KELVIN GROVE SEWER TREATMENT PLANT REPAIRS UPDATE

On February 4, 2019 staff discovered a mechanical failure at the Kelvin Grove sewer treatment plant and were forced to turn the plant off. Public Works staff were able to partially repair the wastewater treatment plant (WWTP) and it is not fully functional but is operating between 80 to 90 percent of its capabilities. Quotes for replacement parts are currently being reviewed.

Recent testing of the effluent determined that we are back within the levels allowed by our Permit. Therefore, Kelvin Grove residents can resume normal water use once more. The Municipality would like to thank you for assisting us in minimizing the wastewater discharge to the environment.

A short video showing the motor turning the media disk can be viewed on **YouTube**. For more information on the plant and how it functions see the 2018 Annual Report available in the Reports and Documents section of our website.

KELVIN GROVE WASTEWATER TREATMENT PLANT REPLACEMENT FAQs

1. **What is the Kelvin Grove Wastewater Treatment Plant (WWTP)?**
   The WWTP, located at the foot of Tidewater Way in Kelvin Grove Beach Park, is the facility that treats all sewage from homes located in upper and lower Kelvin Grove. It was built by the developer circa 1981 when the neighbourhood was created.

2. **Why does the Kelvin Grove WWTP need to be replaced? Can't it just be repaired?**
   All infrastructure has a useful lifespan before it must be replaced and many things affect that lifespan, including ongoing maintenance and repairs. The Kelvin Grove WWTP has seen

many minor and major repairs over the years as various parts of the plant fail. Eventually, repairs become unfeasible due to financial impracticality or non-existent parts, or both. As well, the regulatory environment dictated by higher orders of government changes and treatment requirements become stricter. The Public Works department will continue to maintain and repair the facility as long as possible, but ultimately, the need for replacement is on the horizon.

3. **Does the WWTP treat sewage from other neighbourhoods as well?**
   No, upper and lower Kelvin Grove are the only neighbourhoods in Lions Bay that are connected to a sewage treatment facility. All other lots in Lions Bay (other than one on Oceanview Drive connected to the Kelvin Grove system) have private septic systems for which the property owner is responsible. These too require maintenance, including regular emptying of tanks by pumping contractors (about $1,000 annually for these things), and have a defined life expectancy (about 30-40 years) before they have to be replaced at the substantial expense of the property owner (about $30-40K or more). Kelvin Grove residents do not contribute to these septic system costs.

4. **Does the rest of the Village contribute to the costs of the WWTP? If not, why not?**
   No, the rest of the Village does not contribute to the costs of the WWTP because they do not benefit from the service at all, just as Kelvin Grove property owners do not benefit from nor contribute financially to septic systems throughout the rest of the Village. This is not the same as the provision of services for water, roads, drainage, parks and other services that are shared by all and paid for by all regardless of which neighbourhood they're located in (eg: 2011 Kelvin Grove watermain emergency repair of $327K paid for by all property owners as a cost of the water service).

5. **How is the current sewer utility fee calculated? Does it account for suites?**
   The current sewer utility fee is based on the costs to operate the system divided by the number of properties connected to the system. It is not based on the number of persons per household. Owners with secondary suites in all neighbourhoods are charged separately under the secondary suite surcharge bylaw. A proportionate share of that revenue is included in the sewer budget to help reduce the net fee required to fund the service.

6. **How is it that long term planning for the replacement of the WWTP facility wasn't undertaken ages ago so that Kelvin Grove property owners wouldn't be faced with having to fund a major cost in a short time frame?**
   That's a good question and one that has been asked in cities and towns across Canada as people begin to understand the ramifications of the infrastructure deficit that has been

accumulated by almost all communities. Local governments have been good at covering operational costs but not so good at saving for capital replacement costs. In this regard, Lions Bay is no different than most others in respect of the lifecycle costs of all its infrastructure, as noted in the Infrastructure Master Plan and the new Asset Management Investment Plan, which was presented to the public at the Council Strategy Committee meeting on Thursday evening, February 7th. The last Council set out to identify and address our infrastructure deficit and the current Council is continuing that work. This affects all Lions Bayers and it will take diligent work for many, many years to achieve a sustainable community.

