

CHAPTER 1 Executive Summary

1.1 INTRODUCTION

The City of Salmon has undertaken this Wastewater Facilities Planning Study to provide an assessment of the condition of the wastewater collection and treatment systems, evaluate the treatment plant capacity and ability to meet current and anticipated future treatment requirements, identify system shortfalls, short-term and long-term system needs, and examine alternatives to address the identified system needs. The City was awarded a Wastewater System Planning Grant from Idaho Department of Environmental Quality to fund one half of the cost of this Wastewater Facilities Planning Study.

The Salmon wastewater system is unable to consistently achieve the NPDES discharge limits specified in the 2007 NPDES permit. This study provides a Capital Improvements Plan to address the system shortfalls and provide a course of action to remedy the problems within the system. The implementation of the recommendations of this study will enable adequate wastewater collection and treatment for the City of Salmon for the next 20 years.

1.2 SYSTEM SUMMARY

The Salmon wastewater system provides wastewater collection and treatment for the residents of the City of Salmon. The collection system consists of approximately 32 miles of piping. Some of these lines are likely from the earliest days of the system (1910) and would be approximately 100 years old. The majority of the system was constructed in the 1950's and 1977. More recently, some sections of the collection system have been replaced or repaired and additional lines have been added onto the system to accommodate the continuing development of the City.

The collection system is comprised of two major divisions, the east and west sides, divided by the Salmon River. The system has one major lift station located on the west bank of the Salmon River where the west side system flow enters from the Highway 93 trunk line and the east side system flow enters from the North St. Charles Street trunk line via a siphon line that passes under the riverbed. The main lift station contains four submerged pumps that pump the wastewater to the treatment plant a few hundred yards downriver. A second small lift station is located behind the City office building.

The wastewater treatment facility consists of two wastewater lagoons of approximately 5.42 and 6.54 acres in size. Each lagoon is approximately 12 feet deep. The original wastewater treatment design capacity is estimated to be 3.0 MGD. Average system wastewater flow is 1.34 MGD with an expected peak month flow of 2.35 MGD. The lagoons contain ten surface aerators and the system also includes two closed vessel UV disinfection units. The treated wastewater is disinfected and then discharged to the Salmon River.



FIGURE 1-1 – SALMON WASTEWATER LAGOONS

Population and wastewater flow projections in this study utilize a 1.5% annual growth rate with an additional increase of 300 persons in the first five year period to account for a planned mining project in the area. This population projection yields an estimated population of 4,763 in 2028. The projected peak month wastewater flow is anticipated to be 2.58 MGD in 2028.

1.3 SYSTEM DEFICIENCIES

The treatment plant discharges into the Salmon River under a National Pollution Discharge Elimination System (NPDES) permit ID-002000-1 from the Environmental Protection Agency (EPA). The permit was renewed in 2007, and at present, the wastewater treatment system is unable to consistently meet the limits proscribed, specifically the percent removal of Total Suspended Solids (TSS) and Biological Oxygen Demand (BOD₅). Lagoon systems have a limited capacity to remove TSS and BOD₅. The wastewater collection system experiences very high levels of I/I, an estimated 50-80% of the total wastewater flow at peak periods. The high groundwater infiltration and inflow (I/I) creates very dilute influent wastewater and the lagoon system is unable to achieve 85% removal levels of TSS and BOD. Since the discharge permit was renewed in 2007, the Salmon wastewater system has failed to achieve the 85% removal level for TSS in six months and failed to achieve the 85% removal level for BOD in five months. The previous NPDES discharge permit had percent removal requirements for TSS and BOD of 65%.

In addition to the dilute influent, seasonal changes in the wastewater treatment plant including re-suspension of solids during lagoon turnover and algae growth in the lagoons are contributing factors to the effluent BOD and TSS levels. It is necessary to address the ability of the treatment plant to treat the wastewater generated by the City to consistently meet the limits of the NPDES permit.

