# SUNSHINE COAST REGIONAL DISTRICT STAFF REPORT

**TO:** Committee of the Whole – September 8, 2022

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**SUBJECT:** **CHAPMAN WATER TREATMENT PLANT RESIDUAL MANAGEMENT FEASIBILITY STUDY RESULTS**

## RECOMMENDATION(S)

**THAT the report titled Chapman Creek Water Treatment Plant Residual Management Feasibility Study Results be received for information;**

**AND THAT the budget for the Chapman Creek Water Treatment Plant Sludge Residuals Disposal and Planning project be increased from $200,000 to $570,000 to be funded from [370] Regional Water Services Operating Reserves;**

**AND THAT the designated authorities are authorised to execute the necessary agreements with the shíshálh Nation and/or Lehigh Hanson Materials Ltd. for the implementation of Option 1, transferring the residual stream from Chapman Water Treatment Plant to the mine site;**

**AND THAT the 2022-2026 Financial Plan be amended accordingly;**

**AND FURTHER THAT this recommendation be forwarded the Regular Board meeting of September 8, 2022.**

## BACKGROUND

The purpose of this report is to provide an update on the findings of a feasibility study on Chapman Creek Water Treatment Plant (WTP) residual management strategy. Currently the residual ponds are at capacity and require dewatering and the feasibility study was completed to find a solution to address the management of the Water Treatment Residuals (WTR) as well as explore options for a long-term management plan.

The Board adopted the following resolution at the January 9, 2020 Board meeting:

004/20 (in part) **Recommendation No. 29** *Regional Water Service [370] – 2020 R1 Budget Proposals*

THAT the report titled 2020 R1 Budget Proposal for [370] Regional Water Service be received;

AND THAT the following budget proposals be approved and incorporated into the 2020 Round 2 Budget:

- Budget Proposal 12 – Chapman Creek Water Treatment Plant Sludge Residuals Disposal and Planning, $200,000 funded from Operating Reserves;

Figure 1 indicates the location of the WTP and the WTR ponds. The WTR is transported to the residual ponds from the WTP through dedicated pipes and consist of water and residuals from cleaning the treatment filters, treatment plant processes and the rainwater collected at the WTP facility.

*Figure 1: Location of Chapman WTP and existing residual ponds*


In an effort to address the capacity issues at residual ponds, Sunshine Coast Regional District (SCRD) staff have worked in collaboration with the shíshálh Nation and Lehigh Hanson Materials Ltd. (Lehigh) since 2019 to find a solution to prevent overflow of the residual ponds into the environment and shíshálh Nation lands.

The current budget of $200,000 was approved in 2020 and since then staff have explored several short-term options to alleviate immediate concerns from pond overflows. None have proven to be financially or practically feasible, hence, it was concluded that a consultant should be retained to provide a professional assessment of the options available to the SCRD.

In order to address both long-term and short-term management of the residual ponds, Integrated Sustainability (IS) was retained in 2022 to complete a feasibility report. The purpose of this report is to seek approval for the additional funding required to implement the recommended short-term option.

## DISCUSSION

Given the current residual pond proximity to the Lehigh mine site (see Figure 1) and the strong desire of the shíshálh Nation to stop pond overflows, both parties were invited to participate in a working group. The working group provided input to the consultant on the development and assessment of the options proposed by IS as part of the Chapman Creek Water Treatment Plant Residuals Management Feasibility Study. This study is currently being finalized and will be presented to the Board at a later date. At that time staff will seek direction on the implementation of a long-term solution.

Given the shared desire to implement a short-term option as soon as possible, and to reduce the risk of further overflows from the residual ponds, the Board's direction regarding next steps for the implementation of a short-term options is sought.

Some key-considerations during the development and assessment of the short-term options includes the following:

- The primary objective for the short-term management of the WTR is to stop the overflow of the residuals (water containing solids from the treatment process) at the ponds.
- The short-term option is required to be implemented before the fall/winter rains of 2022 and will be a temporary measure for the next 1-2 years to allow for a long-term solution to be confirmed and implemented.
- No additional permits from the province should be required. It should be noted that Lehigh is authorized under the BC Environmental Management Act to discharge water treatment residuals on the gravel mine property.
- Optimizing on the benefits of siting the active mine site next to the residual ponds is to be explored.
- The feasible option should be cost effective.

*Assessed Short-Term Options*

Four short-term options of the Chapman Creek Water Treatment Plant residual management strategy have been identified and assessed.

<u>Option 1 – Transfer all residual water to the mine sediment pond without dewatering</u>
Residual water will be transferred directly from the WTP to the sedimentation ponds located at various locations within the Lehigh mine site. Some of the residual water in the existing ponds will also be transferred to the Lehigh sedimentation pond.

This would require the construction of a new 1200m pipeline to transfer the residuals to the sediment pond.

