 and lime or other suitable alkaline stabilization reagent are combined with the FGD sludge in the FGD sludge conditioning facility prior to disposal in the landfill. The resulting fixated FGD sludge or ProMat is the primary waste product that is disposed of in the landfill.

4.1 **SEC Fly Ash**

The amount of fly ash produced is directly related to the ash content of the coal. Electrostatic precipitators are used to remove fly ash to conform to current air quality emission standards. With pulverized coal firing, about 85 to 92 percent of the total ash is collected as fly ash. The remainder is collected as bottom ash.

4.2 **Imported Fly Ash/Lime Substitute**

OUC imports high lime content fly ash from a number of generation facilities, e.g., Jacksonville Electric Authority (JEA), and Georgia Pacific. Presently, OUC is importing the fly ash from JEA. The fly ash from these facilities is used as a lime substitute in the FGD sludge conditioning process. The JEA generating facility utilizes circulating fluidized bed (CFB) combustion and produces a product referred to as EZ-Sorb®-Fly with a typical residual lime content of 18 to 25 percent. Lime substitute is trucked to the site and is pneumatically conveyed into the lime silo. Use of the imported material allows OUC to sell some of the fly ash generated at the SEC and avoid having to dispose of it in the horizontal expansion.

4.3 FGD Sludge

FGD sludge is produced in the wet scrubbers used to remove sulfur oxides from air emissions. FGD sludge is composed of primarily silt-sized particles. Historically, calcium sulfite hemihydrate ($CaSO_3 \cdot ½H_2O$) and calcium sulfate dihydrate or gypsum ($CaSO_4 \cdot 2H_2O$) comprised about 90 percent of the solids in the sludge. Calcium sulfite forms fragile crystals which are responsible for the thixotropic nature of the sludge, i.e., it tends to liquefy when vibrated or otherwise disturbed. OUC implemented forced oxidation in both units in May 2014 so that the calcium sulfite would be converted to synthetic gypsum.

In the sludge conditioning system, bleed from the FGD scrubbers is pumped to thickeners, and then to vacuum filters for further dewatering. The resulting filter cake contains approximately 55 to 70 percent solids. The filtrate is returned to the scrubbers.

The quantity of FGD sludge is determined by the amount of sulfur in the coal and the efficiency of the chemical reaction in the FGD system where limestone is used to remove sulfur dioxide.

4.4 Bottom Ash

Bottom ash is the heavier ash fraction produced from combustion of coal in the boilers. It constitutes approximately 8 to 15 percent of the ash generated. Bottom ash is quenched with water and sluiced to the bottom ash dewatering system. If possible, the bottom ash is sold directly as it comes from the dewatering system. Bottom ash that cannot be sold immediately is temporarily stockpiled in the CWSA for sale at a later date. Bottom ash that cannot be sold is disposed of in the CWSA.

4.5 Brine Concentrator and Crystallizer Solids

The brine concentrator and crystallizer solids (BCCS) are dewatered solids from the cooling tower blowdown treatment system. They consist of the concentrated constituents originally contained in the makeup water supply, which includes stormwater and treated wastewater. These solids are primarily the chloride and sulfate salts of calcium, magnesium, and sodium.

4.6 Miscellaneous Power Plant Wastes

In addition to wastes described above, other wastes that are disposed of in the landfill include:

- FGD recirculation tank sludge (FGD sludge fines carryover to recirculation tank)
- Scrubber sludge blowdown (reaction vessel FGD sludge residual out of sump)
- Cooling tower sludge (cooling tower clean-out during outages)
- Stack cleanout residue (sulfur oxide solids from inner stack exterior)
- Scrubber residuals (calcium carbonate)
- Waste coal (unusable coal from coal pile)
- Coal pulverizer rejects

- Lined pond cleanouts (waste pond sediments) and soils that have contacted process water
- Spent cation exchange resin used in the onsite water treatment system
- Various power plant sump cleanouts
- Ditch cleaning wastes that do not include vegetative matter

4.7 Construction and Demolition Debris

In addition to the above wastes, limited quantities of construction and demolition (C&D) debris, primarily concrete and asphalt, are used for road base during landfill deposition operations or directly deposited in the landfill.

4.8 Disposal of Waste from Other OUC Sites

OUC intends to dispose of non-hazardous waste from other OUC facilities (e.g., soil from substations and water plants) within the double-lined horizontal landfill expansion. OUC will provide documentation of the acceptability of waste from other sites that is proposed to be disposed of in the CWSA.

5.0 WASTE RECORDS

Currently, the weights of the following materials are recorded on a daily basis:

- Fly ash (or other lime substitute) delivered to the site
- Fly ash (or other lime substitute) discharged from the lime silo and used for mixing with the FGD sludge to produce the ProMat
- SEC fly ash from Silos 1 and 2 that is used for mixing with the FGD sludge to produce the ProMat
- ProMat that is produced (wet weight basis)
- Fly ash from Silos 1 and 2 that is sold
- Bottom ash that is sold
- ProMat that is diverted to the nearby Orange County Class I Landfill

The lime substitute delivered and the OUC bottom ash and fly ash that are sold are weighed with truck scales. Lime substitutes are weighed either at their place of origin or at SEC on Truck Scale No. 1, which is located on the west side of the Stack Out Pad. OUC bottom ash that is sold is also weighed on Truck Scale No. 2. All OUC fly ash that is sold is weighed on Truck Scale No. 2, which is located directly under Silo 2. Weight tickets are used to track fly ash and bottom ash coming into and going out of the SEC. The weights of the other materials above are calculated from totalizer readings on electronic scales upstream of the feeders and conveyors.

The quantities of FGD sludge used in the production of ProMat are calculated as the difference, adjusted for moisture content, between the quantity of ProMat produced and the quantities of SEC fly ash and lime substitute incorporated in the ProMat. The contractor performs laboratory testing of the solids and lime contents of the ProMat and the solids content of the FGD sludge filter cake. The laboratory testing results are used in the mass balance calculations.

The BCCS and the miscellaneous power plant wastes that are landfilled are delivered to the Stack Out Pad by OUC. The contractor maintains a record of the number of truckloads of these materials delivered to the landfill each day.

6.0 CONTROL OF ACCESS AND DISPOSAL

Access to the SEC site, and thus to the CWSA is controlled by fencing, gates, or other barriers as well as signs and facility security personnel. There are two gate houses manned 24 hours per day, which act as checkpoints for anyone entering the facility. There is no public access to the CWSA, which is designated for disposal of coal combustion products and related industrial waste. Fly ash (lime substitute) materials from other generation facilities are delivered to the site in pneumatic tankers that must pass through the controlled access points. Other than these ash deliveries, only waste generated at the SEC facility or any other waste approved by the FDEP is disposed of in the CWSA. Waste is only placed in the CWSA by OUC-approved contractors.

7.0 MONITORING OF WASTE

With the exception of ash delivered from other generation facilities, other lime substitutes, and nonhazardous waste from other OUC facilities, all wastes disposed of in the CWSA are generated on site, under the control of OUC and OUC approved contractors. Because no municipal solid waste is disposed of in the facility, OUC and the contractor have complete knowledge of the waste placed in the landfill; therefore, no spotters or screening of waste is required.

The CWSA does not accept liquid waste or waste containing free liquids. The Paint Filter Liquid Test (EPA Method 9095) is performed on samples of BCCS and other wastes to confirm that they do not contain free liquids.

8.0 COMBUSTION WASTE PROCESSING

The facilities used in combustion waste processing and other nearby facilities are identified on a January 2016 aerial photograph in Figure 3. Based on observations by Ardaman personnel and conversations with Headwaters personnel, the combustion waste processing operations are performed as follows:

- Fly ash from SEC Units 1 and 2 is pneumatically conveyed to Silos 1 and 2 (Facility Nos. 1 and 2 in Figure 3). Each silo has a nominal capacity of 2,000 tons or approximately 83,000 cubic feet. Fly ash that meets the end user specification for loss on ignition (LOI) may be sold as a supplement to Portland cement in concrete production. Fly ash that is sold is loaded from a silo directly into a pneumatic tanker below the silo.

- High lime content fly ash from power plants or other lime substitutes are trucked to the site and pneumatically conveyed into the lime silo (Facility No. 3 on Figure 3).

- SEC fly ash from Silo 1 is discharged through rotary airlock or pinch valve feeders A, B, and C to covered screw conveyors 5A, 5B, and 5C, respectively. Silo 2 fly ash can be added

through the use of the D feeder and conveyor 5D, which discharges into conveyor 5C from Silo 1. Fly ash or other lime substitute stored in the lime silo can be discharged through the A, B, and C feeders, which discharge to conveyors 7A, 7B, and 7C, respectively. Conveyor 7A discharges into conveyor 5A, conveyor 7B discharges into conveyor 7C, and conveyor 7C discharges into conveyors 5B and 5C. Figure 4 shows a schematic diagram of the flow on conveyors through the waste processing system.

- The combined SEC fly ash and lime substitutes in conveyors 5A, 5B, and 5C is discharged into conveyors 6A, 6B, and 6C, respectively, which are located inside the FGD sludge conditioning building (Facility No. 4 on Figure 3) on the same level as the rotary vacuum filters. As shown on Figure 4, conveyors 6A and 6B can discharge via chutes to mixers 3A, 3B, or 3C, while conveyor 6C can only discharge to mixers 3B and 3C. The mixers are located on a level below the vacuum filters

- To reduce sulfur oxide emissions, OUC uses wet flue gas scrubbers. These scrubbers convert sulfur dioxide into calcium sulfite and sulfate sludge, which must then be disposed of. The FGD scrubber sludge is piped to one of three thickeners, designated A, B, and C (Facility Nos. 15, 16, and 17 on Figure 3), where polymer is added to encapsulate the particles of scrubber sludge and cause the flocs to sink to the bottom of the thickener. A rake rotates in the thickener drawing the material towards the center where it is picked up by the underflow pump.

- The underflow pumps deliver the sludge to one of six rotary vacuum filters, designated 2A through 2F, where it is dewatered to a typical solids content on the order of 55 to 60 percent. The resulting filter cake drops from the rotating drum into an open belt conveyor, which transports it to a chute leading to one of the three mixers on the mezzanine level below. Conveyor 1A serves vacuum filters 2A and 2D and carries the filter cake to mixer 3A. Conveyor 1B serves vacuum filter 2B and carries the filter cake to mixer 3A or 3B. Conveyor 1C serves vacuum filter 2C and carries the filter cake to mixer 3B or 3C. Conveyor 1D serves vacuum filters 2E and 2F and carries the filter cake to mixer 3C. Operation of the vacuum filters requires one vacuum pump and one vacuum receiver for each rotary filter. This equipment is located on the ground level of the FGD sludge conditioning building.

- In normal operations, the SEC fly ash, the fly ash containing lime or other lime substitute, and the dewatered FGD sludge/filter cake are combined in one of three pug mill mixers to produce a fixated FGD sludge, which is referred to as ProMat. The fly ash is essentially dry and the only water in the mixture is the water in the filter cake. Water is added or taken away based on the target percent solids for the mix, which is generally determined by the percentage of lime in the material. The lime content and moisture content of the mixture are tested every 4 hours during plant operation and adjustments to the mixture are made as necessary. This test is known as a "production test" or "run test."

- Occasionally, a mixture containing only SEC fly ash and lime substitute is produced, in which case, water from the recirculation tanks (Facility Nos. 18 and 19 on Figure 3) is added., A mixture containing only SEC fly ash and filter cake will not set up without increasing the lime content.

- After the material leaves the mixer it is fed onto one of two conveyor systems. The "A" side, which consists of the 3A and 4A conveyers, is generally used. Conveyor 4A is a movable radial stacking conveyor (Facility No. 8 on Figure 3), which spreads the material evenly back and forth onto the Stack Out Pad beyond a circular concrete retaining wall, where it is

stockpiled until it is ready to be hauled to the landfill. If there is a problem with the "A" conveyors, the "B" side, which consists of the 3B and 4B conveyors, can be run as an alternative. Conveyor 4B (Facility No. 9 on Figure 3) is a fixed position stacker that is only able to place the material in one position on the Stack Out Pad.

All waste processing operations can be monitored and controlled from the control room on the second floor of the combustion waste processing facility. An Emerson Ovation™ distributed control instrumentation system provides real time data displays of the conditions in the waste processing facilities. Examples of display screens from the control room are presented in Appendix 6. There is an in-house training program with which all operating personnel are trained before they begin work at the combustion waste processing facility.

The fixated FGD sludge/ProMat has to meet the specified quality control criteria. Enhanced ProMat has a higher lime content (3 to 3.5 percent). About 90 percent of the ProMat produced is enhanced.

In addition to the FGD sludge stabilization processing equipment operated by the contractor, the combustion waste processing building contains three ball mills and associated limestone storage and conveyor facilities operated by OUC. The ball mills are used to pulverize limestone delivered by the limestone conveyor (Facility No. 5 on Figure 3). The resulting limestone slurry for use in the wet FGD scrubbers is sent to the wet FGD system directly or stored in tanks (Facility Nos. 6 and 7 on Figure 3) adjacent to the combustion waste processing facility.

9.0 OPERATIONS PERFORMED ON STACK OUT PAD

The area to the west of the combustion waste processing building is underlain by a reinforced concrete pad that encompasses an area approximately 356 feet by 385 feet (3.15 acres). However, only about 1.6 acres of this pad (as shown on Figure 3) that are useable for stockpiling and waste stabilization are considered to be the Stack Out Pad. A survey of the Stack Out Pad area performed by Tetra Tech is included in Appendix 7. Fixated FGD sludge (ProMat) is deposited on the Stack Out Pad by one of the conveyors, most often the radial stacking conveyor. The radial stacker stockpile on the Stack Out Pad is managed to provide adequate initial conditioning time. Radial stacker positioning is controlled to identify the various age materials, thus allowing controlled removal. The Landfill Supervisor establishes conditioning time based on visual inspection in comparison to quality control test results (primarily moisture, solids, and lime contents). These results are coordinated with the FGD sludge processing facility supervisory personnel for positioning the radial stacker to achieve optimal conditioning. If the backup conveyor system is used, the stockpiled materials are moved to different places on the Stack Out Pad and the conditioning time for each area of the stockpile is tracked as with the radial stacking conveyor.

After sufficient initial conditioning, fixated material is loaded and hauled to the landfill for disposal. Adequate stockpile conditioning is determined by experience with the amount of time required for the material to obtain a sufficient initial set to permit transport and placement of the material in the landfill and by observation of the consistency of the material. The stockpile conditioning time varies depending on ambient weather conditions, solids content, and the amount of lime present in the mix. Normal conditioning time is typically on the order of 24 to 48 hours although, in some cases, the ProMat is ready to landfill as it comes off the conveyor belt. The ProMat needs to be removed from the Stack Out Pad before it becomes difficult to excavate from the stockpile and load into trucks. If ProMat is anticipated to be on the pad for a longer period of time than desirable, the lime content is reduced during production.

The concrete pad facilitates loading and minimizes infiltration of surface water runoff into groundwater. Surface runoff from the Stack Out Pad is directed to one of two sumps (shown on Figure 3) from which it is gravity fed in a 30-inch diameter pipe to the South Coal Storage Area Runoff Pond (Facility No. 26 on Figure 3). Water collected in the South Coal Storage Area Runoff Pond flows to the Recycle Pond in two 32-inch diameter HDPE pipes.

Bottom ash is sluiced to two dewatering bins (Facility Nos. 10 and 11 on Figure 3) located near the Stack Out Pad. The contractor requests OUC to dewater bottom ash approximately 2 days per week. OUC performs the dewatering between approximately midnight and 1:00 a.m. The bottom ash is collected in a dump truck via a chute from the bottom of the dewatering bin on the same day that it is dewatered and the dewatered ash is stockpiled against a concrete retaining wall on the Stack Out Pad. The water removed from the bottom ash is conveyed to one of three settling tanks (Facility Nos. 12, 13, and 14 on Figure 3). Bottom ash that can be sold is loaded directly into over-the-road dump trucks for transport to the purchaser. The remaining bottom ash is temporarily stockpiled on the Stack Out Pad. Bottom ash that is expected to be sold in the future is hauled to a designated area of the landfill. Bottom ash that is not sold is disposed of in the landfill.

BCCS and miscellaneous waste without free liquids are mixed with ProMat, fly ash, or filter cake on the Stack Out Pad using the loader to achieve a consistency that allows the waste material to be transported to the landfill in dump trucks. Miscellaneous wastes and sludges that have free liquids are contained within temporary dikes constructed of ProMat on the Stack Out Pad or are placed in the Decant Cell south of the CWSA Runoff Pond. The liquids within the temporary dikes are allowed to drain to one of the sumps adjacent to the Stack Out Pad. Once sufficient drainage has occurred, the waste material is combined with ProMat or filter cake and ash to achieve a consistency that allows it to be transported to and disposed of in the landfill.

Dump trucks used to haul waste materials are washed out daily using a water cannon located on the northwestern side of the Stack Out Pad.

10.0 **OPERATIONS PERFORMED IN DECANT CELL**

As shown in the drawings in Appendix 4, the Decant Cell (see Figure 2) consists of two compartments underlain by a single HDPE liner system covered by 18 inches of soil and 10 inches of reinforced concrete. Each compartment has a sump protected by a gravel filter. The collection pipes beneath the sumps in the east and west compartments of the Decant Cell convey decanted liquid into the north and south compartments of the CWSA Runoff Pond. The solid material from which the liquid has been decanted is then landfilled or, in the case of bottom ash, potentially sold.

Liquids, sediment, and sludges collected in vacuum trucks and sediment removed from the lined ponds that cannot be stabilized in place are transported to the Decant Cell and discharged into one of its compartments. Liquids and sludges that are managed on the Stack Out Pad, as described above, can also be transported to the Decant Cell for dewatering. The Decant Cell can also be used for temporary storage of bottom ash that is destined for sale. OUC intends to provide facilities for truck washing in the Decant Cell.

11.0 EQUIPMENT AND OPERATION FEATURES

11.1 Landfill and Stack Out Pad Operating Equipment

The following equipment, which is owned by OUC, is used for landfill construction and the loading, transport, and placement of the processed materials:

- three Caterpillar 735 articulated trucks with tailgates having a tailgate heaped capacity of approximately 27 cubic yards and a rated payload capacity of approximately 36 tons
- a Caterpillar D6 LGP (low ground pressure) track-type tractor
- a Caterpillar CS-563E vibratory soil compactor
- a Caterpillar 980 wheel loader
- a John Deere motor grader

OUC owns and operates a water truck on site. The contractor owns and operates a Schwarze DST-6 sweeper. OUC has arrangements in place to rent or lease additional heavy equipment from local dealers as needed.

The articulated trucks are used to haul stabilized waste from the Stack Out Pad to the CWSA. The trucks are also used to haul bottom ash from the dewatering facility to a temporary stockpile on the Stack Out Pad, when necessary. Historically, three trucks have been adequate to haul the total volume of ProMat and other wastes placed in the CWSA along with any soil cover material.

The D6 tractor/bulldozer is used to spread waste in layers, place it in the CWSA, and perform some initial compaction. The CS-563E compactor is used to compact the waste to the specified density.

The 980 wheel loader is used to load ProMat and other waste from stockpiles on the Stack Out Pad into the articulated trucks and also to load bottom ash for sale and transport offsite from stockpiles into trucks provided by others.

The motor grader is used to grade roads and the top of the landfill.

The sweeper is used for site cleanup and roadway sweeping.

OUC hauls BCCS and other miscellaneous wastes from the brine plant to the Stack Out Pad for stabilization and disposal by the contractor. The BCCS are hauled in a 17-ton over-the-road dump truck.

OUC uses contracted services for vacuum trucks to clean out ponds, sumps, trenches, etc.

11.2 Haul Roads

As part of the site development work for the original CWSA, a haul road, as shown on Figure 2, was constructed from the Stack Out Pad to the landfill. The haul road consists of a stabilized base and a durable wearing surface (reclaimed asphalt or limestone) to achieve efficient hauling of conditioned waste materials to the landfill in all weather conditions. The haul road is

continuously maintained to minimize any adverse effects to the hauling operation. The locations of the haul roads within the landfill are adjusted as required by the progress of the active landfill area. The design of the haul road within the landfill includes a surface drainage system to remove stormwater runoff from the road. When available, recycled concrete from the SEC site is used to construct or stabilize the roads into and out of work zones within the landfill.

In order to deliver waste to the lined Cell 1 of the horizontal expansion, the previously existing haul road has been extended. The alignment for the northern haul road, which extends from the previously existing haul road to the northern containment/divider dike for Cell 1, is shown on Figure 5. . In addition to the northern haul road, the perimeter road on the east and south sides of the original CWSA, which is labeled as the “southern haul road” in Figure 5, is used to transport waste to Cell 1 or for return trips to the Stack Out Pad. A soil access ramp was constructed from the southern haul road into Cell 1 at the location shown in Figure 5. A 36-inch diameter culvert was installed under the access ramp to convey stormwater perimeter ditch flows from the east side to the west side of the ramp.

11.3 **Communications**

Communication between the landfill operator’s office, which is located in the FGD sludge conditioning building, and the Landfill Supervisor is primarily by cellular telephone. The office has a direct view of the Stack Out Pad operations and is a short distance from the control room for the FGD sludge conditioning facility. The Landfill Supervisor can contact landfill equipment operators by radio. The contractor contacts OUC personnel by telephone extension within the SEC and by cellular telephone outside the SEC.

12.0 **LANDFILL DISPOSAL OPERATION**

As described previously, the four predominant types of waste that are disposed of in the CWSA are:

- Fixated waste material/ProMat
- Bottom ash
- BCCS
- Miscellaneous power plant wastes

Occasionally, C&D debris generated on-site is landfilled in the CWSA. The handling and placement procedures for each of these wastes are described in the following sections.

12.1 **Handling and Placement of Fixated Material**

Fixated material (ProMat), which is a mixture of FGD sludge, fly ash, and lime, is delivered to the CWSA from the Stack Out Pad already mixed, properly cured, and ready for placement. Fixated material is delivered to the landfill in open dump trucks with tailgates.

All fixated material is spread, graded, and compacted in layers varying from 18 to 30 inches in depth (loose material thickness), depending on consistency of the material. The materials are then compacted. Field density tests are performed to verify compaction to a minimum of 94

percent of the maximum dry density as determined by a Standard Proctor compaction test. Compaction seals the surface to reduce potential infiltration during periods of rainfall and the potential for dusting during dry periods.

Only ProMat with sufficient lime, fly ash, and solids content to produce test cylinders with a monthly average 30-day unconfined compressive strength of 80 psi and a minimum 30-day unconfined compressive strength of 40 psi is to be placed within 260 feet of the outside toe of the landfilled waste. Once a mixture of fly ash, lime substitute, and FGD sludge filter cake has been demonstrated to consistently achieve the required strength, testing of cylinders will no longer be required. ProMat that does not set up after curing on the Stack Out Pad is not allowed to be placed within this limit. In addition, in order to reduce erosion and infiltration, enhanced ProMat, is to be used for outside slopes and final closeout elevations in the landfill.

12.2 **Handling and Placement of Bottom Ash**

Bottom ash normally is delivered to the CWSA twice a week in open articulated dump trucks. Unsold bottom ash was disposed of in the original CWSA and the vertical expansion using the macroencapsulation method. Macroencapsulation is no longer necessary for disposal of bottom ash in a lined cell; however, it shall not be placed within 260 feet of the outside toe of the landfilled waste. The GPS or surveyed coordinates of areas in which bottom ash is placed are to be noted on the daily operating logs. The bottom ash is spread in 18- to 24-inch lifts, depending on consistency, and compacted. Bottom ash should be compacted to a minimum of 95 percent of the Standard Proctor maximum dry density or to a relative density greater than 60 percent.

In addition, bottom ash is used to construct haul roads within the CWSA. If bottom ash is anticipated to be sold, it is temporarily stored in a designated area.

12.3 **Handling and Placement of Brine Concentrator and Crystallizer Solids**

BCCS result from the treatment of the cooling tower blowdown in the wastewater treatment facility (brine plant). The BCCS emerging from the treatment process are deposited in one of two covered areas of the brine plant with concrete walls on three sides and an open fourth side. From these areas, they are periodically hauled by OUC to the Stack Out Pad. As described previously, the BCCS are stabilized on the Stack Out Pad prior to being transported to the landfill. At the landfill, the stabilized BCCS goes directly to the active landfill cell for placement. Once it has reached the active landfill cell, it is placed in a depression or lens (pit) that is created in the previously placed layer of ProMat. The stabilized BCCS is placed in 18-inch to 30-inch loose lifts and compacted with the tractor/dozer. After the stabilized BCCS is placed, it is covered with fixated material. As soon as it is stable enough for heavy equipment, it is tracked in, thus macroencapsulating it. This minimizes exposure of the stabilized BCCS to surface precipitation.

The location of stabilized BCCS placement changes to enhance the overall landfill stability by not concentrating it in a specific area. The GPS or surveyed coordinates of the stabilized BCCS placement are to be noted on the daily operating logs and the locations are to be shown on a site map that is updated monthly. BCCS is not to be placed in the bottom 5 feet or top 3 feet of the landfill in order to provide a pure fixated material base and cap. BCCS is not to be placed within 260 feet of the outside toe of the landfilled waste.

12.4 **Handling and Placement of Miscellaneous Power Plant Wastes**

Disposal of miscellaneous power plant wastes is performed within the active landfill area. Other than spent water treatment resin, the miscellaneous power plant wastes described in Section 4.6 are transported by vacuum trucks or dump trucks to the Stack Out Pad or Decant Cell. Drainage and stabilization of these wastes are described in Sections 9 and 10.

Stabilized miscellaneous power plant wastes delivered to the active landfill area are placed in the same manner as described for BCCS in Section 12.3. The location of miscellaneous waste placement changes to enhance the overall landfill stability by not concentrating it in a specific area. GPS or surveyed coordinates of miscellaneous power plant waste placement are to be noted on the daily operating logs and the locations are to be shown on a site map that is updated monthly. These wastes are not to be encapsulated in the bottom 5 feet or top 3 feet of the landfill or placed within 260 feet of the outside toe of the landfilled waste.

12.5 **Handling and Placement of Spent Water Treatment Resin**

Ion exchange resin is used in the demineralizers to treat water for use in the boilers at the SEC. The resin is a polymer of styrene and another chemical in the form of white to yellow beads. When the resin is no longer effective, the resin beads are washed and placed on Visqueen fabric and the water is allowed to evaporate. The dry beads are then hauled to the landfill in a vacuum truck. There are eight resin beds in the water treatment facility ranging in size from approximately 100 to 200 cubic feet. Spent resin is generated at a rate of approximately 1,300 cubic feet every 6 years. OUC has a material safety data sheet (MSDS) for the resin on file at the SEC. GPS or surveyed coordinates of spent water treatment resin placement are to be noted on the daily operating logs.

12.6 **Disposal of C&D Debris**

C&D debris generated on-site, which consists primarily of concrete and asphalt, is placed in thin lifts, covered with ProMat, and compacted to minimize voids and zones of higher permeability in the landfill. The disposal of C&D debris with type and estimated or weighed quantities is recorded in the daily logs, and the GPS or surveyed locations in which C&D debris is placed are noted on the landfill reports and diagrams. No C&D debris will be disposed within 4 feet vertically of the top of the drainage sand in the lined expansion.

12.7 **Sequence of Waste Placement**

12.7.1 Original CWSA

The historic sequence of landfilling in the original CWSA is described in Section 2.5. A 24-foot wide bench has been constructed at approximately elevation +124 to +128 feet (NAVD88) on the eastern and southern side slopes to control surface drainage and erosion due to runoff. The existing bench is sloped toward the toe of the slope above on a grade of approximately 15 percent. A bench was not proposed to be constructed on the western side slope, which is an interim slope that will be covered with additional waste in the future. A fabriform-lined flume has been constructed to convey water from the top of the southernmost cell down the southern slope of the cell to the non-contact/clean water ditch. A new ditch was established by OUC above the current toe ditch to divert clean runoff from covered areas to the wet detention pond.

At the start of landfilling in each of the cell areas, a minimum of 5 feet of enhanced ProMat was placed and compacted at the base elevation for that cell. Waste placement to the base of the vertical expansion took place within cell areas that already had a prepared base.

12.7.2 Vertical Expansion

Prior to starting the vertical expansion, the eastern side slope of the original CWSA to a point approximately 1,280 feet north of its southeast corner was completed and closed by covering it with 2 feet of cover soil and vegetation. Enhanced ProMat was used for all side slopes and closeout elevations. Soil cover and vegetation were already in place on the southern slope and were completed on the western and northern side slopes of the original landfill.

The vertical expansion includes 20-foot wide berms at elevations of +158 and +175 feet (NAVD88) with a runoff collection ditch inside the berm at +158 feet (NAVD88). The berms and ditch were constructed to prevent runoff from the vertical expansion area from discharging to the slopes. The approximately 16-acre area inside the berm at +175 feet (NAVD88) is divided into three separate areas, identified as Sequences 1 through 3.

Landfilling in the vertical expansion started with Sequence 1, the southernmost cell. In order to minimize the quantity of leachate directed to the CWSA Runoff Pond, while Sequence 1 is active, Sequences 2 and 3 were temporarily closed/capped with 2 feet of soil cover. As Sequence 1 reached final elevations, Sequence 2 was uncovered and become the active cell, while Sequence 1 was closed and capped. This process was repeated for activation of Sequence 3. Part of the area of the original CWSA north of Sequence 3 was maintained as a wet weather operation/laydown area.

Waste was delivered to the vertical expansion area via an existing 50-foot wide access ramp constructed of ProMat that originally had a slope of 6.8 percent. The access ramp was shortened and steepened to allow construction of Sequence 3 to its full proposed extent. The materials deposited in the landfill each day were spread, graded and compacted to provide positive drainage away from the working face. Adequate working surface slopes to prevent surface ponding and to facilitate surface drainage were maintained at all times. The waste was placed at a maximum final side slope of 3H:1V[5].

At closure, each sequence was covered with 2 feet of soil that sloped to the south and east at a grade of 1 percent to a low point at an elevation of approximately +169 feet (NAVD88) at which point two 36-inch diameter HDPE drainage culverts convey the runoff to the runoff collection ditch inside the lower berm. Elevations and slopes were controlled by a surveyed and staked reference grid, which is used to record the placement of waste by date. The runoff collection ditch conveys runoff from the vertical expansion area to a fabriform-lined flume draining to the clean water ditch. As shown in Figure 9, once the entire area was closed, the runoff flows via a landfill perimeter ditch to the wet detention pond for treatment prior to discharge to surface water.

A liner and leachate collection system have been constructed on the western side slope of the vertical expansion and have been joined to the slope liner and leachate collection system for Cell 1 at an elevation of approximately +150 feet (NAVD88). The liner and leachate collection system extend to the top of the vertical expansion at approximately +175 feet (NAVD88).

[5] Temporary and interim slopes may, in some cases, have been steeper than 3H:1V.

12.7.3 Lined Horizontal Expansion Cell 1

Cell 1 of the horizontal expansion of the CWSA occupies an area of approximately 30 acres and is subdivided into four subcells. From south to north, the subcells, which are each approximately 300 feet wide, are designated as Subcells 1A through 1D. As shown on Drawing Number CS-7 in Appendix 4, the drainage sand layer at the bottom of Cell 1 is graded so that there is a drainage divide between subcells from where the drainage sand layer slopes toward the centerline of the subcell at a grade of approximately 1 to 2 percent.

As shown on Drawing Number M-1 in Appendix 4:

- Each subcell has its own leachate collection sump with a dedicated pump that enables leachate collected in the sump to be pumped via a force main to the CWSA Runoff Pond.

- Each sump has a separate pump and piping for leachate collected in the leak detection system.

Landfilling inside Cell 1 started with construction of the access road and an adjacent working pad through the cell using ProMat with a minimum compacted thickness of 2 feet over the 24-inch thick drainage sand/protective cover. The access road and working pad were sloped at 1 percent to the west from an elevation of +94.5 feet (NAVD88) on the east side of the access road to an elevation of +93.5 feet (NAVD88) on the west side of the working pad. From the west edge of the working pad, the ProMat was graded at a slope of 6H:1V to meet the existing top of drainage sand elevation. The access road construction created a swale with a bottom width of approximately 40 to 60 feet between the access road and the lined eastern slope of Cell 1 (i.e., the western slope of the original CWSA). Construction of the access road through the cell was performed with waste delivered via the northern and southern haul roads.

, All wastes deposited on the Stack Out Pad will be delivered to the CWSA via either the northern or southern haul road. The access road to the landfill will gradually steepen as each succeeding lift of waste is placed. When the grade of the access road reaches 10 percent, wastes will be sloped around the access road so that the grade can be maintained or the access road alignment will be modified to provide a flatter transition between lifts. The access road will have a low point and drainage improvements inside the lined containment dike so that runoff from the access road is contained within the cell.

The following paragraphs describe the proposed sequence of landfilling. At the discretion of the OUC, modifications of this sequence to adjust for field conditions are permitted.

As shown on Drawing Number OP-1 in Appendix 8, following completion of the access road and working pad through the cell, an initial layer of ProMat will be placed over the entire bottom of the cell except for the following areas:

- within a 40-foot setback from the inside toe of the western containment dike in order to allow drainage to the leachate collection sumps

- the interior side slopes of the northern and southern containment dikes

- between the access road and the lined eastern slope of Cell 1

ProMat will be placed at a slope of approximately 1 percent downward to the west, starting at the elevation of the working pad and proceeding from south to north and east to west. Transition slopes from the ProMat to the drainage sand will be 3H:1V on all sides.

Following placement of the initial layer of ProMat within the prescribed limits, a ProMat cover with a minimum thickness of 2 feet and a slope of 5H:1V will be placed over the entire western piggyback slope of the original CWSA up to elevation +158 feet (NAVD88). The ProMat will be placed and compacted in layers with a maximum compacted thickness of 2 feet. Covering of the slope will proceed from south to north and from lower elevations to higher elevations.

Following covering of the side slope, Cell 1 will be divided into three staging areas. From south to north, the staging areas are designated A, B, and C. Staging Area A will be within Subcells 1A and 1B, which have a combined width of approximately 600 feet; while Staging Areas B and C will be within Subcells 1C and 1D, respectively, which each have a width of approximately 300 feet.

Waste will be placed sequentially in the three areas in approximately 10-foot thick lifts as follows:

- The 40-foot uncovered setback for the sump area will be maintained for each staging area.
- The lifts will be placed in layers with a maximum compacted thickness of 2 feet.
- Lifts will be sloped at a grade of 1 percent to the west.
- Outside slopes of each lift will be constructed at a maximum slope of 3H:1V.
- Staging Area A will be landfilled so that it is always at least one lift higher than Staging Area B, which will always be at least one lift ahead of Staging Area C.
- At the start of each lift, a 10-foot high berm with an inside slope of 6H:1V will be constructed along the outside of the lift. For Staging Area A, the berm will be constructed on the southern, western, and northern sides. For Staging Areas B and C, the dike will only have to be constructed on the western and northern sides, because the previous lift of the adjacent staging area will provide containment on the southern side. For Staging Area A. the berm on the southern side should be constructed first, followed by the berm on the western side. For Staging Areas B and C, the berm on the western side should be constructed first.
- When the lift has been filled to within 3 feet of the top of the berm surrounding the lift, filling should proceed to the next lift, so that adequate storage for runoff is maintained on top of the lift.

Cross sections illustrating the conceptual sequence of filling are shown on Drawing Number OP-1 in Appendix 8. Lifts are numbered in the sequence of filling, and the various staging areas are indicated by different colors and a heavy line between adjacent lifts. As shown, the first two lifts are placed in Staging Area A, followed by Lift 3 in Staging Area B. Filling then proceeds in the sequence A, B, C through Lift 15. Lifts 16 and 18 will be placed across Staging Areas A and B.

Drawing Number OP-2 in Appendix 8 shows schematic plan views at completion of various stages of filling.

After completion of the southern side slope of the landfill to the elevation of the bench at approximately +140 feet (NAVD88), which occurs in Lift 10, the remaining airspace on the side slope will be filled. This fill operation will proceed from east to west in approximately 10-foot lifts. The top of each lift will be graded so that contact runoff from uncovered waste slopes above is conveyed into the lined cell. Filling will proceed at a rate such that exposed waste on the outside slope of the lift will be covered with 18 inches of intermediate soil cover within 1 week of placement. Contact runoff from temporarily exposed waste slopes will be collected and directed into the lined cell.

A similar sequence will be followed after the northern side slope in Staging Area C reaches the bench elevation in Lift 17.

When the entire landfill reaches approximately 2.5 feet below final elevation, waste will begin to be placed within the 40-foot setback. Landfilling within the setback area will proceed from south to north in approximately 10-foot lifts. The top of each lift will be graded so that contact runoff from uncovered waste slopes above is directed to the inside and conveyed into the remaining uncovered sump area of the lined cell. As each lift reaches the western limit of the area, 18 inches of intermediate soil cover will be placed on the outside slope. As for the northern and southern side slopes, filling will proceed at a rate such that exposed waste on the outside slope of the lift will be covered with 18 inches of intermediate cover soil within 1 week of placement. Contact runoff from temporarily exposed waste slopes will be collected and directed into the remaining uncovered sump areas of the lined cell.

12.8 **Placement of Intermediate Soil Cover**

As each lift is completed, at least 18 inches of intermediate soil cover will be placed on the outside slope and compacted to at least 90 percent of the Standard Proctor maximum dry density.

Cover soils will continue to be obtained from both on-site borrow areas and off-site sources. All off-site soil materials brought to the CWSA will be tested for compliance with applicable regulations prior to being used at the site. Specific parameters to be analyzed will be selected by OUC based on the source. "Clean" soil can be contaminated soil that has been properly treated or soil from a site with no known contamination. Soils from a contaminated site that have been treated and which meet the direct exposure residential and leachability soil cleanup target levels of 62-777, F.A.C., are considered to be "clean" soil.

At the discretion of the operator, temporary soil cover, consisting of at least 6 inches of soil, may be placed in areas of Cell 1 that are exposed to the elements and are anticipated to be inactive for a substantial period of time. Depending on the length of time the area is to be inactive, a temporary vegetative cover may also be necessary to limit the potential for erosion.

13.0 **WATER QUALITY MONITORING**

The water quality monitoring program for the SEC, including surface water and groundwater, is conducted by OUC. The approved Monitoring Plan Implementation Schedule (MPIS) for the Stanton Energy Center Combustion Waste Landfill is included as Attachment F to the latest COC. Some of the requirements in the MPIS pertain to other parts of the site beyond the combustion waste management areas.

In accordance with NPDES Permit FL0681661-002, OUC is required to monitor the following surface water points:

- Surface Water Discharge D-001: An existing discharge of makeup pond overflow to Cowpen Branch and thence to the Econlockhatchee River. This monitoring point is designated EFF-1.

- Surface Water Discharge D-002: An existing discharge of non-contaminated groundwater from the drainage system below the Recycle Pond liner to Cowpen Branch and thence to the Econlockhatchee River. This monitoring point is designated EFF-2.

- Surface Water Discharge D-003: An existing discharge from the North Coal Runoff Pond liner drainage system to Hart Branch and thence to the Econlockhatchee River. This monitoring point is designated EFF-3.

- Internal Outfall I-004: A new internal discharge at the emergency overflow from the Recycle Pond to an adjacent stormwater swale, and thence to the makeup pond. This monitoring point is designated OUI-4.

The locations of these monitoring points are shown on Figure 6. Surface Water Discharges D-002 and D-003 will no longer occur at their current locations when proposed modifications to the Recycle and Coal Storage Area Runoff Ponds and the associated underdrains are completed. The monitoring point locations will have to be revised accordingly.

The parameters to be sampled and the required sampling frequency are specified in the NPDES permit.

Stormwater discharges are also required to be monitored in accordance with the NPDES Multisector General Permit for Stormwater Discharge Associated with Industrial Activity.

14.0 LEACHATE MANAGEMENT

14.1 Leachate Generation

Leachate is generated by stormwater runoff in contact with the surface of the waste and by rainwater that infiltrates the surface of the waste material and percolates through the waste. Leachate is generated from the CWSA and from waste materials on the Stack Out Pad and in the Decant Cell.

14.2 Leachate Collection

The lined horizontal expansion of the CWSA includes a leachate collection and removal system and a leak detection system. The leachate collection system and leak detection system for Cell 1 of the lined horizontal expansion are shown in Drawing Numbers CS-6 and D-2 in Appendix 4. Leachate infiltrating through the 2-foot thick drainage sand layer is collected in a geocomposite drainage layer on top of the primary liner and conveyed through leachate collection piping to a geotextile-wrapped, gravel-filled sump at a low point on the west side of the subcell. A geocomposite between the primary and secondary liners comprises the leak detection system. Any water collected in the geocomposite drains to a leak detection sump. Each landfill sump is

equipped with a 5-HP Sligo pump with a capacity of 110 gpm for the leachate collection system and a 0.5-HP Sligo pump with a capacity of 10 gpm for the leak detection system. From the sumps, leachate is pumped through a 3-inch diameter pipe to an 8-inch diameter HDPE force main, which discharges into the CWSA Runoff Pond. The alignment of this force main is shown in Drawing Number G-9 in Appendix 4 and in Figure 7.

14.3 **Leachate Flow Measurement**

As shown in Drawing Numbers M-1 and M-2 in Appendix 4, each of the leachate collection and leak detection sumps is instrumented for pressure, flow, and water level. The readings are transmitted wirelessly to a central data recording station from where it can be accessed by OUC. Leachate flows are calculated from the totalizer readings for the individual flow meters.

14.4 **Leachate Storage**

The CWSA Runoff Pond acts as a leachate surface impoundment, which, in accordance with 62-701.400(6)(b)5, must maintain a minimum 2-foot freeboard in a 25-year, 24-hour storm event. Management of the lined ponds on the SEC site, including the CWSA Runoff Pond, is covered under the Lined Ponds Operation Plan, dated November 27, 2012. The expanded CWSA Runoff Pond was designed with enough capacity to handle the 100-year, 24-hour storm event for a 55-acre watershed.

Expansion of the CWSA Runoff Pond was completed in January 2015. The expanded CWSA Runoff Pond consists of two compartments each with a 6-inch thick clay base and double-lined with HDPE geomembranes, covered by an 18-inch thick compacted soil cover and 8 inches of soil cement and is surrounded by a soil-bentonite cut-off wall. The pond has an underdrain system and air/gas vents around the top of the liner. Discharge from the underdrain system, which is minimal, is pumped into the CWSA Runoff Pond. Discharge from the CWSA Runoff Pond, which includes inflows from the Decant Cell, is through two 24-inch diameter HDPE discharge pipes, one from each compartment, to the lined Recycle Pond.

The CWSA Runoff Pond has a storage capacity of approximately 55 acre-feet from the minimum operating water level of +75.5 feet (NAVD88) to the maximum operating water level of +85 feet (NAVD88) and a storage capacity of approximately 70 acre-feet from the minimum operating water level of +75.5 feet (NAVD88) to the top of liner at +87 feet (NAVD88).

14.5 **Leachate Treatment**

Leachate discharges from each compartment of the CWSA Runoff Pond flow through a 24-inch diameter pipe to the lined Recycle Pond from where it is used as makeup water for the FGD scrubber system. The alignment of this pipe is shown on Figure 7. Leachate generated from the Stack Out Pad drains to the South Coal Storage Area Runoff Pond, from where it gravity flows to the Recycle Pond and is used for makeup water for the FGD scrubber system. Part of the makeup water is evaporated in the FGD scrubber system and the remaining water is contained in the FGD sludge. The dewatered FGD sludge is incorporated in the ProMat and disposed of in the landfill. The water removed from the FGD sludge by the rotary vacuum filters is recirculated. The SEC is a zero liquid discharge facility and thus no contact or process water is discharged from the site.

14.6 **Leachate Sampling**

Historically, the quality of water in the CWSA Runoff Pond has been tested periodically by OUC. Leachate collected in the CWSA Runoff Pond has been analyzed annually for the following parameters:

pH	Arsenic	Iron	Selenium
Conductivity	Barium	Lead	Silver
Chloride	Beryllium	Manganese	Sodium
Nitrate	Cadmium	Mercury	Zinc
Sulfate	Calcium	Molybdenum	Gross Alpha
Total Dissolved Solids	Chromium	Nickel	Radium-226 (If Gross Alpha is >15 pCi/L)
Aluminum	Copper	Potassium	

In accordance with the latest (June 11, 2015) version of 62-701.510, F.A.C., leachate sampling and analysis are not required by FDEP for solid waste management facilities.

14.7 **Leachate Collection System Maintenance**

Operation and monitoring of the leachate collection and removal system by on-site operations personnel should include the following activities:

- Daily recording of rainfall and other on-site meteorological data
- Daily recording of water levels in the CWSA Runoff Pond
- Daily review and recording of all sensor and totalizer readings
- Daily inspection of the system to detect leaks or unusual operating conditions
- Daily inspection of the active cell for ponded water
- Visual inspection of gravity leachate headers if flow records suggest a potential blockage of flow

In addition, the landfill is inspected weekly for conditions which are disrupting or have the potential to disrupt the operation or safety of the landfill in accordance with § 257.84 of the EPA Coal Combustion Residuals (CCR) rule (40 CFR 257).

The gravity leachate collection system piping inside the waste disposal cells should be thoroughly inspected using video equipment every 5 years and jet cleaned if necessary.

Maintenance of the electrical and mechanical components of the leachate collection and removal system is the responsibility of OUC. This includes preventive maintenance of pumps and control systems as well as repairs to pumps, valves, control equipment, and force mains when needed. Operation and maintenance of pumps, valves, and other mechanical equipment should be performed in strict accordance with the manufacturer's recommendations. Operation and maintenance manuals for all major pieces of mechanical equipment are kept on file at the SEC site.

15.0 **STORMWATER MANAGEMENT/EROSION CONTROL**

15.1 **Stormwater Management**

Because it was not required by the Conditions of Certification at the time of initial construction, there is no management and storage of surface water (MSSW) or environmental resources permit (ERP) for the original CWSA and CWSA Runoff Pond. According to the 1987 CSI management plan, non-contact runoff could be discharged to natural surface water bodies without treatment, but contact runoff had to be treated or reused.

According to the CSI management plan, the CWSA Runoff Pond was originally designed to retain the runoff from a 15-acre active working area from a 100-year frequency storm of 24-hour duration, which is 10.5 inches[6]. Considering a curve number of 90 for active landfill areas as assumed by CSI, this is approximately 11.6 acre-feet of runoff. Based on the topographic survey, the original CWSA Runoff Pond had an area of approximately 4.5 acres and a storage volume of approximately 11.9 acre-feet between the maximum and minimum operating water levels of +80.9 and +78 feet (NAVD88), respectively. The top of bank for the CWSA Runoff Pond had an elevation of approximately +84 feet (NAVD88). The original CWSA Runoff Pond is no longer used for stormwater management. The original CWSA Runoff Pond was replaced by a double-lined, two-cell pond with a much larger storage capacity. Stormwater runoff from the landfill is controlled and diverted to a wet detention pond as further described below.

As part of the design for the lined horizontal expansion of the CWSA, Ardaman prepared a hydrologic and hydraulic report[7] that considered stormwater management requirements for the ultimate buildout of a 250-acre CWSA. The stormwater conceptual design is presented in Figure 8. On the figure, the original CWSA and the currently approved lined horizontal expansion are indicated by cross-hatching, and the extent of the landfill at future buildout is indicated by tan shading on the side slopes and brown shading on the top of the landfill. The resulting 22.5-acre wet detention pond, which has been designed to meet FDEP requirements, is shown on Drawing Number P-1 in Appendix 4 and on Figure 9. Construction of the wet detention pond was completed in December 2012. The as-built survey is included in Appendix 4.

Subsequent to the construction of the wet detention pond, additional ditches and culverts have been designed and approved for the northeastern corner and the eastern and southern sides of the landfill, and for the northern haul road to convey stormwater runoff to the wet detention pond. Stormwater drainage for the landfill area is shown in Figure 9. Runoff from the original 90 acre-CWSA, the vertical expansion, Cell 1, and the landfill haul roads and perimeter roads is conveyed to the wet detention pond for treatment and then discharged to the existing stormwater ditch to the southeast of the landfill area.

The stormwater management system should be operated in accordance with the latest Stormwater Pollution Prevention Plan for the SEC.

The stormwater management system for the CWSA should be inspected by operation personnel at least quarterly and after storm events with more than 2 inches of rainfall in 24 hours using the procedures and checklist in Appendix 9. An annual stormwater management system inspection

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[6] The St. Johns River Water Management District criteria and the requirements of 62-701, F.A.C., for a stormwater management system are based on a 25-year, 24-hour storm event.

[7] "Hydrologic and Hydraulic Report, Proposed Horizontal Expansion of Coal Combustion Waste Landfill, Orlando Utilities Commission, Stanton Energy Center, Orange County, Florida," dated November 3, 2011.

should be performed by a licensed professional engineer and a signed and sealed report of inspection should be submitted to FDEP.

Routine maintenance for the stormwater management system includes the following activities:

- Mowing of ditches and wet detention pond above water level.
- Clearing/cleaning drainage swales and channels when accumulated debris is obstructing flow.
- Periodic replacement of topsoil and grass seeding for drainage swale/ditch/pond banks to reestablish lost vegetation.
- Regrading or reconstruction of ditches to promote surface water flow and discourage ponding.
- Clearing/cleaning all inflow and outfall structure grates of accumulated dead grass.
- Clearing the bleed down orifices for outlet structures
- Clearing/cleaning inlets and outlets of all culverts and discharge pipes of accumulated dead grass and silt.
- Clearing/cleaning ditches, structures, and pond of accumulated silt.

15.2 **Erosion and Sedimentation Control**

Erosion is monitored by the Landfill Supervisor and erosion and sedimentation issues are brought to the attention of the Site Manager, who also performs periodic inspections of the landfill area. Once it is placed and compacted, the fixated waste is relatively erosion resistant. Cover soils are seeded as soon as possible after placement. A soil berm is provided around the top of the landfill and the landfill side slopes have benches that collect eroded soil from the overlying slope. Areas of cover soil erosion are restored and reseeded as soon as practical. If necessary, erosion control mats will be used to reduce erosion from steeper slopes until vegetation is established.

As part of stormwater management system maintenance, sediment is removed from ditches, culverts, and ponds by the landfill operator as necessary and as directed by OUC. Sediment that has currently accumulated in the lined ponds will be removed as part of the ongoing Lined Ponds Modification Project. As part of this project, the existing South Coal Storage Area Runoff Pond, which is located west of the Stack Out Pad, will be converted to a sedimentation pond Procedures for sediment control and removal from the lined ponds, including the CWSA Runoff, are covered in a separate document and are not part of the landfill operator's responsibilities.

15.3 **Fugitive Dust Control**

Fugitive dust control for the landfill, road, and other CCR management and material handling activities ,as required by § 257.80 of the EPA CCR Rule, is performed in accordance with the Fugitive Dust Control Plan in Appendix 10.

16.0 **CLOSURE PLANS**

16.1 **Landfill Closure**

The management plan for the CWSA, dated April 7, 1987, prepared by CSI as part of the COC, requires that final closure of the original CWSA be provided with a minimum 24-inch thick compacted soil cover. Furthermore, the final cover shall be vegetated with a viable community of grasses to limit the potential for erosion. The COC requires that the top of each completed cell be constructed with a slope of 0.75 percent (or steeper). The COC also requires that the original CWSA be provided with an adequate perimeter toe ditch and interceptor ditch system to control rainfall runoff within the CWSA.

Waste disposal within the original CWSA, including the vertical expansion, ceased on August 28, 2015. Final closure of the original CWSA was substantially completed in January 2016 and with additional punch list items completed on March 11, 2016. As part of closure, a minimum of 2 feet of soil cover was placed on top of the closeout layer of enhanced ProMat. Ardaman prepared a report titled Certification of Closure of Original Combustion Waste Storage Area at the Orlando Utilities Commission, Stanton Energy Center, dated March 12, 2016, to document the closure construction. The closure drawings from this report are provided in Appendix 11.

The lined horizontal expansion area will be closed sequentially as parts of the landfill reach final elevations. As shown on Drawing Number CS-9 in Appendix 4, the proposed closure design includes, in ascending order:

- a 6-inch thick soil bedding layer on top of the waste
- a 40-mil textured HDPE liner
- a double-sided geocomposite drainage layer, and
- a 2-foot thick protective soil cover.

Monitoring and maintenance of the closed areas of the landfill will be handled by OUC or a designated contractor.

16.1.1 Specifications for Seeding of the Landfill Cells at Closure

After the final cover soil have been placed and compacted, a vegetation program will be implemented to stabilize the cover soils and to minimize erosion. The vegetation program will commence as soon as weather permits seed bed preparation, and when seasonal conditions are suitable for the type of vegetation to be sown.

The contractor will provide a written seeding and mulching plan that will be reviewed by the OUC engineer. The contractor will not be allowed to perform any seeding or mulching of the site until the OUC engineer provides written approval of the contractor seeding and mulching plan.

Seed Requirements and Application Rate

The following seed mixes will be applied to the area to be seeded:

1) Seed Application Rate Per Acre

Winter Mix *September 1st – January 31st*

40 pounds Argentine Bahia (scarified)
20 pounds Winter Oats
20 pounds of Gulf Annual Ryegrass

Summer Mix *February 1st –August 31st*

40 pounds Argentine Bahia (scarified)
40 pounds Japanese Millet

2) Seed Requirements

a. The separate types of seed used shall be thoroughly dry-mixed immediately before sowing. The seed will meet the following specifications:

1) All seed shall meet the requirements of the Florida Department of Agriculture and Consumer Services and all applicable State laws, and shall be approved by OUC before being sown. The seed shall have been harvested from the previous year's crop. All seed will be labeled in accordance with the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect at the time of purchase.
    a. Seed which has become wet, moldy, or otherwise damaged will not be used. Seed used will be less than 2 years old.
    b. Each of the species or varieties of seed shall be furnished and delivered to the site in separate labeled bags.
    c. During handling and storing, the seed shall be cared for in such a manner that it will be protected from damage by heat, moisture, rodents, and other causes of damage.
    d. All permanent and temporary grass seed shall have been tested within a period of 6 months of the date of planting, and shall have a minimum percent of purity and germination as follows:
        i. Bahia grass seed shall have a minimum pure seed content of 98 percent with a minimum total germination of 88 percent.
        ii. Rye grass seed (for planting between September 1st and January 31st) shall have a minimum pure seed content of 95 percent with a minimum total germination of 90 percent.
        iii. Millet seed (for planting between February 1st and August 31st) shall be the Japanese or Brown Top varieties with a minimum pure seed content of 90 percent with a minimum total germination of 88 percent.

2) All areas that are seeded will be mulched with native grass hay with the following requirements:
    a. The hay will be Bahia with a maximum weed percentage of 5%.
    b. No hay mulch will be allowed on the SEC site until the OUC engineer inspects the hay and provides written approval.

c. The mulch will be approximately 4 to 6 inches in length and crimped in place.

3) All seeded areas will be maintained by refilling of rain-washed gullies, reseeding, mulching, and watering.

Grass will be applied by conventional seeding methods or hydroseeding in accordance with FDOT Specifications Section 570 or as otherwise directed or approved by OUC.

16.2 **Closure of the Combustion Waste Processing Facility/Area**

Unless there are significant changes to power plant operations, closure of the waste processing facility and the Stack Out Pad are only possible after the coal-fired generating units are no longer in service. This is not anticipated to occur for many years.

If the combustion waste processing facility is no longer required, OUC will notify FDEP in writing prior to ceasing operations and specify a closing date. No waste will be received or processed by the facility after the closing date. Within 30 days after receiving the last combustion waste or other waste materials, OUC will remove all waste materials from the combustion waste processing facility and the Stack Out Pad and dispose of them in the on-site landfill or other permitted facility in accordance with applicable regulation*s*. The Stack Out Pad and related pipes and sumps will be cleaned and all leachate will be properly disposed. Closure will be completed within 180 days after receiving the last combustion waste. When closure is completed, OUC will certify in writing to the FDEP that closure is complete.

16.3 **Closure of the CWSA Runoff Pond**

The CWSA Runoff Pond previously received both leachate and stormwater. According to the CSI management plan, after 2 feet of final soil cover was placed on the area that drains to the CWSA Runoff Pond, stormwater runoff from the CWSA would no longer be considered leachate. Under the current stormwater management plan, OUC intends to direct all runoff from closed areas of the CWSA to the wet detention pond for treatment prior to discharge. The CWSA Runoff Pond is a dedicated leachate impoundment that would remain active as long as leachate is being generated from the horizontal expansion.

17.0 **EMERGENCY RESPONSE PROCEDURES AND CONTINGENCY OPERATIONS**

17.1 **Emergency Response Procedures**

OUC is responsible for emergency response on the SEC site including the landfill, the FGD sludge conditioning facility, and the Stack Out Pad. All OUC employees and contractors are trained in OUC safety and emergency procedures for the SEC. Excerpts of the SEC Contractor Orientation Information Guide, revised June 4, 2015 are included in Appendix 12.

The document, “OUC Operational Guide, Emergency Plan Procedures,” revised August 2010, provides information for all OUC facilities. Excerpts of this document are included in Appendix 13. Pages 6 through 10 describe the scope and structure of the emergency plan. Pages 40 through 42 describe the responsibilities and emergency procedures for Electric and Water Production, which includes the SEC. Appendix E of the emergency plan document contains the SEC Hurricane Preparedness Plan. In the event of a medical, fire, chemical, or other plant

emergency, the SEC Control Room is to be notified using the SEC emergency telephone number (3111). This activates the emergency plan procedures.

The OUC Electric and Water Production Emergency Response Team (ERT) are trained and equipped to provide an immediate but limited response to emergencies that occur at the Stanton Energy Center and Indian River Plant. New member and refresher training are designed to meet the specifications established by the entities that oversee those types of emergencies anticipated (medical, fire, hazardous material, and rescue). Coordination of training and equipment in support of the ERT is the responsibility of the Safety and Training Organization. OUC's Safety Director (407- 434-3097) has overall responsibility for these activities.

The SEC has fire emergency procedures, which are included in Appendix 14. All wastes handled in the combustion waste processing facility and the CWSA are non-combustible. Dust control equipment is provided for the silos and throughout the FGD sludge conditioning facility. Fuel and equipment represent the greatest risk of fire. In the event of a fire, all personnel have been instructed to call the SEC emergency telephone number (3111).

The ERT has standard operating procedures (SOP) for incipient fires and free burning fires, which are included in Appendix 14. For free burning fires and other emergencies that cannot be addressed by the ERT and on-site personnel, the ERT calls 911 for the Orange County Fire Rescue Department. Orange County Fire Station #85, which is located at 13801 Townsend Drive, approximately 2.1 miles from the entrance to the SEC, is the closest Orange County Fire Rescue Department facility.

17.2 **Contingency Operations**

Contingency operations covered by this management plan include:

- Wet weather operation of the landfill, the Stack Out Pad, and the Decant Cell
- High water levels in the CWSA Runoff Pond
- Unscheduled downtime in the combustion waste processing facility
- Landfill and Stack Out Pad equipment breakdowns and maintenance
- Interruptions of discharge to the wastewater treatment facility

17.2.1 Wet Weather Operation

In the event of severe weather or other emergency that might temporarily prohibit the placement of wastes in the CWSA, the contractor has the ability to temporarily suspend waste processing and/or store waste on the Stack Out Pad or in the Decant Cell. The Stack Out Pad has the capacity to store approximately 5,000 cubic yards of processed waste/ProMat and unprocessed waste (bottom ash, BCCS, etc.), which is equivalent to approximately 3 days of waste generation with both Unit 1 and Unit 2 in operation. The Decant Cell has the capacity to store approximately 2,000 cubic yards per compartment or 4,000 cubic yards for the two compartments.

17.2.2 High Water Levels in the CWSA Runoff Pond

The top of dike in the CWSA Runoff Pond at elevation +89 feet (NAVD88) is 2 feet above the crest of the overflow weir between the North and South Compartments. There is also an emergency overflow pipe on the north side of the North Compartment with an invert elevation of +87 feet (NAVD88) that discharge to the liner Recycle Pond. When heavy rainfall is anticipated and the CWSA Runoff Pond water level is already high, the potential for the pond to overflow is reduced by monitoring the pond staff gauge and discharging or pumping water from the CWSA Runoff Pond to the Recycle Pond to draw down the CWSA Runoff Pond water level. The pre-storm water level can also be managed by removing accumulated sediment from the pond periodically to increase its storage capacity. Management of water levels in the CWSA Runoff Pond is addressed in the Lined Ponds Operation Plan for the SEC.

17.2.3 Unscheduled Downtime in Combustion Waste Processing Facility

Scheduled preventive maintenance and equipment replacement is coordinated with power generation activities to minimize the amount of unscheduled downtime. The processing equipment in the combustion waste processing facility has sufficient capacity and redundancy to meet the processing requirements under most circumstances using part of the equipment operating for part of the day. For example, there are six rotary vacuum filters and three mixers and the normal waste stream can be handled with two or three vacuum filters and one mixer operating. Depending on the solids content of the FGD slurry, processing 10,400 tons per week with this equipment would take between 70 and 149 hours. The waste materials accumulated during downtime can be processed by bringing additional equipment on line or by additional hours of operation. Capacity for fly ash storage is provided in the silos and capacity for FGD sludge storage is provided in the thickeners. This storage acts as a buffer during equipment downtime.

17.2.4 Landfill and Stack Out Pad Equipment Breakdowns and Maintenance

OUC has arrangements in place to rent or lease additional heavy equipment from local equipment dealers as needed. There is a backup conveyor for stacking ProMat on the Stack Out Pad.

17.2.5 Interruptions of Discharge to the Wastewater Treatment Facility

Leachate from the CWSA Runoff Pond and the Stack Out Pad is recycled through the FGD scrubber makeup water system, where it is evaporated or contained in the FGD scrubber sludge. Purge water from the FGD sludge dewatering system is recirculated. Leachate is not directed to the on-site wastewater treatment facility. If the FGD scrubber system is not operating at a level that uses all of the leachate that is generated, the remaining leachate would have to be temporarily stored in lined ponds or tanks, treated onsite using mobile treatment equipment, or trucked off site for treatment.

17.2.6 Leachate Accumulation in Lined Cells

Because the fixated waste (ProMat) has a low permeability, much of the rainfall during a heavy rainfall will run off the surface rather than infiltrating. In addition, as the drainage sand layer in the lined cell is covered with waste, the infiltration area for the leachate collection system is reduced. If a major storm event occurs when the infiltration area is greatly reduced, leachate may not be removed quickly enough using the pumps installed in the sump risers. The potential impacts are partially mitigated by not covering a 40-foot wide base area including the sumps in Cell 1 and by temporarily ponding water over ProMat within the cell. During such a situation, OUC

will deploy additional surface pumps to remove the water from the cell to the CWSA Runoff Pond via the force main. Intakes for additional pumps would be located in areas of ponded water. The required supplementary pump capacity to remove 3 inches of runoff from the 37-acre watershed in approximately 2 days is approximately 1,000 gpm. The quantity of leachate pumped to the force main using the auxiliary pump(s) will be metered and recorded by date.

17.3 **Notification Requirements**

62-701, F.A.C., requires certain notifications of the implementation of emergency procedures. In the event of a fire in the waste management facility, OUC will notify FDEP of the fire and of the fire control plan being implemented. If the fire is beyond the incipient stage and cannot be extinguished or controlled by the ERT, OUC's standard operating procedure is to notify the Orange County Fire Rescue Department (407-836-9061) immediately and seek its assistance.

62-701, F.A.C. also requires that erosion control measures be employed to correct any erosion that exposes waste or causes malfunction of the stormwater management system within 3 days of occurrence. If the erosion cannot be corrected within 7 days of occurrence OUC will notify FDEP and propose a correction schedule.

Notification requirements relative to water quality monitoring are addressed in the SEC water quality monitoring plan.

18.0 **QUALITY CONTROL TESTING**

The quality control program is used to indicate the in-place properties of the processed materials. It is also used to determine the best handling technique for placement of a particular material consistency produced by the FGD sludge conditioning facility. Such items as length of stockpile conditioning time, lift thickness, and compaction effort required to achieve the desired final properties are determined through the landfill quality control (QC) program. The landfill quality control program is coordinated with the FGD sludge conditioning facility quality control program. The characteristics of the material produced by the FGD sludge conditioning facility are monitored in conjunction with the landfill quality control program to document the effectiveness of the fixation system.

