FINAL REPORT

PREPARED FOR THE NORTH OKANAGAN WASTEWATER RECOVERY PARTNERSHIP

Phase 1 Master Wastewater Recovery Feasibility Project

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Okanagan Indian Band

REGIONAL DISTRICT NORTH OKANAGAN

SPALLUMCHEEN TOWNSHIP

URBAN systems

October 2016 | File: 1203.0018.01

Phase 1 Master Wastewater Recovery Feasibility Project

Final Report

Client: Regional District of North Okanagan
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Date issued: October, 2016

Project No.: 1203.0018.01

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ABBREVIATIONS

BOD	Biochemical Oxygen Demand
$^{\circ}C$	Degrees Centigrade
Cm	Centimetre
Gpm	Gallons per minute
Ha	Hectare
ICI	Industrial Commercial Institutional
L	Litre
L/S	Litres per second
m^3	Cubic metres
m^3/d	Cubic metres per day
ml	Millilitre
mg/l	Milligrams per litre
ML/d	Megalitres (million L) per day
MWR	Municipal Wastewater Regulation
NTU	Nephelometric Turbidity Unit
MPN/100ml	Most Probable Number (Coliform) per 100ml
N	Nitrogen
PSI	Pounds per square inch
P	Phosphorus
TSS	Total Suspended Solids

EXECUTIVE SUMMARY

In the Fall of 2015 the Phase 1 Master Wastewater Recovery Project commenced through a joint Partnership ("the Partnership") between the North Okanagan communities of Okanagan Indian Band, Township of Spallumcheen and the Regional District of North Okanagan. At the outset of this study, the Partnership defined its purpose to include:

- Work together on areas of mutual interest, while meeting their respective objectives with regard to development of a Master Waste Water Recovery Plan (MWWRP) for the are known as the Swan Lake Commercial Corridor located in Electoral Areas "B" and "C" of the RDNO, the South Spallumcheen Industrial and Commercial area (existing and proposed) and portions of the Okanagan Indian Band;
- Function as an information-sharing and consultation forum to achieve an integrate approach for a MWWRP;
- Provide the basis for discussions and further specific agreements or arrangements, where appropriate, on distinct issues related to the MWWRP;
- Increase leverage when applying for provincial or federal funding;
- Provide for an integrated approach to public communications; and,
- Facilitate and complement the integration of policies and programs.

To respond to these common objectives, the Partnership held several workshops to confirm several important parameters of a community sewer system, including but not limited to the following questions:

- What should the service area be?
- What type of wastewater treatment is desired?
- How should the recovered wastewater be used?
- Would this be cost effective and return the same number of benefits compared to other options?

After a process of collaborative discussion and enquiry, the three communities have developed a strategic direction for wastewater recovery at the north end of Swan Lake. This report details the collaborative process to date, the assumptions made along the way and the preferred regional response to wastewater recovery for the Swan Lake corridor area.

The next logical iteration to this process is to confirm a number of the technical assumptions made in this study, develop a sustainable service model (finance and governance) and develop a communications strategy to educate and inform community members of the benefits of shared community sewer service, and the risks of continuing with the status quo.

1.0 INTRODUCTION

1.1 Subject Area

The study area of this report is an area in the North Okanagan that is known locally as the "Swan Lake Corridor". The area lies mainly along the east and north shorelines of Swan Lake and is bisected by Highway 97. It is north of the City of Vernon boundary, extending into the Regional District of North Okanagan (RDNO) Electoral Areas B and C, the southern portion of the Township of Spallumcheen (ToS) and includes Okanagan Indian Band's (OKIB) Swan Lake IR4 on the northern shoreline of Swan Lake. The study area is part of three jurisdictions. **Figure 1.1** illustrates the overall study area.

The Swan Lake Corridor has long been considered ideal for commercial and light industrial land uses and affords an excellent employment generating opportunity. However, the lack of community sewer service not only presents an impediment to effective land use planning, but results in an increased risk of soil and water contamination through extensive use of on-site septic ground disposal systems. On-site disposal also precludes any opportunity to re-use treated water for irrigation in a moisture deficient region of the province.

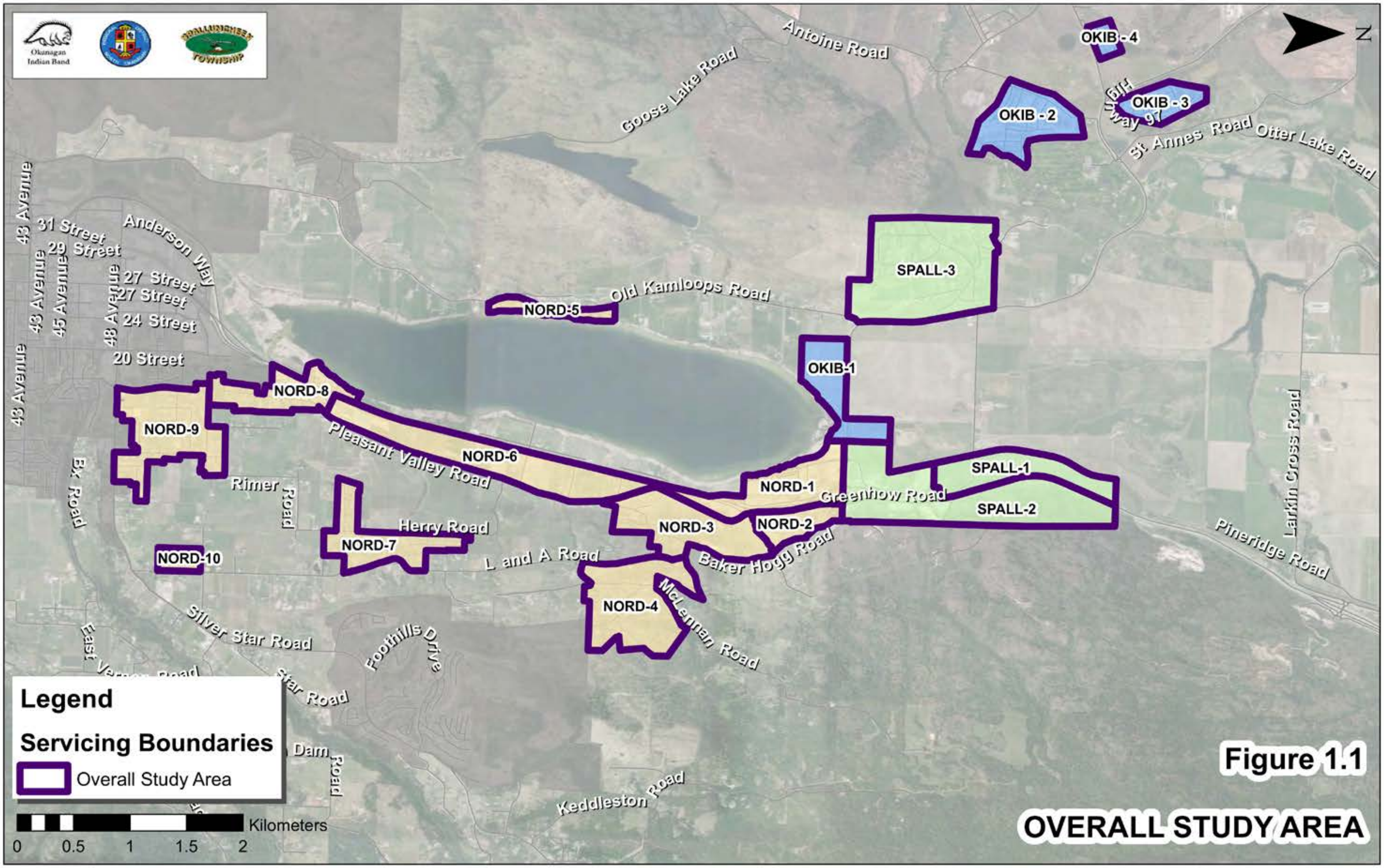
In the Fall of 2015 the Phase 1 Master Wastewater Recovery Project commenced through a joint Partnership ("the Partnership") between the North Okanagan communities of OKIB, ToS and the RDNO. After a process of collaborative discussion and enquiry, the three communities developed a strategic direction for wastewater recovery at the north end of Swan Lake and surrounding areas. This report details the collaborative process to date, the assumptions made along the way and the preferred regional response to wastewater recovery for the Swan Lake corridor area.

1.2 Project Background

The initiative evolved from discussions between the neighbouring communities exploring common objectives of a potential collaborative project. Elected Officials (OKIB Chief, ToS Mayor and RDNO Area Directors) as well as senior staff from each community were present at a roundtable meeting in the Spring of 2015.

The discussions yielded some common themes as follows:

- There is strong interest for commercial/industrial development and lack of sewer poses severe limitations;
- There are environmental concerns arising from on-site ground disposal systems:
    a. Surface and groundwater pollution concerns
    b. Bird habitat; and
    c. Recreational;
- Servicing costs are high if individual communities go it alone;
- Local employment opportunities are being compromised; and
- Water recovery/reuse is essential for agriculture.



