Comox Valley REGIONAL DISTRICT

Staff Report

DATE: February 19, 2019

FILE: 5600-01/CVRWS

TO: Chair and Directors
Comox Valley Water Committee

Supported by Russell Dyson
Chief Administrative Officer

R. Dyson

FROM: Russell Dyson
Chief Administrative Officer

RE: **Memorandum of Understanding for Municipal Natural Assets Initiative**

Purpose
This report presents a Memorandum of Understanding (MOU) between the Municipal Natural Assets Initiative (MNAI) and the Comox Valley Regional District (CVRD), the City of Courtenay, the Village of Cumberland, the Town of Comox, and the K'ómoks First Nation (hereafter referred to as the Project Partners).

Recommendation from the Chief Administrative Officer:
This report is for information purposes only.

Executive Summary
Asset management refers to the process of inventorying a community's existing assets, determining the current state of those assets, and developing plans for a systematic approach of maintaining or replacing assets. Asset management planning is becoming a standard best practice that supports service, asset and financial sustainability for local governments. In 2018, the CVRD began development of corporate asset management policies, followed by the development of strategies and plans for implementing these polices for water and wastewater services.

Within the context of asset management, there is growing evidence that natural assets provide, or could be restored to provide, services just like engineered assets and often at lower costs. As part of its asset management planning process, the CVRD and the other Project Partners have signed a Memorandum of Understanding outlining collaboration with MNAI to understand the current and possible future roles of natural assets in the Comox Lake watershed in providing a safe, reliable drinking water supply for residents of the Comox Valley. MNAI offers solutions to the problems of aging infrastructure and ecosystems decline by supporting municipalities to integrate natural assets (e.g. forests, riparian areas) into core asset management and financial processes. This means that natural assets are understood, managed and valued by municipalities in terms of the services that they can provide (e.g. improved water quality).

Funding for this project is broken down as follows:

Federal funds (NRCan)	$137,500
Provincial funds (Ministry of Municipal Affairs and Housing)	$125,000
Comox Valley project partners	$105,000
Total	**$357,500**

Financial contributions for the Project Partners will be approximated based on total water consumption. The CVRD, the City of Courtenay and the Town of Comox all pay into the Comox Valley Water Service based on their consumption; as such the CVRD Water Service will pay the proportion representing these member municipalities. The Village of Cumberland's consumption is equivalent to approximately 10 per cent of the CVRD Water System, and K'ómoks First Nation's is approximately one per cent. MNAI has suggested the $105,000 Project Partner contribution be spread over two fiscal years, with first payment prior to the end of March 2019.

An initial workshop with the Project Partners and MNAI has been scheduled for March 2019 that will introduce the asset management framework, ecosystem services and municipal natural asset management, and begin looking at methods for natural asset inventory, determination of beneficiaries and associated risks. Two subsequent workshops further into the year will provide guidance for natural asset planning and management. MNAI will provide technical support to municipalities over the 12 month project timeline as well as extensive modelling for prioritized natural assets in the watershed. Project completion is targeted for April 1, 2020.

Prepared by:	Concurrence:	Concurrence:
Z. Norcross-Nu'u		***M. Rutten***
Zoe Norcross-Nu'u Engineering Analyst	Kris La Rose Senior Manager of Water/ Wastewater Services	Marc Rutten, P.Eng General Manager of Engineering Services

Attachments: Appendix A –Memorandum of Understanding between the Comox Valley Project Partners and the Municipal Natural Assets Initiative

Memorandum of Understanding

between the

The Comox Valley Project Partners

and

The Municipal Natural Assets Initiative

This Memorandum of Understanding (MOU) is entered into by the Municipal Natural Assets Initiative and the Comox Valley Project Partners, namely Russell Dyson, Chief Administrative Officer, Comox Valley Regional District; Tina McLean, Band Administrator, K'ómoks First Nation; Richard Kanigan, Chief Administrative Officer, Town of Comox; David Allen, Chief Administrative Officer, City of Courtenay; Sundance Topham, Chief Administrative Officer, Village of Cumberland. Hereafter they will be referred to as "MNAI" and "the Project Partners" respectively.

