GREATER VANCOUVER WATER DISTRICT (GVWD)
BOARD OF DIRECTORS

REGULAR BOARD MEETING
Friday, February 26, 2021
9:00 A.M.
28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia

Membership and Votes

A G E N D A[1]

A. ADOPTION OF THE AGENDA

1. February 26, 2021 Regular Meeting Agenda
That the GVWD Board adopt the agenda for its regular meeting scheduled for February 26, 2021 as circulated.

B. ADOPTION OF THE MINUTES

1. January 29, 2021 Regular Meeting Minutes
That the GVWD Board adopt the minutes for its regular meeting held January 29, 2021 as circulated.

C. DELEGATIONS

D. INVITED PRESENTATIONS

E. CONSENT AGENDA
Note: Directors may adopt in one motion all recommendations appearing on the Consent Agenda or, prior to the vote, request an item be removed from the Consent Agenda for debate or discussion, voting in opposition to a recommendation, or declaring a conflict of interest with an item.

[1] *Note: Recommendation is shown under each item, where applicable. All Directors vote unless otherwise noted.*

1. CLIMATE ACTION COMMITTEE REPORTS

1.1 2021 Water Sustainability Innovation Fund Applications

That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund for the following projects:

a) Building Information Modeling (BIM): Transforming Utilities Information Management: $800,000 over two years starting in 2021;
b) Microplastics Study in Source Waters and Water Treatment: $150,000 over two years starting in 2022;
c) Next Generation Snowpack Monitoring, Phase 2: $400,000 over two years starting in 2021;
d) Visual Documentation of Key Water Services Infrastructure: $700,000 over two years starting in 2022; and,
e) Industrial, Commercial & Institutional Sector Migration – Impact on Water Services: $150,000 over two years starting in 2021.

F. ITEMS REMOVED FROM THE CONSENT AGENDA

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

I. OTHER BUSINESS

J. BUSINESS ARISING FROM DELEGATIONS

K. RESOLUTION TO CLOSE MEETING

Note: The Board must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

That the GVWD Board close its regular meeting scheduled for February 26, 2021 pursuant to the *Community Charter* provisions, Section 90 (1) (c), (e), (g) and (i) as follows:

"90 (1) A part of a board meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

(c) labour relations or other employee relations;
(e) the acquisition, disposition or expropriation of land or improvements, if the board or committee considers that disclosure could reasonably be expected to harm the interests of the regional district;
(g) litigation or potential litigation affecting the regional district; and
(i) the receipt of advice that is subject to solicitor-client privilege, including communications necessary for that purpose."

L. RISE AND REPORT (Items Released from Closed Meeting)

M. ADJOURNMENT/CONCLUSION

That the GVWD Board adjourn/conclude its regular meeting of February 26, 2021.

GREATER VANCOUVER WATER DISTRICT
BOARD OF DIRECTORS

Minutes of the Regular Meeting of the Greater Vancouver Water District (GVWD) Board of Directors held at 10:08 a.m. on Friday, January 29, 2021 in the 28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia.

MEMBERS PRESENT:

Burnaby, Chair, Director Sav Dhaliwal
North Vancouver City, Vice Chair Director Linda Buchanan*
Anmore, Director John McEwen*
Belcarra, Director Carolina Clark*
Burnaby, Director Pietro Calendino*
Burnaby, Director Mike Hurley*
Coquitlam, Director Craig Hodge*
Coquitlam, Director Richard Stewart*
Delta, Director George Harvie*
Delta, Alternate Director Bruce McDonald* for Dylan Kruger
Electoral Area A, Director Jen McCutcheon*
Langley City, Director Gayle Martin*
Langley Township, Director Jack Froese*
Langley Township, Director Kim Richter*
Maple Ridge, Director Mike Morden*
New Westminster, Director Jonathan Coté*
North Vancouver District, Director Lisa Muri*
Pitt Meadows, Director Bill Dingwall*
Port Coquitlam, Director Brad West*
Port Moody, Director Rob Vagramov*
Richmond, Director Malcolm Brodie*
Richmond, Director Harold Steves*
Surrey, Director Linda Annis*
Surrey, Director Doug Elford*
Surrey, Director Laurie Guerra*
Surrey, Director Doug McCallum*
Surrey, Director Mandeep Nagra*
Surrey, Director Allison Patton*
Tsawwassen, Director Ken Baird*
Vancouver, Director Christine Boyle*
Vancouver, Director Adriane Carr*
Vancouver, Director Melissa De Genova *
Vancouver, Director Lisa Dominato*
Vancouver, Director Colleen Hardwick*
Vancouver, Alternate Director Pete Fry* for Kennedy Stewart
Vancouver, Director Michael Wiebe*
West Vancouver, Director Mary-Ann Booth*
Commissioner Jerry W. Dobrovolny (Non-voting member)

