

**Appendix F – Abandonment and Restoration Plan  
Sewage and Solid Waste Facility**

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Yellowknife, N.T.

INDIAN AND NORTHERN AFFAIRS — CANADA N.W.T. REGION
MAR 28 1995
WATER RESOURCES DIVISION YELLOWKNIFE, NT

ABANDONMENT AND RESTORATION PLAN  
PAULATUK SEWAGE AND SOLID WASTE FACILITY  
PAULATUK, N.W.T.

Submitted by:  
Hamlet of Paulatuk  
August 1994

## 1.0 BACKGROUND

Paulatuk did not have an adequate disposal site for sewage and solid waste. The original sites were too close to the community, about 350m from existing development which was not in compliance with Municipal and Community Affairs Standards (MACA) or the Public Health Act. In addition, in 1993 a new airstrip was opened to the immediate north of the existing sewage and solid waste sites.

In 1993 construction began on relocating the sewage/solid waste sites to a location in the area of "Lake A" about 3km south of the existing site. The new site consists of a bulky metal waste area, honeybag pit, solid waste trenches and a natural sewage lagoon at Lake A. Construction was complete on the solid waste trenches in September 1993 and the community has been using the new site for solid waste disposal since that time.

Construction is currently being completed on the sewage lagoon portion of the project and it is expected that the community will begin using the new facility by September 1994.

## 2.0 ABANDONMENT OF EXISTING SITE

This section of the plan has been completed using Part F of the Paulatuk Water Licence as a guideline.

### 2.1 Contaminated site remediation

Paulatuk is a community of approximately 350 people. There has never been any heavy industry in the area therefore the primary source of solid waste has been from municipal type waste. For this reason it is not believed that there are any wastes on the site which would cause this site to be classified as "contaminated". No specific remediation of contaminated waste is planned.

With regard to the sewage lagoon, there is a steady flow of water through the lagoon system with the ocean as the final receiving body. The specific objective as stated in section 1.3 of "Guidelines For The Abandonment and Restoration of Sewage Lagoons in The NWT" are as follows:

#### 1. minimize future effects on public health and safety

After the lake ceases to be used as a natural lagoon it is expected that natural biological processes active in natural lagoons will return this lake in time to its original state. There is no evidence of any sludge build-up. Only municipal waste water has been treated in the lagoon therefore there is not expected to be any great amount of heavy metal contamination. No specific treatment of sludge is planned.

2. minimize public exposure to odours, noise, etc., during restoration

Restoration will consist of removing structures on site. Natural biological processes will restore site.

3. ensure that effluent quality meets the licence requirements

Effluent from this site will be analyzed on an annual basis to ensure that it is in compliance with water board guidelines. The regional water resource officer (DIAND) has established an SNP site at the mouth of the stream where effluent enters Darnely Bay (ocean receiving body).

4. ensure proper protection of the environment

During and abandonment there is not expected to be much heavy equipment activity in the vicinity of the lagoon. After abandonment the site is to be left with no further development planned for the area.

5. minimize long term maintenance and monitoring

Signage will be place in the abandoned lagoon area restricting further disposal of any waste materials. It is expected that annual monitoring of effluent will be sufficient to ensure compliance with Waterboard guidelines.

6. prevent leaching of contaminants through ground water system

This natural lagoon is at sea level. The entire area is underlain with permafrost. For these reasons it is not expected that leaching from contaminants migrates to any extent through ground water flow.

7. return the site to an appropriate level of contamination and aesthetic appearance, which will vary depending on the final use of the site.

The perimeter of the site will be clear of debris and the chute structure removed. It is recommended that the site be left with no further development plans.

## 2.2 Leachate Prevention

Regular operation and maintenance of the solid waste site has included trenching and burning of waste material. Solid waste remaining on the site will be levelled into low areas on the site and covered with sand, graded, capped with gravel and seeded. This will restrict moisture from entering waste media and thus limit leachate production. The site is underlain with permafrost which will act a barrier in the transport of any leachate. It is expected that after covering the site the permafrost will move up into the buried waste and further act to prevent any liquid transport through the waste media.

