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 **DRAFT**

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Southland WWTF
Recharge/Disposal Action Plan

The Nipomo Community Services District is beginning to define the objectives of their wastewater program. However, it appears the following may be appropriate "program-level" objectives, based on the District's current planning efforts:

- 1) Minimize negative impacts on water quality in the groundwater basin;
- 2) Apply reclaimed wastewater to reduce groundwater depressions and reduce potable water demand within the Nipomo Mesa Management Area; and
- 3) Develop multiple disposal/recharge options to accommodate treatment plant upsets and wet weather conditions.

Defining program objectives will be important for developing and evaluating various wastewater reuse strategies.

Onsite Percolation

The District has been percolating their treated effluent at the Southland site since the plant was constructed in 1988. The District wishes to continue using onsite percolation as one disposal option, particular during wet weather. At a minimum, continued use will be required in the immediate future as other options are developed.

The critical first step in evaluating onsite disposal options is to assess groundwater conditions underneath the plant. The objective is to develop a "baseline" understanding of local groundwater conditions, since the treatment, disposal, and/or recharge facilities will be designed to minimize impacts to any receiving ground or surface waters.

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Knowledge of groundwater conditions beneath the WWTF is limited, and is summarized below:

1. Shallow groundwater – As discussed in our letter report to the District regarding onsite monitoring well data, a mound of “perched” wastewater treatment effluent is located underneath the WWTF site. The extent, and ultimate fate, of this water is not known. It appears to be resting on a clay layer which has low permeability.
2. Deep aquifer – The connectivity of the deep aquifer to shallow groundwater is unknown. Water quality information is limited and the accuracy of the available data is questionable.

Recommendations for Groundwater Evaluation

In order to further evaluate impacts of plant effluent on groundwater, and to predict how changes in wastewater management may affect groundwater, we recommend that the District pursue a groundwater study which addresses the following:

Shallow Conditions:

- Extent of shallow groundwater mound beneath the WWTF;
- Direction, flow (if any), and travel time to Nipomo Creek or to the deep aquifer, if effluent travels to these water bodies;
- Presence of indicator organisms (such as coliform bacteria) in extracted groundwater;
- Optimal location(s) to withdraw groundwater from this mound, in order to prevent offsite migration and to “produce” water for offsite irrigation;
- Maximum allowable inflow and yield, as well as expected recovery efficiency, if the shallow aquifer is used for short-term storage and recovery of reclaimed water for irrigation;
- Maximum effluent loading on the treatment plant site with and without pumping of effluent for irrigation use;
- Monitoring program (short-term and long-term) to evaluate quality and extent of mounded effluent;

Deep aquifer:

- Connectivity (and estimated travel time) to nearby wells, District wells, and mounded plant effluent;
- Water quality and depth;

- Geologic profile extending through plant and including both Santa Maria River and Oceano fault lines;

Possible Findings from Groundwater Evaluation

We anticipate the following possible findings from this study: Groundwater is 1) flowing northeast to Nipomo Creek; 2) flowing laterally in a different direction; 3) relatively stagnant and not moving significantly; 4) flowing vertically to the deeper aquifer; or 5) a combination of these conditions.

Findings	Primary Water Quality Concerns for Onsite Disposal	Recommended Onsite Management Strategy
Groundwater is flowing northeast to Nipomo Creek (Clean Water Act - 303d listed impaired water body)	Pathogens (from 303d list)	Salt Management Plan
	Nitrogen	Nitrogen Removal
	Salts (Chloride, sodium, sulfate)	Prevent flow to Creek
	Toxicity	
Groundwater is flowing laterally away from Nipomo Creek	Nitrogen	Salt Management Plan
	Salts (Chloride, sodium, sulfate)	Nitrogen Removal
	Impact to neighboring wells	Prevent lateral flow
Relatively stagnant, not moving significantly	Nitrogen	Salt Management Plan
	Salts (Chloride, sodium, sulfate)	Nitrogen Removal
		Prevent lateral flow
Flowing vertically to deep aquifer	Nitrogen	Salt Management Plan
	Salts (Chloride, sodium, sulfate)	Nitrogen Removal