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NORD-4
McLennan Road
Silver Star Road
Foothills Drive
Star Road
Dam Road
Keddleston Road
Legend
Servicing Boundaries
Overall Study Area
Kilometers
0 0.5 1 1.5 2
Figure 1.1
OVERALL STUDY AREA

1.3 Project Partners

Following the May, 2015 scoping meeting a Memorandum of Understanding (MoU) was drafted and signed by members of the Partnership in August, 2015. The purpose of the MoU was to assist the Parties to work together on areas of mutual interest, while meeting their respective objectives with regards to the development of a Master Wastewater Recovery Plan for Electoral Areas “B” and “C” of the RDNO, the South Spallumcheen Industrial and Commercial area (existing and proposed) and Okanagan Indian Band’s IR4 Swan Lake.

The MoU also established areas of mutual interest, specific goals, principles, governance and communication protocols. A copy of the MoU is enclosed in **Appendix A.**

1.3.1 Township of Spallumcheen

Within the Township of Spallumcheen there is interest in exploring opportunities to develop the South Spallumcheen Industrial/Commercial area (existing and proposed) as a way to diversify the local tax base and provide employment with light industrial and commercial opportunities. This area is the focus of the Township’s commercial and industrial growth due to the vacant and underutilized lands in the area.

1.3.2 Okanagan Indian Band

The OKIB has had a strong interest in utilizing the land in IR #4 to facilitate developments for many years. The land is currently vacant. OKIB has recently taken several steps (Highest and Best Use Study, Site Feasibility Planning, Environmental Reviews, Land Use Plan, Access Reviews) to prepare for a community designation vote, to utilize these lands for greater community benefit which would provide employment opportunities for Band members as well as skills enhancement and training. The availability of community sewer services greatly expands the range of potential initiatives and employment generators in the IR4 area.

1.3.3 Regional District of North Okanagan

Within Electoral Area’s B and C a steadily growing number of highway commercial and light industrial businesses have located along the Highway 97 corridor. All of these existing business have on-site septic fields or in some cases holding tanks. The corridor’s through traffic on Highway 97 and proximity to several communities in the North Okanagan continues to be an attractive location for businesses looking to locate in the North Okanagan or expand their existing operations. Despite these continuous growth pressures, the Electoral Areas B and C are limited by the lack of sewer servicing. There is also great concern about the impact that this growth may have on the freshwater environment of Swan Lake.

The RDNO along with member municipalities, including the ToS, have been proactive with developing regional collaborative policies and partnerships. Within the Regional Growth Strategy, one of the goals relating to economic development includes “*encourage cooperative inter-jurisdictional industrial servicing arrangements that would respond to local and regional economic development goals*.” This cooperative inter-jurisdictional Wastewater Recovery project can fulfil this goal as it relates to the key findings of the Regional Employment Lands Action Plan (see Sec 1.4.2) which identified the Swan Lake Corridor and surrounding area as a priority investment zone. Developing community sewer is key to unlocking the economic development potential of the corridor. Both OKIB and the ToS were partners with RDNO (and several other communities) during the preparation of the Regional Employment Lands Action Plan.

1.4 Project Objectives

1.4.1 Phase 1 Feasibility Study

Following the development of the MoU, the Partnership retained Urban Systems (technical team) to prepare a phase 1 feasibility study work plan. The fundamental objective of the phase 1 study was to understand the technical feasibility of a community sewer service for the Swan Lake Corridor, by taking a "great idea" and determining its feasibility. Instead of undertaking a purely technical exercise, the Partnership held several workshops to confirm several important parameters of a community sewer system, including but not limited to the following questions:

- What should the service area be?
- What type of wastewater treatment is desired?
- How should the recovered wastewater be used?
- Would this be cost effective and return the same number of benefits compared to other options.

Through the facilitated workshop process the answers to these broad questions were confirmed and defined – this report acts as record of those discussions and defines the parameters of a regional system. The workshops also provided an education opportunity for the Partnership, and further developed the working relationships between the communities represented. As technical questions came up for discussion at each Partnership workshop, they were directed to the technical team for analysis and to inform at the subsequent meeting.

Naturally other questions arose during the workshops relating to the finance and governance of a joint community sewer service. Before those questions could be answered, it was imperative to define the primary project parameters. Following the completion of phase 1, the Partnership plans to move forward with a phase 2 feasibility study to explore the technical assumptions in greater detail, governance and finance models. The final section of this report expands on phase 2 activities.

Between February and September, 2016 a total of five Partnership workshops were held with the technical team, with participation by both staff and elected members from each jurisdiction.

1.4.2 Regional Employment Lands Action Plan, 2016

Independent of this project, the ***North Okanagan Employment Lands Study (February, 2016)*** identifies several actions that can be implemented within the next 5 years to increase the number of employment opportunities in the region. A primary outcome of the study is the identification of Regional Investment Corridors/Zones that would focus regional employment land growth on existing transportation corridors, namely Highway 97 and 97A. The study identifies (among others) the Swan Lake Corridor as a focal point for regional employment. *"The zone possesses many key success factors, including:*

- *a clear intent and objective of regional economic growth;*
- *strong leadership and collaboration with a shared development vision;*
- *a high level of accessibility; sound planning directives;*
- *highly applicable densities and thresholds, "*

One of the critical success factors is the availability of infrastructure services (sewer) and budget alignments." The study identifies "expanding infrastructure servicing specific to water and sewer, and develop partnerships and shared service agreements for shared investment and revenue sharing for infrastructure" as critical actions for the corridor.

1.4.3 Swan Lake – Land Use and Water Quality Assessment Report

This detailed report confirms previously anecdotal observations of poor water quality in Swan Lake. Elevated concentrations of several elements beyond BC Contaminated Site Regulations (CSR) were reported. In some locations high ammonia concentrations were observed *"likely related to disposal of on-site wastewater at the shoreline."* A second round of samples were collected during the summer of 2016 and will be reported and compared to the 2015 dataset in early 2017.

The results of this sampling program cannot be ignored. The year 1 reporting clearly indicates anthropogenic impacts on the health of Swan Lake. Correlating the year 2 sampling results (in 2017) with the 2016 reporting will occur during the phase 2 study.

2.0 CURRENT AND FUTURE LAND USES

2.1 RDNO

2.1.1 Swan Lake BX Area Zoning Bylaw

The Swan Lake BX Area zoning bylaw regulates land uses within the RDNO. The zoning bylaw currently defines a wide range of uses including:

- I1 Light Industrial
- I2 General Industrial
- C1 General Commercial
- C4 Service Commercial
- C5 Recreation Commercial
- R1 Residential Single Family
- R5 Residential Manufacture Home Community
- CR Country Residential
- SH Small Holding

2.1.2 Swan Lake BX Area Official Community Plan

The OCP meanwhile designates a broader range of future land uses along the corridor, including: Commercial, Industrial and Residential. The strip of land between Highway 97 and Swan Lake is primarily designated country residential.

RDNO has indicated that a corridor specific Swan Lake Corridor Area Plan will be developed to review future land uses, servicing and access in greater detail.

2.2 Township of Spallumcheen

2.2.1 Official Community Plan and Zoning Bylaw

The Township's OCP designates the land subject to this study as Industrial, Commercial and Agricultural. There has been recent development activity in the existing industrial area without community sewer and the Township sees lots of opportunity for further growth if the area can be serviced.

Meanwhile the Township's Zoning Bylaw regulates land uses and the following land uses are permitted within the study area:

- Service Commercial
- General Industrial
- Light Industrial
- Highway and Tourist Commercial
- Agricultural

2.3 OKIB

2.3.1 Draft Land Use Plan

OKIB's Draft Land Use Plan identifies a broad and flexible range of future land uses on IR4, including accommodation (short and long term), retail, restaurants, automobile sales and repair, gas station, storage and warehousing facilities, tourist information. In total the two lots that make up IR4 combine for total area of 79 acres.

3.0 DESIGN ASSUMPTIONS

The study involves three participating jurisdictions, each with their own set of design guidelines for infrastructure. Discussions with the team members concluded that a province-wide guideline should be adopted for the purpose of this study. The province-wide guideline available in British Columbia is from the Master Municipal Construction Documents Association (MMCD), Design Guidance Manual, 2014. These Guidelines are used by a wide range of local governments in British Columbia.

The other design guideline with respect to wastewater is the BC Municipal Wastewater Regulation (MWR), deposited April 20, 2012. This Regulation provides effluent quality requirements for all types of discharges and wastewater reclamation projects.

3.1 Unit Wastewater Flows

The MMCD provides the following in the Guidance Manual:

- Industrial/Commercial/Institutional areas: 25,000 L/ha/d
- Residential Average Daily Flow (ADWF): 240 L/capita/d
- Diurnal Peaking Factor for Residential zones: Harmon equation: PF = $1+14/(4+P^{0.5})$ (P=population in1000's).
- Diurnal Peaking Factor for ICI areas: 2.0 (from general literature)
- Inflow/Infiltration allowance: 0.06 L/s/ha, or 5000 L/ha/d

Therefore, the overall flow estimate for ICI areas is 30,000 L/ha/d including the infiltration allowance.

