

## REPORT TO SAANICH PENINSULA WASTEWATER COMMISSION MEETING OF THURSDAY, APRIL 2, 2026

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**SUBJECT** District Energy System Efficiencies, Operations, and Potential for Future Expansion

### **ISSUE SUMMARY**

To respond to the Saanich Peninsula Wastewater Commission (SPWWC) referral motion directing staff to investigate the potential expansion of the District Energy System (DES) using recovered wastewater heat from the Saanich Peninsula Wastewater Treatment Plant (SPWWTP).

### **BACKGROUND**

The Saanich Peninsula DES was introduced in 2011 to recover heat from treated effluent at the SPWWTP and supply it to the Panorama Recreation Centre primarily for pool heating. The existing DES reduces the Capital Regional District's (CRD) corporate greenhouse gas emissions by approximately 320 tCO<sub>2</sub>e per year by displacing natural gas.

Following discussion at the October 21, 2025 SPWWC meeting on the opportunities for connecting the DES to neighbouring residential properties, the Commission directed that "the request be referred to staff for more information and to ask staff to bring back a report on existing system efficiencies, operations and potential for future expansions."

This report describes relevant operational and performance considerations of the current DES and presents staff recommendations to maintain the existing service and evaluate future expansion options.

### **ANALYSIS**

#### **Performance and Capacity**

The DES has successfully reduced emissions at the Panorama Recreation Centre by approximately 320 tCO<sub>2</sub>e per year since it has been in operation. However, heat recovery performance varies seasonally, with winter shutdowns being a frequent occurrence when low temperatures trigger freeze-protection measures. Between 2020 and 2025, the heat pump used for heat recovery was offline approximately 10% of winter operating time, requiring the Panorama Recreation Centre to revert to natural gas heating.

Winter performance is the main operational constraint limiting expansion of the DES to new customers, as the current system is unable to reliably meet seasonal heating demands. However, there is a project currently underway at the Panorama Recreation Centre that is expected to significantly reduce the need for external heating supply and provide capacity within the existing DES that could serve additional demands beyond the recreation centre.

#### **Asset Condition**

The DES is now 15 years old, and it is expected that certain equipment and system components are approaching the end of their original design life. As these assets age, the likelihood of reduced performance, increased maintenance requirements, and unplanned outages typically increases.

To date, a comprehensive condition assessment of the DES has not been completed. Undertaking a formal condition assessment would provide staff with a clearer understanding of the current state of critical assets and the timing of renewal or replacement needs. This information would support capital planning and help forecast the timing of investments required to maintain the DES as a reliable, low-carbon heating source for the CRD.

In addition, a detailed understanding of asset condition would establish a foundation for further engineering evaluations for potential service expansion. Identifying components that are nearing renewal or replacement would enable the SPWWC to assess opportunities to improve overall system reliability and explore options to optimize or potentially increase system capacity. This information is important to understanding the potential of expanding the system to serve new loads.

### **Potential Expansion Opportunities**

#### *Panorama Recreation Centre*

Panorama may be able to accept limited additional energy (e.g., building heating or domestic hot water) from the DES if winter reliability improves. The feasibility of this option will be better known once the Panorama Energy Recovery Project is commissioned and operational data are available. Commissioning is currently scheduled to be completed in Summer 2026.

#### *Saanich Peninsula Wastewater Treatment Plant Administration Building*

The administration building at the SPWWTP is used as the primary office, lab and workspace for the operations team. A preliminary review suggests that the existing natural gas-fired air handling units at the administration building could be retrofitted to hydronic heating compatible with the DES. Distribution piping is also already in place. Initial estimates of the climate impacts indicate that connecting the administration building to the DES could reduce emissions by approximately 170 tCO<sub>2</sub>e annually, representing roughly 6% of the CRD's total corporate emissions. Connection of the administration building to the DES is identified in the CRD Climate Action Strategy as a measure supporting corporate 2030 greenhouse gas (GHG) reduction targets.

#### *KELSET Elementary School*

Staff engaged with School District 63 regarding the potential to connect the DES to KELSET Elementary School which is near existing infrastructure. The School District indicated interest in receiving additional information about a potential connection. The school's existing heating, ventilation, and air conditioning (HVAC) system consists of a hydronic heating loop served by boilers, which is compatible with district energy systems; however, further technical review would be required to confirm feasibility.

#### *McTavish Road – East Saanich Road Development*

The 2025 District of North Saanich Official Community Plan identifies a Development Permit Area for commercial development at the intersection of McTavish Road and East Saanich Road. This location is approximately 600 m from the existing DES distribution piping and could represent a potential future connection opportunity. Detailed development information is not available at this time.

### *Centre for Plant Health*

Staff contacted the Canadian Food Inspection Agency regarding potential future heating demand at the adjacent Centre for Plant Health. The agency confirmed there are currently no expansion plans in the next decade and that the facility's recently installed geothermal system meets program redundancy requirements. As such, no foreseeable demand for DES service currently exists at this location.

