DISTRICT OF FORT ST. JAMES

Request for Proposals

LAGOON AERATION UPGRADES

Opportunity ID:	RFP26-09
Issue Date:	April 14, 2026
Closing Date and Time (Pacific Time):	April 30, 2026 4:00 PM
Official Contact and Email Address:	Doug Lowther dlowther@fortstjames.ca

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1. Summary of the Opportunity

The District of Fort St. James is seeking proposals from qualified Proponents to supply aeration equipment for a lagoon aeration upgrade, as defined in Appendix B. The materials, supplies, parts must be supplied and delivered by July 31st 2026

Further details as to the scope of this opportunity, the specifications and requirements can be found within this RFP in Appendix B.

2. RFP Process Rules

2.1 Definitions

Throughout this RFP, the following definitions apply (and the singular is interchangeable with the plural). Some definitions contain cross references to other defined terms of like meaning that may be found in BC Bid.

"**Addenda**" means all additional information regarding this RFP including Amendments to the RFP. The "Addenda" menu tab is located on the left margin of the specific opportunity in the BC Bid application. Suppliers may need to select and set the symbol denoted as ">>" to reveal the menu tab items.

"**Amendment**" means a change to the RFP that results in posting an updated version of the RFP requiring Proponents to submit a new Proposal to the RFP as amended. Amendments will be noted in the amendment reason section of the "Overview" menu tab located on the left margin of the specific opportunity in the BC Bid application. Suppliers may need to select and set the symbol denoted as ">>" to reveal the menu tab items.

"**BC Bid**" means BC Bid located at https://www.bcbid.gov.bc.ca.

"**Business BCeID**" means a password ID that is required if a Proponent intends to prepare and submit Proposals electronically using BC Bid. See https://www.bceid.ca/ for more information.

"**Closing Date and Time**" means the closing time and date for this RFP as set out in the "RFP general information" section of the "overview" menu tab; and as initially set out on the cover page to the RFP.

"**Closing Location**" means, as applicable, the hard copy delivery location; email address; or BC Bid for the submission of Proposals as indicated in the "delivery of submissions" section of the "overview" menu tab; and as initially set out on the cover page to the RFP.

"**Contract**" means a written agreement executed by the District and the Contractor as a result of this RFP.

"**Contractor**" means the successful Proponent to the RFP who enters into a Contract with the District.

"Enquiries Deadline" means the preferred cut-off date for supplier questions set out on the "overview" tab within BC Bid. Supplier questions received after this date, if applicable, may not be answered.

"Issue Date" means the date the RFP was posted to BC Bid as set out in the "RFP general information" section of the "overview" menu tab; and as initially set out on the cover page to the RFP.

"**District**" means the District of Fort St. James.

"**must**", or "**mandatory**" means a requirement that must be met in order for a Proposal to receive consideration.

"**Official Contact**" means the individual named on the "opportunity details" menu tab for the RFP serving as the official RFP contact person for the District; and as initially set forth on the cover page of this RFP.

"**Proponent**" means a single legal entity with the legal capacity to contract (excluding its parent, subsidiaries or other affiliates) or natural person with the legal capacity to contract, that submits a Proposal, (see also "You" and "Your").

"**Proposal**" means a written response to the RFP and includes the information and documentation the Appendix A Submission Declaration Form that is submitted by a Proponent (see also "Submission").

"**Request for Proposals**" or "**RFP**" means this solicitation process described on BC Bid, including any attached or referenced appendices, schedules or exhibits and as may be modified in writing from time to time by the District by Addenda.

"**Response Form**" means any document that is required to be submitted, if any, as part of a Proposal, including, if applicable, the Submission Declaration Form.

"**RFP**" has the same meaning as RFP as the term may appear in BC Bid, the Submission Declaration Form or BC Bid pop-up advisories associated with submitting a Proposal.

"**should**", "**may**" or "**weighted**" means a requirement having a significant degree of importance to the objectives of the Request for Proposals.

"**Submission**" as used in the Submission Declaration and within BC Bid and its pop-up advisories related to this RFP has the same meaning as Proposal.

"**Submission Declaration Form**" means the form so identified and named in the RFP for use with Proposals submitted by email or hard copy delivery if such submission methods are allowed by the RFP.

"**You**" and "**Your**" as used in the Submission Declaration Form and any pop-up advisories related to this RFP has the same meaning as Proponent.

2.2 Acceptance of Terms and Conditions

Submitting a Proposal indicates acceptance of all the terms and conditions set out in the RFP, including all appendices, Addenda and these RFP process rules.

A Proposal must be signed by a person authorized to sign on behalf of the Proponent with the intent to bind the Proponent to the RFP and to the statements and representations in the Proponent's Proposal:

a) For Proposals submitted by a Proponent with a Business BCeID that is registered to submit its Proposal electronically through BC Bid, clicking the "I Agree and Submit" button that follows the pop-up advisory associated with Proposal submission constitutes the signature of the Proponent and is acceptable without additional signature. By submitting its Proposal electronically through BC Bid, the Proponent is agreeing to the terms and conditions of the RFP.

b) For Proposals submitted by hard copy to a physical address or Proposals submitted by email, Proponents must complete and submit the Submission Declaration Form (Appendix A) that is available for download and located in the "RFP documents" section of the "overview" menu tab for the RFP.

2.3 Submission of Proposals

a) Proposals must be received before the Closing Date and Time at the Closing Location using one of the permitted submission methods specified on the cover page of this RFP or as may be set out in the "delivery of submissions" section of the "overview" menu tab of this RFP. Proposals must not be sent in a manner not authorized by the RFP, except in the circumstances set out in the paragraph g) in this section below. The Proponent is solely responsible for ensuring that, regardless of the submission method selected, the District receives a complete Proposal, including all attachments or enclosures, before the Closing Date and Time.

b) For electronic submissions (BC Bid or email), the following applies:

i) The Proponent is solely responsible for ensuring that the complete electronic Proposal, including all attachments, is received before Closing Date and Time;

ii) The maximum size of any attachment uploaded to BC Bid electronically, is required to be 500 MB or less;

iii) The maximum size of each email attachment is required to be 20 MB or less (Proponents are solely responsible for ensuring that email Proposal submissions comply with any size restrictions imposed by the Proponent's internet Contractor);

iv) Proponents should submit email Proposal submissions in a single email and avoid sending multiple email submissions for the same opportunity. If the file size of an electronic submission exceeds the applicable maximum size, the Proponent may make multiple submissions (BC Bid upload or multiple emails for the same opportunity) to reduce attachment file size to be within the maximum applicable size; Proponents should identify the order and

number of emails making up the email Proposal submission (e.g. “email 1 of 3, email 2 of 3…”);

v) For email Proposal submissions sent through multiple emails the District reserves the right to seek clarification or reject the Proposal if the District is unable to determine what documents constitute the complete Proposal;

vi) Attachments must not be compressed, must not contain a virus or malware, must not be corrupted and must be able to be opened. Proponents submitting by electronic submission are solely responsible for ensuring that any emails or attachments are not corrupted. The District may reject Proposals that are compressed, cannot be opened or that contain viruses or malware or corrupted attachments.

c) The Proponent bears all risk associated with delivering its Proposal by electronic submission, including but not limited to delays in transmission between the Proponent’s computer and the Email or BC Bid.

d) While the District may allow for email Proposal submissions, the Proponent acknowledges that email transmissions may be unreliable. The Proponent is solely responsible for ensuring that its complete email Proposal submission and all attachments have been received before the Closing Date and Time. If the Email rejects an email Proposal submission for any reason, and the Proponent does not resubmit its Proposal by the same or other permitted submission method before the Closing Date and Time, the Proponent will not be permitted to resubmit its Proposal after the Closing Date and Time. If the Proponent receives any email confirmation from the District that is associated with an email Proposal submission, despite the content of such email, any such email will not serve to confirm that a complete, sufficient, or timely Proposal or other related submission has been made by the Proponent or received by the District.

e) For Proposals submitted by email and for hard copy Proposals delivered to a physical address, by submitting a clear and detailed written notice by email to the Official Contact, the Proponent may revise or withdraw its Proposal before the Closing Date and Time. Upon the Closing Date and Time, all Proposals become irrevocable as set out in Section 2.6.

2.4 Amendments and Addenda

Proponents should continually monitor the RFP as published on BC Bid in the event any Amendment or Addenda to the RFP have the effect of requiring a Proponent to submit a new Proposal to the RFP in lieu of any Proposal to the RFP that a Proponent may have submitted before such Amendment or Addenda. All Amendments will be noted in the amendment reason section of the “overview” menu tab on BC Bid. All Addenda will be noted on the “addenda” menu tab.

2.5 Late Proposals

Proposals will be marked with their receipt time at the Closing Location. Only Proposals received and marked before the Closing Date and Time will be considered to have been received on time. Proposals received late will be marked late and not considered or evaluated. In case of a dispute, the Proposal receipt time as recorded by the District at the Closing Location will prevail whether accurate or not.

2.6 Proposal Irrevocability

Proposals will be open for acceptance and irrevocable for at least 90 days after the Closing Date and Time.

2.7 Pricing

Without limiting any terms or conditions set by the District in this RFP, including any applicable Response Form, the following terms and conditions apply to pricing for the RFP:

a) Prices will be firm for the entire Contract period unless the RFP specifically states otherwise.

b) Regardless of the allowed Proposal submission method, if unit pricing is required to be proposed and the sum total of that unit pricing is being evaluated, whether or not the Proponent is required to provide a sum total of that unit pricing, so long as all of the required unit pricing components are proposed, if the Proponent has made a mathematical error in adding up the sum total of all required unit pricing, then and in that event the District will compute and take the mathematically correct sum total of the proposed unit pricing for purposes of evaluation and contracting.

2.8 Completeness of Proposal

By submitting a Proposal, the Proponent covenants and warrants that, if the RFP is to design, create or provide a system or manage a program, all components required to run the system or manage the program have been identified in the Proposal or will be provided by the Contractor at no additional charge.