7. **What financing options besides parcel taxes on Kelvin Grove residents have been or will be considered for replacement of the WWTP?**
   All financing options to replace the WWTP will be explored, but each comes with its own set of issues that Council will have to weigh and consider. These include:

   a. **local service area tax** – requires at least 50% approval from affected property owners having at least 50% of the assessed value of the local service area, who may be taxed in the form of a parcel tax or property tax;

   b. **parcel taxes on Kelvin Grove property owners** – this is the standard methodology used to pay the capital costs of infrastructure related to local service areas (i.e. Kelvin Grove);

   c. **parcel taxes on *all* Lions Bay property owners** – this would require a commitment to sewer the entire Village over a specified length of time (eg: 30 years) but is an option that may become clearer after the WWTP replacement study;

   d. **borrowing funds to finance the upfront capital costs of replacement over a long period of time (eg: 30 years)** – this is challenging when the service for which the funds are being borrowed is not a service which is shared by most of the Village as the overall borrowing limit of the Municipality is affected and is already at or near a prudent percentage of borrowing capacity (i.e. about 60%), although this will have decreased in 5 years, assuming no new, unaccounted for borrowing in the interim,;

   e. **grants to help cover the capital costs of replacing the WWTP** – this will certainly be explored to the extent there are grants devoted to the replacement of sewage treatment infrastructure, as opposed to grants covering a variety of eligible categories affecting services benefiting all of Lions Bay (the Municipal portion would still need to be financed by the users benefiting from the service currently or in the future);

f. **development of properties which would connect to the sewer system** – the WWTP is currently operating at about 90% of design capacity, meaning that any substantive new development would have to contribute to the costs of increasing that capacity, with potential contributing sites including the following:

   i. 175/185 Kelvin Grove Way – a preliminary development proposal was presented to Council in 2018 by the owners of these two lots, which are noted on the OCP as "Potential Development", but the presentation was not well received by the Kelvin Grove property owners who attended that meeting;

   ii. 89 Tidewater Way – the owner has been in preliminary discussions with staff about the potential for a subdivision application on this large lot, in accordance with the opportunities provided through the new zoning bylaw adopted in 2017;

   iii. 5 Tidewater Way – staff are preparing an application for a Crown Lease on Brunswick Hill to enable the Public Works Yard to move from its current location, thereby freeing up the opportunity to develop the current site, noted on the OCP as "Potential Development" and which would be connected to the WWTP;

   iv. 410 Crosscreek Road – the two residential stratas and the commercial / residential strata have been undergoing a review process to determine the feasibility of redeveloping the lands on which the condominiums and the store / cafe are situated and if this were to proceed, the Municipality would require connection to the WWTP;

g. **using the net sale proceeds from the new lot at 35 Kelvin Grove Way to defray the replacement costs of the WWTP** – while this single lot connection will not materially affect the current capacity of the WWTP, once connected the prospective new owner will contribute to the capital and operational costs of the service the same as any other Kelvin Grove property owner, but net sale proceeds were intended to help replenish the Municipality's general reserves (development costs to date of about $150K have not been charged to Kelvin Grove taxpayers, but rather shared by all Lions Bay taxpayers, similar to the sharing of benefits and costs in respect of the new lot for sale at 52 Brunswick Beach Road).

8. Why will the WWTP replacement study be charged to the sewer budget reserve instead of being shared by all Lions Bay property owners?

The primary purpose of the WWTP replacement study will be to address the replacement of the current facility to meet modern regulatory treatment requirements, but the potential for an incrementally expandable modular plant capable of servicing a larger number of users over a long period of time (i.e. the potential for a phased expansion of the plant's capacity) will be an added component of the study, which would ultimately be of benefit to the existing users of the service (eg: the more users available to share the costs the lower the individual costs will be) – a feasibility study for a phased expansion of sewer infrastructure (eg: pipes and pump stations throughout the rest of the Village) would logically be a cost shared by the rest of the Village.