18.1 **Initial Operation Testing Program**

The initial operation testing program commenced once steady state FGD sludge conditioning facility operating conditions were achieved. This program ran for about 1 month in 1987 to define the conditioning plant operating parameters. The initial operation testing program was designed to provide the input required to evaluate the proper placement procedures and landfill material characteristics for the range of materials produced by the FGD sludge conditioning facility. The data gathered during the initial operation period were used to insure that a consistent product was being produced, to indicate the physical parameters of the processed materials within the landfill and to define the operating criteria for the long term. Parts of this initial operating testing are used to re-establish process and material parameters when significant changes to the process or materials occur.

18.2 **Long-Term Testing Program**

The objective of the long-term quality control testing program is to continuously monitor the physical properties of the processed materials placed in the landfill. The following testing program is utilized to monitor the quality of fixated waste/ProMat:

Property	Frequency of Testing
Moisture Content and Lime Content	Every 4 hours during plant operation
In-Place Density	Minimum of four tests every 2 weeks
Unconfined Compressive Strength	Six tests per month with two cylinders each tested at 30, 60, and 90 days

Weekly test results are reported to OUC monthly. The testing results are stored on the OUC and contractor computer networks.

18.2.1 Stockpiled Processed Material

An evaluation of the effect of stockpile conditioning time on the ability to load, truck, and place the fixated material is required for the material produced by the FGD sludge conditioning plant. Also, the effect of stockpile conditioning time on final product characteristics (e.g., unconfined compressive strength, permeability, leaching, etc.) is determined by the testing program.

These tests, in conjunction with actual field placement trials, provide indicators for handling processed material at its optimum condition. The frequency of sampling depends on the variability of the material produced by the FGD sludge conditioning facility.

Representative samples of conditioned, stockpiled processed material are obtained on the day that it is placed in the landfill. Samples are tested for moisture content, and lime content. Specific methods used for testing are described in Appendix 15.

18.2.2 In-Place Density Testing

An in-place density testing program is necessary to determine if the minimum density to achieve the required physical and environmental properties is being obtained. The frequency of testing depends on the variability of the processed material placed in the landfill but at least four tests are performed for every 2 weeks using the methods in Appendix 15. The results of the in-place density tests are compared to the Standard Proctor compaction test maximum dry density. Based on historic test results, the target in-place density has been set at 94 percent of the Standard Proctor maximum dry density. Based on previous QC testing results, the typical in-place dry density of ProMat is 69 to 78 pounds per cubic foot (pcf) with a mean value of approximately 72 pcf. Core borings through the landfill were performed by Ardaman in January and February 2010. Laboratory analyses of the cores samples indicated a dry density ranging from 62 to 84 pcf with a mean of about 74 pcf, which is consistent with but slightly higher than the mean indicated by the QC testing results.

19.0 **RECORDKEEPING**

19.1 **Regulatory Records**

OUC maintains a record of the certification, permitting, and compliance history of the SEC including the CWSA.

19.2 **Waste Quantities and Landfill Operation Records**

The contractor prepares a daily activity sheet for landfill operation that lists the weather conditions, load counts for each truck, the types of waste hauled and landfilled, estimated tonnage hauled, the landfill equipment and operators utilized, and comments. The information from the daily activity sheet is transferred into a log book**.**

OUC provides the quantities of coal fired and the as-received and as-fired ash percentages for Unit 1 and Unit 2 to the contractor. The approximate quantities of fly ash and bottom ash are estimated from the relative percentages of fly ash and bottom ash, which are currently about 92 percent fly ash and 8 percent bottom ash. The estimated quantities are reconciled with the actual fly ash quantities at year end to derive the actual percentages of fly ash and bottom ash, which are reflected in an adjusted report. The adjusted year-end percentages are used as the initial estimate of the relative quantities of fly ash and bottom ash for the following year.

Headwaters provides a month-end detailed report (MEDR) to OUC, which includes:

- A month-end reconciled comparison report (MERCR), which summarizes for the year to-date the monthly quantities from the mass balance; the ash availability reports; and the monthly quantities of ProMat, fly ash and bottom ash sold.

- A mass balance report, which summarizes the weighed quantities of ProMat, fly ash, and lime substitute; and the calculated quantities of ProMat and FGD sludge filter cake on a dry weight basis, and FGD sludge filter cake on a wet weight basis.

- Ash availability reports for Unit 1 and Unit 2, which summarize the daily coal burned, the as-fired percent ash, the estimated quantities of fly ash and bottom ash produced, the ash incorporated in ProMat, the fly ash sold, and the percent sulfur in the coal.

- A quality assurance/quality control (QA/QC) report, which summarizes the test results for percent solids; percent lime; fly ash to filter cake ratio; in-place dry density; hydraulic conductivity (permeability) at 30 and 90 days; and compressive strength at 30, 60, and 90 days of the ProMat; and percent solids of the filter cake.

- Landfill report and diagrams, which depict in graphic and tabular form where and at what elevation waste has been placed in the CWSA during the month using GPS/surveyed locations relative to the Florida State Plane Coordinate System. These diagrams also show where BCCS, bottom ash, and miscellaneous wastes, have been placed.

- A maintenance report, which lists equipment maintenance performed during the month.

An example of the MEDR for December 2014 is provided in Appendix 16.

Summaries of the monthly and annual waste quantities from the mass balance reports from January 2005 through October 2016 are presented in Appendix 17. Based on the quantities in Appendix 17, the amount of ProMat produced for the period of record varied from 200,000 to 565,000 tons per year on a wet weight basis (wwb), which is equivalent to 140,000 to 392,000 tons per year on a dry weight basis (dwb). The lowest annual tonnage was recorded in 2012 and represented a significant decline in waste generation. The highest annual waste generation since 2012 was 335,000 tons in 2014. The annual average ProMat solids content ranged from 66.75 to 72.81 percent and averaged 69.72 percent.

At the start of the period of record in 2005 through 2007 most of the bottom ash generated at the SEC was sold. Starting in November 2008, bottom ash sales have been essentially zero and, by the end of October 2016, a total of 106,500 tons of bottom ash had been landfilled.

19.3 **On-Site Rainfall Data**

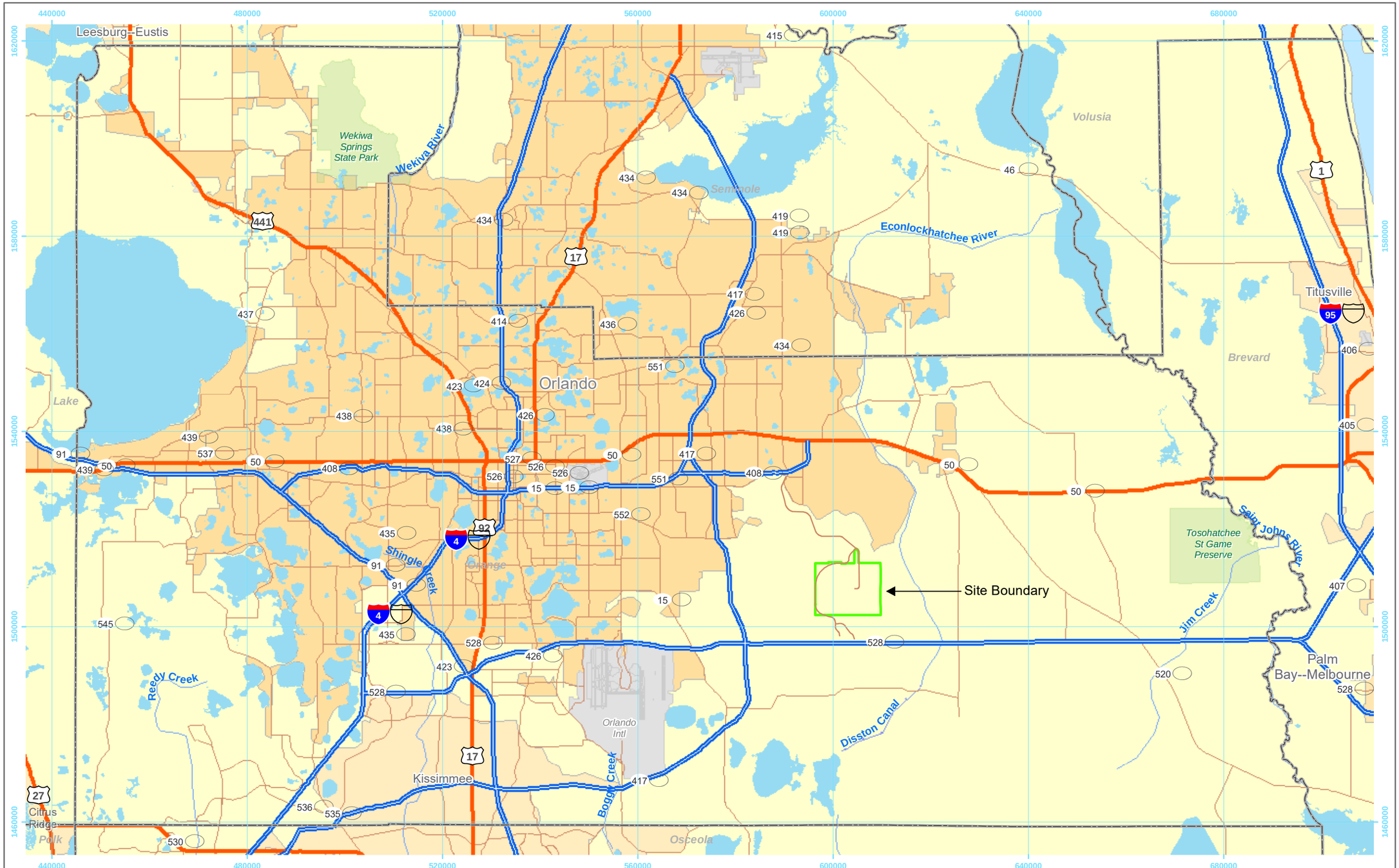
OUC has three rain gauges at the SEC: one at the meteorological station, one near the Makeup Water Supply Pond, and one near the horizontal expansion. . Starting in July 2009, OUC has been taking daily readings at all three gauges manually. OUC maintains a record of on-site rainfall data dating back to 1996.

19.4 **Leachate Quantities**

In accordance with 62-701.500(8)(f), F.A.C., Landfill Operation Requirements, quantities of leachate collected by the leachate collection and removal system will be recorded in gallons per day, and will be included with the operating record. Leachate quantities will be recorded separately for the leachate collection and leak detection systems for each subcell sump and will be summarized in monthly totals. Any leachate diversions by emergency pumps or other means will be noted.

19.5 **Landfill Capacity and Life**

An annual topographic survey of the combustion waste storage area/landfill is typically performed in September. By the end of each calendar year, OUC will provide an annual estimate of remaining landfill capacity and life to FDEP. The remaining landfill capacity will be based on the difference between the surveyed landfill elevations and vertical expansion or Cell 1 final waste grades. The remaining landfill life is estimated based on waste quantities and in-place density determined by testing.



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Scale: 1" = 20,000'

County Boundary
Site Boundary

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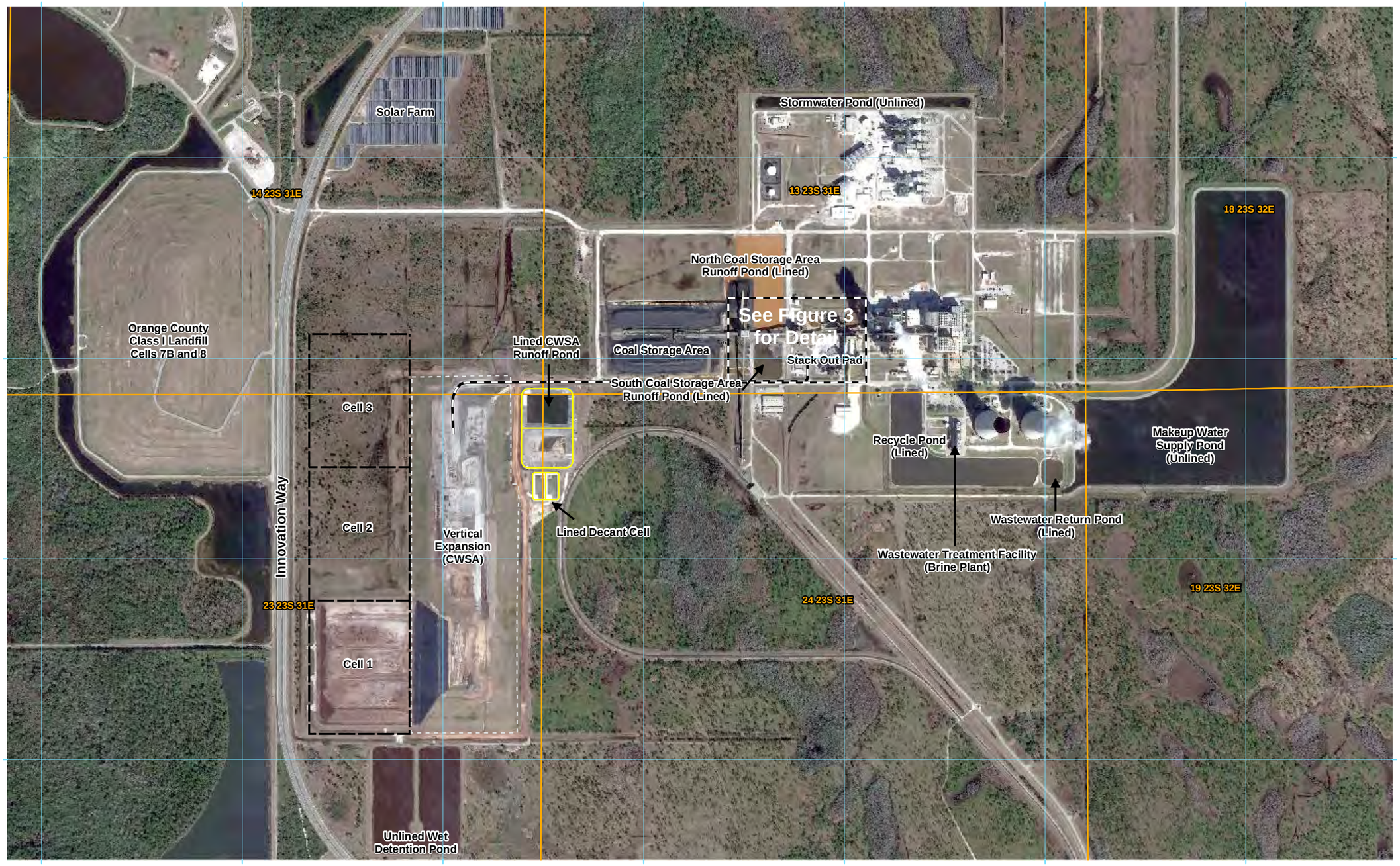
Figure 1

SITE LOCATION MAP

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Project: 13-13-0166	Projection: State Plane Florida East	
Prepared: 07-06-15	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: TJC	Modified by:	Modified:
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Existing Haul Road
Horizontal Expansion of CWSA
PLSS

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Figure 2

Project: 13-13-0166	Projection: State Plane Florida East	
Prepared: 12-23-16	Horizontal Datum: NAD83	Vertical Datum: N/A
Prepared by: TJC	Modified by:	Modified:
File: \\113-13-13-0166-OUC\ArcGIS\ArcLayouts\20161223\Site Plan.mxd		

SITE PLAN

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1	Silo 1 (SEC Unit 1 fly ash)
2	Silo 2 (SEC Unit 2 fly ash)
3	Lime Silo (Lime Substitute)
4	FGD Sludge Conditioning Building
5	Limestone Conveyor
6	Lime Slurry Storage
7	Lime Slurry Storage
8	Radial Stacking Conveyor
9	Fixed Conveyor
10	Bottom Ash Dewatering Bin
11	Bottom Ash Dewatering Bin
12	Settling Tank A
13	Settling Tank B
14	Settling Tank C
15	Thickener A
16	Thickener B
17	Thickener C
18	Scrubber Recirculation Tank
19	Scrubber Recirculation Tank
20	Thickener Pump Building
21	Thickener Pump Building
22	Yard Services Building
23	Crusher Building
24	Coal Conveyor
25	North Coal Storage Area Runoff Pond
26	South Coal Storage Area Runoff Pond



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Scale: 1" = 100'

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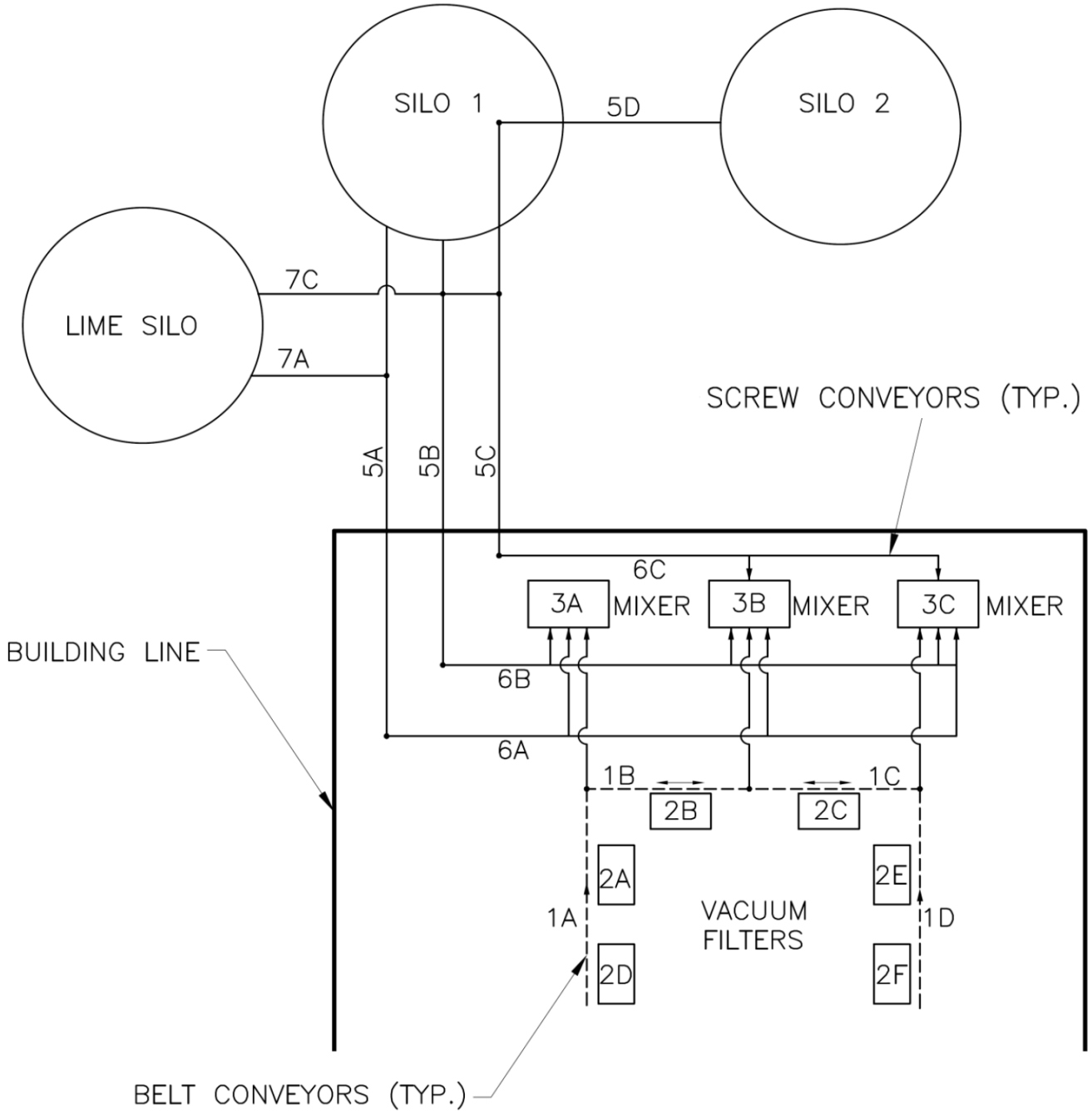
Figure 3

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COMBUSTION WASTE PROCESSING FACILITY/AREA SITE PLAN

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SCHEMATIC OF MATERIAL FLOWS IN THE FGD COMBUSTION WASTE PROCESSING FACILITY
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Figure 4

Project: 10-13-0249	Date: 03-15-13	Created by: TJC
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<all other values>
Northern Haul Road
Southern Haul Road
Existing Haul Road

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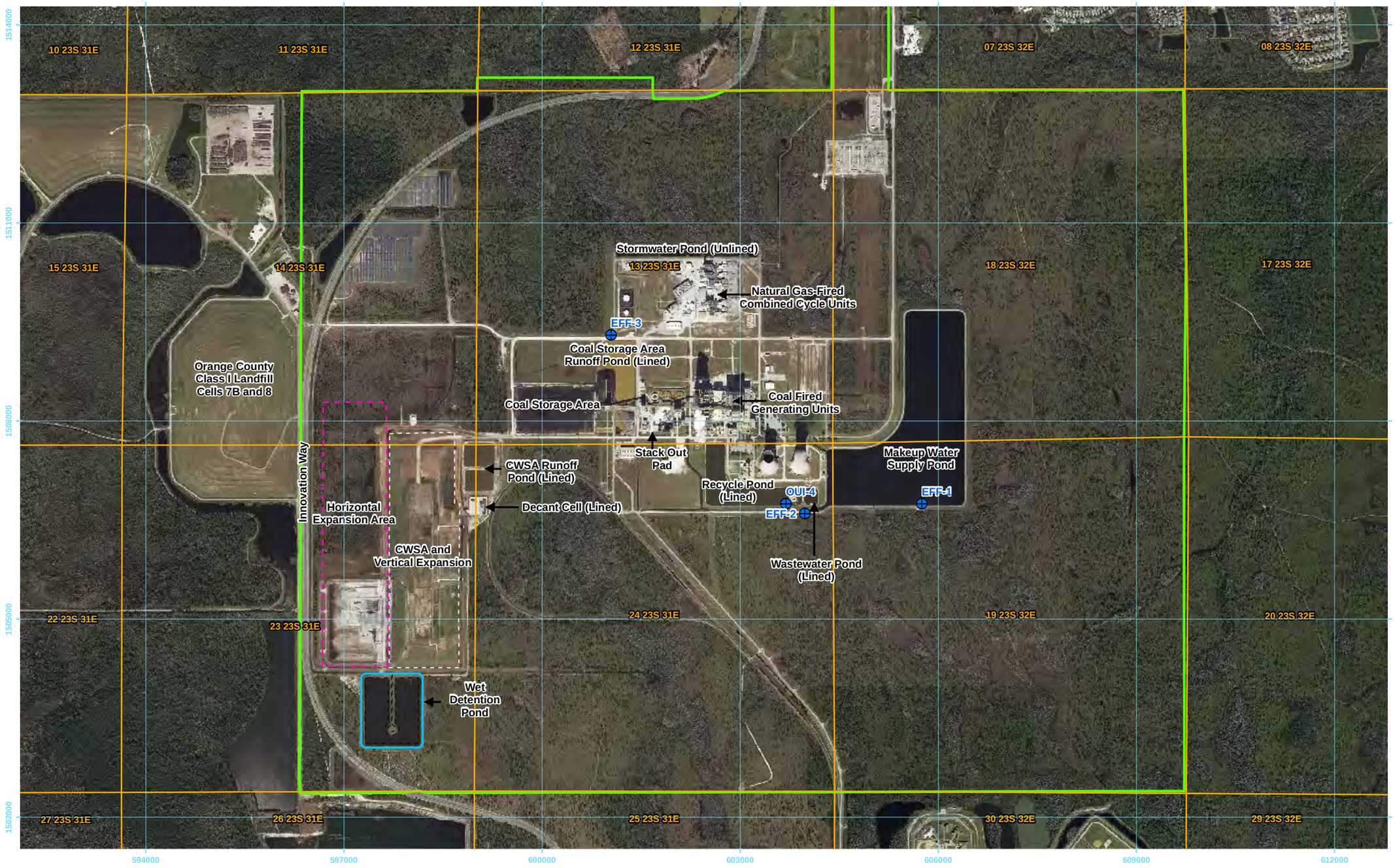
Figure 5

ALIGNMENTS OF HAUL ROADS FOR CELL 1

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Prepared by: TJC	Modified by:	Modified:
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Scale: 1" = 1,500'

- Surface Water Monitoring Points
- Expansion Area
- PLSS
- SEC Property Boundary

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Figure 6

SURFACE WATER MONITORING LOCATIONS

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Project: 13-13-0166	Projection: State Plane Florida East	
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Prepared by: TJC	Modified by:	Modified:
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Scale: 1" = 600'

- Outlet Structure
- Inlet Structure
- 8" PIPE
- 12" PIPE
- 24" PIPE
- 32" PIPE

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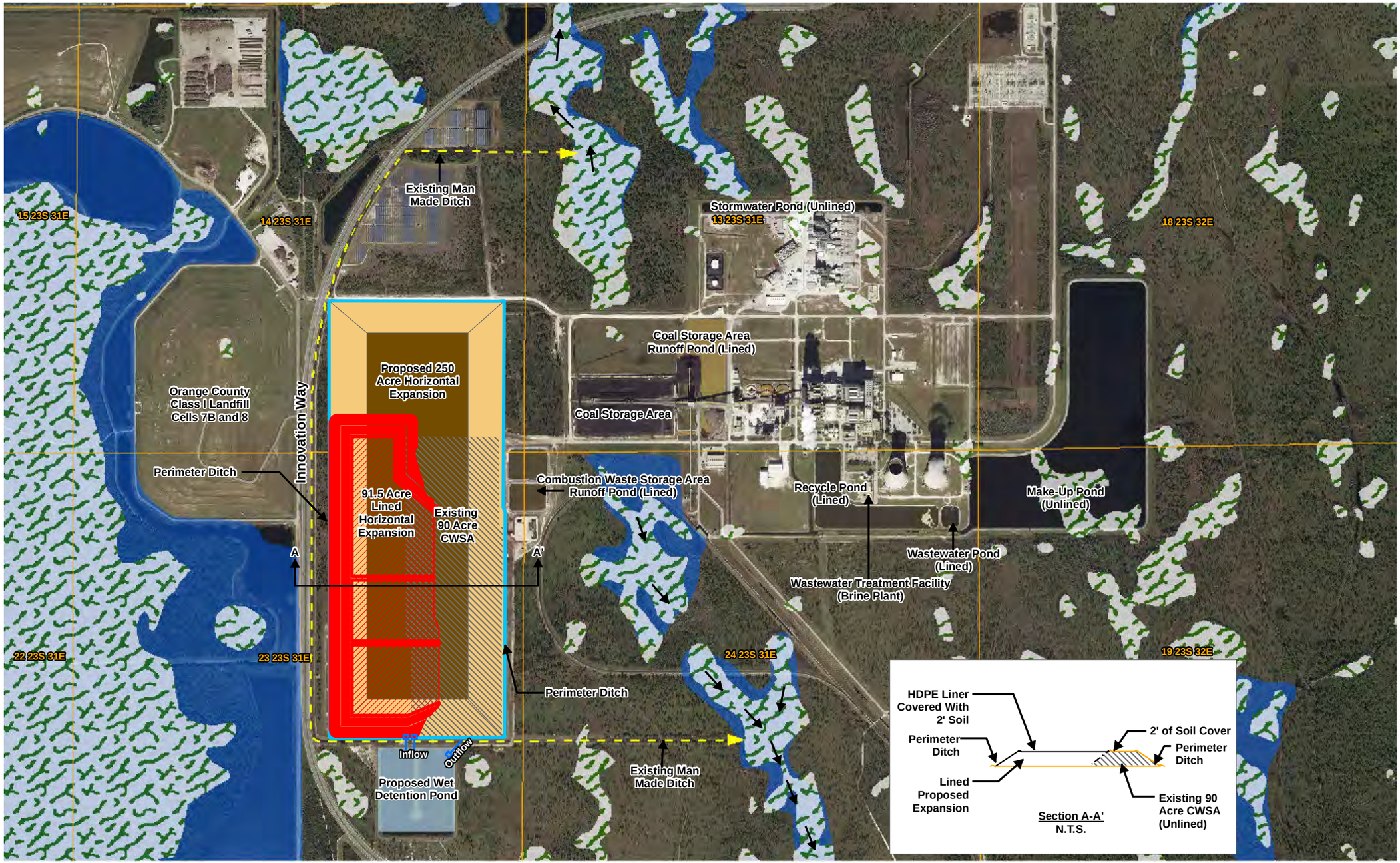
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WASTEWATER PIPING PLAN

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Feet

Scale: 1" = 1,200'

- Proposed Landfill Ditch
- Existing CWSA
- Side Slopes
- Top of Landfill
- PLSS
- National Wetlands Inventory
- FEMA Flood Zone A

Imagery	Orange County Property Appraiser	2016
FEMA	Orange County	2009

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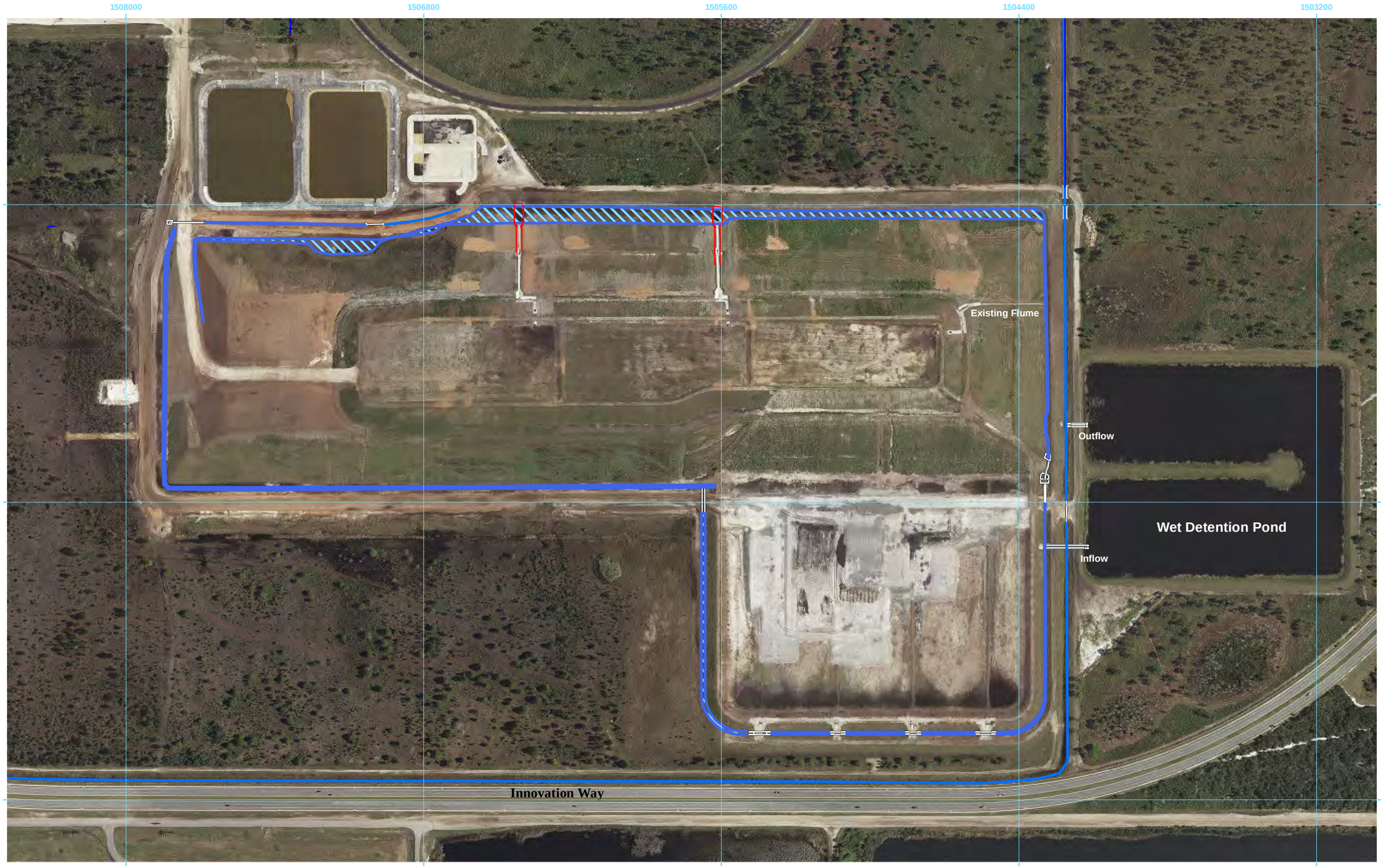
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Prepared by: TJC	Modified by: TJC	Modified:
File: \\ArcGIS_ArcLayouts\20161223\Stormwater Conceptual Design.mxd		

STORMWATER CONCEPTUAL DESIGN

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N E S W

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Scale: 1" = 400'

- Non-Contact Water Drainage
- Flume
- Ditch
- Culvert

Imagery Orange County Property Appraiser 2016

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Figure 9

Project: 13-13-0166	Projection: State Plane Florida East	
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STORMWATER DRAINAGE FOR LANDFILL AREA

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A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

Appendix 1

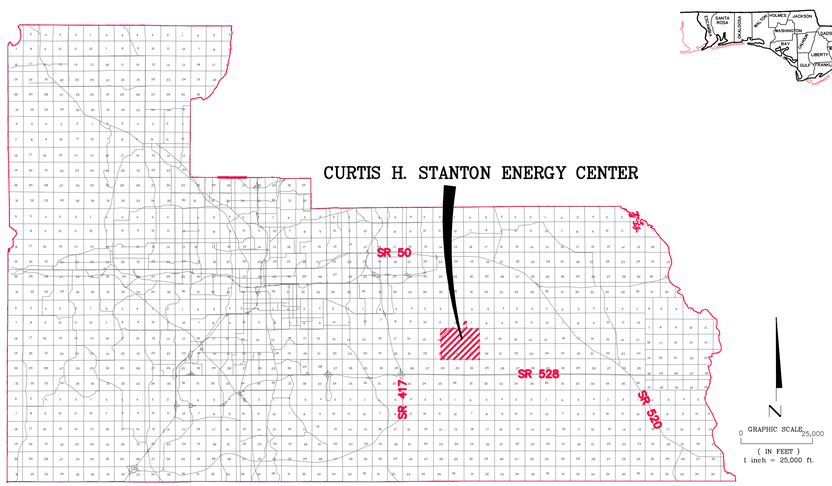
Boundary Survey of Curtis H. Stanton Energy Center

BOUNDARY SURVEY OF

CURTIS H. STANTON ENERGY CENTER

LOCATED IN

SECTIONS 12, 13, 14, 23 & 24, TOWNSHIP 23 SOUTH, RANGE 31 EAST, and
SECTIONS 7, 18 & 19, TOWNSHIP 23 SOUTH, RANGE 32 EAST
ORANGE COUNTY, FLORIDA



ORANGE COUNTY, FLORIDA

LEGAL DESCRIPTION:

All of Section 18, Township 23 South, Range 32 East, Orange County, Florida;
plus the West 990 feet of the Southwest 1/4 of Section 7, Township 23 South, Range 32 East, Orange County, Florida.

less: Right-of-Way Agreement (Official Records Book 3537, page 1156)

Together with:

All of Section 19, Township 23 South, Range 32 East, Orange County, Florida.

Together with:

All of Section 24, Township 23 South, Range 31 East, Orange County, Florida.

Together with:

All of Section 13, Township 23 South, Range 31 East, Orange County, Florida,
less: Right-of-Way for Alafaya Trail Extension. (Official Records Book 8964 at Page 3164)

Together with:

The East 1/2 of Section 23, Township 23 South, Range 31 East, Orange County, Florida,
less: Right-of-Way for Alafaya Trail Extension. (Official Records Book 8964 at Page 3164)

Together with:

The East 1/2 of Section 14, Township 23 South, Range 31 East, Orange County, Florida,
less: Right-of-Way for Alafaya Trail Extension. (Official Records Book 8964 at Page 3164)

Together with:

The South 200' of the SW 1/4 of Section 12, Township 23 South, Range 31 East, Orange County, Florida

LEGEND:

(C)	=	Calculated
℄C/L	=	Centerline
CHD	=	Chord Distance
CB	=	Chord Bearing
(D)	=	Deed
Δ	=	Delta Angle
(F)	=	Field
L	=	Length
R	=	Radius
ORB	=	Official Records Book
PC	=	Point of Curvature
PT	=	Point of Tangent
PI	=	Point of Intersection
CM	=	Concrete Monument
id	=	Identification
—ϟ—	=	Line Not to Scale
– · – · –	=	Section line
▬▬	=	Boundary line
ROW	=	Right of Way
AKA	=	also known as
±	=	more or less

SURVEYOR'S NOTES:

1. This Boundary Survey is not valid without the signature and original raised Seal of a Florida Licensed Surveyor and Mapper.

2. Bearings shown hereon are relative to the Florida State Plane Coordinate System, Transverse Mercator Projection, Florida East Zone (FL E 0901), North American Datum of 1983/2007 adjustment based on the North line of the Northeast Quarter of Section 18, Township 23 South, Range 32 East as being South 89°58'05" West.

3. The lands described hereon were not abstracted for ownership, easements, rights-of-way or other matters of title by this firm nor were any such documents provided by the client.

4. The Legal Description shown hereon was prepared by the surveyor based upon a review of the Orange County Property Appraisers records.

5. Interior improvements were not located.

6. Underground improvements, if any, such as foundations and utilities, were not located.

7. This Boundary Survey certified to the Orlando Utilities Commission.

8. Lands surveyed contain acres:

3138.36 acres ± lying South and East of Alafaya Trail Extension
21.92 acres ± lying Southwest of Alafaya Trail Extension
125.38 acres ± lying North and West of Alafaya Trail Extension

3285.66 acres ± total

ROBERT M. JONES
PROFESSIONAL SURVEYOR AND MAPPER
FLORIDA REGISTRATION NUMBER: PLS 4201

UNLESS IT BEARS THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER THIS DRAWING, SKETCH, PLAT OR MAP IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT VALID.

LAST DATE IN FIELD: August 24, 2011

PREPARED BY:

MACTEC
MACTEC Engineering & Consulting, Inc.
4150 North John Young Parkway Orlando, Florida 32804-2620
Phone: 407.522.7570 Fax: 407.522.7578
CERTIFICATE OF AUTHORIZATION: LB 6989

PREPARED FOR:

ORLANDO UTILITIES COMMISSION
5971 Perishing Avenue
Orlando, Florida 32822
Phone: 407-384-4077

OUC The Reliable One

REVISION	DATE

REVISION	DATE

COUNTY:Orange County, Florida
FIELDBOOK/PAGE #: 1118-53 & 1118-48
OFFF. NO.: 637411-0514
DWG. NAME: Station Energy Center Boundary.dwg

DWG. DATE: August 10, 2011
PHOTO DATE: 2010
DRAWN BY: P.E.W.
CHECKED BY: R.M.J.

PROJECT TITLE:
BOUNDARY SURVEY OF
CURTIS H. STANTON ENERGY CENTER
LOCATED IN
SECTIONS 12, 13, 14, 23 & 24, TOWNSHIP 23 SOUTH, RANGE 31 EAST, and SECTIONS 7, 18 & 19, TOWNSHIP 23 SOUTH, RANGE 32 EAST
ORANGE COUNTY, FLORIDA

SHEET NO.
1 OF 2

BOUNDARY SURVEY OF
CURTIS H. STANTON ENERGY CENTER
LOCATED IN

SECTIONS 12, 13, 14, 23 & 24, TOWNSHIP 23 SOUTH, RANGE 31 EAST, and
SECTIONS 7, 18 & 19, TOWNSHIP 23 SOUTH, RANGE 32 EAST
ORANGE COUNTY, FLORIDA

GRAPHIC SCALE 0 600 (IN FEET) 1 inch = 600 ft.

N

125.38 acres

3138.36 acres

21.92 acres

ORANGE COUNTY LAND FILL

ALAFAYA TRAIL EXTENSION (Section 13 Right-of-Way (per Official Records) Book 8964, Page 3164)

New Alafaya Trail Extension

BOUNDARY (typical)

RANGE 31 EAST
RANGE 32 EAST

PREPARED FOR:

ORLANDO UTILITIES COMMISSION
5971 Perishing Avenue
Orlando, Florida 32822
Phone: 407-384-4077

OUC The Reliable One

DATE	REVISION

DATE	REVISION

DWG. DATE: August 10, 2011
PHOTO DATE: 2010
DRAWN BY: P.E.W.
CHECKED BY: R.M.J.

COUNTY: Orange County, Florida
FIELDBOOK/PAGE: BK 1193,58 BK 1194,48
OFF. NO.: 637411 0514
DWG. NAME: Stanton Energy Center Boundary.dwg

PROJECT TITLE:
BOUNDARY SURVEY OF
CURTIS H. STANTON ENERGY CENTER
LOCATED IN
SECTIONS 12, 13, 14, 23 & 24, TOWNSHIP 23 SOUTH, RANGE 31 EAST, and SECTIONS 7, 18 & 19, TOWNSHIP 23 SOUTH, RANGE 32 EAST
ORANGE COUNTY, FLORIDA

SHEET NO. 1 OF 2

PREPARED BY:

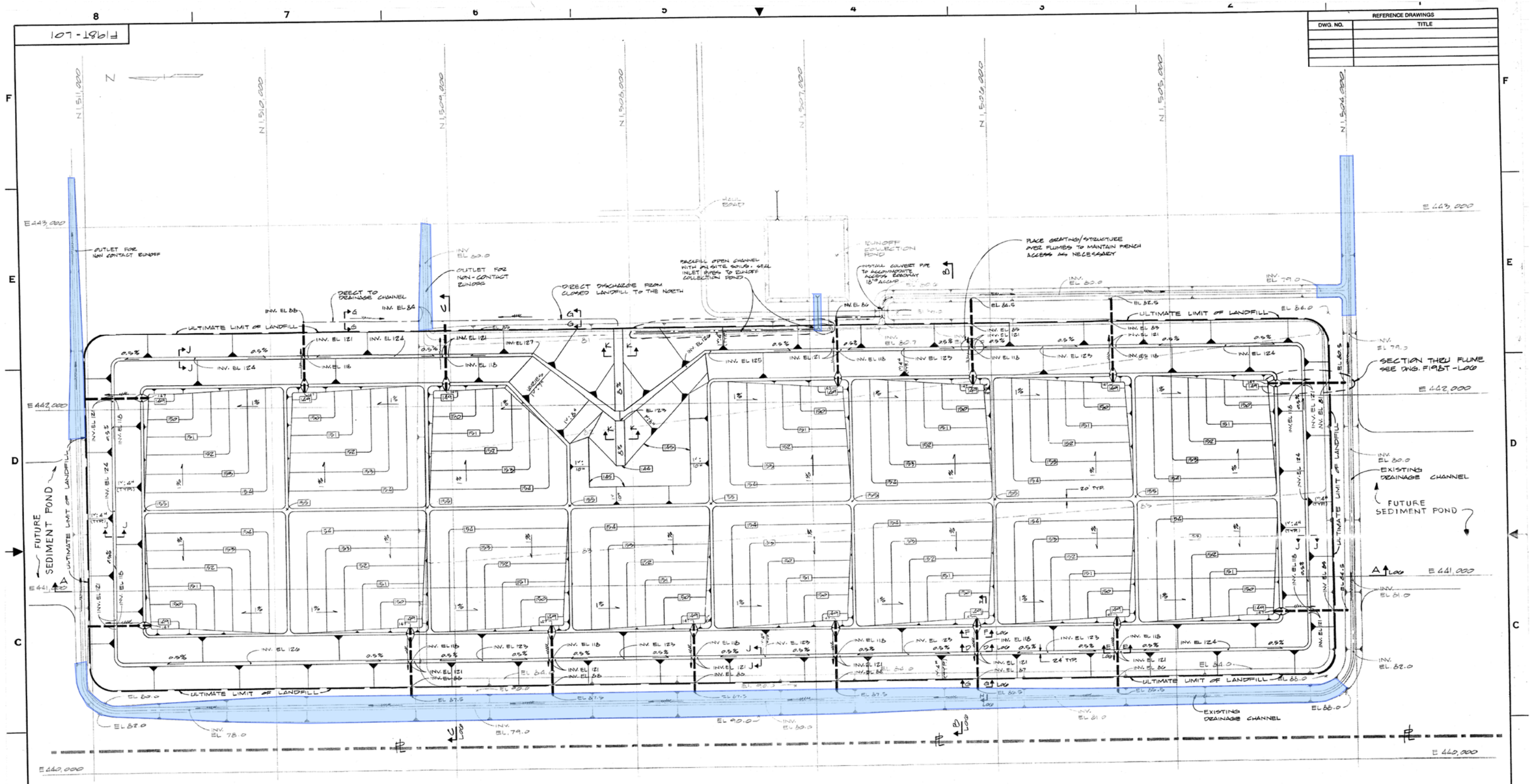
MACTEC
MACTEC Engineering & Consulting, Inc.
4150 North John Young Parkway Orlando, Florida 32804-2620
Phone: 407.522.7570 Fax: 407.522.7576
CERTIFICATE OF AUTHORIZATION: LB 6969

Appendix 2

Conversion Systems, Inc. (CSI) 1987 Drawings for Combustion Waste Storage Landfill

F198T-L01

REFERENCE DRAWINGS	
DWG. NO.	TITLE



LEGEND

- TOP OF SLOPE - PROPOSED
- TOE OF SLOPE - PROPOSED
- --82-- EXISTING GROUND SURFACE CONTOURS
- 98 PROPOSED GROUND SURFACE CONTOURS
- CULVERT
- FLUME
- 2.0% DIRECTION OF GRADING AND PERCENT
- FLOW DIRECTION
- EXISTING FEATURES
- B-1 TEST BORING LOCATION (APPROX.) AND NUMBER

LIST OF DRAWINGS

F198T-L01	FINAL GRADING PLAN
F198T-L02	INITIAL DEVELOPMENT PLAN
F198T-L03	PHASE 1 DEVELOPMENT PLAN
F198T-L04	PHASE 2 DEVELOPMENT PLAN
F198T-L05	PHASE 3 DEVELOPMENT PLAN
F198T-L06	CROSS SECTIONS

GENERAL NOTES

1) WORK DRAWINGS F198T-L01 THROUGH F198T-L06 WITH "MANAGEMENT PLAN FOR THE COMBUSTION WASTE STORAGE AREA"
2) ALL ELEVATIONS IN FEET WITH DATUM AT MEAN SEA LEVEL.
3) TOPOGRAPHY AND EXISTING FEATURES TAKEN FROM B&V DWGS. 8927-55-0027 & 0028

REV.	BY	CHK'D	DATE	DESCRIPTION
0	[illegible]			ISSUED TO CLIENT
A	[illegible]			ISSUE FOR REVIEW

PROJ ENGR DJGC; PROJ MGR. DJGC; DSGN ENGR DJGC; DSGN MGR. MDR; DRWG ENGR DJGC; DRWG MGR. MDR; CHK'D ENGR MDR; APVD ENGR MDR

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER, UNIT 1
SLUDGE CONDITIONING EQUIPMENT
B&V FILE 8927-62-0202-22

THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE USED OR REPRODUCED IN ANY PART WITHOUT WRITTEN CONSENT OF CONVERSION SYSTEMS, INC.

CONVERSION SYSTEMS, INC.
HORSHAM, PA.

TITLE: COMBUSTION WASTE STORAGE LANDFILL FINAL GRADING PLAN, LEGEND GENERAL NOTES & LIST OF DWGS.

DRN. BY	DATE	SCALE	DWG. NO.	REV. NO.
DJGM		1" = 200'	F198T-L01	0
CHK'D BY	DATE	1" GRAPHIC SCALE		
ENGINEER	DATE	PROJ. MGR.	DATE	

REFERENCE DRAWINGS	
DWG. NO.	TITLE
F198T-L01	FINAL GRADING PLAN GENERAL NOTES
F198T-L03	PHASE I DEVELOPMENT PLAN

RUNOFF COLLECTION POND

CONSTRUCT ROAD TO SOUTHERN LIMIT OF LANDFILL.

INLET INV. EL 79.5

FILL DRAINAGE CHANNEL TO BLOCK RELEASE OF ACTIVE RUNOFF

HAUL ROAD

INV. EL 81

ACTIVE RUNOFF

TO COLLECTION POND

INV. EL 84±

15" CMP CULVERT

TO DRAINAGE OUTLET

EXTEND ROADWAY/ DRAINAGE WAY TO LANDFILL

CONSTRUCT BERM TO DIRECT RUNOFF TO POND INLET

BEGIN PLACING POZ-O-TEC HERE - INSURE RUNOFF DRAINAGE TO POND

NON-CONTACT RUNOFF FLOW DIVERTED AROUND LANDFILLED P-O-T

DRAINAGE WAY LINED WITH POZ-O-TEC (NOT START-UP MATLS)

24"ϕ CMP

20' WIDE ROAD TO TEMPORARY STORAGE AREA

SOIL CEMENT LINED AREA

400'

SOIL CEMENT LINED AREA OR LIME/FA. PAD FOR START-UP MATERIALS AND/ OR INITIAL BASELIFT CONSTRUCTION

TEMPORARY BRINE RESIDUE STORAGE FACILITY

CONSTRUCT BERM TO CONTAIN RUNOFF FROM P-O-T AND DIVERT RUNOFF FROM INACTIVE AREAS.

PREPARED LANDFILL AREA

100'±

HAUL WAY & DRAINAGE WAY

INV. EL 80

INV. EL 79

INV. EL 50

E 443,000

E 442,500

E 442,000

E 441,500

E 441,000

E 441,475

N 1,504,675

6" TEMPORARY SOIL COVER

INTERCEPTOR CHANNEL

4

1

P-O-T BASE LIFT

PREPARED GRADE

SECTION S-S
NOT TO SCALE

LIMIT OF ACTIVE LANDFILL AREA

BASE LIFT

HAUL WAY & DRAINAGE WAY

ACTIVE AREA

5%

INITIAL P-O-T LANDFILL AREA

1V:4H

LIMIT OF SOIL COVER

INV. EL 82

INV. EL 81

REV	BY	CHKD	DATE	DESCRIPTION	PROC ENGR	INST ENGR	ELEC ENGR	MECH ENGR	PROJ ENGR
					DISC MGR	DISC MGR	DISC MGR	DISC MGR	PROJ MGR
O	EN		3-5-97	ISSUED TO CLIENT					
A	DRS		3-12-96	ISSUE FOR REVIEW	—	—	—	—	—
-	RS		3-12-96		—	—	—	—	—

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER, UNIT 1
SLUDGE CONDITIONING EQUIPMENT
B&V FILE 8927-62-0202-22

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CONVERSION SYSTEMS, INC.
HORSHAM, PA.

TITLE:
COMBUSTION WASTE STORAGE LANDFILL
INITIAL
DEVELOPMENT PLAN

DRN BY	DATE	SCALE	DWG. NO.	REV. NO.
DSM		1"=100'	F198T-L02	O
CHKD BY	DATE	GRAPHIC SCALE		
ENGINEER	DATE	PROJ. MGR.	DATE	

B&E 19-1255
S-92-62-0207

REFERENCE DRAWINGS	
DWG. NO.	TITLE
F198T-L01	FINAL GRADING PLAN, GENERAL NOTES
F198T-L02	INITIAL DEVELOPEMENT PLAN
F198T-L06	SECTIONS & DETAILS

N 1,511,000 N 1,512,000 N 1,513,000 N 1,514,000 N 1,515,000 N 1,516,000

E 443,000 E 442,000 E 441,000 E 440,000 E 663,000 E 662,000

HAUL ROAD

OUTLET FOR NON-CONTACT RUNOFF

OUTLET INV. EL 79.5 T/RIPR EL 85.5

RUNOFF COLLECTION POND

INV. EL 79.5

INV. EL 80.0

ULTIMATE LIMIT OF LANDFILL

NON-CONTACT RUNOFF DISCHARGE

SOIL CEMENT LINED AREA OR LIME/F.A. PAD FOR START-UP MATERIALS AND/OR INITIAL BASELIFT CONSTRUCTION.

INV. EL 81

INV. EL 80.7

DRAINAGE WAY

TEMPORARY BRINE RESIDUE STORAGE FACILITY.

ACTIVE LANDFILL AREA

24" CMP

EL 87.5

INV. EL 81.5

INV. EL 81.2

INV. EL 81.2

LIMIT OF FINAL COVER

EL 84.0

SECTION THRU FLUME SEE DWG. F198T-L06

INV. EL 79.0

INV. EL 80.0

LIMIT OF PREPARED LANDFILL AREA

LIMIT OF TEMPORARY COVER

TEMPORARY COVER PLACED ON LANDFILL SLOPE

EXISTING DRAINAGE CHANNEL FOR DISCHARGING WATER FROM CLOSED AREAS.

INV. EL 125

INV. EL 124

INV. EL 118

INV. EL 121

INV. EL 116

INV. EL 121

INV. EL 81.0

INV. EL 82.0

EL 84.0

EL 80.0

EL 87.0

INV. EL 78.0

EL 90.0

INV. EL 74.0

INV. EL 80.0

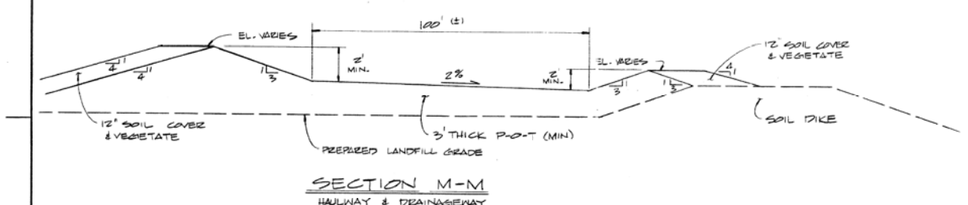
INV. EL 81.0

EL 85.9

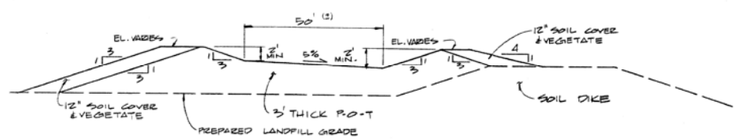
EXISTING DRAINAGE CHANNEL

EL 88.0

B-1 B-2 B-3 B-4 B-18 B-19 B-20 B-21 B-22 B-23 B-24 B-26 B-27 B-29 B-30 B-31 B-32



SECTION M-M
HAULWAY & DRAINAGEWAY



SECTION L-L
DRAINAGEWAY

REV.	BY	CHKD	DESCRIPTION	PROC ENGR	INST ENGR	ELEC ENGR	MECH ENGR	PROJ ENGR
DATE	DATE	DATE		DISC MGR	DISC MGR	DISC MGR	DISC MGR	PROJ MGR
0	TMH	9-7-87	ISSUED TO CLIENT					TMH 9/8/87
A	TMH	8-13-87	ISSUE FOR REVIEW	–	–	–	–	TMH 8/13/87
–	TMH	8-6-87		–	–	–	–	–

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER, UNIT 1
SLUDGE CONDITIONING EQUIPMENT
B&V FILE 8927-62-0202-22

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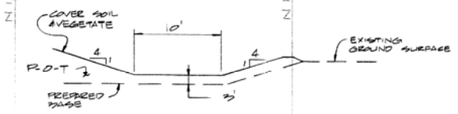
CONVERSION SYSTEMS, INC.
HORSHAM, PA.

TITLE:
COMBUSTION WASTE STORAGE LANDFILL
PHASE 1
DEVELOPMENT PLAN

DRN BY	DATE	SCALE	DWG. NO.	REV. NO.
DSM		1" = 200'	F198T-L03	0
CHK'D BY	DATE	1" GRAPHIC SCALE		
ENGINEER	DATE	PROJ. MGR.	DATE	

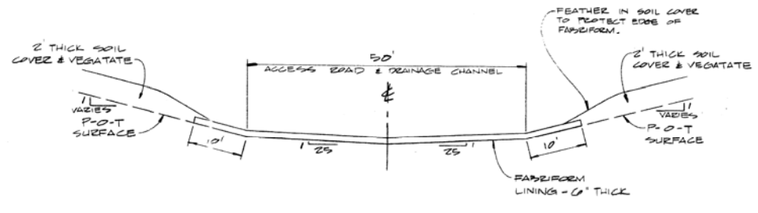
MADE IN USA
8-82 ACCO

DWG. NO.	TITLE
F198T-L01	FINAL GRADING PLAN, GENERAL NOTES
F198T-L06	SECTIONS & DETAILS

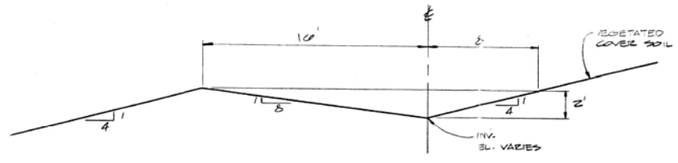


SECTION I-I

NOTE: MAINTAIN OPEN CHANNEL ALONG TOE OF LANDFILL TO ACCOMODATE RUN-OFF FLOW TO INLET PIPES.



SECTION K-K
ACCESS ROAD & DRAINAGE CHANNEL



SECTION J-J
BENCH DRAINAGE CHANNEL

REV.	BY	CHK'D	DESCRIPTION	PROC ENGR	INST ENGR	ELEC ENGR	MECH ENGR	PROJ ENGR
				DISC MGR	DISC MGR	DISC MGR	DISC MGR	PROJ MGR
O	[illegible]		ISSUED TO CLIENT					
A	[illegible]		ISSUE FOR REVIEW	-	-	-	-	-
-	[illegible]			-	-	-	-	-

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER, UNIT 1
SLUDGE CONDITIONING EQUIPMENT
B&V FILE 8927-62-0202-22

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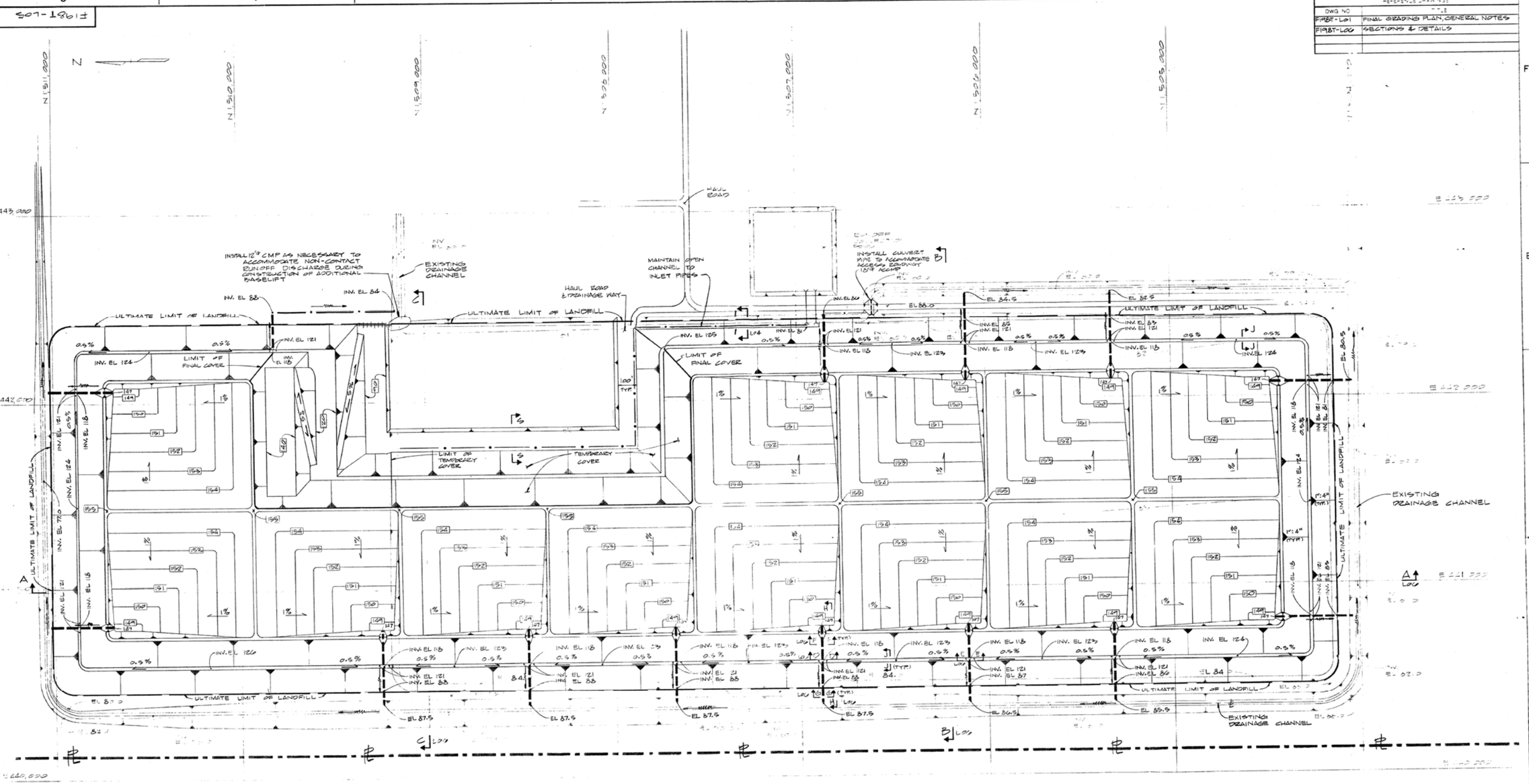
CONVERSION SYSTEMS, INC.
HORSHAM, PA.

TITLE:
COMBUSTION WASTE STORAGE LANDFILL
PHASE 2
DEVELOPMENT PLAN

DRN. BY	DATE	SCALE	DWG. NO.	REV. NO.
[illegible]		1" = 200'	F198T-L04	O
CHK'D. BY	DATE	1" GRAPHIC SCALE		
ENGINEER	DATE	PROJ. MGR.	DATE	

F198T-L05

REFERENCE DRAWINGS	
DWG NO	TITLE
F198T-L01	FINAL GRADING PLAN, GENERAL NOTES
F198T-L00	SECTIONS & DETAILS



NO	DES	DWN	CHK	DESCRIPTION	PROJ ENGR	PROJ MGR	E.I.C. ENGR	E.I.C. MGR	V&S ENGR	V&S MGR
0	RMS	JJ	SS	ISSUED TO CLIENT						JMS
Δ	RMS	JMS		ISSUE FOR REVIEW	-	-	-	-	-	JMS
-	T-13	KG			-	-	-	-	-	-
REV	BY	CHKD		DESCRIPTION	PROJ ENGR	PROJ MGR	E.I.C. ENGR	E.I.C. MGR	V&S ENGR	V&S MGR
DATE	DATE	DATE			DATE	DATE	DATE	DATE	DATE	DATE

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER, UNIT 1
SLUDGE CONDITIONING EQUIPMENT
S&V FILE 8927-62-0202-22

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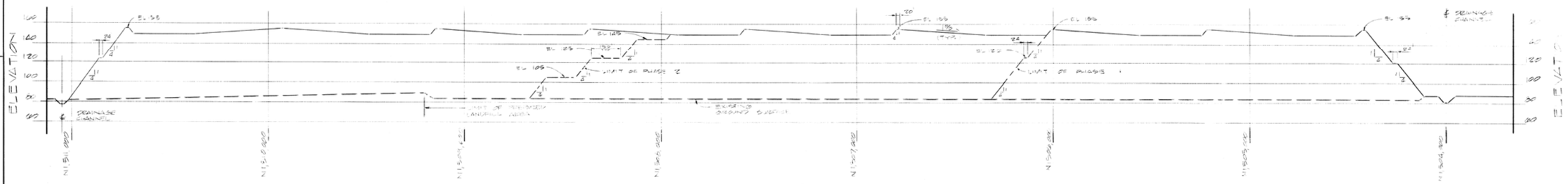
CONVERSION SYSTEMS, INC.
HORSHAM, PA.