3.2 Study Area

The study area is divided into two main designations:

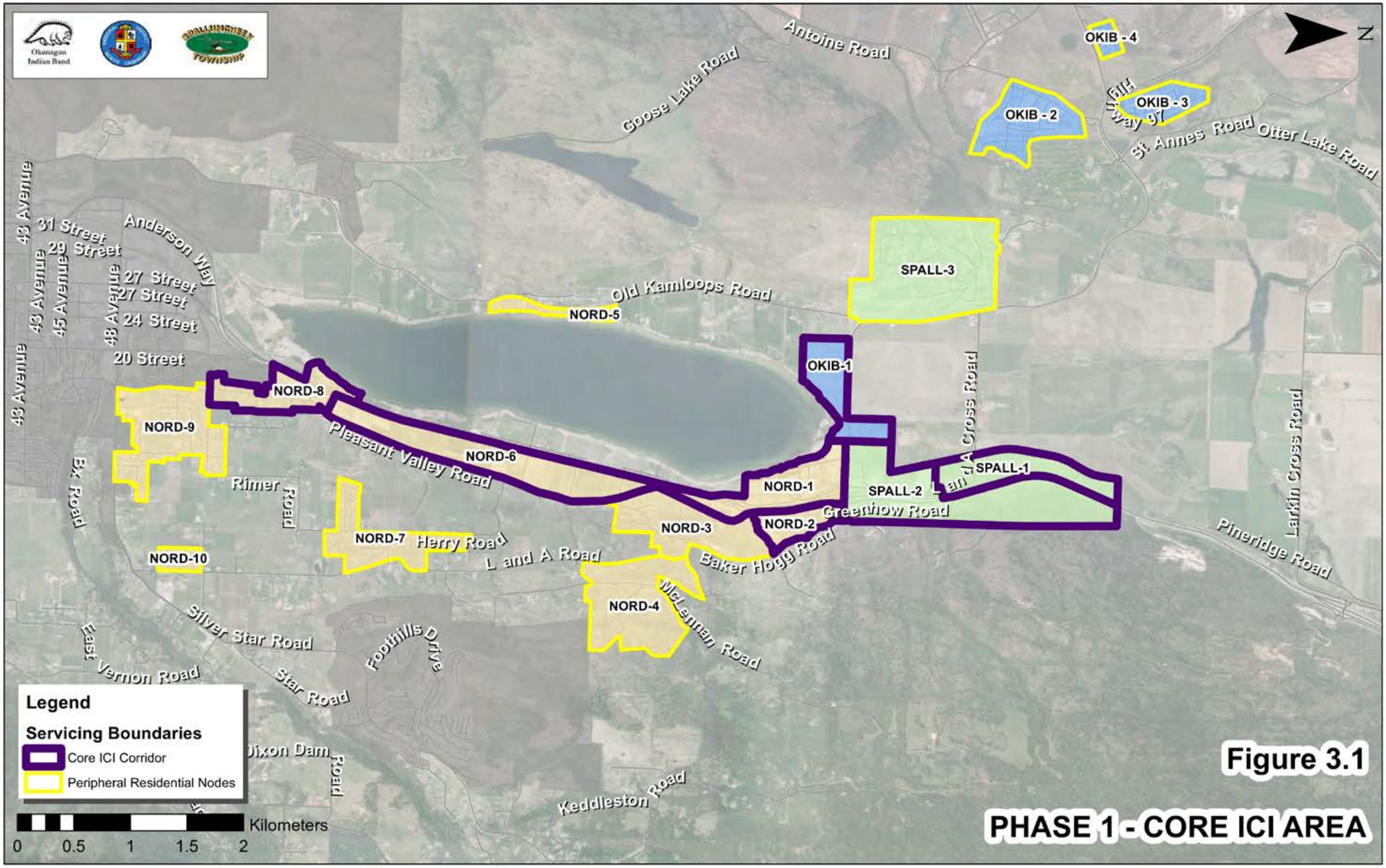
a) The core area ICI corridor
b) The peripheral residential nodes

Figure 3.1 illustrates the areas described below. The core area ICI corridor includes areas in all three jurisdictions, designated as follows:

- RDNO -1
- RDNO -2
- RDNO- 6
- RDNO- 8
- Spallumcheen -1
- Spallumcheen -2
- OKIB - 1

These designated core areas will represent Phase 1 of the project. The peripheral segments are largely residential with lower densities and will represent Phase 2 of the project that may be considered in the future. They include the following areas:

- RDNO-3
- RDNO-4
- RDNO-5
- RDNO-7
- RDNO-9
- OKIB - 2
- OKIB - 3
- OKIB - 4
- Spallumcheen - 3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Servicing Boundaries
Core ICI Corridor
Peripheral Residential Nodes
Dixon Dam Road
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0 0.5 1 1.5 2
Figure 3.1
PHASE 1 - CORE ICI AREA

3.3 Growth Projections

There is often much uncertainty around how fast an area will develop as many factors affect this such as market demand, land and servicing availability. Since there is much uncertainty around development, various scenarios were developed to better understand how growth (however fast it occurs) will affect the system flow and as a natural extension the necessary level of infrastructure investment.

Growth projections for ICI areas are difficult to forecast since growth depends to a large extent on the regional economy and market take-up of a range of commercial and industrial ventures. The approach for this study is to adopt a 20-year horizon and apply a range of take-up rates to determine the sensitivity of growth to land consumption.

The relative ICI areas in each jurisdiction are as follows:

- RDNO (Areas 1, 2, 6 and 8): 175 ha
- Spallumcheen (Areas 1 and 2): 119 ha
- OKIB (Area 1): 32 ha

The calculation of percentage of remaining land for a range of consumption rates for the ICI corridor is as follows:

Consumption rate per Annum	Percent remaining land after 20 years
1%	80%
2%	60%
3%	40%
5%	0%

The foregoing illustrates that if land parcels are developed for ICI purposes at 5% per annum, there would be no land left for development at the end of 20 years. On the other hand, if take-up is at a rate of 1% per annum, only 20% of the available land would be used up, with 80% remaining for the longer term. For the purpose of this analysis, a consumption rate of 2% per annum has been adopted. Resulting in a 40% of build-out within the 20-year horizon.

3.4 Flow Projections

The flow projections for ICI flows are made on the basis of serviced area (hectares). The flow projections for residential areas are made on the basis of number of dwelling units.The ICI flows based on developed hectares using the MMCD allowance of 30,000 L/ha/d. The residential flow derivation uses an allowance of 1,000 L/unit/d.

The Build-out and 20-year horizon flow projections for the ICI core area and the peripheral residential areas are summarized in **Table 3.1** below.

Table 3.1 Flow Projections

	Area	**Build-out (ML/d)**	**20-Year (ML/d)**
ICI			
	RDNO 1,2,6,8 (175 ha)	5.25	2.1
	Spallumcheen 1,2 (119 ha)	3.57	1.4
	OKIB 1 (32 ha)	1.01	0.4
RESIDENTIAL			
	RDNO 7,9,10 (1160 units)	1.16	0.46
	RDNO 3,4,5 (440 units)	0.44	0.18
	Spallumcheen 3 (100 units)	0.10	0.04
	OKIB 2,3,4 (570 units)	0.57	0.23
	ICI	9.83	3.90
Totals	Residential	2.27	0.91
	TOTAL	**12.10**	**4.81**

The design horizons for various components of the system are different. For example, trunk sewer lines and forcemains are buried and are typically designed for the "build-out horizon, since it not efficient to install a new pipeline every 10 or 20 years. On the other hand facilities such as pump stations and treatment plants can be phased in accordance with growth patterns. For example a pump station can be sized with a wet well suitable for the build-out horizon and be equipped with pumps for a 10 or 15-year horizon. Since the life of a pump is generally less than 20 years, pump replacement can be scheduled for a 15 or 20 year interval and upsized to match any flow increase. Similarly, treatment plant facilities can incorporate structures for the long term but utilize equipment for a phased intermediate horizon.

The suggested design horizon flows for various components of the system are as follows:

TRUNK GRAVITY SEWERS
Build-Out: 12.1 ML/d
TRUNK FORCEMAINS
Build-Out: 12.1 ML/d
PUMP STATIONS
STRUCTURES
Build-Out: 12.1 ML/d
EQUIPMENT
10-15 year: 2.0 ML/d
TREATMENT PLANT
STRUCTURES
½ of Build-Out: 6.0 ML/d
EQUIPMENT
10-15 year: 2.0 ML/d

The proposed strategy for treatment plant construction is to develop a treatment plant aimed at the 10-year capacity (2 ML/d). The plant can be expanded in 2 ML/d increments in step with growth, with allowance for an ultimate capacity of approximately 12 ML/d.

Gravity trunk sewers and forcemains should preferably be sized for build-out capacity. However, in the case of forcemains, self-cleansing velocities should be maintained to avoid sedimentation and blockage in the pipe. This problem is sometimes dealt with by installing twin forcemains in the same trench, and allowing one to sit empty until flows increase to the appropriate level.