9. Why are we only hearing about the need to replace the WWTP now?

As noted in the answer to question 6, the last Council (and staff) expended significant effort to produce an Infrastructure Master Plan. That document was heralded as an important piece of the Municipality's long-range infrastructure planning and it includes a section on sewage treatment infrastructure. It was communicated through the Village Update and it lives on the Municipality's website on the Reports and Documents page. The need to plan for that infrastructure was also noted in the 2016 Annual Report and Council's Strategic Plan. Planning for the replacement of *all* Village assets is the objective of the new Asset Management Investment Plan, which will also live on the Reports and Documents page when the draft Plan has been finalized and received by Council soon. Recent mechanical malfunctions at the WWTP turned a spotlight on this asset and the need to prepare for its eventual replacement.

10. Why can't we just keep repairing the existing sewage treatment plant?

As noted in the answer to question 2, we will continue to maintain and repair the facility as long as possible, but the plant is aging and mechanical components are deteriorating. As these components wear out or fail, *they have, are, and will continue to be replaced* – we've already replaced the chain and sprocket twice, the motor once, the serpentine coupler 3 times, the gear reducer twice, the chain-oil drive twice, the media packs once each so far, etc... Our intent is to continue to repair the plant as long as is feasible and parts are available. The current mechanical failure is due to rusting of one of the media pack supports on the axel housing media packs 1 & 2. This support wore thin and snapped with a portion of the support jamming into the side of the plant and effectively putting the brakes on the rotation. Media packs 1 & 2 were replaced in 2002 giving it a 16-year +/- lifespan. Disks 3 & 4 were installed in 2010; therefore, anticipating a 16 +/- lifespan, we can expect these to fail in 2026ish.

Replacement of the plant is an eventuality, likely sometime within the next 5 – 8 years (or longer). This fact is driven by several issues:

(a) This is a proprietary packaged treatment plant subject to patents owned by the RotorDisk brand. The mechanical components are becoming harder to obtain and, as is the case with the chain and sprocket, have to be manufactured as one-offs. The sprocket is not a standard unit that can be purchased off-the-shelf at a marine or mechanical outfitter, it's a specialty item for which the manufacturer's representative in Ottawa had to have custom fabricated at their metal shop using the RotorDisk custom design. At some point in the future, replacement parts may not be available and we'd be faced with attempting to jerry-rig parts to make the plant function.

(b) The plant was designed for a maximum effluent volume of 218 m^3/day based on the number of lots in Kelvin Grove, some of which have not yet been developed. Last year, we approached 200 m^3/day on two occasions; incoming wastewater volumes beyond this number will result in a reduced treatment ability and will likely put us out of compliance with the bacterial and suspended solids (BOD and TSS) counts allowed under our permit.

(c) According to the Environmental Protection Officers and Ministry officials we have had discussion with, any major upgrades (like complete replacement of the internal components of our plant with a similar but new RBC system), decline in treatment performance, or increases in effluent volume, will trigger a new registration process via the Municipal Wastewater Regulations. Registration would subject us to the current standards for treatment of wastewater with caveats for upgrading these requirements to include personal care products (PCPs) and contaminants of emerging concern (CECs). New permits will include more stringent BOD/TSS values and nutrient removal along with tertiary disinfection through chlorine or UV treatment.

Among other things, the study being proposed will determine the appropriate technology required to meet current and potential treatment requirements along with the potential for building out the wastewater system (in phases if possible) to meet the needs of the whole Village, or a greater portion of it, which would result in a wider sharing of associated costs.

11. Has the engineering study for replacement of the WWTP been commenced? What is the anticipated time frame for delivery of the study? Has the Village has been able to access any grants to offset the cost of the study?