## 2.3 Scope of Work and Implementation Schedule

### 1. Removal of Metal Debris from perimeter of Lagoon

This work will include removing various metal debris including empty oil drums from the perimeter of the abandoned sewage lagoon. The metal will be hauled to the new Bulky Metal Waste Site. This work will be done during the summer of 1994.

### 2. Removal of the old Sewage Chute

The new sewage chute at Lake A will be installed by September 1994. At this time the new facility will be commissioned and the existing lagoon abandoned. The old sewage lagoon chute will be removed during the fall of 1994.

### 3. Covering of Site

The new site in the area of Lake A is currently being used for waste disposal. The existing site is now ready for abandonment. Abandonment will consist of levelling the remaining solid waste on site into low areas. The entire site will then be capped with .3m to .5m of sand and graded so as to promote drainage away from buried waste. The sand will be excavated from new solid waste pits in the area of the new sewage/solid waste site. The sand will be overlain with .1m of granular material to hold down the sand cover. This work will occur during the summer of 1994.

Finally the site will be fertilized and seeded with an appropriate mix of northern grasses. This work will occur during the spring/summer of 1995.

#### 4. Construct Levee

A levee will be constructed along the face of buried solid waste adjacent to the old sewage lagoon. The levee will be constructed using pit run gravel as per attachment A. The levee will protect the buried waste from any shore erosion. No significant erosion is expected at this site as it is protected from the direct influence of storm surges coming off Darnley Bay. Construction of levee will commence after old waste site has been capped. Construction of levee should be complete by fall 1994.

#### 2.4 Maps

A sketch map delineating all disturbed areas, borrow material locations, and site facilities is included in Appendix B.

#### 2.5 Altered Drainage Patterns

The surface run-off from the reclaimed site will be graded toward the old sewage lagoon and away from buried wastes. This was the original drainage pass, therefore there will be no alterations.

#### 2.6 Type and Source of Cover Material

The sand cover for the reclaimed solid waste site will come from excavated material from new trenches in the area of the new solid waste site.

#### 2.7 Future Area Use

The reclaimed site should be left and no development planned for it as it lays directly on the approach way of the new airstrip.

