

PROJECT:	Little Diomed Water and Sewer ePER	DATE:	8/31/2023
DOWL PROJECT NUMBER:	1528.50290.01	ANTHC PROJECT NUMBER:	23-D-200815
CLIENT:	ANTHC	CLIENT CONTACT:	Will Moran
PREPARED BY:	M. Wharton	ATTACHMENTS:	

Dear Will,

DOWL is pleased to present the following summary of the field trip to Diomed, Alaska, completed August 28th through 30th, 2023, as part of the Little Diomed Water and Sewer ePER for the Alaska Native Tribal Health Consortium (ANTHC). The work was performed as under the term contract No. 22-TC-16335. The purpose of the trip was to update the community on the more developed alternatives, conduct home eligibility surveys, and discuss non-monetary factors. This was accomplished by organizing and facilitating a community meeting, facilitating a meeting with the Joint Council (City and Tribe), and conducting home visits with willing community members. During home visits, observations were made of the location and condition of the properties as well as the preferred location of a proposed bathroom inside the home. The site visit was performed by a group of five from DOWL, Agnew:Beck and NSHC. The participants in the site visit were Chase Nelson, PE of DOWL; Maya Wharton, EIT of DOWL; Brita Mjos, EIT of DOWL; Curtis Fincher of Agnew::Beck; and Richard Kuzuguk, Remote Maintenance Worker (RMW) of Norton Sound Health Corporation (NSHC).

August 28, 2023

Maya Wharton and Curtis Fincher traveled to Diomed by a helicopter operated by Pathfinder Aviation. The helicopter arrived at 1:00 pm and was met by community members who helped move luggage and equipment into the school gym.

With the help of Robert Larsen, Diomed water treatment plant operator, Wharton and Fincher began conducting home visits. Robert Larsen directed the team to homes that would have residents available for the survey. The home visits consisted of a short survey on the condition of the homes and a 360 video of the interior. Surveys were performed on a voluntary basis and photographs and videos were consented to prior to taking. At approximately 5:00 pm, the team stopped home visits in order to give the community members time to be with family after the workday.

A local resident offered to take Wharton and Fincher on a hike to the top of the island. This was a great opportunity to see the storage area to the South, the wood stave tank, and the existing water source. The potential location of the septage lagoon is at the existing storage area. This is a relatively flat area and could be a good location for either the septage lagoon or a water storage tank. The wood stave tank has newly been installed with no visible leaks. The existing water source was running but the transmission line was closed because the community was not treating water. The source intake did not have a screen, confirming reports from the operator, but appeared to be positioned properly to collect water.



Figure 1 Photo of Raw Water Intake

After Wharton and Fincher returned to the school, they used the remainder of the evening to plan for the coming days and debrief the overall impressions of Day 1.

August 29, 2023

While Wharton and Fincher waited for an appropriate time to start home visits, which was recommended as 11:00 am, they spent time talking to community members. Wharton recorded a 360 video of the boardwalks alignment so that others could see the general layout of the community and the condition of the homes exterior. The company Passive Homes is working with the community of Diomedede to construct the new store and renovate existing housing. Wharton and Fincher were able to discuss with the foreman some of the challenges of construction on the island. Passive Homes claims to be employing 17 community members at a generous wage of \$50/hr.

At approximately 11:00 am, Wharton and Fincher began visiting homes. With the direction of Robert Larsen, Wharton and Fincher also conducted some surveys at residents' workplaces, such as the post office, city office, school etc. In the case of conducting a survey outside of the home, a 360 video of the inside was not taken but photos of the outside were captured.

The picture below is an example of potential problematic foundations found throughout the community. Many homes were observed to have a "post and pad" foundations, but the "pads" were often large boulder, stacks of rocks, or unlevel blocks of wood. It was found that 75% (16 homes) were said to move frequently and homeowners stated the home was not structurally stable. In addition, 40% (8 homes) of residents stated that their home could not maintain temperatures above freezing throughout the winter, resulting in frosting floors and walls.



Figure 2 Example of Foundations Observed

Out of 21 surveys conducted, 17 residents were willing to talk about how much money they would be willing to spend each month on a water and sewer system. Approximately 60% (10 responses) of residents would not be willing to pay over \$250/month. Only one resident stated that they would be willing to pay up to \$600/month.

At approximately 1:00 pm, Chase Nelson, Brita Mjos, and Richard Kuzuguk arrived via Pathfinder helicopter. Fincher and Larsen continued collecting surveys while Wharton met the group at the Helipad to help them get situated in the school. Frances Ozenna, Tribal Administrator, also came to meet with the group at the school and shared her frustration about the state of the WTP project. She was very concerned with the timeline of the project and insisted that the community has been in need of a new WTP since 2005. DOWL explained that the ePER is a separate project from the WTP, and a water and sewer system would not be delivering water that is unsafe to drink.