TITLE:
COMBUSTION WASTE STORAGE LANDFILL
PHASE 3
DEVELOPMENT PLAN

DRWN BY	DATE	SCALE	DWG NO.	REV.
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CHKD BY	DATE	GRAPHIC SCALE		
ENGINEER	DATE	PROJ. MGR.	DATE	

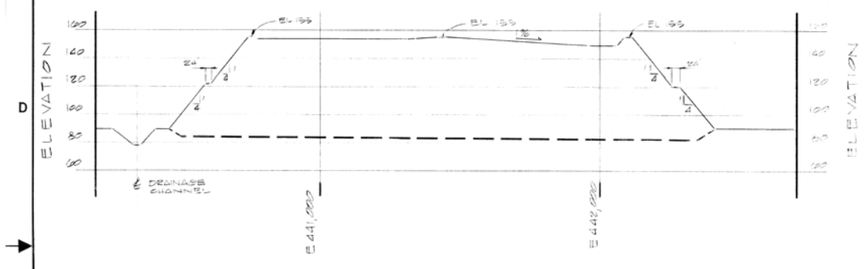
F19BT-L06

REFERENCE DRAWINGS	
DWG. NO.	TITLE
F19BT-L01	FINAL GRADING PLAN GENERAL NOTES
F19BT-L02	INITIAL DEVELOPMENT PLAN
F19BT-L03	PHASE 1 DEVELOPMENT PLAN
F19BT-L04	PHASE 2 DEVELOPMENT PLAN
F19BT-L05	PHASE 3 DEVELOPMENT PLAN



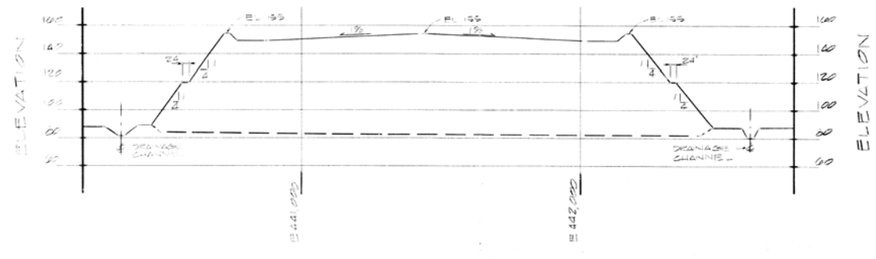
SECTION A-A ALONG E 641,000 (LOOKING EAST)

SCALE: 1" = 200' HORIZ.
1" = 40' VERT.



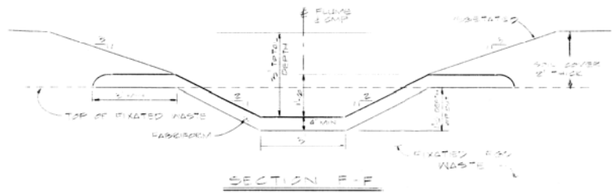
SECTION C-C ALONG N 1,509,000 (LOOKING NORTH)

SCALE: 1" = 200' HORIZONTAL
1" = 40' VERTICAL

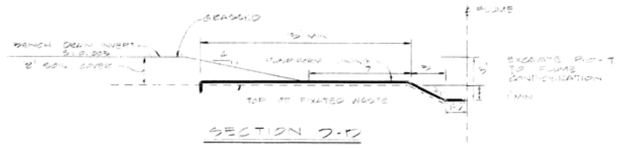


SECTION B-B ALONG N 1,509,100 (LOOKING NORTH)

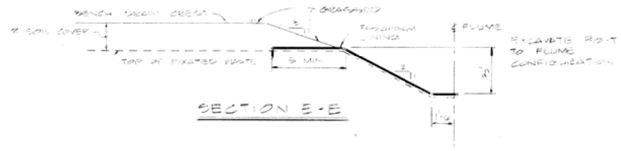
SCALE: 1" = 200' HORIZ.
1" = 40' VERT.



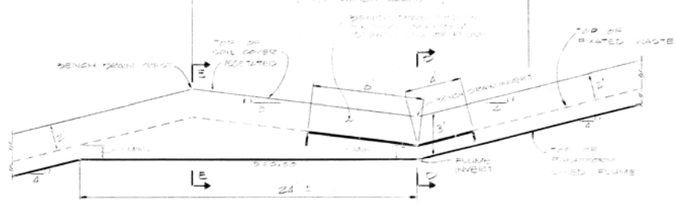
SECTION F-F



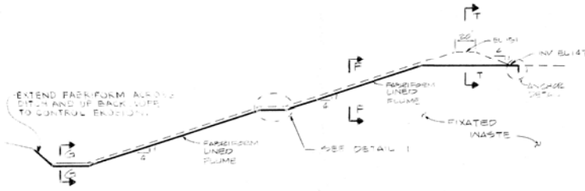
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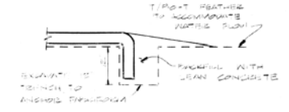
SECTION E-E



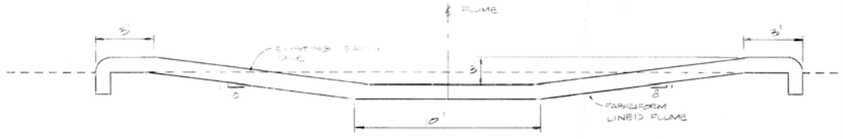
DETAIL 1



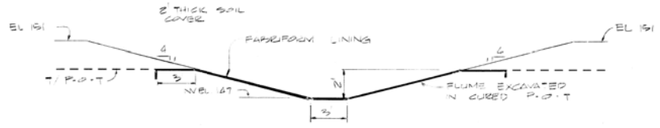
SECTION H-H



ANCHOR DETAIL
TYPICAL



SECTION G-G



SECTION I-I

REV.	BY	CHK'D	DATE	DESCRIPTION	PROC ENGR	PROJ ENGR	ELEC ENGR	MECH ENGR	PROJ ENGR
0				ISSUED TO CLIENT					
A				MINOR REVISION	—	—	—	—	—
					DISC MGR	PROJ MGR	DISC MGR	DISC MGR	PROJ MGR

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER, UNIT 1
SLUDGE CONDITIONING EQUIPMENT

THIS DRAWING IS CONFIDENTIAL AND SHALL NOT BE USED OR REPRODUCED IN ANY PART WITHOUT WRITTEN CONSENT OF CONVERSION SYSTEMS, INC.

CONVERSION SYSTEMS, INC.
HORSHAM, PA.

TITLE:
COMBUSTION WASTE STORAGE LANDFILL
SECTIONS & DETAILS

DRN. BY	DATE	SCALE	DWG. NO.	REV. NO.
DSM		1" = DRAWING SCALE	F19BT-L06	0
CHK'D. BY	DATE			
ENGINEER	DATE	PROJ. MGR.	DATE	

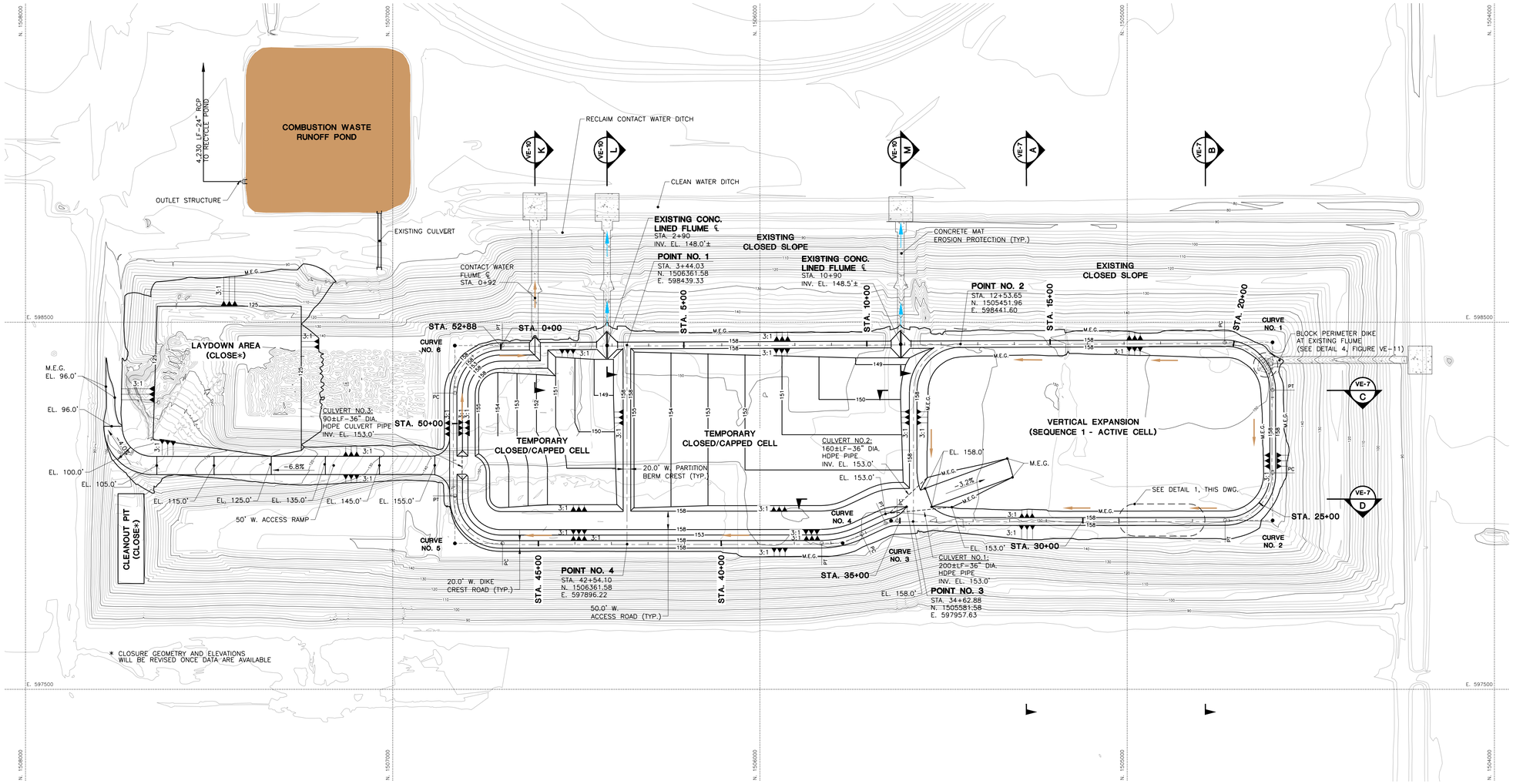
Appendix 3

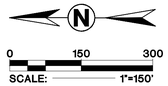
Landfill Development Plan for Vertical Expansion of Combustion Waste Storage Area

Index of Drawings Included in This Appendix

Figure Number	Title
VE-1	Vertical Expansion Grading Sequence 1 During Construction
VE-2	Vertical Expansion Grading Sequence 1 After Construction
VE-3	Vertical Expansion Grading Sequence 2 During Construction
VE-4	Vertical Expansion Grading Sequence 2 After Construction
VE-5	Vertical Expansion Grading Sequence 3 During Construction
VE-6	Vertical Expansion Grading Sequence 3 After Construction
VE-7	Typical Perimeter Dike Detail and Cross Sections A, B, C and D
VE-8	Cross Sections E, F and G
VE-9	Cross Sections H, I and J
–	Storm Water Ditch Design Full Site Layout*

*Shows revised design of access road to the top of the vertical expansion.





AERIAL PHOTOGRAPH PERFORMED BY I.F. ROOKS AND ASSOCIATES, INC.
FLIGHT DATE: 07/19/2011

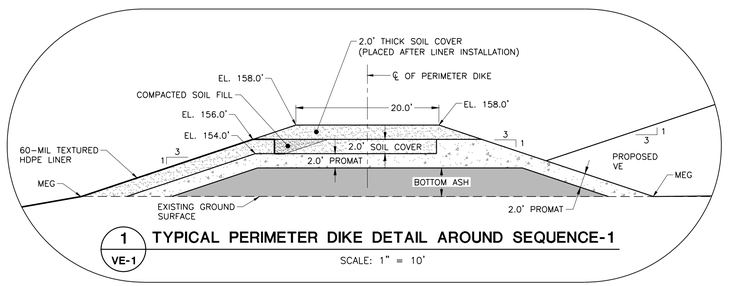
DATUM: NAVD88

STATION POINT DATA

STATION NO.	NORTHING	EASTING	ELEVATION (ft) NAVD88
STA. 0+00	N. 1506705.53	E. 598437.37	158.00'
STA. 5+00	N. 1506205.61	E. 598439.04	158.00'
STA. 10+00	N. 1505705.61	E. 598440.74	158.00'
STA. 15+00	N. 1505205.61	E. 598442.44	158.00'
STA. 20+00	N. 1504705.75	E. 598441.86	158.00'
STA. 25+00	N. 1504631.66	E. 598002.11	158.00'
STA. 30+00	N. 1505118.70	E. 597957.63	158.00'
STA. 35+00	N. 1505618.70	E. 597957.63	158.00'
STA. 40+00	N. 1506107.48	E. 597896.22	158.00'
STA. 45+00	N. 1506607.48	E. 597896.22	158.00'
STA. 50+00	N. 1506835.53	E. 598223.97	158.00'

CULVERT LAYOUT DATA

CULVERT NO.	ELEV. (ft) NAVD88	DOWNSTREAM		UPSTREAM	
		NORTHING	EASTING	NORTHING	EASTING
CULVERT NO.1	153.00'	N. 1505643.70	E. 597979.57	N. 1505451.58	E. 597982.63
CULVERT NO.2	153.00'	N. 1505644.24	E. 597982.52	N. 1505543.64	E. 598074.62
CULVERT NO.3	153.00'	N. 1506810.53	E. 598152.45	N. 1506810.53	E. 598072.70



1 VE-1 TYPICAL PERIMETER DIKE DETAIL AROUND SEQUENCE-1

SCALE: 1" = 10'

DIKE CREST BASELINE CURVE DATA

CURVE NO.	R	L	PI N	PI E	PC	PT	T	Δ
CURVE NO. 1	130.00'	205.11'	N. 1504599.58	E. 598444.98	STA. 19+75.12	STA. 21+80.24	130.91'	90°24'01"
CURVE NO. 2	130.00'	204.20'	N. 1504599.58	E. 597957.63	STA. 24+06.68	STA. 26+10.88	130.00'	90°00'00"
CURVE NO. 3	75.00'	32.58'	N. 1505642.96	E. 597957.63	STA. 35+07.71	STA. 35+40.29	16.55'	24°53'30"
CURVE NO. 4	260.00'	112.96'	N. 1505775.30	E. 597896.22	STA. 36+12.24	STA. 37+25.20	57.38'	24°53'30"
CURVE NO. 5	130.00'	204.20'	N. 1506835.53	E. 597896.22	STA. 45+98.04	STA. 48+02.25	130.00'	90°00'00"
CURVE NO. 6	130.00'	204.20'	N. 1506835.53	E. 598437.37	STA. 50+83.40	STA. 52+87.60	130.00'	90°00'00"

REVISION	DATE	DESCRIPTION	APPR'D
P2	08/29/11	GENERAL REVISIONS; ADD JULY 2011 TOPOGRAPHY	
P1	07/13/11	ISSUED FOR REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MAH	07/13/11	CHECKED BY	MAH	07/13/11
DRAWN BY	AAD	08/29/11	CHECKED BY	TSI	08/26/11
FILE NO.: 10-13-0009			SCALE: AS SHOWN		
APPROVED BY:					

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Geotechnical, Environmental and Materials Consultants
8008 S. Orange Ave., Orlando, FL 32809
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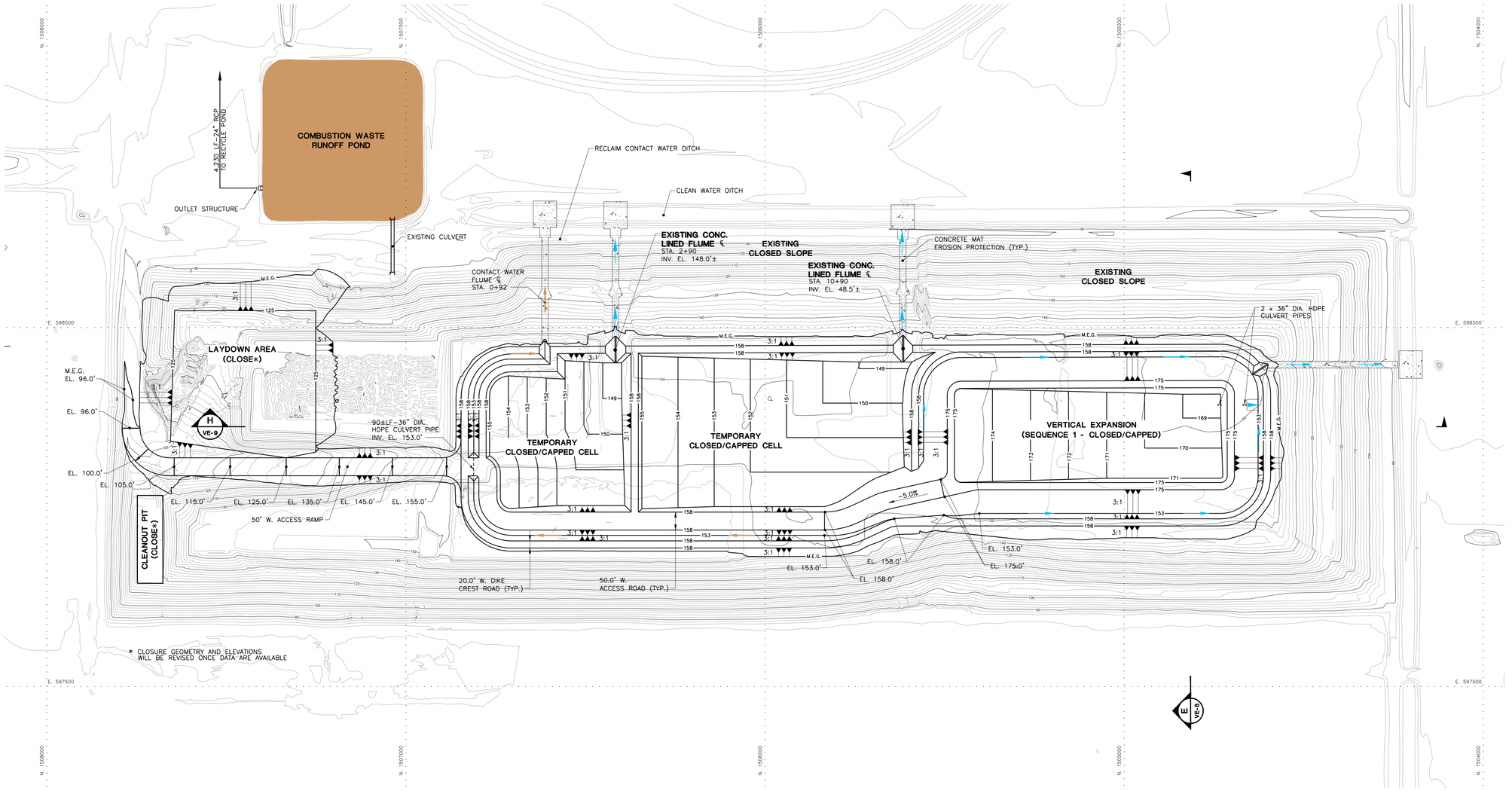
LANDFILL DEVELOPMENT PLAN

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

COAL COMBUSTION PRODUCT LANDFILL VERTICAL EXPANSION GRADING SEQUENCE 1 DURING CONSTRUCTION

FIGURE NO.
VE-1

T:\Corporate\10\10-0009\10-13-0009\LANDFILL DEVELOPMENT PLAN\VE-1 PROPOSED VERTICAL EXPANSION GRADING SEQ 1 - DC.dwg 4/24/2012 5:55:40 PM, ahmed.zaghloul



* CLOSURE GEOMETRY AND ELEVATIONS WILL BE REVISED ONCE DATA ARE AVAILABLE

0 150 300
SCALE: 1"=150'

AERIAL PHOTOGRAPH PERFORMED BY I.F. ROOKS AND ASSOCIATES, INC.
FLIGHT DATE: 07/19/11

DATUM: NAVD88

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P1	07/13/11	ISSUED FOR REVIEW	

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LANDFILL DEVELOPMENT PLAN

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

COAL COMBUSTION PRODUCT LANDFILL VERTICAL EXPANSION GRADING SEQUENCE 1 AFTER CONSTRUCTION

FIGURE NO.
VE-2

T:\Corporate\10\10-0009\10-13-0009\LANDFILL DEVELOPMENT PLAN\VE-2 PROPOSED VERTICAL EXPANSION GRADING SEQ 1 - AC.dwg 4/04/2012 5:58:10 PM, ahmed.zoghloul

COMBUSTION WASTE RUNOFF POND

4,230 L.F. 24" RCP TO RECYCLE POND

OUTLET STRUCTURE

EXISTING CULVERT

RECLAIM CONTACT WATER DITCH

CLEAN WATER DITCH

CONTACT WATER FLUME ℄ STA. 0+92

EXISTING CONC. LINED FLUME ℄ STA. 2+90 INV. EL. 148.0'±

EXISTING CLOSED SLOPE

CONCRETE MAT EROSION PROTECTION (TYP.)

EXISTING CLOSED SLOPE

2 x 36" DIA. HDPE CULVERT PIPES

LAYDOWN AREA (CLOSE*)

M.E.G. EL. 96.0'

EL. 96.0'

EL. 100.0'

EL. 105.0'

EL. 115.0'

EL. 125.0'

EL. 135.0'

EL. 145.0'

EL. 155.0'

50' W. ACCESS RAMP

GLEANOUT PIT (CLOSE*)

90±LF-36" DIA. HDPE CULVERT PIPE INV. EL. 153.0'

TEMPORARY CLOSED/CAPPED CELL

VERTICAL EXPANSION (SEQUENCE 2 - ACTIVE CELL)

VERTICAL EXPANSION (SEQUENCE 1 - CLOSED/CAPPED)

EL. 153.0'

EL. 158.0'

EL. 153.0'

EL. 153.0'

EL. 175.0'

20.0' W. DIKE CREST ROAD (TYP.)

50.0' W. ACCESS ROAD (TYP.)

* CLOSURE GEOMETRY AND ELEVATIONS WILL BE REVISED ONCE DATA ARE AVAILABLE

N. 1508000 N. 1507000 N. 1506000 N. 1505000 N. 1504000

E. 598500 E. 597500

VE-4

0 150 300

SCALE: 1"=150'

AERIAL PHOTOGRAPH PERFORMED BY I.F. ROOKS AND ASSOCIATES, INC.
FLIGHT DATE: 07/19/11

DATUM: NAVD88

LEGEND

AREA THAT MAY BE USED FOR BRINE DISPOSAL

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APPROVED BY:					

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TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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LANDFILL DEVELOPMENT PLAN

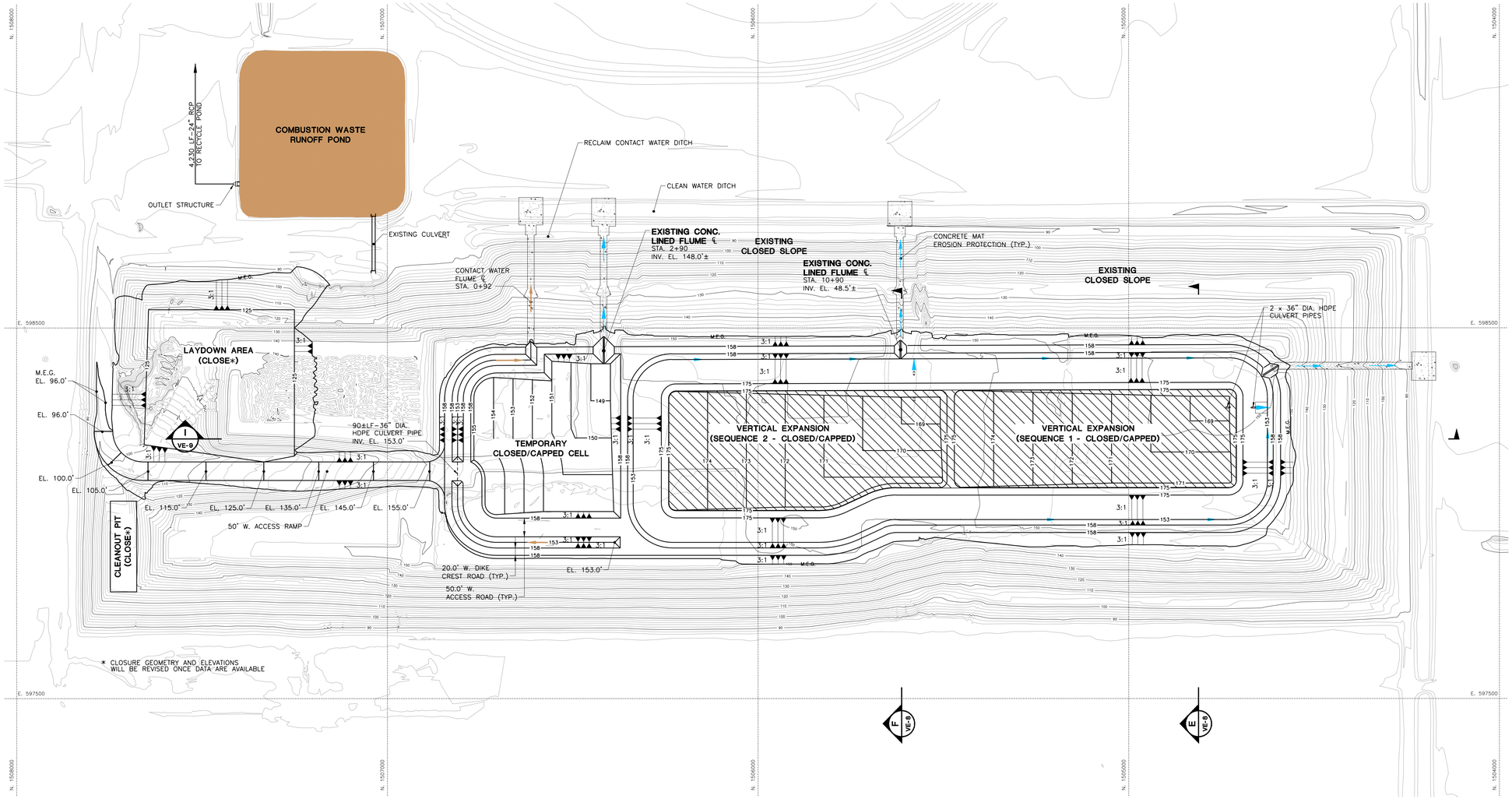
OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

COAL COMBUSTION PRODUCT LANDFILL VERTICAL EXPANSION GRADING SEQUENCE 2 DURING CONSTRUCTION

FIGURE NO.

VE-3

T:\Corporate\10\10-0009\10-13-0009\LANDFILL DEVELOPMENT PLAN\VE-3 PROPOSED VERTICAL EXPANSION GRADING SEQ 2 - DC.dwg 4/04/2012 5:56:37 PM, ahmed.zaghloul



* CLOSURE GEOMETRY AND ELEVATIONS WILL BE REVISED ONCE DATA ARE AVAILABLE

N

0 150 300

SCALE: 1"=150'

AERIAL PHOTOGRAPH PERFORMED BY I.F. ROOKS AND ASSOCIATES, INC.
FLIGHT DATE: 07/19/11

DATUM: NAVD88

LEGEND

AREA THAT MAY BE USED FOR BRINE DISPOSAL

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P1	07/13/11	ISSUED FOR REVIEW	

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DRAWN BY			CHECKED BY		
FILE NO.: 10-13-0009			SCALE: AS SHOWN		
APPROVED BY:					

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LANDFILL DEVELOPMENT PLAN

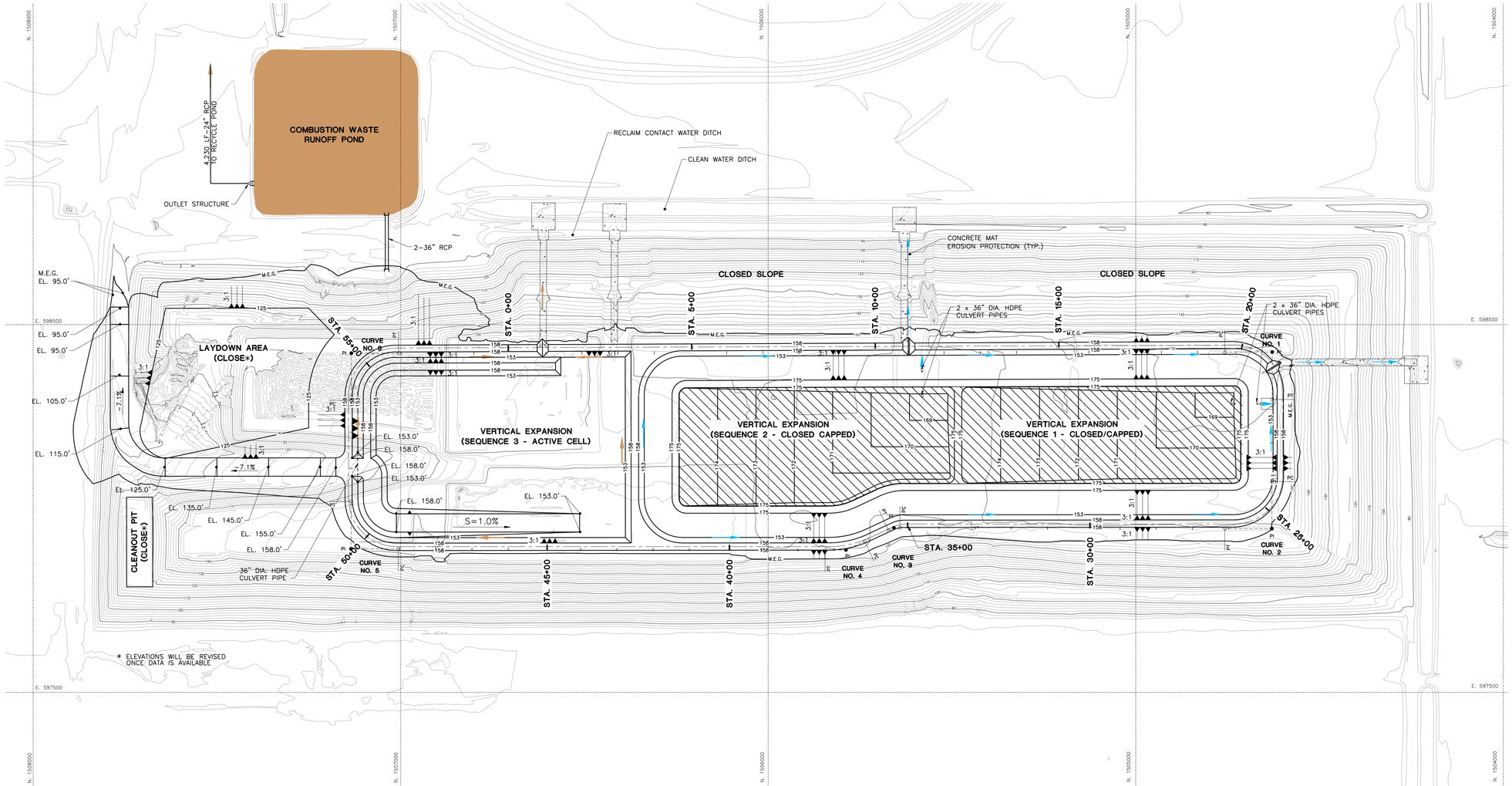
OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

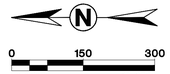
COAL COMBUSTION PRODUCT LANDFILL VERTICAL EXPANSION GRADING SEQUENCE 2 AFTER CONSTRUCTION

FIGURE NO.

VE-4

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AERIAL PHOTOGRAPH PERFORMED BY I.F. ROOKS AND ASSOCIATES, INC.
FLIGHT DATE: 07/19/11

DATUM: NAVD88

LEGEND

AREA THAT MAY BE USED FOR BRINE DISPOSAL

STATION POINT DATA

STATION NO.	NORTHING	EASTING	ELEVATION (ft) NAVD88
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STA. 20+00	N. 1504705.75	E. 598441.86	158.00'
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STA. 30+00	N. 1505118.70	E. 597957.63	158.00'
STA. 35+00	N. 1505618.70	E. 597957.63	158.00'
STA. 40+00	N. 1506107.48	E. 597896.22	158.00'
STA. 45+00	N. 1506607.48	E. 597896.22	158.00'
STA. 50+00	N. 1507098.94	E. 597930.52	158.00'
STA. 55+00	N. 1507096.19	E. 598405.06	158.00'

DIKE CREST BASELINE CURVE DATA

CURVE NO.	R	L	PI N	PI E	PC	PT	T	Δ
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CURVE NO. 2	130.00'	204.20'	N. 1504599.58	E. 597957.63	STA. 24+06.60	STA. 26+10.80	130.00'	90°00'00"
CURVE NO. 3	75.00'	32.58'	N. 1505642.96	E. 597957.63	STA. 35+07.63	STA. 35+40.21	16.55'	24°53'30"
CURVE NO. 4	260.00'	112.95'	N. 1505775.30	E. 597896.22	STA. 36+12.17	STA. 37+25.12	57.38'	24°53'30"
CURVE NO. 5	131.04'	205.83'	N. 1507141.58	E. 597896.22	STA. 49+02.98	STA. 51+08.82	131.04'	90°00'00"
CURVE NO. 6	129.94'	204.12'	N. 1507141.61	E. 598436.32	STA. 53+87.93	STA. 55+92.05	129.95'	90°00'14"

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DRAWN BY			CHECKED BY		
FILE NO.: 10-13-0009			SCALE: AS SHOWN		
APPROVED BY:					

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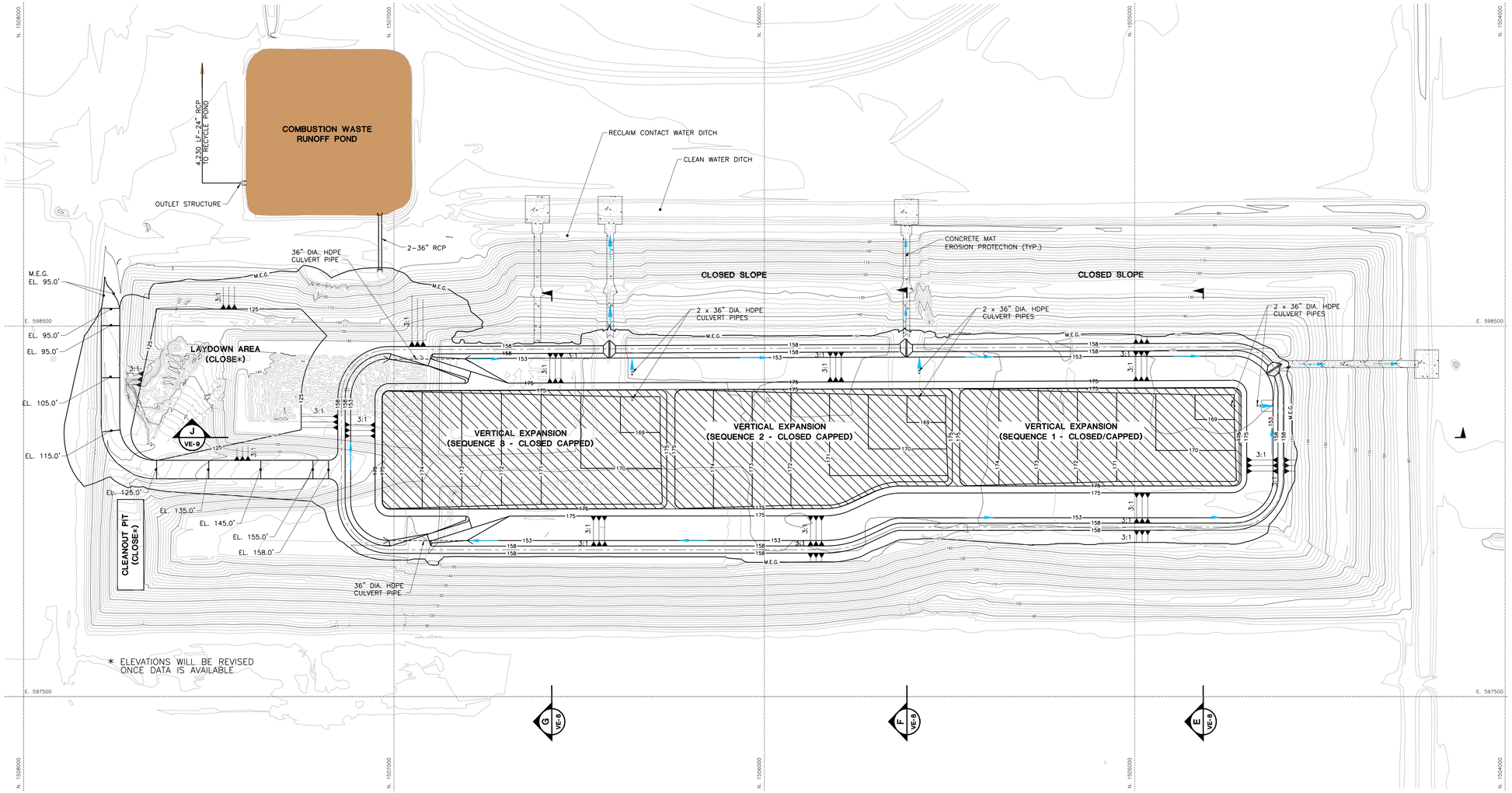
LANDFILL DEVELOPMENT PLAN

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

COAL COMBUSTION PRODUCT LANDFILL VERTICAL EXPANSION GRADING SEQUENCE 3 DURING CONSTRUCTION

FIGURE NO.
VE-5

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0 150 300

SCALE: 1"=150'

AERIAL PHOTOGRAPH PERFORMED BY I.F. ROOKS AND ASSOCIATES, INC.
FLIGHT DATE: 07/19/11

DATUM: NAVD88

LEGEND

AREA THAT MAY BE USED FOR BRINE DISPOSAL

REVISION	DATE	DESCRIPTION	APPR'D
P2	08/23/11	REVISED W/ JULY 2011 TOPOGRAPHY	
P1	07/13/11	ISSUED FOR REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY			CHECKED BY		
DRAWN BY			CHECKED BY		
FILE NO.: 10-13-0009			SCALE: AS SHOWN		
APPROVED BY:					

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LANDFILL DEVELOPMENT PLAN

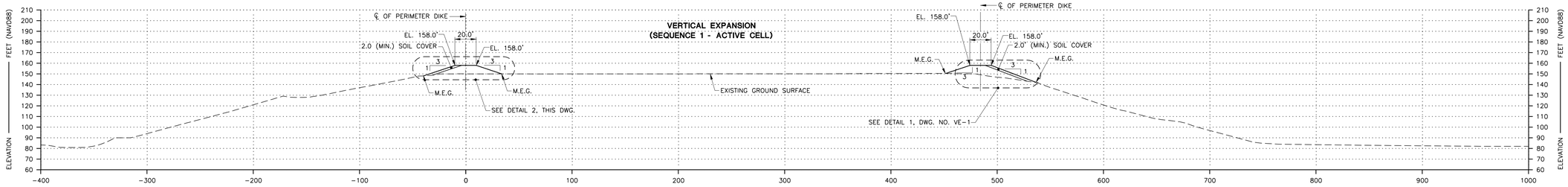
OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

COAL COMBUSTION PRODUCT LANDFILL VERTICAL EXPANSION GRADING SEQUENCE 3 AFTER CONSTRUCTION

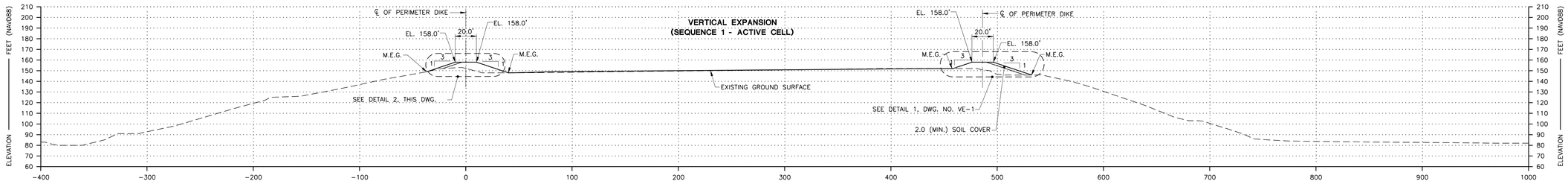
FIGURE NO.

VE-6

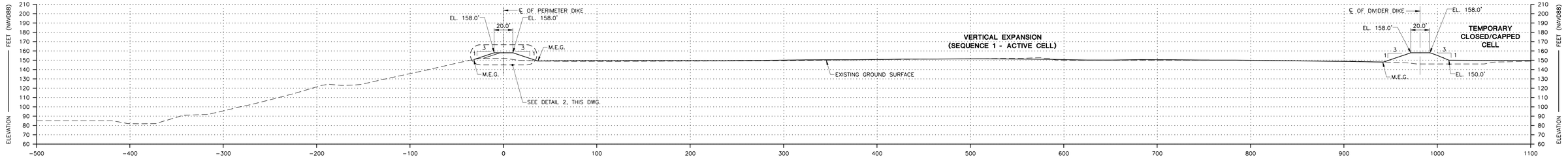
T:\Corporate\10\10-0009\10-13-0009\LANDFILL DEVELOPMENT PLAN\VE-6 PROPOSED VERTICAL EXPANSION GRADING SEQ 3 - AC.dwg 4/24/2012 5:58:10 PM, ahmed.zaghloul



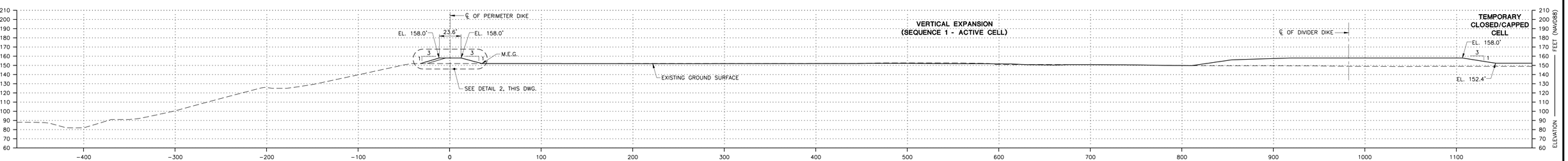
A **CROSS SECTION A**
VE-1
SCALE: 1" = 50'



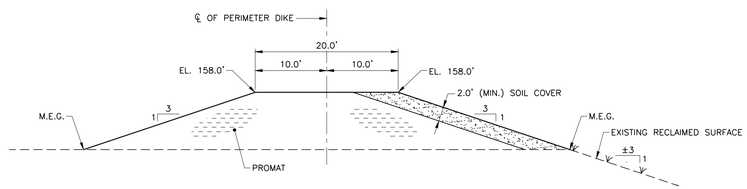
B **CROSS SECTION B**
VE-1
SCALE: 1" = 50'



C **CROSS SECTION C**
VE-1
SCALE: 1" = 50'



D **CROSS SECTION D**
VE-1
SCALE: 1" = 50'



2 **TYPICAL PERIMETER DIKE DETAIL**
VE-7
SCALE: 1" = 10'

REVISION	DATE	DESCRIPTION	APPR'D
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8008 S. Orange Ave., Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

OUC The Reliable One

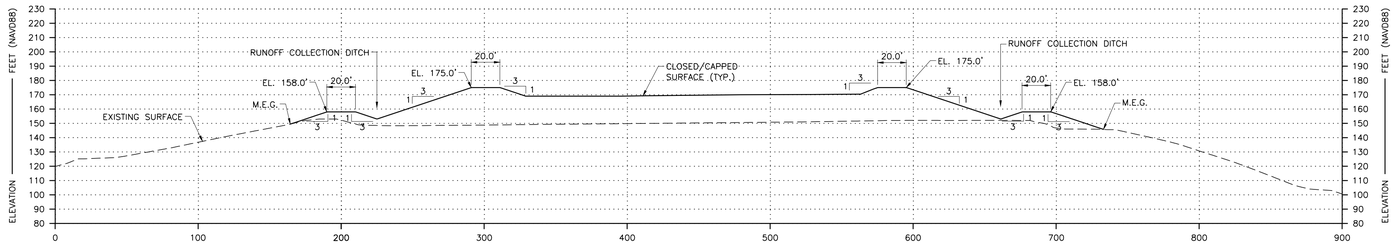
LANDFILL DEVELOPMENT PLAN

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

TYPICAL PERIMETER DIKE DETAIL AND CROSS SECTIONS A, B, C AND D

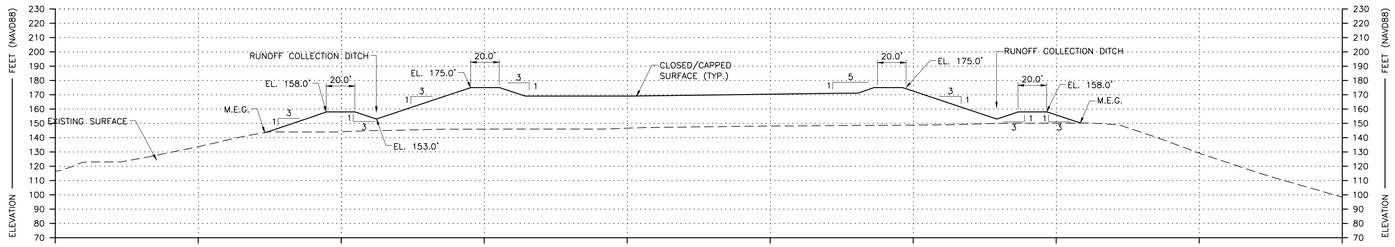
FIGURE NO.
VE-7

T:\Corporate\10\10-0009\10-13-0009\LANDFILL DEVELOPMENT PLAN\VE-7 TYPICAL PERIMETER DIKE DETAIL AND CROSS SECTIONS A, B, C AND D.dwg 4/04/2012 3:58:40 PM, ahmed.zaghloul



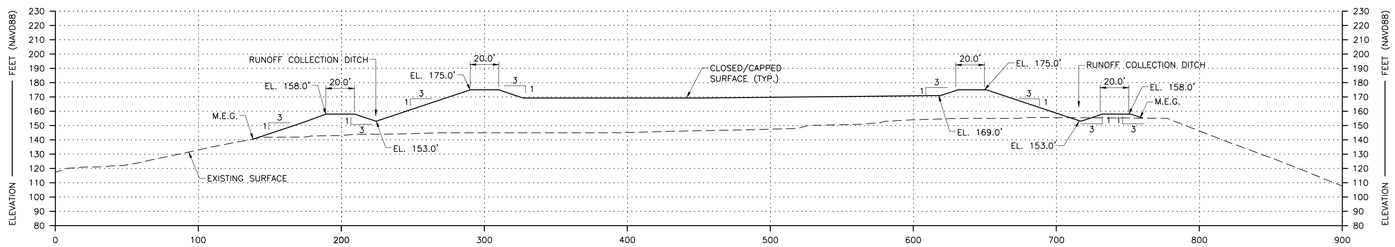
E **VE-2** **VE-4** **VE-6** — **CROSS SECTION E**

SCALE: 1" = 50'



F **VE-4** **VE-6** — **CROSS SECTION F**

SCALE: 1" = 50'



G **VE-6** — **CROSS SECTION G**

SCALE: 1" = 50'

REVISION	DATE	DESCRIPTION	APPR'D
P2	08/23/11	REVISED W/ JULY 2011 TOPOGRAPHY	
P1	07/13/11	ISSUED FOR REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	JM	04/26/10	CHECKED BY	JM	
DRAWN BY	AAD	04/26/10	CHECKED BY		
FILE NO.: 10-13-0009			SCALE: AS SHOWN		
APPROVED BY:					

TETRA TECH

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LANDFILL DEVELOPMENT PLAN

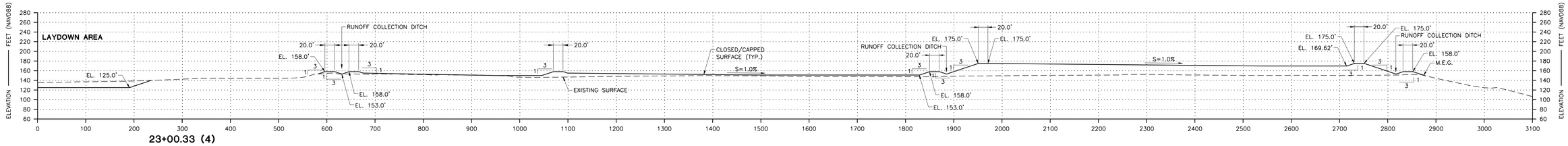
OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

CROSS SECTIONS E, F AND G

FIGURE NO.

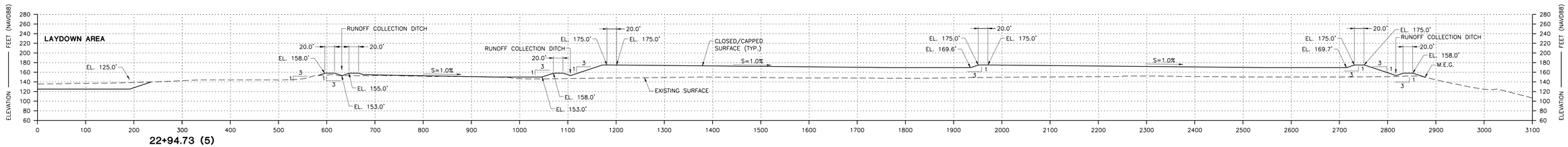
VE-8

T:\Corporate\10\10-0009\10-13-0009\LANDFILL DEVELOPMENT PLAN\VE-8 CROSS SECTIONS E, F AND G.dwg 4/24/2012 5:59:56 PM, ahmed.zaghloul



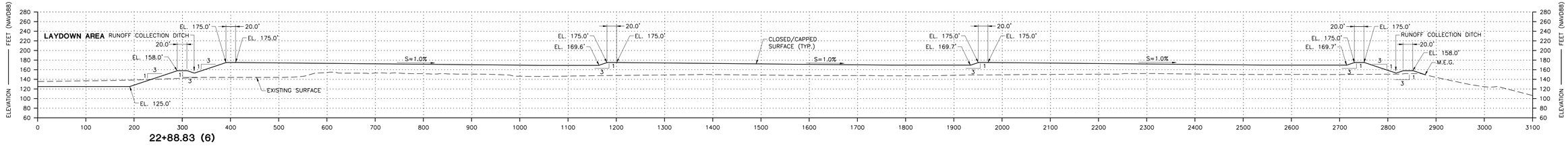
H CROSS SECTION H
VE-2

SCALE: 1" = 100'



I CROSS SECTION I
VE-4

SCALE: 1" = 100'



J CROSS SECTION J
VE-6

SCALE: 1" = 100'

REVISION	DATE	DESCRIPTION	APPR'D
P2	08/23/11	REVISED W/ JULY 2011 TOPOGRAPHY	
P1	07/13/11	ISSUED FOR REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	JM	04/26/10	CHECKED BY	JM	
DRAWN BY	AAD	04/26/10	CHECKED BY		
FILE NO.: 10-13-0009			SCALE: AS SHOWN		
APPROVED BY:					

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LANDFILL DEVELOPMENT PLAN

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

CROSS SECTIONS H, I AND J

FIGURE NO.
VE-9

T:\Corporate\10\10-0009\10-13-0009\LANDFILL DEVELOPMENT PLAN\VE-9 CROSS SECTIONS H, I AND J.dwg 4/04/2012 5:59:30 PM ahmed.zoghloul

N

0 120 240

SCALE: 1"=120'

TOPOGRAPHIC SURVEY PERFORMED BY TKW CONSULTING ENGINEERS ON 03/31/14 AND 06/10/14

AND BY TETRA TECH GEOMATIC TECHNOLOGIES ON 07/19/11

CONTOUR INTERVAL = 1' INCREMENT

DATUM: NAVD 1988

NEWLY CONSTRUCTED LINED HORIZONTAL EXPANSION (CELL 1)

PROPOSED HORIZONTAL EXPANSION (CELL 2)

PROPOSED HORIZONTAL EXPANSION (CELL 3)

EXISTING RCP CULVERT

℄ OF 6100± LF OF 8" DIA. HDPE SDR 17 LEACHATE FORCE MAIN PIPE

℄ OF DIKE FOR HORIZONTAL EXPANSION (CELL 1)

STA. 97+07

℄ OF DIKE FOR HORIZONTAL EXPANSION (CELL 1)

EL. 93.0'

EL. 91.0'

EL. 91.0'

ONE 36" DIA. HDPE SDR 13.5 CULVERT

STA. 95+00

MEET EXISTING ROAD ℗ ELEV. 96'±

LINED WEST SLOPE

EL. 97.0'

EL. 97.0'

EXISTING 36" DIA. HDPE SDR 21 PIPES (INV. EL. 80.0')

EXISTING CONCRETE UNIFORM SECTION MAT

COAL WASTE STORAGE AREA

STA. 0+00

STA. 5+00

ACCESS AREA

STA. 90+00

BROKEN CONCRETE RIPRAP

EXISTING UNIFORM SECTION MAT FLUME FAIRFORM

℄ OF 50' WIDE ACCESS RAMP

STA. 10+00

ADJUST TOE OF SLOPE AS REQUIRED TO MAINTAIN 10' MIN. CLEARANCE FROM EXISTING CULVERT INLETS AND OUTLES

EXISTING COMBUSTION WASTE STORAGE AREA

CONSTRUCTION BASELINE OF ASPHALT ROADWAY

3.0" THK. ASPHALT ROADWAY W/ CONCRETE CONTAINMENT CURBING

UNIFORM SECTION MAT

FDOT TYPE "C" INLET STRUCTURE

STA. 50+00 (=STA. 10+49.44)

REPLACE TWO EXISTING CULVERTS WITH TWO 34" HDPE DR 17 PIPES

12" DIA. HDPE DR 17 CULVERT

8" THK. x 8' x 8' CONCRETE APRONS

STA. 55+00

STA. 60+00

℄ OF 10' WIDE DIKE CREST

STORMWATER DITCH

CONSTRUCTION BASELINE OF ASPHALT ROADWAY

RIPRAP APRON

12" DIA. HDPE DR 17 DISCHARGE PIPE

STA. 100+00 (=STA. 11+25.09)

STA. 13+16

℄ OF 6100± LF OF 8" DIA. HDPE SDR 17 LEACHATE FORCE MAIN PIPE

ADJUST TOE OF SLOPE AS REQUIRED TO MAINTAIN 10' MIN. CLEARANCE FROM EXISTING CULVERT INLETS AND OUTLES

STA. 85+00

STA. 80+00

STA. 75+00

STA. 70+00

STA. 65+00

17' WIDE RAMP (S=10%)

STA. 105+00

STA. 110+00

STA. 111+19

EXISTING DECANT CELL

EXISTING RAMP

EXISTING 9' x 7' VALVE VAULT

EXISTING CWSA RUNOFF POND

DRAFT

REVISION	DATE	DESCRIPTION	APPR'D	REVISION	DATE	DESCRIPTION	APPR'D

	NAME	DATE		NAME	DATE
DESIGNED BY	JM	02/12/15	CHECKED BY	DTC	02/12/15
DRAWN BY	PS	02/12/15	CHECKED BY		
FILE NO.: 12-13-0120B			SCALE: AS SHOWN		
APPROVED BY:					

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STORMWATER DITCH DESIGN AT NORTHEAST CORNER OF CWSA

OUC STANTON ENERGY CENTER
ORANGE COUNTRY, FLORIDA

STORM WATER DITCH DESIGN FULL SITE LAYOUT

DRAWING NO. -

\\Corporate\12\12-13-0120B\STORMWATER DITCH DESIGN AT NORTHEAST CORNER OF CWSA_Current Sheet Set\FULL VERTICAL EXPANSION SITE.dwg 2015/07/13 4:22 PM, Soto, Paula

Appendix 4

Selected Construction Drawings for Horizontal Expansion of Combustion Waste Storage Area Cell 1, CWSA Runoff Pond, and Decant Cell

Index of Drawings Included in This Appendix

Drawing Number	Title
G-5	Topographic Map
G-9	Force Main Pipeline Plan
CS-6	Leachate Collection System Plan
CS-7	Final Grading Plan*
CS-7A	Rain Tarp Plan for Piggyback
CS-8	Final Configuration - Conceptual Closure Plan
CS-9	Final Configuration - Cross Sections
P-1	Proposed Wet Detention Pond Plan and Details
3-16	As-Built Survey of Wet Detention Pond
D-2	Sump Details and Cross Sections
M-1	Leachate Collection Pump and Piping P&ID Diagram
M-2	Leachate Collection Pump and Piping Typical Details
CS-9	CWSA Runoff Pond Soil Cement Final Grading Plan
CS-14	CWSA Runoff Pond Soil Cement Final Grading Cross Sections
DC-7	Decant Cell Plan and Gravel Filter Details
DC-10	Decant Cell Final Grading Cross Sections

*For bottom liner/leachate collection system/drainage sand

EXISTING COAL COMBUSTION WASTE STORAGE AREA RUNOFF POND

PROPOSED DECANT CELL

EXISTING STORMWATER DRAINAGE DITCH

EXISTING COMBUSTION WASTE STORAGE AREA

EXISTING STORMWATER DRAINAGE DITCH

EXISTING WETLAND

PROPOSED WET DETENTION POND

N.W.I.

EXISTING WETLAND

N.W.I.

PROPOSED HORIZONTAL EXPANSION - CELL 3 (FUTURE CONSTRUCTION UNDER SEPARATE CONTRACT)

PROPOSED HORIZONTAL EXPANSION - CELL 2 (FUTURE CONSTRUCTION UNDER SEPARATE CONTRACT)

PROPOSED HORIZONTAL EXPANSION - CELL 1

EXISTING STORMWATER DRAINAGE DITCH

INNOVATION WAY

W.E. 80.4'

W.E. 79.8'

ORANGE COUNTY LANDFILL

0 200 400

SCALE: 1"=200'

TOPOGRAPHIC SURVEY PERFORMED BY GEOMATIC TECHNOLOGIES, CALIFORNIA.
SURVEY DATE: 07/19/2011
DATUM: NAVD (1988)

TOPOGRAPHIC CONTOUR INTERVAL: 1 FT.