The Comox Valley Regional District serves as the agent on behalf of the Project Partners for the purposes of this MOU.

1. Purpose

This MOU documents the understanding and working agreement between MNAI and the Project Partners concerning their collective commitment to:

- Understand the current and possible future roles of natural assets in the Comox Lake watershed in providing safe, reliable drinking water supplies for residents of the Comox Valley; and,
- Develop and implement strategies for their effective management based on this understanding.

2. Background

MNAI collaborates with municipalities to develop resilient, long-term infrastructure alternatives at substantial savings. MNAI employs practical strategies to value nature's ability to provide municipal services and to incorporate this information into mainstream asset management systems. This practice is known as municipal natural asset management.

The Project Partners are individually and collectively committed to both sound management of the Comox Valley Watershed and to reliable, cost-effective delivery of core services such as drinking water provision to local communities.

3. Project Objective and Components

The goals of the project are:

(i) To understand the current and possible future roles of natural assets in the Comox Lake watershed in providing safe, reliable drinking water supplies for residents of the Comox Valley, and
(ii) To develop strategies for their effective management based on this understanding.

Objectives in support of the goals include:

(i) Quantifying the value of the Comox Lake watershed as a natural asset and a critical component of water quantity and quality in the drinking water system; and,
(ii) Determining associated costs and benefits relative to engineered alternatives (Cumberland water filtration) and/or long term operations and maintenance for engineered assets (CVRD water treatment plant).

All collaborators anticipate that at the end of the project period, Project Partners will have started to change decision-making so that Comox Valley Watershed natural assets are accounted for and managed as key assets.

More details are contained in the Project Fact Sheet (Annex 1). The Project Fact Sheet is taken as a basis for the project but elements may change as discussions continue and data is accumulated.

4. Scope of Work

MNAI will provide:

a) Project scoping support to ensure a common understanding amongst the Project Participants of the initiative and its objectives;
b) Municipal natural asset management guidance packages developed by MNAI;
c) Detailed guidance and/or templates for each of the 3 phases of the asset management cycle;
d) A research paper on infrastructure/natural asset funding programs, and summaries of four other research papers prepared for MNAI;
e) Three in-depth, on-site workshops, one for each asset management cycle phase, as follows:

- *Workshop 1*: introduce the asset management framework, ecosystem services and municipal natural asset management; describe how to conduct a natural asset inventory; and determine the condition and beneficiaries of natural assets as well as associated risks;

- *Workshop 2*: provide guidance on how to estimate the value of the services provided by identified natural assets, including introducing methodologies and data requirements;

- *Workshop 3*: provide guidance on: the development of operations and maintenance plans; the development of financial plans to maintain and replace the asset; and other strategies (e.g. Development Cost Charge Bylaws and Subdivision Bylaws; and private land issues) that may be considered to advance the better management, rehabilitation and restoration of identified natural assets;

f) Technical support to municipalities over 12 months at approximately 35 hours per month across the participating municipalities. This typically involves: support for scoping data needs; support in finding data sources to enable modelling; trouble-shooting; training on modelling (e.g. EPA SWMM model); support for developing an Operations and Maintenance plan (or equivalent where private land is involved);
g) Support to identify the natural assets of highest priority;
h) Economic analysis to determine the value of the natural assets' services in a single watershed;
i) Modelling for prioritised natural assets in the watershed (approximately 425 hours of modelling time will be provided)[1];
j) Project evaluation at the end of the pilot, based on monitoring that will be conducted throughout; and,
k) A final, 15-20-page public report that summarizes the project and its findings.

Project partners will:

a) Commit to supporting the identification of data sources, providing data, and working individually and to do the work required to fill in the templates;
b) Commit to exploring changes to decision-making as a result of the project, including, for example the items in the Project Fact Sheet (Annex 1);
c) Commit a multi-disciplinary staff team representing relevant departments such as Finance, Public Works, Planning, Engineering, and Parks. If the community already has an asset management committee then it will be important to ensure the involvement of someone from this group;
d) Designate projects lead that will also be the primary focal point for MNAI;
e) Commit a total of $105,000 over 2 years. This will cover modelling and other expenses additional to activities covered by the proposal to NRCAN and Province of BC;
f) Participate in project evaluation interviews at the close of the project; and,
g) Commit to follow-up exercises at 1, 2, and 3 years after the close of the project so that MNAI can assess long-term impacts.

