

**2024 Annual Landfill Inspection under
Coal Combustion Residuals Rule
Seminole Generating Station
Putnam County, Florida**

March 15, 2024



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Geotechnical, Environmental and
Materials Consultants

March 15, 2024
File Number 23-13-0074

Seminole Electric Cooperative, Inc.
16313 North Dale Mabry Highway
Tampa, FL 33618

Attention: Mr. Justin Gostnell

Subject: 2024 Annual Landfill Inspection under Coal Combustion Residuals Rule, Seminole
Generating Station, Putnam County, Florida

Gentlemen/Ladies:

As requested by Mr. Justin Gostnell and authorized by Seminole Electric Cooperative, Inc. (Seminole) Purchase Order 2307731, Ardaman & Associates, Inc., (Ardaman) has completed an inspection of the landfill and associated facilities at the Seminole Generating Station on January 19, 2024. The objectives of our inspection were to satisfy the requirements in 40 CFR §257.84 of the Coal Combustion Residuals (CCR) Rule promulgated by the United States Environmental Protection Agency (EPA) on April 17, 2015, and to identify any items that need immediate action or long-term attention. In association with the landfill inspection, Ardaman has reviewed the CCR Rule requirements, historical information in our project files, and relevant landfill operation data provided by Seminole.

The focus of our inspection was on the lined Increment 1 Buildout (Increment 1), which is the active CCR disposal area and is subject to provisions of the CCR Rule. Although the closed original landfill and the closed lined vertical expansion landfill are exempted from the CCR Rule requirements, these landfill units as well as other facilities were also observed insofar as they may affect the operation and safety of Increment 1. The subject inspection is the ninth annual inspection since waste materials were first placed into Increment 1 in April 2013. This report provides some background information on the history and design of Increment 1 and documents our findings and recommendations from the ninth annual inspection under the CCR Rule.

Inspection Requirements under CCR Rule

As stated in 40 CFR §257.84(b)(1), the goal of the annual inspections is “*to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.*” The CCR Rule further stated that the annual inspections must be performed by a qualified professional engineer and must, at a minimum, include the following efforts:

- (i) *A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections); and*
- (ii) *A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.*

Per 40 CFR §257.84(b)(2), the inspection report is required to address the following items:

- (i) *Any changes in geometry of the structure since the previous annual inspection;*
- (ii) *The approximate volume of CCR contained in the unit at the time of the inspection;*
- (iii) *Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and*
- (iv) *Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.*

Annual inspections of a CCR unit must be performed by a qualified professional engineer, who is defined as “*an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in the state where the CCR unit(s) is located.*”

Waste Disposal Area

The designated waste disposal area at the Seminole Generating Station is located to the north of the power generating facility. Landfilling of waste materials has occurred within the closed original landfill, the closed vertical expansion landfill, and is currently occurring in the active Increment 1 landfill. Based on the imagery acquired by Pickett and Associates (Pickett) on December 5, 2023 and the Florida Department of Transportation (FDOT) in January 2023, an aerial photograph that shows the layout of the entire waste disposal area is presented in Figure 1.

Increment 1 is located within an approximately 27-acre parcel that lies to the southeast of the closed original landfill and abuts 6 acres of the eastern portion of its southern slope. Lining of Increment 1 occurred in stages referred to as Stages I, IIA, IIB, and III, as shown in Figure 1. The Stage I area, which consists of approximately 17 acres of lined area at the base of Increment 1 and on the south slope of the closed original landfill, began to receive waste materials in April 2013. Lining of the Stage IIA area, which covers approximately 1.5 acres of the south slope of the closed original landfill, was completed in April 2014. Lining of the Stage IIB area, which consists of approximately 5 acres of the base of Increment 1 and the south slope of the closed original landfill, was completed in June 2015. Lining of the Stage III area, which consists of approximately 4 acres of the south slope of the closed original landfill, was completed in October 2017.

Since October 19, 2015 (the effective date of the CCR Rule), Increment 1 has been the only active waste disposal area at the Seminole Generating Station.

Sources of Relevant Information

In association with the landfill inspection, Ardaman has reviewed relevant information from the following sources:

- The eight previous annual CCR landfill inspection reports prepared by Ardaman for 2016 through 2023.
- Conditions of Certification PA78-10A3 for the Seminole Generating Station dated July 27, 2018.
- Design and construction documents for Increment 1.
- "First Update of Run-on and Run-off Control System Plan for Landfill Increment 1 Buildout Landfill," prepared by Ardaman, dated August 31, 2021.
- "Landfill Operation Plan, Seminole Generating Station, Putnam County, Florida," prepared by Seminole, updated August 2022.
- "CCR Fugitive Dust Control Plan for the Seminole Generating Station," prepared by Seminole, with an effective date of July 18, 2022.
- Previous studies on historical waste generation rates and landfill airspace consumption.
- Waste quantity and leachate flow meter records provided by Seminole.
- On-site rainfall records for 2023 and January 2024 provided by Seminole.
- Topographic survey and aerial photograph based on aerial data obtained by Pickett on December 5, 2023.
- Weekly landfill inspection reports for 2023 provided by Seminole.
- Annual CCR Fugitive Dust Control Report, prepared by Seminole dated December 7, 2023.

Waste Composition and Quantities

Waste materials that have been disposed of in Increment 1 consist of fly ash, purge water treatment (PWT) sludge, and miscellaneous wastes. Fly ash is a byproduct from burning pulverized coal for power generation and is essentially a dry material. The PWT sludge originates from the underflow of the TH-101 clarifier, after the suspended solids in the blowdown stream from the flue gas desulfurization (FGD) system have been removed. The suspended solids are formed when ferrous chloride and hydrated lime are added to the purge water for treatment to achieve compliance with the surface water discharge limitations for the facility. The miscellaneous wastes consist of equalization basin sludge (EB sludge), fly ash from sources other than the silos, unsold bottom ash, coal particles, limestone, sandblasting grit, plant sludges, percolation pond sludge, sludge from the effluent processing facility (EPF) area run-off collection ditch and sump,

etc. EB sludge originates from periodic cleanouts of the two equalization basins that are located to the southeast of the coal pile and northwest of the central wastewater treatment facility. The equalization basins receive run-off from the coal pile and drainage from the plant sumps along with other low-volume waste streams. In 2019 and 2020, miscellaneous wastes also included soil and pozzocrete that were excavated as part of the construction associated with the landfill stormwater management modifications project.

Based on historical information provided by Seminole, Ardaman analyzed waste generation by waste type, landfilled waste, and diverted waste for the period between January 1, 2007 and December 31, 2023. For the period 2013 through 2023, the average fly ash generation rate was approximately 224,000 dry tons per year. In addition to fly ash, the waste stream included on average approximately 4,500 tons of PWT sludge and 8,600 tons of miscellaneous waste. The average total waste generation was approximately 237,000 dry tons per year. The waste materials had an average moisture content of 25 percent, and average in-place dry and wet densities of 1.2 and 1.5 tons per cubic yard, respectively. The Seminole Combined Cycle Facility (SCCF) has since started operating, which reduced the power production and ash generation from Unit 1. In 2023, fly ash generation was approximately 151,400 dry tons per year, and total waste generation was approximately 163,300 dry tons.