2.9 Changes to Proposals

a) For Proposals submitted by e-mail and for hard copy Proposals delivered to a physical address, by submitting a clear and detailed written notice by email to the Official Contact, the Proponent may revise or withdraw its Proposal before the Closing Date and Time. Upon the Closing Date and Time, all Proposals become irrevocable as set out in Section 2.6. The Proponent will not change any part of its Proposal after the Closing Date and Time unless requested by the District for purposes of clarification. Proposals cannot be amended after the Closing Date and Time.

b) For Proposals submitted through BC Bid, in order to amend the Proposal electronically through BC Bid, the Proponent will need to copy the previous submission using the “other actions” menu and submit a new Proposal before the Closing Date and Time.

c) For Proposals submitted through BC Bid, in order to withdraw a Proposal electronically through BC Bid, the Proponent will need to go to the "submission history" tab and select "submission withdrawn" from the dropdown in the "withdrawn" column of the table on that screen. Withdrawn Proposals cannot be recovered. This must be done before the Closing Date and Time or the Proposal will not have been withdrawn. Proposals cannot be withdrawn after the Closing Date and Time.

d) In lieu of amending or withdrawing a Proposal in accordance with above subsections b) or c) as applicable (instances where the Proposal was initially submitted electronically through BC Bid), the Proponent may withdraw its Proposal by submitting a clear and detailed written notice by email to the Official Contact before the Closing Date and Time. In the case of an amendment under this subsection d) the Proponent should transmit a complete Proposal containing all revisions sent by email to the Official Contact as a separate attachment; and by doing so the Proponent is reaffirming its agreement to all of the terms and conditions of the RFP, including these RFP process rules.

2.10 Conflict of Interest, Unfair Advantage, Bias and No Lobbying

a) By submitting a Proposal, the Proponent confirms that the current or past employment or other interests or relationships of the Proponent (including a Proponent's subcontractors and named personnel, if any) do not create or lead to any actual, potential or perceived conflict of interest, unfair advantage, bias or reasonable apprehension of bias that would favor the Proponent (including a Proponent's subcontractors and named personnel, if any) with respect to the procurement process. A Proponent may be disqualified if the Proponent's (including a Proponent's subcontractors and named personnel, if any) current or past corporate or other interests, may, in the District's opinion, give rise to an actual or potential conflict of interest, unfair advantage or reasonable apprehension of bias that would favor the Proponent (including a Proponent's subcontractors and named personnel, if any) and thereby import unfairness into the Procurement process. This includes, but is not limited to, involvement by a Proponent (including a Proponent's subcontractors and named personnel, if any) in the preparation of the RFP or a relationship with any employee, contractor or representative of the District involved in preparation of the RFP, participating on the evaluation committee or in the administration of the Contract. If a Proponent is in doubt as to whether there might be a conflict of interest, unfair advantage or reasonable apprehension of bias, the Proponent should consult its own advisors and notify and consult with the Official Contact prior to submitting a Proposal.

b) A Proponent must not attempt to influence the outcome of the RFP process by engaging in lobbying activities. Any attempt by the Proponent to communicate for this purpose directly or indirectly with any employee, contractor, or representative of the District, including members of the evaluation committee and any elected

officials of the District, or with the media, may result in disqualification of the Proponent.

2.11 Subcontractors

a) Unless the RFP states otherwise, the District will accept Proposals where more than one organization or individual is proposed to deliver the services described in the RFP, so long as the Proposal identifies the lead entity that will be the Proponent and that will have sole responsibility to deliver the services under the Contract. The District will enter into a Contract with the Proponent only. The evaluation of the Proponent will include evaluation of the resources and experience of proposed sub-contractors, if applicable.

b) All subcontractors, including affiliates of the Proponent, should be clearly identified in the Proposal.

c) A Proponent may not subcontract to a firm or individual whose current or past corporate or other interests, may, in the District's opinion, give rise to a conflict of interest, unfair advantage, bias or reasonable apprehension of bias as set out in RFP section 2.10.

d) Where applicable, the names of approved subcontractors listed in the Proposal will be included in the Contract. No additional subcontractors will be added, nor other changes made to this list in the Contract without the written consent of the District.

2.12 Evaluation

Proposals will be assessed in accordance with the evaluation criteria and will be by an evaluation committee formed by the District and may include employees and contractors of the District. The District will be under no obligation to receive further information, whether written or oral, from any Proponent.

a) The District is under no obligation to perform any investigations or to otherwise verify any statements or representations made in a Proposal.

b) Proposals from not-for-profit agencies will be evaluated against the same criteria as those received from any other Proponents.

c) The District may consider and evaluate any Proposals from other jurisdictions on the same basis that the government purchasing authorities in those jurisdictions would treat a similar Proposal from a British Columbia supplier.

2.13 Contract

a) By submitting a Proposal, the Proponent agrees that should its Proposal be successful, the Proponent will enter into a Contract with the District.

b) Written notice to a Proponent that it has been identified as the successful Proponent and the subsequent full execution of a written Contract will constitute a Contract for the goods or services, and no Proponent will acquire any legal or equitable rights or

privileges relative to providing the goods or services until the occurrence of both such events.

c) If an interested supplier has any questions about the form of contract, the supplier should pose any questions to the Official Contact before the Closing Date and Time or, if applicable, any Enquiries Deadline.

In addition, interested suppliers and Proponents should carefully review the entire RFP, including these RFP process rules, including sections 2.2 and 2.3.

2.14 Contract Finalization Delay

If a written Contract cannot be finalized with provisions satisfactory to the District within thirty days of notification of the successful Proponent, the District may, at its sole discretion at any time, thereafter, terminate discussions with that Proponent and either commence finalization of a Contract with the next qualified Proponent or choose to terminate the RFP process and not enter into a Contract with any of the Proponents.

2.15 Debriefing

At the conclusion of the RFP process, all Proponents will be notified. Proponents may request a debriefing meeting with the District. At the option of the District, any debriefing meeting will be held by telephone conference or in-person meeting.

2.16 Limitation of Liability and Proponents Expenses

By submitting a Proposal, the Proponent agrees on behalf of itself and its predecessors, successors, parent companies, subsidiary companies, affiliates and successors or assigns, that they will not make claims for and otherwise irrevocably waives any claims whatsoever (whether arising under contract law, tort law, administrative law or otherwise) and howsoever arising, including claims for compensation, costs, damages, expenses, losses, and loss of profits, relating to the RFP or with respect to the RFP competitive process, including claims for costs, expenses and loss of profits if no Contract is made with the Proponent, including any other Proponent.

2.17 RFP Information Disclaimer

While the District has used efforts to ensure information in the RFP is accurate, the information contained in the RFP is supplied solely as a guideline for Proponents. The information is not guaranteed or warranted to be accurate by the District, nor is it necessarily comprehensive or exhaustive. Nothing in the RFP is intended to relieve Proponents from forming their own opinions and conclusions with respect to the matters addressed in the RFP.

2.18 No Commitment to Award

The RFP should not be construed as an agreement to purchase goods or services. The lowest priced or any Proposal will not necessarily be accepted. The RFP does not commit the District in any way to award a Contract.

2.19 No Implied Approvals

Neither acceptance of a Proposal nor execution of a Contract will constitute approval of any activity or development contemplated in any Proposal that requires any approval, permit, or licence pursuant to any federal, provincial, regional district or municipal statute, regulation, or by-law.

2.20 Legal Entities

The District reserves the right in its sole discretion to:

a) disqualify a Proposal if the District is not satisfied that the Proponent is clearly identified;

b) prior to entering into a Contract with a Proponent, request that the Proponent provide confirmation of the Proponent's legal status (or in the case of a sole proprietorship, the Proponent's legal name and identification) and certification in a form satisfactory to the District that the Proponent has the power and capacity to enter into the Contract;

c) not to enter into a Contract with a Proponent if the Proponent cannot satisfy the District that it is the same legal entity that submitted the Proponent's Proposal; and

d) require security screenings for a Proponent who is natural person, subcontractors, and key personnel before entering into a Contract and decline to enter into a Contract with a Proponent or to approve subcontractor or key personnel that fail to pass the security screenings to the District's satisfaction.

2.21 Reservation of Rights

In addition to any other reservation of rights set out in the RFP, the District reserves the right, in its sole discretion:

a) to modify the terms of the RFP at any time prior to the Closing Date and Time, including the right to cancel the RFP at any time prior to entering into a Contract with a Proponent;

b) in accordance with the terms of the RFP, to accept the Proposal or Proposals that it deems most advantageous to itself;

c) to waive any non-material irregularity, defect or deficiency in a Proposal;

d) to request clarification(s) from a Proponent with respect to its Proposal, including clarification(s) with respect to its Proposal on non-material administrative matters (e.g., a matter that is not scored); or where Proposal provisions are ambiguous, without any obligation to make such a request to any other Proponents, and consider such clarification(s) in evaluating the Proposal;

e) to reject any Proposal due to unsatisfactory references or unsatisfactory past performance under contracts with the District, or any material error, omission or misrepresentation in the Proposal;

f) at any time, to reject any or all Proposals;

g) at any time, to terminate the competition without award and obtain the goods and services described in the RFP by other means (including, a future solicitation) or do nothing; and

h) to exclude a Proponent from participation in the RFP, at any point in the RFP process, where there is supporting evidence, on grounds of Proponent:

i) bankruptcy;

ii) false declarations or misrepresentations;

iii) significant or persistent deficiencies in performance of any substantive requirement or obligation under a prior contract or contracts with the District;

iv) final judgments in respect of serious crimes or other serious offences;

v) engaging in conduct prohibited by the Competition Act such as bid rigging as described in section 47 of the Competition Act, or engaging in conspiracies, agreements or arrangements between competitors as described in section 45 of the Competition Act;

vi) professional misconduct or acts or omissions that adversely reflect on the commercial integrity of the Proponent; or

vii) failure to pay taxes.

2.22 Ownership of Proposals

All Proposals and other records submitted to the District in relation to the RFP become the property of the District and, subject to the provisions of the Freedom of Information and Protection of Privacy Act and the RFP.

2.23 Collection and Use of Personal Information

Proponents are solely responsible for familiarizing themselves, and ensuring that they comply, with the laws applicable to the collection and dissemination of information, including resumes and other personal information concerning employees and employees of any subcontractors. If the RFP requires Proponents to provide the District with personal information of employees who have been included as resources in response to the RFP, Proponents will ensure that they have obtained written consent from each of those employees before forwarding such personal information to the District. Such written consents should specify that the personal information may be forwarded to the District for the purposes of responding to the RFP and used by the District for the purposes set out in the RFP. The District may, at any time, request the original consents or copies of the original consents from Proponents, and upon such request being made, Proponents will immediately supply such originals or copies to the District.