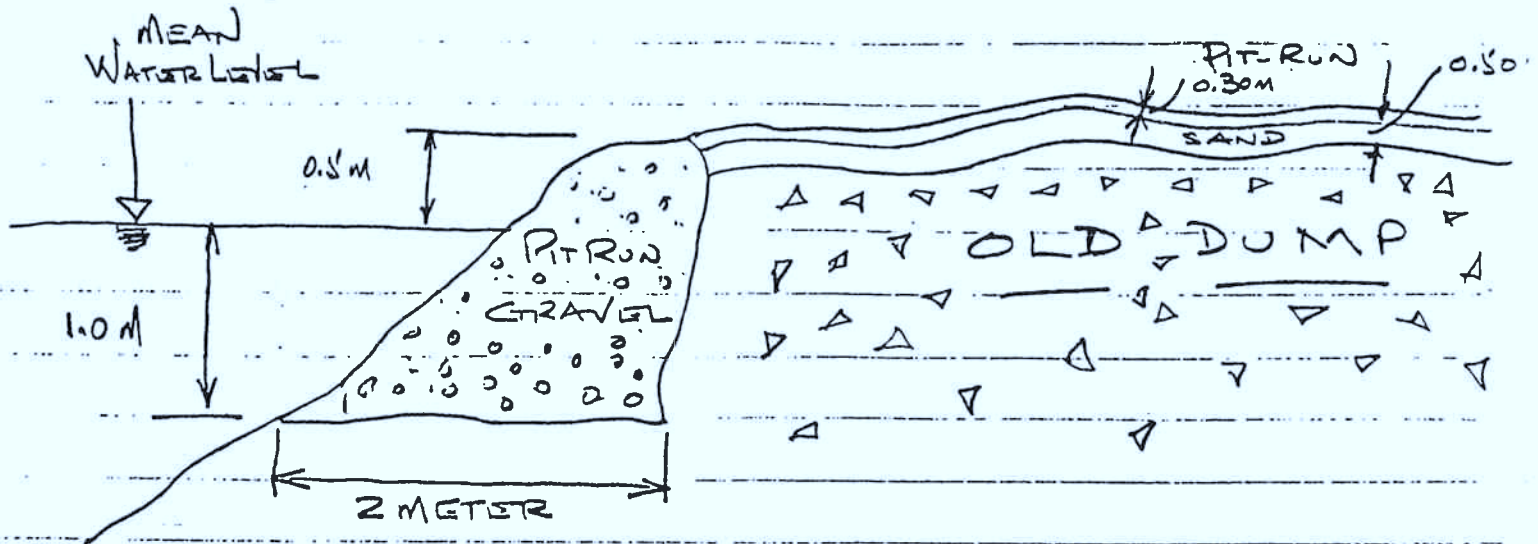
#### 2.8 Hazardous Wastes

As mentioned previously, the waste material at the old site consists almost entirely of municipal waste. Due to the absence of industrial activity in there is minimal risks from hazardous wastes. The community has restricted disposal of petroleum wastes at the site.

#### Attachments:

1. Sketch of levee construction
2. Map of Old and New Sites

# LEVEE DESIGN TIDAL POND - PAULATUK DUMP COVER - BURYING OLD DUMP.



NOTE: LEVEE 30 METERS LONG  
N.T.S.

## QUANTITIES.

① PIT-RUN GRAVEL (DPW & S) — 135 m<sup>3</sup>, (LEVEE)

② SAND (LOCAL) — 1,232 m<sup>3</sup>, (DUMP)

③ GRAVEL (PIT-RUN) (LOCAL) — 660 m<sup>3</sup>, (✓)

ABAND  
SIT

W/L  
0.20'

3.4

2.1

2.8

3.2

+

+

0.8

2.8

10.4

11.1

9.2

5.0

W/L 2.35'