In 2017, Seminole started diverting fly ash from the landfill for beneficial use off-site. In April 2019, Seminole started sending all PWT sludge off-site for disposal instead of mixing it with fly ash and landfilling the mixture on site. In 2023, 108,100 dry tons of fly ash and 3,000 dry tons of PWT sludge were diverted from the landfill resulting in 52,200 dry tons being landfilled.

Design and Construction of Increment 1

Because Increment 1 was designed and constructed prior to enactment of the CCR Rule, it is not subject to the design criteria for new landfills in 40 CFR §257.70. A double liner system that is consistent with the requirements of Chapter 62-701, Florida Administrative Code (F.A.C.), for solid waste management facilities was installed on the base areas of Stages I and IIB (i.e., the entire base area of Increment 1), and on the slope area of Stage I. A single geomembrane liner system, also consistent with the requirements of Chapter 62-701, F.A.C., was placed on the slope areas of Stages IIA, IIB, and III.

The double liner system is composed of the following components in descending order:

- A 2-foot thick drainage sand layer with a minimum saturated hydraulic conductivity of 1×10^{-3} cm/sec.
- A double-sided upper geocomposite with a minimum transmissivity of 1×10^{-3} m²/sec (when measured under a normal stress of 5,000 lb/ft² and a flow gradient of 0.01).
- A 60-mil textured primary HDPE liner.
- A double-sided lower geocomposite with a minimum transmissivity of 1×10^{-3} m²/sec (when measured under a normal stress of 5,000 lb/ft² and a flow gradient of 0.01).
- A 60-mil textured secondary high density polyethylene (HDPE) liner.

- A reinforced, needle-punched geosynthetic clay liner (GCL) with a maximum saturated hydraulic conductivity of 1×10^{-7} cm/sec.
- A prepared soil subgrade.

The single geomembrane liner system is composed of the following components in descending order:

- A 2-foot thick drainage sand layer with a minimum saturated hydraulic conductivity of 1×10^{-3} cm/sec.
- A double-sided HDPE geocomposite with a minimum transmissivity of 1×10^{-3} m²/sec (when measured under a normal stress of 5,000 lb/ft² and a gradient of 0.01).
- A 60-mil textured HDPE liner.
- A bedding soil layer.

The drainage sand layer and upper geocomposite at the bottom of Increment 1 collect leachate and convey it through a network of 8-inch diameter, slotted, DR 17 HDPE leachate collection pipes to the leachate collection sump located at the northeast corner, where the collected leachate is drained by gravity via an 8-inch diameter, solid wall, DR 17, HDPE pipe to a 6-foot diameter, DR 32.5, HDPE leachate collection manhole located on the west bank of Stormwater Pond B (Pond B), which is located east of Increment 1. Similarly, the lower geocomposite collects and conveys any leakage through the primary HDPE liner to the leachate collection sump where the collected leachate is also drained by gravity to the HDPE leachate collection manhole. The quantities of leachate from the leachate collection and leak detection systems are measured by separate flow meters. Cleanouts were provided for all leachate pipelines.

From the leachate collection manhole, the collected leachate from the leachate collection and leak detection systems drains by gravity via an 8-inch diameter, solid wall, DR 17, HDPE leachate conveyance pipe into Pond 8, which is located to the northeast of the closed original landfill. An 8-inch diameter gate valve was installed in the leachate conveyance pipe near the crest of Pond 8 to occlude leachate flow from Increment 1 into Pond 8, if needed.

Increment 1 Landfill Operations

Placement of waste materials in Increment 1 is governed by the Conditions of Certification PA78-10A3 dated July 27, 2018 and the landfill operation plan for Increment 1 updated by Seminole in August 2022 and approved by the Florida Department of Environmental Protection (FDEP).

Prior to landfilling, fly ash from silos was conditioned with PWT sludge in a pug mill inside the old dewatering building of the EPF. The conditioned fly ash was deposited outside the building by a radial stacker. Some of the conditioned fly ash was used to produce "pozzocrete" by adding 2.5 to 3 percent pebble lime from an adjacent silo. Fly ash has also been used to stabilize dewatered PWT sludge and EB sludge.

Conditioned fly ash and pozzocrete were loaded into 40-cubic yard articulated off-road dump trucks for transportation to Increment 1 where the wastes were staged near the working face. When a sufficient volume of wastes has accumulated, the wastes were spread in layers with a

loose thickness of approximately 16 to 18 inches. The wastes were then compacted using a vibratory soil compactor.

Pozzocrete berms with exterior side slopes of 3H:1V and interior side slopes of 7H:1V to 6H:1V were constructed on the outside of each waste lift for dust control. The outside slopes of the pozzocrete berms were constructed to allow placement of 2 feet of soil cover on top of the pozzocrete. Fly ash and other wastes were landfilled in areas inside the pozzocrete berms and, in some cases, other wastes were covered with fly ash to provide a competent surface for the landfill equipment.

The outside slopes of the pozzocrete berms were covered with 2 feet of soil and seeded as they were constructed. Unless at least 18 inches of soil cover has been provided on top of the wastes, stormwater run-off from the waste disposal areas is considered leachate and must be captured inside a lined disposal area or lined pond. A perimeter toe swale was constructed inside the lined area on the east side of Increment 1 to collect leachate run-off from the exterior slope of the outer pozzocrete berm that has not yet been covered with soil. Run-off that was collected in this swale flows into the sump of the Stage I area where it infiltrated into the leachate collection sump. Once the entire exterior slope has been covered with soil, run-off that collects in this swale may be directed to Pond B. However, stormwater run-off from the exposed waste areas above the dike must be directed to the interior of Increment 1.

Any stormwater run-off that did not infiltrate into the waste materials or the leachate collection and removal system flowed to a low area in Stage IIB of Increment 1 that has not yet been covered with waste. This low area had an area of approximately 1 acre. To remove any standing water, Seminole deployed two Godwin Dri-Prime CD225M pumps with their suction pipelines currently positioned so that their intakes are near the low point of the Stage IIB area. Each pump has a capacity of approximately 2,400 gpm. The combined flow through the pumps is conveyed through an 18-inch diameter HDPE pipeline into Pond 9 or Pond 2. Seminole logs the run times for the auxiliary pumps. Based on records provided by Seminole, the auxiliary pumps have not been used to remove leachate since 2018, and the run-off that accumulated in the low area of Stage IIB infiltrated into the leachate collection system and discharged to Pond 8.

Seminole monitored and recorded the quantity of leachate from the leachate collection and leak detection systems of Increment 1 using flow meters located near the leachate collection manhole for Increment 1. Leachate from Increment 1 and the vertical expansion as well as contact run-off from uncovered waste materials was collected in lined ponds and used as makeup or pump seal water for the wet FGD system from which it was either evaporated or treated in the PWT system and discharged.

Fly ash destined for beneficial use is diverted to Silo V-142 or Silo V-143 for loading into trucks. Dewatered PWT sludge is temporarily stockpiled on site as needed, prior to shipment off-site for disposal.