REVISION	DATE	DESCRIPTION	APPR'D
1	05/09/13	DESIGN CHANGES MADE DURING CONSTRUCTION	
0	01/27/12	ISSUED FOR CONSTRUCTION	MH
P3	01/26/12	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	MH
P2	12/01/11	ISSUED FOR PERMITTING	MH
P1	11/16/11	ISSUED FOR CLIENT REVIEW	MH

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/11	CHECKED BY	FKC	12/01/11
DRAWN BY	AZ	10/06/11	CHECKED BY	DTC	12/20/11
FILE NO.: 10-13-0249			SCALE: 1" = 200'		

APPROVED BY:

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A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
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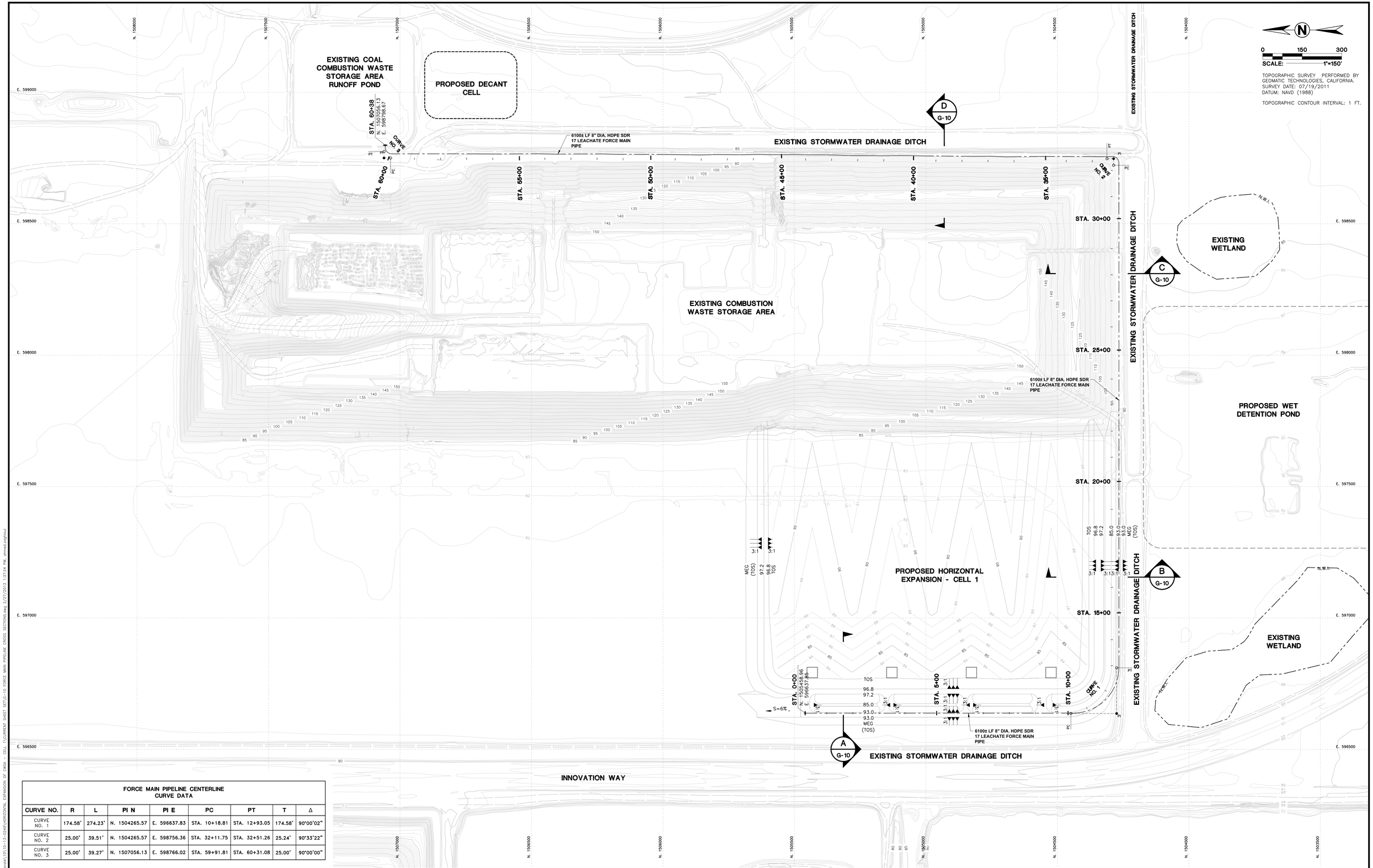
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

TOPOGRAPHIC MAP

DRAWING NO.
G-5

\\Ardawin2\Cad\Corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SET\G-5 TOPOGRAPHIC MAP.dwg 5/15/2013 2:12:43 PM, ahmed.zaghloul



FORCE MAIN PIPELINE CENTERLINE CURVE DATA

CURVE NO.	R	L	PI N	PI E	PC	PT	T	Δ
CURVE NO. 1	174.58'	274.23'	N. 1504265.57	E. 596637.83	STA. 10+18.81	STA. 12+93.05	174.58'	90°00'02"
CURVE NO. 2	25.00'	39.51'	N. 1504265.57	E. 598756.36	STA. 32+11.75	STA. 32+51.26	25.24'	90°33'22"
CURVE NO. 3	25.00'	39.27'	N. 1507056.13	E. 598766.02	STA. 59+91.81	STA. 60+31.08	25.00'	90°00'00"

REVISION	DATE	DESCRIPTION	APPR'D
0	1/27/2012	ISSUED FOR CONSTRUCTION	
P3	1/26/2012	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	DTC	12/20/2011
FILE NO.: 10-13-0249			SCALE: 1" = 150'		
APPROVED BY:					

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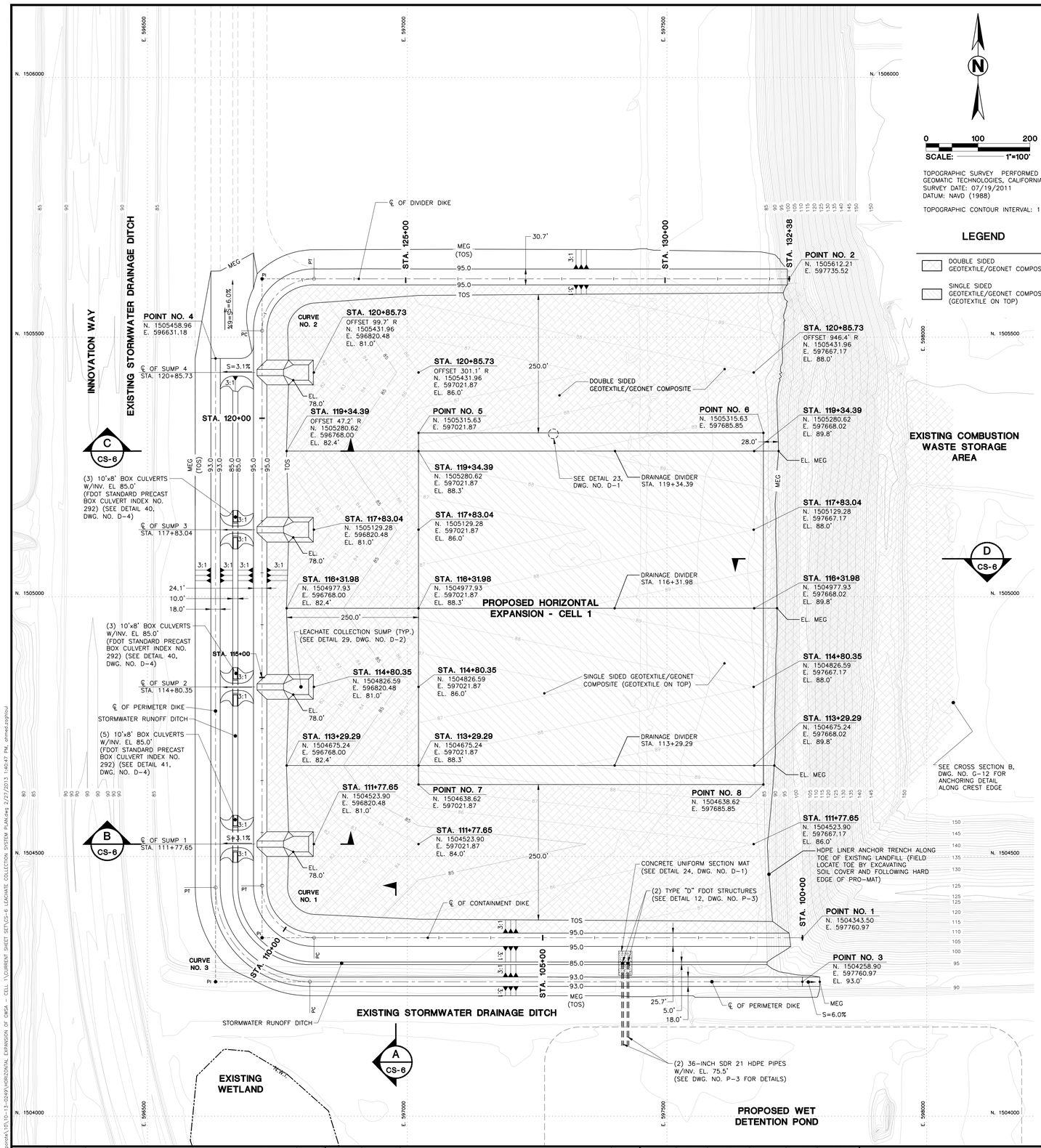
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

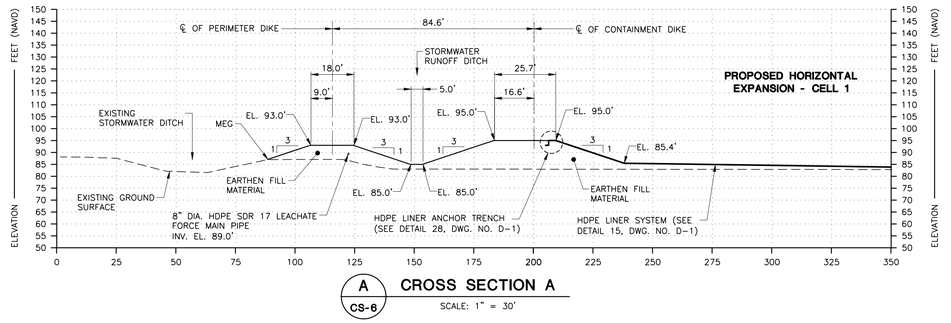
OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

FORCE MAIN PIPELINE PLAN

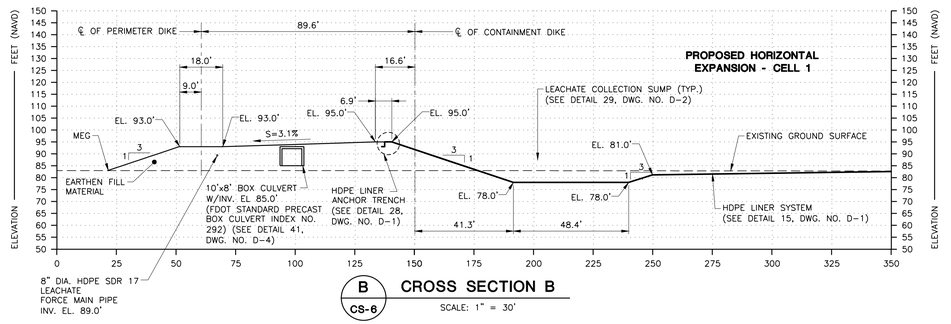
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\\Ardaster2\Civil\Corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SET\G-10 FORCE MAIN PIPELINE CROSS SECTIONS.dwg 2/27/2013 1:37:24 PM ahmed.zoghloul

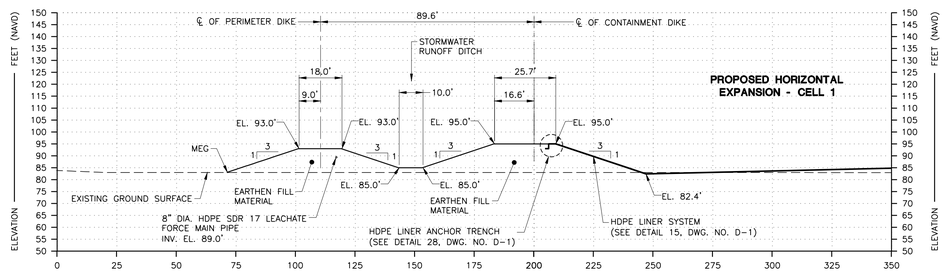




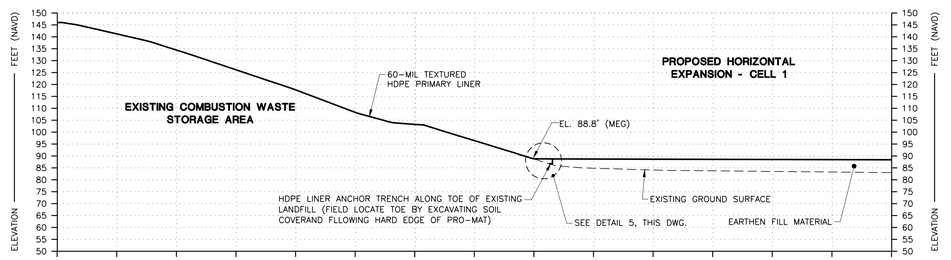
A CS-6 CROSS SECTION A
SCALE: 1" = 30'



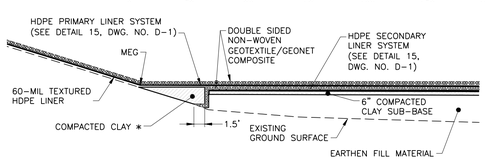
B CS-6 CROSS SECTION B
SCALE: 1" = 30'



C CS-6 CROSS SECTION C
SCALE: 1" = 30'



D CS-6 CROSS SECTION D
SCALE: 1" = 30'



* NOTE: INSTALL LDS GEOCOMPOSITE PRIOR TO BACKFILLING AND COMPACTING THE ANCHOR TRENCH

5 CS-6 HDPE LINER ANCHOR DETAIL
SCALE: 1" = 10'

PROPOSED HORIZONTAL EXPANSION DIKE CENTERLINE CURVE DATA

CURVE NO.	R	L	PI N	PI E	PC	PT	T	Δ
NO. 1	100.00'	157.08'	N. 1504343.50	E. 596720.78	STA. 109+40.19	STA. 110+97.27	100.00'	90°00'00"
NO. 2	100.00'	157.08'	N. 1505612.21	E. 596720.78	STA. 121+65.98	STA. 123+23.06	100.00'	90°00'00"
NO. 3	181.50'	285.10'	N. 1504258.90	E. 596631.18	STA. 9+48.29	STA. 12+33.39	181.50'	90°00'00"

REVISION	DATE	DESCRIPTION	APPR'D
0	1/27/2012	ISSUED FOR CONSTRUCTION	
P3	1/26/2012	ISSUED FOR PERMITTING - REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	DTC	12/20/2011
FILE NO.: 10-13-0249			SCALE: AS SHOWN		
APPROVED BY:					

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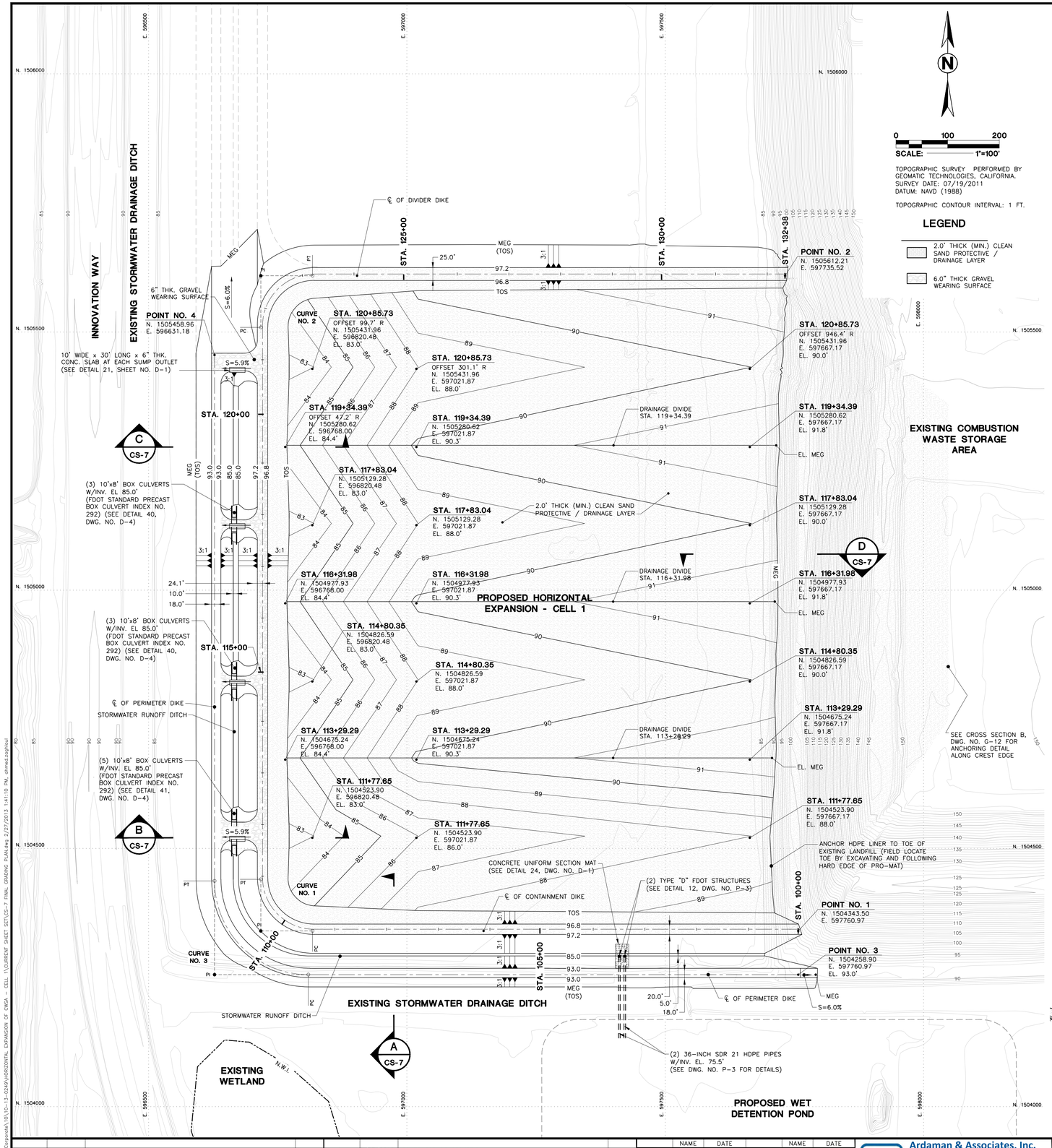
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

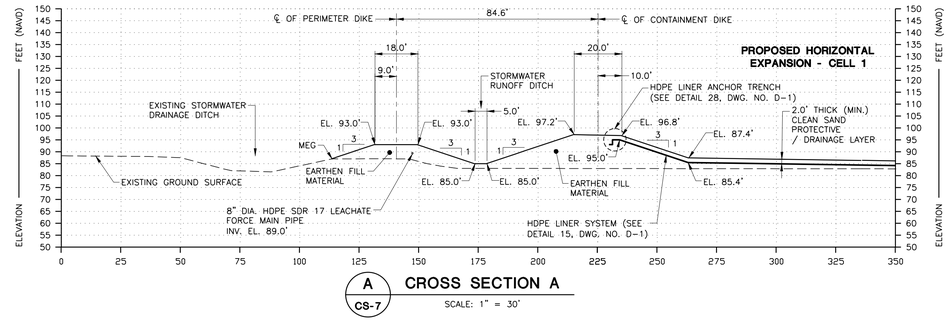
OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

LEACHATE COLLECTION SYSTEM PLAN

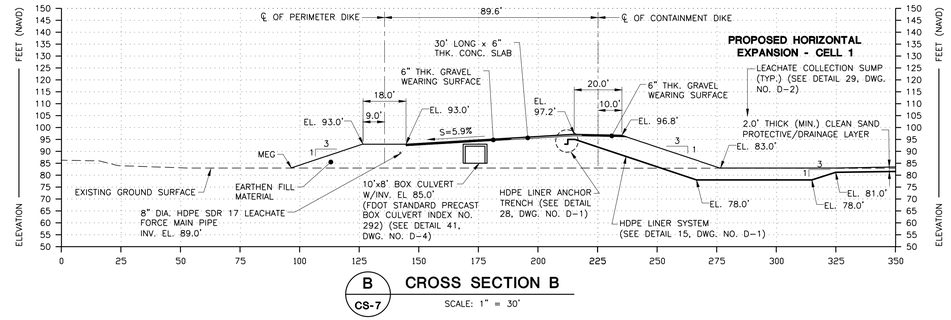
DRAWING NO. CS-6

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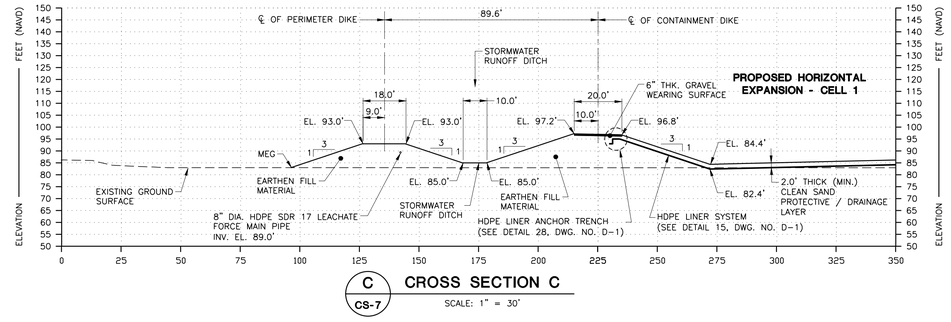




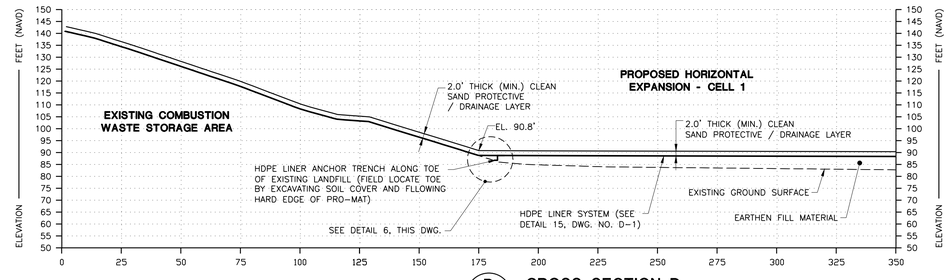
A CS-7 CROSS SECTION A
SCALE: 1" = 30'



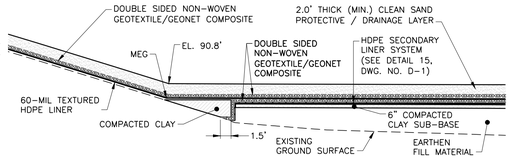
B CS-7 CROSS SECTION B
SCALE: 1" = 30'



C CS-7 CROSS SECTION C
SCALE: 1" = 30'



D CS-7 CROSS SECTION D
SCALE: 1" = 30'



6 CS-7 HDPE LINER ANCHOR DETAIL
SCALE: 1" = 10'

PROPOSED HORIZONTAL EXPANSION DIKE CENTERLINE CURVE DATA

CURVE NO.	R	L	PI N	PI E	PC	PT	T	Δ
NO. 1	100.00'	157.08'	N. 1504343.50	E. 596720.78	STA. 109+40.19	STA. 110+97.27	100.00'	90°00'00"
NO. 2	100.00'	157.08'	N. 1505612.21	E. 596720.78	STA. 121+65.98	STA. 123+23.06	100.00'	90°00'00"
NO. 3	181.50'	285.10'	N. 1504258.90	E. 596631.18	STA. 9+48.29	STA. 12+33.39	181.50'	90°00'00"

REVISION	DATE	DESCRIPTION	APPR'D
0	1/27/2012	ISSUED FOR CONSTRUCTION	
P3	1/26/2012	ISSUED FOR PERMITTING - REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
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	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	DTC	12/20/2011
FILE NO.: 10-13-0249			SCALE: AS SHOWN		
APPROVED BY:					

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TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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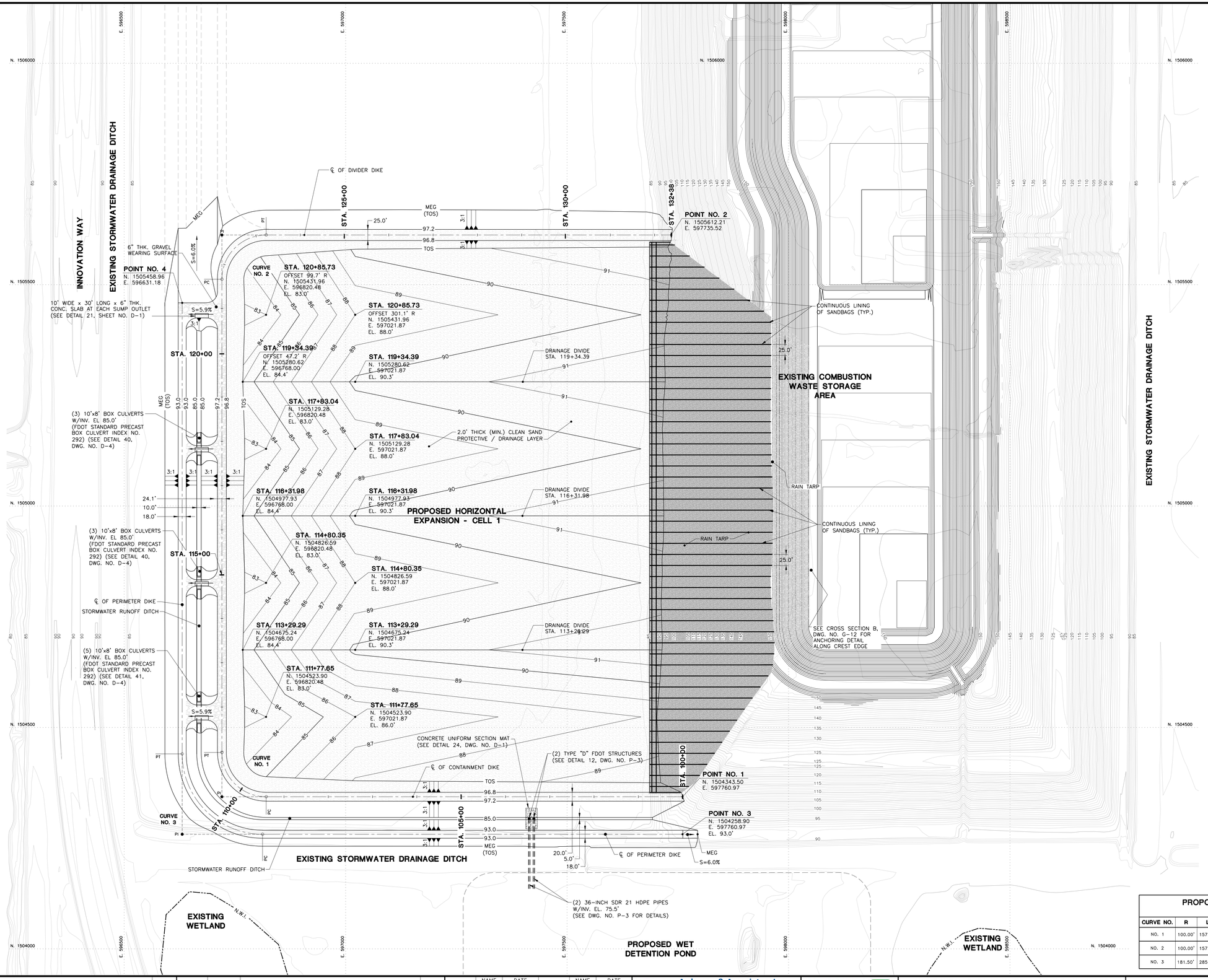
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

FINAL GRADING PLAN

DRAWING NO. CS-7

\\Ardweb2\Jobs\Corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SETS\CS-7 FINAL GRADING PLAN.dwg 2/27/2013 1:41:10 PM, ahmed.zaghloul





0 100 200

SCALE: 1"=100'

TOPOGRAPHIC SURVEY PERFORMED BY GEOMATIC TECHNOLOGIES, CALIFORNIA.
SURVEY DATE: 07/19/2011
DATUM: NAVD (1988)

TOPOGRAPHIC CONTOUR INTERVAL: 1 FT.

LEGEND

- 2.0' THICK (MIN.) CLEAN SAND PROTECTIVE / DRAINAGE LAYER
- RAIN TARP

PROPOSED HORIZONTAL EXPANSION DIKE CENTERLINE CURVE DATA

CURVE NO.	R	L	PI N	PI E	PC	PT	T	Δ
NO. 1	100.00'	157.08'	N. 1504343.50	E. 596720.78	STA. 109+40.19	STA. 110+97.27	100.00'	90°00'00"
NO. 2	100.00'	157.08'	N. 1505612.21	E. 596720.78	STA. 121+65.98	STA. 123+23.06	100.00'	90°00'00"
NO. 3	181.50'	285.10'	N. 1504258.90	E. 596631.18	STA. 9+48.29	STA. 12+33.39	181.50'	90°00'00"

REVISION	DATE	DESCRIPTION	APPR'D
P3	1/26/2012	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	08/09/2012
DRAWN BY	AZ	08/09/2012	CHECKED BY	TSI	08/09/2012
FILE NO.: 10-13-0249			SCALE: AS SHOWN		
APPROVED BY:					

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Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
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HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

RAIN TARP PLAN FOR PIGGYBACK

DRAWING NO. CS-7A

T:\Corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SET\CS-7A RAIN TARP PLAN FOR PIGGYBACK.dwg 2/27/2013 11:41:40 PM, ahmed.zaghloul

INNOVATION WAY

EXISTING STORMWATER DRAINAGE DITCH

℄ OF DIVIDER DIKE

STA. 125+00

STA. 130+00

STA. 132+38

MEG (TOS)

S=6.0%

23.6'

97.20

97.3

142.0

140.0

S=5.9%

STA. 120+00

EL. 173.1'

EL. 175.0'

EL. 153.0'

EL. 173.1'

EL. 174.0'

EL. 175.0'

173.0

173.1

174.0

EXISTING COMBUSTION WASTE STORAGE AREA (CWSA)

171.0

172.0

170.0

169.0

175.0

158.0

153.0

(3) 10'x8' BOX CULVERTS W/INV. EL 85.0' (FDOT STANDARD PRECAST BOX CULVERT INDEX NO. 292) (SEE DETAIL 40, DWG. NO. D-4)

C CS-9

93.0

85.0

97.2

97.3

3:1

24.1'

10.0'

18.0'

PROPOSED HORIZONTAL EXPANSION - CELL 1

TYPE (C) INLET (FDOT INDEX NO. 232) (SEE DETAIL 35, DWG. NO. D-3)

SEE DETAIL 34, DWG. NO. D-3

STA. 115+00

12" DIA. SDR 17 HDPE PIPE

(3) 10'x8' BOX CULVERTS W/INV. EL 85.0' (FDOT STANDARD PRECAST BOX CULVERT INDEX NO. 292) (SEE DETAIL 40, DWG. NO. D-4)

℄ OF PERIMETER DIKE

STORMWATER RUNOFF DITCH

SEE DETAIL 33, DWG. NO. D-3

(5) 10'x8' BOX CULVERTS W/INV. EL 85.0' (FDOT STANDARD PRECAST BOX CULVERT INDEX NO. 292) (SEE DETAIL 41, DWG. NO. D-4)

18" DIA. SDR 17 HDPE PIPE

STORM DRAIN ENDWALL (SEE DETAIL 32, DWG. NO. D-3)

12" DIA. SDR 17 HDPE PIPE

CONCRETE UNIFORM SECTION MAT (SEE DETAIL 24, DWG. NO. D-1)

℄ OF CONTAINMENT DIKE

(2) TYPE "D" FDOT STRUCTURES (SEE DETAIL 12, DWG. NO. P-3)

STA. 100+00

STA. 105+00

STA. 110+00

EXISTING STORMWATER DRAINAGE DITCH

TYPE (C) INLET (FDOT INDEX NO. 232) (SEE DETAIL 35, DWG. NO. D-3)

B CS-9

A CS-9

℄ OF PERIMETER DIKE

21.6'

5.0'

18.0'

MEG

S=6.0%

(2) 36-INCH SDR 21 HDPE PIPES W/INV. EL. 75.5' (SEE DWG. NO. P-3 FOR DETAILS)

EXISTING WETLAND

N.W.L.

PROPOSED WET DETENTION POND

EXISTING WETLAND

N.W.L.

EXISTING STORMWATER DRAINAGE DITCH

N. 1506000

N. 1505500

N. 1505000

N. 1504500

N. 1504000

E. 596500

E. 597000

E. 597500

E. 598000

E. 598500

E. 599000

N

0 100 200

SCALE: 1"=100'

TOPOGRAPHIC SURVEY PERFORMED BY GEOMATIC TECHNOLOGIES, CALIFORNIA.
SURVEY DATE: 07/19/2011
DATUM: NAVD (1986)

TOPOGRAPHIC CONTOUR INTERVAL: 1 FT.

T:\Corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SET\CS-8 FINAL CONFIGURATION - CLOSURE PLAN.dwg 2/27/2013 1:42:03 PM, ahmed.zaghloul

REVISION	DATE	DESCRIPTION	APPR'D
0	1/27/2012	ISSUED FOR CONSTRUCTION	
P3	1/26/2012	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	DTC	12/20/2011
FILE NO.: 10-13-0249			SCALE: AS SHOWN		

APPROVED BY:

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8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

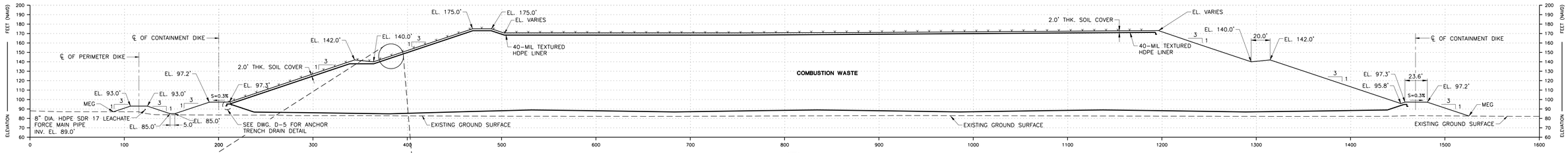
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HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

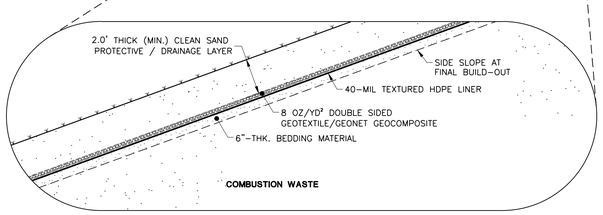
FINAL CONFIGURATION - CONCEPTUAL CLOSURE PLAN

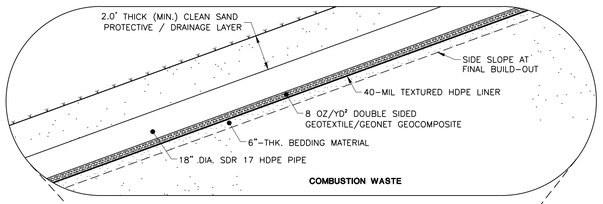
DRAWING NO.
CS-8

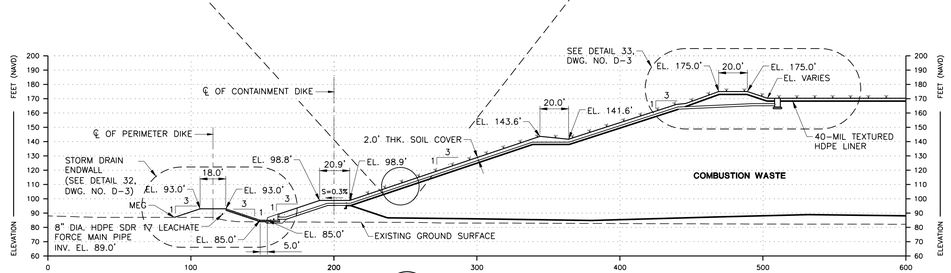


A CS-8 **CROSS SECTION A**

SCALE: 1" = 50'

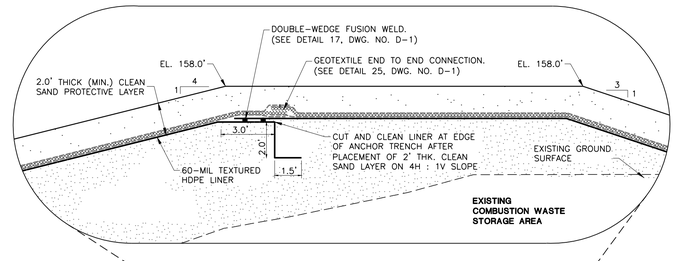


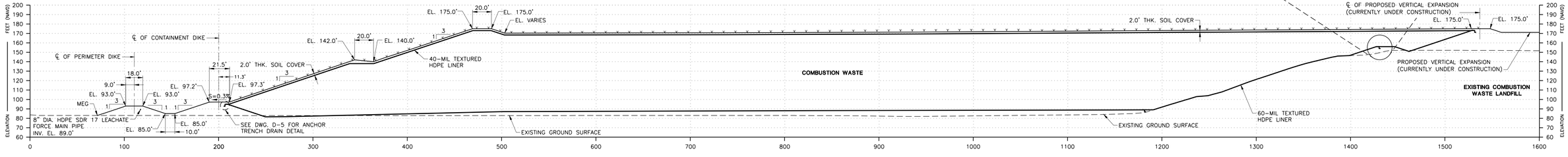




B CS-8 **CROSS SECTION B**

SCALE: 1" = 50'





C CS-8 **CROSS SECTION C**

SCALE: 1" = 50'

REVISION	DATE	DESCRIPTION	APPR'D
P3	1/26/2012	ISSUED FOR PERMITTING - REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	DTC	12/20/2011
FILE NO.: 10-13-0249			SCALE: AS SHOWN		
APPROVED BY:					

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HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

FINAL CONFIGURATION - CROSS SECTIONS

DRAWING NO. **CS-9**

T:\Corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWDA - CELL 1\CURRENT SHEET SET\CS-8 FINAL CONFIGURATION - CLOSURE PLAN.dwg 2/27/2013 1:42:14 PM, ahmed.zoghioul

PROPOSED HORIZONTAL EXPANSION - CELL 1

EXISTING COMBUSTION WASTE STORAGE AREA

EXISTING STORMWATER DRAINAGE DITCH

EXISTING STORMWATER DRAINAGE DITCH

PROPOSED WET DETENTION POND

TOS 96.8
97.2
85.0
93.0
93.0
MEG (TOS)

CONCRETE UNIFORM SECTION MAT (SEE DETAIL 24, DWG. NO. D-1)

SEE DETAIL 7, THIS DWG.

(2) TYPE "D" FDOT STRUCTURES (SEE DETAIL 12, DWG. NO. P-3)

(2) 36-INCH SDR 21 HDPE PIPES (SEE DWG. NO. P-3 FOR DETAILS) INV. EL. 75.5'

INV. EL. 80.20

EXISTING 18" DIA. RCP INV. EL. 80.91'

POINT NO. 1
N. 1504172.34
E. 597725.50

CONCRETE UNIFORM SECTION MAT (SEE DETAIL 24, DWG. NO. D-1)

(2) 36-INCH SDR 21 HDPE PIPES INV. EL. 80.0'

TYPE "D" FDOT STRUCTURE (SEE DETAIL 9, DWG. NO. P-3)

INV. EL. 78.71'
INV. EL. 77.93'
INV. EL. 78.31'
INV. EL. 77.29'
INV. EL. 77.54'
INV. EL. 77.65'
INV. EL. 77.15'
INV. EL. 78.33'
4 EXISTING 36" DIA. RCP (TYP.)

STA. 0+00
STA. 5+00
STA. 10+00
STA. 15+00
STA. 20+00
STA. 25+00
STA. 30+00
STA. 35+00

CURVE NO. 4
CURVE NO. 1
CURVE NO. 3
CURVE NO. 2

MINIMUM REQUIRED DEPTH

MAXIMUM ALLOWABLE DEPTH OF EXCAVATION FOR BORROW MATERIAL

℄ OF DIVERSION DIKE

℄ OF PERIMETER DIKE

POINT NO. 2
N. 1503346.29
E. 597725.50

R50.0'

RUNOFF DIVERSION DITCH

(2) TYPE "D" FDOT STRUCTURES (SEE DETAIL 12, DWG. NO. P-3)

CONCRETE UNIFORM SECTION MAT (SEE DETAIL 24, DWG. NO. D-1)

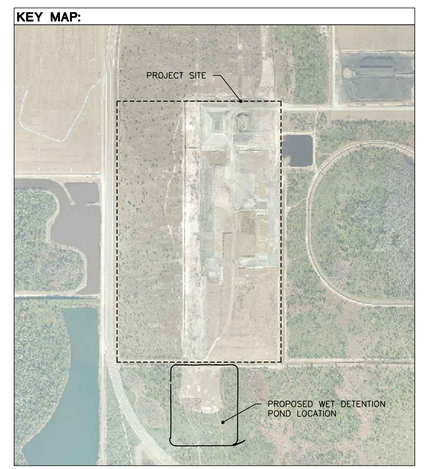
7 / P-1 INLET STRUCTURE
SCALE: 1" = 10'

0 100 200
SCALE: 1"=100'

TOPOGRAPHIC SURVEY PERFORMED BY GEOMATIC TECHNOLOGIES, CALIFORNIA.
SURVEY DATE: 07/19/2011
DATUM: NAVD (1988)

TOPOGRAPHIC CONTOUR INTERVAL: 1 FT.

KEY MAP:



PROPOSED WET DETENTION POND DIKE CREST BASELINE CURVE DATA

CURVE NO.	R	L	PI N	PI E	PC	PT	T	Δ
CURVE NO. 1	68.50'	107.60'	N. 1504172.34	E. 598185.50	STA. 7+83.00	STA. 8+90.60	68.50'	90°00'00"
CURVE NO. 2	68.50'	107.60'	N. 1503060.29	E. 598185.50	STA. 18+65.65	STA. 19+73.25	68.50'	90°00'00"
CURVE NO. 3	68.50'	107.60'	N. 1503060.29	E. 597265.50	STA. 27+56.25	STA. 28+63.85	68.50'	90°00'00"
CURVE NO. 4	68.50'	107.60'	N. 1504172.34	E. 597265.50	STA. 38+38.90	STA. 39+46.50	68.50'	90°00'00"

REVISION	DATE	DESCRIPTION	APPR'D
0	1/27/2012	ISSUED FOR CONSTRUCTION	
P3	1/26/2012	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	DTC	12/20/2011
FILE NO.: 10-13-0249			SCALE: AS SHOWN		
APPROVED BY:					

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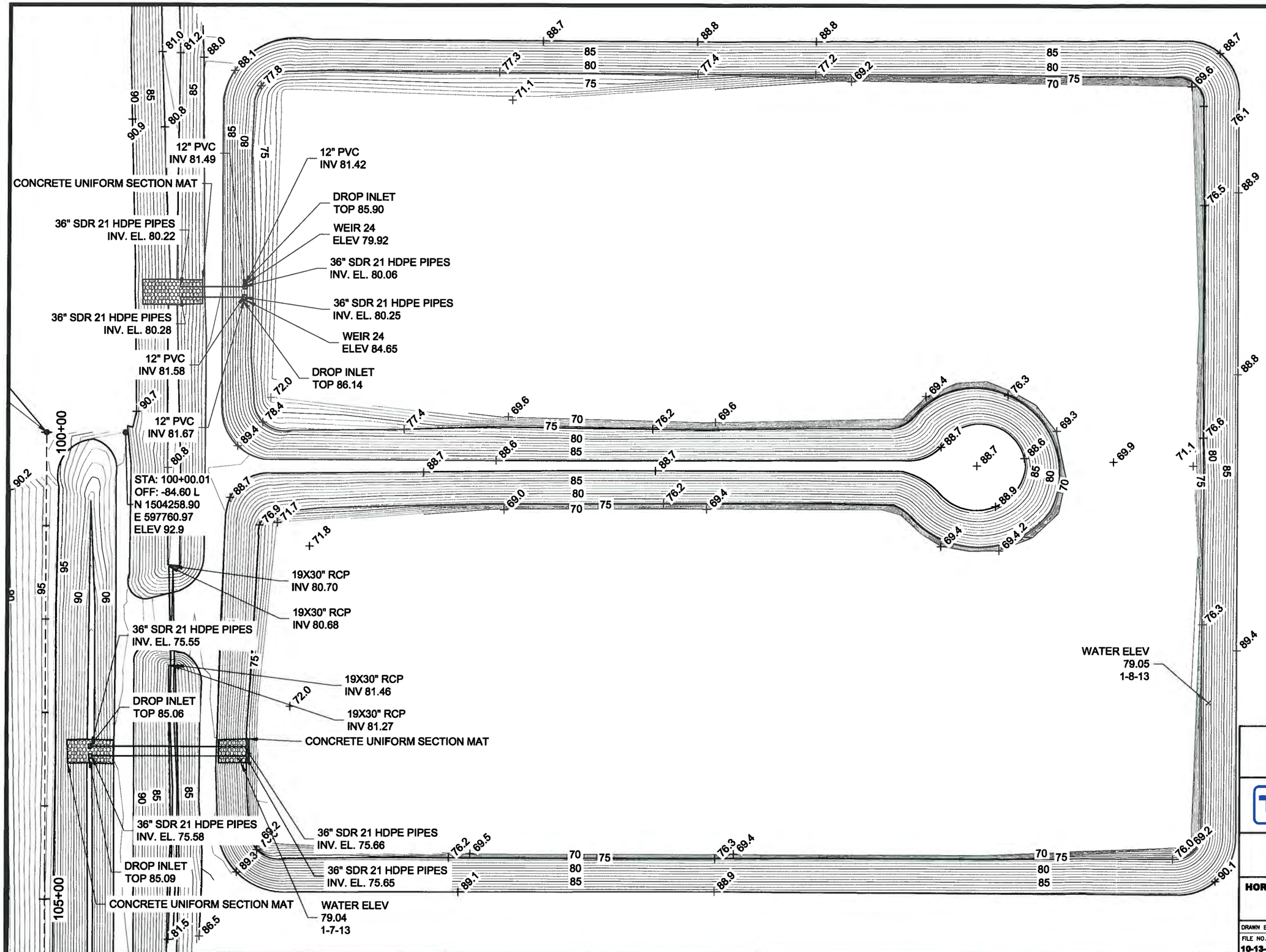
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

PROPOSED WET DETENTION POND PLAN AND DETAILS

DRAWING NO.
P-1

\\Ardaman7\cad\Corporate\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SET\P-2 PROPOSED WET DETENTION POND CROSS SECTIONS.dwg 2/27/2013 1:42:39 PM, ahmed.zaghloul



TOPOGRAPHIC SURVEY PERFORMED BY:

TETRA TECH – ENGINEERING & CONSULTING SERVICES (ECS)

DATED: 01/23/2013

AS-BUILT SURVEY OF WET DETENTION POND

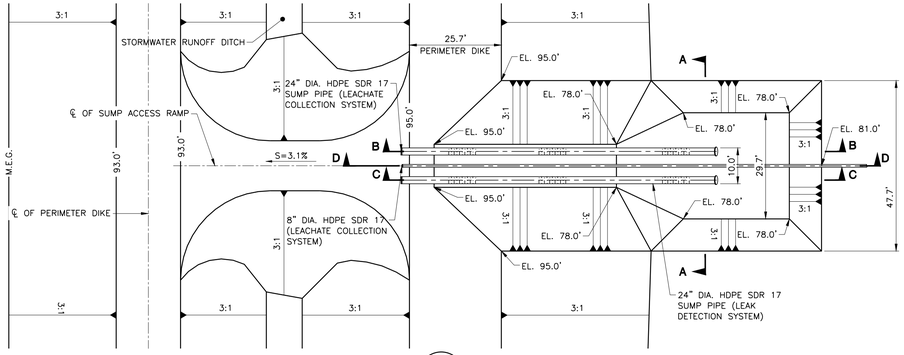
Ardaman & Associates, Inc.
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HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1 ORANGE COUNTY, FLORIDA

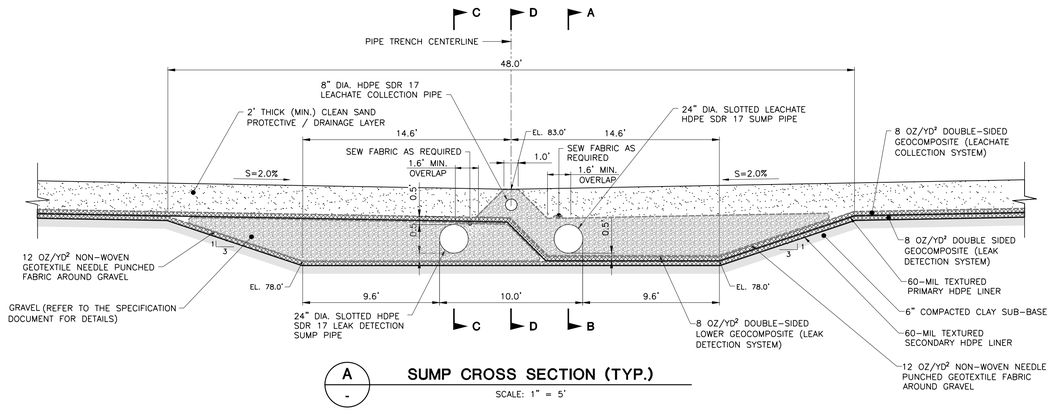
DRAWN BY:	AZ	CHECKED BY:	JR	DATE:	04/15/13
FILE NO.	10-13-0249	APPROVED BY:		FIGURE:	3-16

T:\Corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\REPORT FIGURES_Current Sheet Set\3-16 AS-BUILT SURVEY OF WET DETENTION POND.dwg 4/29/2013 5:46:00 PM, ruben.hoffman



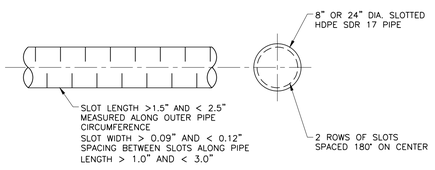
29 - SUMP PLAN VIEW

SCALE: 1" = 20'



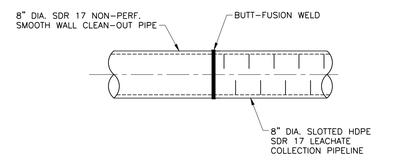
A - SUMP CROSS SECTION (TYP.)

SCALE: 1" = 5'



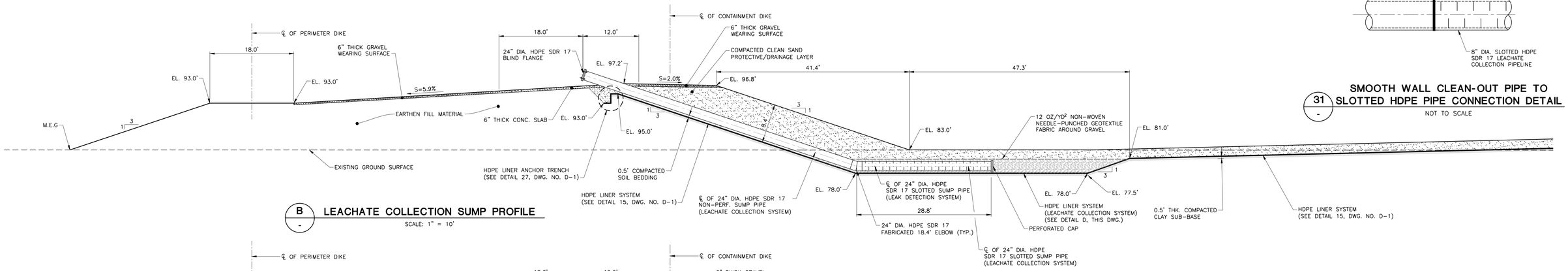
30 - SLOTTED HDPE PIPE

NOT TO SCALE



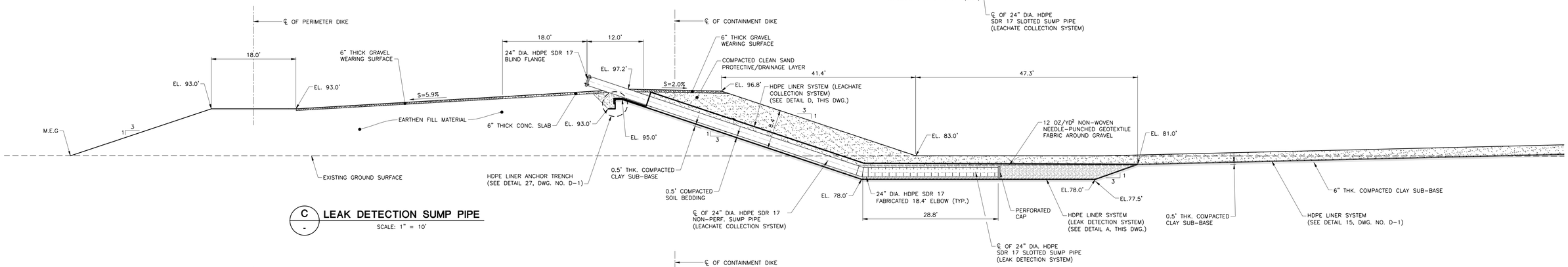
31 - SMOOTH WALL CLEAN-OUT PIPE TO SLOTTED HDPE PIPE CONNECTION DETAIL

NOT TO SCALE



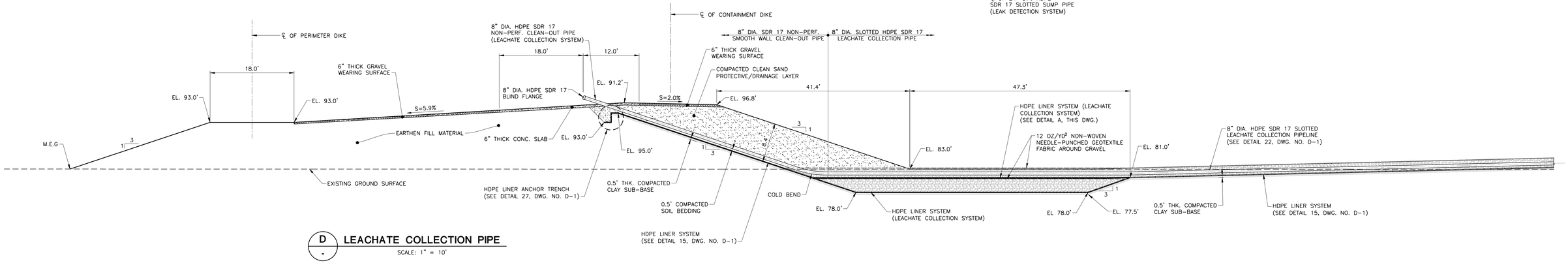
B - LEACHATE COLLECTION SUMP PROFILE

SCALE: 1" = 10'



C - LEAK DETECTION SUMP PIPE

SCALE: 1" = 10'



D - LEACHATE COLLECTION PIPE

SCALE: 1" = 10'

REVISION	DATE	DESCRIPTION	APPR'D
0	1/27/2012	ISSUED FOR CONSTRUCTION	
P3	1/26/2012	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	
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DRAWN BY	AZ	10/06/2011	CHECKED BY	DTC	12/20/2011
FILE NO.: 10-13-0249			SCALE: AS SHOWN		
APPROVED BY:					

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TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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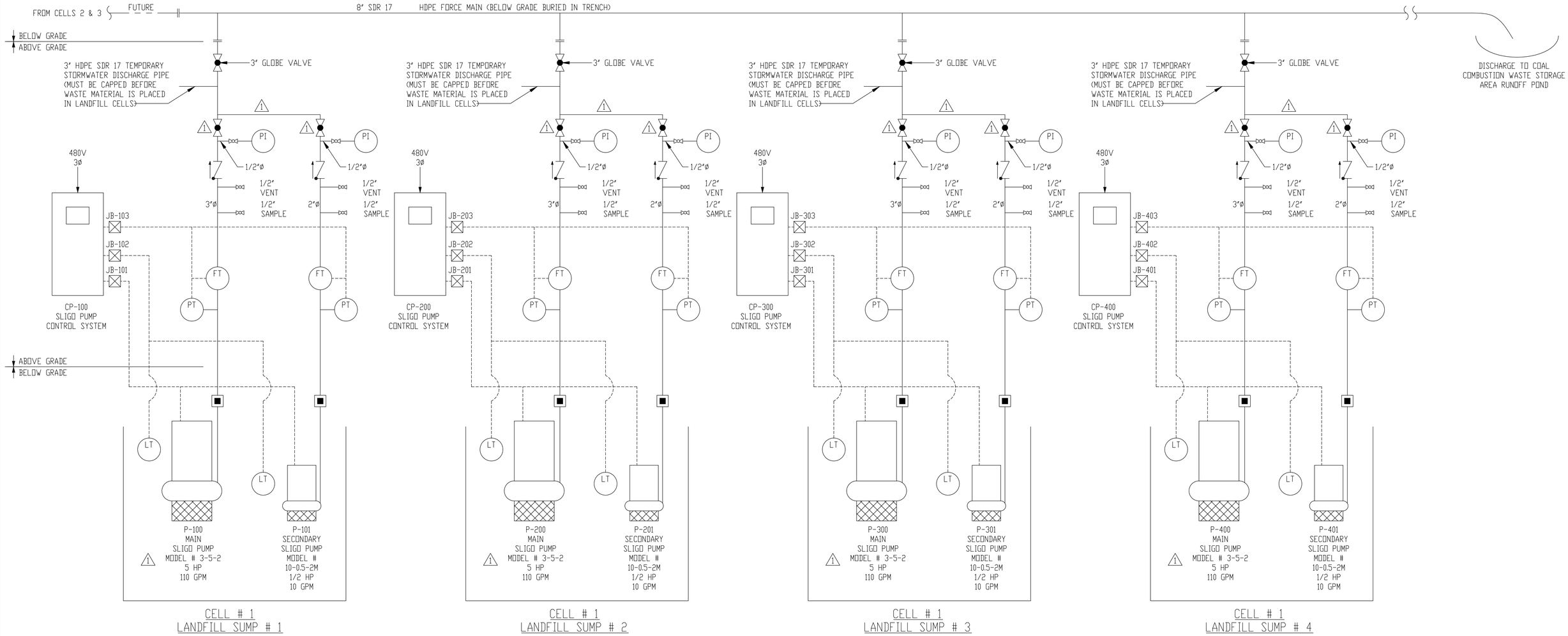
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

SUMP DETAILS AND CROSS SECTIONS

DRAWING NO. D-2

\\Ardaotec2\cost\Corporate\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SETS\D-2 SUMP DETAILS AND CROSS SECTIONS.dwg 2/27/2013 1:43:41 PM, ahmed.zaghloul



LEGEND:

- ⊠ BREAKOUT JUNCTION BOX
- ■ THROUGH-RISER QUICK DISCONNECT

REVISION	DATE	DESCRIPTION	APPR'D
P3	1/26/2012	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	TSI	12/20/2011
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APPROVED BY:					

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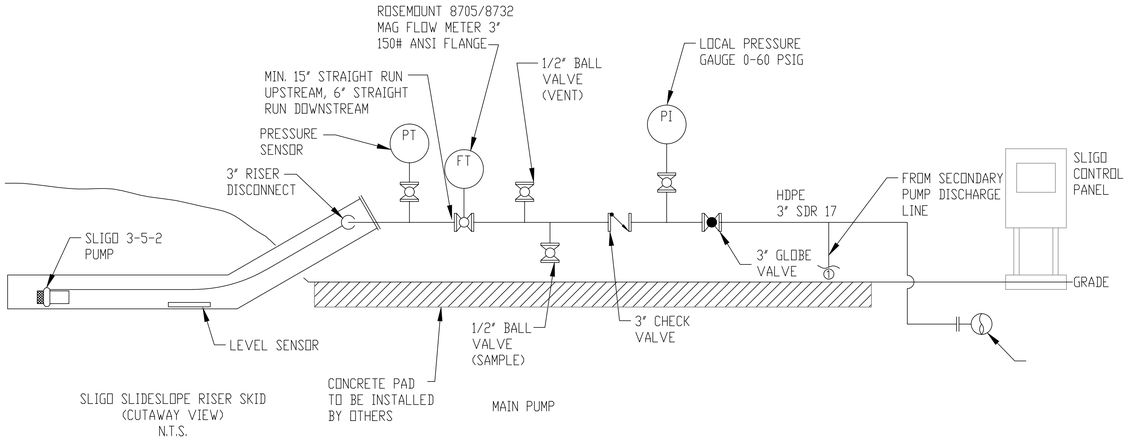
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

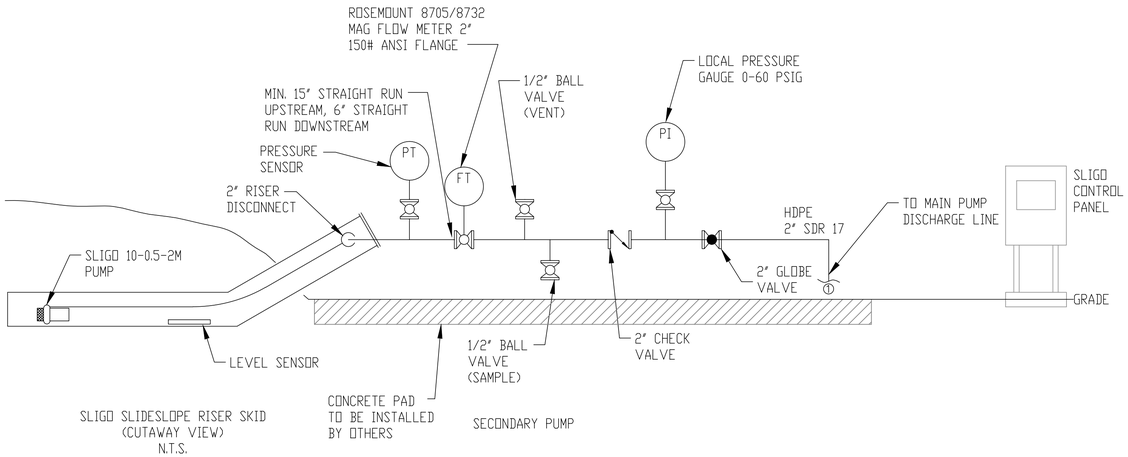
OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

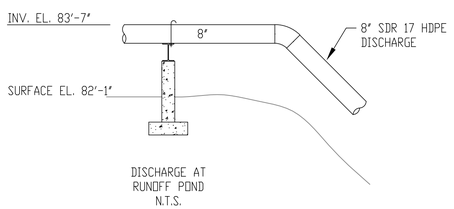
LEACHATE COLLECTION PUMP AND PIPING P&ID DIAGRAM

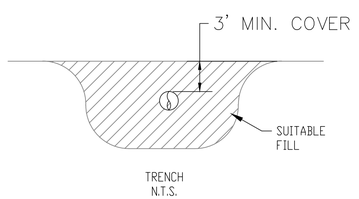
DRAWING NO. M-1

T:\corporate\10\10-13-0249\VORIZONTAL EXPANSION OF OWSA – CELL 1\CURRENT SHEET SET\M-1 LEACHATE COLLECTION PUMP AND PIPING P&ID DIAGRAM.dwg 2/27/2013 1:45:14 PM, ahmed.zaghloul









REVISION	DATE	DESCRIPTION	APPR'D
P3	1/26/2012	ISSUED FOR PERMITTING – REVISED PER FDEP RAI	
P2	12/01/2011	ISSUED FOR PERMITTING	
P1	11/16/2011	ISSUED FOR CLIENT REVIEW	

	NAME	DATE		NAME	DATE
DESIGNED BY	MH	12/01/2011	CHECKED BY	FKC	12/01/2011
DRAWN BY	AZ	10/06/2011	CHECKED BY	TSI	12/20/2011
FILE NO.: 10-13-0249			SCALE: AS SHOWN		
APPROVED BY:					

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

OUC The Reliable One

HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

LEACHATE COLLECTION PUMP AND PIPING TYPICAL DETAILS

DRAWING NO.
M-2

T:\corporate\10\10-13-0249\HORIZONTAL EXPANSION OF CWSA - CELL 1\CURRENT SHEET SET\M-2 LEACHATE COLLECTION PUMP AND PIPING TYPICAL DETAILS.dwg 2/27/2013 1:45:20 PM, ahmed.zaghloul

TO BE CONNECTED TO EXISTING MANHOLE

NEW 4'x4' CONC. MANHOLE
N. 1507726.34
E. 599326.44

5'x5' I.D. STORM MH WITH RING AND COVER
RIM ELEV. = 89.00'
INV. 24" S & NW = 85.00'

24" DIA. HDPE SDR 17 FABRICATED 45° ELBOW W/ IV. EL. 85.0'

℄ OF PERIMETER DIKE AND ALIGNMENT OF CUT-OFF WALL ✳
N. 1507493.51
E. 599291.44

6'x8' CONC. ACCESS BOX WITH 24" DIA. GATE VALVE
N. 1507500.75
E. 599324.44

24" DIA. x 12" DIA. HDPE SDR 17 TEE REDUCER W/
INV. EL. 75.5'
N. 1507708.03
E. 599326.44

8" THK. CONCRETE SLAB 6x6 (6 GAUGE) WWM

24" DIA. HDPE SDR 17 OUTLET PIPE

12" DIA. HDPE SDR 17 OVERFLOW PIPE

℄ OF PERIMETER DIKE AND ALIGNMENT OF CUT-OFF WALL ✳

12" DIA. HDPE SDR 17 FABRICATED 3-SEGMENT 45° ELBOW W/
INV. EL. FROM 87.0' TO 86.0'
N. 1507708.03
E. 599037.44

INV. EL. 87.0'

N. 1507623.85
E. 599217.26
EL. 72.96'

24" DIA. HDPE SDR 17 OUTLET PIPE (SEE DETAIL 35, DWG. NO. D-4)
N. 1507500.75
E. 599222.44

SEE TYPICAL SUMP DETAIL, THIS DWG.

8" THK. SOIL CEMENT

PROPOSED COMBUSTION WASTE STORAGE AREA RUNOFF POND (NORTH COMPARTMENT)

℄ OF PERIMETER DIKE

STA. 8+02.52
(= STA. 30+08)

STA. 30+00

ALIGNMENT OF CUT-OFF WALL ✳

8" THK. CONCRETE SLAB 6x6 (6 GAUGE) WWM

N. 1507380.29
E. 599214.63
EL. 72.30'

N. 1507226.66
E. 599214.63
EL. 72.30'

24" DIA. HDPE SDR 17 OUTLET PIPE (SEE DETAIL 35, DWG. NO. D-4)
N. 1507106.19
E. 599222.44

℄ OF DIVIDER DIKE

PROPOSED COMBUSTION WASTE STORAGE AREA RUNOFF POND (SOUTH COMPARTMENT)

N. 1506983.09
E. 599217.26
EL. 72.96'

5'x5' I.D. STORM MH WITH RING AND COVER
RIM ELEV. = 89.00'
INV. 24" N & S = 85.00'

24" DIA. HDPE SDR 17 OUTLET PIPE

TWO-24" DIA. GATE VALVE

24" DIA. HDPE SDR 17 DECANT CELL OUTLET PIPE (INV. EL. 86.0')

24" DIA. HDPE SDR 17 BYPASS PIPE W/ 24" DIA. GATE VALVE

INV. EL. 85.0'

TWO-24" DIA. GATE VALVE

24" DIA. HDPE SDR 17 DECANT CELL OUTLET PIPE (INV. EL. 86.0')

N. 1507629.48
E. 598852.24
EL. 74.50'

N. 1507374.38
E. 598854.35
EL. 73.78'

N. 1507232.57
E. 598854.35
EL. 73.78'

N. 1506977.49
E. 598852.20
EL. 74.50'

8" DIA. GATE VALVE

INV. EL. 86.0'

8" DIA. HDPE SDR 17 INLET PIPE

8" THK. CONCRETE SLAB 6x6 (6 GAUGE) WWM

EXISTING 6100± LF 8" DIA. HDPE SDR 17 LEACHATE FORCE MAIN PIPE

8" DIA. GATE VALVE

8" DIA. HDPE SDR 17 TEE CONNECTOR
N. 1506995.66
E. 598767.77

STA. 20+39.55
(= STA. 25+00)

8" DIA. HDPE SDR 17 INLET PIPE

℄ OF PERIMETER DIKE AND ✳ ALIGNMENT OF CUT-OFF WALL

8" DIA. HDPE SDR 17 FABRICATED 90° ELBOW W/
INV. EL. 86.0'
N. 1507409.38
E. 598767.77

INV. EL. 83.5'
N. 1507361.28
E. 598767.77

COLD BEND FROM INV. EL. 83.5' TO 86.0'

✳ SOIL-BENTONITE CUT-OFF WALL TO BE INSTALLED UNDER A DIFFERENT CONTRACT BEFORE CONSTRUCTION OF CWSA RUNOFF POND.

EXISTING COMBUSTION WASTE STORAGE AREA

N

0 40 80

SCALE: 1"=40'

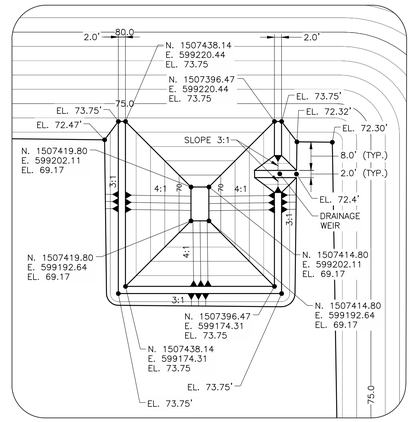
TOPOGRAPHIC SURVEY PERFORMED BY GEOMATIC TECHNOLOGIES, CALIFORNIA. SURVEY DATE: 07/19/2011

DATUM: NAVD (1988)

TOPOGRAPHIC CONTOUR INTERVAL: 1 FT.