+

PILE

14.4

PIT

12.5

+

NEW  
SEWAGE/SOLID WASTE  
SITE

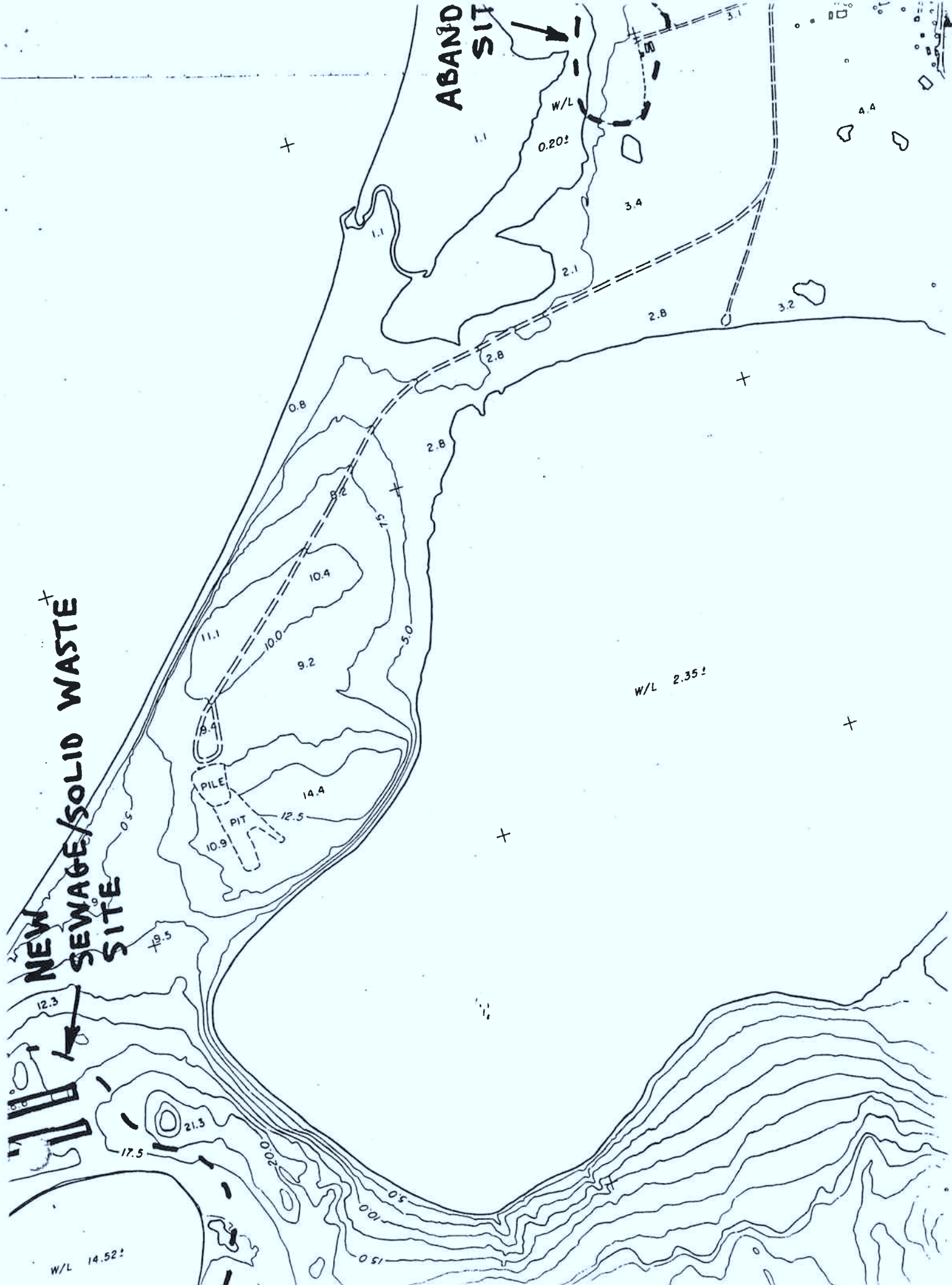
19.5

12.3

21.3

17.5

W/L 14.52'





# Hamlet of Paulatuk Water License Renewal Application

## Potential Environmental Impacts

### Operation and Maintenance of Water Supply Facilities

IMPACT	MITIGATION/RECLAMATION/RESTORATION
Draw down effect on New Water Lake	<ul style="list-style-type: none"> <li>• This lake recharges naturally due to precipitation. Spring melt brings levels back to normal annually.</li> </ul>
Drawing debris into piping system	<ul style="list-style-type: none"> <li>• An intake screen is in place, to reduce any possible impact of water intake.</li> <li>• Screen prevents uptake of material from lake, including fish or plant life if present.</li> </ul>
Chlorine spills	<ul style="list-style-type: none"> <li>• Operators should be trained in proper handling of chemicals</li> <li>• Seal containers when chemicals are not in use</li> </ul>
Aerial emissions from vehicles	<ul style="list-style-type: none"> <li>• Use of trucks will be kept to a minimum, and they are turned off when not in use, when practical</li> </ul>
Fuel spills from trucks, pumps	<ul style="list-style-type: none"> <li>• Spill contingency plan is to contain and clean up any possible spills as soon as possible.</li> <li>• Trucks and pumps will be serviced regularly, to ensure they are in proper working order</li> </ul>

### Operation and Maintenance of Sewage Disposal System

IMPACT	MITIGATION/RECLAMATION/RESTORATION
Use of “Dead Lake” as sewage lagoon	<ul style="list-style-type: none"> <li>• Data is collected from SNP monitoring stations by DIAND inspectors and will be used to monitor water quality at Darnley Bay</li> </ul>
Aerial emissions from vehicles	<ul style="list-style-type: none"> <li>• Use of trucks will be kept to a minimum, however this is an integral step in sewage collection and cannot be avoided</li> <li>• Trucks will be kept in good condition and maintenance will be carried out</li> </ul>
Fuel spills from trucks	<ul style="list-style-type: none"> <li>• Spill contingency plan is to contain and clean up possible spills as soon as possible.</li> <li>• Trucks will be serviced regularly, to ensure they are in proper working order</li> </ul>