Review of Available Information

Rainfall Data

Seminole maintains an on-site manual climatological station that records rainfall and wind direction and an automated Columbia Weather System weather station on the Urea Building that transmits cumulative rainfall to the distributed control system (DCS).

The manual weather station recorded a total of 6.64 inches of rainfall in December 2023 and the automated weather station recorded a total of 6.3 inches. The 1991-2020 normal December rainfall at the nearby Federal Point climatological station, which is no longer in operation, is 2.22 inches, and the 23-year average December rainfall at the Seminole Generating Station manual gauge is 3.16 inches. Therefore, the rainfall for the month prior to our inspection was above normal.

The manual station recorded 63.06 inches of annual rainfall in 2023, and the automated weather station recorded 61.3 inches of annual rainfall in 2023, both of which were well above the Federal Point 1991-2020 normal annual rainfall of 51.40 inches and the 23-year average for the Seminole Generating Station of 57.55 inches.

The manual rain gauge recorded 3.38 inches between January 1 and January 19, 2024 (i.e., from the beginning of the year to the date of our inspection), which is above normal for the entire month of January. A total of 1.13 inches of rainfall was recorded on January 16, 2024 and 0.09 inches of rainfall was recorded on January 18, 2024.

Weekly Landfill Inspection Reports

An employee at the Seminole Generating Station inspected Increment 1, including the leachate sump, leachate flow meters, access roads, stormwater structures and ditches, and Stormwater Pond B, weekly in 2023 using a Microsoft Excel workbook with checklists of inspection items. No items needing attention were noted in the weekly inspection checklists for 2023.

Topographic Survey and Waste Records

The most recent topographic survey of Increment 1 was performed by Pickett from aerial data acquired on December 5, 2023. The topography from this survey is depicted in Figure 2. An aerial photograph from the flight imagery is shown in Figure 3. The boundaries of the Stages I, IIA, IIB, and III areas, were identified in Figures 2 and 3, and the areas on which a soil cover had been placed were also visually identified in Figure 3.

The top of the outer pozzocrete berm on the east and southeast sides of the Stage I area had reached an elevation of +138 to +148 feet (NAVD88)¹, and the waste surface in most of the Stage I area had reached an elevation of +140 to +149 feet (NAVD88). Part of the Stage IIB area had not yet been covered with waste, although sediment and fly ash had accumulated over the top of the drainage sand layer of the leachate collection system. Landfilling in the eastern part of Stage III had reached a maximum elevation of approximately +149 feet (NAVD88).

¹ Some previous inspection reports and topographic surveys have reported elevations relative to the National Geodetic Vertical Datum (NGVD). Elevations relative to NGVD are 0.958 feet higher than elevations relative to the North American Vertical Datum of 1988 (NAVD88) at the Seminole Generating Station site.

Based on waste records provided by Seminole, a total of approximately 1,547,700 dry tons of waste were disposed of within Increment 1 between April 5, 2013 (i.e., the start of landfilling in Increment 1) and December 31, 2023 (i.e., 19 days before the date of the 2024 inspection). Based on the same waste records, approximately 1,546,800 dry tons of waste had been placed in Increment 1 by December 5, 2023 (i.e., the date of the latest topographic survey). Figure 4 presents the differences between the December 5, 2023 landfill elevations and the top of drainage sand elevations in the bottom liner system for Increment 1. Analysis of the topographic data indicated that approximately 1,268,200 cubic yards of waste had been placed in Increment 1 by December 5, 2023, corresponding to an average dry density of 1.22 dry tons per cubic yard.

Based on records provided by Seminole, approximately 52,200 dry tons of waste were landfilled in Increment 1 in 2023. In addition, approximately 108,100 tons of dry fly ash were transported off-site for beneficial use in concrete manufacturing, and 11,800 wet tons (3,000 dry tons) of PWT sludge were transported off-site for disposal. In 2023, airspace was consumed at an average rate of approximately 57,100 cubic yards per year, compared to the annual average airspace consumption rate of approximately 27,500 cubic yards per year in 2022.

Leachate Flow Meter Records

Separate flow meters for the leachate collection and leak detection systems were installed during construction of the Stage I area and have been monitored by Seminole personnel. Typically, totalizer readings were collected and recorded four times per day, and daily average flows were calculated. The leachate records also note the days when the meters were out of service or malfunctioning. In 2023, the leachate flow meters recorded an average flow of approximately 17 gpm, corresponding to approximately 12 inches per year over 27 acres of the Increment 1 leachate collection system footprint, and a peak daily average flow of 325 gpm, corresponding to approximately 0.64 inches per day.

Auxiliary Pump Records

Seminole Generating Station personnel are responsible for recording the run times for the two auxiliary pumps currently stationed in the Stage IIB area. In 2023, the auxiliary pumps did not have to be used for removal of surface leachate run-off.

Run-On and Run-Off Control System

Per the first update of the run-on and run-off control system plan, most rainwater that potentially drains over upslope land onto any part of Increment 1 will be controlled and diverted by reverse benches with drains and Fabriform-lined flumes and ditches.

Per the run-off control system plan, any rainwater, leachate, or other liquid that drains over land from any part of Increment 1 will be contained without resulting in run-off leaving the lined waste disposal area and discharging into a stormwater management system or nearby natural drainageways under the 25-year, 24-hour design storm event.

Fugitive Dust Control

On November 28, 2023, a review of CCR dust control measures was completed by members of Corporate Environmental and SGS ENV. This annual evaluation was conducted in accordance with 40 CFR §257.80(c) and Section 3.2 of the CCR Fugitive Dust Control Plan.

The methods used to control CCR fugitive dust at SGS are documented within the Plan. During the annual review, no significant concerns or deficiencies were identified for the methods in the Plan and their effectiveness in controlling CCR fugitive dust at SGS. Any incident involving dusting of CCR was recorded in an incident report as required by the Plan. Upon notification of any dusting of CCR, SGS staff took immediate actions to remove that equipment from service and address any malfunctions.

During the SGS site visit, which occurred on November 28, 2023, all CCR management areas were noted to have no visible dusting. The roads used to transport CCR to the Effluent Processing Facility and the Increment 1 landfill were clean and well maintained. CCR within the landfill was compacted and cover material was properly placed to prevent dusting.

No citizen complaints regarding CCR fugitive dusts were received in 2023.

Increment 1 Inspection

The ninth annual visual inspection of Increment 1 under the CCR Rule was conducted by Mr. Francis K. Cheung, P.E., and Mr. Patrick A. Kennedy, P.E., of Ardaman on January 19, 2023. The weather at the time of the inspection was cloudy, with a temperature of 63 °F.