Collaboration:
The Project Partners each have different organizational contexts, imperatives and timelines but nevertheless agree to work as a single team within the framework of a single project to achieve collectively agreed upon goals and objectives.

5. Transparency and Communications

There is a common understanding that project results, including from the ongoing monitoring, will be shared in a transparent manner in reports, presentations and articles. A communications plan and protocol will be provided by MNAI with additional details.

6. Expected Outcomes

- Enhancement of services to communities. This project will help to preserve and enhance vital flows of services from natural assets that contribute to community well-being.
- Management of community financial and asset risk. Natural capital assets can, in some cases, provide the same benefits or services to municipalities as engineered assets, at a lower cost.

[1]This work is additional but complementary to the activities funded by NRCAN/Province of BC

The project will help municipalities manage, preserve and/or enhance natural assets in ways that maintain or maximize these services.

- Enhancement of climate change resilience. Managing, preserving and/or enhancing some assets can create positive climate change resilience outcomes.
- Climate change mitigation. Some natural assets will sequester carbon, thus assisting in mitigation efforts.
- A replicable model. The project will provide additional evidence for natural asset management approaches that can be used with other natural assets in the Region, on Vancouver Island, or in other watersheds across Canada.

7. Project Deliverables:

- Capital cost calculation for water purification-related natural assets within the watershed;
- Completed project templates for each asset management phase;
- Modelling results;
- Operating cost calculation for water purification services of natural assets within the watershed. These include maintenance, monitoring and restoration costs;
- Scenario analysis to determine marginal change in service provision associated with changes to land use and/or environmental management;
- Comparison of the value of services provided by natural assets under different planning scenarios and/or environmental management scenarios;
- Understanding of how the project can be scaled to other watersheds;

8. Term
March 1 2019 to April 1 2020.

If either Party wishes to terminate the MOU then 1-month written notice will be provided. The financial commitment by the Project Partners noted in Section 4b is not refundable.

The undersigned agree to the terms of this MOU.

Russell Dyson, Chief Administrative Officer,

Comox Valley Regional District

Roy Brooke, Executive Director,

Municipal Natural Assets Initiative

Tina McLean, Band Administrator,

K'ómoks First Nation

Richard Kanigan, Chief Administrative Officer,

Town of Comox

David Allen, Chief Administrative Officer,

City of Courtenay

Sundance Topham, Chief Administrative Officer,

Village of Cumberland

Attachments: Annex 1 – Municipal Natrual Assets Initiative Project Fact Sheet – Comox Lake Watershed

Municipal Natural Assets Initiative Project Fact Sheet
Comox Lake Watershed

1 Purpose of Document

This document describes the Municipal Natural Assets Initiative (MNAI) project in the Comox Valley Regional District (CVRD), BC. It provides a basis for the MNAI launch workshop and for communication and outreach with internal and external stakeholders.

2 MNAI Background

MNAI collaborates with municipalities to develop resilient, long-term infrastructure alternatives at substantial savings. MNAI employs practical strategies to value nature's ability to provide municipal services and to incorporate this information into mainstream asset management systems. This practice is known as municipal natural asset management.

Experience to date shows that this can lead to positive changes in operations and maintenance plans and associated financial planning; development cost and subdivision bylaws, financial planning and reporting, and many other aspects of local government.

3 Project Context

The Comox Lake watershed (Figure 1) is the drinking water source for over 45,000 people in the City of Courtenay, the Town of Comox, and the CVRD electoral areas, as well as over 3,700 people in the Village of Cumberland. In 2018, the K'ómoks First Nation (KFN) signed a Mutual Benefit Agreement confirming cooperation and collaboration in the management of water resources in the region. The agreement includes plans to extend water services to KFN lands and greater participation by KFN in the management of regional water resources.