### *Neighbouring Residential Properties*

Assessment of the SPWWC's original consideration of connecting the DES to nearby residential properties concluded that this option is not currently feasible as most nearby homes use electric baseboard heating or forced-air natural gas systems, which are not directly compatible with district energy and would require significant equipment and infrastructure investments by both the homeowner and the CRD to connect. Further discussions with industry utilities and experts confirmed that residential retrofits are currently not considered viable customers for district energy systems.

## **ALTERNATIVES**

Engineering assessments are needed to better understand the current reliability of the DES, available capacity, and overall asset condition, before considering expansion. The recommendations proposed by staff identify the assessments required to inform subsequent actions to sustain the climate benefits of the current system and provide the necessary foundation on which to base future expansion opportunities.

### *Alternative 1*

That the Saanich Peninsula Wastewater Commission direct staff to:

1. Undertake a condition assessment of the District Energy System (DES) to identify capital renewal requirements and amend the Capital Plan, subject to CRD Board approval, to reallocate \$100,000 from the decarbonization improvements project to support this work;
2. Undertake a root-cause analysis of the DES winter shutdowns, with recommended mitigation measures;
3. Report back on changes to the heating demand of the Panorama Recreation Centre following commissioning of the internal heat recovery project and the implications to the DES; and
4. Report back on expansion options for the DES following engineering assessments of condition and capacity.

### *Alternative 2*

That this report be referred back to staff for additional information.

## **IMPLICATIONS**

### *Alignment with Existing Plans & Strategies*

Connection of the SPWWTP administration building to the DES is identified as a critical action in the 2021 CRD Climate Action Strategy and supports achievement of corporate GHG reduction targets.

### *Climate Implications*

Continued operation of the DES reduces fossil fuel consumption at the Panorama Recreation Centre and contributes 320 tCO<sub>2</sub>e towards the CRD corporate emissions target. Connection of the SPWWTP administration building is estimated to further reduce corporate emissions by approximately 170 tCO<sub>2</sub>e annually. Expansion to other customers could provide additional community-wide emissions reductions; however, these reductions would depend on participation levels, system reliability, and lifecycle energy performance and have not yet been assessed.

### *Environmental Implications*

The DES recovers thermal energy from treated effluent that would otherwise be discharged to the marine environment. Maintaining reliable operation improves overall resource recovery efficiency. Any system expansion would require review of environmental protection measures, including fluid containment and pipe routing.

### *Financial Implications*

Capital funding of up to \$100,000 is anticipated to undertake a comprehensive condition assessment of the DES and a root-cause analysis of winter capacity constraints. The current five-year Capital Plan (Service 3.718, Project 26-03) includes \$120,000 in 2026 for detailed design of the DES connection to the SPWWTP administration building. Should the SPWWC direct staff to proceed with the work proposed in this report, subject to CRD Board approval, these funds will be reallocated to complete the proposed condition assessment and root-cause analysis, and the capital plan will be amended as part of the 2027 budget to ensure funds are available for any necessary design work to inform connection of the administration building to the DES.

The five-year Capital Plan also currently includes implementation of the administration building decarbonization project, as identified in the 2024 Low Carbon Electrification Study. However, while this project is currently assumed to be grant-funded, no external funding has been secured to date. Staff will continue to identify and pursue external funding opportunities where available.

Future expansion of the DES beyond CRD facilities is likely to require significant capital investment and would introduce long-term operating, maintenance, and asset replacement obligations. These details would be reviewed at a future date should expansion options arise following initial engineering assessment work contemplated as a recommendation in this report.

### *Service Delivery Implications*

Continued delivery of the existing DES service will be supported by proactively assessing system condition, identifying capital renewal requirements, and addressing the root cause(s) of recent winter shutdowns to improve system reliability and reduce operational risk. This information is required before service expansion options can be understood.

## **CONCLUSION**

Following a referral from the Saanich Peninsula Wastewater Commission to examine the District Energy System's (DES) operations, efficiencies and expansion potential, staff identified seasonal reliability challenges, aging infrastructure and uncertainty regarding available system capacity as key considerations before expansion can be evaluated. Staff recommend that the Commission direct staff to undertake a condition assessment and root-cause analysis of winter performance constraints and report back on updated heating demand at the Panorama Recreation Centre and

addition expansion options. This sequence of activities will help ensure information is available to maintain the existing service and determine the feasibility of future expansion. Collectively, these steps support the Capital Regional District’s climate objectives, reduce operational risk, and position the Commission to make informed decisions regarding the long-term role of the DES.

**RECOMMENDATION**

That the Saanich Peninsula Wastewater Commission direct staff to:

1. Undertake a condition assessment of the District Energy System (DES) to identify capital renewal requirements and amend the Capital Plan, subject to CRD Board approval, to reallocate \$100,000 from the decarbonization improvements project to support this work;
2. Undertake a root-cause analysis of the DES winter shutdowns, with recommended mitigation measures;
3. Report back on changes to the heating demand of the Panorama Recreation Centre following commissioning of the internal heat recovery project and the implications to the DES; and
4. Report back on expansion options for the DES following engineering assessments of condition and capacity.

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