For the inspection, Mr. Cheung and Mr. Kennedy were driven by Mr. Wyatt Wilkinson of the Seminole Generating Station, who is a Materials Handling Equipment Operator. The inspection proceeded by traversing Increment 1 and surrounding roads in a Kubota electric golf cart and stopping periodically to walk and observe the condition of Increment 1 as well as the conditions of other waste disposal areas and facilities that may affect the stability and safety of Increment 1. The inspection started at the access ramp to Increment 1 on its western side and proceeded through Stage IIB and along the bench around the southern and eastern sides of Increment 1. We then reversed our path to the access ramp and then proceeded along the perimeter road around the east side of Pond B to the leachate collection sump and manhole. We then rode along the perimeter access road to the leachate pipe discharge into Pond 8 and then around the closed original landfill to the concrete pad adjacent the new gypsum dewatering building.

An annotated December 5, 2023 aerial photograph with the items observed during our inspection is shown in Figure 5. Selected representative photographs taken during the site inspection on January 19, 2023 are included in Appendix 1.

Articulated dump trucks hauling waste enter and leave Increment 1 via the access ramp near the northwestern corner of the Stage IIB area, which is where we began our inspection. We observed that vegetation had grown up in the perimeter ditch on both ends of the culvert under the access ramp and needed to be trimmed. An internal access road runs east from the access ramp to the top of waste in Stage I. On the north side of the access ramp/road, Seminole had graded two flat plateaus that would delay run-off and allow it to infiltrate. The ash placement against the inside of the Stage IIB containment dike north of the access road appeared to have reached the elevation of the liner anchor trench in the containment dike and, therefore, the waste against the dike should not be placed higher. The lower bench on the southern and eastern sides of Increment 1 can be reached by an internal access road to the south past the low point of the Stage IIB area. The area

at the low point of Stage IIB where the intake pipes for the two auxiliary pumps are deployed was holding a small amount of rain water. According to Seminole, waste has not yet been placed in this area and the accumulated sediment from run-off was periodically removed to expose the drainage sand. Even with the sediment deposited over the drainage sand, run-off gradually infiltrated into the leachate collection system.

A pozzocrete dike had been constructed above the existing bench in the southern part of Stage IIB. The area inside the dike was graded toward the low point of Stage IIB where the auxiliary pump intakes are deployed. The benches along the southern and western sides of Increment 1 and the adjacent side slopes were observed to be in good condition. The pozzocrete dike on the east side of the Stage I area had reached an elevation of approximately +140 to +148 feet (NAVD88). All but the upper 15 to 20 feet of the pozzocrete dike above the highest bench had been covered with soil and grassed. The benches below the dike at elevations of approximately +135 feet and +115 feet (NAVD88) and the adjacent side slopes were covered with soil and grass. The waste at the top of Stage I was generally sloped in a westerly direction toward the Stage IIB area.

The eastern part of the Stage III area had been covered to a maximum elevation of approximately +149 feet (NAVD88) near the junction of the pozzocrete dike and Stage III. The waste surface in Stage III was sloped to convey run-off toward the Stage IIB area. A Fabriform-lined flume was constructed along the western boundary of the Stage III area to intercept and divert run-off from the upslope area.

The outside containment dike for Increment 1, the adjacent perimeter stormwater swale, and perimeter access road were observed for stability, grass cover, and signs of erosion. The western and southern containment dikes and perimeter swales for Increment 1 were in good condition with no visible erosion or stability issues. Monitor well MW-18, which is located near the southwestern corner of Increment 1, was intact and protected by bollards, and the leachate collection system cleanouts at the top of the containment dike were in good condition and surrounded by protective bollards.

Stormwater Pond B and the perimeter road around the east side of the pond were in good condition. The CS-1 and CS-2 outlet structures were clear and unobstructed. The water level in Pond B was well below the overflow or bleed down elevations.

The leachate collection manhole for Increment 1 and the leachate flow meter appeared to be functioning properly. At the time of our inspection, the leachate collection control panel displayed a totalizer reading of 716985 x100 gallons and a flow rate of 33.1 gpm. The leak detection meter indicated no flow. The Fabriform-lined flume on the eastern slope of the closed original landfill just north of Increment 1 discharges into the north end of Pond B. This flume had been extended to the top of the vertical expansion as part of closure construction for the vertical expansion.

The four leachate collection system cleanouts and four monitor wells (MW-19 through MW-22) on the east side of Increment 1 were in good condition and protected by bollards painted yellow or white for visibility. All of the monitor wells had labels or metal tags showing the well number, measuring point elevation, and depth. The swale within the lined containment that drains toward the sump was unobstructed and had good grass cover. No standing water was observed in the swale or the sump. The two Fabriform-lined flumes and stilling basins draining into Pond B on the east side of Increment 1 were in good condition, with minor amounts of sediment and no water collected at the low points of the road crossings.

Leachate was flowing from the discharge pipeline from Increment 1 into Pond 8.

On February 19, 2024, Mr. Kennedy interviewed Mr. Butch Williams, the Material Handling Supervisor, who has overall responsibility for the CCR landfill, about landfill operation. The interview took place online via Microsoft Teams. Based on the interview, the existing landfill operating equipment was adequate and performed satisfactorily, and there were no significant landfill operation issues in 2023. Mr. Williams noted that Unit 1 is no longer in service.

Findings and Recommendations

Based on our visual inspections, Ardaman has the following key findings and recommendations:

- No signs of an actual or potential structural weakness of the CCR unit and no conditions that were disrupting or had the potential to disrupt the operation and safety of the CCR unit were observed.
- Based on our observation of completed surfaces at the time of the inspection, placing, grading and compaction of wastes appeared to be ongoing in a satisfactory manner.
- The outside slopes of the containment dike for Increment 1 were stable with no visible signs of erosion.
- There were no signs of erosion around the inlet near the southeastern corner of Increment 1 which was re-constructed in 2018.
- Any bare areas and areas of sparse grass coverage should be overseeded when conditions permit.
- The inside slopes of the Stages IIA, IIB, and III areas that have not been covered with wastes also appeared to be stable with no significant erosion. Overseeding should be performed for any parts of the interior side slopes of the Stages IIA, IIB, and III areas with sparse grass coverage.
- The remaining 15 to 20 feet of upper pozzocrete dike on the southern and eastern sides of Increment 1 should be covered with soil and seeded as soon as conditions permit.
- Waste should not be placed against the inside of the containment dike on the west side of Stage IIB higher than liner anchor trench, which was placed 2 feet below the containment dike crest.
- The top of waste surface should continue to be graded toward the Stage IIB area. Even though they have not been used to remove leachate since 2018, auxiliary pumps should continue to be on hand to remove any standing water from the low area of Increment 1. Seminole should continue to provide enough emergency storage in Increment 1 to accommodate run-off from areas of exposed waste and should monitor any accumulation of standing water.
- Seminole should continue to monitor vegetation growth in the drainage sand/protective cover and remove vegetation that has the potential to damage the liner or clog the leachate collection system. This includes vegetation in the sump and perimeter toe swale area on the east side of the Stage I area.
- Seminole should continue with the weekly landfill inspections, as required by the CCR Rule.

Recordkeeping and Future Inspection

Seminole should be cognizant of the following recordkeeping requirements: (i) the annual CCR landfill inspection report must be placed in the written operating record at the facility as stipulated in by 40 CFR § 257.105(g)(9); (ii) the State Director² must be notified of the availability of the report as stipulated in 40 CFR § 257.106(g)(7); and (iii) the report must be posted on the Seminole website as stipulated in 40 CFR § 257.107(g)(7).