Staff are exploring grant opportunities to offset the cost of the study and are in the process of determining the scope of work for the engineering study; this work will dovetail into the process of preparing a Request for Proposals (RFP) that will be posted to BC Bid, a marketplace where public sector organizations (including local governments, school districts, health authorities, Crown corporations and the B.C. government) advertise opportunities for contracts for a wide range of goods and services. Once posted, it will be

open for about 3 weeks. Staff will then bring a report to Council with a recommendation for awarding a contract for the study. Staff anticipate the study itself will likely take a couple of months before a final report is received.

12. **Once the engineering study is received, how long will it be before a decision can be made on how to move forward, one year, two years, more, less?**

    Once the study is received, it will be reviewed by staff and the Infrastructure Committee and a recommendation on how to move forward will be brought to Council. At that time, likely July, long term financing options and a replacement schedule will be revisited.

13. **With the length of time it appears to take to get new parts, and given the number of years before replacement of the WWTP would actually happen, would it be prudent to have a few of these parts on hand, particularly for vital items, notwithstanding the expense?**

    Many of the components are no longer available and need to be manufactured specifically for each order. For the most part, staff closely monitor the components of the plant for corrosion and potential failure. The most recent component that failed was an internal component of the media packs that was not readily visible at the time of inspection. Some components can be purchased and manufactured ahead of time; however, a cost/benefit and risk analysis of this option will indeed be explored further once the current set of repairs has been completed and all repair costs have been finalized.

14. **The Infrastructure Master Plan of 2016 indicated that safety repairs of the WWTP should be performed as soon as possible to reduce workplace risk. Has that been done?**

    Yes, these repairs involved the replacement of deteriorating wooden walkways and handrails with aluminum, a new bridge over the secondary clarifier, and the construction of new doors to the plant. This project was completed in late September of 2016 at a total cost of $20,758.

15. **The existing WWTP system was likely designed and built to accommodate as many single family homes as there are lots in KG. If an expandable WWTP was considered to be an option then presumably there would be an additional encroachment into the Kelvin Grove Park area to accommodate any expansion. Is this correct?**

    Many new treatment plants are quite compact and modular but the available footprint at Kelvin Grove Park will certainly be considered with respect to all potential options.

16. **How many more connections could be realistically accommodated with an expanded WWTP? I would not think that an expanded WWTP would be able to provide sewer services for the whole Village, or could it?**

    Yes, a modular WWTP could be expanded in phases to service the entire Village.

17. **The Infrastructure Master Plan at 3.1.2, Table 3-1 indicates a replacement value for the existing WWTP of about $1,300,000. 3.5.3 indicates the estimated costs of a proposed expanded sewer system for the entire Village would be around $15,557,200 and for an upgraded WWTP alone the cost as shown in Table 3-2 would be in the region of $4,000,000 which is twice the cost of the estimated replacement cost noted in the Direction Request of January 30, 2019 of about $2,000,000. I assume the price differential is because the concept for sewer services for the whole of the Village takes into consideration an expanded WWTP. Is this correct?**

    Essentially, yes, but relative costs really won't be known until the engineering study has been completed.

18. **As noted in the Direction Request, the financing of a replacement WWTP will be an expensive exercise and has a number of challenges. The Village cannot take on any further borrowing since it is currently at 60% borrowing capacity. If all else fails and no additional grants or funding can be found the funding for this infrastructure project would be downloaded onto those current residents who have the benefit of the use of the sewer system. Development cannot be relied upon to contribute to the costs if no development takes place for years and at this stage any development can only be considered as a potential not a certainty. As I understand it, the idea is the cost of the project would be borne by each residence contributing what might be close to $5,000 per year for a period of 5 years. Given that the WWTP now appears to have risen in priority as an infrastructure project does the Council or the Committee know how much money would be required upfront before commencing the project?**

    The engineering study is being financed by funds within the sewer reserve. This study will provide guidance on treatment requirements and options, along with some estimated costs. Even with a reasonably good scenario whereby WWTP replacement costs are low and a 2/3 grant is available, Kelvin Grove residents would still need to fund about $1,000/year for about 5 years or so, based on an expectation that the plant will need to be replaced in 6-8 years and the assumptions set out above, although borrowing capacity should be improved by then.