MEMBERS ABSENT:

None

OTHERS PRESENT:

Bowen Island, Councillor David Hocking*
Lions Bay, Mayor Ron McLaughlin*
White Rock, Mayor Darryl Walker*

STAFF PRESENT:

Lauren Cichon, Legislative Services Coordinator, Board and Information Services
Chris Plagnol, Corporate Officer

*denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

A. ADOPTION OF THE AGENDA

1. January 29, 2021 Regular Meeting Agenda

It was MOVED and SECONDED
That the GVWD Board adopt the agenda for its regular meeting scheduled for January 29, 2021 as circulated.

CARRIED

B. ADOPTION OF THE MINUTES

1. November 27, 2020 Regular Meeting Minutes

It was MOVED and SECONDED
That the GVWD Board adopt the minutes for its regular meeting held November 27, 2020 as circulated.

CARRIED

C. DELEGATIONS

No items presented.

D. INVITED PRESENTATIONS

No items presented.

E. CONSENT AGENDA

No items presented.

F. ITEMS REMOVED FROM THE CONSENT AGENDA

No items presented.

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

No items presented.

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

No items presented.

I. OTHER BUSINESS

1. GVWD Board Committee Information Items and Delegation Summaries

It was MOVED and SECONDED
That the GVWD Board receive for information the GVWD Board Committee Information Items and Delegation Summaries, dated January 29, 2021.

CARRIED

J. BUSINESS ARISING FROM DELEGATIONS

No items presented.

K. RESOLUTION TO CLOSE MEETING

It was MOVED and SECONDED

That the GVWD Board close its regular meeting scheduled for January 29, 2021 pursuant to the *Community Charter* provisions, Section 90 (1) (e) and (g) as follows:

"90 (1) A part of a board meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

(e) the acquisition, disposition or expropriation of land or improvements, if the board or committee considers that disclosure could reasonably be expected to harm the interests of the regional district; and

(g) litigation or potential litigation affecting the regional district."

CARRIED

L. RISE AND REPORT (Items Released from Closed Meeting)

No items presented.

M. ADJOURNMENT/CONCLUSION

It was MOVED and SECONDED

That the GVWD Board adjourn its regular meeting of January 29, 2021.

CARRIED

(Time: 10:10 a.m.)

CERTIFIED CORRECT

Chris Plagnol, Corporate Officer

Sav Dhaliwal, Chair

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metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

To: Climate Action Committee

From: Lucas Pitts, Director, Policy, Planning and Analysis
Water Services Department

Date: January 26, 2021 Meeting Date: February 12, 2021

Subject: **2021 Water Sustainability Innovation Fund Applications**

RECOMMENDATION

That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund for the following projects:

a) Building Information Modeling (BIM): Transforming Utilities Information Management: $800,000 over two years starting in 2021;
b) Microplastics Study in Source Waters and Water Treatment: $150,000 over two years starting in 2022;
c) Next Generation Snowpack Monitoring, Phase 2: $400,000 over two years starting in 2021;
d) Visual Documentation of Key Water Services Infrastructure: $700,000 over two years starting in 2022; and,
e) Industrial, Commercial & Institutional Sector Migration – Impact on Water Services: $150,000 over two years starting in 2021.

EXECUTIVE SUMMARY

The Climate Action Committee is responsible for overseeing the Sustainability Innovation Funds, and for making all funding recommendations to the respective Boards. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration. This report presents five projects recommended for funding, totaling $2,200,000 over three years, which will be funded through the Water Sustainability Innovation Fund. The projects cover a range of areas including water supply, water quality and infrastructure.

PURPOSE

To present five projects recommended for Sustainability Innovation Funding for the Climate Action Committee and the GVWD Board's consideration.