As stipulated in 40 CFR §257.84(b)(4), the schedule for the next annual CCR landfill inspection is as follows:

“... In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. For purposes of this section, the owner or operator has completed an inspection when the inspection report has been placed in the facility’s operating record as required by § 257.105(g)(9).”

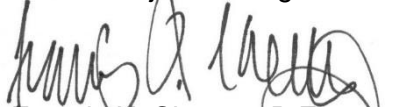
Ardaman interprets this to mean that the next annual CCR landfill inspection should be completed and the inspection report should be placed in the operating record at the Seminole Generating Station within one year of the date that this report is officially placed in the operating record. Accordingly, we recommend the next annual inspection of Increment 1 be performed no later than January 2025.

Ardaman appreciates the opportunity of providing our service to Seminole. If you have any questions or need additional information, please contact us.

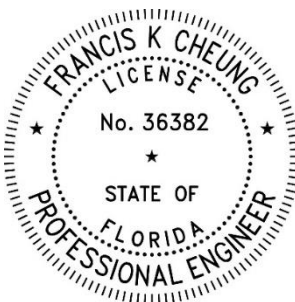
Very truly yours,
ARDAMAN & ASSOCIATES, INC.
Certificate of Authorization No. 5950



Patrick A. Kennedy, P.E.
Senior Project Manager



Francis K. Cheung, P.E.
Principal Engineer 03/15/2024
Florida License No. 36382



Enclosure

This item has been digitally signed and sealed by Francis K. Cheung on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

² In the CCR Rule, the State Director refers to “the chief administrative officer of the lead state agency responsible for implementing the state program regulating disposal in CCR landfills, CCR surface impoundments, and all lateral expansions of a CCR unit.”

1968800 1968000 1967200 1966400 1965600 1964800 1964000

457600

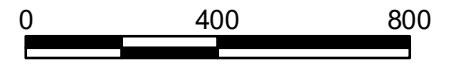
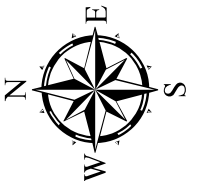
456800

456000

455200

454400

1968800 1968000 1967200 1966400 1965600 1964800 1964000



Scale: 1" = 400'

SOURCE: AERIAL IMAGERY FLOWN
DECEMBER 5, 2023 BY,
PICKETT & ASSOCIATES, INC, AND
JANUARY 7-11, 2023 BY FDOT



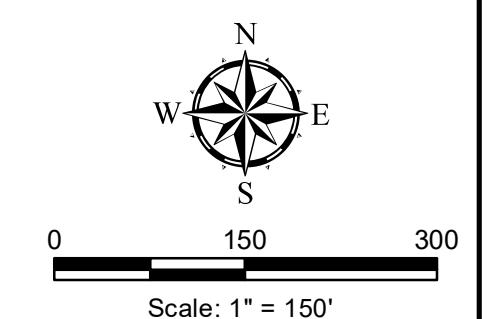
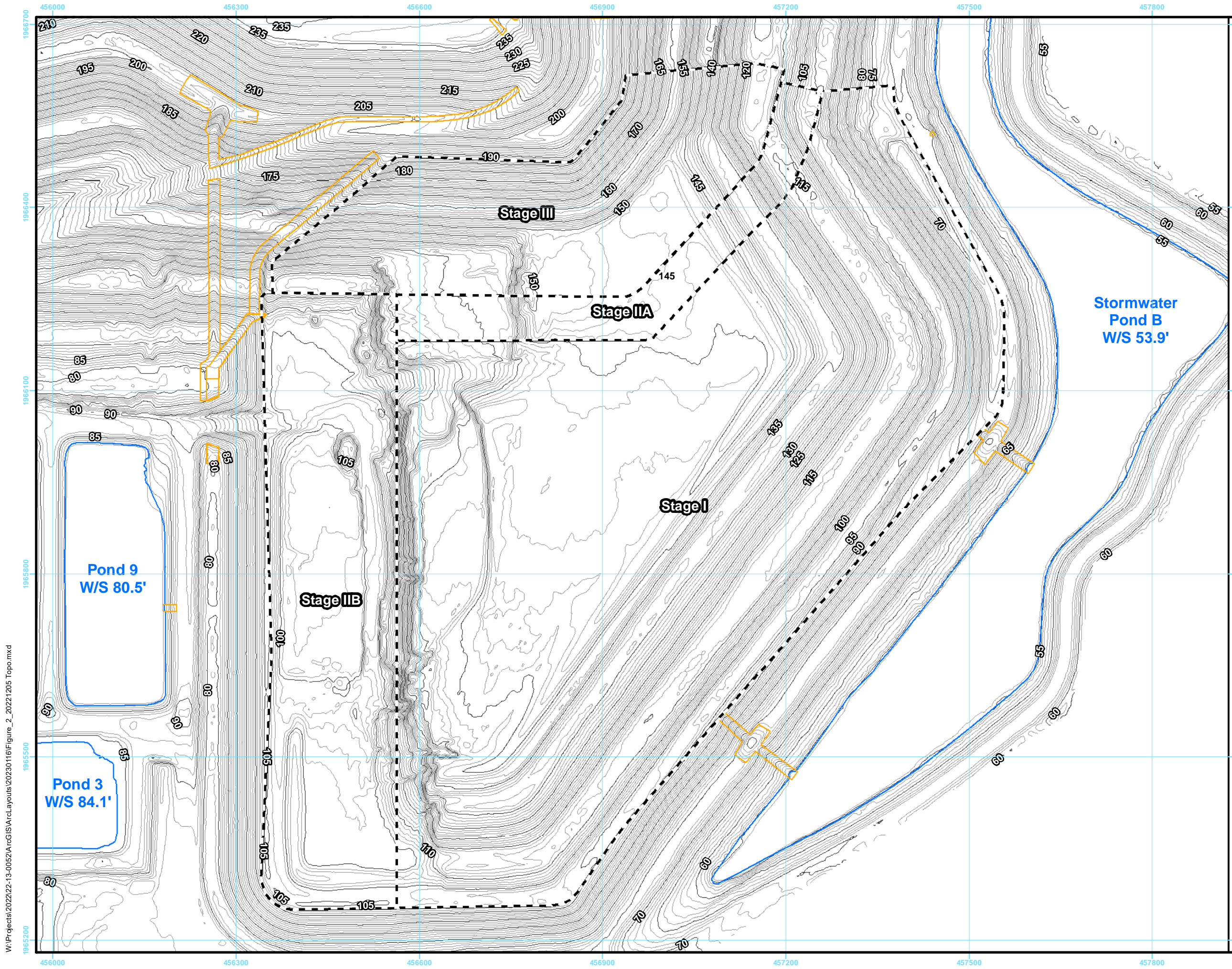
LANDFILL LAYOUT



**2024 ANNUAL CCR
LANDFILL INSPECTION
SEMINOLE GENERATING STATION
PUTNAM COUNTY, FLORIDA**

DRAWN BY: ACV	CHECKED BY: PAK	DATE: 01/08/2024
FILE NO. 23-13-0074	APPROVED BY: FKC	FIGURE: 1

W:\Projects\2023\23-13-0074\Arc Layouts\20240108\Figure_1_Landfill Layout.mxd



SOURCE: TOPOGRAPHIC SURVEY
 COMPILED BY PICKETT & ASSOCIATES,
 INC. FROM AERIAL DATA ACQUIRED
 ON DECEMBER 5, 2023.