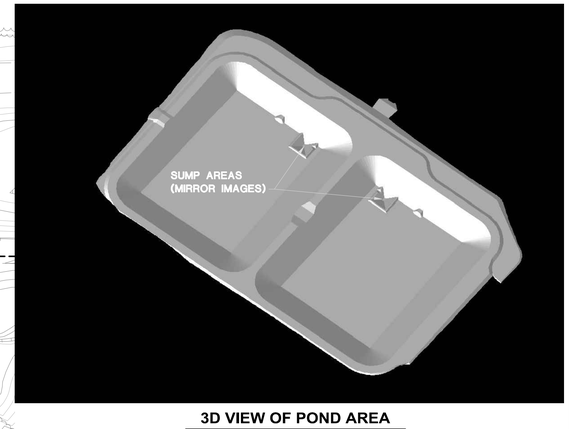
LEGEND

SOIL CEMENT



TYPICAL SUMP DETAIL

SCALE: 1" = 20'



3D VIEW OF POND AREA

REVISION	DATE	DESCRIPTION	APPR'D
1	05/14/15	REVISED EAST SIDE OF SITE AND ADDED 24" PIPE INFORMATION	
0	08/07/13	ISSUED FOR CONSTRUCTION	
P1	08/02/13	ISSUED FOR REGULATORY REVIEW	
P0	04/15/13	ISSUED FOR PRELIMINARY REVIEW MEETING WITH FDEP	

	NAME	DATE		NAME	DATE
DESIGNED BY	JM	04/29/13	CHECKED BY	DTC	04/29/13
DRAWN BY	AAD	04/29/13	CHECKED BY	MH	04/29/13
FILE NO.: 12-13-0166			SCALE: AS SHOWN		
APPROVED BY:					

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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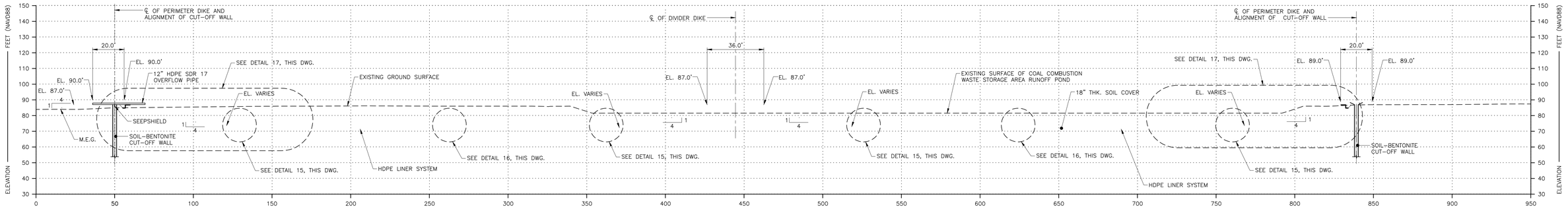
COMBUSTION WASTE STORAGE AREA RUNOFF POND

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

SOIL CEMENT FINAL GRADING PLAN

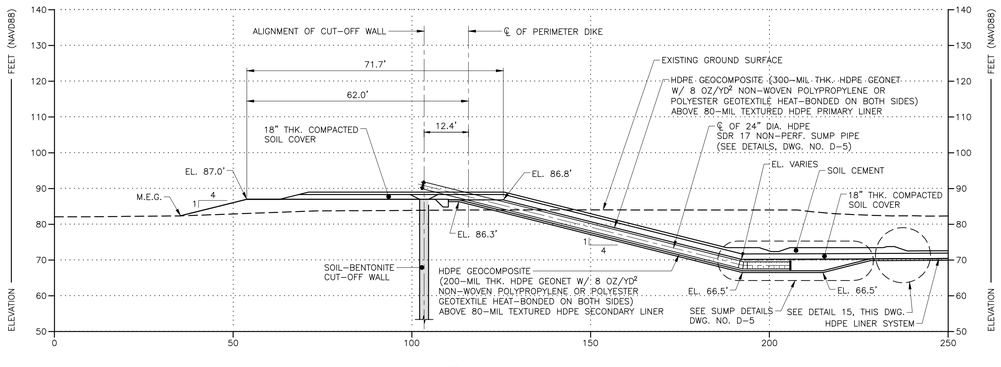
DRAWING NO. CS-9

C:\Users\Carol.Stone\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\XSPS9PR5\CS-9 SOIL CEMENT FINAL GRADING PLAN.dwg 7/21/2015 10:48:10 AM, carol.stone



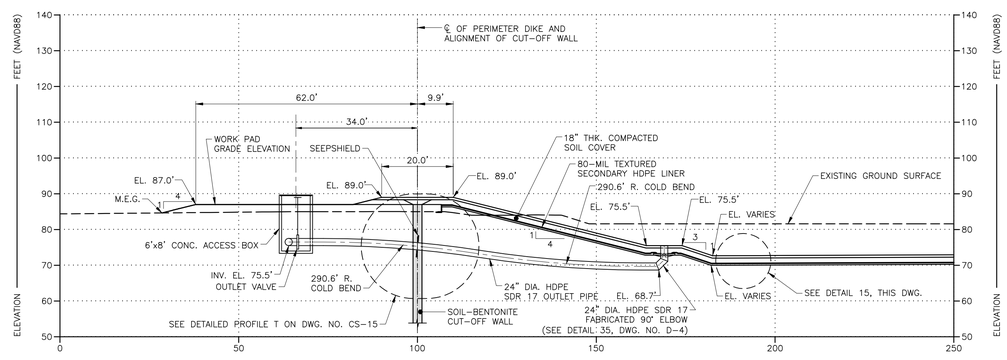
R CS-9 **CROSS SECTION R**

SCALE: 1" = 30'



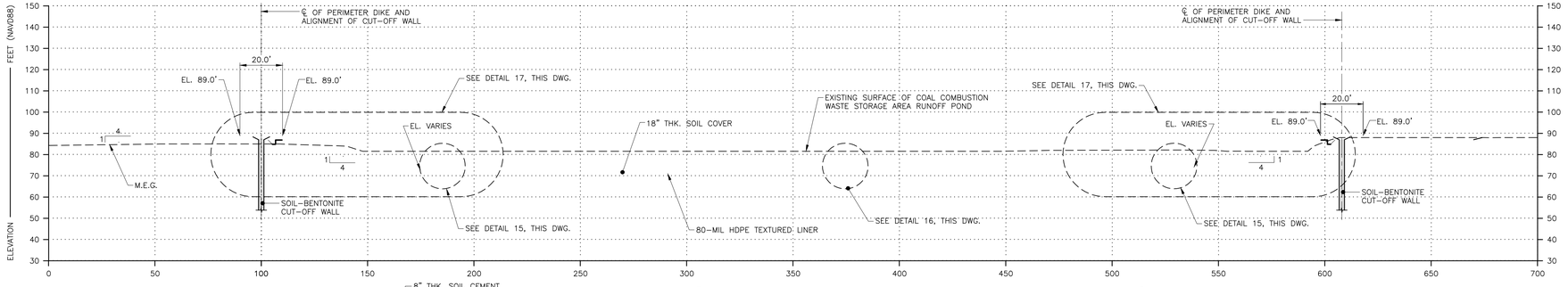
S CS-9 **CROSS SECTION S**

SCALE: 1" = 20'



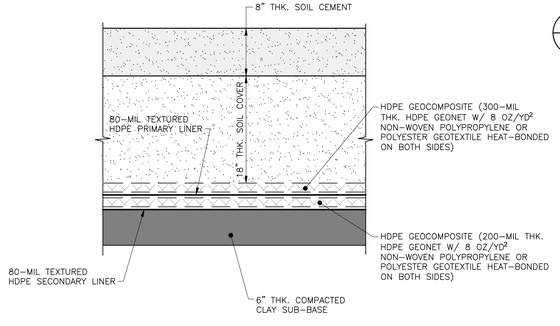
T CS-9 **CROSS SECTION T**

SCALE: 1" = 20'



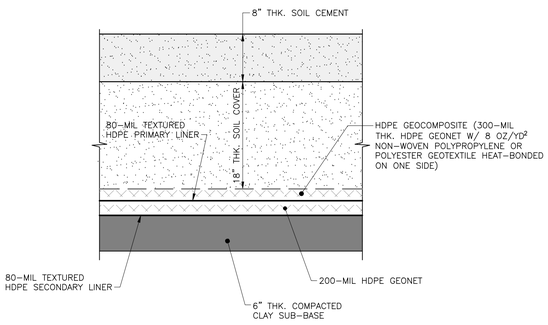
U CS-9 **CROSS SECTION U**

SCALE: 1" = 30'



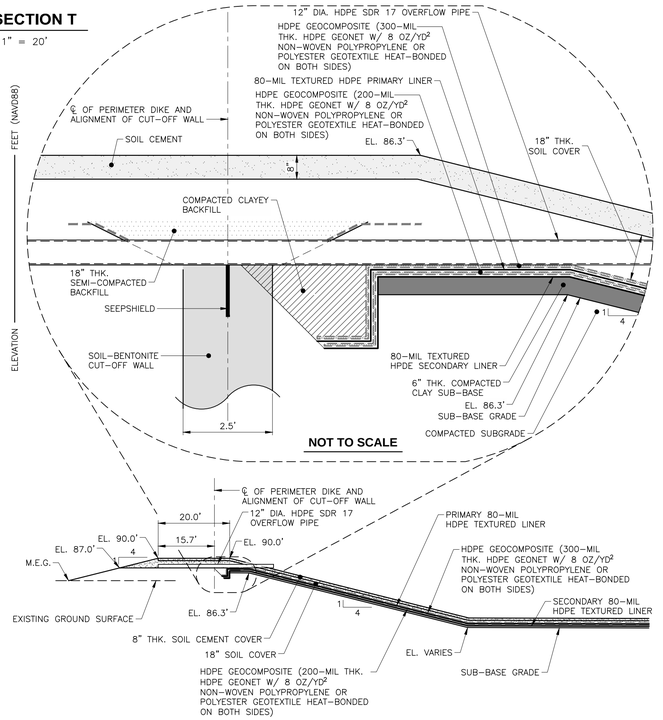
15 - **TYPICAL FINAL GRADE DETAIL**

SCALE: 1" = 1'



16 - **TYPICAL FINAL GRADE DETAIL**

SCALE: 1" = 1'



17 - **TYPICAL FINAL GRADE DETAIL**

SCALE: 1" = 20'

REVISION	DATE	DESCRIPTION	APPR'D
1	05/14/15	REMOVED SECONDARY LINER ANCHOR TRENCH	
0	08/07/13	ISSUED FOR CONSTRUCTION	
P1	08/02/13	ISSUED FOR REGULATORY REVIEW	
P0	04/15/13	ISSUED FOR PRELIMINARY REVIEW MEETING WITH FDEP	

	NAME	DATE		NAME	DATE
DESIGNED BY	JM	04/29/13	CHECKED BY	DTC	04/29/13
DRAWN BY	BTW	04/29/13	CHECKED BY	MH	04/29/13
FILE NO.: 12-13-0166			SCALE: AS SHOWN		
APPROVED BY:					

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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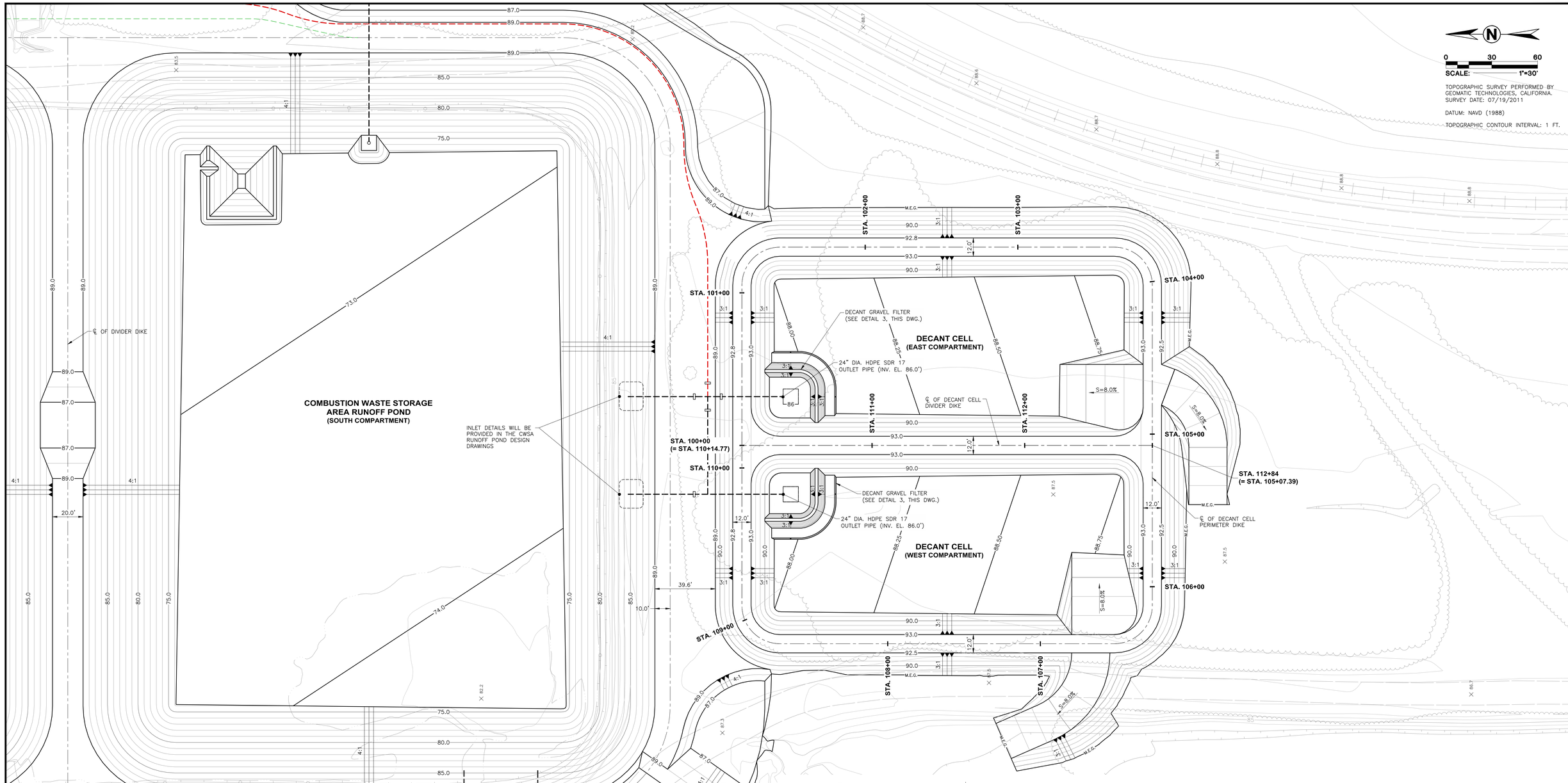
COMBUSTION WASTE STORAGE AREA
RUNOFF POND

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

SOIL CEMENT FINAL GRADING CROSS SECTIONS

DRAWING NO.
CS-14

C:\Users\Coral.Stone\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\NSPS9PR5\CS-14 FINAL GRADING CROSS SECTIONS.dwg 7/21/2015 10:46:13 AM, coral.stone



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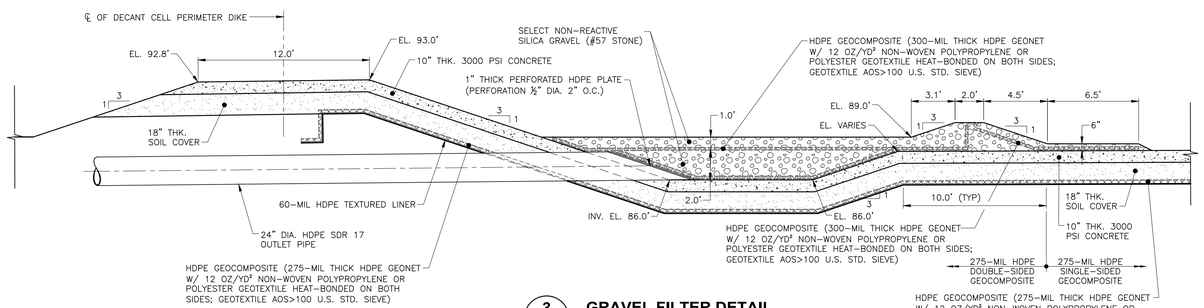
0 30 60

SCALE: 1"=30'

TOPOGRAPHIC SURVEY PERFORMED BY GEOMATIC TECHNOLOGIES, CALIFORNIA.
SURVEY DATE: 07/19/2011

DATUM: NAVD (1988)

TOPOGRAPHIC CONTOUR INTERVAL: 1 FT.



3 - **GRAVEL FILTER DETAIL**

SCALE: 1" = 5'

REVISION	DATE	DESCRIPTION	APPR'D
P3	10/11/13	ISSUED FOR CONSTRUCTION	
P2	08/07/13	ISSUED FOR BID	
P1	05/03/13	ISSUED FOR PERMITTING	
P0	04/15/13	ISSUED FOR PRELIMINARY REVIEW MEETING WITH FDEP	

	NAME	DATE		NAME	DATE
DESIGNED BY	JM	04/29/13	CHECKED BY	DTC	04/29/13
DRAWN BY	AAD	04/29/13	CHECKED BY	MH	04/29/13
FILE NO.: 12-13-0166			SCALE: AS SHOWN		
APPROVED BY:					

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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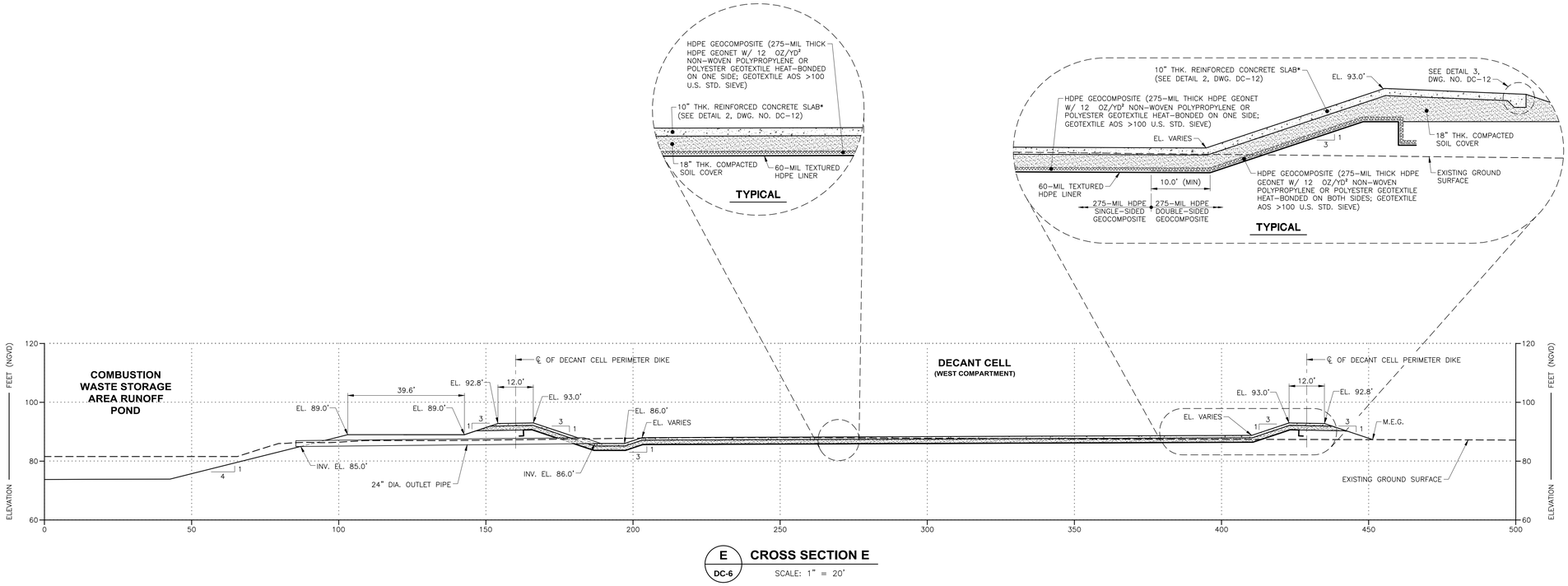
DECANT CELL

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

DECANT CELL GRAVEL FILTER DETAILS

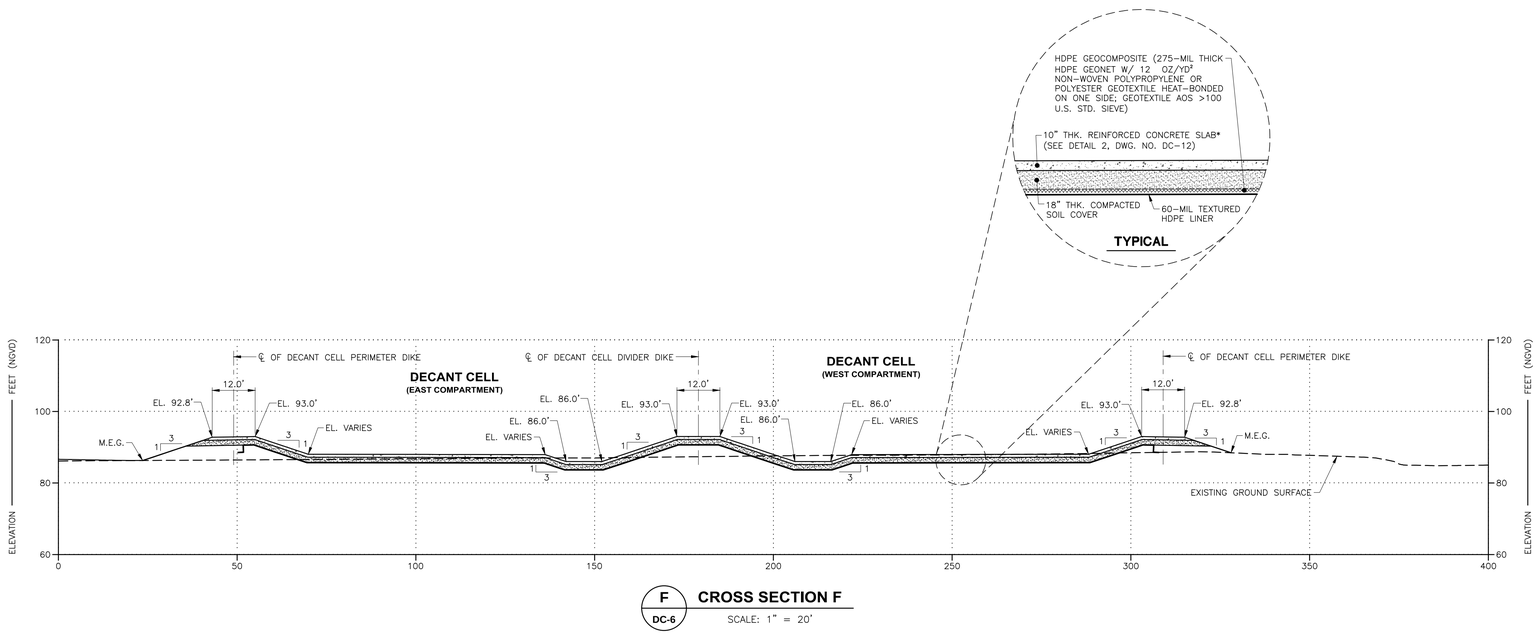
DRAWING NO. DC-7

T:\Corporate\12\12-13-0166\DECANT CELL_Current Sheet Set\DC-7 DECANT CELL GRAVEL FILTER DETAILS.dwg 11/19/2013 10:04:20 AM, Paula.Soto



E / **DC-6** **CROSS SECTION E**

SCALE: 1" = 20'



F / **DC-6** **CROSS SECTION F**

SCALE: 1" = 20'

* EXPANSION JOINTS, CONTROL JOINTS AND REINFORCEMENT DETAILS ARE PROVIDED ON DRAWING NUMBERS DC-11 AND DC-12.

REVISION	DATE	DESCRIPTION	APPR'D
P3	10/11/13	ISSUED FOR CONSTRUCTION	
P2	08/07/13	ISSUED FOR BID	
P1	05/03/13	ISSUED FOR PERMITTING	
P0	04/15/13	ISSUED FOR PRELIMINARY REVIEW MEETING WITH FDEP	

	NAME	DATE		NAME	DATE
DESIGNED BY	JM	04/29/13	CHECKED BY	DTC	04/29/13
DRAWN BY	AAD	04/29/13	CHECKED BY	MH	04/29/13
FILE NO.: 12-13-0166			SCALE: AS SHOWN		
APPROVED BY:					

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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DECANT CELL

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

DECANT CELL FINAL GRADING CROSS SECTIONS

DRAWING NO. **DC-10**

T:\Corporate\12\12-13-0166\DECANT CELL_Current Sheet Set\DC-10 DECANT CELL FINAL GRADING CROSS SECTIONS.dwg 11/19/2013 10:06:31 AM, Paula.Soto

Appendix 5

Mikon Corporation 2013, 2014, 2015, and 2016 Annual Topographic Surveys for Combustion Waste Storage Landfill

MIKON CORPORATION Consulting Engineers

October 30, 2013

Mr. Brian Moore
Orlando Utilities Commission
5100 South Alafaya Trail
Orlando, FL 32831-2001

RE: Stanton Energy Center
Ash Landfill

Dear Mr. Moore:

We have completed the volume determinations of the Fly Ash Landfill at the Stanton Energy Center. The volume is reported 2 ways: total volume referenced to base, and total volume referenced to constant elevation 82 feet. Total volume includes active and capped areas. The results are as follows:

	Total Volume (cy)[1]	
	Fill	Cut
Volume referenced to base	7,356,200	707
Volume referenced to elevation 82 feet	7,453,968	28

[1] Total = Active Area + Capped Area

Attached is a site topography drawing both in paper format and on disk. Should you have any questions regarding this report or if we may be of further assistance, please do not hesitate to contact us. We appreciate the opportunity to provide our services to Orlando Utilities.

Sincerely,

MIKON Corporation

Bryan W. Davis

Eric E. Coustry

BWD/EEC:js / #113004-3
Attachment

4414 B South 40th Street, St. Joseph, MO 64503 816.364.2890 fax 816.364.2126 mikon@mikoncorp.com

SCALE 1" = 300'
2' CONTOUR INTERVAL

0 300

NORTH

DATE OF SURVEY: SEPTEMBER 14 - 15, 2013

SHEET NOTES:

1. FIELD WORK AND MAPPING FOR LANDFILL TOPOGRAPHY PROVIDED BY MIKON CORPORATION.
2. A FABRIC LINER HAD BEEN INSTALLED IN A PORTION OF THE SOUTHWEST CORNER OF THE LANDFILL (SHOWN AS LINER AREA IN DRAWING). CONTOURS IN THIS AREA WILL BE DEVELOPED WHEN THE LINER AREA IS SURVEYED NEXT YEAR.
3. EXPANSION AREA CONTOURS DEPICT SURFACE OF SOIL FILL AT TIME OF SURVEY.

PERMITTED AREA = 315.1 ACRES

ASH LANDFILL
- CAPPED AREA = 59.4 ACRES
- ACTIVE AREA = 23.1 ACRES
- LINER AREA = 8.3 ACRES
- TOTAL AREA = 90.8 ACRES

LANDFILL EXPANSION AREA
- EXPANSION AREA = 27.4 ACRES

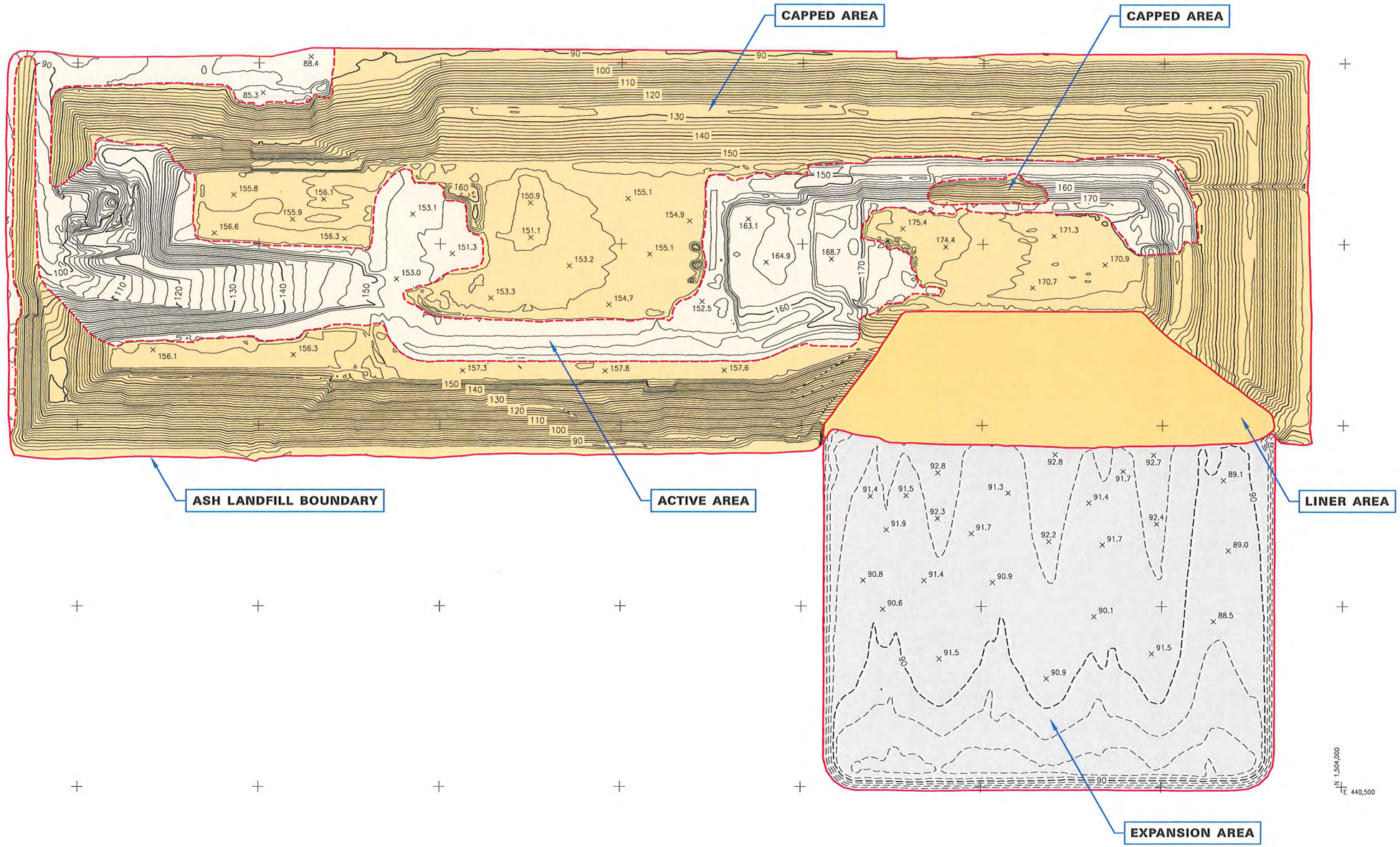
N 1,507,500 E 443,000

N 1,504,000 E 443,000

N 1,508,000 E 442,500

N 1,508,000 E 440,500

N 1,504,000 E 440,500



PROJECT NO. 113004-3
FILE NAME: STANTON_LF_9_13
DRW. BY: DHS
CKD. BY: RLP

ORLANDO UTILITIES COMMISSION
5100 ALAFAYA TRAIL
ORLANDO, FLORIDA 32831

MIKON CORPORATION
4414 SOUTH 40th STREET, Suite B
ST. JOSEPH, MISSOURI 64503
816-364-2880 fax 816-364-2126
email: mikon@mikoncorp.com

ORLANDO UTILITIES COMMISSION

STANTON ENERGY CENTER; ORLANDO, FLORIDA

ASH LANDFILL TOPOGRAPHY

DATE: 10/30/13

SHEET 1 of 1

MIKON CORPORATION Consulting Engineers

September 25, 2014

Mr. Brian Moore
Orlando Utilities Commission
5100 South Alafaya Trail
Orlando, FL 32831-2001

RE: Stanton Energy Center
Ash Landfill

Dear Mr. Moore:

We have completed the volume determinations of the Fly Ash Landfill at the Stanton Energy Center. The volume is reported 2 ways: total volume referenced to base, and total volume referenced to constant elevation 82 feet. Total volume includes active and capped areas. The results are as follows:

	Total Volume (cy)[1]	
	Fill	Cut
Volume referenced to base	7,694,607	592
Volume referenced to elevation 82 feet	7,790,925	28

[1] Total = Active Area + Capped Area

Attached is a site topography drawing both in paper format and on disk. Should you have any questions regarding this report or if we may be of further assistance, please do not hesitate to contact us. We appreciate the opportunity to provide our services to Orlando Utilities.

Sincerely,

MIKON Corporation

Bryan W. Davis

David J. Kramer

BWD/DJK:js / #114004-3
Attachment

4414 B South 40th Street, St. Joseph, MO 64503 816.364.2890 fax 816.364.2126 mikon@mikoncorp.com

NORTH

SCALE 1" = 300'
2' CONTOUR INTERVAL

0 300

PERMITTED AREA = 315.1 ACRES

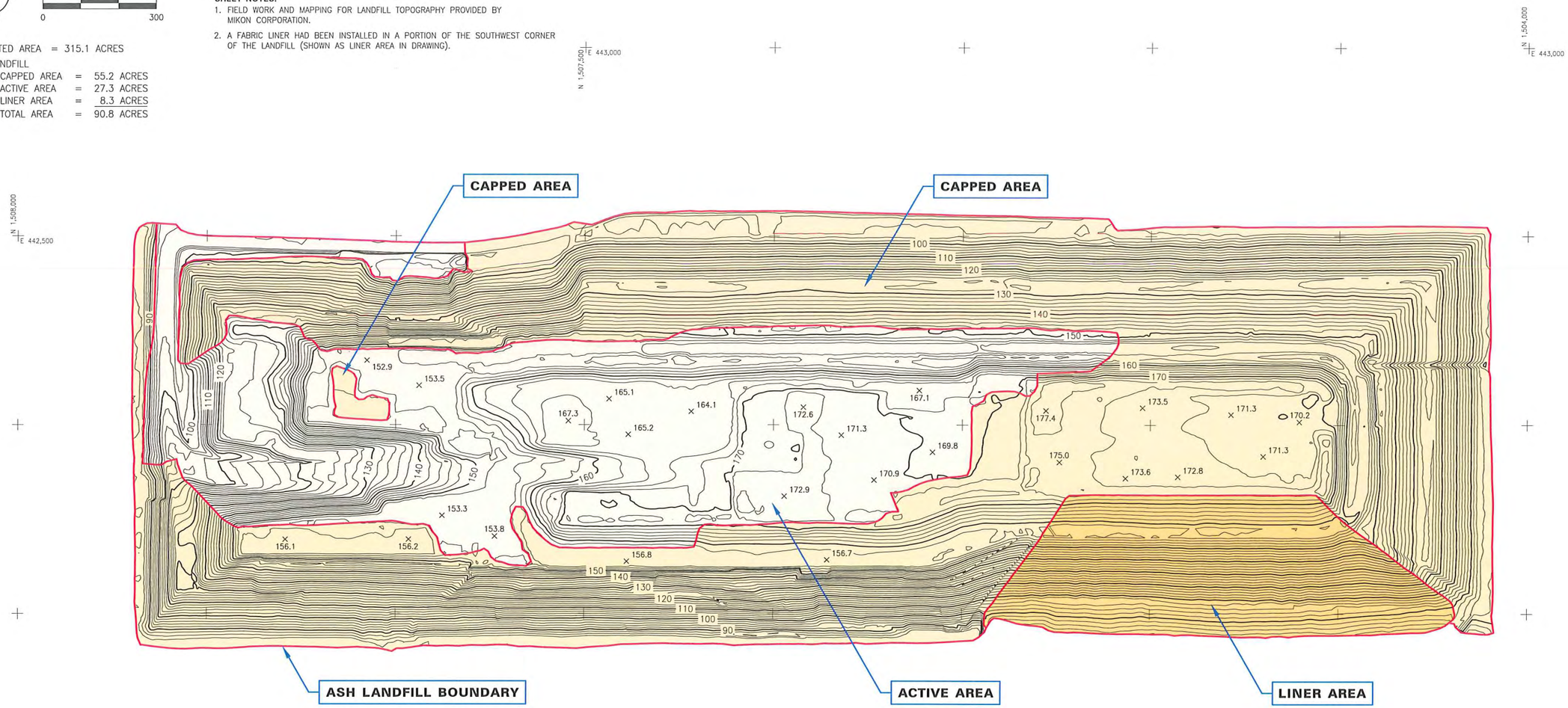
ASH LANDFILL

CAPPED AREA	=	55.2 ACRES
ACTIVE AREA	=	27.3 ACRES
LINER AREA	=	8.3 ACRES
TOTAL AREA	=	90.8 ACRES

DATE OF SURVEY: AUGUST 28 - 29, 2014.

SHEET NOTES:

1. FIELD WORK AND MAPPING FOR LANDFILL TOPOGRAPHY PROVIDED BY MIKON CORPORATION.
2. A FABRIC LINER HAD BEEN INSTALLED IN A PORTION OF THE SOUTHWEST CORNER OF THE LANDFILL (SHOWN AS LINER AREA IN DRAWING).



PROJECT NO. 114004-3
FILE NAME: STANTON_LF_8_14
DRW. BY: DHS | CKD. BY: BJP

ORLANDO UTILITIES COMMISSION
5100 ALAFAYA TRAIL
ORLANDO, FLORIDA 32811

MIKON CORPORATION
4414 SOUTH 40th STREET, Suite B
ST. JOSEPH, MISSOURI 64503
816-364-2880 fax: 816-364-2126
email: mikon@mikoncorp.com

ORLANDO UTILITIES COMMISSION

STANTON ENERGY CENTER; ORLANDO, FLORIDA

ASH LANDFILL TOPOGRAPHY

DATE: 9/24/14

SHEET 1 of 1

MIKON CORPORATION Consulting Engineers

December 29, 2015

Mr. Brian Moore
Orlando Utilities Commission
5100 South Alafaya Trail
Orlando, FL 32831-2001

RE: Stanton Energy Center
Ash Landfill

Dear Mr. Moore:

We have completed the volume determinations of the Fly Ash Landfill at the Stanton Energy Center. The volume of the vertical area is reported 2 ways: total volume referenced to base, and total volume referenced to constant elevation 82 feet. Total volume includes active and capped areas. The reported total volume of the horizontal area is referenced to base. The results are as follows:

VOLUMES

Dates of Survey: December 10-12, 2015

Area	Reference Datum	Type of Volume	Fill (cy)	Cut (cy)
Vertical	Base [1]	Total	8,321,093	11
Vertical	Elev. 82.0 [2]	Total	8,427,227	0
Horizontal	Base [3]	Total	140,131	7

[1] Base model developed by MIKON Corporation from survey data provided by OUC.
[2] Reference datum = constant elevation 82.0', per Client.
[3] Base model developed by MIKON Corporation from survey data obtained September 2013.

Attached is a site topography drawing both in paper format and on disk. Should you have any questions regarding this report or if we may be of further assistance, please do not hesitate to contact us. We appreciate the opportunity to provide our services to Orlando Utilities.

Sincerely,

MIKON Corporation

Bryan W. Davis

David J. Kramer

BWD/DJK:js / #115002-4
Attachments: Landfill Topography Drawing (11 x 17) and CD

4414 B South 40th Street, St. Joseph, MO 64503 816.364.2890 fax 816.364.2126 mikon@mikoncorp.com

SCALE 1" = 300'
2' CONTOUR INTERVAL

0 300

NORTH

PERMITTED AREA = 315.1 ACRES

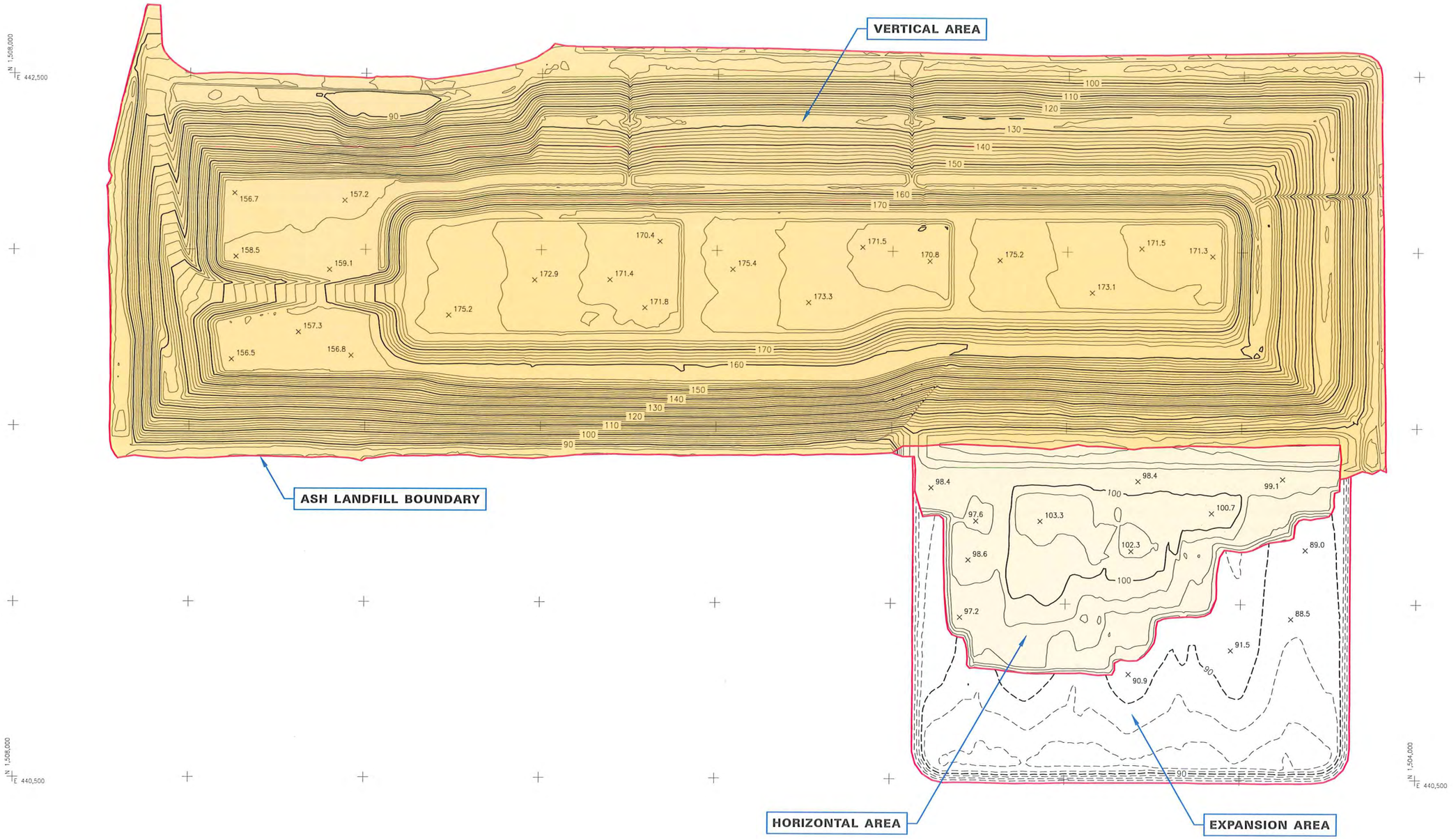
ASH LANDFILL

VERTICAL AREA	=	93.4 ACRES
HORIZONTAL AREA	=	13.0 ACRES
TOTAL AREA	=	106.4 ACRES

DATE OF SURVEY: DECEMBER 10 - 12, 2015

SHEET NOTES:

1. FIELD WORK AND MAPPING FOR LANDFILL TOPOGRAPHY PROVIDED BY MIKON CORPORATION.
2. EXPANSION AREA CONTOURS DEPICT SURFACE OF SOIL FILL AT TIME OF SURVEY ON SEPTEMBER 14 & 15, 2013.



PROJECT NO. 115002-4
FILE NAME: STANTON_LF_12_15
DRW. BY: DHS | CKD. BY: DJK

ORLANDO UTILITIES COMMISSION
500 AVEX TRAIL
ORLANDO, FLORIDA 32831

MIKON CORPORATION
4414 SOUTH 40th STREET, Suite B
ST. JOSEPH, MISSOURI 64503
816-364-2890 fax: 816-364-2126
email: mikon@mikoncorp.com

ORLANDO UTILITIES COMMISSION

STANTON ENERGY CENTER

ASH LANDFILL TOPOGRAPHY

DATE: 12/28/15

SHEET 1 of 1

MIKON CORPORATION Consulting Engineers

September 14, 2016

Mr. Brian Moore
Orlando Utilities Commission
5100 South Alafaya Trail
Orlando, FL 32831-2001

RE: Stanton Energy Center
Ash Landfill

Dear Mr. Moore:

We have completed the volume determinations of the Fly Ash Landfill at the Stanton Energy Center. The volume of the horizontal area is reported as total volume referenced to base. Total volume includes active and capped (if any) areas. The results are as follows:

VOLUMES

Date of Survey: September 12, 2016

Area	Reference Datum	Type of Volume	Fill (cy)	Cut (cy)
Horizontal	Base [1]	Total	353,301	19

[1] Base model developed by MIKON Corporation from survey data obtained September 2013.

Attached is a site topography drawing both in paper format and on disk. Should you have any questions regarding this report or if we may be of further assistance, please do not hesitate to contact us. We appreciate the opportunity to provide our services to Orlando Utilities.

Sincerely,

MIKON Corporation

Bryan W. Davis

David J. Kramer

BWD/DJK:js / #116003-3
Attachments: Landfill Topography Drawing (11 x 17) and CD

4414 B South 40th Street, St. Joseph, MO 64503 816.364.2890 fax 816.364.2126 mikon@mikoncorp.com

SCALE 1" = 300'
2' CONTOUR INTERVAL

NORTH

0 300

PERMITTED AREA = 315.1 ACRES

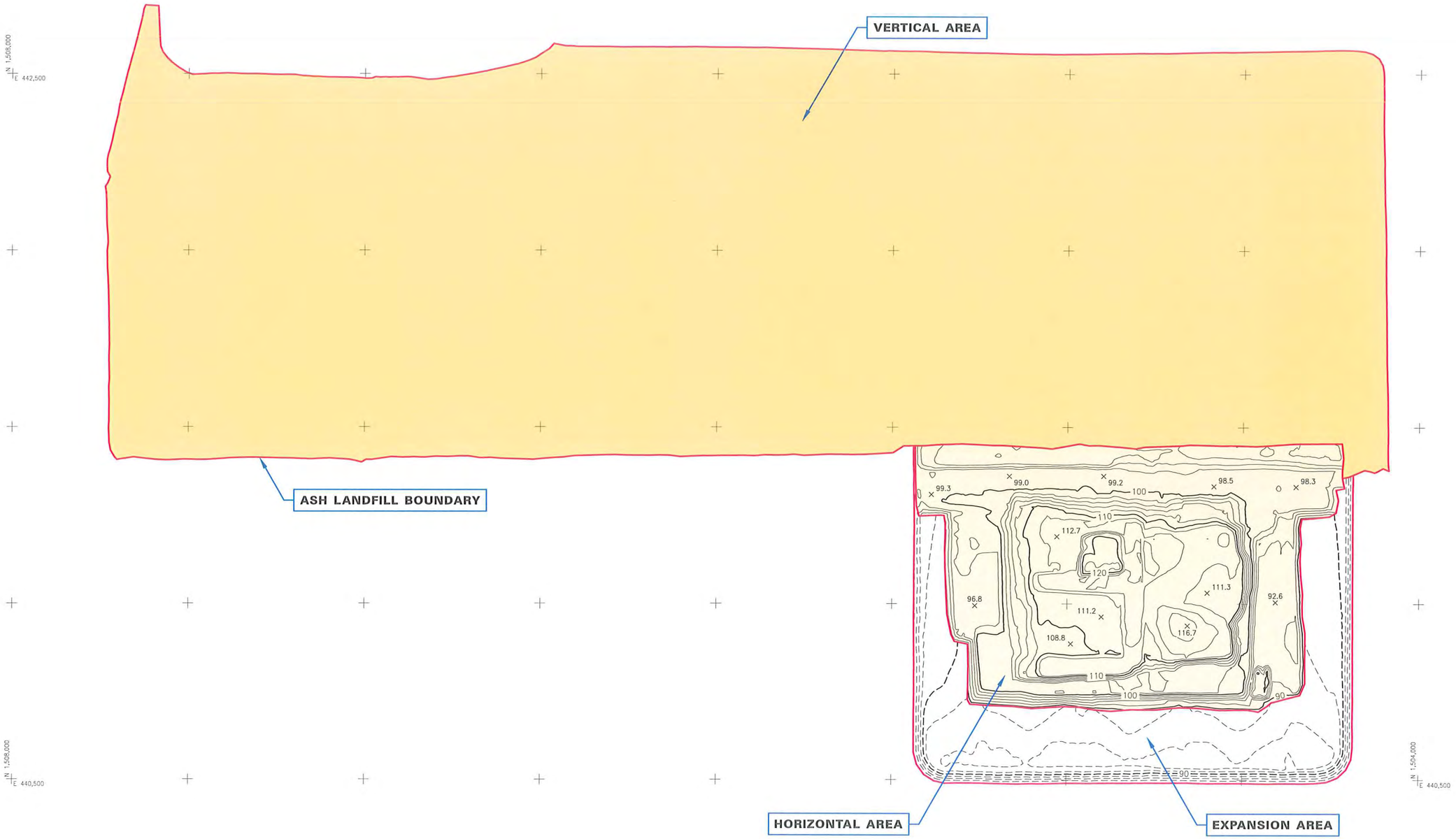
ASH LANDFILL

VERTICAL AREA	=	93.4 ACRES
HORIZONTAL AREA	=	17.9 ACRES
TOTAL AREA	=	111.3 ACRES

DATE OF SURVEY: SEPTEMBER 12, 2016

SHEET NOTES:

1. FIELD WORK AND MAPPING FOR LANDFILL TOPOGRAPHY PROVIDED BY MIKON CORPORATION.
2. EXPANSION AREA CONTOURS DEPICT SURFACE OF SOIL FILL AT TIME OF SURVEY ON SEPTEMBER 14 & 15, 2013.



PROJECT NO. 116003-3
FILE NAME: STANTON_LF_9_16
DRW. BY: DHS CKD. BY: DJK

ORLANDO UTILITIES COMMISSION
5100 ALAFAYA TRAIL
ORLANDO, FLORIDA 32831

MIKON CORPORATION
414 SOUTH 4TH STREET, SUITE B
ST. JOSEPH, MISSOURI 64503
816-364-2880 fax: 816-364-2126
email: mikon@mikoncorp.com

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER

ASH LANDFILL TOPOGRAPHY

DATE: 9/14/16

SHEET 1 of 1

Appendix 6

Screen Displays from FGD Sludge Conditioning Facility Control Room

Screen displays on the following pages include**:**

- Silos and Thickeners
- Unit 1 Vacuum Filters
- Unit 2 Vacuum Filters
- Mixers and Discharge Conveyors

MAIN MENU 1 | MAIN MENU 2 | TURBINE MENU | COMMON MENU | TRAIN A & C FA/CVY SY | MIX & DSCH CONVEYOR | SEC-1 VAC FILTERS | SEC-2 VAC FILTERS | THICKNER 1A UNDFLW | THICKNER 1B UNDFLW | THICKNER 1C UNDFLW | U1 RTN/SEAL WTR SYS | U2 RTN/SEAL WTR SYS

07/01/15 16:47:14

SCRUBBER SOLIDS

OVATION

XXXXX XXXX
SEC-1

471 MW
SEC-2

DRIVE TORQUE 31 PCT
SEP-1A
91 PCT
RAKE POS

1A1 — 39 — 57 — 354 BGPM — -0 % SL
1A2 — 40 — 60 — -0 GPM — 58 — -1 % SL
1A3 — 41 — 61 — 354 BGPM — 59 — -0 % SL
62

DRIVE TORQUE 41 PCT
SEP-1B
19 PCT
RAKE POS

1B1 — 42 — 66 — -4 BGPM — 63 — -0 % SL
1B2 — 43 — 67 — 212 GPM — 64 — 42 % SL
1B3 — 44 — 68 — -0 GPM — 65 — -0 % SL

DRIVE TORQUE 29 PCT
SEP-1C
0.50 PCT
RAKE POS

1C1 — 369 — 381 — 178 GPM — 378 — 48 % SL
1C2 — 368 — 380 — 1 GPM — 377 — 14 % SL
1C3 — 367 — 379 — 0 GPM — 376 — 1 % SL

HIGH LVL
22 FT OF 53 FT
LIME M/A
0 BTONS LIME

SPEED CNTRL 1

SPEED CNTRL 2

STKR 4B
0 TPH
0 TONS

1886 TONS FLY ASH 1
41 FT OF 53 FT
FLUID AIR

28 FT OF 53 FT
FLUID AIR
FLY ASH 2

1 — 2 — 356 — 358 — 360 — 361

3 — 355 — 7 — 8 — 357 — 359

0 TPH — 0.13 TPH — -0 TPH — 0 TPH — -0 TPH — -0 TPH

2A — 2C — 1A — 1B — 1C — 1D

7A 0 TONS — 7C 0 BTONS — 5D 0 TONS

5A 0 TONS — 5C 0 TONS

5B 0 TONS

6B — 6C

M 6 — M 412

6A

M 5 — M 411 — M 363

3A — 1B — 3B — 1C — 3C

2B — 2C

1A — 2A -0.0 IN — -0.0 IN — 2D 50 FPCT

-0.0 IN — 2F 19 PCT — 1D — 2 PCT — 2E

STKR 4A
-0 TPH
856 TONS

FLYASH M/A

RADIAL STACKER

STEAM TEMP	STEAM FLOW	STEAM PRESS	FUR PRESS	GEN MW	AIR FLOW	FUEL FLOW	WATER FLOW	DRUM LEVEL	BFPT SPEED
1007 DEGF	3336 KLBH	2400 PSI	-0.71 INWC	471 MW	3931 KLBH	73 PCT	3104 KLBH	-0.04 IN	5383 RPM

07/01/15 16:51:38

SEC-1 VACUUM FILTERS

OVATION

1ASEG02

BLOWER 1A NP -0.0 IN LEVEL 50 PCT SPEED
JOG LOCAL
SEP 2A
REMOTE NP JOG LOW LEVEL
MIX 2A
REMOTE JOG

BLOWER 1B NP -0.0 IN LEVEL 50 PCT SPEED
JOG LOCAL
SEP 2B
REMOTE NP LOW LEVEL
MIX 2B
REMOTE

BLOWER 1C NP -0.5BIN LEVEL 50 PCT SPEED
JOG LOCAL
SEP 2C
REMOTE NP LOW LEVEL
MIX 2C
REMOTE

THKNR UNFLW PUMPS

VACUUM FILTERS

NP CONVEYOR 1A JOG
NP CONVEYOR 1B
NP CONVEYOR 1C

MIX-3A
MIX-3B
MIX-3C

SERVICE WATER
0BPCT

NP EXH 2A REMOTE S 24
RECEIVER 2A
REMOTE P2A S 27

NP EXH 2B REMOTE S 25
RECEIVER 2B
REMOTE P2B S 28

NP EXH 2C REMOTE S 26
RECEIVER 2C
REMOTE P2C S 29

VACUUM FILTER FILTRATE PUMPS

RETURN WTR TANK 3

STEAM TEMP	STEAM FLOW	STEAM PRESS	FUR PRESS	GEN MW	AIR FLOW	FUEL FLOW	WATER FLOW	DRUM LEVEL	BFPT SPEED
1005 DEGF	3337 KLBH	2401 PSI	-0.67 INWC	471 MW	3922 KLBH	73 PCT	3108 KLBH	-0.40 IN	5388 RPM

07/01/15 16:52:11

SEC-2 VACUUM FILTERS

OVATION ASEG02

THKNR UNFLW PUMPS

50FPCT 0BPCT LEVEL SPEED SEP 2D

2 PCT -0 PCT LEVEL SPEED SEP 2E

50FPCT -1BPCT LEVEL SPEED SEP 2F

VACUUM FILTERS

REMOTE NP REMOTE MIX 2D

REMOTE NP REMOTE MIX 2E

REMOTE NP REMOTE MIX 2F

NP JOG CONVEYOR 1A NP

NP CONVEYOR 1D

MIX-3A

MIX-3C

SERVICE WATER

0 GPM

NP EXH 2D S 308 NP REMOTE

NP EXH 2E S 312 LOCAL

NP EXH 2F S 316 LOCAL

RECEIVER 2D REMOTE 2D

RECEIVER 2E REMOTE 2E

RECEIVER 2F LOCAL 2F

VACUUM FILTER FILTRATE PUMPS

RETURN WTR TANK 3

STEAM TEMP	STEAM FLOW	STEAM PRESS	FUR PRESS	GEN MW	AIR FLOW	FUEL FLOW	WATER FLOW	DRUM LEVEL	BFPT SPEED
1005 DEGF	3337 KLBH	2401 PSI	-0.69 INWC	471 MW	3913 KLBH	73 PCT	3097 KLBH	-0.32 IN	5383 RPM

07/01/15 16:43:31

MIXERS & DISCHARGE CONVEYORS

OVATION

ASEG06

TRANSFER CVY 6A

TRANSFER CVY 6B

TRANSFER CVY 6C

VAC FLT DISCH CVY-1C

VAC FLT DISCH CVY-1D

412

363

411

SCRUBBER SOLIDS SEAL WTR PUMPS

VAC FLT DISCH CVY-1A & CVY-1B

VAC FILTER SEAL WATER PUMPS

NP

M

6A

6B

6C

STACKER CVY-4B

MIXER DC 3A

STABILIZATION MIXER-3A

MIXER DC 3B

STABILIZATION MIXER-3B

MIXER DC 3B

STABILIZATION MIXER-3C

CVY-2A

CVY-2B

CVY-2C

RADIAL STACKER CVY-4A

CVY-3B

CVY-3A

0 TPH

0 TONS

FINISH TREND

RADIAL STACKER

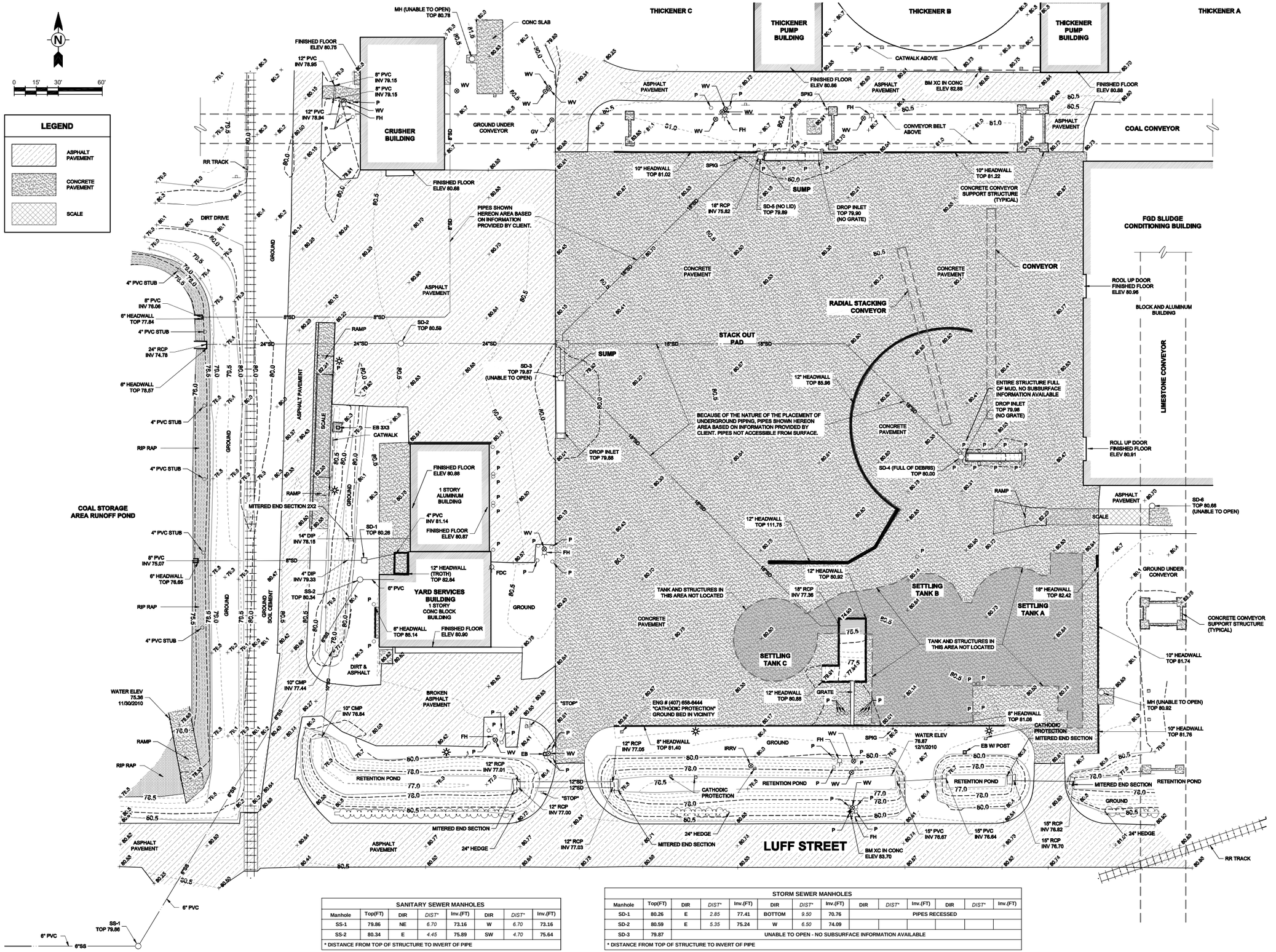
-0 TPH

856 TONS

STEAM TEMP	STEAM FLOW	STEAM PRESS	FUR PRESS	GEN MW	AIR FLOW	FUEL FLOW	WATER FLOW	DRUM LEVEL	BFPT SPEED
1004 DEGF	3337 KLBH	2401 PSI	-0.45 INWC	471 MW	3905 KLBH	73 PCT	3108 KLBH	0.10 IN	5384 RPM

Appendix 7

Survey of the Stack Out Pad Area



SANITARY SEWER MANHOLES							
Manhole	Top(FT)	DIR	*DIST**	Inv.(FT)	DIR	*DIST**	Inv.(FT)
SS-1	79.86	NE	*6.70*	73.16	W	*6.70*	73.16
SS-2	80.34	E	*4.45*	75.89	SW	*4.70*	75.64

* DISTANCE FROM TOP OF STRUCTURE TO INVERT OF PIPE

STORM SEWER MANHOLES												
Manhole	Top(FT)	DIR	*DIST**	Inv.(FT)	DIR	*DIST**	Inv.(FT)	DIR	*DIST**	Inv.(FT)	DIR	*DIST**	Inv.(FT)
SD-1	80.26	E	*2.85*	77.41	BOTTOM	*9.50*	70.76	PIPES RECESSED					
SD-2	80.59	E	*5.35*	75.24	W	*6.50*	74.09						
SD-3	79.87	UNABLE TO OPEN - NO SUBSURFACE INFORMATION AVAILABLE											

* DISTANCE FROM TOP OF STRUCTURE TO INVERT OF PIPE

ABBREVIATIONS

EM	ELECTRIC METER	JBL	JURISDICTIONAL BOUNDARY	PG	PAGE	TEL	TELEPHONE
ET	ELECTRIC TRANSFORMER		LINE	PK	PK NAIL	TP	TRAVERSE POINT
F	FOUND	(M)	MEASURED	RCP	REINFORCED CONC PIPE	TSC	TRAFFIC SIGNAL CONTROL
FF	FINISHED FLOOR	MB	MAILBOX	RR	RAILROAD	TSP	TRAFFIC SIGNAL POLE
FH	FIRE HYDRANT	MES	MITERED END SECTION	RW	RECLAIMED WATER	TW	TIME WARNER
FO	FIBER OPTIC	MW	MONITORING WELL	S	SET	UE	UNDERGROUND UTILITY LINES
G	GAS	ND	NAIL & DISK	SC	SECTION CORNER		
GM	GAS METER	NL	NAIL	SH	SPRINKLER HEAD	W	WATER
GV	GAS VALVE	OHE	OVERHEAD UTILITY LINES	SMH	SANITARY MANHOLE	WH	WATER HYDRANT
INV	INVERT	OR	OFFICIAL RECORDS	SS	SANITARY SEWER	WM	WATER METER
IP	IRON PIPE	P	POST	SD	STORM DRAIN	WV	WATER VALVE
IR	IRON ROD	(P)	PER PLAT	SV	SANITARY SEWER VALVE	XC	X CUT
IRRV	IRRIGATION VALVE	PB	PLAT BOOK	TB	TELEPHONE RISER		

ANT	ANTENNA	UTILITY MARKER (AS SHOWN)	
BM	BENCHMARK	UTILITY MANHOLE (AS SHOWN)	
(C)	CALCULATED	UTILITY METER (AS SHOWN)	
CO	CLEANOUT	UTILITY RISER (AS SHOWN)	
CONC	CONCRETE	UTILITY VALVE (AS SHOWN)	
CM	CONCRETE MONUMENT	UTILITY POLE (AS SHOWN)	
CMP	CORREGATED METAL PIPE	WELL	
CPP	CORREGATED PLASTIC PIPE		
DIP	DUCTILE IRON PIPE		
DH	DRILL HOLE		
EB	ELECTRIC RISER		
ELEC	ELECTRIC		

LEGEND

BM	BENCHMARK	CO	CLEANOUT
ND	NAIL & DISK		DECIDUOUS TREE
TP	TRAVERSE POINT		ELECTRIC TRANSFORMER
F	FOUND IRON (TYPE)		EVERGREEN TREE
S	SET IRON (TYPE)		FIRE HYDRANT
F	FOUND MONUMENT (TYPE)		FLAG (AS SHOWN)
S	SET MONUMENT (TYPE)		GUY ANCHOR
SC	SECTION CORNER		LIGHT POLE
MB	MAIL BOX		
	PALM TREE		
P	POST		
	SATEUITE DISH		
	SPIGOT		
	SPRINKLER HEAD		
	TRAFFIC SIGN		

