Town of Discovery Bay WW Master Plan Update

Chapter 11 - Plant 1 and 2 Capacity and Denitrification Alternatives

HERWIT ENGINEERING

Stantec

Plant No. 1 and 2 Capacity

- Capacities are based on the flows and loads previously approved with future design buildout flow of 1.63 Mgal/d AAF under critical cold temperature design conditions.
- Plant 2 alone with anoxic basin improvemtns has a capacity of 1.45 Mgal/d annual average flow (AAF)
- The capacity of Plant 1 with anoxic basin improvements is estimated to be 0.79 Mgal/d AAF.
- Combined capacity of Plants 1 and 2 (2.24 Mgal/d AAF)

Plant No. 1 and 2 Capacity

- In warm weather conditions,
- Plant 2 has a capacity of 1.86 Mgal/d AAF with one clarifier out of service
- And 1.37 Mgal/d with one oxidation ditch out of service.
- Therefore, at the future design flow of 1.63 Mgal/d, Plant 2 alone would be adequate with a clarifier out of service, but not with an oxidation ditch out of service.

Denitrification Alternatives

- Preliminary concepts eliminated from further consideration.
  - Locate anoxic basins at Plant No. 1
  - Use earthen basins at Plant No. 2
  - Change effluent disposal location from Old River To percolation ponds or other land disposal
  - Denitrification Filters

Denitrification Alternatives

- Anoxic basins recommended at each oxidation ditch
- Analyzed in detail in Master Plan
  - Below grade concrete tanks
  - Above grade steel tanks
- Project cost for each alternative
  - Below Grade Concrete: $7.8 Million
  - Above Grade Steel: $11.1 Million
  - Facilities required at Plant No. 1 and Plant No.2
- Proceed with concrete basins

Other Significant Issues

- Lower wastewater flows resulted in lower wastewater temperatures which has a significant impact on plant performance.
- Additional and improved influent sampling and analysis are required to confirm final design.
  - Supplemental carbon @ $500K may be needed?
- Oxidation ditch rotors probably not produce enough oxygen.
  - Supplemental oxygen likely needed. ($400K)

Immediate Recommendations

- Improve Influent Sampling and collect more consistent sampling data. (ASAP)
- Once new data is obtained, complete special monitoring to determine diurnal load pattern and verify readily biodegradable COD.
- Consider testing oxygen transfer rates for rotors or confirm interim ways to operate.
- Investigate alternatives for supplemental oxygen.
- Complete pre-design report with updated information

Project Costs

- Concrete Anoxic Basins $7.8 Million
- Supplemental Oxygen/Standby Oxygen $400K
- Possible supplemental carbon $500K
- Total $8.7 million

- Does not count rehabilitation of Plant 1 developed separately in Chapter 20 (draft), currently more than $4 million
- Other master plan projects still being developed.