- Legend**
- Increment 1 Liner Stage Limits
 - Fabriform
- Elevation (feet, NAVD88)**
- 5' Contour
 - 1' Contour
 - Water



12/05/2023 TOPOGRAPHY		
Ardaman & Associates, Inc. Geotechnical, Environmental and Materials Consultants		
2024 ANNUAL CCR LANDFILL INSPECTION SEMINOLE GENERATING STATION PUTNAM COUNTY, FLORIDA		
DRAWN BY: ACV	CHECKED BY: PAK	DATE: 01/08/2024
FILE NO: 23-13-0074	APPROVED BY: FKC	FIGURE: 2

W:\Projects\2022\22-13-0052\A\rcGIS\ArcLayouts\20230116\Figure_2_20221205 Topo.mxd

W:\Projects\2023\23-13-0074\Arc Layouts\20240108\Figure_3_20221205_Aerial.aprx



Scale: 1" = 150'

SOURCE: AERIAL IMAGERY
FLOWN DECEMBER 5, 2023 BY
PICKETT & ASSOCIATES, INC.

Legend

- Increment 1 Stage Limits
- Limit of Soil Cover



12/05/2023 AERIAL PHOTO



**2024 ANNUAL CCR
LANDFILL INSPECTION
SEMINOLE GENERATING STATION
PUTNAM COUNTY, FLORIDA**

DRAWN BY: ACV	CHECKED BY: PAK	DATE: 01/08/2024
FILE NO: 23-13-0074	APPROVED BY: FKC	FIGURE: 3

W:\Projects\2023\23-13-0074\Arc Layouts\20240108\Figure_4_20221205 Base Liner Airspace Add Stage II.aprx

456300 456600 456900 457200 457500 457800

1966400

1966100

1965800

1965500

1965200

456300 456600 456900 457200 457500 457800

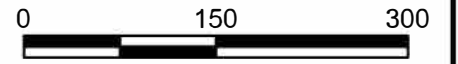
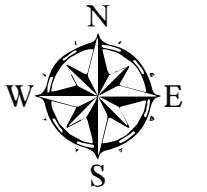
1966400

1966100

1965800

1965500

1965200



Scale: 1" = 150'

SOURCE: TOPOGRAPHIC SURVEY
COMPILED BY PICKETT & ASSOCIATES,
INC. FROM AERIAL DATA ACQUIRED
ON DECEMBER 5, 2023.

Legend

Difference Between Surfaces (feet)