19. **If it was decided that it would be preferable to go for an expandable WWTP so that at some future point in time other residents in the Village could gain access to the sewer system would the current owners of the properties in KG (presumably including vacant lot owners and the property on Oceanview) have to pay all the upfront costs for an expandable WWTP? An expandable WWTP appears as if it would be quite bit more expensive than a replacement WWTP. Is that a correct assumption?**

    It depends upon the treatment methodology selected for the WWTP. Current membrane technology has led to very compact wastewater treatment systems that can be modularly expanded to increase treatment capabilities. The intent would be to construct a new facility that could be expanded as required to incorporate additional neighborhoods as a phased approach. Any costs related to actual expansion of the WWTP would logically be borne by those benefitting parcels, but the base capacity for an expandable plant will not necessarily be much more expensive than the base capacity for a non-expandable plant.

20. **Due to costs I assume that any expansion of sewer services within the Village would have to be done in phases. That being the case, the benefits of reduced sewer fund costs coming back to those who have funded an expandable WWTP project might not necessarily materialize for years, if not decades. If that were the case, please explain why a more expensive expandable WWPT would be a good option at this time without other residents in Village (who might have the opportunity to attach to the WWPT within a reasonable time frame in the future) joining in to help fund it?**

    This question is based on an incorrect premise that an expandable WWTP is necessarily more expensive or that Kelvin Grove residents would be paying a premium for an expandability option. Any incremental costs of expandability ought to be identified for fair and appropriate resolution and any actual costs of expansion ought to be borne by those parcels benefitting from the expansion.

21. **It has been suggested that the plant is running at 90% of its capacity. Information in the 2016 Infrastructure Master Plan, page 3.10, suggests that the design capacity is 218 m3/day and the permit is 340 m3/day. The information in the WWTP Annual Report for 2018 states that on only 28 occasions the flow exceeded 100 m3/day and 18 of those were in December and these may be related to the equipment failure at that time. This suggests that the plant is actually operating below 50% of its capacity. Supporting the measured flow is a comment by AECOM in page 3.10 of the Infrastructure plan that a "flow of 190 - 200 m3/day is quite high for the estimated Kelvin Grove population of 257 people". This suggests that the plant**

is actually larger than it needs to be and a smaller and presumably less expensive facility could be installed.

The plant is designed to treat a ***maximum*** daily flow of 218 m^3 – any volumes beyond this number would likely result in a reduced treatment ability and would likely put us out of compliance with the bacterial and suspended solids (BOD and TSS) counts allowed under our permit. This would trigger fines and a review by the Ministry of the Environment and likely push us into a revised permit requirement. The plant was sized in about 1980 in accordance with the manufacturer's estimate of average residential flows and also included factors for inflow and infiltration – meaning that spikes in incoming wastewater were anticipated and accounted for. The WWTP is functioning within the design parameters and is sized appropriately.

22. **If the daily flow averaged less than 100 m3/day, would Kelvin Grove need a WWTP at all? I realize that this will not be a popular question but, in all seriousness, is it required "by law"? Is there a demonstrable scientific harm to releasing untreated or partially treated waste to Howe Sound? Obviously, there are other considerations such as public perception and the proximity to a beach, but does science support the expenditure?**

    Yes, treatment is required by law. Discharge volumes below 22.7 m^3/day are governed by the Health Act and discharges above this are governed by the *Municipal Wastewater Regulation* and *Environmental Protection Act*.