BACKGROUND

The Water Sustainability Innovation Fund was created by the Board in 2004 to provide financial support to Water projects that contribute to the region's sustainability. The GVWD Board adopted the *Water Sustainability Innovation Fund Policy* in 2014, with further amendments in 2016, to guide the use and management of the Fund. The Policy describes the process of generating, submitting, evaluating and recommending proposals for funding each year.

The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

WATER SUSTAINABILITY INNOVATION FUND POLICY

On an annual basis, Water projects are submitted to an internal staff Steering Committee, representing a cross-section of the organization, to evaluate projects and initiatives based on the Fund's evaluation criteria. As defined in the policy, projects need to fulfill the following criteria:

- Be overseen by the GVWD;
- Be consistent with the authority and responsibility of the GVWD;
- Be consistent with the objectives of the *Drinking Water Management Plan* and/or the *Board Strategic Plan;*
- Consider partnerships including, but not limited to, member jurisdictions, academic institutions, non-governmental organizations, and community groups;
- Result in a positive contribution, in the form of tangible results and/or measurable benefits, to the sustainability of the region; and,
- Demonstrate innovation and facilitate action.

On an annual basis the Climate Action Committee receives an update report on the projects supported by the Fund including the deliverables, outcomes, and the measurable benefits of these projects to the region's sustainability. A summary of past projects can be found on the Sustainability Innovation Program website.

2021 APPLICATION PROCESS

An internal call for proposals closed on November 6, 2020 and five Water proposals were considered by the cross-departmental Sustainability Innovation Fund Steering Committee, comprised of representatives from seven different departments within Metro Vancouver.

The Steering Committee evaluated the submissions and determined the proposals have strong alignment with promoting regional sustainability and innovation. The proposals recommended for funding by the Steering Committee are listed in the table below with additional detail provided in the executive summaries (Attachment 1).

Recommended Allocation from the Water Sustainability Innovation Fund		
Project Title	**Year**	**Amount Requested**
Building Information Modeling (BIM): Transforming Utilities Information Management	2021-2022	$800,000
Microplastics Study in Source Waters and Water Treatment	2022-2023	$150,000
Next Generation Snowpack Monitoring, Phase 2	2021-2022	$400,000
Visual Documentation of Key Water Services Infrastructure	2022-2023	$700,000
Industrial, Commercial & Institutional Sector Migration – Impact on Water Services	2021-2022	$150,000
Total		**$2,200,000**

ALTERNATIVES

1. That the GVWD Board approve the allocation from the Water Sustainability Innovation Fund for the following projects:
   a) Building Information Modeling (BIM): Transforming Utilities Information Management: $800,000 over two years starting in 2021;
   b) Microplastics Study in Source Waters and Water Treatment: $150,000 over two years starting in 2022;
   c) Next Generation Snowpack Monitoring, Phase 2: $400,000 over two years starting in 2021;
   d) Visual Documentation of Key Water Services Infrastructure: $700,000 over two years starting in 2022; and,
   e) Industrial, Commercial & Institutional Sector Migration – Impact on Water Services: $150,000 over two years starting in 2021.

2. That the Climate Action Committee receive for information the report dated January 26, 2021, titled "2021 Water Sustainability Innovation Fund Applications" and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If the Board approves Alternative 1, $2,200,000 for the five projects will be disbursed from the Water Sustainability Innovation Fund over three years. The Fund has sufficient budget to support Alternative 1.

Approved projects will be incorporated into the applicable work plans and budgets.

CONCLUSION

The Water Sustainability Innovation Fund was created by the Board in 2004 to provide financial support for Water projects that contribute to the region's sustainability. The *Water Sustainability Innovation Fund Policy* guides the use and management of the Fund and describes the process of generating, submitting, evaluating and recommending proposals for funding each year. The Climate Action Committee is responsible for overseeing the Fund, and for making all funding recommendations to the GVWD Board. Staff assist the Climate Action Committee in reviewing and evaluating all proposals that are submitted for consideration.

This report presents the Steering Committee's recommendation to fund the following project proposals:

- Building Information Modeling (BIM): Transforming Utilities Information Management
- Microplastics Study in Source Waters and Water Treatment
- Next Generation Snowpack Monitoring, Phase 2
- Visual Documentation of Key Water Services Infrastructure
- Industrial, Commercial & Institutional Sector Migration – Impact on Water Services

Additional details of each project are provided in the executive summaries (Attachment 1). Staff recommend that the Climate Action Committee approve the Steering Committee's recommendations for funding the proposals and forward the recommendations to the GVWD Board for consideration. Staff recommendations are presented as Alternative 1.