2.24 Enquiries to Official Contact

Enquiries related to this RFP including any requests for information or clarification may only be directed in writing to the Official Contact using the "enquiries" interface or the email address identified on the "opportunity details" menu tab, who (subject to the Enquiries Deadline, the preferred cut-off date and time for enquiries set out in the RFP general information section of the "overview" tab), will respond if time permits before the Closing Date and Time. Information obtained from any other source is not official and should not be relied upon. Enquiries and any responses providing new information will be recorded and posted to BC Bid or otherwise distributed to Proponents. Despite the foregoing, the District may choose in its sole discretion not to respond, respond in whole or in part, or reformulate enquiries in whole or in part. The District may in its sole discretion choose whether to post any such enquiries (as reformulated if reformulated) and responses to BC Bid or otherwise distribute to Proponents.

3. Overview

3.1 District Responsibility

The District of Fort St. James will be responsible for the overall administration of this Request for Proposals and coordination with the successful Proponent. The District will provide a primary point of contact for all communications related to the project, and will provide the successful proponent with any available background information. The District will facilitate reasonable access to the Lagoon site, if required, for the purposes of confirming existing conditions.

4. Requirements

In order for a Proposal to be considered, a Proponent must clearly demonstrate that they meet the mandatory requirements set out in Section 6.1 (Mandatory Criteria) of the RFP. Proposals that do not meet all mandatory criteria will not be considered further.

The RFP must be prepared and completed to the extent applicable; and must be submitted as the Proponent’s Proposal.

5. Proposal Format

a) Proponents should ensure that they comply with all mandatory requirements and to fully respond to all other requirements in the RFP in order to receive full consideration during evaluation.

b) The following format, sequence, and instructions should be followed in order to provide consistency in Proponent responses and ensure each compliant Proposal receives full consideration. All pages should be consecutively numbered.

c) If the RFP allows email or hard copy Proposal submission and if the Proponent is submitting its Proposal by email or hard copy then a signed Submission

Declaration Template must be submitted as part of the Proponent's Proposal.

d) Proposals should not contain links to information that is not set down directly in the Proponent's Proposal. Should this occur, the District may disregard any referred to source of information that is not contained in the Proposal being evaluated.

6. Evaluation

Evaluation of Proposals will be by a committee formed by the District and may include employees and contractors of the District and other appropriate participants.

The District's intent is to enter into a Contract with the Proponent who has met all mandatory criteria and minimum scores (if any) and who has the highest overall ranking.

Proposals will be assessed in accordance with the entire requirement of the RFP, including mandatory and weighted criteria.

6.1 Mandatory Criteria

Proposals not clearly demonstrating that they meet the following mandatory criteria will be excluded from further consideration during the evaluation process.

Mandatory Criteria
The Proposal must be in English.
The Proposal must be received at the Closing Location before the Closing Date and Time.
If the Response is submitted by email or by hardcopy delivery to a physical address (if either submission method is allowed by the RFP), the Response must include a Submission Declaration (located in the "RFP documents" section of the "overview" menu tab in BC Bid) signed by an authorized representative of the Proponent.
The Proposal must have experience and qualifications included.
The Proposal must meet the minimum specifications included within Appendix B, and if there are any substitutes made, the Proposal must clearly identify and define that they are of equivalent or superior nature.

6.2 Weighted Criteria

Proposals meeting all the mandatory criteria set out above will be further assessed against the following weighted criteria.

Weighted Criteria	Weight
Price	30
Technical Specifications	30
Warranty and Service Support	10
Delivery and Lead Time	15
Vendor Experience and References	10
Environmental Considerations	5
Total	**100**

6.3 Tie Breaker

If there is a tie between one or more Proponents, then the Proponent with the highest score in the Price category set out in above section 6.2 will be considered the lead Proponent. If there remains a tie between one or more Proponents, then in that event, the tie shall be finally broken by utilizing www.random.org/lists/. All tied Proponents authorize the District to utilize www.random.org/lists/ and the tied Proponents' names in relation to randomly generating the lead Proponent using www.random.org, which will be deemed the final and conclusive method to break the tie.

The District will enter the tied Proponent names into the www.random.org/lists/ application (in no particular order) and select the button "randomize" once. The order returned will be used to rank the tied Proponents. For further clarity, the Proponent that is assigned number "1" will become the lead Proponent.

The order assigned to the tied Proponents by www.random.org/lists/ shall also serve as the order of Proponents for the purpose of the RFP.

The Official Contact will notify all tied Proponents in the event of a tie and offer all tied Proponents the opportunity to witness the tie breaking procedure. In such a case, all tied Proponents consent to their respective identities being made known to each other and consent to the tiebreaking procedure being conducted and broadcast through, at the option of the District: video conferencing technology; or in person, or some combination thereof.

6.4 Reference Check

The District may conduct reference checks on the Proponent and, if applicable, any Proponent resources proposed by the Proponent.

The Proponent, on request by the District, will provide referee information set out below for itself and for any Proponent resource (if applicable) that corroborates the relevant work experience.

References need to be from a referee that is not the Proponent. For each Proponent and resource reference (if applicable), the Proponent should provide the following information:

a) Company name (if applicable) of referee;

b) Current contact name, position, mailing address, telephone number and email address of the referee; and

c) Brief description of work performed by the Proponent and the Proponent resources, if applicable.

Failure to provide the referee information set out above will result in the Proponent and Proponent resource, if applicable, failing the reference check. Reference checks will be conducted, on a pass-fail basis, on the Proponent and Proponent resource, if applicable. The District reserves the right to reject the Proponent and any Proponent resource whose references, in the District's sole opinion, are deemed to be unsatisfactory.

In addition, the District reserves the right to contact referees that were not provided to the District by the Proponent to obtain references pertaining to the Proponent and Proponent resource (if applicable). This includes contacting substitute referees from the same reference company as the one provided by the Proponent.

The District reserves the right, on a pass-fail basis, to reject any Proponent if any of these other references, if any, in the District's sole opinion, are deemed to be unsatisfactory. These reference check provisions do not replace and should not be deemed to replace or be inconsistent with any reservation of rights in favour of the District, including any reservation of rights set out in this RFP.

Appendix A: Submission Declaration Form

The Submissions Declaration Form is available for download in the “RFP documents” section for this RFP.

Appendix B: Specifications and Scope/Expectations

The District of Fort St James invites qualified proponents to submit proposals for the supply of surface aeration equipment for upgrades to an existing wastewater lagoon system.

Background

The District of Fort St James currently operates an existing wastewater treatment system comprised of 5 lagoon cells, with cells 3 and 5 having a submerged aeration system. The treatment system was designed to service a population of 5000 people, with the last upgrades being installed in 1985. However, the current population the system services is 2153 as of 2021. The operating temperatures of the cells is -1.5˚ C in winter conditions and 13˚ C in the summer. The following Section 1.2 provides information of the cells that are proposed to have surface aerators installed and highlights existing conditions the District of Fort St James is seeking to improve.

Effluent Requirements:

- The current permit requires effluent quality of 30 BOD / 30 TSS, which is met by the existing system.

Project Objectives

- Improve mixing and O_2 levels in Cells 1, 2 and 4
- Reduce odor release
- Prevent stratification and seasonal turnover events

Scope of Work

The successful proponent shall:

- Supply surface aeration units suitable for cold climate operation
- Provide recommended sizing and quantity of units for each cell
- Provide anchoring/mooring systems appropriate for lagoon installation
- Provide electrical and control system requirements
- Provide installation guidance and commissioning support
- Provide performance data and design calculations
- Provide operation and maintenance manuals

Optional (if applicable): - Provide installation services and ongoing maintenance support

The attached drawing C101 includes a preliminary layout of a surface aerator configuration, including number of units and horsepower. Proponents are asked to provide recommendations for layout, based on their equipment requirements and surface aerators.

Reference Information

- Cell Data & Existing Conditions

  Cell 1 – High BOD & No Odor Control
  - Design Flow: 690 m^3/day
  - Volume: 4,000m^3
  - Water Level: 685.15
  - Floor Elevation: 681.5

  Cell 2 – High BOD & No Odor Control
  - Design Flow: 690 m^3/day
  - Volume: 4,000m^3
  - Water Level:685.18
  - Floor Elevation: 681.5

  Cell 4 – Limited Mixing
  - Volume:48,000m^3
  - Water Level: 684.77
  - Floor Elevation: 681.6

- The following documents are enclosed and are to be considered integral to the scope of work and your proposal:

  Functional Design Report For Sewage Treatment Lagoon Upgrading – January 1984
  Lagoon Aeration Preliminary Drawing C101

Technical Requirements

The successful proponent must demonstrate that proposed equipment meets the following requirements:

- General

  - Designed for municipal wastewater applications
  - Suitable for operation in cold climates, including icy conditions
  - Corrosion-resistant materials suitable for lagoon environments

- Performance

  - Capable of providing both oxygen transfer and high efficiency mixing
  - Demonstrated ability to control odors in primary cells
  - Capable of full water column mixing in Cell 4

- Mechanical
    - Robust float and motor assembly
    - Minimal maintenance requirements
    - Protection against debris and fouling
- Electrical
    - Compatibility with standard municipal power supply
    - Energy efficient motor design
    - Option for variable speed operation (preferred)
- Installation
    - Suitable for retrofitting into existing lagoon without major civil works
    - Mooring/anchoring system included

Proposal Requirements

Proponents shall include the following in their submission:

- Company profile and relevant experience
- Description of proposed equipment
- Recommended number and size of aerators per cell
- Performance data
- Power requirements and operating costs
- Instillation requirements
- References from similar lagoon installations (preferably in cold climates)
- Installation requirements
- Project schedule
- Warranty information

Submission Details

- Submission deadline:
- Contact person: Doug Lowther
- Email: dlowther@fortstjames.ca

General Conditions

- Clarifications may be requested during evaluation
- Proponent must deliver electrical schematics and drawings for the supplied equipment, and supply technical support and consultation during the installation of the equipment supplied at no additional charges.
- Proposals are to be broken down to capture costs for all material and equipment included in proposal.