TETRA TECH
www.tetratech.com
201 EAST PINE STREET, SUITE 1000
ORLANDO, FL 32801
PHONE (407) 839-3955 FAX: (407) 839-3790

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

MARK	DATE	DESCRIPTION	BY

Client: ORLANDO UTILITIES COMMISSION
Proj. Loc.: ORANGE COUNTY, FL

SPECIFIC PURPOSE & TOPOGRAPHIC SURVEY OF THE

STANTON ENERGY CENTER
ORLANDO, FL
SECTION 13 - T 23 S - R 31 E

Project No.:	200-08391-11001
Designed By:	N/A
Drawn By:	CIS
Checked By:	LEJ

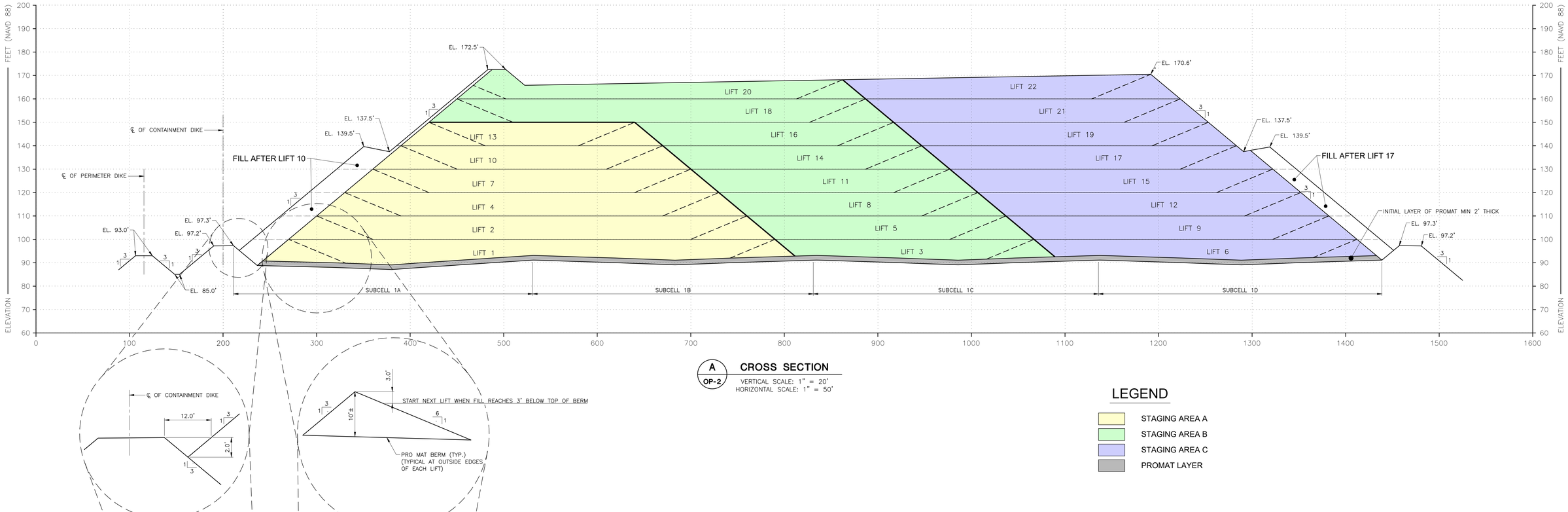
V102

Copyright: Tetra Tech

1/5/2011 2:06:28 PM - P:\ENV\08391\200-08391-11001\CAD\MODEL\FILES\V-XP SURVEYBASE.DWG - SANFORD, CHAD\WICK

Appendix 8

Drawings Showing Conceptual Sequence of Landfilling

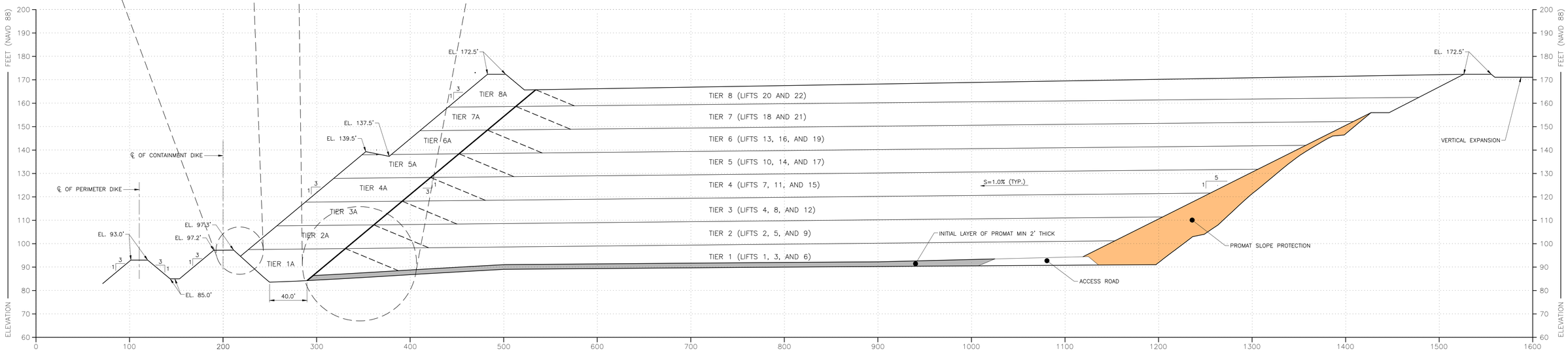


A **OP-2** **CROSS SECTION**

VERTICAL SCALE: 1" = 20'
HORIZONTAL SCALE: 1" = 50'

LEGEND

- STAGING AREA A
- STAGING AREA B
- STAGING AREA C
- PROMAT LAYER



B **OP-2** **CROSS SECTION**

VERTICAL SCALE: 1" = 20'
HORIZONTAL SCALE: 1" = 50'

REVISION	DATE	DESCRIPTION	APPR'D

REVISION	DATE	DESCRIPTION	APPR'D

	NAME	DATE		NAME	DATE
DESIGNED BY	PAK	08/04/15	CHECKED BY	FKC	08/04/15
DRAWN BY	CLD	08/04/15	CHECKED BY	–	–
FILE NO.: 13-13-0166			SCALE: AS SHOWN		
APPROVED BY:					

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

OUC The Reliable One®

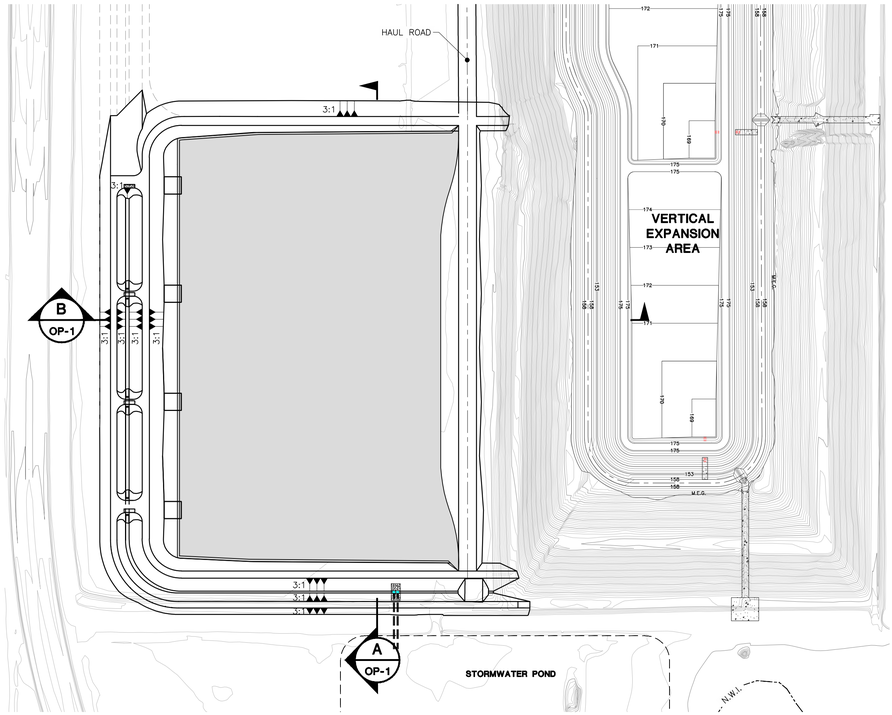
HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

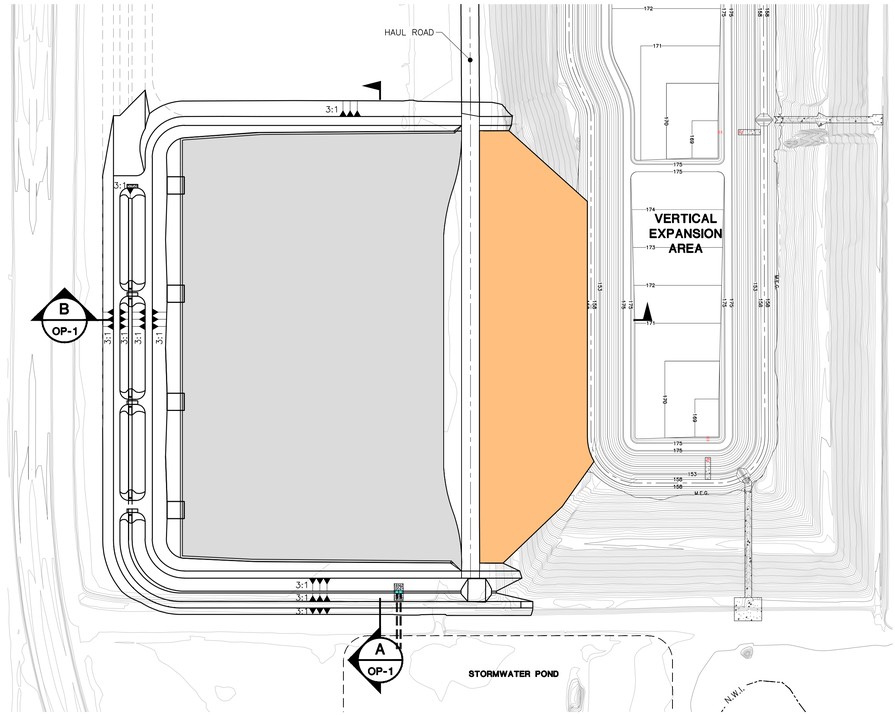
FILL SEQUENCING CROSS SECTIONS

DRAWING NO. **OP-1**

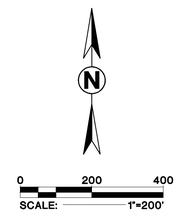
T:\Corporate\13\13-0166\LANDFILL OPERATION PLAN_CURRENT\Cross Sections A and C.dwg 8/28/2015 3:44:59 PM, Chris.Drew

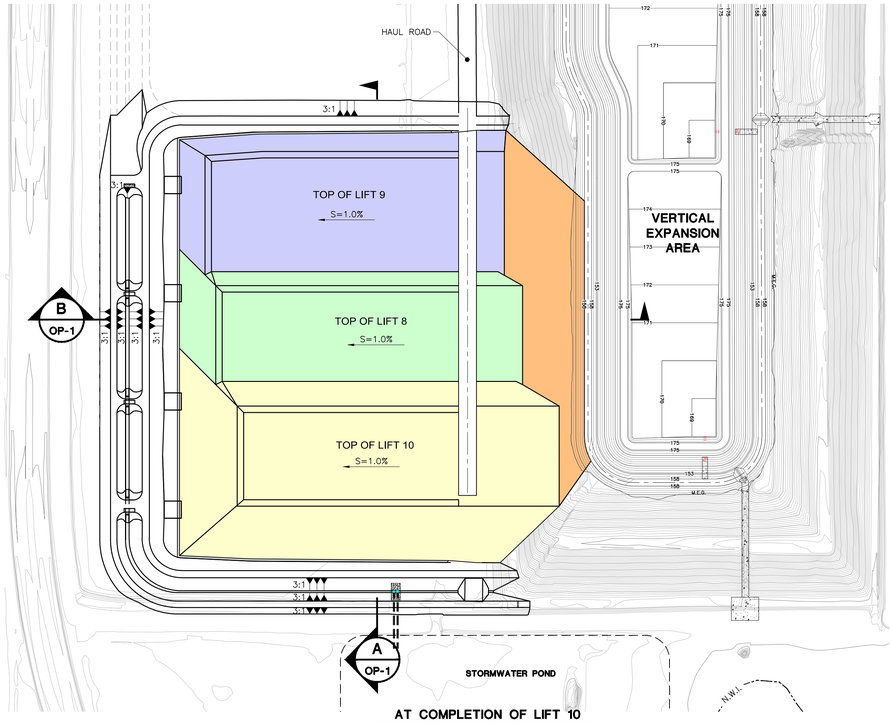


AFTER PLACEMENT OF INITIAL LAYER OF PROMAT

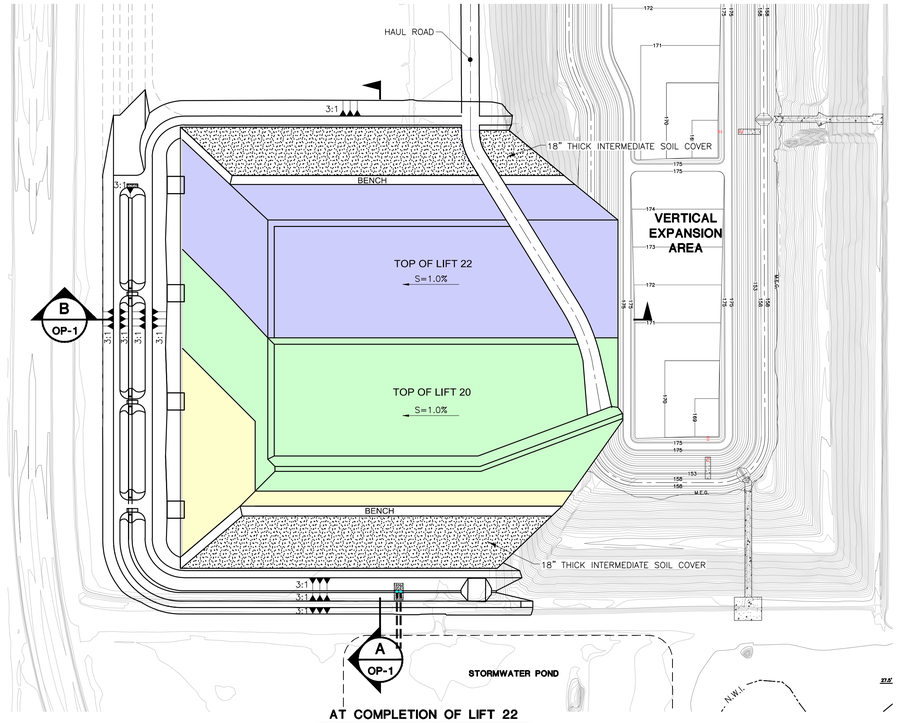


AFTER PLACEMENT OF PROMAT SLOPE PROTECTION





AT COMPLETION OF LIFT 10



AT COMPLETION OF LIFT 22

REVISION	DATE	DESCRIPTION	APPR'D	REVISION	DATE	DESCRIPTION	APPR'D

	NAME	DATE		NAME	DATE
DESIGNED BY	PAK	08/04/15	CHECKED BY	FKC	08/04/15
DRAWN BY	PS	08/04/15	CHECKED BY	–	–
FILE NO.: 13-13-0166			SCALE: AS SHOWN		
APPROVED BY:					

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

OUC The Reliable One®

HORIZONTAL EXPANSION OF COMBUSTION WASTE STORAGE AREA - CELL 1

OUC STANTON ENERGY CENTER
ORANGE COUNTY, FLORIDA

FILL SEQUENCING PLANS

DRAWING NO. OP-2

T:\Corporate\13\13-13-0166\LANDFILL OPERATION PLAN_CURRENT\OP-2 FILL SEQUENCING PLAN2.dwg 2015/08/28 10:45 AM, Drew, Chris

Appendix 9

Stormwater Management System Inspection Instructions and Checklist

INSTRUCTIONS FOR STORMWATER MANAGEMENT SYSTEM INSPECTIONS

An inspection log with explanations of observations made will document each inspection and become part of the operating records for the facility. Inspection logs will be in a checklist/fill-in-the-blank format. All site inspection reports will include the date, place, time, weather, and names of the individual(s) conducting the inspection.

A typical inspection log form is attached. The log is formatted to ensure that a specific itinerary is followed, and that all pertinent parts of the system identified are inspected. The inspection logs will be supplemented, as necessary, with written reports documenting problem areas and maintenance actions performed.

The inspection logs will be completed for each of the specific areas listed in the inspection schedule and will be maintained in a binder. Separate written reports, documenting maintenance activities and remedial actions, shall be recorded together with these logs.

Quarterly and post-storm event Inspections should include i) the culverts and ditch on the west side of Cell 1 including the stormwater discharge pipes from the sump risers; ii) the stormwater runoff ditch south of Cell 1; iii) the wet detention pond south of Cell 1 including inflow and outflow structures and bleed down; iv) the clean water ditch on the east side of the CWSA; and v) the natural drainage ways downstream from the wet detention pond and the clan water ditch.

Inspection Checklist Form				
SITE:				**WEATHER:**
DATE:				**INSPECTOR :**
	CONDITIONS TO CHECK	**YES**	**NO**	**DETAILS OF PROBLEM/DEFECT AND CORRECTIVE ACTION(S)**
				IMPLEMENTED AND DATE
DO NOT DIG OR DRIVE OBJECT				
WITHIN LINED AREAS INSIDE				
OF ANCHOR TRENCH				
STORMWATER DRAINAGE	Any Obstructions	❑	❑	
AND CONVEYANCE SYSTEMS	Excessive Bank Erosion	❑	❑	
	Ponding	❑	❑	
• SWALES, DITCHES, AND CHANNELS	Adequate Vegetation	❑	❑	
• INTAKE STRUCTURES	Excessive Vegetation	❑	❑	
• OUTLET ENDS	Excessive Scouring	❑	❑	
• CULVERTS	Excessive Siltation, Obstructions, Damage	❑	❑	
	Any Significant Differential Settling or Ponding	❑	❑	
	Settling and Ponding	❑	❑	
STORMWATER WET DETENTION POND	Any Obstructions	❑	❑	
	Excessive Erosion	❑	❑	
• BOTTOM SURFACE	Excessive Siltation	❑	❑	
• CONTROL STRUCTURE INTAKE & OUTLET	Adequate Vegetation	❑	❑	
• STORMWATER DISCHARGE OVER WEIR	Excessive Vegetation	❑	❑	
• TOP OF STRUCTURE	Did any discharge over weir occur? List date.	❑	❑	
• ORIFICE	Was a water sample obtained from discharge?	❑	❑	
	Was quarterly report submitted to FDEP regarding discharge?	❑	❑	

Appendix 10

Fugitive Dust Control Plan

CCR Fugitive Dust Control Plan
Curtis H. Stanton Energy Center
Orange County, Florida

The Orlando Utility Commission (OUC) operates the Curtis H. Stanton Energy Center which is subject to the requirements of 40 CFR Part 257, Hazardous And Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities. The requirements for a coal combustion residuals (CCR) fugitive dust control plan are set forth in § 257.80. This CCR fugitive dust control plan follows the requirements a set forth in the rule.

§ 257.80 Air criteria.

(a) The owner or operator of a CCR landfill, CCR surface impoundment, or any lateral expansion of a CCR unit must adopt measures that will effectively minimize CCR from becoming airborne at the facility, including CCR fugitive dust originating from CCR units, roads, and other CCR management and material handling activities.

(b) CCR fugitive dust control plan. The owner or operator of the CCR unit must prepare and operate in accordance with a CCR fugitive dust control plan as specified in paragraphs (b)(1) through (b)(7) of this section. This requirement applies in addition to, not in place of, any applicable standards under the Occupational Safety and Health Act.

(1) The CCR fugitive dust control plan must identify and describe the CCR fugitive dust control measures the owner or operator will use to minimize CCR from becoming airborne at the facility. The owner or operator must select, and include in the CCR fugitive dust control plan, the CCR fugitive dust control measures that are most appropriate for site conditions, along with an explanation of how the measures selected are applicable and appropriate for site conditions. Examples of control measures that may be appropriate include: locating CCR inside an enclosure or partial enclosure; operating a water spray or fogging system; reducing fall distances at material drop points; using wind barriers, compaction, or vegetative covers; establishing and enforcing reduced vehicle speed limits; paving and sweeping roads; covering trucks transporting CCR; reducing or halting operations during high wind events; or applying a daily cover.

Fugitive Dust Control Measures:

A) Water Applications and Sweeping Operations

OUC hires an on-site contractor to perform coal combustion residue (CCR) operations. The contractor will have an individual employee perform visible emission observations. Based on the experience of the observer, when visible emissions are observed, the observer will use this indicator to determine if there is a need to apply water as a dust suppressant or to remove material from paved roadways with a sweeper. Water may be applied with a water spray truck in the landfill when work activities are causing a disturbance of the erodible surface and on all roadways during operational activities. Sweeping operations may be performed on the paved haul roads whenever CCR materials build-up on the paved haul roads.

The on-site contractor will keep a daily log to show the following:

i) when and what observations are made
ii) when water is applied to the landfill
iii) when the roadways are sprayed with water
iv) when the roadways are swept
v) reasons the above control measures are not implemented, e.g., during a precipitation event.

These dust control measures will be performed until areas are observed to be sufficiently free of fugitive emissions, i.e., until observations for visible emissions do not indicate the need to apply additional fugitive dust control measures.

B) Vehicular and Equipment Speed Limits

A 15 mile per hour (mph) speed limit is posted within the plant facilities and enforced by OUC security personnel. Based on the observations of the contracted emissions observer, the speed limit for vehicular and heavy equipment travel within the plant facilities and on the haul roads may be reduced if necessary.

Time spent in non-paved areas by hauling vehicles is limited to only that necessary.

Justification:

"Water acts as a dust suppressant by forming cohesive moisture films among the discrete grains of surface material. In turn, the moisture level depends on the moisture added by natural precipitation, the moisture removed by evaporation, and moisture movement beneath the surface. The evaporation rate depends on the degree of air movement over the surface, material texture and mineralogy, and the degree of compaction or crusting. The moisture-holding capacity of the air is also important, and it correlates strongly with the surface temperature. Vehicle traffic intensifies the drying process primarily by increasing air movement over the surface."[1] *"Following the wetting of a soil or other surface material, fine particles will move to form a surface crust. The surface crust acts to hold in soil moisture and resist erosion." "Exposed soil that lacks a surface crust (e.g., a disturbed soil or a very sandy soil) is much more susceptible to wind erosion."*[2] *Application of dust suppressants, in this case water, on disturbed areas are 80% efficient in controlling PM_{10} emissions.*[3]

[1] Western Regional Air Partnership (WRAP), September 2006. *Fugitive Dust Handbook*, pg. 1-5.
[2] Ibid., pg.1-6.
[3] Ibid., pg. 8-19

(2) If the owner or operator operates a CCR landfill or any lateral expansion of a CCR landfill, the CCR fugitive dust control plan must include procedures to emplace CCR as conditioned CCR. Conditioned CCR means wetting CCR with water to a moisture content that will prevent wind dispersal, but will not result in free liquids. In lieu of water, CCR conditioning may be accomplished with an appropriate chemical dust suppression agent.

Fugitive Dust Control Measures:

All CCR materials undergo processing prior to placement in the landfill that results in a wetted product. If the material is too wet to pass a paint-filter test, it is placed in a decanting cell.

(3) The CCR fugitive dust control plan must include procedures to log citizen complaints received by the owner or operator involving CCR fugitive dust events at the facility.

The OUC Environmental Division will keep a log documenting all complaints from citizens regarding CCR fugitive dust events received by the OUC Marketing and Community Relations Division.

(4) The CCR fugitive dust control plan must include a description of the procedures the owner or operator will follow to periodically assess the effectiveness of the control plan.

The OUC Environmental Division will keep a log documenting all complaints from citizens regarding CCR fugitive dust events received by the OUC Marketing and Community Relations Division. The log will be reviewed on a monthly basis and used by OUC Environmental Division to evaluate the appropriateness of fugitive dust control measures and to modify those measures as needed.

(5) The owner or operator of a CCR unit must prepare an initial CCR fugitive dust control plan for the facility no later than **October 19, 2015**, or by initial receipt of CCR in any CCR unit at the facility if the owner or operator becomes subject to this subpart after **October 19, 2015**. The owner or operator has completed the initial CCR fugitive dust control plan when the plan has been placed in the facility's operating record as required by § 257.105(g)(1).

The Fugitive Dust Control Plan will be posted on OUC web site no later than October 19, 2015.

(6) Amendment of the plan. The owner or operator of a CCR unit subject to the requirements of this section may amend the written CCR fugitive dust control plan at any time provided the revised plan is placed in the facility's operating record as required by §257.105(g)(1). The owner or operator must amend the written plan whenever there is a change in conditions that would substantially affect the written plan in effect, such as the construction and operation of a new CCR unit.

OUC will amend the Fugitive Dust Control Plan if the planned operational controls are ineffective or there is a change at the facility that reduces the effectiveness of the current control operations.

(7) The owner or operator must obtain a certification from a qualified professional engineer that the initial CCR fugitive dust control plan, or any subsequent amendment of it, meets the requirements of this section.

I certify that this CCR fugitive dust control plans meets the requirements of 40 CFR 257.80.

P.E. Signature — *October 2nd, 2015* *Date*

Mr. Charles Doud
Printed Name

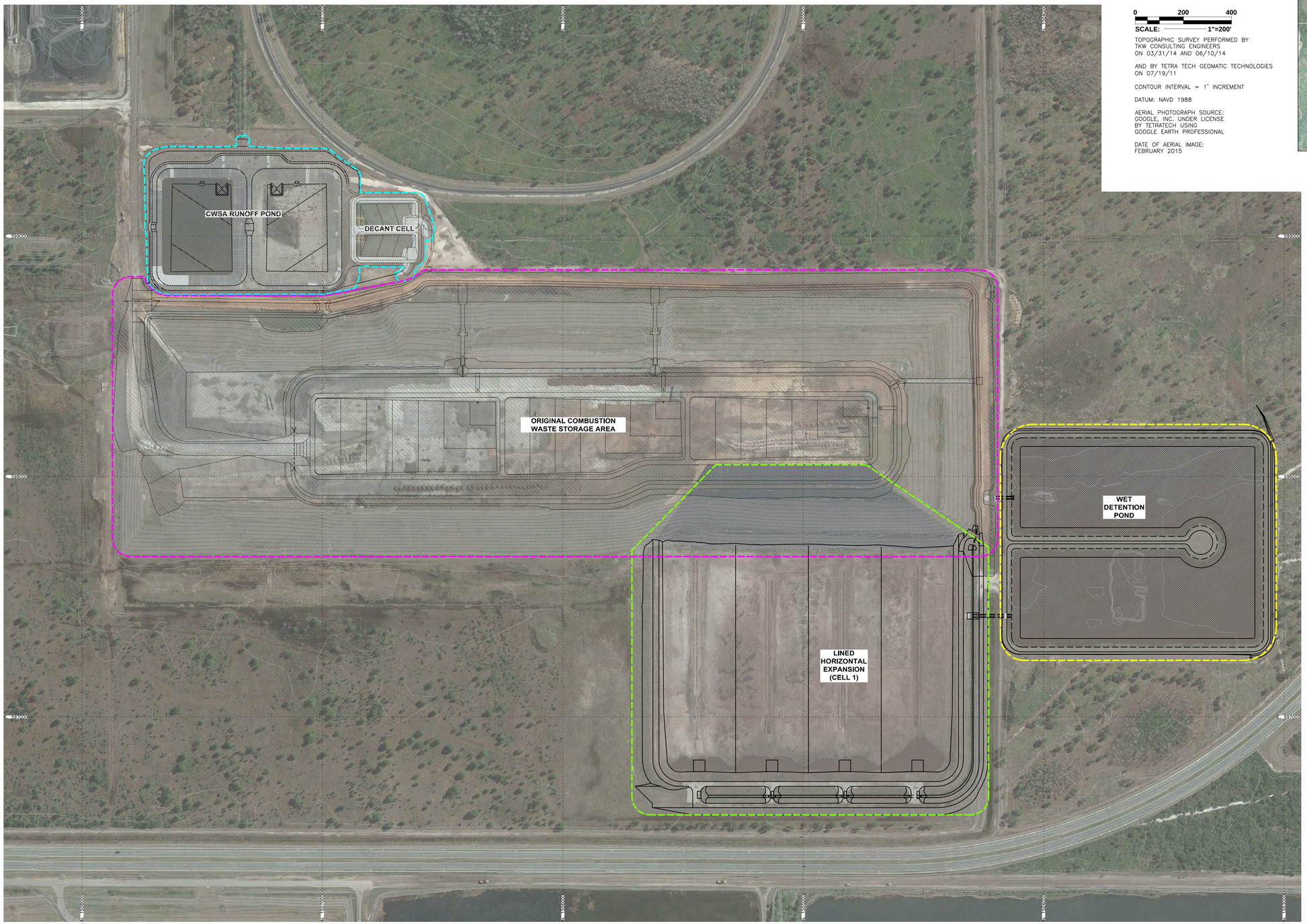
 # 58596 *Florida*
Registration Number *State*

(Affix seal)

10/2/15

Appendix 11

Closure Drawings for Original CWSA Including Vertical Expansion



N

0 200 400

SCALE: 1"=200'

TOPOGRAPHIC SURVEY PERFORMED BY TKW CONSULTING ENGINEERS ON 03/31/14 AND 06/10/14

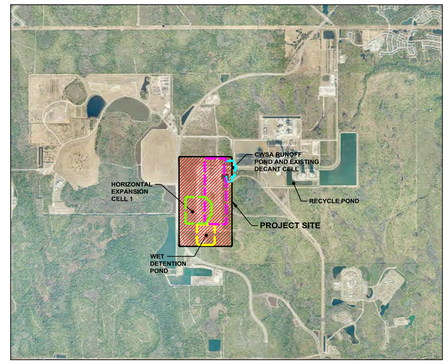
AND BY TETRA TECH GEOMATIC TECHNOLOGIES ON 07/19/11

CONTOUR INTERVAL = 1' INCREMENT

DATUM: NAVD 1988

AERIAL PHOTOGRAPH SOURCE: GOOGLE, INC. UNDER LICENSE BY TETRATECH USING GOOGLE EARTH PROFESSIONAL

DATE OF AERIAL IMAGE: FEBRUARY 2015



SITE VICINITY MAP

1" = 4,000'

SITE LOCATION

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

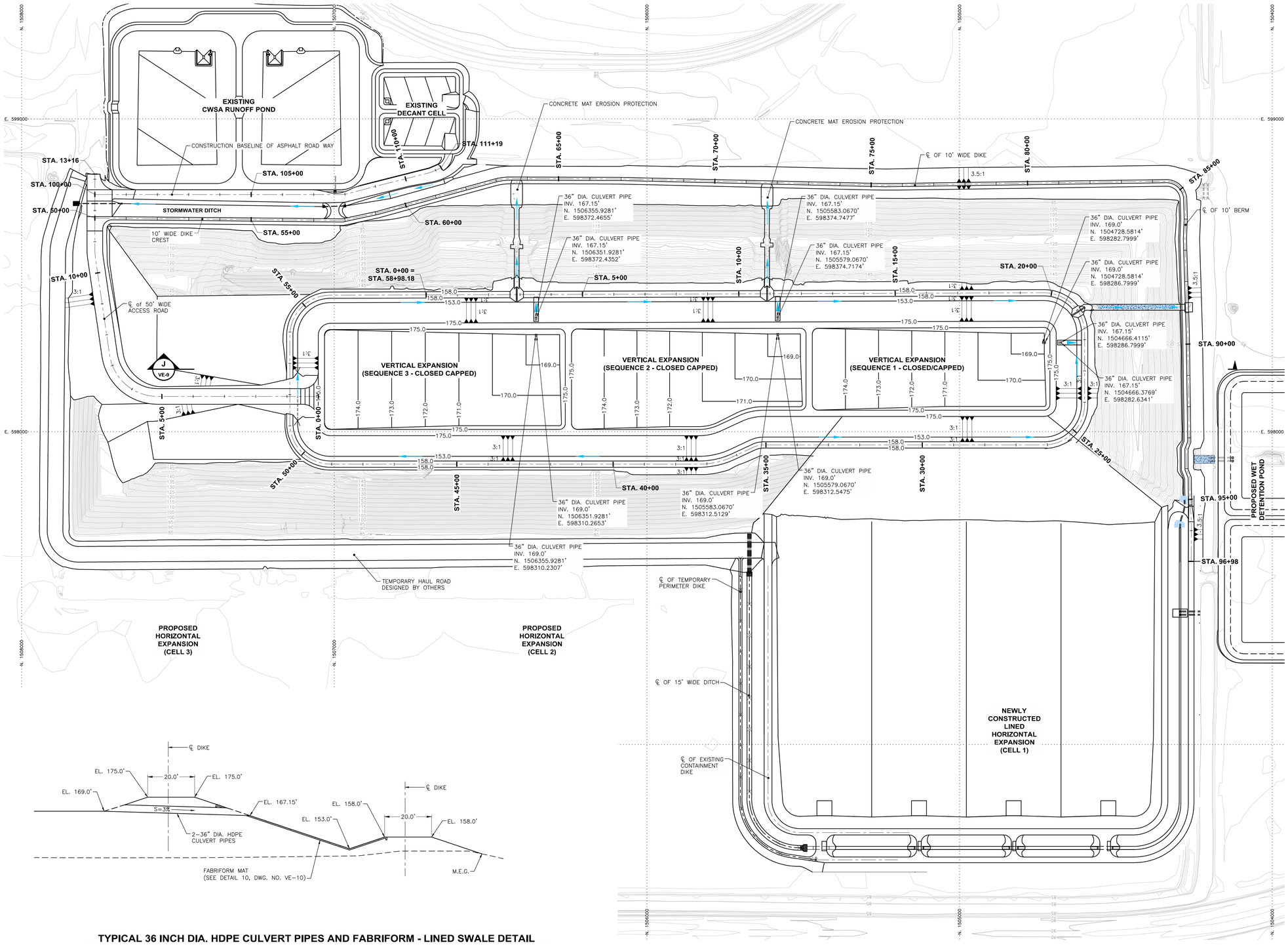
OUC The Reliable One®

CERTIFICATION OF CLOSURE CONSTRUCTION COMPLETION FOR ORIGINAL COMBUSTION WASTE STORAGE AREA AT THE ORLANDO UTILITIES COMMISSION, STANTON ENERGY CENTER

DRAWN BY:	CHECKED BY:	DATE:
PS	JM	02/09/16

FILE NO.	APPROVED BY:	FIGURE:
15-13-0249		1

I:\Corporate\15\15-13-0249\LANDFILL DEVELOPMENT PLAN_Report\FIGURE 1.dwg 2016/03/14 12:43 PM, Soto, Paula



TYPICAL 36 INCH DIA. HDPE CULVERT PIPES AND FABRIFORM - LINED SWALE DETAIL

SCALE: 1" = 20'

N

0 150 300

SCALE: 1"=150'

TOPOGRAPHIC SURVEY PERFORMED BY TKW CONSULTING ENGINEERS ON 03/31/14 AND 06/10/14

AND BY TETRA TECH GEOMATIC TECHNOLOGIES ON 07/19/11

CONTOUR INTERVAL = 1' INCREMENT

DATUM: NAVD 1988

FINAL CLOSURE CONFIGURATION

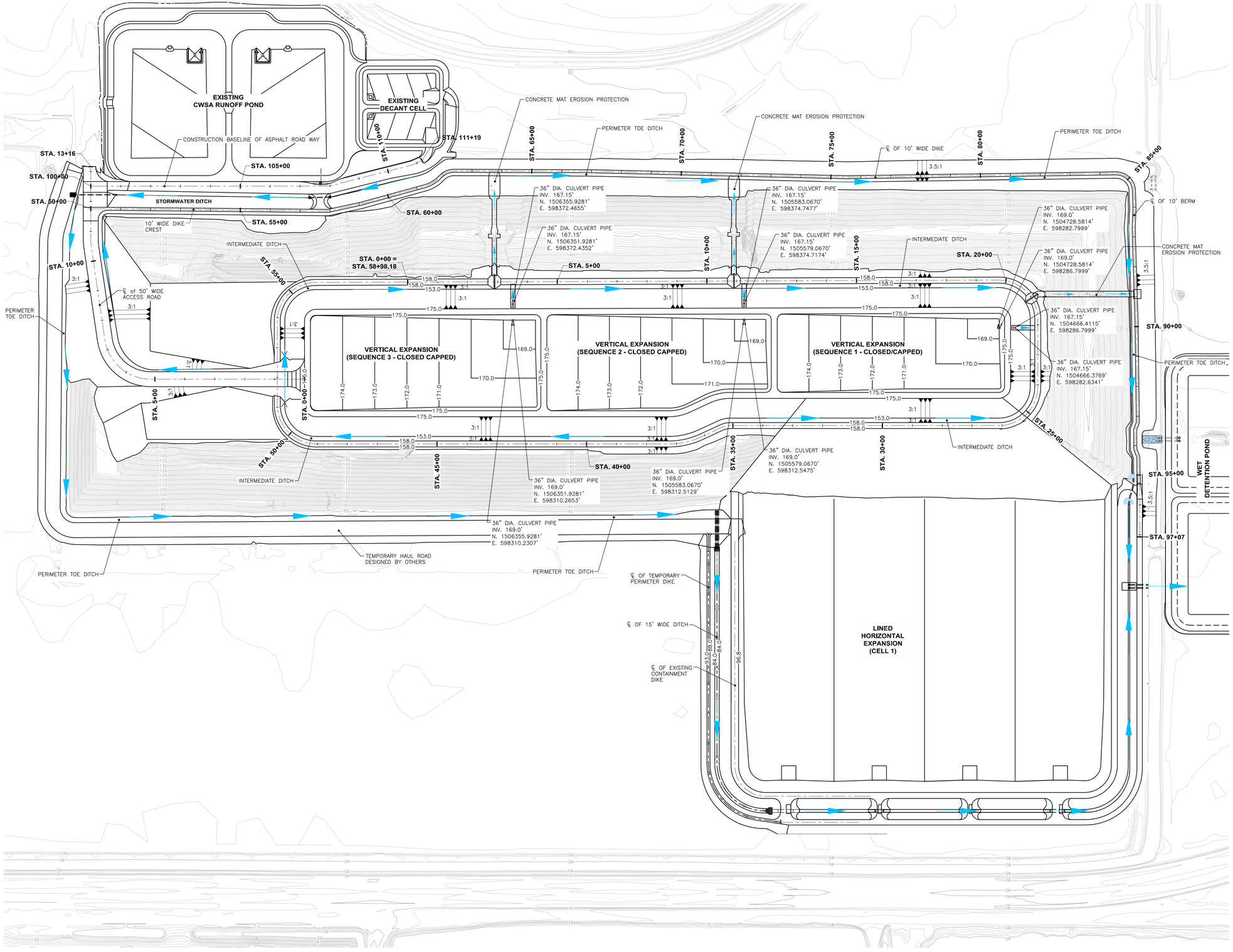
Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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DRAWN BY:	CHECKED BY:	DATE:
PS	JM	02/09/16

FILE NO.	APPROVED BY:	FIGURE:
15-13-0249		2



N

0 150 300

SCALE: 1"=150'

TOPOGRAPHIC SURVEY PERFORMED BY TKW CONSULTING ENGINEERS ON 03/31/14 AND 06/10/14

AND BY TETRA TECH GEOMATIC TECHNOLOGIES ON 07/19/11

CONTOUR INTERVAL = 1' INCREMENT

DATUM: NAVD 1988

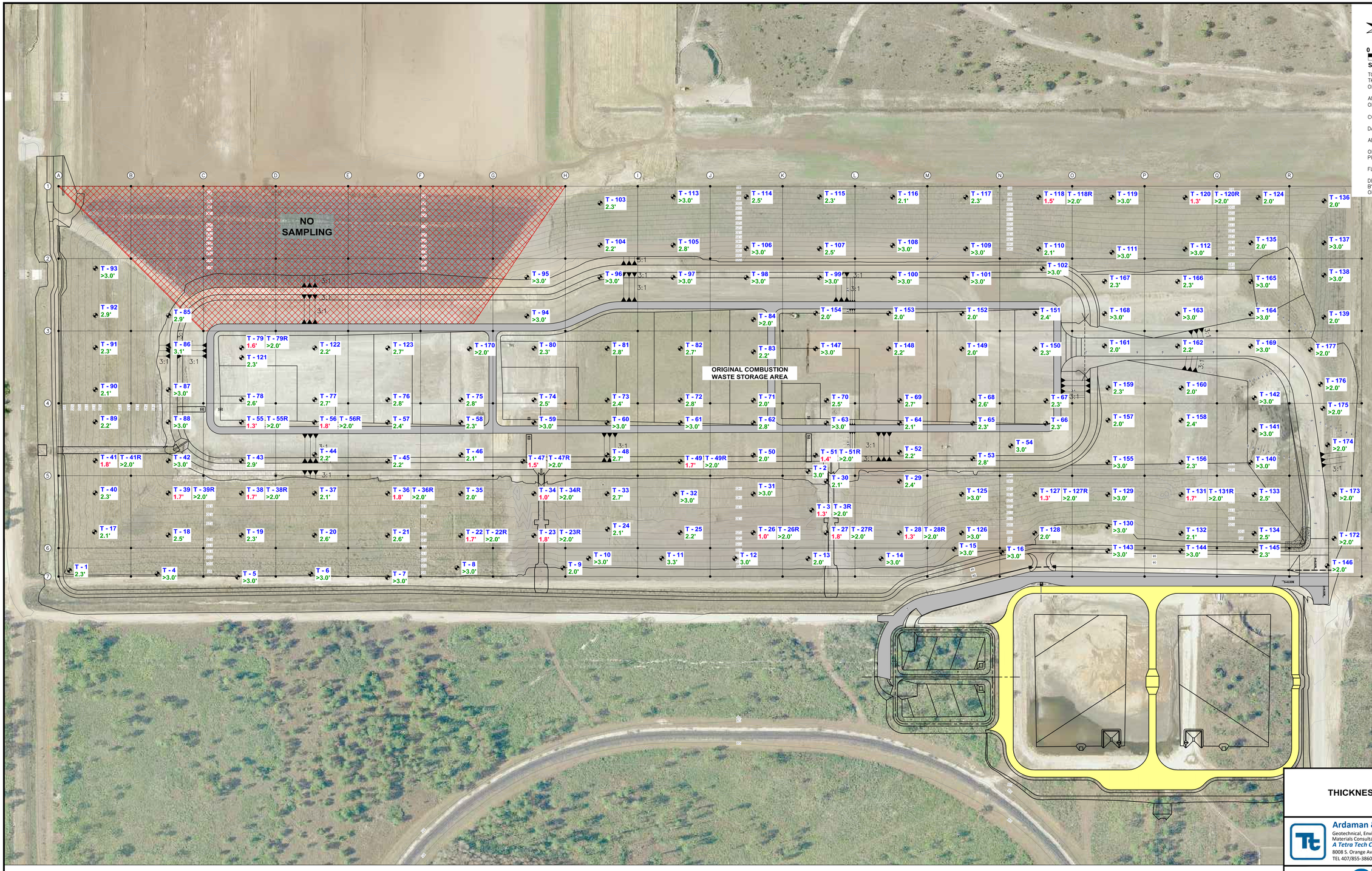
STORMWATER CONVEYANCE SYSTEM

Ardaman & Associates, Inc.
Geotechnical, Environmental, and Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

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DRAWN BY:	PS	CHECKED BY:	JM	DATE:	02/09/16
FILE NO.	15-13-0249	APPROVED BY:		FIGURE:	3



N

0 120 240

SCALE: 1"=120'

TOPOGRAPHIC SURVEY PERFORMED BY TKW CONSULTING ENGINEERS ON 03/31/14 AND 06/10/14

AND BY TETRA TECH GEOMATIC TECHNOLOGIES ON 07/19/11

CONTOUR INTERVAL = 1' INCREMENT

DATUM: NAVD 1988

AERIAL PHOTOGRAPH SOURCE:

ORANGE COUNTY PROPERTY APPRAISER

FLIGHT DATE: JANUARY 2013

DEPTH CHECK WAS PERFORMED BY TT-AAI FIELD TECHNICIANS ON DECEMBER 2015

LEGEND

- T - 28 2.3' — MEASURED THICKNESS GREATER THAN OR EQUAL TO 24 INCHES
- T - 28 1.5' — MEASURED THICKNESS LESS THAN 24 INCHES
- T 28R >2.0' — MEASURED THICKNESS AFTER RE-GRADING WITH ADDITIONAL FILL (GREATER THAN OR EQUAL TO 24 INCHES)

THICKNESS MEASUREMENTS

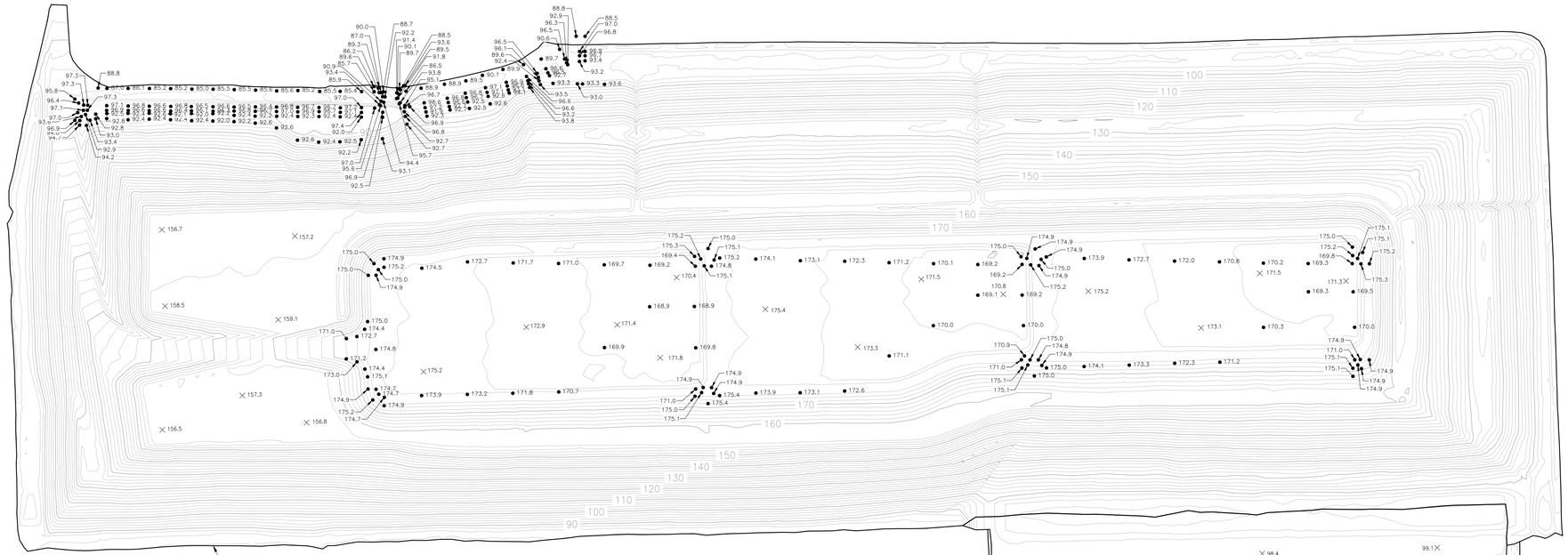
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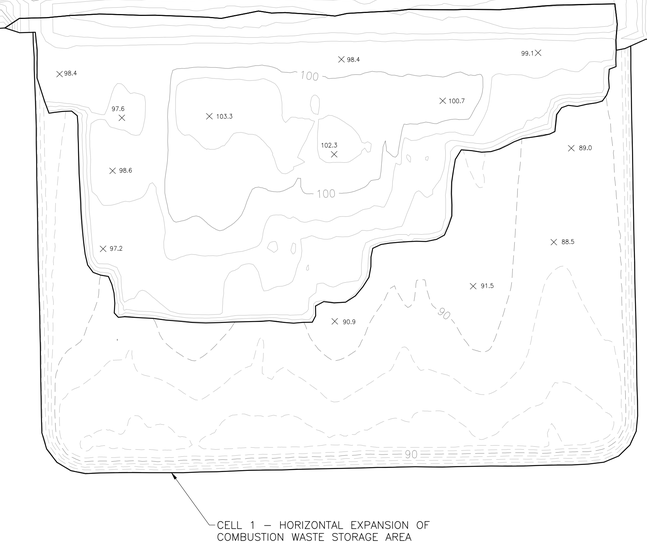
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CERTIFICATION OF CLOSURE CONSTRUCTION COMPLETION FOR ORIGINAL COMBUSTION WASTE STORAGE AREA AT THE ORLANDO UTILITIES COMMISSION, STANTON ENERGY CENTER

DRAWN BY:	CHECKED BY:	DATE:
PS	JM	02/09/16

FILE NO.	APPROVED BY:	FIGURE:
15-13-0249		4





N

0 150 300

SCALE: 1"=150'

DATE OF MIKON SURVEY: DECEMBER 10 - 12, 2015

SHEET NOTES:

1. FIELD WORK AND MAPPING FOR LANDFILL TOPOGRAPHY PROVIDED BY MIKON CORPORATION.
2. EXPANSION AREA CONTOURS DEPICT SURFACE OF SOIL FILL AT TIME OF SURVEY ON SEPTEMBER 14 & 15, 2013.

× 173.1 SPOT ELEVATION BY MIKON

DATE OF AMEC SURVEY: MARCH 12, 2016

● 170.3 SPOT ELEVATION BY AMEC

TOPOGRAPHIC SURVEY

Ardaman & Associates, Inc.
Geotechnical, Environmental, and
Materials Consultants
A Tetra Tech Company
8008 S. Orange Ave. Orlando, FL 32809
TEL 407/855-3860 FAX 407/859-8121 C.A.N. 5950

OUC The Reliable One®

CERTIFICATION OF CLOSURE CONSTRUCTION COMPLETION FOR ORIGINAL COMBUSTION WASTE STORAGE AREA AT THE ORLANDO UTILITIES COMMISSION, STANTON ENERGY CENTER

DRAWN BY: PS	CHECKED BY: JM	DATE: 03/10/16
FILE NO. 15-13-0249	APPROVED BY:	FIGURE: 5

Appendix 12

Excerpts from SEC Contractor Orientation Information Guide

ORLANDO UTILITIES COMMISSION
STANTON ENERGY CENTER
CONTRACTOR ORIENTATION

Emergency Phone # 43111 or 3111

CONTRACTOR / COMPANY NAME *

Print Name of Company Above

OUC REPRESENTATIVE*	CONTRACTOR REPRESENTATIVE*
Print Name Above	*Print Name Above*

Phone #*	Extension #*	Phone #*	Extension #

JOB/WORK INFORMATION

Date of Orientation*	Date Work Begins*	Date Work is Scheduled to Conclude*

Indicate Peak Number Of Contractor Personnel Expected To Be On Site In Box On The Right		Check The Box On The Right If The Contractor Will Be Bringing Materials On Site That Require An MSDS	

System Contractor Is Working On*

Nature Of Work On Site*

SCOPE OF CONTRACTOR ORIENTATION

All Contractors Working On Site Are Required To Review Sections I - IV.

Work Covered by Section V. Special Hazards And Work Conditions

Check Each Box Below that Represents the Needs of the Contractor for Section V of the Contractor Orientation.

	1. Fall Arrest		5. Respiratory Protection		9. Process Safety Management
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		
	4. Scaffold Requirements		8.Trenching and Excavations		

The Following Procedures And Rules Have Been Developed To Protect The Employees And Equipment Of The Orlando Utilities Commission at Stanton Energy Center. It Is Not Meant To Be All Inclusive Nor Does It Relieve Any Contractor Of Any Of Their Responsibility As Defined In The Contract, Or Any Federal, State, Or Local Regulation.

AREAS OF SPECIAL CONCERN

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

CONTRACTOR EMPLOYEE NOTIFICATION

The Contractor is responsible for informing their personnel of the above rules, regulations and information. All employees who will be on site to perform work shall sign the Contractor Employee Notification List. Failure to sign the Contractor Employee Notification List may result in removal of the Contractor employee from site.

CONTRACTOR INJURY/ILLNESS REPORTS

Per the terms of your contract, the Contractor shall conduct investigations on all incidents involving injury to Contractor or subcontractor employees or equipment damage. "Near Miss" incidents where significant injury or equipment damage could have but did not occur shall also be investigated. All investigations shall include corrective action to be taken to prevent re-occurrence and shall be documented in a detail report and submitted to the Owner within 7 calendar days of the incident. The Contractor shall maintain accurate accident and injury records as defined in OSHA Part 1904, Recording and Reporting Occupational Injuries and Illnesses. All OSHA Recordable injuries and illnesses shall be reported to the Owner no later than 12 hours after the accident.

VIOLATIONS

1. Violations of the above rules and regulations may result in the employee and/or contractor being removed from the site.

* _____ * _____

OUC Representative Contractor Representative

EMERGENCY EVACUATION NOTIFICATION☐

1. I have read and understand that the Contractor Representatives must provide a completed Contractor Evacuation List to Security before any personnel enter or any work will begin on site located at the main gate Security office.

* _____

Contractor Representative

All areas with * must be filled out.

CONTRACTOR EMPLOYEE NOTIFICATION LIST

I have been informed, and understand the rules; regulations and information contained in the SEC Contractor Orientation, and understand violation of these rules may result in my removal from site.

COMPANY NAME:			
Print Name		Signature	Date
1.			
2.			
3.			
4			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			

Competent and Qualified Person Designation Explanation

Definitions:

Competent Person - means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, AND who has the authorization to take prompt corrective measures to eliminate them.

Qualified Person - means one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems relating to the subject matter, the work or the project. Note: Generally speaking, a "Qualified Person" is considered to have a higher level of expertise than a "Competent Person".

Explanation of Competent and Qualified Form:

29 CFR 1926 and 29 CFR 1910 (OSHA) requires your company to provide Competent Persons and/or Qualified Persons for various types of work. The Competent and Qualified Form has multiple boxes to be checked indicating the person(s) designated as "Competent/Qualified Person" for your company, depending on the scope of work. By checking each appropriate box as "Competent/Qualified Person" on the Competent and Qualified Form you are also indicating the person named has met any OSHA requirements for performing duties at this level of responsibility and has the authority to take prompt corrective measures to eliminate hazards and enforce safety rules for your company. Some of the check boxes on the Competent and Qualified Form may not have a specific OSHA regulation that mentions a "Competent or Qualified Person", however, this form is used to ensure OUC contacts the person(s) with the appropriate training and authority to take the actions necessary for the safety of your company's employees. While OUC does not require documentation prior to beginning work on site, OUC reserves the right to request documentation of the training and qualifications of those personnel designated as "Competent/Qualified Person" on the Competent and Qualified Form should plant management deem it necessary at a later date.

Example:

The ABC Construction Company will be replacing underground water piping attached to the potable water tank. Their work will require Lockout/Tag out, Confined Space Work, Welding & Cutting and Excavation while on site.

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
✓	2. Lockout/Tag out	✓	6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work	✓	7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements	✓	8.Trenching and Excavations		

The Contractor Representative prints the name of the person(s) on the form who is to be the "Competent or Qualified Person" and checks each item in their scope of work for which they will be the "Competent or Qualified Person", if one person is to be the sole "Competent or Qualified Person", then the contractor should have each item in their scope of work check under his name. If multiple personnel, or personnel with varying qualifications are needed, write the name of the "Competent or Qualified Person" in the space provided and check only those items in the scope of work for which they will be the "Competent or Qualified Person".

Competent and Qualified Form

Based upon their training and experience, the following personnel have the authority of a Competent/Qualified Person Representative for the specific types of work noted by the check marks in the table below. ***This document must be filled out if Section V is filled out.***

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements		8.Trenching and Excavations		

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements		8.Trenching and Excavations		

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements		8.Trenching and Excavations		

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements		8.Trenching and Excavations		

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements		8.Trenching and Excavations		

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements		8.Trenching and Excavations		

Name of Competent/Qualified Person:					
	1. Fall Arrest		5. Respiratory Protection		9. Hazardous Materials
	2. Lockout/Tagout		6. Confined Space Procedure		10. Commercial Diving
	3. Exposed Energized Electrical Work		7. Welding & Cutting/Hot Work		11. Other
	4. Scaffold Requirements		8.Trenching and Excavations		

INFORMATION GUIDE

EMERGENCY # 43111 or 3111

OUC REPRESENTATIVE _____ EXT. # _____
WATCH ENGINEER EXT. # 43718 or 43507
PLANT PAGING SYSTEM = DIAL 84 and state announcement.

EVACUATION AREA(S):

PRIMARY = AREA # 3 ON MAP - IMMEDIATELY SOUTH OF SEC 1 AQC BLDG.
SECONDARY = AREA # 4 ON MAP - IMMEDIATELY WEST OF SEC 2 CHIMNEY

EMERGENCY PROCEDURES:

1. Medical, Fire and Other Plant Emergencies

For medical, fire and other plant emergencies the Control Room shall be notified using the plant emergency telephone number 3111.

The person making the call should be prepared to relay the following information:
- Type of emergency
- Location of emergency
- Severity of emergency
- Name of caller and telephone number call is being made from

The person making the call shall not break communication until directed to by the Control Room.

Medical and chemical emergencies will be announced over the Public Address system in conjunction with three two (2) second tones of the alarm system. Do not evacuate when the three two-second tones are used.

2. Evacuation Plan

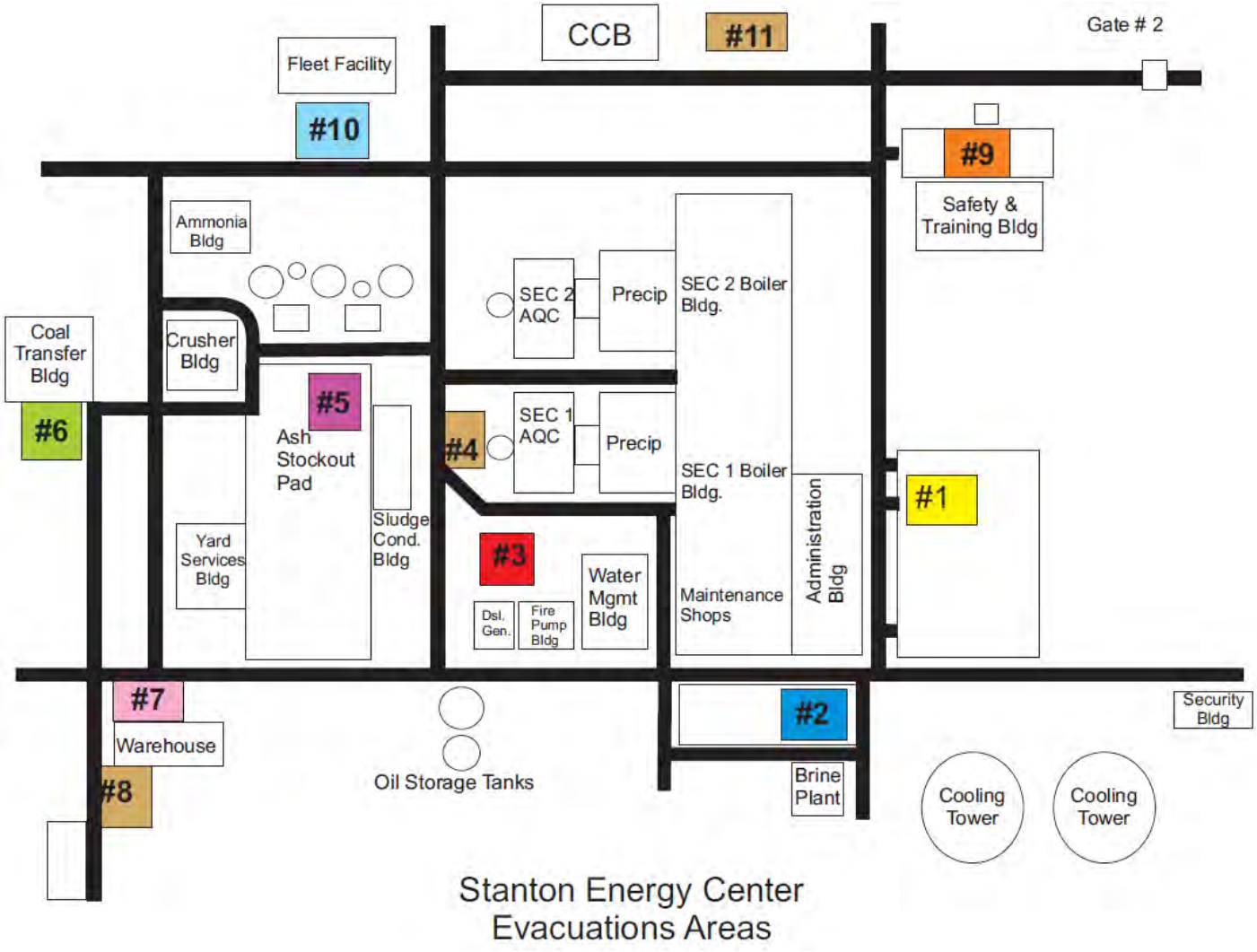
A. In the event a plant evacuation is required an alarm will be sounded three (3) times at 15-second intervals. In between each alarm a verbal announcement will inform all personnel as to the nature of the emergency. Regardless of the verbal announcement, personnel shall evacuate upon hearing the three tones at 15-second intervals and report to their evacuation areas. Regardless of where a fire is located all personnel must report to their evacuation areas when the three 15-second tones are used.

B. Outside contractor personnel shall assemble on the south side of the Air Quality Control Building, location 3 on the evacuation map. The alternate assembly point will be on the west side of the chimney, location 4 on the evacuation map. Elevators shall not be used for plant evacuations.

C. Supervisors shall be responsible to account for their personnel in the assigned areas. The Contractor Representative(s) will provide a Contractor Evacuation List to Security prior to any personnel beginning work or entering the site. The Contractor Representative will also insure that all of the Contractor's personnel entering the site are informed of their evacuation area. Site Security shall drive to each evacuation area and check in with each Supervisor. Supervisors shall inform Security of any missing persons.

D. During the emergency use of the paging system, OUC radios, or calls to the Control Room should be limited to only those calls concerning additional information about the current emergency, or to report a new emergency. An "all clear" will be sounded when normal communications may resume.

E. Personnel shall remain at their assembly areas until released by the Watch Engineer in charge of the emergency scene.



1) VISITOR PARKING LOT
2) ADMIN. & PLANT SERVICES PARKING LOT
3) SOUTH OF AQC ACROSS ROAD
4) WEST OF UNIT # 1 CHIMNEY
5) PAD WEST OF STOCK OUT PILES
6) SOUTH OF TRANSFER BUILDING
7) N. E. OF WAREHOUSE (Primary)
8) S. W. OF WAREHOUSE (Alternate)
9) SAFETY & TRAINING PARKING LOT
10) FLEET FACILITY
11) CCB

I. SECURITY

1. Identification and Access

A. Authorization for any Contractor, or person to enter to the site, or to remain on site, can be denied solely at the discretion of the Management or the designated OUC Representatives of Stanton Energy Center.
B. All Contractor employees will provide photographic identification to Security as requested upon entering or exiting.
C. All Contractor employees shall be required to wear an identification badge. The badge shall be worn in plain view on the upper part of the body.
D. No employee shall enter any electrical enclosure or substation without prior approval.
E. Contractor Employees shall only be allowed in pre-approved areas.
F. The use of the plant restroom facilities shall be prohibited unless prior arrangements have been made.
G. Smoking shall only be allowed in designated areas.

2. Materials and Equipment

A. Property removal forms are required to take any material or equipment off site. They shall be signed by the appropriate OUC Supervisor.
B. The following are specifically prohibited at the Stanton Energy Center: Firearms or other deadly weapons, explosives or fireworks, alcoholic beverages, narcotics or non-prescription drugs, pets, open fires, posting of unauthorized signs.
C. All vehicles and equipment entering the site are subject to search by Security or other personnel designated by OUC. OUC reserves the right to forbid access to any vehicle, as well as the driver and occupants of any vehicle that is not searched or has deficiencies that may impair the safety of the vehicle or equipment.
D. Material and equipment shall be stored only in pre-approved areas. Unless prior approval is obtained, the use of OUC trash bins, dumpsters, etc., is not allowed. Contractors must make arrangements for storage and removal of all waste products or trash.
E. The use of cameras or video equipment shall be prohibited unless prior arrangements have been made.