## Operation and Maintenance of Solid Waste Disposal Facility

IMPACT	MITIGATION/RECLAMATION/RESTORATION
Litter blowing into surrounding environment	<ul style="list-style-type: none"> <li>• Fence will be installed around the solid waste facility when funding becomes available, in an effort to contain litter</li> <li>• Windblown litter will be removed from fences on a regular basis.</li> </ul>
Soil excavation and erosion	<ul style="list-style-type: none"> <li>• Contain excavations to designated areas</li> <li>• Excavated soils will be stockpiled for covering over cells as they become full</li> </ul>
Abandoned or full waste cells	<ul style="list-style-type: none"> <li>• Cells are covered over when full; if and when a site is abandoned, it is reclaimed by covering and seeding to natural vegetation</li> </ul>
Aerial emissions from vehicles	<ul style="list-style-type: none"> <li>• Use of trucks will be kept to a minimum, however this is an integral step in solid waste collection and cannot be avoided</li> <li>• Trucks will be kept in good working condition</li> </ul>
Fuel spills from trucks	<ul style="list-style-type: none"> <li>• Spill contingency plan is to contain and clean up as soon as possible.</li> <li>• Trucks will be kept in good working condition</li> </ul>
Attraction of Wildlife/birds	<ul style="list-style-type: none"> <li>• A fence around the solid waste disposal site will, when erected, help to prevent wildlife from entering. Covering of waste will aid in reducing the attraction for birds and wildlife</li> </ul>

### Potential Cumulative Effects

- **Waste Accumulation:** Waste will accumulate at the current solid waste disposal site, until the site has reached its' capacity. At that point, a new waste disposal site will need to be chosen and the current site will be closed. Adverse effects will be reduced through proper management of the waste disposal facilities, consistent with current regulatory requirements and standards.
- **Habitat Reduction:** Continued operation of the current water treatment facility and the solid waste disposal facility should have little effect on natural habitat reduction. When the current sites reach capacity, new sites will need to be chosen, and the current sites will be closed. There should be limited net loss in habitat.

## **Socio-Economic Issues**

The operation of the water treatment facility, the solid waste disposal facility and the sewage lagoon creates jobs for Paulatuk community members. Positions such as the following will always be needed:

- Truck drivers (water, sewage and solid waste)
- Plant operators
- Supervisors for the facilities
- Contractors

In addition, there may be opportunities for community members to receive further training to help with their jobs. As an example, training to upgrade mathematical skills was suggested during a Department of Public Works and Services visit in 2002 and then during the visit in 2004, they advised that training might be available for a Small Systems Certification course. These types of training opportunities provide benefits that extend beyond the immediate job situation and benefit others in the community as well.

Opportunities exist for small enterprise in Paulatuk as well; for example, a local contractor is able to secure work for several years at a time by winning the bid to supply trucked water to the community.

Due to the small scale, non-industrial nature of the operation in Paulatuk, the water supply facility and waste disposal sites do not result in other potential social effects such as health effects. There are not likely to be effects on traditional land uses, though during seasons when residents are out on the land it means a less busy time for operators of the facilities mentioned.

Public consultation regarding potential changes to the water supply system or the waste disposal system may need to occur occasionally due to legislative requirements, Water Board Hearings (if requested) or due to community concern regarding a particular issue. If it takes place, this consultation may provide an opportunity for residents to voice opinions or concerns in a meaningful way and to interact with regulators or other agencies that may not always hear community feedback. This may foster a sense of empowerment within the community.

Similarly, information such as Traditional Knowledge may be required to make decisions regarding changes to any of the water or waste facilities. If this were the case, the sharing of this knowledge would provide excellent, valuable insight into the decision-making process and would recognize the contribution of local community members while giving them a chance to be a part of a solution or change.