— 5' Contour

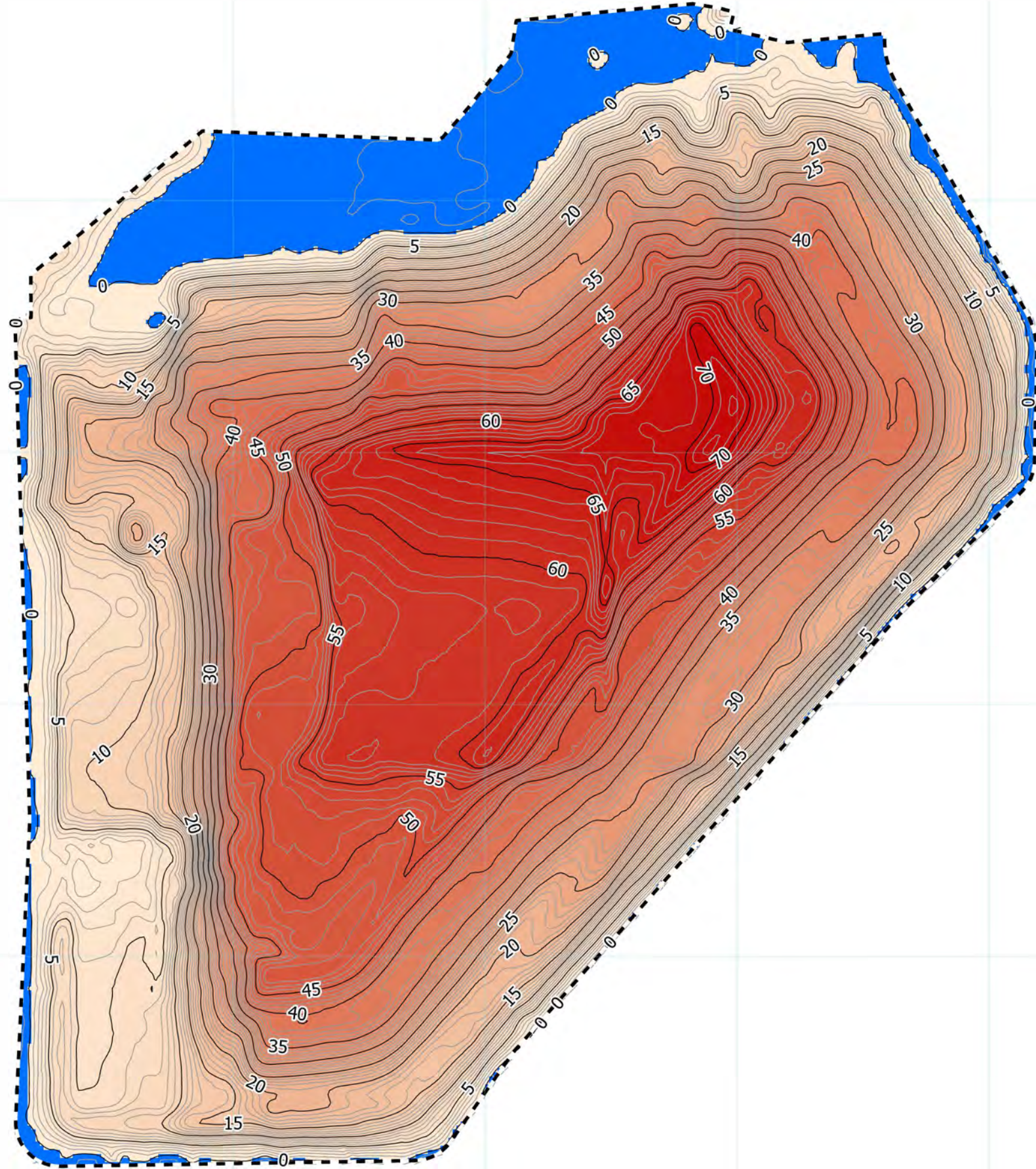
— 1' Contour

--- Boundary of Increment 1
Stages I, IIA, IIB, and III

High: 73

Low: 0

Less Than 0



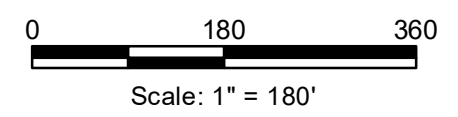
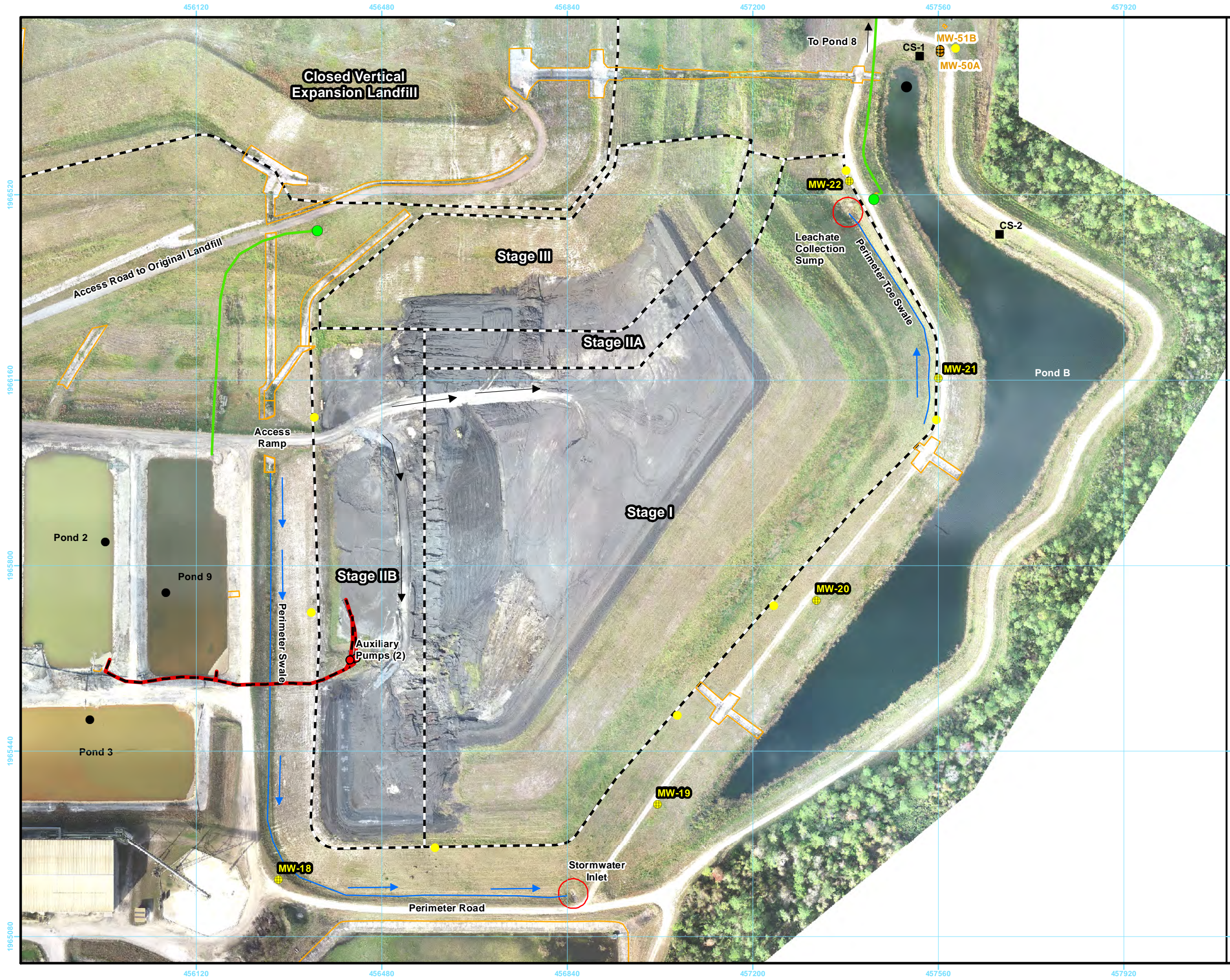
**AIRSPACE CONSUMED FROM
04/05/2013 TO 12/05/2023**



**2024 ANNUAL CCR
LANDFILL INSPECTION
SEMINOLE GENERATING STATION
PUTNAM COUNTY, FLORIDA**

DRAWN BY: ACV	CHECKED BY: PAK	DATE: 01/10/2024
FILE NO: 23-13-0074	APPROVED BY: FKC	FIGURE: 4

W:\Projects\2023\23-13-0074\Arc Layouts\20240108\Figure_5_20221205 Annotated Aerial.mxd



SOURCE: AERIAL IMAGERY
FLOWN DECEMBER 5, 2023 BY
PICKETT & ASSOCIATES, INC.

Legend

- Cleanout
- Staff Gauge
- ⊕ Solid Waste Monitor Well
- ⊕ Shallow Surficial Aquifer Monitor Well for Groundwater Remediation System
- Fabriform
- Leachate Collection Manhole
- - - Temporary Pipeline
- Flow Arrows
- Leachate Pipeline
- Traffic Flow



**ANNOTATED
12/05/2023 AERIAL PHOTO**



**2024 ANNUAL CCR
LANDFILL INSPECTION
SEMINOLE GENERATING STATION
PUTNAM COUNTY, FLORIDA**

DRAWN BY: ACV	CHECKED BY: PAK	DATE: 01/10/2024
FILE NO. 23-13-0074	APPROVED BY: FKC	FIGURE: 5

Appendix 1

**Selected Photographs Taken During Landfill Inspection
on January 19, 2024**



Access Ramp to Stage IIB, Looking East



North End of Western Containment Dike for Stage IIB and
Fabricform-Lined Flumes, Looking North



Fabricform Around Reinforced Concrete Pipe Under
Access Ramp to Stage IIB, Looking East



Caterpillar CS-563E Compactor in Stage IIB North of Access Ramp

Annual Inspection of CCR Landfill
Seminole Generating Station



Access Ramp through Stage IIB and Western Extent of Waste, Looking North
Toward Closed Vertical Expansion



Access Ramp through Stage IIB, Looking Southeast



Auxiliary Pumps with Intake Pipelines in Low Point of Stage IIB



Pozzocrete Dike in Southern Part of Stage IIB, Looking West



Side Slope of East Containment Dike for Stage I and Adjacent Perimeter Road,
Looking Northeast from Bench Toward Stormwater Pond B



Pozzocrete Dike at Top of Waste on Eastern Side of Stage I,
Looking South Along Dike



Top of Waste in Increment 1, Looking Southwest



Top of Waste in Stage I and Stage III, Looking Southwest with Grassed Area
of Stage III Not Yet Covered with Waste

Annual Inspection of CCR Landfill
Seminole Generating Station



Containment Dike for Stage IIB, Perimeter Swale, Perimeter Road,
and Culvert Looking South



Pipeline from Auxiliary Pumps for Low Point of Stage IIB to Pond 9,
Looking East



Discharge of Pipeline in Previous Photo into Pond 9, Looking West
Along Dike Between Ponds 3 and 9



Perimeter Swale Along Toe of Western Containment Dike for Stage IIB,
Looking North Toward Closed Original Landfill and Vertical Expansion