Attachment

1. Water Services Sustainability Innovation Fund – Executive Summaries *(43397633)*

Reference

1. http://www.metrovancouver.org/services/air-quality/sustainability-innovation-program/Pages/default.aspx

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Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Building Information Modeling (BIM) - Transforming Metro Vancouver Utilities Information Management**

Amount Requested from Sustainability Innovation Fund: $800,000 (2021-2022)

Purpose:

> 'Building Information Modeling (BIM) is the process of designing, constructing or operating a building or infrastructure assets using object-oriented design.' (British Standards Institute, 2013)

This SIF project is intended to explore and advance the potential of BIM for Metro Vancouver Utilities.

Specifically, it is proposed that the project be conducted in three phases over 6 years, each stage-gated for review and approval to proceed. The initial Phase I request for funding is $800,000 and the total estimated cost for all three proposed phases is $2.2 M.

Project Objectives:

The long term objectives of this project are to fully evaluate and integrate BIM best practices into Metro Vancouver operations. The specific Phase I objectives are:

- To research and develop BIM policies and standards applicable for the Utilities environment
- To explore BIM templates for discipline specific content and incorporate component Tag/Equipment Location Number data
- To review existing procedures to incorporate 3D review processes throughout the infrastructure lifecycle
- To incorporate laser scanning standards and capabilities to enable creation of BIM models for existing infrastructure

Contributions to Regional Sustainability:

The project supports the aims of the Board Strategic Plan, the Resilient Region Strategic Framework, the Drinking Water Management plan, and the Liquid Waste Management Plan. It promotes sustainability practices in utilities infrastructure design, development, operations and maintenance. BIM utilization will not only add lifecycle value to capital projects but also enhance sustainable operations and maintenance of the overall infrastructure. This includes:

- More efficient and quality driven design employing sustainable BIM driven processes
- More collaborative environment for the Architecture-Engineering-Consulting (AEC) teams to communicate / share
- Faster, safer, less wasteful construction
- More cost-effective, sustainable operation and maintenance of water and liquid waste infrastructure

Innovation Element:

BIM offers an innovative approach to integrated design, construction, operation and maintenance of utilities infrastructure. The successful introduction and integration of BIM into Metro Vancouver will begin to yield:

- Up to 10% cost reduction during design of projects (e.g. reduce rework)
- Up to 10% cost reduction on change orders during construction
- Greater ease in compliance with safety regulations (e.g. meeting Confined Space Entry requirements)

Tangible Benefits and Outcomes:

The Phase I deliverables will include:

- BIM policies and standards, including owner's information requirements from AEC teams
- Templates, procedures, work flows and checklists for design and review with BIM 3D models
- Pilot BIM 3D model tools with trained and knowledgeable staff
- Laser scanning standards and capabilities for creating BIM models for existing infrastructure

The Phase I benefits will be from projects that support collaborative use of 3D technologies and data, combined with BIM design workflows, resulting in:

- Improved design quality and reduced field engineering
- Clear insight into constructability issues and required sequencing
- Reduction in construction delays due to contractor misinformation around site conditions
- Improved ability to relay design intent to contractors

Phase II (future application pilots) would further the utility of BIM beyond initial project design to include:

- Field-based, mobile access to BIM 3D models, contract specifications and drawings
- Workflow configurations to support RFI's, CO's, Submittals and Shop Drawings
- Dashboard reporting tools

Phase III (future SIF application) would involve piloting of a Digital Twin environment that explores integration with Enterprise Asset Management (EAM), GIS and other corporate systems to optimize infrastructure management, including planning, performance benchmarking, asset management, and business intelligence.

Members and other Partners:

Based on the BIM strategy development work completed in 2020, the Metro Vancouver BIM Utilites Steering Committee will continue to provide oversight on this project. The Steering Committee has senior management representatives from the Water, Liquid Waste, Project Delivery and Corporate Services departments and is well positioned to support this project.

Lessons learned from each phase will be shared with member municipalities, for their consideration in adopting best practices in utilities infrastructure information management.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Microplastics Study in Source Water and Water Treatment**

Amount Requested from Sustainability Innovation Fund: $150,000 (2022-2023)

Purpose:

This study will evaluate the presence and concentration of microplastics in Metro Vancouver's source waters (Capilano, Seymour, and Coquitlam), treatment residuals from the Seymour Capilano Filtration Plant (SCFP) and within the water treatment train at SCFP and the Coquitlam treatment plant.