- All warranty information must be supplied in bid proposal.
- All freight and shipping costs must be included in the proposal.
- All suppliers used in proposal must be listed in bid proposal.

Maps and drawings attached are for information and reference of the identified streets outlined in the RFP, and to show basic outline of project scope for bidding purposes.

Prepared For

THE CORPORATION OF

The Village of Fort St. James

FUNCTIONAL DESIGN REPORT
FOR
SEWAGE TREATMENT LAGOON UPGRADING

Village of Ft. St. James

Prepared By

USL urban systems ltd.
consulting planners and engineers

JANUARY, 1984

USL urban systems ltd.
consulting planners and engineers

January 31, 1984 Our File No. A728-2

Village of Fort St. James
Drawer 640
Ft. St. James, B.C.
V0J 1P0

Attention: Mr. G. Williams, Administrator

Dear Sir:

Re: Sewage Treatment Lagoon Upgrading,
Function Design Report

We are pleased to submit our functional design report for upgrading of the Village's lagoon treatment system. The report describes in detail the scope of proposed works, design criteria and estimated construction costs. Subject to review by the Village, it would be our intention to proceed with detailed design drawings on the basis of this report.

The report also presents all design criteria associated with the lagoon upgrading project. This information will be used as the basis for a formal approval application to the Waste Management Branch.

We look forward to an opportunity to discuss the report with you and Village Council.

Yours truly,

URBAN SYSTEMS LTD.

T.R. Underwood, P. Eng.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. R. UNDERWOOD

D.B. McKerracher, P. Eng.

TRU/DMK/dp

enclosure

7 St. Paul Street West
Kamloops, B.C. V2C 1E9
Telephone 374-8311

214-1626 Richter Street
Kelowna, B.C. V1Y 2M3
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319-280 Victoria Street
Prince George, B.C. V2L 4X3
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INTRODUCTION SECTION 1

In accordance with authorization from the Village of Ft. St. James, dated November 29, 1983, an analysis of alternative concepts for upgrading and increasing the capacity of the Village sewage treatment works has been completed. This review of the alternatives is summarized in this report together with a presentation of the basic design objectives, design criteria, capital and operating cost estimates and a proposed implementation schedule.

Subject to review of this report by the Village and regulatory agencies, it is intended that the detailed design of the improvements to the Village sewage treatment works will be carried out on the basis of the recommendations presented herein. The recommended approaches to the upgrading of the Village's lagoon treatment system were discussed with Village Council in a preliminary fashion at a meeting in Ft. St. James on December 8, 1983 and with representatives of the Waste Management Branch in Prince George on January 11, 1984.

The emphasis of this report is placed on the design criteria and definition of actual components of the proposed lagoon treatment system upgrading. Details on project history and background may be obtained from previous reports prepared by Associated Engineering Services Ltd. and dated October 7, 1982, October 25, 1982, April 1978, and February 1981.

2.1 DESCRIPTION OF EXISTING SYSTEM

The Village of Ft. St. James sewage treatment lagoons are located south of the Village on land leased from the Necoslie Indian Band. The existing system was constructed in 1965 and consists of two stabilization lagoons, each approximately 2 ha (5 ac) in size. All influent to the lagoon treatment system from the Village and the Necoslie Indian Reserve is pumped. Flexibility is available in the influent piping arrangement to operate the lagoons either in series or parallel. Series operation involves diversion of all flow to Cell 1, the easterly of the two cells, with cross over flow to Cell 2. The design operating depth of both cells is 1.5 m (5 ft.) although it should be noted that the design full water elevation of Cell 2 is 0.9m (3 feet) lower than Cell 1. Following treatment in the stabilization lagoons, the treated effluent is chlorinated and discharged to the Necoslie River.

The Village of Ft. St. James sewage treatment plant is covered by Waste Management Branch Permit #239 originally issued in July 1968. The permit was most recently amended in April of 1983. The April 1983 amendment forms the basis for the upgrading program proposed herein, however the previous major permit requirements were:

- Permitted Flow - 546 cu.m./day (120,000 gpd)
- BOD_5 - 75 mg/L
- Total Suspended Solids - 85 mg/L
- Total Solids - 500 mg/L

Concerns with overloading of the existing lagoon system, and impact of discharged treated effluent were major factors in a long discussion with the Waste Management Branch concerning the major functional objectives of an upgraded system.

2.2 EFFLUENT QUALITY DATA

Effluent quality from the existing Ft. St. James lagoons has generally been reasonable recognizing that the stabilization lagoons have been operating at or over what would normally be considered as their maximum capacity in terms of people served. Effluent quality data from the existing lagoon treatment system is summarized as follows:

TABLE 1

HISTORICAL SUMMARY OF FT. ST. JAMES LAGOON EFFLUENT QUALITY

Date	BOD_5	Suspended Solids	Fecal Coliform
03/14/1978	113	47	
04/27/1978	75	53	
08/23/1978	22	17	
09/28/1978	57	50	
11/23/1978	50	28	
04/18/1979	37	21	
05/29/1979	21	30	
07/17/1979	34	90	
09/18/1979	23	38	
10/31/1979	21	50	
04/23/1980	65	35	
01/ /1982	84	18	720,000
01/ /1982	64	26	790,000
02/ /1982	84	12	640,000
02/ /1982	64	29	460,000
03/ /1982	185	32	540,000

Date	BOD_5	Suspended Solids	Fecal Coliform
04/ /1982	89	14	580,000
04/ /1982	49	20	330,000
05/ /1982	40	14	170,000
06/ /1982	20	14	L.2.
06/ /1982	39	46	35,000
07/ /1982	40	11	62,000
08/ /1982	44	29	40
09/ /1982	44	12	360,000
10/ /1982	59	20	310,000
10/ /1982	57	18	240,000
12/ /1982	60	20	490,000
01/ /1983	110	16	1,370,000
02/ /1983	130	14	860,000
03/ /1983	83	18	130,000
03/ /1983	62	21	1,600,000
04/ /1983	42	23	980
04/ /1983	48	29	240,000
05/ /1983	29	20	15,000
06/ /1983	22	30	2,000
08/ /1983	42	13	34,000
08/ /1983	21	13	100

The effluent quality from the lagoons generally complies with the previous permit requirements of BOD_5 - 75 mg/L and Suspended Solids - 85 mg/L. Of all the test results summarized in Table 1, the permit maximum for BOD was exceeded on 4 occasions and suspended solids on one occasion. An indication of the overloading of the existing system is obtained from a trend in recent years of higher than permitted maximums for BOD quality results during the winter. The deterioration of winter effluent quality is generally the first sign of an overloaded stabilization lagoon treatment system.

3.1 WASTE MANAGEMENT BRANCH PERMIT

The overall functional design performance of the upgrading program for the Ft. St. James lagoons is to be in accordance with the amended permit issued to the Village in April of 1983. The effluent quality specifications of this permit are summarized as follows:

Effluent Quality Required	BOD	SS	Fecal Coliform
Up to September 30, 1989			
May 1 to July 31 annually	45	60	1000 MPN
Aug. 1 to April 30 annually	30	40	1000
After Sept. 30, 1989			
May 1 to July 31 annually	30	40	1000
Aug. 1 to April 30 annually	30	40	1000

The permit specifies that the system upgrading must meet the above permit limits and that works are to be operational on or before October 1, 1984. The permit contains a clause which states that the effluent quality standards may be adjusted after five years of operation to reflect an 85% removal of influent BOD based on actual influent testing.

Other important requirements of the Waste Management Permit are briefly summarized as follows:

- a maximum discharge quantity of 3200 cu.m./day (704,000 gpd). This flow would correspond to a contributing population of about 8800 people.
- chlorination to provide a residual of between 0.5 and 2.0 mg/L after one hours contact time at average flow rates.
- effluent is to be dechlorinated to reduce chlorine residuals to below detectable limits.
- suitable sampling facilities and flow measurement equipment shall be provided.

The lagoon upgrading alternatives presented herein will comply with all provisions of the Waste Management Permit as amended in April 1983.

3.2 DESIGN POPULATION AND FLOWS

The objective of the lagoon upgrading is to provide sewage treatment capacity for a contributing population of 5000. For a design population of 5000 the estimated hydraulic and organic loading on the system are:

Design Flow - 5000 pop x 0.364 cu.m./day/capita = 1820 cu.m./day
or 5000 pop x 80 gallons/capita/day = 400,000 gpd
Organic Loading -5000 pop x 0.077 kg/capita/day = 386 Kg/day
or 5000 pop x 0.17 lbs/capita/day = 850 lbs/day

Dividing the design flow into the organic loading results in a design influent BOD_5 concentration of 212 mg/L. It should be noted that the per capita sewage flow may vary from municipality to municipality. In general, the per capita BOD contribution is reasonably constant. If the actual sewage flows are lower than 80 gallons/capita per day, influent BOD concentrations would be higher than the computed value of 212 mg/L. Greater treatment efficiencies would be expected in this case because longer retention times than values presented herein would be provided corresponding to a lower per capita sewage flow.

In general, adequate treatment capacity to a population of 5000 can be provided by upgrading, involving cell deepening and the addition of a mechanical aeration system in existing Cell 1 or Cell 2. By concentrating the upgrading program in Cell 1, Cell 2 would be deepened and partitioned at some future date as a second stage of improvements. Preliminary consideration is given herein to the probable future approach to improvements in Cell 2. Piping systems and lagoon cross flow structures between the two cells are therefore planned recognizing the probable future scope of upgrading in Cell 2.

3.3 SYSTEM DESIGN CRITERIA

Alternative approaches are described herein for upgrading of the Ft. St. James lagoons for a contributing population of 5000. The upgrading concepts have been derived on the basis of generally accepted lagoon loading criteria and mathematical relationships which enable the calculation of system performance. The basic lagoon design criteria utilized herein are summarized as follows:

Anaerobic Lagoons -

- Loading Rate - 6 lbs. BOD_5/1000 cu.ft.
- Retention Time - min. 2 days
- Anticipated Summer BOD removal Efficiency - 50%
- Anticipated Winter BOD Removal Efficiency - 35%

Aerated Lagoons -

- Efficiency (BOD removal) = $\frac{kt}{1 + kt}$
- where k = reaction cooefficient - 0.5 @ 20°C.
  t = retention time days
- Reaction coefficient @ T°C = $K(20°C)\ \theta^{(T-20)}$
- where T = design temperature
  θ = coefficient = 1.06
- Design Temperatures - winter - 1.5°C
  - summer 13°C.