The collection system is aging and sections have been identified with structural pipe failures and severe cracking. Sand buildup at some infiltration zones has been identified and several pipelines have recurring root penetration problems. The high levels of I/I threatens to exceed the hydraulic capacity and decreases the treatment ability of the wastewater treatment lagoons. Even a slight increase in the I/I could exceed the hydraulic capacity of the wastewater treatment lagoon during high flow periods. The collection system is in need of improvement to limit the increase of I/I in the system and to remediate identified critical structural issues such as pipe collapses, major pipe cracks, root intrusion, and sedimentation of lines from sand infiltration.

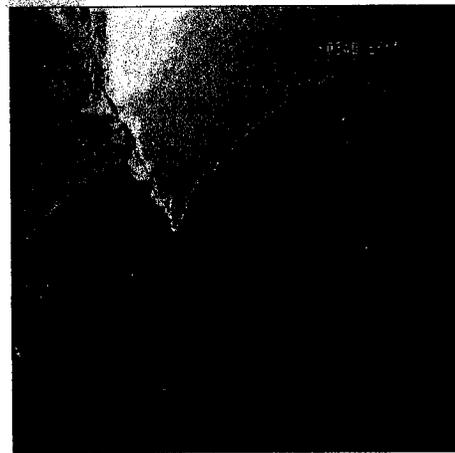


FIGURE 1-2 – HIGHWAY 93 PIPE COLLAPSE

Bio-solids (sludge) accumulation in the wastewater lagoon was measured and it was determined that Lagoon 1 has accumulated approximately 19.6% sludge by volume. This amount of sludge is to levels that will likely impede the treatment capability of the wastewater lagoon system. Lagoon 2 has accumulated approximately 8.5% sludge by volume. Built up sludge in the second

lagoon is suspected to contribute to the effluent TSS from re-suspension of the settled solids under certain conditions.

The UV disinfection system is failing and replacement parts are unavailable. Disinfection is a vital component of the wastewater treatment system and a failed UV system would lead to violations of the NPDES permit and contamination of the Salmon River.

1.4 NEED FOR ACTION

The Salmon wastewater treatment system, although operating well, is unable to meet the effluent water quality standards required under the current NPDES permit (ID-002000-1), administered by EPA under the authority of the Clean Water Act. The Environmental Protection Agency is the enforcing agency for the Clean Water Act and NPDES permits. Violations to the NPDES permit constitute violation of the Clean Water Act and can result in fines of up to \$32,500 per day per violation (NPDES Permit No. ID-002000-1, Section IV.B.1). In this situation with continued violations of the NPDES permit occurring, IDEQ and EPA tend to be more understanding if the permittee is proactive and taking action to identify and execute solutions to the problems. Continuing to violate the NPDES permit limits could make the system subject to enforcement action that could include revocation of the discharge permit as well as civil and criminal penalties.

The problem is two-fold: high I/I levels create dilute wastewater and high flow rates which reduce the efficiency of the wastewater treatment lagoons and approach the hydraulic capacity of the wastewater lagoons, and the wastewater lagoon treatment process is inherently limited in capability to remove BOD₅ and TSS from wastewater. Reducing I/I levels through replacement/repair of high I/I collection system lines will address the high flow problem and increase the influent wastewater strength, partially addressing the treatment problem. The failure to consistently achieve the required treatment levels necessitates the implementation of additional treatment technology at the wastewater treatment plant.

It is necessary for the City of Salmon to take action by implementing wastewater treatment and collection system improvements to bring the wastewater treatment system into compliance with the NPDES permit. The actions recommended by this study will enable the Salmon wastewater system to provide wastewater collection and treatment which will comply with the current and anticipated regulations and accommodate the projected growth of the City for the next 20 years. Without such action the Salmon wastewater system will continue to violate federal and state regulations designed and intended to protect the people of Salmon and the Salmon River, an important natural resource for the nation, the state, and the community.

1.5 PROPOSED IMPROVEMENTS

As of this writing, the collapsed pipe section on Highway 93 had been replaced and the replacement UV systems had been ordered. The repair of the second pipe collapse was scheduled for summer 2010. These projects are being funded from the City's wastewater system capital funds.