Project Objectives:

The long-term objective of this project is to provide Metro Vancouver and member municipalities with additional information on microplastics within the drinking water treatment and transmission system. Key objectives include:

- To provide additional information on the presence or absence of microplastics in source reservoirs.
- To determine the concentration of microplastics throughout the water treatment process and in water treatment residuals at the Seymour Capilano Filtration Plant.
- To determine the potential vertical distribution of microplastics (if identified during the pilot project) in the water column.
- To develop a base understanding of the role atmospheric deposition plays of microplastics within Metro Vancouver's protected watersheds.
- To develop a foundation for further microplastic study within the drinking water treatment and transmission systems as well as within other departments such as Liquid Waste Services.

Contributions to Regional Sustainability:

Environmental Benefits – determining an elementary understanding via background review of how microplastics in Metro Vancouver source waters may impact the environment, specifically zooplankton up to larger animals such as fish.

Social/Community Benefits – improving the understanding of contaminants within Metro Vancouver source waters to ensure drinking water is treated suitably. This has region-wide benefits for Public Health in maintaining water quality.

Economic/Financial Benefits – there are significant economic benefits to the region by providing increased knowledge of: source water quality, water treatment efficiency of microplastics, and the potential for consideration needing to be given to future treatment processes.

Gaining further knowledge on the presence of potential emerging contaminants will help Metro Vancouver to better prepare and anticipate possible changes necessary at the treatment plants. This knowledge facilitates the maintenance of a reliable and resilient regional water supply.

The results of this project will help inform planning of future water treatment processes as well as assessment of potential sources of contamination for Liquid Waste Services processes.

Innovation Element:

This project would be Metro Vancouver's first evaluation of microplastic contamination in source water and within the treatment process. The evaluation will solicit the best available local expertise for the most current technologies for sample collection and analysis.

Tangible Benefits and Outcomes:

The results of the Pilot Project will be compiled into a technical report providing the concentration of microplastics in one water sample collected from the Seymour reservoir and within one water treatment residual sample from the SCFP. The technical report will be used to support long-term planning for both the operations and maintenance of the SCFP as well as to provide LWS with background atmospheric deposition data of microplastics in the region.

If a full study is warranted, a second technical report will be completed that will provide the concentrations of microplastics at discrete locations within the water column samples from the Capilano, Seymour, and Coquitlam reservoirs as well as within the treatment train at both the SCFP and Coquitlam treatment plant. This will provide preliminary data on the distribution of microplastics vertically throughout the reservoirs and how efficiently the treatment process removes microplastics from source water.

The results of both studies can be used to inform the 2019 SIF project '*Treating Emerging Contaminants of Concern*' that aims to determine the ability of the SCFP to treat emerging contaminants (including microplastics) and obtain recommendations for new treatment processes and/or changes to plant operations.

Members and other Partners:

A dialogue with three organizations UBC, Vancouver Aquarium and Ocean Wise, who are able to complete the sample collection and analysis methodology will be initiated upon approval of the project.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Next Generation Snowpack Monitoring, Phase 2**

Amount Requested from Sustainability Innovation Fund: $400,000 (2021-2022)

Purpose:

The first phase of the Next Generation Snowpack Monitoring project (NGSM) was approved for funding by the Sustainability and Innovation Fund in 2019. Initially, the goal of this project was to investigate emerging remote sensing technologies, and look for ways to integrate them into the existing watershed snowpack monitoring program. Satellite imagery and snow cover algorithms, and aerial Light Detection and Ranging (LiDAR) surveys showed the most promise in our specific mountain environment. These tools were tested during the 2019 and 2020 winters. One goal of the project was to validate data collected remotely through additional manual snow measurements. Unfortunately, this work was very limited do to COVID-19 physical distancing requirements.

LiDAR surveys have shown great promise for improving our understanding of snow depth and distribution across the watershed areas. We hope to continue and build on this work over the next two winter seasons. Our primary objective is to refine the data collection and processing workflows, and start to produce operational products for water supply planning. In addition, we plan to continue exploring other remote sensing tools that have the potential to fill important data gaps.