Kg Oxygen Supplied/Kg BOD removed - 2.25
Aeration System Field to Tap Water
Transfer relationship - 0.50.

Lagoon treatment systems rely on bacterial activity to achieve organic removals (BOD reductions). Bacterial activity is highly dependent on temperature, therefore lagoon sizing has been calculated on the basis of minimum operating temperatures experienced during the winter. Aeration systems must be sized to satisfy the maximum oxygen requirements of the micro-organisms in the lagoons which is typically experienced at elevated liquid temperatures during the summer months. Computation of maximum energy requirements (input horsepower) is based on summer operating conditions.

3.4 SITE CONSTRAINTS

Golder Associates, consulting geotechnical engineers, were retained to undertake a soils investigation program of the lagoon area. The soils investigation program consisting of backhoe excavated test pits and rotary drill holes was to identify any soils related constraints which might affect the feasibility of additional berm construction, deepening of the existing lagoons and increasing of the heights of existing berms.

The major findings and conclusions of the investigation program undertaken by Golder Associates are summarized as follows:

- the existing berms are constructed of silt and clay materials with side slopes of 4:1. The material in the existing dykes is adequately compacted.
- a clean gravel layer was found in the bottom of existing Cell 1 at the northwest corner (near chlorination building). The gravel is waterbearing and was encountered at elevation 681.6 m. The existing floor elevation of Cell #1 is 682.7 m.

- soil materials throughout the remainder of Cell #1 will generally consist of silt and clay to elevation 681.0. This elevation is 1.7 m (5.5 feet) below the existing bottom elevation.
- Golder Associates recommend that clean gravel that may be encountered during the cell deepening should be sub-excavated and replaced with 0.6 m (2 feet) of clay and silt to prevent leakage of partially treated sewage out the bottom of the lagoon.
- foundations conditions for proposed operations building at the northwest corner of Cell 1 are adequate.
- clean water bearing gravel was found in the southwest area of Cell 2. The gravel is at or near elevation 681.4 which is 0.4 m lower than the existing lagoon floor elevation.
- some seepage of sewage effluent through the gravels under the berm in the southwest corner of Cell 2 was noted during the soils investigation program.
- soil materials consisting of silt and clay available from the dump area are suitable for berm construction at the lagoon site.
- soil materials found in the bottom of Cell 1 and Cell 2 are suitable for berm construction. Their moisture content is, however higher than optimum and unless they are allowed to "dry" during construction, they will not be able to be compacted in place. In this case it is unlikely that they will be suitable.

The major constraint identified by Golder Associates during the soils investigation program is the waterbearing gravel material at or near elevation 681.4 along the west side of existing Cell 1 and Cell 2. Excavation into the gravel to deepen either of the cells below elevation 681.4 will require dewatering and over excavation to place a liner consisting of clay and silt. To reduce the possibilities of problems associated with the water bearing clean gravel, it is now proposed to establish the new lagoon floor grades above the gravel materials and provide the necessary additional lagoon depth by raising the existing berm heights. In Cell 1, the maximum excavation will be to elevation 681.4m (approximately 1.25m [4 feet] below the existing floor elevation).

In Cell 2, no deepening (other than sludge removal) is proposed recognizing that the gravel is likely exposed at the existing lagoon floor grade.

3.5 SLUDGE ACCUMULATION

A survey of sludge accumulation in existing Cell 1 was carried out by Urban Systems' staff on November 25, 1983 using a plexiglass hollow tube. In general, there is a modest accumulation of organic sludge in Cell 1.

Within a 30 m radius of the inlet sewer to Cell 1, sludge depths of up to 0.45m (1.5 feet) were noted. The sludge typically consists of a dense "black" zone immediately above the lagoon floor and a "grey" zone above the "black" zone where the organic material is more in suspension. Outside of a 30m radius of the inlet pipe, the depth of accumulated sludge is less than 0.15m (6 inches). This includes the "grey" zone where solids are in suspension.

Two samples of the sludge from the bottom of Cell 1 were taken and forwarded to Eco-Test Laboratories in Kamloops for analysis. The results are as follows:

	Sample 4:	Sample 6:
% Solids	39.8%	8%
% Volatile Solids	4.76%	3.58%

The testing results for the two samples indicate a wide variation in solids concentration. Sample 4 taken in the vicinity of the lagoon influent pipe has a total suspended solids concentration of 39.8%. Sample 6 is taken approximately 30m from the influent pipe and has a solids concentration of 8%. The result for sample 4 suggests that the volatile or degradable component of the sludge is low, in other words, the sludge is well digested and stable. In terms of sludge

disposal, the sampling results suggest the material is suitable for disposal onto an agricultural area or stockpiling for use as a soil conditioner in topsoil. The final disposal of excavated sludge will be defined during final design through consultation with the Waste Management Branch.

For cost estimating purposes, the total sludge quantity to be removed has been estimated on the basis of the survey results. Using a sludge depth of 0.4m in a 30m radius of the influent pipe and 0.15m elsewhere, the total sludge quantity is estimated to 4,000 cubic metres. It is probable that this is a conservative estimate of the sludge quantity because the sludge will dewater and compact as the lagoon is drained and allowed to dry.

3.6 LAGOON DRAINING

Up until a meeting with representatives of Waste Management on January 11, 1984, the scheduling of the draining of existing Cell #1 was not considered to represent a major constraint on the construction period for the lagoon upgrading. Up to January 11, 1984, the exact construction schedule had not been finalized but it was hoped that the lagoon (Cell 1) could be drawn down prior to tender call (tentatively scheduled for the end of March). Ideally the lagoon draining should commence on or about the end of February to enable some dewatering of the accumulated sludge by the tender period. Contractors could then gain a very clear indication visually of the sludge accumulation, and probable water content.

During the meeting with Waste Management on January 11, 1984, the subject of the lagoon draining was brought out. Waste Management requested a written submission after some preliminary discussion with the provincial Fish and Wildlife Branch and the Federal Department of Fisheries.

Serious reservations associated with the proposed end of February drawdown of Cell 1 have been expressed by Federal Fisheries. Federal Fisheries require that the drawdown not be commenced until freshet, typically June 1 to June 30. Efforts to secure an earlier drawdown schedule are continuing with the assistance of the Waste Management Branch. Based on discussions to date, it is unlikely that the drawdown of Cell 1 can be started before mid April 1984 due to the concerns of the Federal Department of Fisheries.

4.1 OVERVIEW OF SYSTEM UPGRADING CONCEPTS

Three concept plans for upgrading of the Ft. St. James lagoons have been prepared and were discussed with Village Council in a meeting on December 8, 1983. All concepts involved constructing improvements only in existing Cell 1 for a design contributing population equivalent of 5000. All concepts involved deepening of existing Cell 1, the division into two or more cells, and the installation of a mechanical aeration system. In all cases, the effluent quality achieved at the outlet of Cell 1 would reasonably comply with the amended Waste Management Permit. Existing Cell 2 would be used in all cases as an effluent polishing cell prior to chlorination - dechlorination and subsequent effluent discharge to the Necoslie River.

The three concepts considered for upgrading of the Ft. St. James lagoons are briefly summarized as follows:

Alternative A: Large Cell Aeration: (See Figure 1)
This alternative would involve the construction of a partition dyke parallel to the existing division berm between Cells 1 and 2, to provide a large mechanically aerated cell and a smaller aerated effluent polishing cell. Influent would pass through the aerated cell from south to north.

NECOSLIE INDIAN RESERVE
No. 1

PLAN 51766 C.L.S.R.
PLAN 14048 L.R.O.

LOT 220
PLAN 56166

TO CELL 2

OPERATIONS BUILDING

AERATED CELL
25 DAYS

WATER LEVEL = 684.19

CHLORINATION

AERATED POLISHING CELL
3 DAYS

FRAC.
N.W. 1/4 D.L. 1631

8200 INFLUENT PIPE

8200 INFLUENT LINE

FORCE LINE

DIST. BOX

TO NECOSLIE ROAD

EDGE OF POND

WATER LEVEL = 683.30

LEGAL MEAN HIGH WATER MARK

DISCHARGE

8300 OUTFALL LINE

RIVER OUTLET (8300)

RIVER BANK

RIVER EDGE

NECOSLIE RIVER

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SCALE
HOR.

urban systems ltd.
CONSULTING ENGINEERS & PLANNERS

VILLAGE
OF
FORT ST. JAMES

ALTERNATIVE
- A -
SINGLE CELL AERATED

PROJECT NO 78-83-8782-2
DWG NO 8782-2 R
FIGURE 1

With a liquid depth of 3.66m (12 feet), the retention time in the large aerated cell would be about 27 days at the design flow and 3 days in the aerated polishing lagoon. An effluent BOD of 32 mg/L is predicted from Cell 1 using performance relationships presented earlier for winter operation. Additional effluent polishing would be achieved in existing Cell 2 and the aerated polishing cell.

Several concerns associated with Alternative A are as follows:

- with a single large mechanically aerated cell, short circuiting of flow through the lagoon is possible. Reduced treatment efficiencies may result.
- double air distribution piping would be required to provide adequate air flow to each aerator across the lagoon.
- bypass flexibility for operation and maintenance of the aerated cell is poor. Influent sewage would have to be diverted to Cell 2 which would not be aerated.
- some clogging of aerators may be experienced with addition of raw sewage directly to aerated cell.
- preliminary capital cost estimate of $702,000 not including an allowance for engineering and contingencies.
- operating costs will be significant based on a continuous input horsepower requirement of 120 at the design flow of 1820 cu.m./day, (400,000 gpd).

Alternative B: Anaerobic and Aerated Lagoons (See Figure 2). This alternative would involve the division of existing Cell #1 into four cells, two short retention anaerobic lagoons, one large aerated lagoon and an aerated polishing lagoon. At the design flow of 1820 cu.m./day, the retention time in each anaerobic lagoon would be two days, 15 days in the aerated cell, and 3 days in the aerated polishing lagoon. The computed system efficiency during the winter months is 83% resulting in an effluent BOD_5 concentration to existing Cell 2 of 38 mg/L.