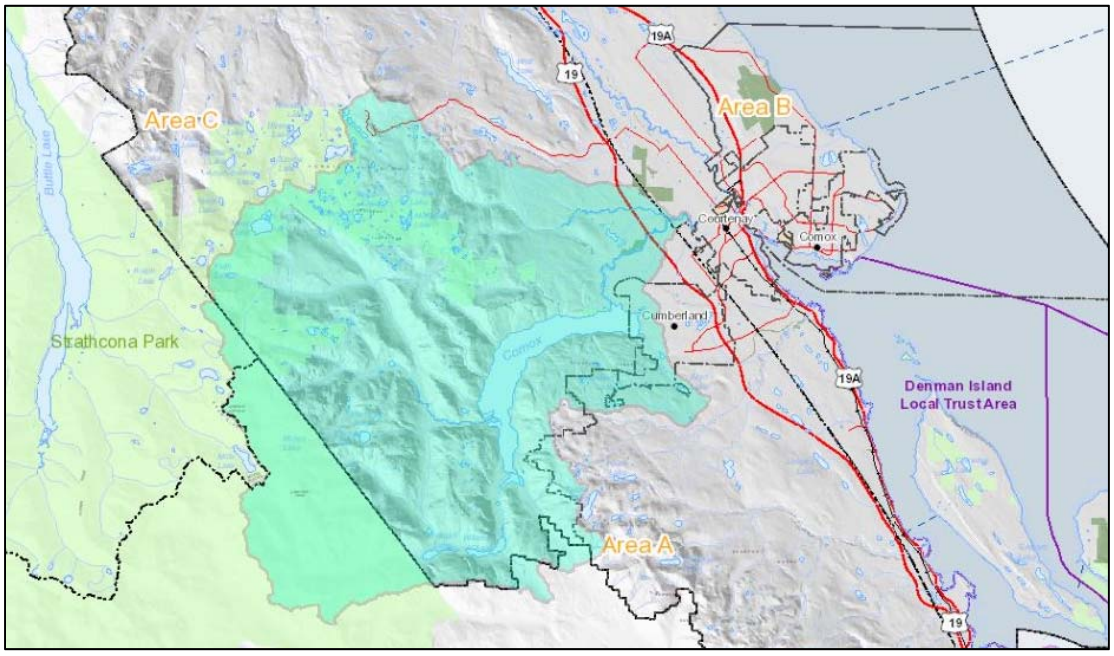

Figure 1. The Comox Lake watershed, in turquoise, and surrounding municipalities.

Policy related to the administration and operation of the Comox Valley water system is determined by the Comox Valley water committee, and comprises directors from Electoral Areas A, B, and C of the CVRD, as well as from the City of Courtenay and the Town of Comox. The water committee provides advice and recommendations to the CVRD board for actions such as adopting bylaws or entering contracts. Voting is weighted based on the water consumed in each participant area. Municipal administrators, engineering and operations staff as well as KFN serve as non-voting members of the water committee.

Policy for the administration of the Village of Cumberland water system is determined by the Council from the Village of Cumberland.

A major challenge in the Comox Lake watershed is that it is a multi-use watershed with multiple owners (Figure 2). Along the shoreline, there are nine different categories of landowners or responsible jurisdictions. The lands and waterways in the watershed are popular recreational destinations for swimming, boating, fishing and hiking, along with active logging throughout much of the watershed. The waterways of the Comox Lake watershed also provide critical fish and wildlife habitat and hydroelectric power generation, and supply drinking water to approximately 45,000 people in the Comox Valley.