Project Objectives:

This project has the following objectives:

- Enhance the watershed snowpack monitoring program by utilizing emerging technologies and processes;
- Increase the spatial and temporal density of snow observations;
- Use the collected data to more accurately estimate stored water volume in the snowpack for water supply planning, research, climate change monitoring, and education; and
- Reduce the reliance on manual observations, which will result in a safer more cost effective snow monitoring program.

Contributions to Regional Sustainability:

This project can potentially contribute to regional sustainability by providing the following benefits:

1. Ongoing satellite analysis of snow conditions in the watersheds for climate change studies and resilience. Historical satellite imagery (back to ~1990) can be analyzed to show change and variability over time. This information can then be used to advocate for water conservation or changes in current water supply planning targets.
2. Images, and particularly images that show change over time, tell a much more compelling story than numbers and graphs. Images can be used to educate partners and citizens on how source water in monitored and managed, and what implications a changing climate might have for our water supply. It may be possible to use developed data and graphics for Climate 2050 Reporting and Communication.

3. LiDAR data can be used for other studies. Some possibilities include forest health monitoring, and landslide analysis and monitoring. Recent research has demonstrated how our watershed LiDAR data can be used to quantify current forest composition and ecosystem components.
4. Once remote monitoring processes are established, it may be possible to partially reduce the reliance on manual snow observations. This could reduce staff and helicopter time involved, which in turn would reduce overall program costs.

Innovation Element:

This project is an attempt to integrate cutting edge technology into the existing snow monitoring program. It uses an innovative and balanced approach to measuring and monitoring snowpack conditions in our watersheds. Many of the tools proposed have been well researched but have not been used collectively in an operational snow monitoring program.

Tangible Benefits and Outcomes:

Benefits and outcomes from this project include:

1. Updated and refined snow reports and graphics for water supply analysis;
2. Data will be used to more accurately quantify the contribution of seasonal snow to the region's water supply, which is of particular importance with changing climate;
3. Additional data will be incorporated into hydrological models to improve/refine current products like the Capilano and Seymour Reservoirs stop-spill prediction, alpine lake refill models, and snowmelt runoff forecasts;
4. Additional data to be incorporated into climate change models and climate change predictions; and
5. Detailed and accurate satellite and 3D snow maps of the watersheds to be used for education and communication purposes.

Members and other Partners:

Water Services, Watershed and Environmental Management (WEM), will lead this project. Much of the manual validation data will be collected by WEM staff.

WEM has partnered with researchers from Vancouver Island University, the University of Northern British Columbia, and the Hakai Institute to collect and process LiDAR and drone-based photogrammetry from watershed areas.

This group works with BC Hydro and several other regional districts to collect, process, and analyze LiDAR data, and to model stored water in the seasonal snowpack.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Visual Documentation of Key Water Services Infrastructure**

Amount Requested from Sustainability Innovation Fund: $700,000 over 2 years (2022: $600,000; 2023: $100,000)

Purpose:

This project would create a visual database of some of Metro Vancouver's key pieces of drinking water infrastructure, including dams and water treatment plants. The visual database would result in a potential number of services, including 360° site walk-throughs that allow for remote management and visualization and measurable 2D and 3D images that document existing conditions, as well as accurate and representative floorplans. Having an accurate inventory of Metro Vancouver's infrastructure is crucial to effectively managing assets and making informed decisions about future development.

Project Objectives:

The long-term objectives of this project are to:

- Construct a visual database of Metro Vancouver's key pieces of drinking water infrastructure that can be accessed remotely.
- Develop a detailed infrastructure inventory to promote resilient design and innovation as well as provide a base assessment of infrastructure for asset management.
- Help create an accurate foundation for modelling platforms such as Building Information Modelling (BIM).

Contributions to Regional Sustainability:

The project supports the aims of the Drinking Water Management Plan and Integrated Liquid Waste and Resource Management Plan. The project deliverables can be incorporated into a strong foundation for better asset management, as well as:

- Supporting Environmental Impact Assessments
- Potentially providing 3D walkthroughs of public areas, such as the top of the Capilano Dam, on the Metro Vancouver website.
- Can save time and money on future construction or modification projects of scanned infrastructure.
- Can support sustainable construction, especially when integrated with BIM (or similar platform).