4.0 WATER RECOVERY OBJECTIVES

One of the defining objectives of this initiative is the recovery of wastewater for the beneficial use of the agricultural and industrial sector in the region. All three jurisdictions (RDNO, OKIB and ToS) support local agriculture and recognize that this is a water-deficient region. There is also several properties zoned for industrial uses, which depending on the nature of the industry may use the recovered water for cooling or processing.

A community sewage collection and treatment system based on water recovery objectives will not only keep contaminated water away from local watercourses (lakes and streams) but will assist the agriculture and industrial businesses through the provision of a consistent and secure water supply.

The study area is ideal for the development of light industry and highway commercial businesses, some of which are in support of agriculture. A secure water supply and community sewerage system will facilitate development of these types of businesses, bolster the local economy, and provide increased employment. It will also provide training and skills enhancement for local residents.

4.1 BC Legislation Parameters

The objective of water recovery falls under the BC Municipal Wastewater Regulation (MWR - April 2012) under the heading of "Reclaimed Water". The MWR defines the Reclaimed Water requirement in Part 7 of the MWR under 4 categories, briefly described as follows:

- Category A – indirect potable reuse. Can be used to replenish a potential potable water source;
- Category B – greater exposure potential. Risk of public contact is likely;
- Category C – moderate exposure potential. Public contact risk minimal and access restricted;
- Category D – lower exposure potential. Public access strictly restricted and contact unlikely.

The Partnership discussions resulted in a unanimous preference to target Category A – Indirect Potable Reuse. It was felt that while this category is not required for agricultural irrigation, producing the best quality water would provide substantially more flexibility in the potential destinations for the product. The intent is to construct a treatment facility capable of producing Category A water, but it is not intended to supplement any potable water supplies. Rather, the project will produce water which could have multiple uses in addition to agricultural irrigation.

Additional uses could include industrial cooling water, industrial or commercial washdown water, recreational water, stream enhancement, groundwater recharge, gravel washing, wetland enhancement, fire-fighting, and other uses.

The quality requirements listed by the MWR for Category A - Indirect Potable Reuse are:

- Biochemical Oxygen Demand and Total Suspended Solids: less than 5 mg/L
- Turbidity: less than 1 NTU (Nephelometric Turbidity Unit)
- Fecal Coliform: less than 2.2 MPN/100mL; median less than 1 CFU (coliform forming unit).

In addition to the quality parameters, the MWR requires that an alternate disposal or storage system be in place to deal with events where use of reclaimed water is curtailed for any reason. If a suitable alternate disposal system cannot be found, a minimum of 48 hours of emergency storage must be available. Notwithstanding, if reclaimed water is discharged directly into a wetland, the Ministry of Environment may waive the requirement for an alternate method of disposal if not required to protect public health and the receiving environment.

The Category A parameters do not include phosphorus and nitrogen removal. Accordingly, the treatment process train would include:

- Headworks – screening and grit removal
- Primary sedimentation – gravity settling
- Bio-reactor
- Secondary sedimentation
- Filtration
- Disinfection

The primary target in the water recovery strategy is agricultural irrigation. The key parameters for an agricultural irrigation scheme include:

- Length of the irrigation season and average moisture deficit
- Size of storage required for the non-irrigating season
- Location of storage site
- Location of recovered water distribution mains
- Provision of alternate disposal for "wet" years

The agricultural irrigation season in the North Okanagan is from mid-May to mid-September, depending on the crop and the climate during the irrigation season. For conceptual design purposes, a 120-day period with an average application of 400 mm of water has been assumed.

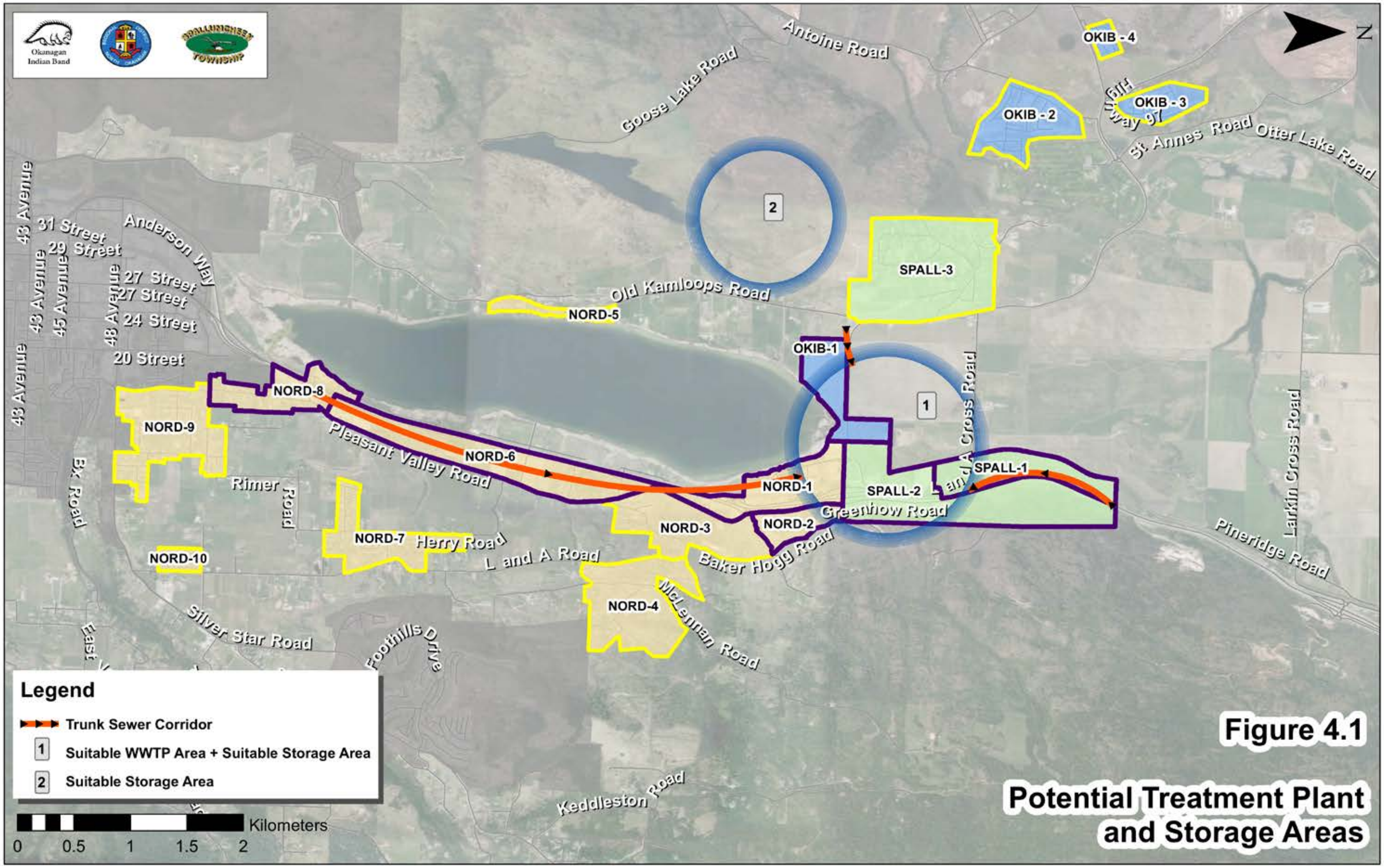
The storage and irrigation area requirements for each stage are approximated in **Table 4.1** below.

Table 4.1 Irrigation Area and Storage Area Requirements

Stage (Flow in ML/d)	Irrigation Area (ha)	Storage Volume (ML)	Storage Area (ha)
1 (2 ML/d)	183	490	4
2 (4 ML/d)	365	980	8
Build-Out (12 ML/d)	1,090	2,890	24

4.2 Potential Treatment Plant and Storage Sites

The treatment plant site should be located within the core area surrounding Swan Lake, preferably at the north end of the lake which is centrally located within the study area. Sites may be available in any of the three jurisdictions. Neither RDNO nor ToS own any suitable land in the area, so a site would need to be purchased. The majority of the vacant agricultural land is likely subject to the Agricultural Land Reserve and so a non-farm uses or an exclusion process may be required if that option is pursued. OKIB has indicated that land may be available on Swan Lake IR 4 on a long term lease basis, should the OKIB membership vote in favour through the Indian Reserve Land Designation process. It should be noted that at this stage of the planning process that no preference has been given to any particular site in the study area, but there are site options that would align with the objectives of the Partnership communities. Possible locations for a treatment plant and storage have been discussed by the Partnership and are illustrated in **Figure 4.1**.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Pineridge Road
NORD-10
L and A Road
NORD-4
McLennan Road
Silver Star Road
Foothills Drive
Keddleston Road
Legend
Trunk Sewer Corridor
Suitable WWTP Area + Suitable Storage Area
Suitable Storage Area
Kilometers
0 0.5 1 1.5 2
Figure 4.1
Potential Treatment Plant and Storage Areas

4.2.1 Desirable Site Characteristics

The site area requirement for the treatment plant is approximately 0.8 hectare for the first phase facility sized at 2 ML/d processing capacity. With provision for future expansions to an ultimate build-out size of 12 ML/d, the site should be 3.2 hectares. Allowing for a landscaped treed buffer area, the overall site requirement for the long term is approximately 4 hectares.