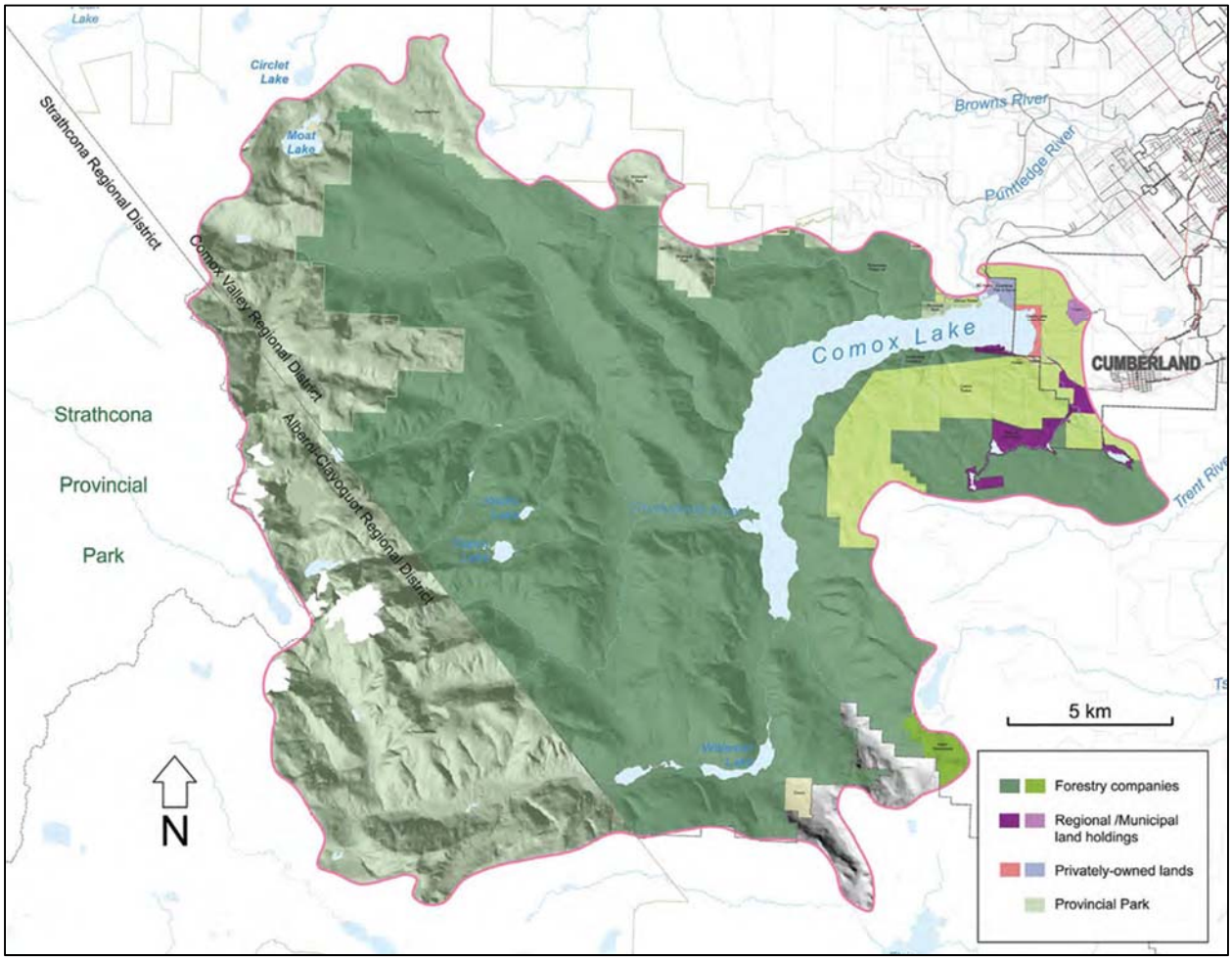

Figure 2. Ownership of lands in the Comox Lake watershed

The Village of Cumberland's water is supplied from a series of reservoirs within the Perseverance watershed, which is one of the sub-watersheds of the Comox Lake watershed. This system supplies drinking water to approximately 3,753 people in the Village of Cumberland (along with bulk water sales to approximately 2,000 people in Royston located in CVRD Electoral Area A). To date, this water system has met the requirements for filtration exemption, due to low levels of turbidity and *E. coli*, and a watershed control program that minimizes the potential for fecal contamination in the sources water. The naturally high quality of the water in this system currently provides a cost savings to the Village of Cumberland by avoiding the need for a costly water filtration plant. As such, the ability of the watershed to provide clean water for the Village of Cumberland is of great importance.

