



Integrated Water Resources Plan New WWTP Process Workshop

Workshop Meeting Minutes February 4, 2011 - 9:00 AM

Community Room, City of Franklin Police Headquarters, 900 Columbia Avenue

Attendees:

David Parker, City of Franklin	Bo Butler, SSR
Mark Hilty, City of Franklin	Paolo Fonda, SSR
Vic Bates, City of Franklin	Kati Bell, CDM
Ken Moore, City of Franklin	Chris Provost, CDM
Eric Stuckey, City of Franklin	Zack Daniel, CDM
Eric Gardner, City of Franklin	Andrew Lynn, CDM
Alvin Burns, City of Franklin	Al Sun, CDM
	Michelle Hatcher, CDM

I. Introductions

The Workshop opened with team introductions from the City of Franklin, SSR and CDM. Al Sun is one of CDM's national experts on wastewater treatment plant (WWTP) design and optimization and led the technical discussions. Vic Bates and Alvin Burns from the WWTP operations staff were both in attendance at the meeting. A copy of the presentation slides that were used to guide the meeting are provided as an attachment to these meeting minutes.

II. Project Goals and Objectives

A brief overview of the IWRP project objectives with respect to the need for wastewater treatment capacity and options was provided. This included a summary of the material from the Phase I IWRP Report with respect to WWTP options as shown below.

Wastewater Treatment Options	Alternatives	Efficiency + Safety & Security	Water Quality Plus	Revised Low Cost	Revised Reliability
	Upgrade and rerate existing WWTP		X	X	X
	Construct new WWTP in the Southern Service Area	X			X
	Collect and treat wastewater from adjacent communities or other small systems (e.g., Lynwood, Cartwright Creek)	X	X		
	Treat effluent to higher standard during summer months	Already a permit requirement			



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III. Overview of Wastewater Demands and Future Flow Routing

The purpose of this discussion was to more clearly explain and begin to define the future wastewater flows that would be attributable to the various drainage basins and understand the division of flow between the existing north WWTP and a potential future southern WWTP. Bo Butler led this discussion because SSR has ~~historically and continues to conduct the bulk of the City's engineering work with regard to a familiarity with the City's~~ wastewater collection and ~~routing~~ transmission system.

In summary, the estimated flows to the proposed southern treatment facility, by the year 2040, could range between 3.6 million gallons per day (mgd) and 6.6 mgd, depending upon the rate and pattern of population growth over the planning period for the IWRP. Flows to the existing northern treatment facility are anticipated to range from between 12.0 mgd and 16.5 mgd in the year 2040.

IV. Regulatory and Permitting Requirements

With respect to a new WWTP in the Harpeth River watershed, upstream of the existing WWTP, the possibility of obtaining a discharge permit will be challenging, at best. However, there are innovative solutions being evaluated as part of the IWRP that could allow permitting of a new WWTP. Discussions with TDEC staff in conjunction with modeling the water quantity and water quality of the Harpeth River ~~modeling~~ have been positive; and, the key to obtaining a permit would be a design to provide advanced wastewater treatment resulting in very high effluent quality, coupled with enhanced reuse and other potential nutrient offsets within the watershed. The nutrient limits that were discussed for planning are provided in the slides attached to these minutes.

V. Treatment Challenges

The Harpeth River is not only impaired due to nutrients, it also has significant low flows during summer months upstream of the existing WWTP, thus construction of an advanced WWTP upstream of this river segment could actually result in an enhancement of the low flow conditions that impact the ability of the existing water treatment plant to withdraw water from the Harpeth River, as well as positively impacting the local aquatic ecology. However, this is also the period when irrigation demands are highest and the balance between various end use demands for the treated effluent resource will need to be further ~~defined~~ evaluated; this will be accomplished through the IWRP modeling efforts currently being conducted.

Thus, for this proposed new WWTP evaluation, based on discussions with TDEC as well as the interest in supplementing the City of Franklin's water supply, technology based limits will be assumed for any new proposed facility.



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VI. Available Technologies and National Trends

Technologies that meet advanced water treatment (AWT) requirements and have been demonstrated to reliably provide a high level of treatment were discussed with the City of Franklin staff and during this Workshop, an overview of technology based processes that could reliably meet low discharge limits was provided.

VII. City of Franklin Criteria for a Successful Facility Plan

During Phase I of the IWRP, some of the alternatives selected by the stakeholders identified a new wastewater treatment plant in the southern portion of town to be a potential long-term option. In order for CDM to complete the conceptual engineering necessary to evaluate costs and feasibility of constructing a new WWTP facility in the southern part of the service area, it is also necessary to identify the criteria that the City identifies as critical for success of any new project. The group was polled in a discussion period to identify critical success factors for the project, three major areas were identified and a summary of these is provided below:

A. Address public perception issues

1. Provide process approaches to address microconstituents from WWTP with respect to its location upstream of WTP.
2. Consider treatment processes that will allow supplementing the water supply with indirect potable reuse.

B. Provide sufficient odor control measures in design

1. Provide a process with no primary treatment
2. Document cost for providing high level odor control

C. Provide flow equalization (to a peaking factor of 2) for MBR options

It is assumed that advanced treatment processes will be required to meet the stringent permit limits anticipated, as well as garnering public acceptance necessary for permitting and regulatory support. Additionally, the proposed plant will include consideration of a membrane bioreactor (MBR) and tertiary polishing wetlands. Liquid process options will be evaluated at the level of conceptual design so that a selection of the most viable liquid process train can be advanced to approximately a 10% design so that costs estimates for equipment and construction can be completed during the next phase of evaluations.

VIII. Formulation of Treatment Process Alternative for Evaluation

Based on discussions with the Steering Committee and WWTP operations staff, two generic biological processes that will be evaluated for further consideration include an anaerobic/anoxic/aerobic (A²O) activated sludge process followed by a denitrification filter and, a membrane bioreactor configuration which is essentially a modified A²O process with a secondary anoxic reactor and a separate membrane tank. Both of these biological processes result in high removal of CBOD and nutrients that produce AWT quality effluent. Conventional UV irradiation and UV-advanced oxidation processes (UV-AOP) will both be evaluated as disinfection processes, with the UV-AOP proposed for addressing the potential concerns with regard to microconstituents such as endocrine disrupting compounds (EDCs) and pharmaceuticals and personal care products (PPCPs), which are not currently regulated.

IX. Next Steps

CDM will work to develop process flow diagrams for the scenarios identified in the Workshop. The BLOWIN model will be used to evaluate the optimum internal recycle flows that would minimize operating costs and meet the anticipated treatment requirements for the proposed facility. Influent wastewater quality data collected from the existing WWTP will be used as the basis of design for the proposed facility layouts. A summary of the AWT process alternatives for evaluation is provided in Table 1.

**Table 1
Summary of AWT Process Alternatives for a Proposed New WWTP**

Process Train	Biological Process	Tertiary Treatment	Disinfection
Option 1	Conventional Plug-Flow Activated Sludge	Sand Filter	UV & UV-AOP
Option 2	Oxidation Ditch	Sand Filter	UV & UV-AOP
Option 3	Conventional Plug-Flow Activated Sludge	Membrane Bioreactor	UV & UV-AOP

Comment [C1]: Wouldn't this be better described as a de-nite filter? A sand filter in my mind just filters.

Comment [C2]: See previous comment

Comment [mmh3]: I have in my notes that we were going to look at costs between conventional disinfection vs. AOP, but then I've also got that there not interested in chlorine, so I'm not sure what conventional disinfection would mean. I'm just thinking outloud.