II. HAZARDOUS MATERIALS ON SITE

A. The following Extremely Hazardous Materials are found on site in the locations noted (areas covered by the Process Safety Management are in the ***BOLD, Italicized*** print):

1. Anhydrous Ammonia
   A. Ammonia Storage Tank, north side of Unit #1 Boiler Building
   B. ***Ammonia Storage Tanks, Ammonia Storage Building for the SCR System***
   C. ***SCR System in Unit #2 Boiler Building***
   D. Ammonia Feed systems in Unit #1 & #2 Boiler Buildings
2. Asbestos
   A. Some of the breakers on site have transite arc chutes, an Asbestos Containing Material (ACM). Before any work is performed inside SUS breakers, a determination must be made if the breaker has ACM. Any case in which the breaker has ACM, the breaker shall be cleaned of any friable ACM material before work may be performed on the breaker, except by those personnel who meet the requirements for the work to be performed, as found in 29 CFR 1926.1101.
   B. Several of the gaskets used on the steam turbine have ACM impregnated in the gaskets. The removal of these gaskets also must meet the requirements for the work to be performed, as found in 29 CFR 1926.1101.
3. Biocide
   A. South of Unit #1 Main Transformers.

4. Chlorine
   A. *Unit #1 & #2 Cooling Towers*
   B. Domestic Wastewater Treatment Facility
   C. Water Management Building
   D. Cooling Tower Blowdown Treatment (Brine Plant)
   E. Gas Storage Facility
5. Hydrogen
   A. Hydrogen Building
6. Liquid Nitrogen
   A. Liquid Nitrogen Storage Tank *Note: This tank is filled intermittently and is not always available.*
7. Radioactive Materials
   A. Radioactive sources are used for measuring purposes on various piping and vessels. Each source is marked with the appropriate warning sign. Unless entering a vessel using a source, or involved in removal/renovation of a source the exposure on the site is within the levels determined as acceptable for members of the public by the Florida Bureau of Radiation Control and the Nuclear Regulatory Commission.

8. Sodium Hydroxide
   A. Condensate Polishing areas of Unit #1 & #2 Boiler Buildings
   B. Water Management Building
   C. Cooling Tower Blowdown Treatment (Brine Plant)
9. Sulfuric Acid
   A. Unit #1 & #2 Cooling Towers
   B. Water Management Building
   C. Cooling Tower Blowdown Treatment (Brine Plant)
   D. Unit #1 Boiler Building (North side) and Unit #2 Boiler Building (North side)

B. All Contractor personnel working on site must be aware of the presence and hazards of these materials. Any personnel working in the immediate area must be notified of the appropriate actions to take in an emergency involving these materials. The actions to be taken are:

1. Exit the area immediately.
2. Notify the Control Room using the Emergency Procedures noted in the Emergency Procedures section of this document.
3. Follow the directions given by OUC personnel as to evacuation, etc.

C. Contractors whose scope of work will include performing maintenance, repair, renovation or specialty work on any system involving extremely hazardous materials shall perform a Job Hazard Analysis (JHA) for the work to be performed in conjunction with OUC personnel.

D. Contractors bringing hazardous or toxic materials on site shall provide, upon request, an emergency plan for any spill/release of the material they are using, and the appropriate training records for the type of work of the personnel are expected to perform.

E. Potable (Drinking) Water and Re-Use Water

1. The only water that is acceptable for drinking on site is the following:
   a. Spigots found at sinks in offices or restrooms.
   b. Spigots found at sinks inside kitchens.
   c. Drinking fountains.

   DO NOT DRINK FROM ANY OTHER SOURCE OF WATER
2. Emergency Eyewash/Showers use potable water supplies, but it is not recommended they be used for drinking unless thoroughly flushed.
3. All plant Service Water and Fire Water is Re-Use water. This includes all outlets in the plant environment. The Re-Use water is treated wastewater from a local Orange County sewage treatment plant. Water reuse involves taking domestic wastewater, giving it a high degree of treatment, and using the resulting high-quality reclaimed water for a new, beneficial purpose. Extensive treatment and disinfection ensure that public health and environmental quality are protected. The treatment of wastewater prevents it from being considered a hazard for incidental contact. However, Re-Use Water is not considered suitable for drinking, or hygiene activities such as washing the face, hands, etc. When prolonged contact is likely to occur, rubber gloves, rain suits etc. should be used.

III. EMERGENCY PROCEDURES

1. Medical, Fire and Other Plant Emergencies

A. For medical, fire and other plant emergencies the Control Room shall be notified using the plant emergency telephone number 3111.
   1. The person making the call should be prepared to relay the following information:
      Type and Location of emergency.
      Severity of emergency.
      Name of caller and telephone number call is being made from.
   2. The person making the call shall not break communication until directed to by the Control Room.

B. Medical and chemical emergencies will be announced over the Public Address system in conjunction with three two (2) second tones of the alarm system. Do not evacuate when the three two-second tones are used.

2. Evacuation Plan

A. In the event a plant evacuation is required an alarm will be sounded three (3) times at 15-second intervals. In between each alarm a verbal announcement will inform all personnel as to the nature of the emergency. Regardless of the verbal announcement, personnel shall evacuate upon hearing the three tones at 15-second intervals and report to their evacuation areas. Regardless of where a fire is located all personnel must report to their evacuation areas when the three 15-second tones are used.

B. Outside contractor personnel shall assemble on the south side of the Air Quality Control Building, location 3 on the evacuation map. The alternate assembly point will be on the west side of the chimney, location 4 on the evacuation map. Elevators shall not be used for plant evacuations.

C. Supervisors shall be responsible to account for their personnel in the assigned areas. A Contractor Evacuation List will be provided by the Contractor Representatives to Security prior to any personnel beginning work or entering the site. The Contractor Representative will also insure that all of the Contractor's personnel entering the site are informed of their evacuation area. Site Security shall drive to each evacuation area and check in with each Supervisor. Supervisors shall inform Security of any missing persons.

D. During the emergency use of the paging system, OUC radios, or calls to the Control Room should be limited to only those calls concerning additional information about the current emergency, or to report a new emergency. An "all clear" will be sounded when normal communications may resume.

E. Personnel shall remain at their assembly areas until released by the Watch Engineer in charge of the emergency scene.

IV. GENERAL SAFETY

1. Work Apparel and Hearing Protection

A. Hardhats and safety glasses shall be worn at all times (except while in air-conditioned areas or vehicles with enclosed cabs).

B. Good leather work shoes or boots shall be worn. Athletic and open toed shoes shall not be allowed.
   Exception: Athletic style shoes which meet the requirements and specifications established in the American Standard Safety Requirements for Foot Protection ANSI *Z41-1991 may be worn*.

C. Shirts covering the full trunk and upper arm shall be worn. Cut off jeans or shorts shall not be allowed. Minimum acceptable apparel is considered a Cotton Tee-Shirt and Cotton Pants. Personnel who may be exposed to arcs or flames shall not wear apparel that may increase their injuries in an accident. Further guidelines for proper apparel for personnel who may be exposed to arcs or flames can be found in 29 CFR 1910.269 and the additional requirements noted in Section V, Paragraph - 3 Exposed Energized Electrical Work of this document.

D. Hearing protection shall be worn while working in excessively noisy areas or when using tools that exceed 90 decibels. Further information on hearing protection requirements may be found in 29 CFR 1910.95.

2. Vehicular Safety

A. Unless otherwise stated, only company owned or rented vehicles will be allowed on site. All contractor employee personal vehicles shall park in the construction parking lot unless otherwise designated.
B. Personnel riding in the bed of a pickup truck shall not sit above the floor of the bed unless provided with a suitable seat with a backrest that prevents them from falling out of the vehicle. Sitting on the tailgate while the vehicle is in motion is strictly prohibited.
C. Personnel shall not ride on the running boards, fenders, etc., of any vehicle.
D. All persons operating motor vehicles must have the appropriate license for the vehicle being operated.
E. The project speed limit is 15 mph unless otherwise posted.

3. Housekeeping

A. Special attention shall be given to keeping the inside of the structures and surrounding grounds clean and free from trash and debris. Work areas and storage areas shall be continuously cleaned each workday.
B. All hoses, cables, extension cords, and similar materials shall be located, arranged, grouped and routed overhead so that they will not block any access way or work area, and will permit easy cleaning and maintenance.
C. Material and supplies shall be stored in an orderly manner to prevent their falling or spreading, and to eliminate tripping and stumbling hazards.
D. Flammable and combustible liquids shall only be stored, or dispensed, using Underwriters Laboratories or Factory Mutual listed safety containers and only in approved quantities.
E. Gas or diesel powered vehicles and equipment shall not be allowed in any building unless prior approval has been obtained; a Welding and Cutting Permit is utilized to receive approval.
F. Upon completion of work, all equipment, material and waste shall be removed from the plant site.
G. Any operation that produces air contaminants above the permissible exposure limits noted on the Material Safety Data Sheet for the material being used, or above the limits set in Table Z-1-A (29 CFR 1910.1000), shall provide engineering controls to restrict the exposure of air contaminants above the limits to only those personnel working in the immediate area of the work to be performed. The suggested method of protecting the adjacent areas from air contaminants above the limits is a ventilation/exhaust system with tenting if necessary. The exhaust of the system must have the appropriate filter(s) to prevent the air contaminants from producing an exposure above the permissible exposure limits. Other methods of controlling the air contaminant exposure requires approval by the Manager of Maintenance or PRBU Safety & Training Manager prior to beginning to perform the work.

   The need for protecting the adjacent areas from air contaminants shall be assumed unless the Contractor can provide documentation from a Certified Industrial Hygienist that the exposure level is below the permissible exposure limits. Any dust or other contaminant produced from the operation is the Contractor's responsibility, and the Contractor shall ensure it is cleaned/removed upon completion of the work unless prior arrangements have been made.

4. Hazardous or Toxic Materials

A. The Contractor shall provide Material Safety Data Sheets covering all hazardous materials furnished under or otherwise associated with the work under this contract in accordance with applicable federal, state and local laws. Before entering the site, the contractor must provide a copy of all the Material Safety Data Sheets for the materials that will be used on site to perform their work, or any of their subcontractor's work. Should additional materials be needed after work has begun, the materials must receive approval by OUC and the MSDS must be on site and supplied to OUC before the material is brought on site.
B. All hazardous and toxic material brought on site, ***or generated by the work process***, shall be clearly labeled with the Contractor's name. All containers must have the appropriate labels containing the information on the hazards of the materials. The minimum requirements for day use containers or similar containers that do not have the appropriate manufacturers warning label are: the trade name of the product, a hazard warning such as the NFPA 704 system or H.M.I.S. System.

C. Hazardous and toxic materials shall only be stored in pre-approved locations.

D. Contractors are responsible for all hazardous materials or toxic materials brought on site or generated by their work and shall properly dispose of all hazardous and toxic material for which they are responsible at their cost unless prior arrangements are made. Contractors shall immediately report any spills to the appropriate OUC representative.

5. Fire Equipment and Fire Hydrants

A. Fire equipment and fire hydrants shall not be used unless there is an emergency or unless prior approval has been given.
B. To prevent hydrant damage when using a fire hydrant, it shall be opened all the way when in use and closed all the way when not in use.
C. If a plant fire extinguisher is used it shall be turned in to the appropriate OUC representative.

6. Ladders

A. All ladders and use of ladders shall comply with 29 CFR 1910.25, 1910.26 and 1910. 27.
B. Site Specific Rules regarding ladders are the following:
   1. Portable metal ladders shall not be used. Exception: Such ladders may be used in specialized work, as high voltage substations, where non-conductive ladders might present a greater hazard. These ladders shall be properly marked.
   2. Ladders shall not be used as scaffold platforms.
   3. Boxes, chairs, etc., shall not be used as ladders.
   4. Portable straight ladders shall be used only if they have non-skid bases.
   5. When working from a portable ladder, employees shall ensure that the ladder is securely placed, held, tied, or otherwise made secure to prevent slipping or falling.
   6. Personnel working from portable ladders shall wear fall arrest equipment whenever they are exposed to a fall of 24 feet or more.

7. Mechanical

A. Pulley, gear and similar equipment guards shall be replaced if removed.
B. No work shall be performed in close proximity to running conveyor belts.
C. No one shall ride, stand on, or cross over a conveyor.

8. Cranes, Hoists, Forklifts and Heavy Equipment

A. Prior approval must be obtained before using any plant crane, hoist, forklift or heavy equipment.
B. Only qualified persons shall operate any crane, hoist, forklift or heavy equipment.
C. All Contractor hoists and cranes must meet the requirements as specified in 29 CFR 1910 and 1926.
D. Upon request, the Contractor must provide the inspection records of any Contractor supplied hoist or crane to be used on site.
E. All forklift operators must have a license/certification as being qualified to operate a forklift and a current valid evaluation indicating they have the skills necessary for the type of forklift they will be using.

9. Area Protection and Access

A. Work area protection is the adequate protecting of all employees by the use of suitable barriers, warning signs, lights, flags, flagmen, etc., as the job requires on approaches to work areas, excavations, open manholes, floor holes, etc. Proper work area protection shall be preplanned.
B. Safe access shall be provided to all work areas.
C. Any open floor hole with a vertical dimension greater than four (4) feet shall have a suitable barrier with appropriately constructed guardrails, midrails and toeboards, or suitable cover, designed for 2 times the intended load. For short duration jobs, warning tape with signs denoting that 100% Fall Protection is needed, in conjunction with a standby employee to ensure personnel entering the designated area wear the appropriate fall arrest equipment, may be utilized. The barricade tape must be placed at least six (6) feet from the edge of the fall exposure and the standby employee must be present AT ALL TIMES WHEN THE FLOOR HOLE IS OPEN.
D. Open manholes are required to have a suitable barrier with appropriately constructed guardrails, midrails and toeboards.

E. Any *Leading Edge* type of fall exposure (roof, walkway without handrails etc.) in excess of four (4) feet shall be protected appropriately constructed guardrails, midrails and toeboards. For short duration jobs, warning tape with signs denoting 100% Fall Protection is needed may be used. The barricade tape must be placed at least six (6) feet from the edge of the fall exposure. All personnel entering past the barricade tape must wear the appropriate fall arrest equipment.

10. Tools and Equipment

A. All portable power tools, portable lighting, and other temporary equipment require the use of a Ground Fault Circuit Interrupter (GFCI).
B. Electrical equipment and tools shall be wired and grounded as required by applicable electrical codes.
C. Appropriate guarding shall be used on tools and equipment.
D. Defective tools and equipment must be identified as defective by tagging, marking etc. and may not be used until repaired.
E. Use of OUC tools or equipment is forbidden unless authorized by the OUC Representative.

11. Operation and Modification of Equipment

A. Contractor employees shall not operate any switch, valve, breaker, etc., unless they receive approval from their OUC representative and the Tagging Authority for the equipment they need to operate.
B. Contractor employees shall not make any circuit logic, control modifications, or other modification to equipment without approval from the appropriate OUC representative.

V. SPECIAL HAZARDS AND WORK CONDITIONS

1. Fall Arrest

A. Fall arrest equipment shall be properly used when exposed to a fall in excess of six (6) feet, when the use of other fall protection means are not practical. Fall protection shall be provided 100% of the time personnel are exposed to a fall in excess of six (6) feet, with the exception of working from a portable ladder with a fall exposure of twenty-four (24) feet in height or lower. Any time personnel work from a portable ladder in excess of than twenty-four (24) feet, or climb a fixed ladder that has a fall exposure greater than twenty-four (24) feet; the appropriate fall protection measures must be taken. Appropriate fall arrest equipment is considered the following:

1. A full body harness is required for use as part of the fall arrest system. A body belt or a chest harness is not considered proper fall arrest equipment.
2. All lanyards used for fall arrest shall have double locking snap hooks.
3. All lanyards used for fall arrest shall have a shock absorber that limits the arresting force to less than 900 pounds in the event of a fall.
4. Those devices which limit the fall distance in such a manner as to ensure the arresting force does not exceed 900 pounds may be used without a shock absorber (e.g.: retractable lifelines, ladder clamps, etc.).

Note: Floor Holes and Leading Edge Fall Exposures require fall protection or fall arrest at an exposure of 4 feet.

B. Additional requirements and information on fall protection may be found in 29 CFR SUBPART M.

2. LOTO Procedure (Lockout/Tagout)

A. Stanton Energy Center requires all contractors to comply with 29 CFR 1910.269(d) - Hazardous Energy Control (Lockout/Tagout) Procedures, the SEC LOTO Procedure will be used to ensure the control of hazardous energy.
B. No personnel shall work in such proximity to any part of an electric power circuit that he may contact in the performance of the work unless protected against electrical shock. Effective protection is considered to be the following:
    1. De-energize the circuit and use of the SEC LOTO Procedure.
    2. If the circuit is required to be worked on while energized, it must be guarded by effective insulation or other means and must conform to the guidelines for work performed on energized equipment, as found in 29 CFR 1910.269 and the additional requirements noted in Paragraph - 3. Exposed Energized Electrical Work of this document.

C. Anytime personnel must de-energize or de-pressurize equipment to perform their work safely, the requirements of the SEC LOTO Procedure must be followed. Precautions to relieve, or block, stored energy must also be taken. Examples are, but are not limited to:
    1. Capacitors.
    2. Pressure trapped in piping or vessels.
    3. Spring operated equipment.
    4. Hydraulics.
    5. Eccentrics

D. The SEC LOTO Procedure uses three different colored tags for the purposes of preventing equipment from being operated. Violation of any of these tags may cause serious injury or equipment damage. Any contractor employee violating a LOTO Tag will be removed from site.

E. Red Tags: Operations hangs Red Tags to prevent operation of equipment. Equipment that is Red Tagged may only be operated by Operations personnel, and only after approval has been obtained from the Tagging Authority.
    1. The SEC LOTO Procedure requires "Blockout" with Red Tags. Blockout is the use of a heavy-duty tie-wrap to prevent inadvertent operation of equipment similar in manner to the use of a lock for this purpose.

F. Yellow Tags: Personnel designated as Primary Authorized Employees hang Yellow Tags. Equipment that is Yellow Tagged may only be operated under the authority and by direct communication with, the Primary Authorized Employee.
    1. The SEC LOTO Procedure requires "Blockout," or Lockout, to be used with Yellow Tags in compliance with the provisions of the SEC LOTO Procedure. Blockout is the use of a heavy-duty tie-wrap to prevent inadvertent operation of equipment similar in manner to the use of a lock for this purpose. The decision as to which is appropriate, Blockout or Lockout, is the responsibility of the Primary Authorized Person.

G. A Yellow Tag shall not be placed on equipment that has a Yellow or Red Tag already placed on it, and a Red Tag shall not be placed on equipment with a Yellow Tag or Red Tag hung on it.

H. Blue Tags: When equipment is tagged to prevent injury to personnel, a Blue Tag is hung adjacent to a Red or Yellow Tag by a person designated as a Lead Authorized Person. <u>No equipment may be operated while a Blue Tag is attached to the equipment.</u>
    1. Only Lead Authorized Persons may hang OUC/PRBU Blue Tags and perform the other duties assigned this designation in the SEC LOTO Procedure.
    2. A Blue Tag shall only be removed by the Lead Authorized Person who hangs the tag, except under the Emergency Release Provisions of the SEC LOTO Procedure.
    3. Contractor employees who have been designated as Lead Authorized Persons may provide Blue Tag administration for contractor employees using the provisions of the SEC LOTO Procedure. Only personnel designated by the OUC PRBU Safety & Training Manager may be Lead Authorized Persons. The designation of Lead Authorized Person is based upon successfully passing training requirements and demonstration of the proper use of the SEC LOTO Procedure.
    4. Contractors who have no person designated as a Lead Authorized Person will have their personnel work under the Blue Tags of an OUC Representative that has the designation. The OUC Lead Authorized Person will create an Authorized Person Clearance Log. All contractor employees working under the Blue Tags of an OUC Lead Authorized Person shall sign on the Authorized Person Clearance Log before beginning work, and shall sign off of the Authorized Person Clearance Log when the work is complete, or when they will no longer be working on the equipment. The OUC Lead Authorized Person shall not remove a Blue Tag if any signatures are not cleared from (signed off) the Authorized Person Clearance Log.
    5. Each contractor employee is responsible for his or her own LOTO device (signature). No person shall sign for another person, work under the signature of another person, or sign off for another person on the Authorized Person Clearance Log except under the Emergency Provisions of the SEC LOTO Procedure.
    6. When the OUC Lead Authorized Person deems it necessary, they have the authority to require all contractor employees to sign off the Authorized Person Clearance Log at the end of each work shift when contractor employees are leaving the site for the day.
    7. The OUC Lead Authorized Person has the authority to require the contractor to designate a "Senior Authorized Person". The Senior Authorized Person is responsible to ensure all contractor employees sign on and off the Authorized Person Clearance Log as needed for their protection and provide the completed Authorized Person Clearance Log to the OUC Lead Authorized Person as needed to control hazardous energy.

3. Exposed Energized Electrical Work

A. No employee shall approach or take any conductive object closer to exposed, energized lines or equipment than set forth in TABLE 1 in this section unless, the employee is *Qualified* as per the definition in 29 CFR 1910.269 and the employee is insulated from the energized part(s) using gloves, sleeves, or tools rated for the voltage of the exposed, energized part(s), or the exposed energized part(s) are insulated from the employee.

B. All personnel performing exposed, energized, electrical work on equipment under the exclusive control of Stanton Energy Center shall barricade unshielded areas and wear the appropriate level of protective apparel (ATPV Rating) within the barricaded area. The distance the unshielded area shall be barricaded shall conform to the following:

50 volts to 599 volts = 10 feet
Greater Than 600 Volts = 20 feet

Note: Exposed, energized, work on electrical equipment not under the exclusive control of Stanton Energy Center shall conform to the appropriate guidelines and regulations per the authority having control of the equipment.

C. All electrical protective devices shall meet the requirements of 29 CFR 1910.137 as minimum standard.

D. Additional requirements may be found in 29 CFR 1910.269.

TABLE 1

AC LIVE-LINE EXPOSURE MINIMUM APPROACH DISTANCE

NOMINAL VOLTAGE PHASE TO PHASE	DISTANCE	
	PHASE TO GROUND EXPOSURE (FT - IN)	PHASE TO PHASE EXPOSURE (FT - IN)
50 to 1000	AVOID CONTACT	AVOID CONTACT
1100 to 15000	2 - 1	2 - 2
15100 to 36000	2 - 4	2 - 7
36100 to 46000	2 - 7	2 - 10
46100 to 72500	3 - 0	3 - 6
72600 to 121000	3 - 2	4 - 3
138000 to 145000	3 - 7	4 - 11
161000 to 169000	4 - 0	5 - 8
230000 to 242000	5 - 3	7 - 6
345000 to 362000	8 - 6	12 - 6
500000 to 550000	11 - 3	18 - 1
765000 to 800000	14 - 11	26 - 0

4. Scaffold Requirements

A. Detailed regulations on specific types of scaffolding are given in 29 CFR, Part 1926 Subpart L.
B. Competent persons as defined by 29 CFR 1926.450 (b) must be designated to supervise the erecting, moving, dismantling, and alteration of scaffolds.
C. A Competent Person shall check all scaffolding each shift (prior to use) to ensure it is of sufficient strength and rigidity to safely support the weight of workers and material to which it will be subjected.
D. The following rules are site-specific requirements for scaffolding and supports.

1. Scaffolds 4 feet and higher must have standard guardrails and midrails installed on all open sides and ends of the platform where feasible. If standard guardrails and midrails are not installed on all open sides and ends of the platform, the scaffold must denoted as requiring fall protection using the Yellow Scaffold Tag. Toeboards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor unless other precautions are taken for personnel.
2. All scaffolds shall have the appropriate tag hung indicating their suitability for use. Only the competent person in charge of the erection/dismantling of the scaffold may sign the scaffold tag. The scaffold tag shall be signed and dated in the spaces provided on the back of the tag. Any other pertinent information may be written on the back of the tag.
    a. When any scaffold is incomplete (such as during erection or dismantling) or damaged, the red colored scaffold tag shall be hung appropriately. The front of the red scaffold tag will read as follows:

WARNING-THIS SCAFFOLD IS NOT COMPLETE-DO NOT USE

In the event a piece(s) of scaffold is damaged it shall be tagged and the reason noted on the back of the tag under the warning header. The damaged piece of scaffold shall be removed from service and placed out of service, with the tag remaining in place, until the scaffold piece(s) is repaired or destroyed.

b. In the event a scaffold must be built which is unable to have the guardrails and midrails, or has a ladder access with a fall hazard of greater than 24 feet, fall protection shall be used. Any scaffold which requires the use of fall protection shall have a yellow scaffold tag hung appropriately. The front of the yellow scaffold tag will read as follows:

CAUTION-FALL PROTECTION MUST BE USED ON THIS SCAFFOLD

For those scaffolds which require fall protection only because the ladder access exceeds 24 feet, the competent person shall indicate on the back of the yellow scaffold tag (under CAUTION header) that fall protection is needed only while climbing/descending the ladder access.

c. Those scaffolds that are complete and meet the proper specifications shall have a green scaffold tag hung appropriately. The front of the green scaffold tag will read as follows:

. ATTENTION: THIS SCAFFOLD WAS BUILT TO MEET PROPER SPECIFICATIONS IT IS SAFE TO USE.

d. Any scaffold which is tagged with a green or yellow scaffold tag shall have the tags removed and replaced with a red scaffold tag before any modification may be made which changes the safety status of the scaffold.

e. Scaffold tags shall be hung at approximately eye level and adjacent to each ladder access. In the event the scaffold does not have a ladder access, the tag shall be placed at each access location where it is easily visible before accessing the scaffold.

5. Respiratory Protection

A. Respirator protection shall be worn when required. The Contractor's Respiratory Program shall meet the applicable O.S.H.A standard for the operation or maintenance to be performed. Upon request, the records of your respirator program shall be provided to OUC for the personnel needing to use respiratory protection. This information must contain, but not be limited to, the following:

1. Training record for the type of respirator to be used.
2. Medical clearance for respirator use.
3. Fit test records for tight fitting respirators requiring a seal on the face.
4. Methods used to determine the change out schedule for respirator cartridges.

The PRBU Safety & Training Manager is the PRBU Respiratory Program Administrator has final authority on the type and level of respiratory protection used; unless the Contractor provides written authorization to use a different level of respiratory protection from the Contractor's Respirator Program Administrator. The written authorization must include the data and methodology used to determine the level of respiratory protection.

B. Additional information on respiratory protection may be found in 29 CFR 1910.134 and 1910.120.

6. Confined Space Procedure

A. A Confined Space Entry Permit shall be obtained before entering into any confined space. The Confined Space Entry Permit shall be obtained from the appropriate OUC Representative.

1. A confined space is any one of the following areas that employees may need to enter in the course of their work:
   a. A structure such as a boiler or condenser
   b. A container such as a tank, drum, sump, vault, or other vessel
   c. A pipe, ventilation or exhaust duct, sewer, coal silo, mill, manhole.

2. Any structure which was not designed for continuous human occupancy where there may be a lack of oxygen or where potentially explosive, flammable, poisonous, asphyxiant, suffocant, or anesthetic vapors or gases could be

present in hazardous amounts. Any structure in which engulfment or entrapment is possible. Confined spaces should be marked; however, lack of proper marking does not relieve personnel of determining if the space requires to be considered as a confined space prior to entry.

B. Responsibilities:
    1. Contractors Representatives: Shall coordinate their requests for a Confined Space Permit through their OUC representative. Unless other arrangements are made through the OUC representative, it is the Contractor's responsibility to assign a qualified person to authorize a Confined Space Permit, as the Person in Charge of the Work, and to provide a rescue plan, the personnel, equipment and/or devices necessary to ensure the requirements of the Confined Space Permit are met.
    2. Supervisors: It shall be all supervisors' responsibility to inform their employees of the requirements of the Confined Space Entry Procedure and the hazards associated with working in confined spaces and to initiate disciplinary action for any violation of the procedure.
    3. Employees: It shall be all employees' responsibility to abide by the requirements of the Confined Space Entry Procedure.
C. Personnel required to enter a confined space shall obtain a Confined Space Entry Permit from the appropriate authorized person.
D. The employee issuing the permit and the employee requesting the permit shall fill out the permit and it shall be posted in a conspicuous location near the entrance to the confined space.
E. The following items shall be considered and the appropriate actions taken before anyone enters the confined space:
    1. The atmosphere shall be tested to determine the oxygen percentage level and the presence of explosive or toxic gases, fumes, or dust.
        a. Only an approved instrument shall be used. Instruments found not working properly shall immediately be repaired.
        b. Employees conducting the tests shall be properly trained.
        c. All levels of the confined space shall be tested to ensure there are no pockets of hazardous gases, fumes, or oxygen deficient areas.
        d. If long work in the confined space is anticipated, tests shall be conducted periodically to ensure that safe conditions are maintained. A test shall be conducted a minimum of once each shift to ensure the atmosphere remains in a safe condition.
        e. Constant monitoring may be required based on the hazards and the work being performed (i.e., welding, painting, coating, using chemicals). In the Air Quality Control Building constant monitoring for Sulfur Dioxide is required inside the modules and the connecting ductwork while the boiler is in operation.

F. All test results shall be recorded on the Confined Space Entry Permit.
G. Detailed requirements for welding in confined spaces are given in 29 CFR, Part 1910.252.
H. Entry into a confined space with an unsafe atmosphere shall be avoided if at all possible. An employee required to enter a confined space with an unsafe atmosphere shall be equipped with the necessary personal protective equipment. Any entry into a confined space with an unsafe atmosphere requires a consultation with OUC Plant Management and the methods of protecting employees must be agreed upon before work may be performed. Any entry into a confined space with an atmosphere that is Immediately Dangerous to Life or Health (IDLH) requires a Job Hazard Analysis (JHA) and consultation with Plant Management, the PRBU Safety & Training Manager or designee.
I. The confined space shall be ventilated as required to ensure a continuous supply of breathing air to the work area.
J. The SEC LOTO Procedure shall be used to ensure all equipment and systems that could affect the confined space are rendered inoperative.
K. If required, the space shall be prepared by isolation, draining, venting and cleaning.
L. No employee shall enter a confined space unless a standby employee (hole man) is stationed outside the entrance.
    1. It shall be the standby employee's responsibility to provide assistance to the employees working in the confined space, and to summon emergency assistance in the event of an emergency.
    2. The standby employee shall not enter the confined space or leave the area without being replaced by another employee.
    3. It shall be the standby employee's responsibility to keep track of employees entering and exiting the confined space. He/she shall log them in and out on the back of the Confined Space Entry Permit.
M. The “Person in Charge of the Work” as denoted on the OUC-SEC Confined Space Permit shall ensure a rescue plan, rescue equipment and fire equipment are available in the event of an emergency. The rescue plan must indicate the

equipment required for extricating personnel in an emergency and must be at the entrance to the confined space under the control of the standby employee with a copy of the OUC - SEC Confined Space Permit.

1. If the contractor is providing their own rescue services:
    a. The name of the response team or person(s)and their response time must be indicated on the Rescue Plan. The response time must be no longer than four minutes for the rescuer(s) to respond to the scene.
    b. The availability of rescue services for each shift that entry occurs in the confined space must be denoted on the Confined Space Permit in the appropriate location.
    c. The OUC Representative and Watch Engineer must be notified each shift entry occurs that the contractor is providing their own rescue services for the confined space.
2. If OUC is providing rescue services:
    a. There must be an SEC approved Rescue Plan and there must also be a SEC Rescue Checklist for use by the SEC Emergency Response Team at the entrance to the confined space under the control of the standby employee.
    b. Any deviation(s) from a SEC approved rescue plan must be approved by the PRBU Safety & Training Division.
    c. Any confined space that must be entered for which there is not a SEC pre-approved rescue plan requires a plan to be written and approved by the PRBU Safety & Training Division before entry is allowed.
    d. In cases where there is not a PRBU Safety & Training representative available, the OUC Representative and a SEC Confined Space Qualified ERT member may authorize the deviation to the Rescue Plan or write a new rescue plan.
    e. To ensure SEC ERT Confined Space Rescue Services are available, the Person in Charge of the Work shall call the Watch Engineer, and verify the availability of rescue services and denote it in the appropriate space on the Confined Space Permit.

N. A communication system shall be preplanned to include communications between the standby person and employees inside the confined space, and a method to call for emergency assistance.
O. Safe access to the confined space shall be maintained at all times.
    1. If the confined space is entered by a ladder, the ladder shall remain in place and shall be fastened in a firm position while employees are inside the confined space.
    2. If possible, all cords, hoses, leads, etc., shall be routed through an entrance other than the employee access into the confined space.
P. All electrical equipment used shall be properly grounded. GFCI protection is required for use with portable lighting and portable power tools used in confined spaces.
Q. To prevent the latching of self-locking doors or hatches while employees are working inside a confined space, the locking devices shall be made inoperative before employees enter.
R. No work activities that cause or produce open flames, such as welding, shall be performed without a Welding and Cutting Permit.
S. Electric welding, gas welding, cutting, or any other hot work, shall not be performed on the interior, exterior, or near the openings of any confined space that may contain flammable or explosive vapors until the confined space has been properly cleared.
T. Compressed gas bottles other than compressed air shall not be allowed in a confined space.
U. All entryways deeper than five (5) feet vertically require a mechanical device (e.g., Tripod) for emergency extrication to be in place at all times while personnel are in the Confined Space.
V. After the permit has been hung, but before any employee enters the confined space, a pre-entry briefing with all employees required to enter the confined space shall be conducted by the person in charge of the work. The briefing shall cover all the items required to safely enter the confined space and the hazards associated with working in confined spaces.
W. When the work in the confined space is complete, the person that requested the permit shall ensure all personnel and equipment are out of the confined space. They shall then sign off on the permit and turn it in to their supervisor. The supervisor shall turn it in to the PRBU Safety Coordinator or their OUC representative.
X. Failure to follow the guidelines of the confined space procedure may require work to stop until the correct procedures are followed. The determination as to who is responsible for the cost of a work stoppage will be determined by the OUC Representative and Contractor Representative.

7. Welding and Cutting/Hot Work

A. A welding and cutting/ hot work permit is required whenever welding, cutting or heating is done. Welding and cutting permits shall be coordinated through the appropriate OUC representative.
B. When welding or cutting in elevated positions, precautions shall be taken to prevent sparks and hot metal from falling on people and equipment below. Walls, roofs, ceilings, pipes, tanks and partitions shall be assessed to determine if welding or cutting on them will cause a fire due to conductive heat, radiated heat or sparks from the hot work process. Conveyors and ductwork shall be considered when performing welding, cutting or other hot work that might carry sparks or otherwise cause a fire at a distant location. The conveyors or ducts must be protected, or shut down to prevent fires due to the welding, cutting or hot work if is determined the work may cause a fire. The person requesting the permit or the OUC Representative shall notify the Watch Engineer or appropriate Operations Area Supervisor when beginning work, and at the end of each shift that the day's hot work has concluded until the hot work being performed under the permit is complete.
C. Welding screens shall be used while working next to other employees or walkways and stairways.
D. Suitable fire extinguishing equipment shall be immediately available at all locations where welding and cutting work is being performed.
E. A fire watch shall be provided during and after the work is completed to ensure no fire hazards exist. The minimum length of time for a fire watch is 30 minutes, however, based upon the determination of the OUC Representative, the fire watch may be required for up to an hour.

8. Trenching and Excavations

A. Before any work is started, all underground structures and utilities affected by the work shall be located and marked. A map or drawing of the proposed excavation or trenching and any obstructions must be reviewed by all personnel involved in the trenching or excavation and agreement reached as to the methods used to ensure no underground utilities or structures are damaged during the process of the excavation or trenching.
B. All excavations 5 foot or deeper shall be shored or sloped in accordance with Federal, State and local standards.
C. All excavations 4 feet or deeper shall have a ladder for access into the excavation with no more than 25 feet of travel in any direction.
D. Spoil piles shall be kept a minimum of 2 feet from the edge of the excavation.
E. The soil type on site is to be considered Type C for excavations and trenches.
F. All excavations or trench operations shall be inspected and supervised by a “Competent Person” as designated in 29 CFR 1926 Sub Part P - Excavations.
G. Further information on the requirements for excavations and trenching can be found in 29 CFR 1926 Sub Part P - Excavations.

9. Process Safety Management

A. The Stanton Energy Center has two systems which are covered by 29 CFR 1910.119 Process Safety Management of Highly Hazardous Chemicals:
    1. The Selective Catalytic Reduction Ammonia system (SCR) which is used to reduce NOx emissions on SEC Unit # 2.
    2. The Chlorine Injection system used to chemically treat the cooling water at both the SEC Unit # 1 & # 2 Cooling Towers.

B. In accordance with 29 CFR 1910.119 (h) (1) (Process Safety Management), the Orlando Utilities Commission is required to review the safety performance and safety program of contractors who perform maintenance or repair, turnaround, major renovation, or specialty work on or adjacent to systems that are covered by the standard as part of the evaluation used to determine the award of contracts. In order for your company to be evaluated for award of the contract, a completed, signed and dated Contractor Safety Evaluation form must be submitted along with a copy of the contractor’s Experience

Modification Rate (EMR) on Insurance Company Letterhead. Failure to submit the Contractor Safety Evaluation will remove the Contractor from the qualified contractor/vendor list and the contractor will not be eligible for award of the contract.

C. All contractors awarded work that is on the systems covered by the Process Safety Management Standard shall provide documentation that all employees have received training in the potential fire, explosion, or toxic release hazards related to his/her job and the process and the applicable provisions of the emergency plan. The documentation shall include the identity of the contract employee, the date of the training, and the means used to verify that the employee understood the training. In addition, a Job Hazard Analysis (JHA) is required for all work on systems covered by the Process Safety Management Standard and the JHA must be reviewed by all personnel involved in the work prior to the work beginning, and as needed, during the progress of the work. Any modification to the JHA during the job must be approved by the senior contractor supervisor on site and either the OUC/PRBU Safety & Training Manager or Stanton Energy Center Maintenance Manager, or their designees.
D. All contractors awarded work that is on the systems covered by the Process Safety Management Standard shall report any injuries or illness related to work in the process areas immediately and shall provide an injury and illness log on a weekly basis to the Safety & Training Manager.
E. All contractors awarded work that is on the systems covered by the Process Safety Management Standard shall comply with all other pertinent provisions of 29 CFR 1910.119 that are not mentioned in this document.

10. Commercial Diving Operations

A. All diving operations shall conform to the non-diving safety procedures contained in the Contractor Orientation.
B. The Watch Engineer on duty shall be made aware of each day's planned diving activities.
C. Diving operations will be supervised by an OUC representative.
D. Any diving operation taking place at the intake of a pump or pumps shall be a surface supplied air dive with helmet and shall meet all requirements as outlined in 29 CFR 1910.425.
E. An operational 2-way voice communication system shall be used for all dives.
F. Communications shall be checked at least each 3 minutes. A correct response from the diver is required to continue the dive.
G. All divers must be line-tended.
H. Detailed information concerning the requirements for diving operations is given in 29 CFR 1910. SUBPART T Commercial Diving Operations.

Appendix 13

Excerpts from OUC Operational Guide, Emergency Plan Procedures

OUC Emergency Numbers

To report an EMERGENCY (requiring immediate help)

Reliable Plaza, Gardenia, Pershing & St. Cloud
Call: **9-911** EMS and **x44911** SMC

Stanton Energy Center
Call: **x43111** Control Center

Indian River Plant
Call: **3-911** EMS and **x44911** SMC

OUC The Reliable One®

SMC = OUC Security Monitoring Center
When calling from an outside phone, dial 407-434-4911 to reach the SMC

OUC Non-Emergency Numbers

To Report a Non-Emergency Accident or Injury

Call: **x46111** Service Dispatch

OUC The Reliable One®

Other Phone Numbers

Security Guards

x46100 407-434-6100 — ***Reliable Plaza***
x46200 407-434-6200 — ***Pershing***
x46300 407-434-6300 — ***Gardenia***
x43136 407-434-3136 — ***SEC Main Gate***

Stanton Energy Center
407-658-6444

OUC Emergency Operational Guide

Emergency Plan Procedures

ORLANDO UTILITIES COMMISSION
ORLANDO, FLORIDA

REVISED AUGUST 2010

OUC Emergency Preparedness

Overview
The emergency plan procedure is established to provide a continuing program to prepare for, respond to, and recover from any emergency or disaster and to assure maximum protection, continuity, and recovery of personnel, property, and services.

OUC recognizes the essential role that must be played by all personnel in planning to minimize the effects of any type of disaster, which might strike the Commission's, electric, and water facilities distribution or support systems. Two general types of disasters that could threaten normal operations are Natural Disasters or Manmade Disasters.

Natural Disasters: (Types of natural phenomena)
• Hurricanes
• Severe Thunderstorms/Lightning
• Extreme Cold Weather Conditions
• Tornadoes/High Winds
• Flooding
• Fires
• Sinkholes
• Drought

Man-Made Disasters:
• Terrorist Attacks
• Civil Disorders
• Chemical/Hazardous Material Spills
• Arson
• Vandalism
• Bomb Threats
• Major Fires or Explosions
• Transportation Accidents or Derailments

The most common type of emergency condition encountered in the past has been hurricanes. OUC has been through a number of these conditions and has a standard procedure in place. If the disaster is the result of terrorist action, some advance warning may be received. In the event of terrorist attack, the Commission's contribution of electric power and uncontaminated water supply is essential to survival and to post attack recovery. The effectiveness of this contribution will depend upon any blast damage to the system and the extent of completion of pre-attack preparation.

Employee Expectations
Maximum support to OUC's Divisions is required by both management and employees in times of emergency. Emergency preparedness plans are designed to show employees where and when to report to a pre-assigned station. While OUC is under a level I status an employee may be asked to perform duties different from their normal work load. They may also report to a different person depending on the task assigned.

Because OUC provides an essential public service, the forced closing of its facilities is unlikely. However, as a result of severe weather conditions which may include hazardous driving conditions and other weather-related problems beyond employees' control (e.g., the closing of schools), work attendance maybe affected. In such instances, special procedures will be

Power Resources Branch

The Power Resources Branch is responsible for securing all OUC power plants prior to an event and restoring their operations in the event of a major incident. The Power Resources Branch Director shall have primary responsibility for implementation and direction of the procedures to secure and restore the plants as deemed necessary.

Power Resources Branch Director

- **Report to the Operation's Section Chief**

Responsibilities: (See Appendix E for detailed plan)

Power Resources Director's role is to oversee securing the plant before an incident and restoring the plant to normal operating status as needed.

Preparation Phase

LEVEL 2

- ❑ All loose material on the plant premises which might create damage during high winds shall be removed or secured.
- ❑ Bracing for roll up doors should be located.
- ❑ The radiator for the Emergency Diesel Generator should be assessed for additional protection from wind-driven hazards and protective action taken.
- ❑ Contact CCA and ensure they are aware of the hurricane status and are taking the appropriate precautions.
- ❑ All pumps and auxiliary equipment at all outlying pump structures shall be checked for proper operation
- ❑ All plant sump pumps and ash pumps shall be checked for status and operation condition
- ❑ The location and condition of foul weather gear shall be checked and should obtain new gear as necessary.
- ❑ If high rainfall is predicted, check position of all basin outlet gates.
- ❑ Operating condition of plant auxiliary power systems shall be checked
- ❑ Advise all plant personnel that a Watch is in effect, and explain the time to be given for their domestic responsibilities in order that they may be available for emergency. Review the OUC Employee Handbook Section 1 page 171 - 175, Weather Policy, and explain assignments that will probably be made as the situation develops.
- ❑ Review personnel roster and plan to provide the extra personnel that may be required for the anticipated emergency
- ❑ Secure air-monitoring stations by checking for loose items and continue normal operation.
- ❑ Check No. 2 oil tank and check No. 5 oil tank levels. Top off raw water, potable and de-ionized water tanks. Top off emergency diesel generator and fire pumps
- ❑ Plant vehicles should be properly serviced and fueled.
- ❑ Contact OUC Telecommunications to acquire microwave phones for use as needed.

- ❑ Make certain that supplies of battery-powered lights, spare bulbs, and spare batteries for all battery-powered devices are adequate
- ❑ Check operation and security of normal and emergency communication equipment between plants and Load Dispatch Center.
- ❑ Determine food requirements and other supplies required for those personnel remaining at the plant during the hurricane.
- ❑ Close windows and doors
- ❑ Place a 6" pump for use in drainage & flood control inside the building near the unit # 2 Forced Draft Fans
- ❑ Make a copy of plant operating procedures for hurricane conditions available in the Control Room
- ❑ Top off coal silo and additive storage tanks. Override key for additive feed storage tank mixers.
- ❑ Operations personnel shall be alerted to standby for Pond Water Level Control if not during normal duty hours.
- ❑ Check operation of battery-operated AM/FM radio, OUC radios and cellular phone.
- ❑ Decide if it is advisable to disconnect electrical supply to all streetlights for the fixtures at Coal Handling.

LEVEL 1

- ❑ Switching operations will be implemented as directed by the Control Center to place the system in the most reliable condition
- ❑ Bracing for roll up doors should be applied
- ❑ All plant vehicles will be moved to the most secure positions available on the plant sites
- ❑ Systems should be shut down to control nuisance breaker trips and electrical shorts in various areas of the site. This will be performed as directed
- ❑ Remaining road signs should be removed
- ❑ The Stacker/Reclaimer should be secured
- ❑ The equipment at the Sludge Conditioning Building should be secured
- ❑ Verify the Auxiliary Boiler is available for use

Operational Phase:

During event

- ❑ Plant loads will be adjusted as directed by the Load Dispatcher.
- ❑ Availability of units and estimated availability of damaged units will be furnished to the Load Dispatchers.
- ❑ Units will be loaded as directed as system recovery proceeds.

After Event

- ❑ The Plant Director or his designee will coordinate the operation of the Indian River Plant Combustion Turbines as needed to support the needs of the Stanton Energy Center and OUC Transmission System during, and after, the Hurricane.
- ❑ Damage to plant and equipment will be assessed as rapidly as possible, and reported Estimates of repair requirements and assistance, beyond the capabilities of plant personnel, shall be a part of this report.
- ❑ Availability of units and estimated availability of damaged units will be furnished to the System Operators.

- ❑ Units will be loaded as directed as system recovery proceeds.
- ❑ Verify with System Operations, integrity of the 17-21 Distribution Line. This is the power for phone system at SEC.
- ❑ The Stanton Energy Center has minor damage, or no damage, at the discretion of the Plant Director SEC personnel may be assigned to assist other areas of the Commission to complete recovery operations.

TERMS

What is a Hurricane?
A hurricane is a type of tropical cyclone, which is a generic term for a low pressure system that generally forms in the tropics. The cyclone is accompanied by thunderstorms and, in the Northern Hemisphere, a counterclockwise circulation of winds near the earth's surface. Tropical cyclones are classified as follows:

Tropical Depression
An organized system of clouds and thunderstorms with a defined surface circulation and maximum sustained winds* of 38 mph (33 kt**) or less

Tropical Storm
An organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds of 39-73 mph (34-63 kt)

*** Sustained winds**
A 1-minute average wind measured at about 33 ft (10 meters) above the surface.

**** 1 knot** = 1 nautical mile per hour or 1.15 statute miles per hour. Abbreviated as "kt".

Hurricane
An intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph (64 kt) or higher

HURRICANE WATCH indicates the **possibility** that you could experience hurricane conditions (sustained winds of 74 mph or higher) within **48 hours.**
This watch should trigger your family's disaster plan, and protective measures should be initiated, especially those actions that require extra time such as securing a boat, leaving a barrier island, etc.

HURRICANE WARNING indicates that sustained winds of at least 74 mph are **expected** within **36** hours or less.
Once this warning has been issued, your family should be in the process of completing protective actions and deciding the safest location to be during the storm.

****HURRICANE WATCH – STANTON ENERGY CENTER/INDIAN RIVER PLANT ****
(ACTIVATION LEVEL II - 48 HOUR NOTICE OF POSSIBLE HURRICANE FORCE WINDS)

PLANT MANAGEMENT

- Advise all **Personnel** that a Watch is in effect
- **Contact Stanton A and Reliant** regarding OUC weather plans and the status of their preparations
- **Review OUC Weather Policy** with employees and remind all personnel to keep OUC identification with them when traveling to/from SEC
- **Develop staffing plan**. Request volunteers from Operations and Maintenance group. Advise personnel of the possibility of extended shift work. Verify that employee emergency phone numbers are current ***(See list at end of document).*** **NOTE: Depending upon the location and direction of the storm, SEC Employees residing in Brevard County may need to be released early to allow safe travel home.**
- Direct all plant vehicles should be serviced and fueled.
- **Finalize list and begin procurement of supplies and food** needed to sustain personnel at site during storm. **(*See guide at end of document*)**
- **Sleeping Accommodations** – Provide air mattresses and sheets for 80 persons (supplied from OUC-Pershing)
- **Create time and material tracking system (work orders, etc.) for labor hours and material costs to support FEMA provisions.**
- **FUELS**
  1. Evaluate the need for using OUC tank trailers and trucks or renting additional tank trucks and scheduling drivers to provide No. 2 Fuel Oil to IRP. Determine location for staging trucks if needed.
  2. Evaluate Coal Suppliers and Rail Company plans for delivery through anticipated duration of hurricane watch and warning.
  3. Make provisions for railroad (crossing equipment, signs, etc.) repair after the hurricane has passed.
- **WAREHOUSE** - Begin securing supplies on pallets **(*See guide at end of document*)**
- **Contact OUC ICC Operations Section Chief or Incident Commander to communicate action taken.**

UNIT 1/2 OPERATIAONS	PLANT MAINTENANCE	SITE MAINTENANCE	STANTON B	INDIAN RIVER PLANT
Verify operational status of **outlying pumps and auxiliary equipment**	Locate bracing for **roll up doors**	**Remove loose materials** on plant grounds	Verify operational status of **outlying pumps and auxiliary equipment**	Verify operational status of **outlying pumps and auxiliary equipment**
Verify operational status of plant **sump and ash pumps**	Inspect **Emergency Diesel Generator radiator** for risk of wind damage	**Inspect buildings** for secure wall panels, doors, etc.	Locate bracing for **roll up doors**	**Remove loose materials** on plant grounds
Check position of all **basin outlet gates**	Organize **standby crew** to reside onsite during the hurricane	**Secure mobile equipment**, and vehicles	**Remove loose materials** on plant grounds	Inspect **Emergency Diesel Generator radiator** for risk of wind damage
Verify operational status of **Aux Boiler and auxiliary power systems Test Fire Aux Boiler**	Secure air-monitoring stations	De-install **non-essential road signs**	**Inspect buildings** for secure wall panels, doors, etc. **Close all windows and doors**	**Inspect buildings** for secure wall panels, doors, etc. **Close all windows and doors**

Check/top off **bulk oil tank** (No. 2 and 6) levels	Close all windows and doors		**Secure mobile equipment**, and vehicles	**Secure mobile equipment**, and vehicles
Verify operational status of emergency communication systems - Radios– Base Station at Main Control Room, Remote Units - Land Lines - Cell Phones	Rent (2) 6" drainage-flood control pump (one Mudhen pump)		Verify operational status **auxiliary power systems**	Verify operational status **auxiliary power systems**
Provide copy of Hurricane Procedures to Main Control Room	Evaluate need to isolate electrical service for fixtures at Coal Handling		Check/top off **bulk oil tank**	Check/top off **bulk oil tank** **Fill Portable fuel containers/top off portable equipment**
Top off coal silos	Power off: 1. Front Street Lights - Breaker Panel 1-APC-LPL-F531 (at Emergency Diesel Generator Bldg.) 2. Coal Pile Lights – Breaker Panel 1-APC-LPL-F922 (in the Coal Transfer Bldg.)		Verify operational status of emergency communication systems - Radios– - Land Lines - Cell Phones	Verify operational status of emergency communication systems - Radios– - Land Lines - Cell Phones
Top off additive storage tanks			Verify Remote Operation of outlying facilities from Control Room	Verify Remote Operation of outlying facilities from Control Room
Empty Brine Tanker – Park vehicle in the A&B Centrifuge Room				
Verify Remote Operation of outlying facilities from Control Room				

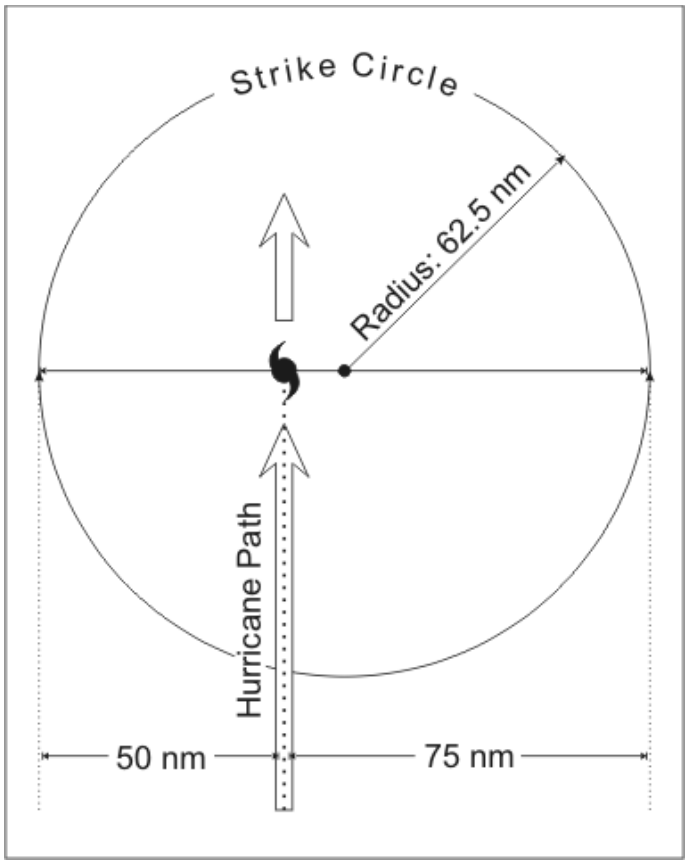
****HURRICANE WATCH – STANTON ENERGY CENTER/INDIAN RIVER PLANT ****
(ACTIVATION LEVEL I - 36 HOUR NOTICE OF POSSIBLE HURRICANE FORCE WINDS)

PLANT MANAGEMENT

- **Advise all SEC employees that a Hurricane Warning is in effect.**
- Receive instructions from **Load Dispatch**
- Contact **DTE Energy** to advise plans for **Landfill Gas**.
- **Finalize and Communicate Staffing Plan** to operate facility during storm
- Complete procurement of supplies and food.
- Monitor news reports for road closures
- Insure that all personnel not assigned to work during the storm are sent home 12 hours in advance.
- Move all plant vehicles to secure locations (indoors) with keys left in the vehicles.
- Move all employee vehicles to location TBD.
- Insure that all work assignments have been communicated to appropriate personnel 12 hours in advance of hurricane winds.
- **WAREHOUSE – Move supply pallets to Crane Bay by Unit 1 Boiler Building.**

OPERATIONS	MAINTENANCE	SITE MAINTENANCE	STANTON B	INDIAN RIVER PLANT
Park diesel tank truck near Emergency Diesel Generator Bldg.	Install bracing for roll up doors	De-Install remaining road signs	Install bracing for roll up doors	Secure reference materials and records in trailer
Evaluate the need to isolate all **Chemical feed systems** (Ammonia, Sulfuric Acid, Caustic, Chlorine, Bulk Fuel oil tanks, etc.) Verify that gas cylinders are secure	Move 2 six inch diesel sump pumps under Unit 1 and Unit 2 Precipitators		Evaluate the need to isolate all **Chemical feed systems** (Ammonia, Sulfuric Acid, Bulk Fuel oil tanks, etc.)	
To prevent nuisance alarms and electrical outage, consider shutdown of the following; 1. Coal handling 2. 2 Spray Levels – Units 1 and 2 AQC 3. Precipitator Fields 4. Brine Plant	Secure all Outside Overhead Cranes			
Assess the need to Shut off Fire Suppression system to GSU MAT and RATS				
Evaluate the need to isolate the Biogas supply				
Secure the Stacker/Reclaimer				
Secure equipment in Sludge Conditioning Bldg. (radial stacker, conveyors, vehicles, etc.) (**HVFL Operations)**				

****HURRICANE STRIKE – STANTON ENERGY CENTER/INDIAN RIVER PLANT **** ***(HURRICANE FORCE WINDS HAVE REACHED SITE)***
PLANT MANAGEMENT
• Category 1 and 2 Hurricanes – Adjust Plant Loads as directed by Load Dispatch • Category 3 and Higher – Evaluate need to shutdown Units • **Move all onsite personnel to designated storm-protected areas (Maintenance Shops) inside SEC Main Building and IRP.**



****POST HURRICANE STRIKE – STANTON ENERGY CENTER/INDICAN RIVER PLANT**** ***(HURRICANE HAS TRAVELED AWAY FROM AREA – WIND SPEED < 30 mph)***				
PLANT MANAGEMENT				
• **Initiate Site Damage Evaluation and Repair** • Coordinate with Load Dispatch to Evaluate Storm impact on Coal and Natural Gas Supply • **Contact OUC ICC Operations Section Chief or Incident Commander** to communicate status. • **Notify Employees of return-to-work plans**				
OPERATIONS	**PLANT MAINTENANCE**	**SITE MAINTENANCE**	**STANTON B**	**INDIAN RIVER PLANT**
Inspect chemical storage tanks - Return chemical and gas supply systems to normal status.	Return Overhead Cranes to normal status	Re-Install all road signs	Inspect chemical storage tanks - Return chemical and gas supply systems to normal status.	Inspect site for debris
Return Stacker Reclaimer to normal status	Use pumps to transfer water as needed	Inspect site for debris	Return mobile equipment/ vehicles to normally designated parking locations.	Inspect buildings for damage and repair as needed.
Return mobile equipment/ vehicles to normally designated parking locations.	Remove bracing for roll up doors	Inspect buildings for damage and repair as needed.	Inspect site for debris	
	Re-Energize all breakers supporting Street and Coal Pile Lighting		Remove bracing for roll up doors	
			Return mobile equipment/ vehicles to normally designated parking locations.	

STAFFING OPTIONS	SUPPLIES (SMALL ARTICLES PALLETIZED)
Operations Crews 2 (weekday) = 30 3 (weekend) = 45	1 Case of Duct Tape
Machine Shop - 10	4 Rolls of Plastic 20' wide x 100' (6 mil)
Electric Shop - 5	24 D Cell Batteries
Instrument Shop - 5	12 Flashlights (2 D Cell Type)
Management - 3	8 6 Volt Flashlights (Lantern)
Security Personnel - 3	4 100' Electrical Extension Cord
VFL - 2	1 Spool (600') of 3/8" Rope
Engineers - 3	1 Spool (600') of 1/4" Rope
Labor Crew - 9 (2 Janitorial)	8 Cases of Aerosol Tire Sealant
Fleet Mechanic - 1	8 6 Volt Batteries
Warehouse - 2	1 Bundle (48 sheets) of plywood (1/˜" thick)
Environmental - 1	1 Bundle (96 boards) of 2" x 4" x 8' boards
Safety - 1	20 Assorted size tarps
TOTAL: 75-90	Portable Flood lights (placed in the I&C Pick-up Truck)
	Note: 200 ea. – 40 lb. bags of Builders Sand with 200 reinforced polypropylene bags on pallets covered with shrink wrap should be staged at the SEC # 1 FD Fans by the North Door (These bags and sand should normally be kept in the Temporary Warehouse out of the weather).

MEAL AND FOOD SUPPY GUIDE

PLAN – Supply meals for 4 days for 80 individuals. All meals prepared in 2nd Floor Kitchen or 2nd Floor warehouse area. Management will be responsible for purchasing food and preparing meals

MEAL PLAN
DAY 1 - DINNER- 06:00 PM CATER MEAL FOR ALL PLANT HURRICANE TEAM MEMBERS
DAY 2 BREAKFAST BACON/SAUSAGE EGGS TOAST
DAY 2 LUNCH HOT DOGS BAKED BEANS CHIPS ICED TEA
DAY 2 DINNER HAMBURGERS AND CHICKEN CORN ICED TEA
DAY 3 - BREAKFAST PANCAKES BACON
DAY 3 - LUNCH PIZZA ICED TEA
DAY 3 - DINNER SPAGHETTI WITH MEAT SAUCE GARLIC BREAD
DAY 4 BREAKFAST BACON/SAUSAGE EGGS BUSCUITS
DAY 4 LUNCH/DINNER BBQ BOSTON BUTTS GREEN BEANS POTATOES ICED TEA

FOOD LIST TO SUPPORT MEAL PLAN	
MEATS	**QUANTITY**
Meatballs	250 meatballs
Hamburgers	440 hamburger patties
Hot Dogs	
Chicken	120 pieces
Boston Butts	61lbs. / 8 Butts
Bacon	X Lbs.
Sausage Links	X Lbs.
Pasta	32 Lbs.
Pizzas	24 (14 inch)
Potatoes	
Green Beans	
Baked Beans	
Corn	
Pancakes	
Eggs	
Garlic Bread	16 loaves
Sliced Bread	
Hot Dog Buns	
Chips	
Spaghetti Sauce	36 Jars
Tea	
Syrup	6 Bottles
Charcoal	

Appendix 14

SEC Fire Emergency Procedures

3.5 SEC FIRE EMERGENCY PROCEDURES

3.5.1 Major Fire

A. The Control Room shall be notified using the plant emergency telephone number 3111. The person making the call should be prepared to relay the following information: Type of emergency, location of emergency, severity of emergency, name of caller and telephone number call is being made from. The person making the call shall not break communication until directed to by the Control Room.

B. The Watch Engineer or Watch Engineer's designee (Control Center Operator) shall enact the plant evacuation plan and alert the Emergency Response Team.

1. Sound the fire alarm 3 times at 15 second intervals. Using the emergency paging system, announce the following between each alarm signal: "We have a fire emergency at (then give the exact location of the emergency. Give the building name, floor, direction and equipment reference point.) Please report to your assigned evacuation area."
2. All personnel shall evacuate all buildings and gather at their assigned areas with the exception of the following: (Note: the following should remain only if safe to do so.)

Main Bldg.	- Control Center I (Control Center Operator)
Scrubber	- Env. Systems Operator (Control Center Operator)
Waste Water Treatment Bldg.	- Aux. Operator I (Control Center Operator)
Sludge Conditioning Bldg.	- Lead Operator (Control Center Operator)

(Note: elevators should not be used to evacuate the building.)