The site for winter storage should accommodate 490 ML for the first phase (2 ML/d). Provision should be made for future phases culminating with a build-out flow of 8 ML/d and a storage requirement of approximately 1900 ML, or a surface area of approximately 16 hectares. This storage site could be located at the valley bottom and would require pumping out of the storage pond to provide sufficient pressure for agricultural irrigation. Alternatively, it could be located at a higher elevation with recovered water pumped from the treatment plant to the storage pond and a gravity supply to the irrigation supply main. Locating the storage pond at least 50 m above the valley floor will provide sufficient pressure for agricultural irrigation.

Site selection will be an important component of the project. It will require a comprehensive community engagement process. Some of the parameters to be assessed include:

- Opportunity cost (are other uses preferred for potential revenue)
- Visibility (potential objections from neighbouring property owners)
- Public acceptance
- Conformance with OCP or zoning bylaws
- Physical characteristics (soils, slopes, surface and groundwater, prevailing winds, etc.)
- Efficiency (transmission lines to and from site)

5.0 WATER RECOVERY OPPORTUNITIES

5.1 Primary Destination

The primary recovery destination, by consensus of the project partners, is agricultural irrigation. The region is moisture deficient and reliable irrigation water for non-food crops would provide a significant benefit to area farmers and ranchers. These crops could include hay and forage crops, silage corn, nurseries and shrubs. Food crops are not included at this time because of potential public perception issues. Golf course irrigation, while not directly benefitting farmers, affords a benefit by reducing community potable water demand. **Figure 5.1** illustrates schematically the potential reclamation system concept.

The approximate area with irrigation potential lies mainly in Spallumcheen (south of Larkin Cross Road) and the north side of Highway 97 near the Okanagan Indian Band IR #1. The area in Spallumcheen is approximately 700 ha, the golf course is approximately 70 ha and the OKIB lands approximately 100 ha. With a total area of 870 ha and a seasonal application rate of 0.4m, the usable annual volume is approximately 3,500 ML. The build-out annual production is 12 ML/d x 365 days = 4,380 ML. At build-out the area for irrigation must be increased to over 1,000 ha. Further, on "wet" years the application rate may be less than 400m, so it is prudent to have as many irrigation customers as possible to ensure that there is a destination for the water. Initially, the projected flow is 2 ML/d x 365 days = 730 ML/year, yielding an initial irrigated area requirement of just under 200 ha.

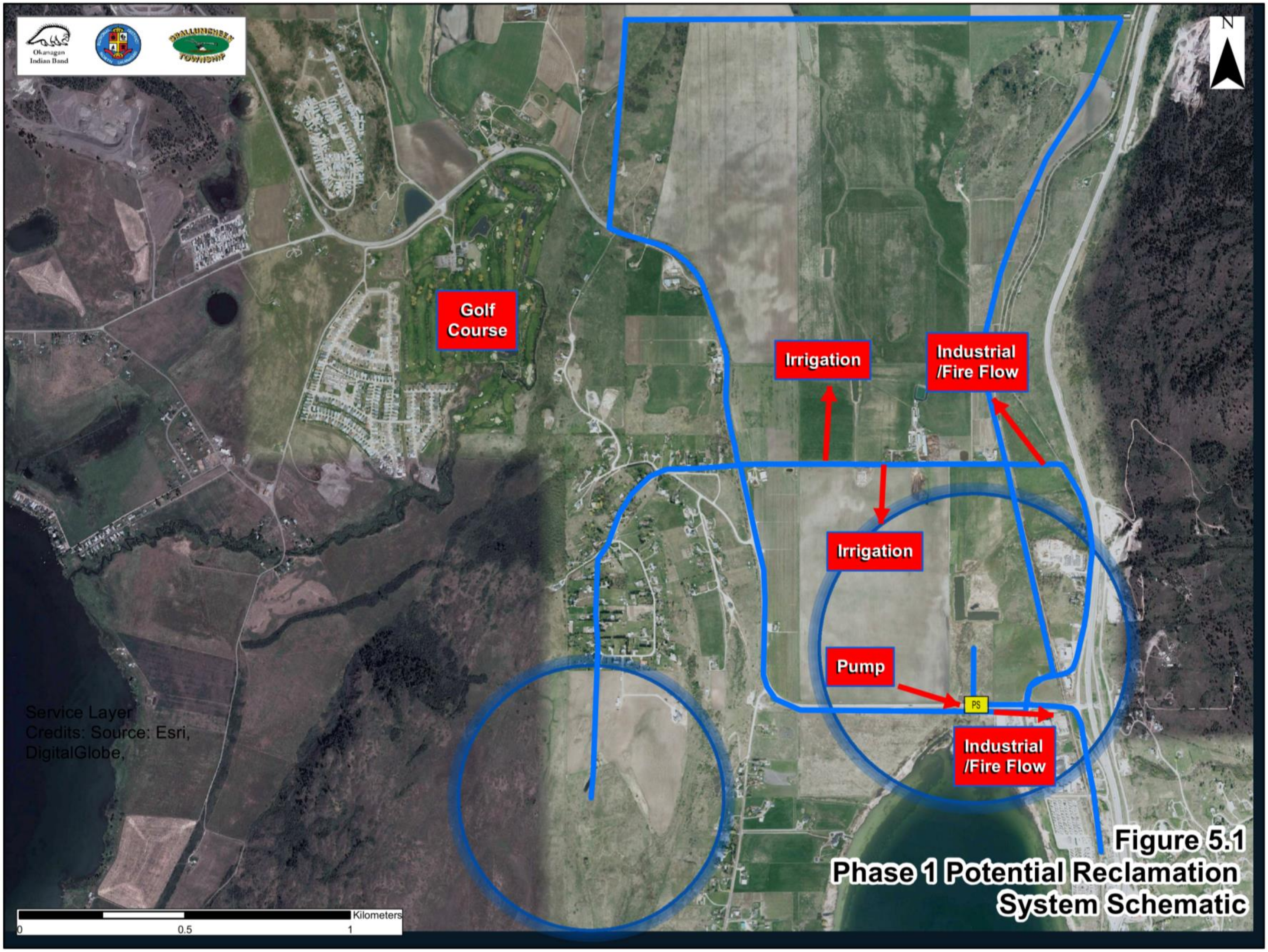
The MWR requires that reclamation or water recovery strategies include an alternate disposal system. This project can include several potential directions in addition to the primary agricultural irrigation system proposed. Since the Partnership has opted to produce Category A water, the potential destinations for this water are many. Some destinations would require environmental impact assessment, while other destinations will require a protocol for protection of public health.

5.2 Alternate Destination to Receiving Environment

The high quality of Category A water may allow it to be used for stream or lake enhancement. In this region, this could include Otter Creek, Swan Lake, Goose Lake or Okanagan Lake. Each of these environments will have specific conditions for receiving reclaimed water and must be thoroughly assessed to ensure that the appropriate parameters are being met. When reclaimed water is used for stream or lake enhancement, nutrients such as nitrogen and phosphorus must be considered since these nutrients can lead to degradation rather than enhancement if the receiving environment is not appropriate.

Nitrification and denitrification are part of conventional treatment processes, but phosphorus removal will require chemical precipitation or a biological nutrient removal process. Since the phosphorus removal would only be periodic, the chemical precipitation process would be the more appropriate. Wetland enhancement does not require nutrient removal since wetland plants have a significant take-up of nutrients.

Groundwater re-charge is another alternate disposal process. This is typically achieved through the use of rapid infiltration basins, allowing the water to trickle through native soils to the sub-surface aquifer. This method requires that the soils above the aquifer be granular to allow a reasonable infiltration rate. Where the surface soils are impermeable, deep well injection has been attempted but has rarely been successful hydraulically. This alternate disposal method requires that suitable surface soils be found. However, based on an initial desktop review of existing well logs in the study area, the presence of clay layers confining the aquifers will pose challenges to this type of recovery. One small area of gravelly soils was identified. This area will be reviewed in further detail during phase 2 of this study to determine the feasibility of this method.


Okanagan Indian Band
SPALLUMCHEEN TOWNSHIP
N
Golf Course
Irrigation
Industrial /Fire Flow
Irrigation
Pump
PS
Industrial /Fire Flow
Service Layer Credits: Source: Esri, DigitalGlobe,
Kilometers
0
0.5
1
Figure 5.1
Phase 1 Potential Reclamation System Schematic

5.3 Alternate Destination Through Dual Distribution

The reclaimed water can be used in the serviced area by the same industries that it services. The water can be available for cooling water, process water, washdown water, gravel washing, car or truck washing, and other uses. The MWR classifies this as “dual distribution” to distinguish it from the potable water system. The main concern in such a system is the avoidance of cross-connection. Cross connection control can be achieved with appropriate design, construction and a rigorous inspection protocol.

