

CITY OF GRINNELL WASTEWATER TREATMENT FACILITY IMPROVEMENTS



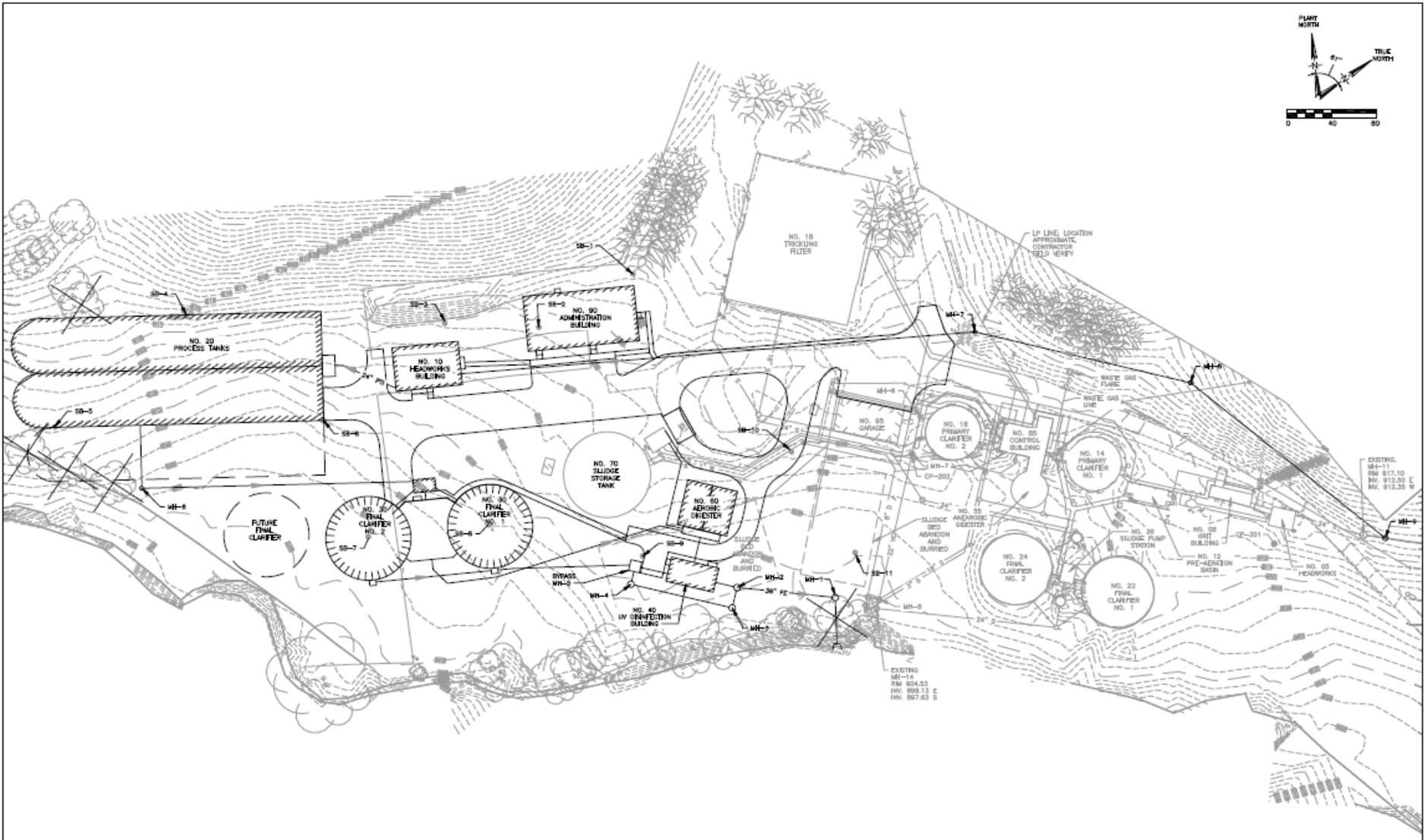
BY VEENSTRA & KIMM, INC.
OCTOBER 3, 2016



WASTEWATER TREATMENT FACILITY PROPOSED IMPROVEMENTS



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DATE	REVISIONS	SCALE AS NOTED
		DATE
		BY
		CHECKED
		APPROVED
		DATE
		AC.