While heavy rainfall is common during the winter months, summer months are often characterized by extended periods with little to no rainfall. Periods of extreme low inflows can result in water shortages, requiring implementation of water use restrictions. Water levels in Comox Lake are controlled by BC Hydro for power generation purposes, and managed according to the Puntledge River Water Use Plan. However, there is also growing concern that dropping lake levels during an extreme drought could result in the complete cessation of flows in the Puntledge River.

High rainfall and inflows to Comox Lake in the winter months can adversely affect water quality via increased turbidity levels which have led to the requirement of boil water notices in the Comox Valley water system and ultimately the need for a water filtration plant for this system, which is currently in the planning stages. This project, which includes a new intake in Comox Lake, as well as pumping stations and pipelines, force mains, transmission mains and a filtration facility, is estimated to cost $110 million and will bring the Comox Valley water system into compliance with the provincial guidelines.

To better understand the potential effects of climate change on water availability, the CVRD engaged the Pacific Climate Impacts Consortium to model climate change impacts on hydrology for the Comox Lake watershed. The results of this work indicated the high likelihood of more and higher intensity rainfall events in the winter, and more and longer drought events in the summer, with overall warmer temperatures leading to a rain-dominated hydrological system rather than the hybrid snow-rain hydrological system that currently exists. These changes could have significant impacts on water quality and water availability for the Comox Lake watershed. As such, it would be beneficial to have a better understanding of the factors that could influence the capacity of the watershed to absorb excess winter water and prolong the release of water through warm/dry weather periods.

4 Project Details

The following sections summarize key details of the scope and objectives of the MNAI project:

4.1 Goal

The overall goals of the MNAI project are (i) to understand the current and possible future roles of natural assets in the Comox Lake watershed in providing safe, reliable drinking water supplies for residents of the Comox Valley, and (ii) to develop strategies for their effective management based on this understanding. Objectives in support of this goal include: (i) quantifying the value of the Comox Lake watershed as a natural asset and a critical component of water quantity and quality in our drinking water systems and (ii), determining associated costs and benefits relative to engineered alternatives (Cumberland water filtration) and/or long term operations and maintenance for engineered assets (CVRD water treatment plant).

4.2 Natural Assets of Interest

The Comox Lake watershed, including its sub-watersheds, is the primary asset of interest. The watershed spans 460 km2, with approximately 2/3 of this area under private ownership by forestry companies. Most of the remaining area is part of Strathcona Provincial Park, with a small amount under municipal land holdings and other private ownership.

Specific questions that will be explored include the value of natural assets relative to strictly engineered solutions for:

- The entire watershed in providing naturally high quality drinking water for the Comox Valley water system
- The Perseverance sub-watershed in providing drinking water meeting or exceeding the provincial and federal criteria for surface water drinking supplies for the Village of Cumberland

4.3 Biophysical Aspects and Services of Interest

- Biophysical aspects:
- The Comox Lake watershed falls on the central eastern coast of Vancouver Island. The watershed is fed by headwater streams and the Comox Glacier, which stands at 2000 m elevation. Most of the land in the watershed is undeveloped forests, approximately 2/3 of which is in active forestry. Over 10 tributary rivers and creeks feed into Comox Lake, which has a surface area of 21 km^2.
- The Comox Lake watershed is within the Coastal Western Hemlock and Mountain Hemlock biogeoclimatic zones. Their key feature from a water quality perspective is that the zones are considered "summer-dry maritime" zones – areas where little rain occurs in the summer months but heavy rainfall often occurs in winter months; and where large wildfires occasionally occur. Historically, the trees in the watershed grew to be very large and had strong root masses capable of withstanding very high stream flows. These same roots were able to stabilize steep slopes present in many areas of the watershed.
- Much of the watershed consists of a bedrock subsurface, however there are areas of unconsolidated glacial till toward the eastern edge of the watershed which are subject to erosion when exposed to overland flow or stream flow. The erosion of glacial till and other unconsolidated sediment contributes turbidity to Comox Lake during and after heavy rainfall events. Turbidity in Comox Lake has been one of the main drivers for construction of a water filtration plant for the Comox Valley water system. (The Village of Cumberland water system currently has filtration deferral due to high raw water quality.)
- Services:
- The ability of the Comox Lake watershed to provide a reliable, high quality raw water supply for the Comox Valley water system and Village of Cumberland water system
- Reduces water treatment costs for the Comox Valley water system, and continues to provide a surface water supply meeting the requirements for filtration exemption for the Village of Cumberland
- Supports indigenous cultural practices
- Provides fish and wildlife habitat
- Provides recreational opportunities including mountain biking, swimming, boating, fishing and hiking; and includes two lakeside campgrounds, one of which is part of the Comox and District Fish and Game Protective Association facilities.
- A dam on Comox Lake controls water for BC Hydro's hydroelectric power generation