This project will have irrigation water supply and distribution mains. A system that is strictly seasonal irrigation will typically drain and close down for the winter. If alternate uses are considered, the system would remain live year-round and the same pipe can be used for industrial water uses. The same pipe can also be used for the fire protection system. Note that while fire protection is made available, it does not represent a distinct usage volume so it cannot be considered in the alternate disposal volume calculations. The ability to use the treated water for firefighting would have significant benefits to the study area. Currently there is limited fire protection within the area, raising insurance costs for businesses and residents. A dual irrigation/fire flow system would reduce insurance costs and provide superior firefighting capability.

5.4 Initial Recommendation for the Recovery Scheme

The water recovery scheme should be based on agricultural irrigation for the benefit of the agricultural sector. The irrigation supply lines should be buried to a depth below frost to allow year-round operation and function as “dual distribution”. These mains will also serve to deliver process and wash water to the industries in the area. Hydrants could be connected to the system to provide fire flows to enhance fire protection.

Storage is recommended at higher elevation to supply the area with sufficient pressure for both irrigation and fire protection.

A second alternate or standby disposal system should be included. It is suggested that an engineered wetland be considered for further treatment and nutrient removal and overflow discharge to Swan Lake or Goose Lake.

5.5 BIOSOLIDS CONSIDERATIONS

5.5.1 Biosolids Production

The treatment process for wastewater produces renovated water which can be recovered for a variety of uses. The process also produces a quantity of organic and inorganic solids which have been separated from the liquid. This material is referred to as sludge, but with further treatment to drive off the volatile fraction and stabilize the solids mixture, it is referred to as “biosolids”.

The sludge production relates to the amount of liquid-solid separation achieved in the treatment process. For example, if the Suspended Solids concentration of raw sewage arriving at the plant is 300 mg/L and the solids concentration of the liquid leaving the plant is 5 mg/L (Category A), and the flow is 1 ML/d, the solids accumulation is 295 kg/d (equivalent dry solids). The sludge that is removed from the process is typically at 1% concentration (10,000 mg/L), so the liquid volume is approximately 29,500 L/d.

The sludge that accumulates in the clarifier is typically either recycled back to the bioreactor or processed by sending it to a “digester”. The effect of a digester is to detain the solids and apply dissolved oxygen to drive off the volatile fraction and concentrate the remaining fraction.

5.5.2 Biosolids Regulations

The BC Regulation that governs handling of biosolids is the Organic Matter Recycling Regulation (OMRR) deposited June 30, 2007 under the Environmental Management Act and the Public Health Act.

The Regulation defines six classes of material as follows:

- Class A Biosolids
- Class B Biosolids
- Biosolids Growing Medium
- Class A Compost
- Class B Compost

The definitions relate to the processes applied to stabilize volatile compounds, the reduction of pathogens, vector attraction reduction, pH, percent solids content, concentrations of heavy metals, and other parameters.

The application of biosolids treatment processes will relate to their final destination and the quality parameters required to protect the environment and public health. Some of the available biosolids treatment technologies are briefly described below.

5.5.3 Biosolids Treatment

Aerobic digestion is the most commonly used method in small plants for dealing with sludge. Digestion consists of directing the sludge to an aerated tank, providing complete mixing and oxidation, and thickening by settling and returning the decant water to the bio-reactor. Aerobic digestion has the effect of converting the volatile solids to gas (a reduction of 30%), and thickening through the decant mechanism, to terminate with a 3-4% solids concentration (30,000 – 40,000 mg/L).

Digested sludge at this concentration is suitable for land application with a liquid spreader. However, since the process does not reach pasteurization temperature, the places where it can be applied and the application procedure are severely restrictive. In addition, the hauling of liquid or semi-liquid biosolids is costly due to volume and risky due to incomplete stabilization.

Digested biosolids are typically dewatered by mechanical means such as a belt filter press or centrifuge. This mechanical dewatering produces 15 – 20% solids concentration (150,000 – 200,000 mg/L) and reduces the haul volume by a factor of 5.

A further process is referred to as “drying”. Drying is achieved with the use of heat in a rotating kiln arrangement and evaporating the moisture. The dried product can be as much as 90% solids. The high temperatures achieved in drying ensure that Pasteurization is achieved and the product is free of pathogens. It can be used by the general public.

5.5.4 Available Biosolids Process Trains

There are numerous methods of processing biosolids, each with a different final product. The choice depends on many factors including capital and operating cost, the required quality and water content for the final destination, and the training and qualifications of the personnel handling the product.

Typical process trains include:

- Aerobic digestion and dewatering (produces Class B biosolids)
- Lime stabilization and dewatering (produces Class B biosolids)
- Gravity thickening and dewatering (produces Class B biosolids)
- Multi-stage Anaerobic Digestion and Dewatering (produces Class A biosolids)
- Thickening, Dewatering and Heat Drying (produces Class A biosolids)
- Single –stage Anaerobic Digestion, Dewatering and Heat Drying (produces Class A biosolids)

5.5.5 Biosolids Potential Destinations

In keeping with the "recovery" objectives, it is not anticipated that the plant sludge would be disposed to landfill. Rather, opportunities will be explored for the beneficial use of a safe organic product as a soil amendment to improve crop production, or as a fuel to generate energy.

The potential safe destinations for biosolids depending on the level of stabilization, water content, and solids concentration can be summarized as follows:

a) Liquid aerobically digested sludge (3% solids):
   - Can be applied to land for non-edible crops or trees. Must be applied under a Land Application Plan (LAP) as approved by the Ministry of Environment. Further treatment for pathogen reduction may be required.

b) Semi-solid dewatered biosolids (15% solids):
   - Can be applied to land under a LAP approved by the Ministry
   - Can be trucked to the Regional composting facility at Predator Ridge with the agreement of the City of Kelowna and City of Vernon
   - Can be directed to a local composting facility
   - Can be incinerated by adding a secondary fuel such as wood chips. Incineration can also be part of an energy recovery scheme whereby the heat generated is converted to electrical power

c) Dried biosolids (85% solids):
   - Can be marketed to individual consumers as well as nurseries and garden centres as a soil amendment
   - Can be incinerated as part of an energy recovery scheme

The initial analysis shows that the quantity of biosolids produced in the first phase of the project is not sufficient to warrant the investment for incineration and co-generation facilities. As the system expands and more biosolids are produced the investment in co-generation equipment may become feasible.

It is suggested that the first phase of the project include thickening or aerobic digestion, mechanical dewatering and heat drying. The heat dried product will be a Class A product with very low water content (10%) and the range of potential uses and users is broader than other biosolids products. This would leave the Partnership with the greatest latitude for seeking out customers for the product. Similar to the treatment plant and storage site locations – no definitive biosolids management strategy has been defined by the Partnership – these details will be developed and refined further in phase 2 of the planning process.

6.0 COST ESTIMATES

The North Okanagan Water Recovery Project has not been developed to the extent where detailed cost estimates can be undertaken. Sites for a treatment plant and for storage of recovered water have not been secured, and the location of4 these facilities will impact the cost of pump stations and transmission lines.

Nevertheless, an approximate routing for trunk sewers in the core area, pump station location, an assumed general area for a treatment plant, a general area for a storage pond and the routing of recovered water lines to serve potential irrigation customers have been used to formulate approximate capital cost estimates for the major facilities. These estimates are summarized as follows:

1.	Collection and Transmission System (core area corridor only)	$10M
2.	Treatment Plant: first phase 2 ML/d module – Category A effluent	$10M
3.	Effluent transmission to storage pond	$4M
4.	Storage Pond	$6M
5.	Irrigation and re-use network – Phase 1	$4M
6.	Wetland for alternate disposal	$2M
7.	Biosolids process train	$6M
	TOTAL CAPITAL	**$42M**

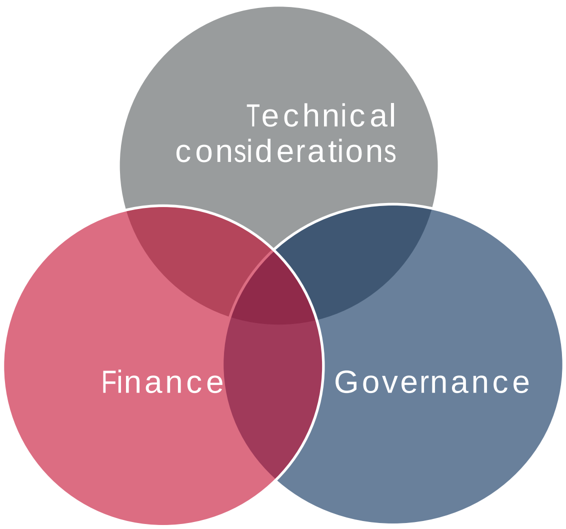
The above are Class D estimates (including a 30% contingency).

This is a significant capital cost for the Partnership communities. During the phase 1 workshops, the Partnership agreed that this project will only be financially feasible if there is federal and/or provincial assistance to fund the project.