NECOSLIE INDIAN RESERVE
No. 1

PLAN 81788 C.L.S.R.
PLAN 14048 L.R.O.

LOT 220
PLAN 56166

ANAEROBIC CELL 1
2 DAYS

ANAEROBIC CELL 2
2 DAYS

AERATED CELL 3
15 DAYS

AERATED POLISHING CELL
3 DAYS

WATER LEVEL = 684.19

WATER LEVEL = 683.30

OPERATIONS BUILDING

CHLORINATION

DISCHARGE

NECOSLIE RIVER

RIVER OUTLET (#300)

TO NECOSLIE ROAD

FORCE LINE

600Ø EFFLUENT LINE

600Ø INFLUENT LINE

EFFLUENT PIPE

EDGE OF ROAD

TOP OF BANK

TOE OF BERM

RIVER BANK

FRAC.
N.W. 1/4 D.L. 1631

ISSUES		
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P ENG SEAL

SCALE
HOR.

urban systems ltd.
CONSULTING ENGINEERS & PLANNERS

VILLAGE OF FORT ST. JAMES

ALTERNATIVE - B -

ANAEROBIC - AERATED

PROJECT NO PS-83-8782-2
DWG NO 8782-2 R

FIGURE 3

The anaerobic-aerated alternative overcomes many of the concerns with Alternative A, namely:

- short circuiting possibilities are reduced with multi-celled configuration.
- good bypass flexibility of any one cell is provided for maintenance purposes.
- solids settling in anaerobic lagoons will reduce possibility of clogging of the submerged aerators.
- preliminary capital cost estimate is $581,000, not including engineering and contingencies.
- operating costs will be lower on the basis of an input horsepower requirement of 50 to 60 horsepower at design flow.

It should be recognized, however that some odors will originate from the anaerobic cells. The odors will be most pronounced in the early spring (after ice has gone off ponds) and in the late fall. Low level odors will result from the anaerobic cells the remainder of the year and will be noticeable for a distance of 100 to 200 metres from the lagoon area. Odor carrying distances of 100 to 200 metres are not likely until the organic loading to the system approaches design levels.

The anaerobic cells provide 35 to 50% of the overall system BOD removal with no input energy requirements. This is the primary advantage of the concept. As a means to reduce the potential odors from the anaerobic lagoons, mechanical floating aerators can be added to the cells during the summer months. The aerators would be anchored to concrete bases provided in a 3 point pattern in the lagoon berms and the aerator simply plugged into an electrical receptacle. To mitigate possible odor problems, it is recommended that electrical systems be provided adjacent to each anaerobic lagoon for the use of surface aerators.

Alternative C; Multi-Cell Aerated Lagoon (See Figure 3)
This alternative is similar to Alternative A except that the single large aerated cell is divided into two cells. The advantages of this alternative relative to Alternative A are reduced short circuiting concerns and greater bypass flexibility. Input energy requirements remain about the same as Alternative A.

A preliminary capital cost estimate for Alternative C indicated total construction costs approximately $40,000 more than Alternative B. Operating costs for Alternative C will be significantly more than the anaerobic-aerated option.

The advantages and disadvantages of the three alternatives were discussed with Village Council on December 8, 1983. Arising out of this meeting and recognizing the lower capital and operating costs associated with the anaerobic-aerated Alternative B, a tentative decision was made to proceed with this alternative. The anaerobic-aerated alternative was presented to the Waste Management Branch on January 11, 1984 and a verbal approval in concept was received from Branch Officials. The remainder of this functional report deals specifically with the anaerobic-aerated alternative (Alternative B).

4.2 FUTURE UPGRADING OF EXISTING CELL 2

Arising out of the meeting with Village Council on December 8, 1983, the future upgrading of existing Cell 2 was discussed at some length. The current upgrading proposed in existing Cell 1 must be compatible with the long range future upgrading of Cell 2.

In preliminary detail, the options for upgrading of existing Cell 2 have been assessed. The two anaerobic ponds proposed in the perimeter of Cell 1 are each sized for an organic loading from a contributing population of 5000.

NECOSLIE INDIAN RESERVE
No. 1

PLAN 51768 C.L.S.R.
PLAN 14048 L.R.O.

LOT 220
PLAN 56186

TO CELL 2

8200 INFLUENT LINE

FENCE LINE

TOP OF BANK

EDGE OF ROAD

MH L-3

8200 INFLUENT PIPE

AERATED
CELL 1
11 DAYS

OPERATIONS
BUILDING

WATER LEVEL = 684.19

AERATED
CELL 2
11 DAYS

CHLORINATION

DIST. BOX

8200 INFLUENT LINE

MH L-2

TO NECOSLIE ROAD

AERATED
POLISHING
CELL
3 DAYS

WATER LEVEL = 683.30

DISCHARGE

8200 OUTFALL LINE

RIVER OUTLET
(8300)

NECOSLIE RIVER

FRAC.
N.W. 1/4 D.L. 1631

ISSUES

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REVISIONS

P. ENG. SEAL

DES SU/DMK
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CHK DMK

SCALE
HOR.

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CONSULTING ENGINEERS & PLANNERS

VILLAGE
OF
FORT ST. JAMES

ALTERNATIVE
- C -

MULTI CELL
AERATED

PROJECT NO. P6-83-8782-2

DWG NO. 8782-2 R

FIGURE 3

Therefore, when the contributing population exceeds 5000, the flow should be split between the two anaerobic cells (ie operated in parallel). With this mode of operation, contributing populations approaching 10,000 can be serviced by the anaerobic cells proposed.

Beyond the current 5000 design population, additional aerated cell capacity will be required to be provided in Cell 2. Conceptually, it is proposed to provide additional aerated cell volume by dividing existing cell 2 into two basins by a centre berm in a north to south direction. A liquid depth of 3.0 metres would be provided by raising the existing perimeter berms of Cell 2 approximately 1.5 metres (5 feet). The liquid elevation in Cell 2 would be the same as the proposed new operating elevation in Cell 1 (elevation 684.7 m).

The dividing berm in Cell 2 would result in two additional aerated cells, each with a retention time of 6.5 days at an ultimate design flow of 800,000 gpd (population 10,000). Including the aerated cell in Cell 1, the total aerated cell retention time provided at a flow of 800,000 gpd is 20 days. The system will be capable of meeting the Waste Management Permit requirements of 85% BOD removal or 30 mg/L effluent BOD.

The final layout of the anaerobic and aerated lagoon improvements in Cell 1 have been carried out recognizing that in the future Cell 2 will be divided into two aerated cells and an increased operating depth provided by raising the existing berms. Some consideration may also be given to undertaking earthwork components of the upgrading of Cell 2 as part of the herein proposed upgrading of Cell 1.

4.3 DETAILED DESCRIPTION OF LAGOON UGPRADING PROPOSAL

A detailed site plan of the proposed upgrading in Cell 1 comprising two anaerobic ponds, an aerated lagoon and an aerated polishing lagoon is presented in Figure 4. Components of the proposed system upgrading are discussed in detail in the following sections:

4.3.1 Anaerobic Cells 1 and 2

Each of the anaerobic cells will have a design liquid volume of 3640 cu.m. (800,000 Igal) which represents a retention time of 2 days at the design flow of 1820 cu.m./day. Each cell will have a design operating depth of 3.66 m (12 feet). The design BOD loading to each cell is 6.6 lbs. BOD_5 per 1000 cubic feet of volume. As defined earlier, the BOD removal through the anaerobic cells is expected to be 35% in the winter and 50% in the summer. Using the design influent BOD concentration of 213 mg/L, the effluent BOD from the anaerobic cells should be 138 mg/L in the winter and 107 mg/L in the summer.

The existing influent pipe to existing Cell 1 will be connected into once a hydraulic structure with valves giving the capability of diverting flows either to anaerobic Cell 1 or Cell 2. Normal operation will be a series operation with flow into anaerobic Cell 1, and then into anaerobic Cell 2. The aerated cell (Cell 3) would be bypassed by reversing the flow through the anaerobic cells, ie. into anaerobic Cell 2 then cross over to Cell 1.

Electrical receptacles and anchors are to be provided for the use, if required, of surface aerators on the anaerobic cells to control odors. The surface aerators would be used in the summer months only and would be approximately 5 HP each.

NECOSLIE INDIAN RESERVE
No. 1

PLAN 51768 C.L.S.R.
PLAN 14048 L.R.O.

LOT 220
PLAN 56188

FRAC.
N.W. 1/4 D.L. 1631

ANAEROBIC CELL 2
PROPOSED FLOOR ELEV. 681.5
FWL 685.2

ANAEROBIC CELL 1
PROPOSED FLOOR ELEV. 681.5
FWL 685.2

AERATED CELL 3
PROPOSED FLOOR ELEV. 681.5
FWL 685.1

FUTURE AERATED CELL 4
EXIST. & PROPOSED FLOOR ELEV. 681.6±
PROPOSED FWL 684.7

FUTURE AERATED CELL 5
PROPOSED FWL 684.7

AERATED POLISHING CELL
FWL 684.7
FLOOR ELEV. 682.5

OPERATIONS BUILDING (BLOWERS & CHLORINATIONS)

CHLORINE CONTACT TANK

RE-AERATION CELL

FLOW METER STRUCTURE
ELEV. 685.6

BYPASS CELL 1

NORMAL OPERATION

EMERGENCY BYPASS CELL 3

EMERGENCY BY-PASS

TYP. HYDRAULIC STRUCTURE

ALL PIPING Ø 300 SDR 35 PVC

Ø200 INFLUENT PIPE

TOP OF BERM ELEV. 686.0

3.0m WIDE BERM

4.0m BERM

PUMP MANHOUSE

PUMP OUT MANHOLE

BY-PASS CELLS 485

Ø 200 SCD. 40 STEEL AIR HEADER

Ø 150 SCH. 40 STEEL AIR HEADER

Ø64 PE

TYPICAL SUBMERGED AERATORS

WATER LEVEL 684.19

ELEV. 686.0

ELEV. 685.6

WATER LEVEL = 683.30

FUTURE 3.0 m WIDE DIVISION BERM

DECHLORINATION

TO BE ABANDONED

Ø300 SEWAGE LINE

PROPOSED OUTFALL TO NECOSLIE RIVER

NECOSLIE RIVER

RIVER OUTLET (Ø300)

Ø200 INFLUENT LINE

TO NECOSLIE ROAD

DIST. BOX

FENCE LINE

TOP OF SLOPE

EDGE OF POND

EDGE OF CLEARING

MEAN HIGH WATER MARK

RIVER BANK

RIVER EDGE

ISSUES		
	DESCRIPTION	DATE
1	FOR APPROVAL	
2	FOR TENDER	
3	FOR CONSTRUCTION	
4		
5		
6		
7		
8		
9		

REVISIONS

DES SU/DMK / BR
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CHK DMK

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SCALE HOR

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CONSULTING ENGINEERS & PLANNERS

VILLAGE OF FORT ST. JAMES

LAGOON UPGRADING

SITE PLAN

PROJECT No. PG-83-8782-2

DWG. No. 8782-2 R

FIGURE 4

To permit future cleaning of accumulated sludge from either of the anaerobic cells, a manhole with piping into each cell is proposed for a drainage pump. A portable submersible pump would be dropped into this manhole and simply plugged into the surface aerator power supply. The pump would permit withdrawl of all but the lower 0.6 m of the cell volume.