Innovation Element:

This project would be the first of its type at Metro Vancouver. Some of the technology used to create a visual database is relatively new. For instance, while 2D imagery can provide very useful information and record keeping, the newer technology of 3D imagery can allow users to accurately calculate measurements of any object captured in that image in seconds.

This type of work goes beyond the basic as-built drawings for a facility, which can easily include inaccuracies and therefore become out of date. Creating visual documentation of an existing building and

allowing for this data to be built upon over time, provides an innovative and new way of creating records, minimizing risk and liability, and supporting decision making for future construction and modifications.

Tangible Benefits and Outcomes:

This project would result in the following:

- 3D virtual walkthroughs of scanned infrastructure
- Accurate and representative 2D and 3D floorplans
- 3D building models based on real physical building information
- Measurable 2D and 3D images

Integration with BIM

The raw data from this project, as well as the constructed 3D building models, will have the ability to be integrated into BIM for assimilation into larger asset management tools. The comprehensive data that laser scanning collects, called Point Cloud data, enables projects to realize clear benefits associated with the following:

- Improved design quality and reduced field engineering
- Better design co-ordination with existing plant layout
- Reduced reliance on facility documentation for existing conditions
- Clear insight into constructability issues and required sequencing
- Reduction in construction delays due to contractor misinformation around site conditions
- Improved ability to relay design intent to contractors

This project will provide not only advantages to Water Services by creating benefits to Engineering and Construction as well as Operations and Maintenance, but it will provide Metro Vancouver with larger-scale benefits by providing accurate 3D models for inclusion into Metro Vancouver's BIM platform.

Members and other Partners:

This project would require the technical consultants to conduct the work, analyze the data, and create the project deliverables. Metro Vancouver staffing would be sufficient to provide project management and will work closely with the Metro Vancouver BIM Utilities Steering Committee throughout the project.

Sustainability Innovation Fund: Water Services
Executive Summary

Project Name: **Industrial, Commercial & Institutional Sector Migration – Impact on Water Services**

Amount Requested from Sustainability Innovation Fund: $150,000 (2021-2022)

Purpose:

Land use patterns are changing rapidly as increasing growth pressures in the region and rising land value has driven industry and other businesses to move to more cost-effective areas within and outside the GVWD. Industry uses large volumes of water in their product or in manufacturing and migration factors can also include not only the cost of land but needing; more land space for expansion or for lower lease rates, access to major highways or ports or to be near labour pool and public transportation for employees.

This project will look at how future Industrial, Commercial & Institutional (ICI) sector development/buildout in the region may occur and its potential to shift water demand in the region and impact water system servicing infrastructure.

Project Objectives:

At its core, the project will look for local causes of business migration and develop both a 100 year ICI sector buildout scenarios and a long-range ICI water demand forecasting tool. A consultant will be selected through an RFP process and as part of the work will:

- Compare historical ICI sector water usage and water rates across GVWD members.
- Compare current ICI sector water usage and water rates to other jurisdictions (Abbotsford, Calgary, Toronto and Montreal).
- Review past 20-year migration of ICI sector within and from Metro Vancouver.
- Identify any correlation between ICI sector migration with water rates and land availability and cost.
- Based on Regional Growth Strategy, study the potential changes in land-use and project how this may impact the ICI sector - the types of business it will support.
- Develop ICI sector buildout scenarios and their impact on water demand as it aligns with MV Water Supply Outlook 2120.
- Investigate water conservation/efficiency potential within the ICI sector.
- Assess the potential impacts of climate change on estimated future ICI sector water demand.
- Develop a water demand forecasting tool for the ICI sector.

Contributions to Regional Sustainability:

The work will use Metro Vancouver 2040: Shaping our Future, the regional growth strategy and its goal's i.e. "Support a Sustainable Economy". Several ICI build out scenarios to year 2120 will be developed and water demand modeled.

This project does not supersede Metro 2040 and is not intended to be used for Economic Development.

Innovation Element:

The ICI project is innovative because similar evaluation has not been completed by other jurisdictions and it builds upon the 2016 SIF funded Densification project that assessed residential water demand and determined relationships with land use developments.

Tangible Benefits and Outcomes:

Migration of the ICI sector has not been assessed and has the potential to shift water demand in the region. This project will estimate future ICI water demand and how it may impact planning of future water supply infrastructure.

Members and other Partners:

MV Regional Planning will participate and support the project. WS will reach out to partner with businesses, associations and municipalities.