3. The assigned evacuation areas are as follows:

a. Personnel assigned to the Control Center Building, Administration and Plant Services Building shall gather in the Visitor Parking Lot, location 1 on the SEC Evacuation Map. The alternate assembly point will be the Administration and Plant Services Parking Lot, location 2 on the SEC Evacuation Map.

b. Personnel assigned to the Waste Water Treatment Building will assemble in the Administration and Plant Services Parking Lot, location 2 on the SEC Evacuation Map. The alternate assembly point will be the Visitor Parking Lot, location 1 on the SEC Evacuation Map.

c. Personnel assigned to the Air Quality Control Building shall assemble on the south side of the building across the pavement, location 3 on the SEC Evacuation Map. The alternate assembly point shall be on the west side of the Unit #1 chimney, location 4 on the SEC Evacuation Map. (Rev. 3/27/96)

d. Personnel assigned to the Sludge Conditioning Building shall assemble on the pad west of the sludge stock out piles, location 5 on the SEC Evacuation Map. The alternate assembly point shall be on the west side of the Unit #1 chimney, location 4 on the SEC Evacuation Map. (Rev. 3/27/96)

e. Personnel assigned to the Material Handling Area shall assemble at the south side of the Transfer Building, location 6 on the SEC Evacuation Map. The alternate assembly point shall be the area west of the sludge stock out piles, location 5 on the SEC Evacuation Map.

f. Personnel assigned to the Permanent Warehouse shall assemble on the north edge of the parking lot on the north side of the building, location 7 on the SEC Evacuation Map. The alternate assembly area will be on the southwest corner of the fenced-in area, on the south side of the building, location 8 on the SEC Evacuation Map.

g. All site visitors shall assemble in the Visitor Parking Lot, location 1 on the SEC Evacuation Map. The alternate assembly area shall be the Administration and Plant Services Parking Lot, location 2 on the SEC Evacuation Map. Plant Security shall account for visitors using the gate log book.

h. Outside contractor personnel shall assemble on the south side of the Air Quality Control Building, location 3 on the SEC Evacuation Map. The alternate assembly point shall be on the west side of the Unit #1 chimney, location 4 on the SEC Evacuation Map. (Rev. 3/27/96)

i. Contract labor shall assemble in the Administration and Plant Services parking lot, location 2 on the SEC Evacuation Map. The alternate assembly area shall be the Visitor Parking Lot, location 1 on the SEC Evacuation Map.

j. Personnel assigned to the Safety & Training building will utilize the parking lot north of the Safety & Training building as their primary evacuation area. The primary evacuation area will be designated as Area #9. The main parking lot east of the Administration Building is designated as the alternate evacuation area (Area #1) for personnel assigned to the Safety & Training building. During normal working hours All OUC personnel assigned to the Stanton Energy Center as their normal workplace who are attending training at the Safety & Training building must report to their regular evacuation area. All other OUC personnel, or non-OUC personnel attending training will be accounted for as if assigned to the Safety & Training building. The Training Coordinator, or his designee, will determine if any personnel are missing from the PRBU Safety & Training Division, and will utilize the attendance roster(s) to verify personnel in training classes are in evacuation area #9 (or area #1 if alternate is used). Any personnel not in the evacuation area must be reported as missing. After normal working hours All personnel attending the Craft training classes will report to area #9 (or area #1 if alternate is used). The Lead Craft Training Instructor, or designee, will utilize the attendance list to verify the personnel in evacuation area #9 (or #1 if alternate is used). Any personnel not in the evacuation area must be reported as missing. (ERT members will be reported as missing because they will respond to the scene, not the evacuation area). (Revised 7/30/98)

k. Personnel assigned to the SEC Fleet Maintenance Facility will utilize area #10 (west of the building) as their primary evacuation area and area #11 (south of the building) as their alternate evacuation area. (Revised 12/1/98)

4. Supervisors shall be responsible to account for their personnel in the assigned areas. Site security shall drive to each evacuation area and check-in with each Supervisor. Supervisors shall inform security of any missing persons. After checking with each evacuation area, security shall report to the Watch Engineer in charge of the emergency scene. (Note: Supervisors shall list members of the Emergency Response Team as missing when reporting to security. Emergency Response Team members shall report to the Watch Engineer in charge of the emergency scene. The Watch Engineer shall keep a list of members that have reported. The Watch Engineer shall compare their list to Security's list to ensure all Emergency Response Team members are accounted for.)

5. Personnel shall remain at their assembly areas until released by the Watch Engineer in charge of the emergency scene.

C. The Watch Engineer or Watch Engineer's designee (Control Center Operator) shall call 911 and request outside emergency services.

D. Upon hearing the evacuation notice, the Plant Emergency Response Team shall report to the emergency location. It shall be the Watch Engineer's responsibility to have the emergency vehicle and trailer taken to the emergency location. The Watch Engineer or Watch Engineer's designee shall be in charge of the emergency scene.

E. The Watch Engineer or Watch Engineer's designee shall contact the Service Dispatcher, extension 4088 or outside line 9-384-4088. Information relayed to the Service Dispatcher shall include:

- Type of emergency,
- Location,
- That 911 has been called.

F. The Watch Engineer or Watch Engineer's designee shall send a person to the Main Gate. The person shall wait for the emergency vehicles and escort them to the accident scene.

G. It shall be the Watch Engineer's or Watch Engineer's designee's responsibility to notify the following:

- Plant Director appropriate Supervisor,
- PRBU Safety & Training Manager,
- Environmental Engineer,
- others as deemed necessary or as denoted in the ERT Standard Operating Procedures.

H. Personnel should not use the radio, PA system, or phone the Control Room except in regards to safe plant operation, or personnel involved in the emergency. To ensure personnel know when the emergency is over, an "All Clear" message will be given to indicate the emergency is over. The following is how the "All Clear" will be administered: (Rev. 1/19/96) Upon determining the incident is secure and it is safe to resume normal plant communications, the Watch Engineer or Senior Emergency Response Team member will have the following message announced over the PA system: "Attention all plant personnel, the emergency is now secure, you may resume normal communications". (Rev. 1/19/96) The Watch Engineer or Senior Emergency Response Team member will have each area evacuated, checked, and have any personnel in the evacuation areas notified the emergency is over and they may return to work either to the whole Plant or individual buildings. After evacuation, no personnel shall enter a building or leave the Plant site until so directed. (Rev. 1/19/96)

I. During a fire emergency, site security shall limit access to the site and egress from the site to emergency personnel only.

J. A Fire Watch will be posted as decided necessary by the Watch Engineer.

3.5.2 Minor Fires

A. At Stanton Energy Center all fires must be reported. Those that have been extinguished will be considered as a minor fire. If the fire has not been extinguished it is considered a Major Fire. Follow PRBU Guidelines in reporting and notifying the proper personnel.

B. The Control Center shall be notified.

C. The Watch Engineer and those designated from the Emergency Response Team shall check the emergency scene to ensure possible re-ignition or other fire hazards are eliminated. The Watch Engineer or Watch Engineer's designee shall notify the Emergency Response Team members deemed necessary by name using the plant paging system (84).

D. The Emergency Response Team members will assemble at the minor fire emergency scene and size up the emergency.

E. After the minor fire emergency scene is determined safe by the Watch Engineer and the designated Emergency Team Members, personnel may return to work.

F. At any time the minor fire emergency re-ignites, or otherwise begins to burn, the procedure for major fires may be initiated.

F. A Fire Watch will be posted as decided necessary by the Watch Engineer.

The Watch Engineer or Watch Engineer's designees shall then contact the Commission Service Dispatcher, extension 4088 or outside line 9-384-4088. Information relayed to the Field Operations Dispatcher shall include:

- type of emergency,
- location,
- fire is under control.

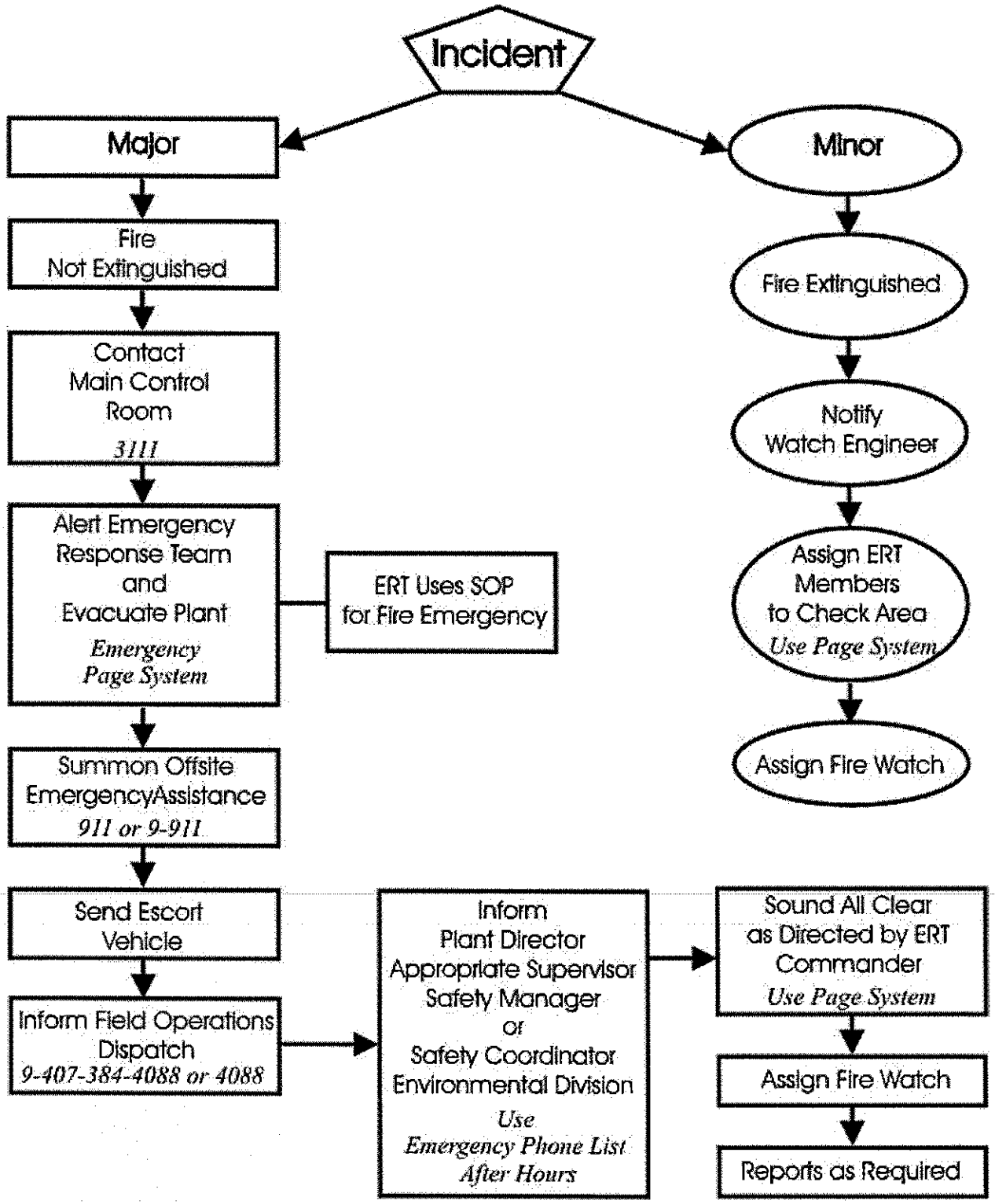
G. It shall be the Watch Engineer's or Watch Engineer's designee's responsibility to notify the following:

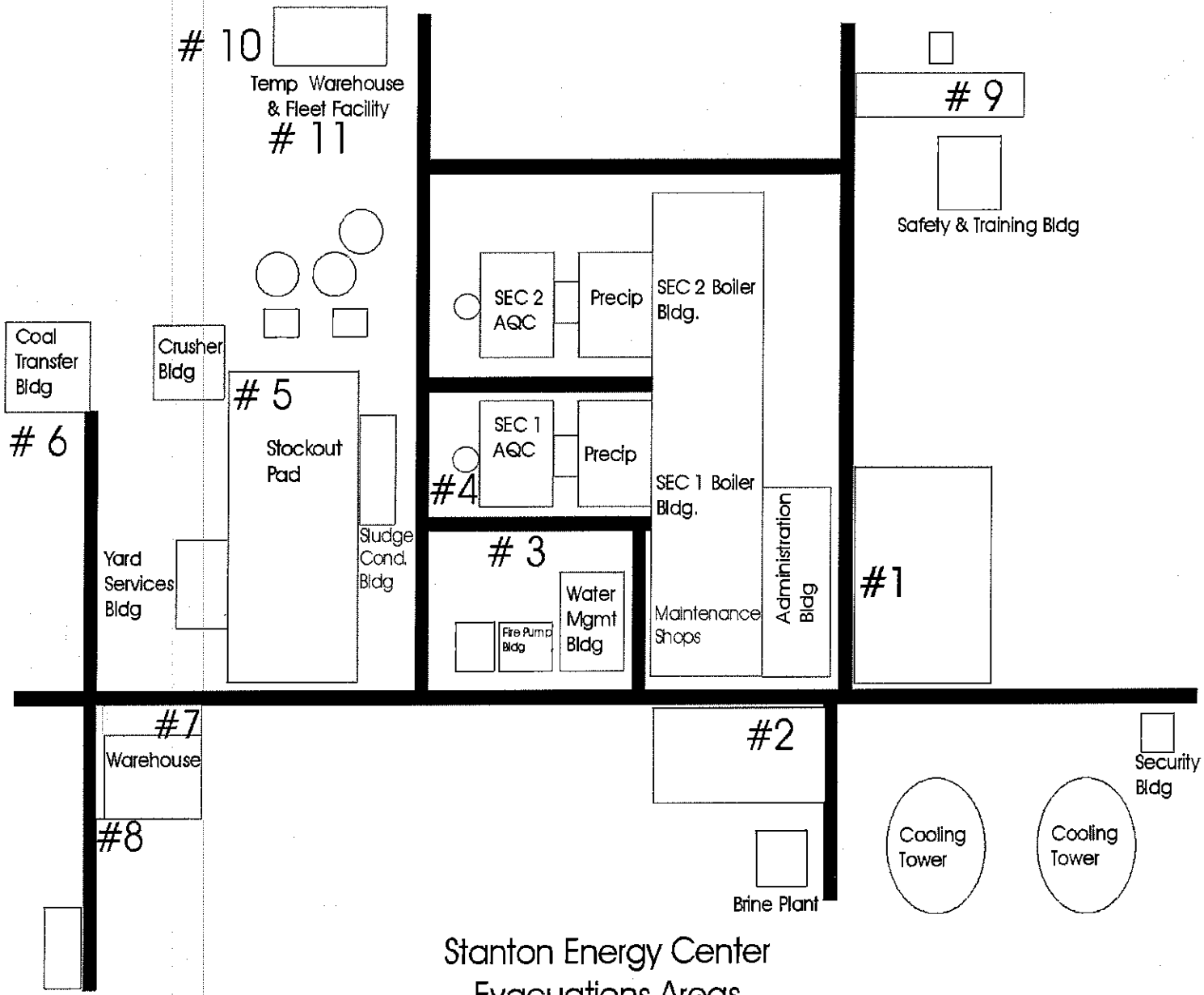
- Plant Director,
- appropriate Supervisor,
- PRBU Safety & Training Manager, Others as deemed necessary.

3.5.3 Reports

a. Reports as required shall be completed as soon as possible after each fire emergency.

Stanton Energy Center
Fire Procedure Flow Diagram





Stanton Energy Center
Evacuations Areas

SOP FOR INCIPIENT FIRES

1. Report to the fire trailer and Team Leader **(Watch Engineer). Insure your name is noted as having responded on ERT list on door of command center.**

2. Should Watch Engineer be unable to respond, the senior team member shall assume control of the team's actions.

3. **Insure non-team members evacuate emergency area**, they should be told to proceed to their evacuation area until further notification.

4. **Assign an escort for county fire service** to scene of emergency.

5. **Assess fire magnitude - take appropriate action.**

A. Safe distance assessment can be performed if the fire is readily visible without exposure to fire hazards. This can be performed without SCBA or fire protective clothing.

- OR –

Close proximity assessment/dispatch scout team if fire is not readily visible and must be investigated, fire protective clothing and SCBA should be considered. There must be at least 2 team members or scouts sent to assess the fire situation. Each scout should take a portable fire extinguisher. (One Class C and one Class ABC unless the type of fire is known) The Team Leader may direct scout team to pull or wait for hoselines instead of taking portable fire extinguishers if necessary.

Scout team should determine:

I. **Are any personnel in area? Are they injured?** Rescue should only be attempted if risk to team members is minimal or warranted.

II. **What is on fire and type of fire?**

III. **Do electrical systems need to be disabled?**
(Both AC and DC power may be available)

IV. **Can scout team extinguish the fire?**
(Scout team should extinguish fire at this time if it can be accomplished safely)
Note: If extinguishment is accomplished team should start procedures taken for - Step #6 - Fire is declared extinguished.

V. **Is fire beyond incipient stage, or can ERT extinguish the fire?**

VI. **Are automatic fire systems in area? Are they working?**

B. Lay hoselines while scouts assess situation. (If sufficient numbers of team members are present) Should hoselines be needed the second team should advance the hose to protect the scout position. The scout team should return to report to the Team Leader or do as directed by Team Leader if unable to extinguish the fire.

C. Establish plan of attack based on scout teams assessment. At this point the Team Leader must decide if fire is beyond incipient stage if scout team is unable to extinguish fire during close proximity assessment.

D. Extinguish the fire with hoselines or portable fire extinguishers, if scout team does not accomplish extinguishment. This situation must be assessed as the fire may be beyond the incipient stage if the scout team extinguishers do not provide sufficient extinguishment capabilities.

6. **Fire is declared extinguished** by the Team Leader. The Team Leader will insure that the area is secure and check for possible secondary ignition points. The Team Leader will report to the plant director or his designee as to whether it is safe to give an all clear for plant personnel to return to their workstations.

7. **Fire can not be extinguished** and is declared beyond the incipient stage and into the free burning stage. When the fire is declared to be beyond the incipient stage team members should retreat to a safe location and follow the SOP for free burning fires.

SOP FOR FREE BURNING FIRES

8. **Establish plan of defense** based on steps 1 - 5 of **Incipient Fire** procedures, scout teams assessment and results of the teams actions to this point.

9. **Take defensive action/await county fire services.** The primary concern is protecting the lives of team members and plant personnel. Rescue of personnel in emergency area should only be attempted if risk to team members performing rescue is minimal or warranted.

Defensive actions to be taken:

A. De-energize electrical power where needed to assist in fighting the fire and preventing contact with energized electrical equipment by team members or county fire service personnel. It should be remembered that some systems have auxiliary DC power, this power should also be de-energized.

B. Lay hoselines and protect exposures. Pay special attention to compressed gas cylinders, tanks or drums which may pressurize and B.L.E.V.E.

C. Ensure automatic fire systems are operating if provided. (It may be necessary to manually activate a system) automatic fire systems should remain in operation until the fire is declared extinguished by the appropriate authority.

D. Close or open valves to assist in control or extinguishment of fire.

E. Ensure fire water supply. It may be necessary to start diesel fire pumps, if electrical pump should fail or be disabled. The diesel fire pumps may also be used to augment water supply, if electrical pump cannot keep up sufficient water flow.

Note: It is possible for fire pumps to out produce flow to water tanks. If fire is of major proportions, county fire service personnel may need to pump water from ponds to increase water supply. (Consult - Fire Water Augmentation SOP)

10. **Arrival of county fire services** the Team Leader must relinquish control of the fire scene to the on-scene commander. The Team Leader should remain to assist the on-scene commander. Other team members should assist, as directed by the Team Leader.

11. **Fire is declared extinguished** by the on-scene commander or appropriate authority. The Team Leader shall notify the plant director or his designee as to whether the all clear for plant personnel to return to their workstations may be given.

12. **Clean up and equipment protection** may be necessary. This function may be performed in part or wholly by team members. The Plant Director, along with the Team Leader will determine what procedures may be necessary.

Appendix 15

Quality Control Test Procedures

Test Procedures

Property Tested	Test Method
In-Place Density	ASTM D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
Moisture Content/Solids Content	ASTM D4643 Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating
	ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass (See Note 1)
Compaction	ASTM D698 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (See Note 2)
	ASTM D4254 Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density (See Note 3)
Unconfined Compressive Strength	ASTM D2166 Standard Test Method for Unconfined Compressive Strength of Cohesive Soil

NOTES

1. Because ProMat, filter cake, and FGD sludge contain gypsum, results from ASTM D4643 should be calibrated against results using ASTM Test Method 2216 with the maximum drying temperature limited to 40°C.

2. Standard Proctor compaction tests should be performed at least once per year and any time there is a significant difference in the composition or characteristics of the ProMat or other waste materials.

3. ASTM D4254 is an alternative method that can be used for bottom ash.

STANDARDIZED JOB
MATERIAL LIME PERCENTAGE TEST

Description: This is an effective method for measuring the amount of lime in a given sample of ProMat material.

Procedure

1. Weigh out 25 g of stabilized material and place in a 400 ml beaker. Record weight to the nearest hundredth of a gram.

2. Add approximately 200 ml of warm water (70°F) to beaker.

3. Using a magnetic stirrer with stir bar, agitate the contents of the beaker.

4. Calibrate a pH meter to 7.

5. Using 0.5 N Hydrochloric acid (HCl), titrate the sample for 20 minutes maintaining a pH of 8.0-8.5. Do not let the pH drop below 8.0.

6. Record the final burette reading in ml of HCl.

7. Determine the % solids content.

   Calculations:

   A) Uncorrected Lime Content

$$\frac{(\text{ml of HCl})(0.5)(y)(100)}{\text{sample weight}}$$

   B) Corrected Lime Content of the Stabilized Material (WWB)

$$\frac{\text{\% lime in stabilized material uncorrected}}{\text{Lime Efficiency Factor}} \times 100$$

   C) Corrected Lime Content of Stabilized Material (DWB)

$$\frac{\text{\% lime in stabilized material (MB)}}{\text{\% Solids}} \times 100$$

NOTES: y = 0.037 for hydrated lime
y = 0.028 for quick lime
The 20-minute titration time is relatively critical and must be the same for all samples tested. Also if the ash being utilized contains available lime, one must take into account the lime content of the ash when determining lime content of a mixture.

STANDARDIZED JOB

Solids Content Test Procedure

Description: This method is used for testing the solids content of soil-like, ProMat, filter cake and sludge materials.

Microwave Method

1. Weigh and record weight of evaporating dish and paper cover to the nearest 0.1 g (tare weight).

2. Use approximately 20 g of wet sample for test. Weigh and record weight of sample, dish and paper cover to the nearest 0.1 g.

3. Cover sample with paper cover and dry in microwave. Microwave should be set on "defrost," to prevent overcooking of the sample. At these settings, the sample should dry in approximately 9 minutes.

4. If sample does not fully dry, cycle sample at 3- to 4-minute intervals on "defrost" until dry.

5. Weigh and record weight of dry sample, evaporating dish, and paper cover.

Calculation: Report results to the nearest 0.1%

$$\text{Solids Content (\%)} = \frac{\text{Dry Weight of Material, g}}{\text{Wet Weight of Material, g}} \times 100$$

Referenced Method: ASTM D4643, Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating

NOTES: If multiple samples are to be run simultaneously, drying times must be increased. Care should be exercised so as not to overcook the sample since this may lead to inaccurate results. This method should not be used on petroleum, salt or metal sludges. Please do not confuse this method with moisture content.

Because ProMat, filter cake, and FGD sludge contain gypsum, results should be calibrated against results using ASTM Test Method 2216 with the maximum drying temperature limited to 40°C.

HEADWATERS RESOURCES

"Adding Value to Energy"

STANDARDIZED JOB
UNDERFLOW SOLIDS SAMPLE

1) CHECK STATUS OF UNDERFLOW PUMPS TO DETERMINE WHICH PUMPS ARE RUNNING.
2) OBTAIN CORRECT SAMPLE CONTAINER (A, B, C) FROM DRYING RACK ABOVE LAB SINK.
3) COLLECT 1/2 TO 3/4 BOTTLE OF SLURRY FROM SAMPLE PORT AT PUMP.
4) WEIGH CORRECT (A, B, C) 100 ml. BEAKER EMPTY TO OBTAIN TARE WT. AND WRITE WEIGHT IN UNDERFLOW SOLIDS LOG BOOK.
5) SHAKE SAMPLE BOTTLE WELL TO MIX SLURRY AND POUR APPX. 30 ml. OF SLURRY INTO BEAKER.
6) WEIGH BEAKER AND SAMPLE TO OBTAIN COMBINED WEIGHT AND WRITE IN LOG BOOK.
7) PLACE SAMPLES IN DRYING OVEN OVERNIGHT.
8) REMOVE FROM OVEN AND COOL ON COUNTER FOR 10 MIN. WEIGH COOLED SAMPLE AND WRITE WEIGHT IN LOGBOOK.
9) CALCULATE % SOLIDS. DRY WEIGHT/ WET WEIGHT x 100 = % SOLIDS.
10) IF NO PUMPS ARE RUNNING, SAMPLE CAN BE TAKEN FROM BED BOMB STICK.

created3/18/08AWS

HEADWATERS RESOURCES

"Adding Value to Energy"

S T A N D A R D I Z E D J O B
FILTER CAKE PRODUCTION TEST

NOTE: BE SURE TO USE CORRECT TEST SHEET FOR FILTER BEING TESTED. I.E., FILTERS "A, B, AND C" ARE UNIT 1. FILTERS "D, E, AND F" ARE UNIT 2.

1) OBTAIN SAMPLE CUP (6x3 CYLINDER) FROM DRYING RACK IN LAB AND WEIGH.

2) WRITE WEIGHT ON TEST SHEET UNDER WEIGHT OF SAMPLE BAG.

3) TIME FILTER DRUM TO DETERMINE TIME OF ROTATION IN SECONDS AND WRITE TIME ON TEST SHEET.

4) USING PLASTIC CYLINDER CUP CUT AT LEAST 5 SAMPLES OF FILTER CAKE FROM SURFACE OF FILTER DRUM FROM DIFFERENT AREAS.

5) WEIGH CUP AND SAMPLES AND WRITE WEIGHT AND NUMBER OF SAMPLES IN APPROPRIATE PLACES ON TEST SHEET AND DO ALL CALCULATIONS TO DETERMINE TONS PER HOUR OF FILTER CAKE PRODUCTION FOR THAT FILTER.

6) AFTER WEIGHING, THESE SAMPLES WILL BE USED FOR FILTER CAKE SOLIDS TEST ON PRODUCTION RUN TEST SHEET.

HEADWATERS RESOURCES

"ADDING VALUE TO ENERGY"

S T A N D A R D I Z E D J O B

Field Density Test - Balloon Method

Phase A:

1) At prearranged time (Presently 1500) you will need to be in the landfill to pull density. Insure you carry volumeasure, base plate, sample bags, and marker to write on them with. **If inclement weather occurs, you may want to call the landfill supervisor to see if it will even be possible to pull density.**

2) Determine location to be tested (needs to be two holes dug and measured for each run). Samples should be from two separate grids (holes should not be closer than ten foot minimum). Try to obtain samples from areas with similar moisture percentage.

3) Place base plate on first sample area. Seat volumeasure in slot in base plate. Release control valve and let balloon drop until water level ceases to drop (Note: **Do Not Pump Vacuum Bulb To Force Water Level More).** Take measurement at eye-level and record the initial reading to nearest **.025.** Turn vacuum bulb over and pump balloon back up into volumeasure until tip of balloon pops out **(Do not pump past this. Over-pumping only stretches the balloon and if pumped past "airflow tube" will cause loss of water in the volumeasure).** Remove volumeasure from **base-plate (hold base-plate to insure it doesn't move).**

4) With steel spoon, dig hole as big as cutout in center of base-plate to a depth of approx. the blade of spoon (Try not to dig "outside" circumference of center of base-plate - can result in false readings).

5) Still holding base-plate, reset volumeasure over hole, release control valve, and pump vacuum bulb until pressure barely moves volumeasure off of base-plate. Holding pressure on vacuum bulb, take final reading "at eye-level" and record.

6) Repeat steps 3 through 5 in second location.

7) Return to lab to complete testing. **Note: Landfill needs to be notified by 1630, so start testing immediately.**

NOTE: If the landfill calls and says density is ready, you have four hrs. from that point to pull samples. Otherwise, it will have to be recompacted.

NOTE: If you feel it would be futile to pull density due to it being too dry or too wet, notify landfill supervisor and plant manager. Do not make the decision not to pull density without one-or-both of their approval.

HEADWATERS RESOURCES

"ADDING VALUE TO ENERGY"

S T A N D A R D I Z E D J O B

Field Density Test - Balloon Method

Phase B:

It is very important that the lab-testing portion of density begin immediately to let landfill crew know results ASAP.

1) Immediately upon return to the lab, weigh both samples and a dry 3" X 6" black plastic cylinder. Record these weights on the density work sheet.

2) Do material solids test on both samples. These numbers will be averaged to get final solids number for Proctor dry density.

3) While waiting on solids tests make a Proctor from the mixed samples from both tests. Weight of Proctor in grams minus weight of cylinder divided by 454 divided by volume of cylinder (0.02453) will determine wet density. I.E., 1100 g – 82 g= 1018 g/454/0.02453= 91.41 lbs. per cu. ft.

4) Wet density of Proctor times avg. solids from both samples in decimal form gives dry density of proctor. IE: 0.75 solids times wet density of 100 lbs./ cu. ft. = 75 lbs. per cu. ft. dry density

5) Determine wet density of each sample by dividing weight of sample in grams minus bag weight by 454 to convert to pounds. Divide weight in pounds by test volume from volumeasure to determine wet density of sample. I.E., 1000 g – 7 g bag wt. = 993/454= 2.19 lbs./0.0225 test volume = 97.33 lbs. per cu. ft.

6) Determine moisture content of solids tests by subtracting dry sample weight from wet sample weight and dividing weight of water in sample by dry sample weight. I.E., wet wt. 20 g - dry wt.14 g = 6 g divided by dry wt. = 6 / 14 = 0.43 (43%)

7) Determine dry density of sample by dividing wet density by moisture content + 1 I.E., 97.33 lbs. per cu. ft./1.43 = 68.06 lbs. per cu. ft.

8) For density to pass, dry density must be at least 94% but not more than 102% of dry control density. I.E., dry density of 75 lbs. per cu. ft. divided by Proctor dry density of 80 lbs. per cu. ft. = 93.75 % FAILURE 75 lbs. per cu. ft./73 lbs. per cu. ft. Proctor = 102.74% FAILURE. 75 lbs. per cu. ft./74 lbs. per cu. ft. = 101.35 PASS.

9) Report results to your supervisor and/or landfill ASAP.

Appendix 16

Headwaters Month-End Detailed Report for December 2014

HEADWATERS RESOURCES

OUC STANTON ENERGY CENTER

MONTH END DETAILED REPORTS (MEDR)

DECEMBER 2014

TABLE OF CONTENTS

(1) MERCR REPORT
(2) MASS BALANCE REPORT
(3) ASH AVAILABILITY REPORTS
(4) QA/QC REPORTS
(5) LANDFILL REPORT & DIAGRAMS

(1)
MERCR REPORT
DECEMBER 2014

Month End Reconciled Comparison Report

MONTH	JEA DELIVERED	CBA DELIVERED	LIME SUB INTO PROMAT	BOTTOM ASH PRODUCED		B/A SOLD	F/A PRODUCED		F/A SOLD	PROMAT WWB	OUC F/A INTO PROMAT	PROMAT TO OCLF	FILTER CAKE WWB
				UNIT #1	UNIT #2		UNIT #1	UNIT #2					
Jan-14	2278.62	0.00	2465.00	383.66	889.67	0.00	4412.04	10231.26	8344.64	27078.00	6629.00	0.00	15965.00
Feb-14	3936.15	0.00	3974.15	813.31	829.63	0.00	9353.01	9540.73	9095.83	38074.00	12498.00	0.00	20884.00
Mar-14	352.56	4530.74	4955.00	646.87	425.25	0.00	7439.06	4890.37	9461.26	27914.00	3512.00	4840.00	18607.00
Apr-14	2728.24	641.32	2984.00	518.13	670.54	0.00	5958.45	7711.25	11842.73	23613.00	2662.00	8861.00	16823.00
May-14	375.22	3558.50	3968.00	138.36	610.15	0.00	1480.35	7016.70	9001.67	12021.00	1491.00	3832.00	6244.00
Jun-14	0.00	3934.70	3171.00	422.56	714.68	0.00	4859.42	8218.86	9157.33	25968.00	3304.00	0.00	19493.00
Jul-14	0.00	4064.90	4194.00	551.18	601.87	0.00	6889.79	7523.42	8284.74	33828.00	4879.00	0.00	24755.00
Aug-14	0.00	4915.52	4636.00	544.68	609.30	0.00	6263.87	7006.96	9010.30	33473.00	3333.00	0.00	25492.00
Sep-14	0.00	4066.00	3714.00	457.54	554.92	0.00	5261.68	6381.61	8698.21	25011.00	1833.00	2222.00	19464.00
Oct-14	408.80	1758.54	2584.00	536.87	127.21	0.00	6174.04	1462.87	9761.60	15709.00	118.00	0.00	14822.00
Nov-14	386.85	3030.58	3370.00	677.52	725.37	0.00	7791.44	8341.81	7346.44	35938.00	2325.00	0.00	26949.00
Dec-14	2354.86	2284.60	4213.00	447.86	611.78	0.00	5150.35	7035.53	8585.52	36402.00	5010.00	0.00	26243.00
Totals	**12821.30**	**32785.40**	**44228.15**	**6138.54**	**7370.37**	**0.00**	**71033.50**	**85361.37**	**108590.27**	**335029.00**	**47594.00**	**19755.00**	**235741.00**

(2)
MASS BALANCE REPORT
DECEMBER 2014

2014 MASS BALANCE
OUC OPERATIONS W/ LIME SUB

	Totalizer Readings (tons)								Daily Totals				Calculated Quantities (tons)					Lab Data			
DEC 2014	ProMat		Lime Sub		OUC Ash				ProMat WWB	Lime Sub	OUC ASH UNIT 1	OUC ASH UNIT 2	ProMat % Solids	ProMat DWB	ProMat w/o Lime	F/C (dwb)	F/C (wwb)	ProMat			
					Silo #1			Silo #2										% Lime	% FA	FA:S	F/C
Run #	Start	Stop	A	C	A	B	C	D												FA:1.0	SOLIDS
1	0	3651	300	0	656	0	0	0	3651	300	0	656	72.60	2651	2351	1673	2695	2.27	41.4	0.73	62.09%
2	0	2423	223	0	344	0	0	0	2423	223	0	344	72.86	1765	1542	1364	1856	2.08	36.9	0.60	73.50%
3	0	5458	533	0	929	0	0	0	5458	533	0	929	72.34	3948	3415	2617	3996	2.05	38.5	0.65	65.50%
4	0	1252	105	0	211	0	0	0	1252	105	0	211	72.16	903	798	601	936	2.09	41.9	0.75	
5	0	2013	278	0	0	0	0	0	2013	278	0	0	73.60	1482	1204	1151	1735	2.50	39.4	0.68	66.32%
6	0	1131	158	0	35	0	0	0	1131	158	0	35	73.22	828	670	615	938	2.40	41.3	0.73	65.52%
7	0	3556	449	0	630	0	0	0	3556	449	0	630	71.38	2538	2089	1588	2477	2.83	42.0	0.76	64.12%
8	0	4051	425	0	466	0	0	0	4051	425	0	466	72.00	2917	2492	1870	3160	2.82	42.2	0.77	59.19%
9	0	1760	182	0	194	0	0	0	1760	182	0	194	73.13	1287	1105	892	1384	3.07	40.0	0.70	64.42%
10	0	1280	156	0	168	0	0	0	1280	156	0	168	72.92	933	777	593	956	2.87	41.9	0.76	62.08%
11	0	1302	193	0	300	0	0	0	1302	193	0	300	72.45	943	750	506	809	2.82	45.3	0.87	62.52%
12	0	800	123	0	171	0	0	0	800	123	0	171	72.46	580	457	324	506	2.26	43.7	0.81	64.02%
13	0	1077	127	0	175	0	0	0	1077	127	0	175	72.68	783	656	477	775	2.92	47.0	0.94	61.50%
14	0	2425	287	0	370	0	0	0	2425	287	0	370	72.33	1754	1467	1130	1768	2.45	41.4	0.74	63.92%
15	0	3057	385	0	361	0	0	0	3057	385	0	361	72.24	2208	1823	1501	2311	2.25	44.6	0.84	64.93%
16	0	700	109	0	0	0	0	0	700	109	0	0	72.17	505	396	374	591	2.41	36.2	0.59	63.27%
17	0	1266	180	0	0	0	0	0	1266	180	0	0	71.55	906	726	706	1086	2.45	32.5	0.50	65.05%
18																					
19																					
20																					
21																					
22																					
23																					
24																					
25																					
26																					
27																					
28																					
29																					
30																					
31																					
Total		37202	4213	0	5010	0	0	0	37202	4213	0	5010	72.48	26932	22719	17982	27979	2.50	40.9	0.73	64.25%

DEC 2014	Promat		Lime Sub		OUC Ash				ProMat WWB	Lime Sub	OUC ASH UNIT 1	OUC ASH UNIT 2	ProMat Solids	ProMat DWB	ProMat w/o Lime	F/C (dwb)	F/C (wwb)	% Lime	% FA	FA:S	F/C SOLIDS
																		Promat			
YTD		31327	27884	413	38270	165	0	14204	309542	44575	14204	38435	71.68	213916	169341	138248	208654	3.20	38.5	0.74	66.39%

Totalizer Readings ONLY are Cake & Ash – No Lime-Conditioned Runs

Notes **– On days we do not run, leave ProMat Solids Place Blank. Entering a "0" will produce erroneous results.

(3)
ASH AVAILABILITY REPORTS
DECEMBER 2014

DECEMBER 2014 UNIT 1 ASH AVAILABILITY

DATE	DAILY COAL BURN UT 1	AS FIRED REPORT TOTAL ASH	AVG % ASH OF COAL (EST)	TONS ASH PRODUCED (EST)	F/A PRODUCED (0.92)*(EST)	B/A PRODUCED (0.08)*(EST)	SUL FROM OUC REPORT
12/1/2014	3467	6.44	0.06	223.27	205.41	17.86	2.11
12/2/2014	3134	7.47	0.07	234.11	215.38	18.73	2.64
12/3/2014	3281	6.13	0.06	201.13	185.04	16.09	2.21
12/4/2014	3323	7.81	0.08	259.53	238.76	20.76	2.40
12/5/2014	3496	7.44	0.07	260.10	239.29	20.81	1.88
12/6/2014	3422	6.80	0.07	232.70	214.08	18.62	2.50
12/7/2014	3422	6.60	0.07	225.85	207.78	18.07	2.27
12/8/2014	3653	5.73	0.06	209.32	192.57	16.75	2.33
12/9/2014	2919	6.34	0.06	185.06	170.26	14.81	2.16
12/10/2014	2784	7.37	0.07	205.18	188.77	16.41	2.75
12/11/2014	2987	7.14	0.07	213.27	196.21	17.06	2.78
12/12/2014	2910	7.47	0.07	217.38	199.99	17.39	2.88
12/13/2014	3410	6.98	0.07	238.02	218.98	19.04	1.95
12/14/2014	2545	7.50	0.08	190.88	175.61	15.27	1.79
12/15/2014	3033	6.97	0.07	211.40	194.49	16.91	2.19
12/16/2014	3056	8.20	0.08	250.59	230.54	20.05	2.94
12/17/2014	2560	8.02	0.08	205.31	188.89	16.42	1.89
12/18/2014	2422	7.31	0.07	177.05	162.88	14.16	1.70
12/19/2014	2165	6.27	0.06	135.75	124.89	10.86	2.08
12/20/2014	2621	8.32	0.08	218.07	200.62	17.45	2.35
12/21/2014	2041	5.84	0.06	119.19	109.66	9.54	1.88
12/22/2014	2493	6.50	0.07	162.05	149.08	12.96	2.06
12/23/2014	2375	8.13	0.08	193.09	177.64	15.45	1.63
12/24/2014	1669	7.07	0.07	118.00	108.56	9.44	2.39
12/25/2014	2453	7.24	0.07	177.60	163.39	14.21	2.42
12/26/2014	922	7.56	0.08	69.70	64.13	5.58	2.54
12/27/2014	1089	6.13	0.06	66.76	61.42	5.34	2.31
12/28/2014	1721	7.02	0.07	120.81	111.15	9.67	2.40
12/29/2014	1958	8.02	0.08	157.03	144.47	12.56	2.81
12/30/2014	1674	7.17	0.07	120.03	110.42	9.60	0.00
12/31/2014	0	0.00	0.00	0.00	0.00	0.00	0.00
	79005	**6.87**	**0.07**	**5598.21**	**5150.35**	**447.86**	**2.14**

* THE F/A (0.92) AND B/A (0.08) PRODUCED ARE ESTIMATES ONLY AND WILL BE ADJUSTED ON THE FINAL YEAR END REPORT.

**????: AVERAGE ASH & SULFUR CONTENTS DUE TO NO LAB TESTS RECEIVED FROM TSUB REPORT.

DECEMBER 2014 UNIT 2 ASH AVAILABILITY

DATE	DAILY COAL BURN UT 2	AS FIRED REPORT TOTAL ASH	AVG % ASH OF COAL (EST)	TONS ASH PRODUCED (EST)	F/A PRODUCED (0.92)*(EST)	B/A PRODUCED (0.08)*(EST)	SUL FROM OUC REPORT
12/1/2014	4174	6.44	0.06	268.81	247.30	21.50	2.11
12/2/2014	3515	7.47	0.07	262.57	241.56	21.01	2.64
12/3/2014	3621	6.13	0.06	221.97	204.21	17.76	2.21
12/4/2014	3684	8.56	0.09	315.35	290.12	25.23	2.52
12/5/2014	3773	7.48	0.07	282.22	259.64	22.58	1.80
12/6/2014	3755	6.80	0.07	255.34	234.91	20.43	2.50
12/7/2014	3568	6.60	0.07	235.49	216.65	18.84	2.27
12/8/2014	3854	5.73	0.06	220.83	203.17	17.67	2.33
12/9/2014	4046	6.34	0.06	256.52	236.00	20.52	2.16
12/10/2014	3810	7.37	0.07	280.80	258.33	22.46	2.75
12/11/2014	3316	7.14	0.07	236.76	217.82	18.94	2.78
12/12/2014	3930	7.47	0.07	293.57	270.09	23.49	2.88
12/13/2014	4007	6.98	0.07	279.69	257.31	22.38	1.95
12/14/2014	3867	7.50	0.08	290.03	266.82	23.20	1.79
12/15/2014	3861	6.97	0.07	269.11	247.58	21.53	2.19
12/16/2014	3664	8.20	0.08	300.45	276.41	24.04	2.94
12/17/2014	3629	8.02	0.08	291.05	267.76	23.28	1.89
12/18/2014	3796	7.31	0.07	277.49	255.29	22.20	1.70
12/19/2014	3693	6.27	0.06	231.55	213.03	18.52	2.08
12/20/2014	3520	8.52	0.09	299.90	275.91	23.99	2.21
12/21/2014	3262	7.30	0.07	238.13	219.08	19.05	1.54
12/22/2014	3128	6.41	0.06	200.50	184.46	16.04	2.01
12/23/2014	3020	7.67	0.08	231.63	213.10	18.53	2.36
12/24/2014	2753	6.96	0.07	191.61	176.28	15.33	2.29
12/25/2014	2545	7.24	0.07	184.26	169.52	14.74	2.42
12/26/2014	3802	7.56	0.08	287.43	264.44	22.99	2.54
12/27/2014	2580	6.13	0.06	158.15	145.50	12.65	2.31
12/28/2014	2051	7.02	0.07	143.98	132.46	11.52	2.40
12/29/2014	2699	8.02	0.08	216.46	199.14	17.32	2.81
12/30/2014	2791	8.66	0.09	241.70	222.36	19.34	2.82
12/31/2014	2779	6.62	0.07	183.97	169.25	14.72	2.29
	106493	7.19	0.07	7647.31	7035.53	611.78	2.31

* THE F/A (0.92) AND B/A (0.08) PRODUCED ARE ESTIMATES ONLY AND WILL BE ADJUSTED ON THE FINAL YEAR END REPORT.

**????: AVERAGE ASH & SULFUR CONTENTS DUE TO NO LAB TESTS RECEIVED FROM TSUB REPORT.

(4)
QA/QC REPORTS
DECEMBER 2014

QA/QC REPORT FOR DECEMBER 2014

DECEMBER	RUN NUMBERS AVERAGED						DENSITY				PERMEABILITY		COMPRESSIVE STRENGTH			
DATE	RUN #	PROMAT % SOLIDS	PROMAT MOISTURE	LIME	F/A TO SLUDGE RATIO	FILTER CAKE SOLIDS	TEST #1 % SOLIDS	TEST #2 % SOLIDS	PROCTOR DRY DENSITY (pcf)	% PROCTOR DENSITY (94%-103%)	30-DAY	90-DAY	30-DAY	60-DAY	90-DAY	QA/QC COMMENTS
12/1-12/3	1	72.60	37.74%	2.27%		62.09%	72.17	76.76	75.11	99.14%						Enhanced
12/3-12/5	2	72.86	37.25%	2.08%	0.60	73.50%	79.31	77.02	78.50	99.57%						Enhanced
12/5-12/8	3	72.34	38.24%	2.05%	0.63	65.50%	74.92	74.76	75.28	99.42%						Enhanced
12/8-12/9	4	72.16	38.58%	2.09%	0.75		77.83	76.22	76.01	101.34%						Enhanced
12/9-12/11	5	72.60	37.74%	2.50%	0.68	66.32%										Cake & Lime
12/11-12/12	6	73.22	36.57%	2.40%	0.73	65.52%										Cake & Lime
12/12-12/15	7	71.38	40.10%	2.83%	0.77	64.12%	70.07	69.48	73.09	95.46%						Enhanced
12/15-12/18	8	72.00	38.89%	2.82%	0.78	59.19%	68.00	66.95	70.87	95.21%						Enhanced
12/18-12/19	9	73.13	36.74%	3.07%	0.71	64.42%										Enhanced
12/19-12/20	10	72.92	37.14%	2.87%	0.76	62.08%										Enhanced
12/20-12/22	11	72.45	38.03%	2.82%	0.88	62.52%	76.90	76.79	77.35	99.35%						Enhanced
12/22-12/23	12	72.46	38.01%	2.26%	0.81	64.02%	75.74	76.58	78.08	97.54%						Enhanced
12/23-12/24	13	72.68	37.59%	2.92%	0.79	61.50%										Enhanced
12/24-12/26	14	72.33	38.26%	2.45%	0.72	63.92%										Enhanced
12/26-12/30	15	72.24	38.43%	2.25%	0.84	54.93%										Cake & Lime Enhanced
12/30-12/31	16	72.17	38.56%	2.41%	0.59	63.27%	74.82	73.87	78.55	94.65%						Cake & Lime
12/31-1/2	17	71.55	39.76%	2.45%	0.51	65.05%	68.63	72.46	72.76	96.96%						Enhanced

(5)
LANDFILL REPORT & DIAGRAMS
DECEMBER 2014

LANDFILL MONTHLY REPORT - DECEMBER 2014

RUN #	MATERIAL TYPE	MATERIAL USAGE	GRID LOCATION	ELEVATION	COMMENTS
1,2	Enhanced	Cover	3300W X 500S ABCD; 3300W X 400S BD 3400W X 500S ABCD; 3400W X 400S BD	135	
3	Enhanced	Cover	3300W X 700S AC; 3400W X 700S AC 3300W X 600S ABCD; 3400W X 600S ABCD	135	
4	Enhanced		2500W X 500S ABCD	170	
5	Enhanced		2600W X 500S ABCD; 2700W X 500S ABCD	170	
6	Enhanced		2700W X 600S AC	170	
7	Enhanced	Cover	3300W X 500S ABCD; 3300W X 400S BD 3400W X 500S ABCD; 3400W X 400S BD	142	
8	Enhanced	Cover		142	
9	Enhanced		2600W X 600S ABCD	170	
10,11	Enhanced		2700W X 700S ABCD	170	
12,13	Enhanced		2600W X 700S ABCD	170	
14	Enhanced	Cover	3300W X 400S BD; 3300W X 500S ABCD 3400W X 400S BD; 3400W X 500S ABCD	148	
15	Enhanced	Cover	3300W X 700S AC; 3300W X 600S ABCD 3400W X 700S AC; 3400W X 600S ABCD	148	
16	Enhanced		2500W X 600S ABCD	170	
17	Enhanced		2500W X 700S ABCD	170	

Appendix 17

Summaries of Waste Quantities from January 2005 through October 2016

Waste Quantities for 2005

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Indiantown and Cedar Bay Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	Bottom Ash Sold (tons)
January	16,956	17,281	1,283	18,166	31,021	54,613	67.26	36,733	2,312	1,346
February	16,893	17,689	1,144	15,027	24,587	43,406	68.12	29,566	2,304	630
March	11,292	12,723	39	17,111	20,327	41,865	67.42	28,227	1,540	4,071
April	13,151	12,392	1,380	6,884	15,620	24,618	69.16	17,027	1,793	924
May	14,135	15,472	1,395	17,815	18,777	44,847	67.70	30,359	1,927	951
June	18,844	19,087	3,354	20,808	24,638	57,118	66.26	37,848	2,570	3,137
July	22,966	20,925	618	21,725	20,987	51,582	66.04	34,067	3,132	4,633
August	24,715	22,331	31	20,799	19,929	49,433	64.93	32,097	3,370	1,890
September	20,275	20,727	2,105	17,710	19,349	46,660	66.59	31,071	2,765	2,101
October	22,000	16,798	4,130	18,904	17,112	49,917	66.47	33,181	3,000	2,588
November	19,676	19,259	1,345	9,936	20,140	35,293	65.49	23,113	2,683	648
December	22,266	20,179	823	18,922	23,052	50,156	66.85	33,529	3,036	3,189
Total	223,169	214,863	17,647	203,807	255,539	549,508	66.75	366,818	30,432	26,108

wwb - Wet weight basis
dwb - Dry weight basis

Waste Quantities for 2006

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Indiantown and Cedar Bay Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	Bottom Ash Sold (tons)
January	20,986	19,083	1,505	12,249	19,190	45,322	67.93	30,786	2,862	4,406
February	17,314	16,197	1,505	12,249	18,415	36,512	68.24	24,918	2,361	2,920
March	17,990	13,244	1,036	10,081	12,273	26,264	67.22	17,655	2,453	1,459
April	11,011	11,529	3,620	12,797	19,409	36,349	68.31	24,832	1,501	1,018
May	20,968	14,138	10,636	13,028	31,774	54,589	67.53	36,866	1,578	1,485
June	22,907	18,676	4,400	14,697	30,192	48,995	66.71	32,684	1,724	3,139
July	22,553	15,864	5,429	14,833	30,710	51,109	67.56	34,529	1,961	2,105
August	21,714	20,062	2,250	14,684	21,504	43,345	68.59	29,731	1,888	1,973
September	21,782	13,067	9,582	16,269	17,850	52,802	69.47	36,680	1,894	2,141
October	13,596	9,782	3,719	11,970	15,019	36,217	68.03	24,637	1,182	1,708
November	20,391	7,672	11,648	8,674	9,114	36,515	70.40	25,705	584	1,686
December	18,539	9,623	14,366	16,552	2,418	46,769	69.10	32,318	1,681	1,682
Total	229,750	168,937	69,696	158,083	227,867	514,788	68.25	351,341	21,671	25,720

wwb - Wet weight basis
dwb - Dry weight basis

Waste Quantities for 2007

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Indiantown and Cedar Bay Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	Bottom Ash Sold (tons)
January	19,163	8,103	11,265	–	–	46,713	69.43	32,434	1,666	1,908
February	15,647	6,400	10,559	12,537	–	44,215	70.16	31,020	1,178	1,188
March	9,529	7,610	3,647	12,124	12,836	31,775	68.87	21,884	829	711
April	15,757	8,984	8,794	9,152	16,932	34,825	69.37	24,159	1,144	599
May	22,716	7,834	15,082	15,054	25,142	56,489	70.24	39,676	1,817	3,000
June	22,490	7,350	17,132	16,700	22,045	57,736	66.91	38,632	1,857	1,529
July	25,577	6,717	18,590	14,730	22,616	59,478	69.38	41,264	2,012	2,019
August	24,264	6,753	16,650	14,996	28,346	61,475	69.79	42,902	2,070	1,818
September	24,920	5,648	16,293	10,572	24,450	51,141	69.99	35,796	2,167	1,224
October	17,042	7,764	10,392	8,815	19,346	38,553	69.68	26,862	1,482	2,100
November	14,636	7,634	7,729	9,204	14,658	31,542	68.52	21,612	1,273	1,807
December	22,368	7,269	13,977	10,591	26,277	50,845	70.62	35,907	1,945	1,439
Total	234,107	88,067	150,110	134,475	212,648	564,787	69.43	392,148	19,439	19,342

wwb - Wet weight basis
dwb - Dry weight basis

Waste Quantities for 2008

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Indiantown and Cedar Bay Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	Bottom Ash Sold (tons)
January	23,013	6,994	17,536	16,331	28,948	59,150	70.95	41,969	2,001	2,650
February	19,207	5,883	14,255	12,762	21,142	50,807	70.08	35,608	1,670	1,837
March	16,717	6,771	10,943	11,919	19,110	41,954	69.14	29,008	1,395	1,505
April	10,636	8,197	2,817	5,711	13,271	21,947	68.84	15,108	1,450	1,158
May	13,632	7,814	10,133	9,880	21,811	41,013	65.64	26,920	1,859	627
June	22,856	6,524	15,915	10,853	24,046	48,978	71.34	34,941	1,987	3,082
July	25,398	7,523	17,101	10,187	23,922	49,518	71.46	35,387	2,208	2,048
August	24,443	5,194	16,893	7,675	30,342	54,567	71.32	38,917	2,126	2,109
September	24,771	5,981	17,358	10,027	33,081	59,389	70.72	42,000	2,154	2,501
October	12,917	5,933	8,483	7,710	18,016	32,800	71.37	23,409	1,123	1,349
November	21,083	5,148	15,325	7,871	10,328	32,918	72.26	23,785	1,833	0
December	26,042	4,190	22,108	11,367	24,085	55,912	71.47	39,963	2,265	0
Total	240,715	76,152	168,867	122,292	268,103	548,953	70.50	387,015	22,072	18,867

wwb - Wet weight basis
dwb - Dry weight basis

Waste Quantities for 2009

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Indiantown and Cedar Bay Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	Bottom Ash Sold (tons)
January	21,028	3,645	18,440	8,775	19,358	47,231	70.91	33,489	1,829	0
February	21,249	3,899	20,870	9,147	21,792	51,621	69.87	36,068	1,848	0
March	19,547	5,025	16,185	8,480	24,446	47,698	69.92	33,349	1,700	0
April	17,936	4,179	17,773	5,722	17,190	42,357	69.82	29,574	1,560	0
May	20,412	3,339	17,755	7,946	18,896	43,186	71.50	30,876	1,775	0
June	20,433	5,886	16,130	6,264	20,990	42,956	71.64	30,773	1,777	0
July	24,865	4,983	18,802	6,268	21,568	46,279	71.94	33,292	2,162	0
August	23,004	5,031	20,371	6,222	20,254	49,265	63.73	31,397	2,000	0
September	20,415	4,820	20,746	5,599	21,177	47,817	72.23	34,540	1,775	0
October	11,316	4,670	9,961	5,178	11,380	25,806	71.52	18,457	984	0
November	18,529	3,967	12,792	3,494	18,182	35,185	71.80	25,264	1,611	0
December	22,027	4,827	21,335	6,545	23,675	49,791	71.96	35,828	1,915	0
Total	240,762	54,272	211,160	79,640	238,908	529,192	70.47	372,908	20,935	0

wwb - Wet weight basis
dwb - Dry weight basis

Waste Quantities for 2010

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Indiantown and Cedar Bay Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	Bottom Ash Sold (tons)
January	23,091	4,029	18,543	6,394	26,261	52,914	71.96	38,079	2,008	0
February	20,035	4,787	14,341	6,917	22,237	42,342	71.84	30,417	1,742	0
March	12,033	5,673	7,133	2,946	8,079	18,740	71.31	13,364	1,046	0
April	10,281	5,856	4,546	2,208	13,616	20,632	69.59	14,358	894	0
May	22,287	6,834	14,570	3,940	28,533	48,070	69.54	33,427	1,938	0
June	22,037	5,646	16,253	3,453	16,591	38,267	71.19	27,241	1,916	0
July	24,133	8,485	20,214	3,923	28,235	54,869	71.53	39,249	2,099	0
August	19,301	4,487	16,781	4,376	21,645	43,987	71.19	31,313	1,678	0
September	21,137	4,533	16,763	5,070	17,324	38,528	71.01	27,357	1,838	0
October	11,437	4,815	7,005	2,953	10,468	19,767	70.73	13,982	995	0
November	16,407	5,348	11,727	3,473	17,610	33,612	71.04	23,879	1,427	0
December	19,825	5,074	14,928	5,111	22,228	43,647	70.94	30,962	1,724	0
Total	222,006	65,568	162,804	50,762	232,827	455,375	71.07	323,628	19,305	0

wwb - Wet weight basis
dwb - Dry weight basis

Waste Quantities for 2011

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Indiantown and Cedar Bay Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	Bottom Ash Sold (tons)
January	16,957	7,300	11,635	6,609	21,321	39,953	70.95	28,346	1,475	0
February	12,103	8,322	3,779	3,948	12,890	18,908	70.56	13,341	1,052	0
March	7,856	9,481	5	3,179	5,797	6,480	63.52	4,116	683	0
April	14,810	8,843	6,053	4,306	11,283	20,792	71.08	14,778	1,288	0
May	15,671	8,386	8,446	4,284	11,049	25,993	71.39	18,557	1,363	0
June	16,569	6,173	10,185	4,811	22,421	41,165	71.04	29,242	1,441	0
July	19,036	4,567	11,833	5,944	19,811	41,721	71.15	29,685	1,655	0
August	18,307	5,754	12,279	6,496	25,232	45,932	70.71	32,480	1,592	0
September	10,399	5,493	4,789	6,426	17,528	28,069	69.30	19,453	904	0
October	15,082	4,693	8,211	5,354	19,474	34,041	70.78	24,093	1,311	0
November	15,750	5,865	7,364	2,764	25,280	36,440	68.78	25,062	1,370	0
December	8,386	5,584	4,822	4,506	18,010	25,176	69.31	17,450	729	0
Total	170,926	80,461	89,401	58,627	210,096	364,670	70.37	256,603	14,863	0

wwb - Wet weight basis
dwb - Dry weight basis

Waste Quantities for 2012

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Imported Ash Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	ProMat to OCLF (tons)
January	7,076	5,041	1,521	1,664	6,003	10,893	70.25	7,652	615	528
February	5,768	5,029	405	26	5,371	6,166	71.43	4,404	502	0
March	6,252	5,647	1,226	2,427	7,502	10,684	70.40	7,522	544	2,088
April	8,785	5,484	3,550	787	8,287	14,150	71.67	10,141	764	0
May	7,427	6,336	1,791	3,787	8,307	11,194	72.42	8,107	594	1,368
June	12,917	7,352	4,395	2,990	12,375	19,808	70.83	14,030	1,123	0
July	15,607	8,876	6,672	4,093	20,468	28,964	71.48	20,703	1,357	576
August	11,632	8,460	4,073	2,804	22,302	28,165	68.75	19,363	1,011	0
September	9,306	5,596	4,453	2,891	16,153	22,335	68.27	15,248	809	0
October	11,535	6,067	3,609	3,111	11,494	19,055	66.61	12,693	1,003	0
November	7,767	5,201	3,007	26	12,125	17,510	67.44	11,809	675	0
December	6,525	4,750	176	1,633	9,978	11,118	69.58	7,736	567	0
Total	110,598	73,839	34,968	26,240	140,365	200,042	69.69	139,408	9,566	4,560

wwb - Wet weight basis
dwb - Dry weight basis
OCLF – Orange County Landfill

Waste Quantities for 2013

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Lime Substitute Delivered (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids)	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)	ProMat to OCLF (tons)
January	4,646	6,072	529	2,020	7,914	10,121	75.29	7,620	404	1,872
February	4,525	4,470	0	2,216	6,858	8,392	75.54	6,339	393	0
March	7,607	5,821	1,379	3,384	12,774	17,926	72.31	12,962	661	0
April	9,411	6,081	3,549	2,912	9,503	15,717	74.11	11,648	818	0
May	8,894	7,233	3,123	3,021	10,507	16,459	71.08	11,699	773	0
June	15,972	6,799	10,482	3,347	23,565	38,307	73.08	27,995	1,389	0
July	15,752	7,567	10,460	4,568	23,989	38,979	73.63	28,700	1,370	0
August	15,969	8,636	8,464	4,344	26,238	38,895	72.75	28,296	1,389	0
September	9,808	7,502	3,267	3,808	13,194	20,953	71.11	14,900	853	0
October	9,844	9,863	1,372	3,717	15,834	17,822	71.32	12,711	788	0
November	12,718	8,299	3,791	3,717	21,205	25,760	71.37	18,385	1,106	0
December	10,479	8,295	5,853	3,486	25,953	34,109	73.63	25,114	911	0
Total	125,625	86,639	52,269	40,540	197,534	283,440	72.81	206,369	10,855	1,872

wwb - Wet weight basis
dwb - Dry weight basis
OCLF – Orange County Landfill

Waste Quantities for 2014

Month	SEC Fly Ash Produced (tons)	SEC Fly Ash Sold (tons)	SEC Fly Ash into ProMat (tons)	Lime Substitute Delivered (tons)	Lime Substitute into ProMat (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat Produced* (tons dwb)	Bottom Ash Produced (tons)	ProMat to OCLF (tons)
January	14,643	8,345	6,629	2,279	2,465	15,965	27,078	18,878	1,273	0
February	18,894	9,096	12,498	3,936	3,974	20,884	38,074	26,545	1,643	0
March	12,329	9,461	3,512	4,883	4,955	18,607	27,914	19,461	1,072	4,840
April	13,670	11,843	2,662	3,370	2,984	16,823	23,613	16,463	1,189	8,861
May	8,497	9,002	1,491	3,934	3,968	6,244	12,021	8,381	749	3,832
June	13,078	9,157	3,304	3,935	3,171	19,493	25,968	18,104	1,137	0
July	14,413	8,285	4,879	4,065	4,194	24,755	33,828	23,584	1,153	0
August	13,271	9,010	3,333	4,916	4,636	25,492	33,473	23,337	1,154	0
September	11,643	8,698	1,833	4,066	3,714	19,464	25,011	17,437	1,012	2,222
October	7,637	9,762	118	2,167	2,584	14,822	15,709	10,952	664	0
November	16,133	7,346	2,325	3,417	3,370	26,949	35,938	25,055	1,403	0
December	12,186	8,586	5,010	4,639	4,213	26,243	36,402	25,379	1,060	0
Total	156,395	108,590	47,594	45,607	44,228	235,741	335,029	233,577	13,509	19,755

wwb - Wet weight basis
dwb - Dry weight basis
OCLF – Orange County Landfill

* Based on average ProMat solids content of 69.72%.

Waste Quantities for 2015

Month	SEC Fly Ash Produced (tons)	Fly Ash Sold* (tons)	SEC Fly Ash into ProMat (tons)	Lime Substitute Delivered (tons)	Lime Substitute into ProMat (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat (% solids))	ProMat Produced (tons dwb)	Bottom Ash Produced (tons)
January	3,955	8,555	164	2,978	1,503	11,840	14,469	71.98	10,415	344
February	6,067	6,693	0	3,307	2,737	14,091	16,822	68.81	11,576	528
March	13,450	10,985	1,935	2,930	3,263	27,461	33,337	66.87	22,294	1,170
April	6,287	11,811	203	3,831	2,023	22,914	25,140	71.09	17,871	547
May	4,826	7,386	10	2,594	3,198	14,354	17,562	68.71	12,067	420
June	11,345	10,987	0	4,975	3,745	22,756	26,501	72.43	19,194	986
July	12,438	11,490	1,560	4,668	3,734	27,516	34,871	73.14	25,505	1,082
August	13,171	10,594	1,869	6,825	4,552	24,327	34,778	71.45	24,848	1,145
September	10,305	11,049	1,154	5,426	4,366	27,363	33,156	72.02	23,879	896
October	6,979	8,970	24	4,882	3,544	19,981	23,549	72.00	16,956	607
November	10,449	10,185	0	4,692	3,575	26,999	30,574	72.36	22,124	909
December	7,168	8,082	0	4,405	2,961	21,487	21,482	64.24	13,799	623
Total	106,440	116,787	6,919	51,513	39,201	261,089	312,241	70.63	220,527	7,418

wwb - Wet weight basis
dwb - Dry weight basis

* Incudes lime substitute fly ash.

Waste Quantities for 2016

Month	SEC Fly Ash Produced (tons)	Fly Ash Sold* (tons)	SEC Fly Ash into ProMat (tons)	Lime Substitute Delivered (tons)	Lime Substitute into ProMat (tons)	FGD Sludge Filter Cake (tons wwb)	ProMat Produced (tons wwb)	ProMat Produced** (tons dwb)	Bottom Ash Produced (tons)	ProMat to OCLF (tons)
January	6,894	7,249	0	3,045	3,162	11,890	15,205	10,948	599	–
February	11,340	11,600	0	4,905	5,340	46,210	51,796	36,637	986	–
March	10,532	12,072	0	5,650	4,853	46,106	50,959	34,451	916	–
April	5,909	6,776	0	866	1,281	13,745	15,026	9,956	514	–
May	5,574	5,847	0	1,386	832	19,242	20,074	12,086	485	–
June	6,961	7,382	0	4,504	3,865	20,205	24,070	15,717	605	–
July	7,377	8,323	0	5,219	4,331	19,094	23,425	14,842	641	–
August	9,963	9,006	1,921	7,442	6,800	37,014	45,742	30,708	867	–
September	12,740	8,348	2,627	6,128	5,347	40,391	48,905	32,831	1,107	–
October	8,204	8,638	0	4,338	3,628	31,292	37,920	25,457	712	–
November										
December										
Total	85,494	85,241	4,548	43,483	39,439	285,189	333,122	223,632	6,833	–

wwb - Wet weight basis
dwb - Dry weight basis
OCLF – Orange County Landfill

* Incudes lime substitute fly ash.
** August through October based on average ProMat solids content of 67.13%.