

11.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

11.1 SUMMARY

The Comprehensive Wastewater Facilities Plan (Plan) has been prepared to identify improvements to the City of Ferndale wastewater collection and treatment facilities. The Plan has been prepared to satisfy the requirements of the Department of Ecology State Revolving Fund (SRF) program for financial assistance. Moreover, the Plan is based on population growth and urban service area developed for the City's Comprehensive Plan in response to the Growth Management Act requirements.

The City of Ferndale wastewater treatment plant was expanded in 1992 to a design capacity of 1.72 million gallons per day (MGD). Wastewater flows exceeded 1.6 MGD in 1995, demonstrating the need to expand treatment capacity even though effluent quality meets permit limitations. The existing treatment facilities have deficiencies that are unrelated to growth, yet should be addressed including disinfection facilities and a new outfall.

Growth is expected to increase the City of Ferndale residential population from 7,000 in 1995 to approximately 28,000 over the next twenty years. Some of this growth will occur through infilling to the 2,900 acres of present service area. Approximately 80% of the growth is expected to occur through annexation and growth with an additional 4,400 acres of contiguous new service area.

Alternatives for both collection and treatment system upgrade and expansion improvements are developed and evaluated in the Plan. All alternatives are capable of meeting service and regulatory requirements and are in use in similar communities. An economic analysis was performed in order to compare alternatives; non-economic factors were also considered in the comparative analyses.

The sewer system in the downtown area experiences surcharging problems during wet weather. These problems will be alleviated by diverting a portion of upstream contributing area flows to a new west-side interceptor on Olson Road. The downtown sewer system will also be upgraded either by construction of a new interceptor to the treatment plant or by increasing the capacity of Pump Station #1 and constructing a new forcemain to the treatment plant.

Five treatment alternatives are considered appropriate and viable for upgrading and expanding the City's wastewater treatment system. The alternatives include: 1) a partial-mix aerated lagoon system; 2) a dual-power aerated lagoon system; 3) an activated sludge (conventional) system; 4) an oxidation ditch system; and 5) a sequencing batch reactor (SBR) system. Based on the equivalent annual costs, either of the lagoon system alternatives is considered less costly than any of the mechanical plant systems. In addition to lower costs, lagoon systems offer simpler operations, less maintenance,

greater ability to handle fluctuations in wastewater characteristics (e.g., flow, BOD, pH, toxics) and less generation and handling of biosolids.

The disadvantages of a lagoon system include the need to provide effluent filtration, limited ability to remove nutrients (i.e., nitrogen and phosphorus) if required in the future and limited ability to expand/increase capacity due to site constraints beyond the year 2015.

11.2 CONCLUSIONS AND RECOMMENDATIONS

The aerated lagoon systems are essentially equal based on the economic analysis. However, initial phasing improvements and associated capital costs for a partial-mix aerated lagoon system are significantly greater than for a dual-power aerated lagoon system. Because of this, the dual-power system is recommended for implementation.

Implementation of the DPAL system is proposed to occur in three phases. These phases have been developed to respond to potential capacity needs in response to City of Ferndale population growth and to upgrade existing wastewater treatment deficiencies. The first phase of improvements (Phase I) recommended for implementation includes increasing the treatment capacity to 3.23 MGD and providing new facilities including an effluent filter, chlorination/dechlorination, an effluent pump station and an outfall to the Nooksack River.

Increases in user fees are recommended to fund the wastewater treatment facility improvements. Phase I increases are \$909 for connection fees \$29.73 for bi-monthly sewer rates. Thus, recommended connection fees to fund Phase I improvements are \$3,329 with recommended bi-monthly sewer rates increasing to \$62 in 1995 dollars for single family residential equivalent units. It is further recommended that a detailed rate study be undertaken to support future increases in connection fees and bi-monthly sewer rates.

The implementation of collection facilities improvements are required to alleviate current capacity deficiencies in the downtown area, establish primary conveyance to the WWTP and provide service to the City's expanding service area. A preliminary analysis of the primary conveyance to the WWTP indicates that two interceptors (one serving west side, one serving downtown) are preferred. The downtown interceptor will be further evaluated during the initial design of improvements in order to determine the most cost effective facilities.

The water quality analysis prepared for the Plan indicates that the metals concentrations in the treatment plant effluent cause exceedances of Nooksack River water quality standards for chronic and acute criteria. Recomp of Washington, a recycling and energy recovery facility, is a major source of metals discharging to the City of Ferndale sewer system. The quality of biosolids in the present aerated lagoons has also been affected by Recomp discharges. While Recomp is presently negotiating a discharge permit with DOE, the City of Ferndale has had discussions with Recomp to reduce its metals

discharges and to investigate potential sludge disposal options Recomp may provide to the City.

The City of Ferndale should apply for a new discharge permit for additional capacity based on the design capacity of the existing facility and the Phase I improvements. This application should immediately follow the approval of the Plan by DOE.

It is recommended that the City of Ferndale adopt a sewer use ordinance for special waste dischargers. These special waste dischargers include commercial and industrial facilities which may have higher flows or more concentrated waste loads than typically encountered in the Ferndale service area. The objective of this ordinance should be to set minimum pretreatment requirements and to develop a mechanism for establishing equitable connection fees and monthly sewer rates. Monitoring requirements and payment for professional services to analyze potential discharges should be considered in the ordinance.

A list of additional issues to be resolved or refined during the design of phased improvements is provided below:

- outfall relocation evaluation (phase I)
- chlorination/dechlorination alternatives (phase I)
- filtration system alternatives (phase I)
- collection system-primary conveyance, headworks and influent pumping (phase I)
- detailed rate analysis (all phases)
- refinement of industrial flows (all phases)

It is further recommended that additional land adjacent to the existing treatment plant be purchased by the City of Ferndale for possibly locating additional expansion improvements in the future. At a minimum, approximately one-quarter acre of land immediately south of the existing middle lagoon should be purchased to allow for implementation of the proposed Phase III improvements.