7.0 GOVERNANCE AND FINANCE MODELS

The focus of this phase 1 feasibility study has been on the technical considerations of building a regional treatment and collection system. The information provided to date has enabled the Partnership to gain a deeper understanding of the project and decide whether they would like to further investigate the feasibility of this project. During this process many questions arose regarding potential governance models. The technical team briefly overviewed a few options for sustainable service delivery for discussion purposes. The Partnership will analyze and define the governance and the appropriate financial model during the phase 2 feasibility study. The following sections outline the discussion materials that the Partnership reviewed during this phase 1 study.

The three key components of sustainable service delivery are illustrated below:



Each of these components work together to ensure services can be provided today and into the future. The components not yet considered include; governance – how the Partnership will be structured and finance – how will the costs be allocated.

Governance as it relates to sustainable service delivery includes:

- Representation & Voting;
- Decision making and policy
- Liability and responsibilities
- Administration and staffing

The finance as it relates to sustainable service delivery includes:

- Capital and operation expenses
- Current and future customers
- Local and shared assets

The next step for the Partnership is to consider governance and financing approaches that would address their specific needs and enable it to achieve their goals. During the phase 1 workshops, the technical team presented to the Partnership a series of governance and finance examples from other communities in British Columbia. Four different models utilized by other communities are summarized below:

7.1 Central Okanagan Regional District Governance and Finance Model – Regional Approach

This partnership was led by the Regional District of Central Okanagan (RDCO) which brought together the City of West Kelowna, Peachland and Westbank First Nation (WFN) to deliver a regional; trunk, collection, treatment and outfall/disposal system. The key governance and finance components that make up this agreement are summarized in **Table 7.1**.

Table 7.1 RDCO Regional Model – Governance and Finance Summary

Finance	Governance
• Regional Cost Share Model - Costs are shared based on sharing formula: *Treatment capacity costs by development unit: e.g. 70/20/10;* *O&M by actual flows via regional requisition* *All regional capital projects paid for by capacity formula regardless of which jurisdiction they're built* • Assets are jointly owned by all beneficiaries;	• Standing Committee made up of elected officials from each of the beneficiaries; • Administration is a function of the Regional District; • Service establishment outlines major service requirements; master plans and studies address routine service needs

7.2 Capital Regional District (CRD) Governance and Finance Model – Regional Approach

This partnership was led by the Capital Regional District (CRD) which brought together Sannich, Esquimalt, Oak bay, Victoria, Langford, Colwood, View Royal, Esquimalt and Songhees Nation to deliver a regional trunk, lift station, screen and outfall. The key governance and finance components that make up this agreement are summarized in **Table 7.2**.

Table 7.2 Capital Regional District Model – Governance and Finance Summary

Finance	Governance
• Annual fees collected by requisition based on actual flows through the system • Collection system projects cost-shared based on location and percentage of capacity per municipality o E.g. trunk upgrade only serving Saanich paid by Saanich (only)	• Committee is made up of representatives from each municipality and First Nation, based on population and formula for minimum and maximum representation • Service establishment bylaw + multiple other regulations

Both the CORD and CRD model takes a regional approach but the main difference between models includes how projects are financed. In the CORD model, all costs are shared between different entities based on a cost sharing formula (typically based on equivalent population) that was established at the onset of the project. This means that no matter where the infrastructure is installed and who it benefits, each partner would pay their share of the costs based on this sharing formula. This model differs from the CRD model which is based on a 'design-capacity' and the user benefit allocation model. This means that each partner would purchase capacity at the treatment plant and pay for their share of the infrastructure that benefits them.

7.3 Abbotsford-Mission (JAMES) – Formal Commission

The Abbotsford-Mission formal commission brings together two entities who have joint ownership of major infrastructure, treatment and disposal. The key governance and finance components that make up this agreement are summarized in **Table 7.3**.

Table 7.3 JAMES – Governance and Finance Summary

Finance	Governance
• Joint Cost Share Model - Costs are shared based on sharing formula *Treatment capacity costs by development unit: e.g. 75/25;* *O&M by actual flows via agreement formula* *All regional capital projects paid for by capacity formula regardless of which jurisdiction they're built* • Assets are jointly owned by all beneficiaries;	• Commission is made up of representatives from each community (no regional district involvement) • Uncommon model where Order in Council creates legal entity with sole focus on joint sewer service delivery • Most regulation granted authority through Letters Patent and contractual agreements

7.4 Municipal Type Servicing Agreement (MTSA)

Municipal type servicing agreements (MTSA) brought together the City of Vernon and Coldstream where the City of Vernon provides an external service to Coldstream for major collection, treatment and disposal systems. The key governance and finance components that make up this agreement are summarized in **Table 7.4**.

Table 7.4 MTSA – Governance and Finance Summary

Finance	Governance
• City of Vernon coordinates and directly funds capital and maintenance needs *Coldstream's rates include share of capital, operations and administration based on actual flows* *Occasional 'requisitions' for unexpected upgrades*	• City of Vernon takes lead and ownership over their WWTP (responsible for decisions)

After further discussion with the Partnership and reviewing each of the governance and finance approaches to service delivery in BC, it was agreed that an important next step in phase 2 would be to further explore which governance and finance approach would best meet the needs and objectives of the Partnership.

8.0 CONCLUSION AND RECOMMENDED NEXT STEPS

This phase 1 feasibility study has moved the Partnership communities from having a “great idea”, to proving that there is a real willingness to work together towards a shared community sewer system. The process has provided an opportunity for open dialogue amongst the partners, which has confirmed alignment of project objectives and through collaborative discussion defined some fundamental parameters of what the system should include (treatment levels, wastewater recovery etc). Aligning objectives and defining these parameters has now provided the Partnership with the confidence to move forward with a technically feasible solution that meets the needs of the three communities.

The Partnership has recommended that the technical solution described in the preceding chapters is a concept that has promise and fulfills the vision. It is worthy of further investigation and analysis. The next logical iteration to this process is to confirm a number of the technical assumptions made in phase 1, develop a sustainable service model (finance and governance) and develop a communications strategy to educate and inform community members of the benefits of shared community sewer service, and the risks of continuing with the status quo.

At the conclusion of the final phase 1 Partnership Workshop, the decision was made to apply for a grant under the BC Rural Dividend Fund to assist with phase 2 funding. The funding program is providing $25 million a year over three years to assist rural communities with a population of 25,000 or less to reinvigorate and diversify their local economies. The Swan Lake Wastewater Recovery project fits well with the funding programs objectives of “*developing new and effective partnerships to support shared prosperity”,* among several other eligibility criteria.

The Partnership is preparing an application for the October 31st, 2016 intake of the program to fund phase 2 of the feasibility study. The grant application will seek $60,000 and supported by $30,000 from the Partnership communities, plus $10,000 of in-kind contribution. The phase 2 study will therefore cost $100,000. It is expected that decisions on the October intake will occur in February 2017.

Some initial consideration has been given to the phase 2 Feasibility Study activities. During the process of applying for the BC Rural Dividend Fund application, this activity list will be refined and confirmed along with a project budget.

1. **Collection and Trunk Sewer System Refinement**
   - Refine routing of trunk sewers through discussion with MOTI
   - Investigate pump station locations
   - Obtain geotechnical information (from desk study) to determine potential costs of dealing with unsuitable backfill materials, rock and/or trench dewatering provisions
   - Determine the Rights-of-Way that need to be acquired for the best apparent route
   - Undertake pump sizing calculations and develop an optimum style of pump station
   - Determine the extent of surface reinstatement in the trunk sewer corridor
   - Determine extent of first phase service area with number (and area) of parcels to be serviced
   - Develop a plan for the trunk sewer system using existing topographic information and update the capital cost estimates.

2. **Water Recovery Treatment Plant**
   - Detailed assessment of potential sites (zoning, size, topography, prevailing wind, soils, access, power supply, neighbouring land uses, visibility)

- Evaluation and comparison of available process trains to achieve the Category A effluent quality
- The comparison to include: reliability, risk of failure, consequence of failure, redundancy requirements, potential for odour, production of waste residuals, level of operator attention relative to complexity of process, resiliency to higher/lower loading rates and/or toxic substances in the incoming wastewater
- Development of a process flowsheet with hydraulic and organic loading parameters
- The cost comparison will include capital construction costs, annual operation and maintenance costs (converted to Present Worth) and capital replacement costs (converted to Present Worth) for a Net Present Worth value. The cost of land will be based on average typical cost per hectare of agricultural land in the region.
- Development of a Phasing Plan for treatment plant expansion to keep pace with growth
- Selection of the Best Apparent Alternative

3. Water Recovery Irrigation and Reclamation System

- Search and detailed evaluation of potential upland storage sites. The search will include lands in the upper benches on either side of the valley
- Evaluation parameters to include: slopes and topography; native soil materials and ease/difficulty of construction, evaluation of liner requirements, elevation and available pressure for irrigation/reclamation system, zoning and land use, neighbouring land uses, access, available screening (trees)
- Analysis and comparison of routes for irrigation and reclamation water supply mains.
- Development of the servicing plan for potential users in the first phase
- Development of a constructed wetland concept to act as the alternate disposal system as required by the MWR
- Development of a phased expansion plan for the addition of users to keep pace with growth. The cost comparison will include capital construction costs, estimated annual operation and maintenance costs
- Preparation of capital construction costs, annual operation and maintenance costs and capital replacement costs for equipment (equipment may include an aeration system; synthetic liners typically require replacement after 30-40 years)

4. Biosolids Treatment and Recovery

- Comparison of biosolids treatment alternatives and the respective final product characteristics
- Preparation of a biosolids treatment comparison matrix with capital costs, operation and maintenance costs, and capital replacement costs. The matrix will also include complexity of process, operator attention, risk of producing unacceptable product, potential users in the area for respective product quality, and overall net present value).
- Potential revenue from sale of agricultural amendment products and/or energy sales from co-generation
- Development of a phasing plan to introduce co-generation as quantities increase.