4.4 Scenarios Under Consideration

- Status quo / baseline scenario
- Asset Management best practices
- Climate change impacts
- Other scenarios based on input from the MNAI working group

4.5 Possible Operational Outcomes

Each project collaborator (see Section 4.8) has different roles and responsibilities relative to the watershed. Broadly speaking, however, the following operational outcomes are foreseeable as a result of this project:

- Influence watershed protection plans
- Integration of natural asset purchase/restoration into capital plans
- Development of an Operation and Maintenance (O&M) plan for natural assets
- Zoning changes and setbacks
- Land use and access
- Collaborative approach to watershed protection and management

4.6 Outline of MNAI Approach

- Review historical natural systems
- Define the boundaries of the watershed
- Identify and work with jurisdictions and key stakeholders in the watershed
- Identify current assets and their condition
- Determine functions and service levels from current natural assets and integrate this information with the existing Asset Management process
- Determine required service levels in future scenarios
- Model asset changes that would meet required service levels
- Determine estimates of the lifecycle costs
- Financial modeling
- Land use discussions
- Communications approach (internal & external)

4.7 Data Sources, Needs, Gaps

- There are numerous data sources for the project including:
- Capital plans
- BC Hydro modelling process/data
- CVRD data on water quality, rainfall, water temperature, water use – current and projected – and more. LiDAR data has been collected and is now being processed.
- Village of Cumberland water quality and water use data
- Pacific Climate Impacts Consortium data
- Land use/land cover data
- Digitized point locations for known areas of erosion concern and an initial assessment to indicate areas of high, medium and low concern
- Soils data, which can likely obtain from provincial datasets

Furthermore:

- Integrating AM with the watershed protection and drinking water management planning will support lifecycle decision-making and prioritization associated with possible outcomes outlined in 4.5
- There is a need to clarify the asset management framework we are going to use for the watershed

4.8 Potential Collaborators

Firm support has been provided by the CVRD, the City of Courtenay, and the Village of Cumberland. Other stakeholders being approached for potential collaboration include the KFN, the Town of Comox, B.C. Hydro, and private landowners.

The process would be led by the CVRD, with oversight and final decision making by the Comox Valley water committee. The process would be guided by a working group, co-chaired by Kris La Rose, senior manager of water and wastewater with the CVRD, and Ryan O'Grady, Director of Engineering with the City of Courtenay, and including participation by the Village of Cumberland and KFN. One of the first steps in the process will be to identify key stakeholders and how they should be engaged and/or added to the working group.

4.9 Financial Contributions

The project partners would like to divide financial contribution over two fiscal years. Contributions by the various partners will be approximated based on total water consumption. The CVRD, the City of Courtenay and the Town of Comox all pay into the Comox Valley water service based on their consumption; as such the CVRD water service will pay the proportion representing these member municipalities. Cumberland's consumption is equivalent to approximately 10 per cent of the CVRD water system, and KFN's is approximately 1 per cent. MNAI has suggested the $105,000 contribution be spread over two fiscal years, with first payment prior to the end of March, 2019.

4.10 Partner Approval Processes

Project partner staff have reviewed and contributed to this project document, and are in support of its submission as an application to the MNAI watershed pilot program.

If supported by the MNAI, the CVRD, Cumberland and KFN plan to bring forward the MOU between local partners and MNAI to committee/council meetings at the end of January and early February for approval.