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VIA ELECTRONIC CORRESPONDENCE

February 11, 2016

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File No: 8.DC.20.19

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RE: DOJ No. 90-5-1-1-4022/1
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Southeast District – West Palm Beach
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Attn: Compliance/Enforcement Section
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RE: Consent Decree (Case: No. 1:12-cv-24400-FAM)
Reference DOJ Case No. 90-5-1-1-4022/1
Section VI – Specific Capital Improvement Projects, Paragraph 19(i)
Section XX – Modification
Request for Non-Material Change – CD Project 2.12 & 2.13 Sludge Thickeners Plant 1 and 2

Dear Sir/Madam:

Pursuant to our discussions during our December 4, 2015 teleconference, Miami-Dade County (County) respectfully requests to modify the scope of work for Appendix D-2, CD Project 2.12 & 2.13 – Sludge Thickeners Plant 1 and 2. Attached for your review and approval is a technical memorandum outlining the requested non-material change to Projects 2.12 and 2.13. This technical memorandum summarizes the presentation made by Water and Sewer Department (WASD) to the United States Environmental Protection Agency (EPA) and Florida Department of Environmental Protection (FDEP) at that meeting.

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

Should you have any questions regarding this matter, please call me at (786) 552-8120.

Sincerely,



Bertha Goldenberg, P.E., LEED® Green Associate
Assistant Director, Regulatory Compliance and Planning

Attachments: CD Project 2.12 and 2.13 –Sludge Thickeners Plant 1 and 2 Technical Memorandum

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To	Manuel Moncholi
CC	Pedro Hernandez, PE, Maricela J. Fuentes, PE, Brian Stitt
Subject	CD PROJECT # 2.12 Sludge Thickeners Plant 1 PCTS: 13284, CD PROJECT 2.13 Sludge Thickeners Plant 2 PCTS: 13285, and CD PROJECT 2.16 Dewatering Building PCTS: 13290
From	John Ososkie, PE / Consent Decree PMCM Team
Date	February 04, 2016
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Technical Memorandum

1. INTRODUCTION

The Central District Wastewater Treatment Plant (CDWWTP) is the oldest existing wastewater treatment facility owned and operated by the WASD. The plant is located on Virginia Key and was originally constructed in 1956. The plant has undergone numerous expansions and upgrades from its original permitted capacity of 47 million gallons per day (mgd) as a modified activated sludge process to its current configuration as a 143 mgd average annual daily flow (AADF), high-purity oxygen, activated sludge facility. The CDWWTP has two separate liquid process treatment streams - Plant 1 and Plant 2. Plant 1 is rated at 60 mgd AADF and Plant 2 is rated at 83 mgd AADF. The sludge that is generated in the wastewater treatment process is removed from the liquid stream for further processing onsite. The activated sludge wasted from the secondary clarifiers is concentrated using gravity thickeners. From the gravity thickeners, the thickened sludge is stabilized through anaerobic digestion and then dewatered using centrifuges prior to disposing via land application, composting, or landfill.

2. EXISTING CONDITIONS AND PROJECT OVERVIEW

The CDWWTP thickening and dewatering systems are operated with outdated, inefficient equipment, reducing the effectiveness of the thickening process. Furthermore, the current performance of these units results in a need for additional capacity in the anaerobic digestion system to meet the required 15 day sludge retention time (SRT) at the CDWWTP. The excess water in the thickened sludge occupies a significant portion of the available digester's volume, reducing attainable Volatile Suspended Solids (VSS) destruction, gas production and overall residual reduction. Most modern digestion systems are designed for concentrations two to four times higher than what is currently obtained with the existing gravity thickeners. Each Consent Decree project is further defined below.

2.1. CD 2.12 Gravity Sludge Thickeners Plant 1 and CD 2.13 Gravity Sludge Thickeners Plant 2

CDWWTP has a total of eight circular gravity thickeners that are each 55-feet in diameter to thicken the sludge produced in the biological treatment process, prior to stabilization within the anaerobic digestion facilities. Four gravity thickeners are located at Plant 1 and four gravity thickeners are located at Plant 2. The gravity thickeners are designed to process approximately 0.77 mgd or 72,100 pounds per day (lbs/day) of sludge. The gravity thickeners are covered to allow for air extraction for odor control purposes. The gravity thickeners/concentrators were designed to reduce the overall volume of raw primary and secondary sludge to

be processed. Sludge at approximately 1% solids is fed to the gravity thickeners where it is conditioned with polymer and thickened to an average of approximately 3.7% dissolved solids (DS). Thickened underflow is pumped to the anaerobic digesters for treatment. All of the pumps for the gravity thickeners are located in the basement of the sludge concentrator buildings. The supernatant from the gravity thickeners is returned to the head of the plant for treatment.

In addition to the CDWWTP secondary sludge, there are two sludge streams from the North District Wastewater Treatment Plant (NDWWTP) processed at the CDWWTP – primary and secondary sludge. The NDWWTP sludge can be sent directly to the Plant 2 gravity thickeners or sent to Pump Station 2, which mixes the sludge with the raw wastewater and delivers the sludge to the headworks of the CDWWTP for treatment. Due to hydraulic capacity provided by the existing gravity thickeners, the secondary sludge from the NDWWTP is typically fed to the CDWWTP via Pump Station 2, and primary sludge is conveyed directly to the gravity thickeners of Plant 2. The NDWWTP primary sludge is also, on occasion, fed to the CDWWTP via Pump Station 2.