5. Governance Plan

- Exploration and evaluation of alternate governance structures that bring the 3 jurisdictions together to form a permanent sustainable structure that owns and operates the utility. Core areas of discussion and confirmation will include answering the following questions:
  - Ownership over infrastructure (common vs. uncommon?)
  - Who will make decisions?
  - How will the system be operated and managed and who pays for it?
  - How will initial capacity to the system be allocated?
  - How will additional capacity be provided, allocated and paid for?

6. Financial Plan

- Investigation of the range of mechanisms to fund the project with contributions from senior government funding programs and a revenue plan to collect contributions from the beneficiaries of the project for the remaining capital cost, the annual maintenance and operation costs and the capital replacement costs. Some of the discussion questions that will be addressed in phase 2 include:
  - What are the trade-offs between a simplistic financial model versus an equitable financial model?
  - What rate structure will be used and how will costs between customers be allocated (residential vs. commercial vs. industrial)?
  - What approach will be taken for recovering costs related to growth (i.e. DCCs, Latecomers)?
  - What are the limitations and opportunities of a multijurisdictional community system potentially located on federal, regional district and municipal lands?

7. Communication Strategy

- A detailed communications strategy will be developed to ensure community members are informed, educated and empowered to make decisions regarding the benefits of a shared community wastewater recovery system. The strategy will define the following:
  - Community Engagement Objectives
  - Identify the audience
  - Define the key messages and educational information i.e.
    - How much will I have to pay every year and for how long?
    - Who gets to make decisions/Who can I hold accountable for decisions?
    - What am I getting for my money?
  - Identifying the key ways of disseminating the information
  - Define the tactics to be used and a schedule to roll the communications and engagement activities out.
- Building buy-in and support from members and constituents of the three communities is a crucial step in the process of developing a shared community wastewater recovery system. The importance of executing this stage cannot be overstated. Consistent and accurate messaging from the Partnership will build trust and confidence in the communities when asked to approve potentially significant financing.

APPENDIX A

Partnership Memorandum of Understanding

Memorandum of Understanding

FOR THE FORMATION OF A PARTNERSHIP TO COOPERATIVELY DEVELOP A MASTER WASTE WATER RECOVERY PLAN

BETWEEN: REGIONAL DISTRICT OF NORTH OKANAGAN ("RDNO"), incorporated under the *Local Government Act* of the Province of British Columbia, and having its Offices at 9848 Aberdeen Road, Coldstream, BC V1B 2K9

OF THE FIRST PART

AND: TOWNSHIP OF SPALLUMCHEEN ("Spallumcheen")
4144 Spallumcheen Way
Spallumcheen, BC VOE 1B6

OF THE SECOND PART

AND: OKANAGAN INDIAN BAND ("OKIB")
12420 Westside Road
Vernon, BC V1G 2A4

OF THE THIRD PART

COLLECTIVELY "THE PARTIES"

Background

The Regional District of North Okanagan has engaged in discussions with both the Township of Spallumcheen and the Okanagan Indian Band to explore the concept of a shared waste water recovery service. Following a meeting on May 22, 2015, it was agreed that working collaboratively as a partnership would be of benefit to all three Parties.

Purpose

The formation of this Partnership will:

- Assist the Parties to work together on areas of mutual interest, while meeting their respective objectives with regard to development of a Master Waste Water Recovery Plan (MWWRP) for the area known as the Swan Lake Commercial Corridor located in Electoral Areas "B" and "C" of the RDNO, the South Spallumcheen Industrial and Commercial area (existing and proposed) and portions of the Okanagan Indian Band, as outlined on the attached Schedule ("the Plan Area");
- Function as an information-sharing and consultation forum to achieve an integrated approach for a MWWRP;
- Provide the basis for discussions and further specific agreements or arrangements, where appropriate, on distinct issues related to the MWWRP;
- Increase leverage when applying for provincial or federal funding;
- Provide for an integrated approach to public communications; and,
- Facilitate and complement the integration of policies and programs.

Areas of Mutual Interest

In the context of this Memorandum of Understanding (MoU), the areas of mutual interest are:

- Preservation of Swan Lake and the wetlands surrounding the lake
- Improve opportunities for economic development

Specific Goals

Specific goals include, but are not limited to:

Phase I - Scoping

- Develop work plan for the project

Phase II – Technical Analysis

- Identification of existing conditions;
- Identification of development projections, including types and areas of existing and potential industrial and commercial uses in the Plan Area;
- Consideration of a range of waste water treatment, reuse and disposal options (variables to compare options);
- Development of a comprehensive waste water strategy;
- Identification of areas for collaboration between the Parties;
- Identification of items for specific action;
- Consideration of governance options; and,
- Feasibility – construction, operations, maintenance, capital replacement.

Principles

The Parties agree that decisions and actions resulting from this Partnership will be guided by the following principles:

- Waste water is considered a water resource.
- Working collaboratively achieves better results.
- Sharing of resources and expertise improves the feasibility of the project.
- Respect for individual Parties' mandates and decision-making processes strengthens the Partnership.
- Open and transparent communications among the parties and to the public.

Governance

- The Partnership will consist of elected officials, two from each Party (RDNO, Spallumcheen, OKIB) as appointed by each Party.
- Each elected representative will have one vote and resolutions will be by simple majority.
- A Partnership Chair will be determined by majority vote on an annual basis.
- Each Party may provide technical representatives (non-voting), with approval of their Board or Council (as applicable).
- The Partnership may utilize the expertise of outside consultants where deemed necessary or appropriate.
- All financial and resource commitments shall be pre-approved by each Party.
- All financial obligations to be shared by the Parties
    - Phase I scoping (1/3, 1/3, 1/3)
    - Phase II technical analysis (possible differential cost sharing)

- Agreement from each Party is required for grant funding applications using the Partnership name and the names of the three Parties.
- The Partnership will meet as necessary to develop the Plan.
- Minutes will be recorded at all meetings of the Partnership, and distributed to each Party.

Technical Working Group

A Technical Working Group, consisting of staff representing each Party, may be established as deemed appropriate, to:

- Facilitate the achievement of goals and objectives;
- Address specific priorities; or,
- Undertake communications activities.

The Technical Working Group may engage consultants in an advisory capacity as needed.

Communications Protocol

- The Parties acknowledge that citizens have a right to transparency and public accountability, which is best served by full information about the benefits of this Partnership.
- The Parties agree that communications activities marking the signing of this MoU and other key milestones that occur within the context of the MoU will involve all Parties in planning and execution.
- Joint communications material and signage will reflect all applicable communications policies of the Parties, including use of identifying logos and graphics.
- In addition to joint communications activities, the Parties may include messaging in their own communications products and activities related to this MoU.
- Communications activities include, without limitation, major public events or announcements, or communications products such as speeches, press releases, websites, advertising, promotional material or signage.
- The Parties will use best efforts regarding the timing of public events to allow for all Parties to plan their involvement.
- The Chair will act as the spokesperson for the Partnership with regard to media communications.

Information Exchange

Information and/or documents will be exchanged to all Parties via Administration, which will be responsible for disseminating information to their respective political representatives. RDNO Administration will act as the coordinator for disseminating information to the Parties.

Regional District of North Okanagan:

Leah Mellott, General Manager, Electoral Area Administration
9848 Aberdeen Road
Coldstream, BC V1B 2K9
Telephone: (250) 550-3722
Facsimile: (250) 550-3723
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Telephone: (250) 546-3013
Facsimile: (250) 546-8878
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Okanagan Indian Band:

Eddy Davis
Director of Public Works,
12420 Westside Road
Vernon, BC V1H 2A4
Telephone: (250) 542-4328
Facsimile: (250) 542-4990
E-mail: ken.mcgregor@okanagan.org

Memorandum of Understanding

This Memorandum of Understanding outlines the intent of the three Parties to commit resources and collaborate on development of a Master Waste Water Recovery Plan. This is not a legal document and in no way binds any of the three Parties.

Signatures

Dated for reference this 18th day of August., 2015

REGIONAL DISTRICT of NORTH OKANAGAN as represented by:

Bob Fleming, Electoral Area "B" Director

Mike Macnabb, Electoral Area "C" Director

TOWNSHIP of SPALLUMCHEEN as represented by:

Janice Brown, Mayor

OKANAGAN INDIAN BAND as represented by:

Byron Louis, Chief

Allan Louis

Schedule

Plan Area

Map to show jurisdictional boundaries

and lands proposed to be in the service area.