All berms surrounding the anaerobic cells would have 3:1 side slopes and a 3 m berm crest distance.

4.3.2 Aerated Cell

Aerated Cell #3 will have an operating depth of 3.66 m and a hydraulic retention time of 15 days at the design flow of 1820 cu./day (400,000 gpd). From the performance relationship presented in section 3.3, the summer and winter BOD removal efficiencies of the aerated cell are as follows:

Winter Operation:

- BOD applied - 138 mg/L.
- Removal 1.5°C and retention of 15 days = 72%.
- BOD out - 38 mg/L.
- BOD removed - 181 kg/day.

Summer Operation:

- BOD applied - 107 mg/L.
- Removal 13°C and T = 15 days - 84%.
- BOD out - 17 mg/L.
- BOD removed - 163 kg/day.

The effluent BOD concentration from the aerated cell during the winter months is expected to be within 8 mg/L of the permit standards. This 8 mg/L is expected to be removed through existing Cell 2 and the aerated polishing lagoon.

A submerged coarse bubble aeration system is proposed to be installed in aerated Cell #3 as shown in Figure 4. The aeration system design is based on summer operating conditions recognizing that oxygen transfer efficiencies are lower as the lagoon operating temperature increases. The aeration system is designed to supply 2.25 Kg O_2 per Kg of BOD removed, or a total daily oxygen transfer of 366 Kg per day during the summer.

In total, 34 coarse bubble aerators are to be provided in the aerated cell. The oxygen transfer capacity of the aerators is summarized as follows:

Clean water oxygen transfer* - 1.13 Kg/hr/aerator
(*based on 25 SCFM/tube and 3.66m depth).
Field transfer rate - 50% of clean water rate.
Actual oxygen transfer - 1.13 Kg/hr x 34 x 50% x 24 hrs/day
= 436 Kg O_2/day.

The actual total oxygen transfer of the aeration system exceeds the minimum requirement by 70 Kg per day. This additional margin recognizes the geometry of the cell and the fact that cell influent sewage flow may not be distributed equally across the lagoon.

Air supply to the aerators is to be provided from a 200mm (8") diameter air header buried in the common berm between the aerated cell and the aerated polishing lagoon. Air distribution piping 65mm (2-1/2") in diameter extends from the air header to the submerged aerators. Each lateral will be individually valved.

4.3.3 Existing Cell 2

Effluent from the aerated cell (Cell #3) will be piped into existing Cell 2 which will further reduce the BOD in the sewage. Exactly how much BOD will be removed in the existing Cell 2 is difficult to predict

however, it is certain that the effluent from Cell 2 will have a BOD concentration of 30 mg/L or less recognizing that the concentration of the BOD applied will be 38 mg/l or less.

Existing Cell 2 should remain facultative throughout the year because the applied BOD to the Cell will be less than 10 lbs. per acre per day initially and about 30 lbs. per acre per day when the design population of 5000 is reached. The only complicating factor about existing cell 2 is the accumulated sludge in the lagoon. The accumulated sludge may represent a net BOD addition in the lagoon for a period of years until all accumulated sludge is adequately digested. Accordingly, removal of accumulated sludge from Cell 2 is considered as a priority for surplus funds which may be available after completion of the work in existing Cell #1.

4.3.4 Re-Aeration, Chlorination and Dechlorination

These works will be located immediately west of the operations building as shown on Figure 4. Effluent from existing Cell 2 will be drawn through a magnetic flowmeter into the reaeration basin. The reaeration basin is proposed as a means to remove H_2S from the sewage which may be present during the winter. If the H_2S is not removed, chlorine added will simply react with the H_2S and,as a result,is ineffective in killing coliform bacteria that may be present. The reaeration system would be sized for a two hour retention of the average daily flow and would contain four coarse bubble aerators, similar to the ones to be installed in the aerated Cell 2. These aerators would be used only when H_2S is present in the effluent from Cell 2, typically during the winter months.

Following reaeration, the effluent would be chlorinated and passed through a baffled cast-in-place chlorine contact basin. The contact chamber is sized for a one hour contact time of the design average daily

sewage flow (ie. 16,700 Igal or 73 cu.m.). The chlorination equipment from the existing building would be relocated to the proposed operations building. Treated effluent would be used through a booster pump for the water supply for the chlorinator.

A chemical dechlorination system is to be provided. Systems involving the addition of sodium sulphide are currently being used in Cache Creek and Merritt for dechlorination. The chemical is added using a small chemical feed pump from a solution tank. The reaction with residual chlorine is almost instantaneous.

The chemical dechlorination system will likely have to be used only during the winter months. During the summer months, the retention time in the aerated polishing lagoon should be adequate to achieve complete removal of chlorine residuals. Until flows approaching the design flow are reached, there is a good possibility that adequate chlorine residual reductions will be achieved through the aerated polishing lagoon during the winter months. The need to operate the chemical dechlorination system will have to be established through operator experience with the system.

4.3.5 Aerated Polishing Lagoon

The aerated polishing lagoon has design retention time of 3 days as the design flow of 1820 cu.m./day. The aerated polishing lagoon is the final treatment component prior to ultimate effluent discharge in the Necoslie River. The aerated polishing lagoon may be considered as a safety factor in the overall process. The cell serves several functions in this regard:

- adds dissolved oxygen to the effluent prior to discharge.
- removes hydrogen sulphide in final effluent, should any be present.
- will reduce chlorine residuals in the event of dechlorination system malfunction or accidental over chlorination.
- provides BOD and suspended solids removal in the event of malfunction or bypass of other treatment cells.

A major constraint associated with the construction of the aerated polishing lagoon is the presence of clean granular materials at or near the present floor elevation of 682.7m. If raising of berms of existing Cell 2 is not carried out as part of the proposed lagoon upgrading project, the existing floor elevation of Cell 1 in the polishing lagoon area will have to be lowered a minimum of 1.2m to result in an operating liquid depth of 1.8m (6 feet). If the berms of Cell 2 are raised, no excavation or deepening in the polishing lagoon area is necessary.

4.3.6 Operations Building

The operations building's two main functions are to house the air blowers for the lagoon aeration system and the chlorination and dechlorination equipment. Overall building dimensions will be finalized during the detailed design phase of the project. For a design population of 5000, three 25 horsepower blowers will be required to be located in the operations building. Until a contributing population of 3000 is reached, sufficient air volume will be provided by one of the proposed blowers. As the contributing population exceeds 3000, two blowers will have to be run during the summer months and one during the winter. For a design population of 5000, two of the blowers provided will be run on a duty basis with one as standby.

Masonry construction with a flat roof is proposed for the operations building. The potential of damage from vandalism is recognized at the lagoon site, therefore windows, exterior lighting, etc. are not proposed.

4.4 CAPITAL COST ESTIMATE

A capital cost estimate for the proposed lagoon improvements within existing Cell #1 is given in Table 2. The capital cost estimate given in Table 2 is inclusive of all project components in existing Cell 1 which would provide adequate treatment capacity for a population of 5000 in the Village.

In Table 3, a capital cost estimate is given for berm construction, hydraulic structures and piping in existing Cell 2. The grading and piping work would divide existing Cell 2 into two cells, each with a liquid depth of 3.0 metres. To upgrade the system to a design population of 10,000, aerators and air header piping would be necessary into Cell 2 and additional blowers added in the operations building.

The capital cost estimate for the upgrading of Cell 1 to provide treatment capacity for a design population of 5000 as given in Table 2 is reasonably straightforward.

Work in Cell 2 as shown in Table 3 would be undertaken as available funds permit from the overall loan authorization bylaw. Table 3 also shows a reduction for unnecessary excavation in the aerated polishing lagoon area of Cell 1. If the existing berms of Cell 2 are raised (estimated cost $58,500) then deepening of the aerated polishing lagoon is unnecessary, therefore a reduction in the excavation quantities given in Table 2 is achieved. The net cost for raising of the existing berms is therefore $49,500. It should be noted that Cell 2 does not have to be drained to raise the existing berms to the ultimate design (pop. 10,000) height.