The original Consent Decree project for Plants 1 and 2 (CD 2.12 and CD 2.13), included replacement of thickened sludge pumps, sanitary sewer pumps, HVAC, and electrical systems in the concentrator pump station as well as rehabilitation of concentrator collector mechanisms and structural rehabilitation and coating of concentrators.

2.2. CD 2.16 Dewatering Facility

The dewatering facility is housed in a 2-story structure located north of Anaerobic Digester Cluster 4 at Plant 2. The dewatering system is composed of dewatering centrifuges located in an uncovered mezzanine, ferric sulfate injection system, dry polymer system, sludge transfer pumps, and sludge grinders. Digested sludge is pumped from the Plant 2, Anaerobic Digester Cluster 4 to the dewatering building. The solids concentration of the sludge pumped from the digestion facilities ranges between 1 and 4 % DS, with the average being approximately 1.8% DS. Before entering the dewatering building, ferric sulfate is mixed with the digested sludge for struvite control. The sludge then enters individual sludge grinders – one per centrifuge feed pump – to minimize sewage solids size of items such as rags, plastics, and other inorganic material and thereby reduce equipment cleaning or maintenance downtime of the downstream treatment processes. Progressive cavity pumps (one per centrifuge) feed the conditioned digested sludge to the centrifuges. Polymer is mixed with sludge upstream of the centrifuge to condition the sludge and enhance the dewatering performance. After being processed by the centrifuges, the dewatered sludge is discharged directly onto trucks for transport into the onsite biosolids storage building. The current layout does not include provisions for re-directing the slop created by the centrifuges during startup/shutdown or store cake during truck transfer. During these events, the slop/cake is deposited on the floor of the loading bays and is then manually washed to the plant drains by operators. In addition, due to the lack of storage, if no trucks are available the centrifuges are shutdown. The solids concentration for the centrifuge sludge cake is approximately 23% DS. The centrate from the centrifuges is returned to the front end of the treatment plant for retreatment.

The original Consent Decree project (CD 2.16) includes construction of a new dewatering facility and sludge cake conveyance system to sludge storage buildings.

3. BASIS OF DESIGN REPORT

There have been two previous technical memorandums (TM) related to the overall treatment plant condition and biosolids system improvements at CDWWTP. The first report, titled “Projects and Prioritization Update for the 2008 CDWWTP Existing Conditions Report by MWH in December 2012” provides an extensive evaluation of the overall facility and the condition of the existing equipment and recommended replacement projects. However, the report includes limited information on sludge flows/loads and finding on the dewatering building

outside of mentioning the findings from the “Existing Conditions Report - Upgrades to the Central District Wastewater Treatment Plant - Work Order No.1”, dated September 2008.

A more recent report is the “Technical Memorandum No. 2 System Wide Digestion Alternatives Final - February 2015” prepared by MWH. This TM’s focus was the modifications required for improving the operation of the anaerobic digesters at the CDWWTP, and includes evaluations of the existing thickening process, potential improvements, as well as possible replacement alternatives. This memorandum also includes estimated sludge quantities (flows and loads) for the primary and secondary sludge produced by the NDWWTP and the secondary sludge produced by the CDWWTP Plants 1 and 2 based on the flow to the facilities.

The 2012 Report and 2015 TM provided assessment of the existing equipment recommendations for upgrade or replacement of the thickening and dewatering systems. The 2012 document concentrated on the condition of the facilities and replacement requirements, providing recommendations for replacements/improvements on the sludge thickening system. The 2012 Report does not provide much detail on the deficiencies on dewatering system and building, but it does recommend the construction of a completely new dewatering system. The 2015 TM provided an evaluation of the digestion systems that included evaluation and recommendations to the sludge thickening system in relation to improvements to the operation of the digesters. It presented recommendations on technologies to replace the existing thickening system, but did not provide recommendations to improve the dewatering system. In addition, the 2015 TM provided the projected sludge loading at CDWWTP, under the current operating configuration of the residual treatments. NDWWTP primary sludge treated by the gravity thickeners of CDWWTP Plant 2 and the NDWWTP waste activated sludge (WAS) entering the facility as part of the raw wastewater influent to CDWWTP Plant 1 and 2, and treated as part of the WAS produced by CDWWTP (Plant 1 and 2). Although these documents were used as reference for the evaluation of thickening and dewatering improvements, none of these reports provided a comprehensive evaluation of the alternatives for thickening/evaluation systems.

4. CONCLUSIONS

Due to the existing condition of the equipment, the limitations of the existing conventional gravity thickeners and the temporary nature of the structures housing the dewatering equipment, the CDWWTP requires a new combined thickening and dewatering building to house new thickening and dewatering systems both utilizing centrifuge technology. The project will provide a new Thickening and Dewatering Building with a design life of 20 years for major electrical and mechanical equipment, with the exception of Variable Frequency Drives (VFDs) that shall have a design life of 15 years, and 50 years for the Thickening and Dewatering Building.

5. RECOMMENDATION

The PMCM Team affirms the CD description for Project 2.16, i.e. “Construction of a new dewatering facility and sludge cake conveyance system to sludge storage buildings”, remains the same.

However, the CD PMCM Team recommends changing Projects 2.12 and CD 2.13 descriptions to:

- CD 2.12 CDWWTP Sludge Thickening – Install a new mechanical sludge thickening and dewatering systems including mechanical, structural, electrical, and all other ancillary items.
- CD 2.13 CDWWTP Sludge Thickening – Install a new mechanical sludge thickening and dewatering systems including mechanical, structural, electrical, and all other ancillary items.