23. **Is predictive and preventative maintenance done on the WWPT? If they are then the plant could likely have been kept in running order for quite a long time and probably well past the 40 year life span. Who said and on what basis were you informed that the plant only had a 40 year life span? Where did this information come from? How long do similar plants last? Do you know? 3.2 of the "Asset Management Policy Statements dated March 13, 2013 states: "Though these assets age and deteriorate, by using sound asset management practices, Council and the community can be assured that the assets meet performance levels, are used to deliver the desired service in the long term and are managed for present and future users." Do you know if this policy was followed?**

    Predictive and preventative maintenance at the WWTP consists of monthly inspections of the mechanical components and greasing of the moving parts within the system. Annual pump-out of the solids at the bottom of the treatment plant occurs each September, at which time, a more in-depth inspection is conducted. This maintenance program follows the manufactures recommended program and has, in fact, extended the lifespan of the WWTP.

The manufacturers estimated lifespan for the RBC WWTP system is 30-35 years – this is primarily due to the environment the mechanical components are exposed to. Wastewater, and in particular, hydrogen sulfide (H_2S), which is produced during the decomposition of wastewater, is extremely corrosive and greatly reduces the life expectancy of metal components.

24. Item 4 of the FAQs says that other Lions Bay residents do not contribute to the costs of the WWTP because they receive no benefit from the service just as KG residents do not pay to maintain septic systems throughout the Village. I do not understand this argument because almost all the septic systems are located on private property and do not appear to be part of the Lions Bay infrastructure. The WWTP appears to be part of the Lions Bay infrastructure as indicated in The Executive Summary of the Infrastructure Master Plan dated July 28, 2016 which states on the first line that:

"The Village of Lions Bay... owns and manages water, sanitary, stormwater, combined, roads and street lighting... The Infrastructure assets included in the scope of the IMP were: Water (including treatment plants, pipes); Sanitary (including treatment plants, pipes); Stormwater (including pipes and roadside channels); and Roads and bridges."

I don't see that septic systems on private property were included as part of the infrastructure. If they were included then presumably the Village would have to maintain those septic systems. When you purchase a house which has a septic system that needs to be maintained you are aware of it at the time of purchase. Usually you pay a little less for properties with septic systems but at the end of the day it is a personal choice on what you decide to purchase. The residents at Kelvin Grove usually pay a little more for their properties and possibly pay slightly higher property taxes. As you know, they pay an Annual User Fee for maintenance of the WWPT up front.

If the WWTP is considered part of the Lions Bay infrastructure and an asset why should the residents of Kelvin Grove pay for the replacement or expansion of the WWTP? Could you please explain as to how you came to the conclusion in item 4 of the FAQs?

Firstly, it is important to correct a false premise in your query above regarding Kelvin Grove residents paying for an expansion of the WWTP. That proposition has never been put forward and, in fact, has been explicitly addressed in Question 20, the Answer to which states: "Any incremental costs of expandability ought to be identified for fair and appropriate resolution and any actual costs of expansion ought to be borne by those parcels benefitting from the expansion."

Secondly, the reason why property owners in the rest of Lions Bay cannot be expected to contribute to the costs of a "like for like" replacement of the existing facility is the same as why they are not charged for the Sewer Utility Fee: they have no opportunity to connect to the service. In respect of parcel taxes, the *Community Charter*, section 201(2) is very clear:

> In the case of a service that is provided to land or improvements, a parcel tax under this Division may be imposed only on parcels that have the opportunity to be provided with the service, whether or not they are in fact being provided with the service.

This is a basic principle of fairness in respect of the authority of local governments to raise revenues to pay for the services they provide.

25. How can residents and property owners receive more information and provide feedback?

Mayor and Council want to ensure that all residents are aware of these matters as they evolve and come before Council, transparently sharing information and receiving feedback. Our primary means of communication is the Village Update, so if you are not yet a subscriber, you are encouraged to sign up here. If you wish to explicitly have your personal correspondence included on the next regular Council meeting agenda, click here.

If you wish to provide feedback to Council and staff, or ask additional questions, please use the feedback form on the website here, or email feedback@lionsbay.ca – staff will add new questions and answers to this page for the benefit of all to review.