<u>Option 2 – Dewatering of residuals prior to discharge of solids into mine site</u>
All residuals would be dewatered in specially designed tubes (geotubes) and only the recovered water from the dewatering process would be transferred to the mine site through existing infrastructure. The geotubes will be filled with the residual water from the WTP and the existing ponds. Once filled, the excess water will filter through the walls of the tubes, leaving the solids

trapped inside. The tubes with the solids would need to be disposed offsite once dewatered completely.

Please note this option would require additional chemical treatment to operate the geotubes.

Options 3 – Recirculation of part of the treatment process residual water at Water Treatment Plant and remainder directly to Lehigh

The residual water from a portion of the treatment process would be dewatered through a rented innovative treatment system (Suspended Air Floatation [SAF]) to be installed outside of the current Chapman WTP facility. The retrieved water would be recirculated into the treatment plant while the solids, filter backwash and storm water would be transferred for disposal in the mine site through the same new pipeline as mentioned under Option 1.

As the effectiveness of the additional treatment process is difficult to predict at this point in time, this option should be considered as a pilot for the implementation of an additional dewatering system as a long-term solution. The earliest this option could be implemented would be early 2023.

Options 4 - Recirculation of part of the treatment process residual water at Water Treatment Plant and dewatering of remaining residual water before transfer to Lehigh

Similar to Option 3, this option would allow a pilot for optimizing water recovery at the WTP. Water not recovered by the SAF unit will be transferred to geotubes for dewatering similar to Option 2. Only water from the dewatering process from the geotubes would be transferred to the Lehigh mine quarry pond using existing infrastructure. This option eliminates the need to construct a new 1200m pipeline but includes more staff time and two treatment processes.

As the effectiveness of the additional treatment process is difficult to predict at this point in time, this option should be considered as a pilot for the implementation of an additional dewatering system as a long-term solution. The earliest this option could be implemented would be early 2023.

*Cost estimates*

IS determined the cost estimates for these Options as presented in Table 1. These estimates are based on industry standards, however, due to the proposed partnership between Lehigh and the SCRD described in some of the Options, the cost may vary.

Table 1: Class D Cost Estimates

| | Option 1 (Recommended) | Option 2 | Option 3 | Option 4 |
|---|---|---|---|---|
| **Capital costs** | $297,000 | $330,030 | $752,520 | $693,930 |
| **Estimated Engineering (15%)** | $44,550 | $49,505 | $112,878 | $104,090 |
| **Contingency (30%)** | $102,465 | $113,861 | $259,619 | $239,406 |
| **Total** | **$444,015** | **$493,396** | **$1,384,637** | **$1,037,4260** |

*Assessment of options*

The working group and IS assessed the Options and it was concluded that while the concept of recirculation of some or all of the residual water is in principle desirable, the associated additional cost and the uncertainty regarding effectiveness makes it a less feasible approach to implement as a short-term option to the current residual ponds.

As the total costs for Option 1 is less than for Option 2, and since Option 1 is easier to implement and requires less staff time to operate, staff recommend the implementation of Option 1 as a short-term option.

*Financial Implications*

A total budget of $200,000 was originally approved for the Chapman Creek Water Treatment Plant Sludge Residuals Disposal and Planning Project. To complete work to this point, $60,000 of funds have been committed with the remaining funds to be used to partially fund the implementation of a short-term strategy.

Table 2: Funding Analysis

| | |
|---|---|
| Approved Budget (2020) | $200,000 |
| Committed Funds (to-date) | ($60,000) |
| Option 1 | ($444,015) |
| 15% Contingency Allowance | ($65,985) |
| **Required Funding** | **$370,000** |

In order to implement the recommended Option 1 an additional $370,000 would be required, this includes a ~15% contingency allowance. These additional funds are recommended to be funded from Operating Reserves.

*Next steps*

An agreement between the SCRD and Lehigh for the construction and operation for Option 1 will need to be developed and executed followed by engineering and construction. It is desired to be completed within six to eight weeks following Board approval of the additional budget.

A report regarding the long-term options will be presented at a future Committee meeting.

## STRATEGIC PLAN AND RELATED POLICIES

This report aligns with the Board's strategic focus area of Asset Stewardship, Engagement and Communication and working together to enhance First Nation relations and intergovernmental collaboration.

## CONCLUSION

The existing residual ponds are at capacity and require a suitable solution for the dewatering of the ponds and prevent any overflow.

In an effort to mitigate any environmental impacts and risks, and to develop a short and long-term solution, Integrated Sustainability was retained to complete a feasibility study to evaluate alternative options for the management of the WTR residuals.

Following the detailed analysis of the feasibility study, Option 1 (transferring the residual stream from Chapman Water Treatment Plant to the mine site) is recommended to be implemented.

In support of the implementation of this option, staff recommend an increase in funding of $370,000 in support of Option 1 (transferring the residual stream from Chapman Water Treatment Plant to the mine site).

| Reviewed by: | | | |
|---|---|---|---|
| Manager | | Finance | X – B. Wing |
| GM | X - R. Rosenboom | Legislative | |
| CAO | X - D. McKinley | Purchasing & Risk | X - V. Cropp |