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		DATE
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		CHECKED
		APPROVED
		DATE
		AC.



NEW FACILITIES PLAN

3000 Westport Parkway • Westport, Maine 04091-1220
 212-212-0200 • 212-212-7245 (FAX) • 202-241-0000 (W/INT)

DWG. NO.
02-C-3
OF --
PROJECT 288116

HEADWORKS

4

- Screening
- Grit Removal
- Flow Measurement



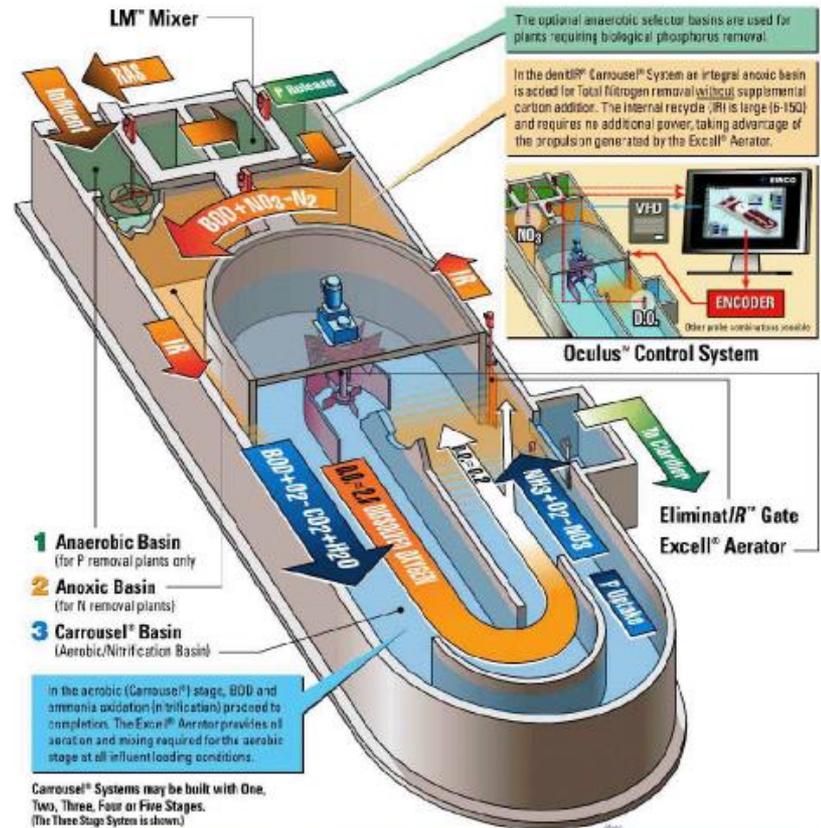
BIOLOGICAL PROCESS

5

- Oxidation Ditch Process with Anoxic Swing Basin
- Two Manufacturers
 - Ovivo Carrousel
 - WesTech OxyStream
- Treatment of Organic Material
- Ammonia Removal
- Total Nitrogen Removal
- Phosphorous Removal

OXIDATION DITCH PROCESS

6



	One Stage Carrousel [®] System	Two Stage dentif [®] Carrousel [®] System	Three Stage A [®] C Carrousel [®] System	Four Stage Barileglio [®] System	Five Stage Barileglio [®] System
1 Anaerobic					
2 1st Anoxic					
3 Carrousel	●	●	●	●	●
4 2nd Anoxic					
5 No-Aeration					
Effluent (avg)	BOD-5 NH ₃ -N:0.5	BOD-5 NH ₃ -N:0.5 TN:0.8	BOD-5 NH ₃ -N:0.5 TN:0.4 TP:0.1mg**	BOD-5 NH ₃ -N:0.5 TN:0.3	BOD-5 NH ₃ -N:0.5 TN:0.3 TP:0.1mg**

* Not shown in graphic above.
** Metal salt addition sometimes required to avoid direct bio-removal for lowest total phosphorus effluent requirements. Carrousel[®] is a registered trademark of CH2M.