Monitor Well MW-18 Looking Northeast Toward
Western Containment Dike for Stage IIB



Perimeter Swale and Road at Southwestern Corner of Stage IIB
Containment Dike, Looking Southeast



Perimeter Road and Swale South of Increment 1, Looking West;
Gypsum Dewatering Building and Silos in EPF Area to Rear of Photo



Stormwater Inlet in Southeastern Corner of Increment 1

Annual Inspection of CCR Landfill
Seminole Generating Station



Perimeter Road, Eastern Slope of Containment Dike for Stage I,
and Stormwater Pond B, Looking North



Eastern Slope of Increment 1 and Fabriform-Lined Flume into Stormwater Pond B,
Looking Southwest from Perimeter Road Around Eastern Side of Pond B



Outlet Structure CS-2 for Stormwater Pond B, Looking West from
Perimeter Road Around Eastern Side of Pond B



Eastern Slope of Increment 1 and Fabriform-Lined Flume into Stormwater Pond B,
Looking West from Perimeter Road Around Eastern Side of Pond B

Annual Inspection of CCR Landfill
Seminole Generating Station



Outlet Structure CS-1 and Staff Gauge for Stormwater Pond B, Looking South



Fabriform-Lined Flume from Top of Closed Vertical Expansion to Stormwater Pond B, Looking Uphill from Perimeter Road



Staff Gauge for Stormwater Pond B and Fabriform-Lined Flume into Stormwater Pond B, Looking Southeast



Monitor Well MW-22 and Leachate Collection System Cleanout East of Perimeter Road, Looking South with Stormwater Pond B to the Left



Leachate Collection Flow Meter Control Panel for Increment 1



Leak Detection Flow Meter Control Panel for Increment 1



Leachate Collection and Leak Detection System Manhole for Increment 1



Sump Area of Increment I and Perimeter Swale East of Stage I, Looking Southwest



Monitor Well MW-19, Looking East Toward Culvert Outlet into Stormwater Pond B



Fabriform-Lined Flume on Southern Part of Eastern Slope of Containment Dike for Stage I and Perimeter Road, Looking South



Fabriform-Lined Flume from Southern Part of Eastern Containment Dike of Stage I into Stormwater Pond B, Looking East



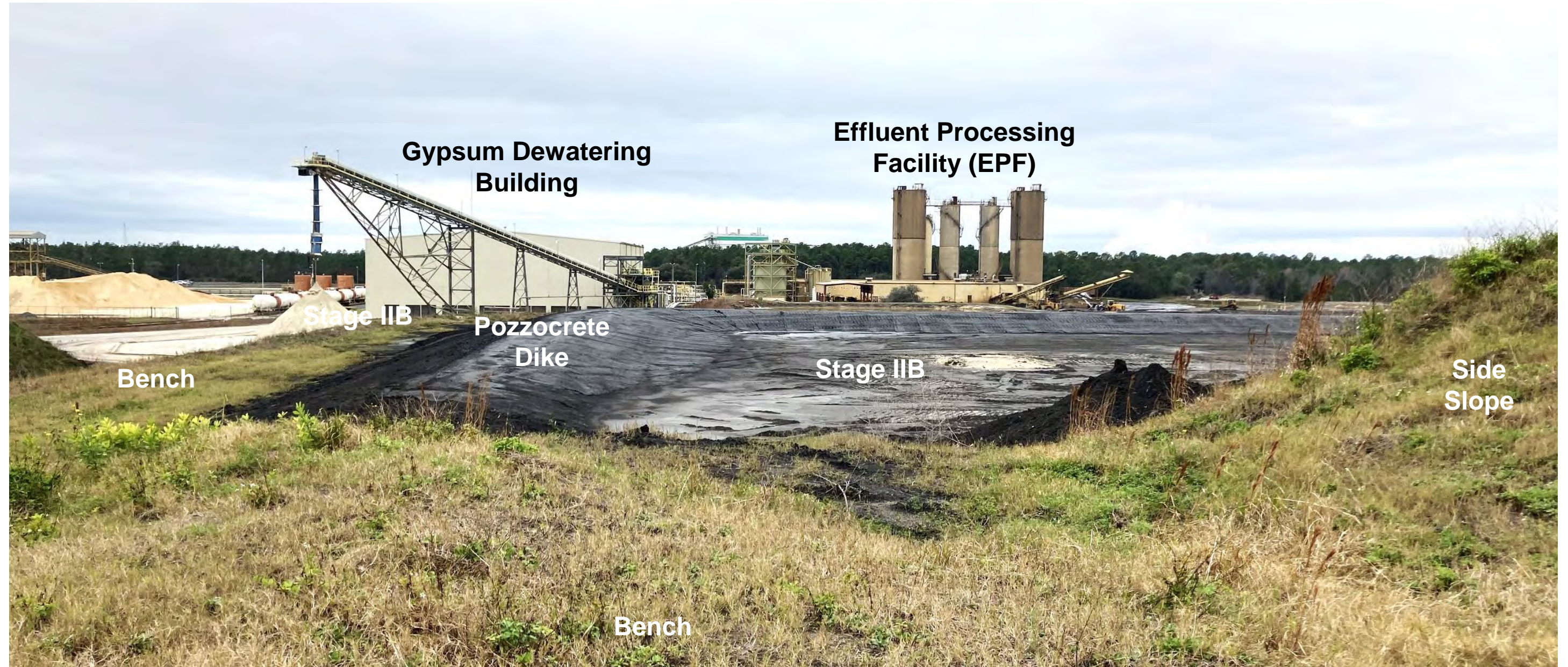
8-Inch Diameter HDPE Discharge Pipe from Increment 1 Leachate Collection and Leak Detection System into Pond 8



Access Ramp to Stage IIB, Looking East Toward Increment 1 Buildout



Pump Intake Pipelines in Low Point of Stage IIB, Looking West



Pozzocrete Dike and Bench at Southwest Corner of Stage IIB, Looking West Toward EPF



Southern Side Slope of Increment 1 Containment Dike, Looking South from Bench in Stage IIB



Pozzocrete Dikes and Reverse Benches on East Side of Increment 1, Stage I, Looking Southeast Toward Stormwater Pond B



Top of Increment 1, Stage I, and Stage III, Looking Southwest



Access Ramp to Top of Stage I and Stage III, Looking Downhill to the West



Perimeter Road and Swale on West Side of Increment 1, Stage IIB, Looking South



Panorama Along Perimeter Road and Swale, Looking Northeast from Perimeter Road at Southwestern Corner of Stage IIB Containment Dike



Stormwater Inlet in Perimeter Swale at Southeastern Corner of Stage I Containment Dike, Looking Northwest



Increment 1, Stage I Eastern Side Slope and Containment Dike, Looking West from Perimeter Dike/Road on the Other Side of Stormwater Pond B



Increment 1, Stage I Eastern Side Slope and Containment Dike, Looking South from Road at Northern End of Stormwater Pond B



Eastern Side of Increment 1, Stage I, Looking South from Near Leachate Collection Sump