TABLE 2

CAPITAL COST ESTIMATE

(CELL 1 UPGRADING TO POPULATION 5000)

Item	Description	Est. Quantity	Unit Cost	Total Cost
1.	Sludge Excavation & Disposal	4000 cu.m.	$6.00	$ 24,000
2.	Excavation; Cell Deepening	11,000 cu.m.	$3.00	$ 33,000
3.	Embankment; Berm construction	29,000 cu.m.	$4.50	$130,500
4.	Hydraulic Structures	8	$6000	$ 48,000
5.	Pump Out Chambers	2	$4000	$ 8,000
6.	Site Piping	Ø300-720m	$90	$ 64,800
7.	Static Tube Aerators	45 each	$550	$ 25,000
8.	Aeration System Header			
	- Ø200 Sch. 40 steel	160 m	$150	$ 24,000
	- Ø150 Sch. 40 steel	140 m	$120	$ 17,000
9.	Magnetic Flowmeter	Lump Sum		$ 12,000
10.	Chlorine Contact Chamber	Lump Sum		$ 30,000
11.	Operations Building			
	Foundation			$ 18,000
	Superstructure			$ 30,000
	Blowers & Mechanical			$ 40,000
	Chlorination-Dechlorination			$ 10,000
	Painting			$ 7,000
	Electrical			$ 20,000
12.	Electrical Extension to Operations Building			$ 6,000
13.	Allowance for fencing			$ 12,000
14.	Electrical Subfeed for surface aerators			$ 8,000
			Total Construction Cost - Cell 1	$567,300
			Engineering & Contingency Allowance (20%)	$112,700
			TOTAL PROJECT COST	$680,000

TABLE 3

CAPITAL COST ESTIMATE

CELL 2 EMBANKMENTS AND PIPING SYSTEMS

Item	Description	Est. Quantity	Unit Cost	Total Cost
1.	Sludge Excavation & Disposal	4000 cu.m.	$6.00	$ 24,000
2.	Excavation; Stripping Ex. Berms	2000 cu.m.	$3.00	$ 6,000
3.	Embankment - Division Berm Construction	12,000 cu.m.	$4.50	$ 54,000
4.	Embankment - Raising Ex. Berms	13,000 cu.m.	$4.50	$ 58,500
5.	Hydraulic Structure	1	$6000	$ 6,000
6.	Site Piping	30 m	$90	$ 2,700
7.	Enlarged Blower Bldg. & Electrical			$ 22,000
8.	Fencing			$ 9,000
		Sub-Total Cell 2		$182,200
	(Less) Unnecessary Excavation from Table 2 in Aerated Polishing Lagoon	3000 cu.m.	$3.00	$ 9,000
	(Less) Unnecessary Site Piping from Table 2 to Northend of Excavated Cell 2			$ 10,000
		Total Estimated Cost Cell 2		$163,200
	Engineering and Contingency Allowance (20%)			$ 32,800
		TOTAL COST CELL 2		$196,000

As funds permit, the recommended priority items for construction in existing Cell 2 are:

1)	Enlarge Operations Building & Electrical -	$22,000
2)	Raise Existing Berms	
	- embankment - 13,000 cu.m.	$58,500
	- fencing	$ 9,000
	- stripping existing berms	$ 6,000
	- (Less) Unnecessary Excavation Cell 1	$ 9,000
	Sub-Total Raise Ex. Berms	$64,500
3)	Sludge Excavation and Disposal	$24,000
4)	Division Berm Construction	
	- Embankment 12,000 cu.m.	$54,000
	- Piping & Hydraulic Structure	$ 8,700
	- (Less) Unnecessary Piping	$10,000
	Sub-Total Division Berm	$52,700

The enlarged operations building would provide adequate floor area for the installation of two additional blowers (total 5 units) for the future aeration system in existing Cell 2. The electrical service would be oversized for these additional blowers.

4.5 OPERATING COSTS

Operating costs are in general difficult to accurately estimate. Costs for electrical energy and chemicals can be related to the sewage flow and reasonably estimated. Operation and maintenance requirements are more difficult and ultimately are determined by the Public Works Department as operating experience with the system is gained. For operation and maintenance, the system should be checked daily to ensure all components are operating, the chlorine and dechlorination dosage rates are correct, blowers have adequate lubrication, etc. Operation and maintenance requirements are based on a daily inspection, 5 days per week with an average time requirement of 1-1/2 hours per day. Estimated operating costs for the present Village population and the design population are given in Table 4.

TABLE 4

OPERATING COST ESTIMATE

		Present Population	Population 5000
1.	Routine Operation & Maint. 360 hrs.	$ 5,400	$ 5,400
2.	Electrical Energy-Blowers	$ 6,000	$12,000
3.	Electrical Energy-Heating - Ventilation, etc.	$ 1,500	$ 1,500
4.	Chlorine	$ 1,800	$ 3,600
5.	Dechlorination Chemicals	$ 900	$ 1,800
6.	Annual Flowmeter Calibration Check	$ 500	$ 500
7.	Monitoring as per WMB Permit	$ 1,200	$ 1,200
8.	Allowance for Miscellaneous Equipment Repair Parts, etc.	$ 3,000	$ 5,000
	Total	$20,300	$31,000

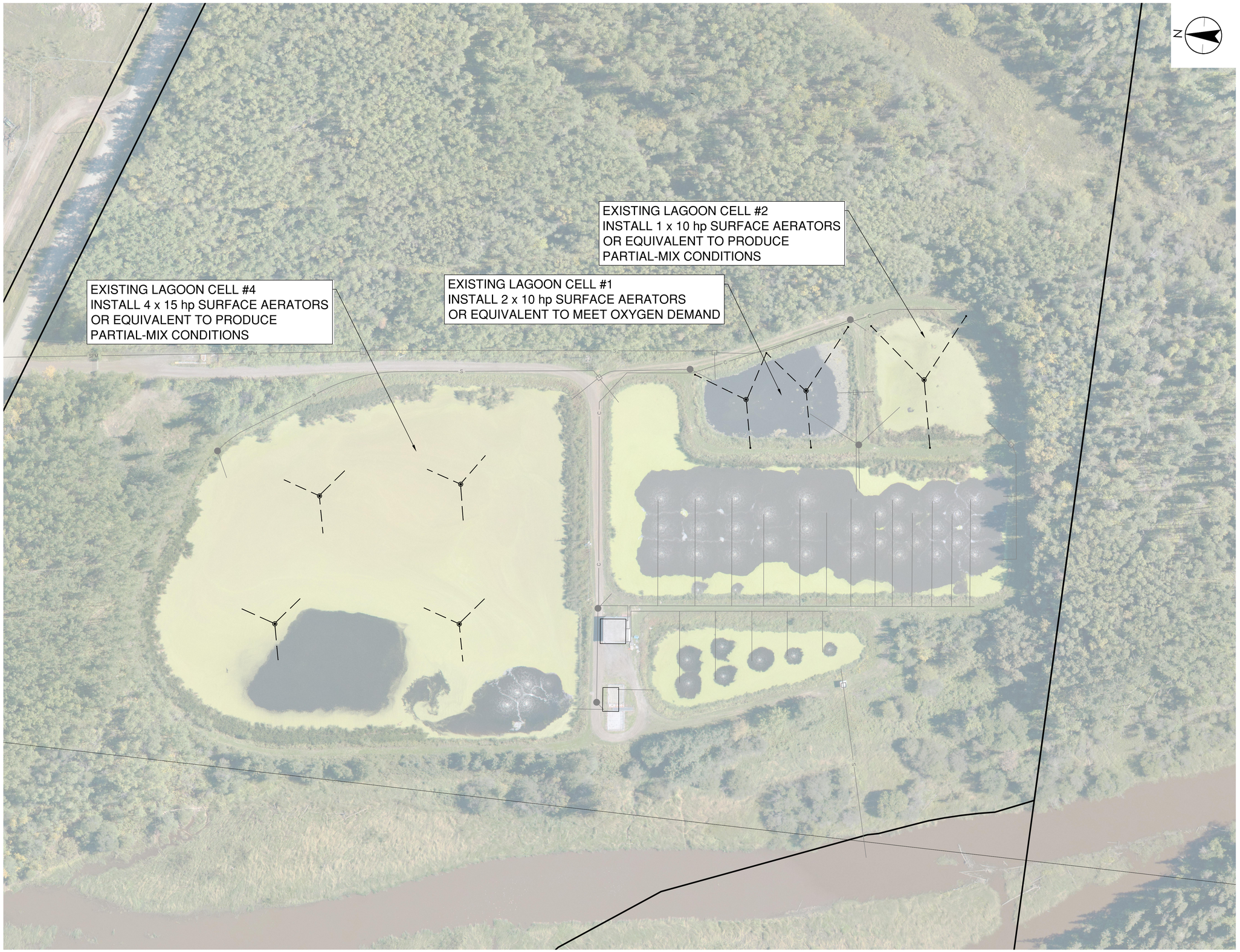
4.6 IMPLEMENTATION SCHEDULE

With the approval of the Village, it is proposed to proceed with the detailed project design on the basis of this functional design report. It is recommended that the scope of the design be expanded to include all earthwork and piping system components in existing Cell #2 as delineated in Table 3. The contract documents would be set up giving the Village the option of deleting some portion (or all) of the proposed work in Cell 2. The tender documents would clearly set out the fact that the work in existing Cell 2 are optional items and subject to deletion by the Village.

The detailed project design drawings will take approximately two months to complete which would enable tenders to be called on or after the end of March 1984. This design schedule is consistent with the original proposal presented to the Village in November 1983.

It was originally intended that actual construction would begin in the last week of May 1984. This construction start date assumed that lagoon drawdown could be started in February and contractors could view the drained pond during the tender period in April. The concerns of Federal Fisheries with an early drawdown period may require some modifications to the proposed tender and construction schedule. It remains our recommendation that Cell 1 be drained for contractor viewing during the tender period. Assuming formal approval from Waste Management can be obtained for draining Cell 1 starting in mid April, the following implementation schedule is proposed.

April 15 - Start Draining Cell #1.
April 20 - Call Tenders.
May 7 - Complete Lagoon Drawdown.
May 17 - Close Tenders.



Stantec

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Notes

LOCATIONS OF ABOVE GROUND AND UNDERGROUND INSTALLATIONS ARE APPROXIMATE AND ACTUAL CONDITIONS MAY NOT BE ACCURATELY REPRESENTED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING ABOVE GROUND AND UNDERGROUND INSTALLATIONS PRIOR TO CONDUCTING ANY WORK THAT COULD AFFECT, OR BE AFFECTED BY, THE ABOVE GROUND AND UNDERGROUND INSTALLATIONS. STANTEC ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THE EXISTING ABOVE GROUND AND UNDERGROUND INSTALLATIONS SHOWN OR FOR ANY ERRORS OR OMISSIONS THAT MAY BE REPRESENTED.

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Revision	By	Appd	YYYY.MM.DD
A FOR REVIEW	JMB	SB	2026.02.23
Issued	By	Appd	YYYY.MM.DD

Permit/Seal

PRELIMINARY NOT FOR CONSTRUCTION

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Client/Project Logo

Client/Project
District of Fort St. James

Lagoon Upgrade Ph. 1 - Aeration

Fort St. James, BC

Title
Proposed Surface Aerators

Project No.
115824031

Scale
1:750 (0, 7.5, 15, 37.5)

Revision
1/1

Sheet
1 of #

Drawing No.
C-101