As shown above, water quality concerns (and conceptual treatment goals) will be similar under any of these conditions. However, if flow is moving toward Nipomo Creek, toxicity and pathogens also become issues since the creek is surface water. Two programs affecting surface waters would be of particular concern to the District:

Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) – This policy requires the establishment of aquatic life-based numerical limits for 23 toxics and human health-based limits for 57 toxics. Pollutants include metals, ammonia, trihalomethanes, and organic compounds such as pesticides. Southland

WWTF may be required to include limits for these pollutants in their Waste Discharge Requirements (WDRs).

Total Maximum Daily Load Program (TMDL) – The TMDL program sets numerical goals for reducing specific pollutants flowing into an impaired water body. The Regional Water Quality Control Board has designated Nipomo Creek as “impaired for beneficial uses” by the presence of pathogens.

Recommended Wastewater Management Strategies

Nitrogen Removal: The proposed wastewater treatment strategy, presented in the Draft Southland WWTF Master Plan, will reduce nitrogen (forms include ammonia, nitrite, nitrate, and organic nitrogen) to below 10 milligrams per liter (mg/L), which is the California Department of Health Services drinking water standard for nitrate.

Prevention of Offsite Flow: Preventing offsite flow is the preferred wastewater management strategy in any of the conditions described above, since it would prevent impacts to neighboring wells or to Nipomo Creek. Implementation would require the development of offsite recharge or reuse facilities.

Salt Management Plan: The objective of a Salt Management Plan is to reduce salt concentrations in wastewater treatment plant effluent by modifying practices which currently add salt to wastewater.

Three (3) basic components are recommended to implement these strategies: onsite wastewater disposal (to be defined after groundwater evaluation is completed); offsite recharge/reuse facilities; and a Salt Management Program.

Offsite Recharge/Reuse Facilities

Offsite recharge/reuse facilities could include groundwater recharge ponds and/or irrigation systems at Blacklake and Woodlands golf courses, as well as County parks. Conceptual recharge and reuse alternatives are being presented in the District’s Sewer Master Plan Update and Supplemental Water Alternatives Evaluation. A Recycled Water Study could incorporate the findings from these studies, and would complete the following steps:

- Identify potential users and the quantities of water they would use on a daily, seasonal, and annual basis;
- Evaluate potential groundwater recharge locations (general locations of groundwater depressions will be presented in the District’s Sewer Master Plan and Supplemental Water Alternatives Evaluation). This would include estimates of sizes required based on anticipated percolation characteristics of the soils, precipitation, and evaporation rates;

- Determine storage, pumping, and pipeline facilities required to deliver water to these customers and recharge sites; and
- Develop a phased Capital Improvements Plan for constructing these facilities.

Salt Management Plan

Development of a Salt Management Plan would include the following steps:

- Identify sources of salt in wastewater collection system, including possible industrial dischargers and self-regenerating water softeners;
- Develop a public education program to encourage voluntary mitigation measures, such as the use of *offsite* regenerated water softeners;
- Determine strategies for managing water supplies to reduce salt input, including importation of surface water sources and use of wells with lower salt concentrations;
- Predict impact these measures may have on salt concentrations in plant effluent; and
- Monitor program to determine success of these efforts.

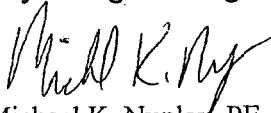
Recommendations

As described above, Boyle recommends proceeding with the following tasks:

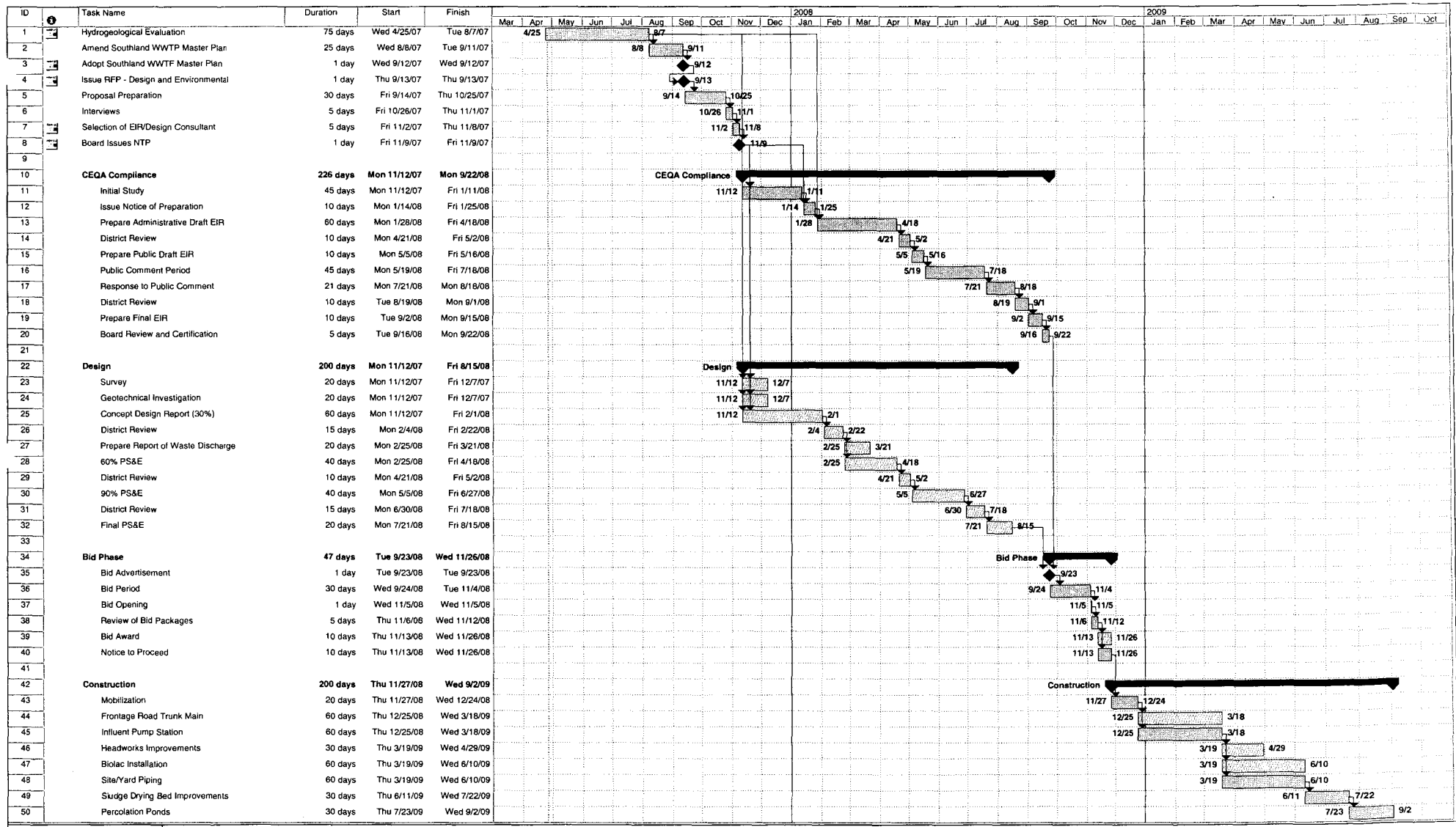
- 1) Onsite Disposal Facilities – Perform groundwater characterization
- 2) Offsite Reuse/Recharge Facilities – Continue with development of a phased Capital Improvements Program for these facilities
- 3) Salt Management Plan – Begin development of a program, with elements as outlined above.

Please call if you would like to discuss these further.

Boyle Engineering Corporation



Michael K. Nunley, PE
Managing Engineer



Project: Southland Schedule
Date: Thu 4/26/07

Task		Milestone		Rolled Up Critical Task		Split		Group By Summary	
Critical Task		Summary		Rolled Up Milestone		External Tasks		Deadline	
Progress		Rolled Up Task		Rolled Up Progress		Project Summary			