UCT Modification

FINAL CLARIFIERS

7

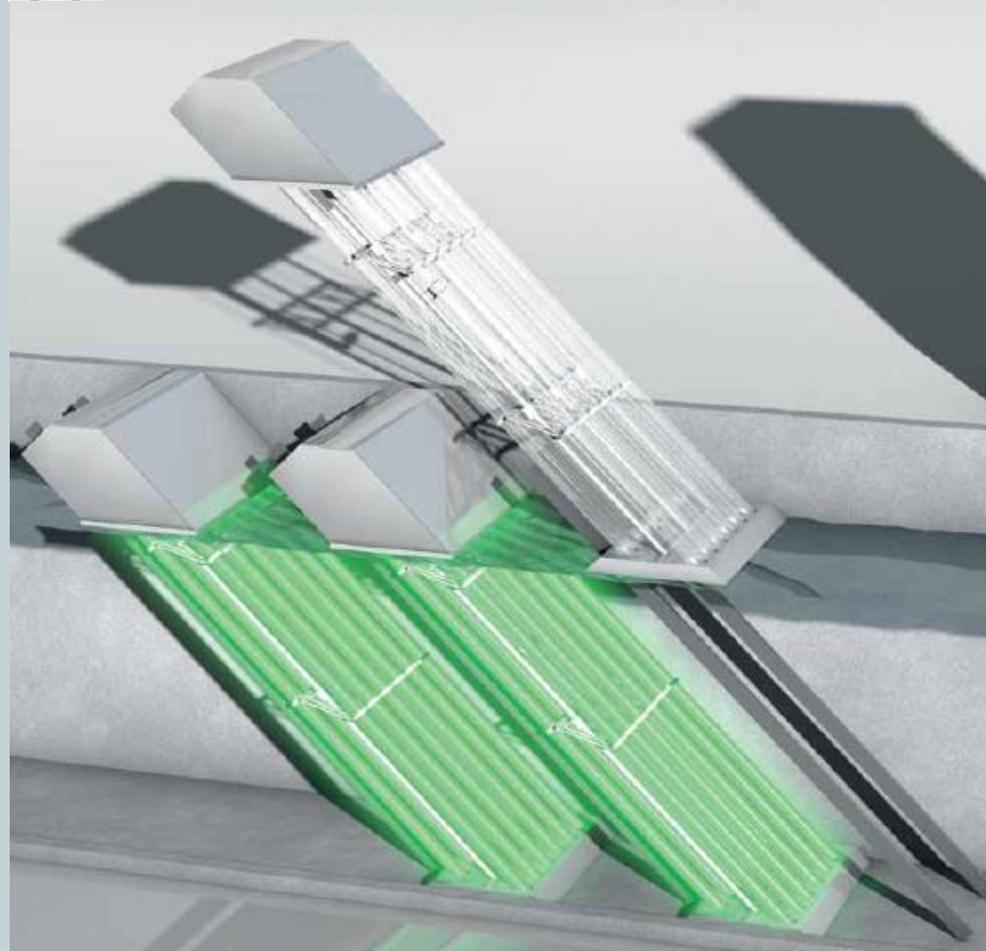
- Sludge Settling
- Activated Sludge Return to Process Tanks
- Sludge to Digester



OPEN CHANNEL UV DISINFECTION WITH INCLINED BULBS

8

- Includes automatic lifting mechanism for easy maintenance
- Utilizes Low Pressure High Intensity Ecoray (Amalgam Style) lamps which have guaranteed life of 14,000 hours
- Equipped with electric motor driven automatic wiping system
- All electronic connections are out of the water



SCHEDULE

9

Activity	Date
Council Sets Public Hearing and Bid Dates	November 7, 2016
Receive and Open Bids	December 14, 2016
Public Hearing and Award of Contract	December 19, 2016
Begin Construction	January 30, 2017
Complete Permit Required Construction	May 18, 2018
Complete All Construction	September 28, 2018