After talking with Frances Ozenna and the principal, Nelson, Mjos, Kuzuguk, and Larsen began a DEC Sanitary Survey. Wharton and Fincher continued to collect surveys until approximately 4:30 pm when they went back to the school to start setting up for the community meeting at 6:00 pm.

At the meeting, residents were asked to sign in and take the printed materials provided by DOWL. Subway sandwiches and fruit were brought from Nome to be enjoyed by all attendees. Once everyone had served themselves food and taken a seat, Chase Nelson led the presentation to the community where they introduced the purpose of the ePER and discussed the proposed alternatives for water and sewer service. The presentation was given verbally with the assistance of visual aids such as posters and booklets. Community members asked questions throughout the presentation. Near the end of the presentation, the community was asked to brainstorm factors excluding the cost of the project that would be important to consider while selecting an alternative. The brainstormed list included:

- End user cost
- Ease of maintenance – cost of shipping materials
- Longevity
- Corrosion resistance
- Replacement cost
- Ground instability

- Water conservation
- Energy savings
- Small footprint or vertical construction given limited space
- Homeowner maintenance/burden

See notes attached for community meeting details. After the presentation, group members spread out and spoke with people one-on-one to answer questions and hear concerns. Despite understanding that the ePER was a separate project than the WTP, the community expressed frustration at the quality of their water and the lack of progress on the WTP project.

Agnew::Beck encourages ANTHC to communicate more proactively with community leaders about the state of the WTP project and the reason for any delays to ensure that trust and goodwill are maintained with the community.

Approximately a quarter of the community (18 of approximately 80 people) was in attendance and engaging with the project. Many community members were out of town on medical appointments because there had been flight delays in the previous weeks. Community leaders and school staff that observed the meeting told the group the meeting was well attended. The meeting lasted approximately 3 hours and maintained attendance and engagement throughout.

August 30, 2023

The group reconvened at 8:30 am and discussed a plan for the day. The group debriefed to consolidate notes from the community meeting and prepared for leadership meeting scheduled for 10:00 am. A Pathfinder helicopter was scheduled for pickup for after 12:00 pm to bring the group back to Nome.

At 10:00 am, the group gathered in the Tribal Office to discuss the community meeting and solidify a list of non-monetary priorities from the community. The community had brainstormed 11 factors that the tri-org council was able to simply into four main points:

- End user cost
 - Specifically the cost to homeowners to operate and maintain the system, this includes replacement costs.
- Environmental concerns
 - Environmental concerns combine the resiliency of the system to ground instability, permafrost, climate change, storm surges, and salt exposure.
- Ease of maintenance, and
 - Diomed leadership want to be self-reliant and not depend on RMW's or outside technicians.
- Homeowner responsibility.
 - Lighten the burden on the homeowner to maintain the system as much as possible.

See notes attached for discussion details.

After the meeting, the group packed and brought everything to the Helipad in preparation for the incoming helicopter. The helicopter agent was then able to give the update that the helicopter would not arrive until 2:00 pm. This gave the group some extra time to walk around the community and assess potential areas for construction. Pictures were taken to the north of school where the potential water storage tank is planned for construction. Past the potential tank was explored for the possibility of a septage lagoon. Construction to the North of the community

was observed to be very difficult. The average slopes are greater than 30 degrees. There are slightly flatter (15–25-degree slopes) directly above the potential WST site but many grave sites could be seen from below.



Figure 3 Possible Septage Lagoon Location, Facing South

The helicopter arrived at approximately 2:00 pm and transported Chase Nelson, Brita Mjos, Richard Kuzuguk, Curtis Fincher, and Maya Wharton to Nome. The group arrived in Nome at approximately 3:30 pm. Once back in Nome, the group went to lunch and then waited for the evening flight back to Anchorage at 6:00 pm.

Attachments

- Attachment 1: Community Meeting Notes
- Attachment 2: Community Sign-in
- Attachment 3: Tri-org Meeting Notes
- Attachment 4: Tri-Org Sign-in

Attachment 1: Community Meeting Notes

Diomed Community Meeting Notes (8/29/2023)

Comments from the community below.

- You'll do all this work, then the fee will be like \$100.
- A 12x12 house doesn't have room for a bathroom, will the project include bathrooms?
 - *Home additions have not been included in other similarly funded projects that we are aware of.*
- Have you gotten outside engineers input like Canada, because they do a lot of arctic pipe? Would consulting with outside engineers add to the cost of W&S to the users?
 - *We have not consulted with outside engineers at this point in the project. If we were to consult it would not affect the cost to operate the system.*
- Do other communities in Alaska, like Barrow, have systems like what Dio would get? They have the money to fix them when they need maintenance.
 - *Many communities in Alaska are operating versions of the systems we are presenting. A utility haul system, like the satellite station alternative is a common system in YK Delta region, the difference being those communities use 4-wheelers or trucks instead of the hoses. PASS has been used by other communities and was developed by ANTHC for rural Alaska.*
- Would there be financial subsidies to put W&S to the homes?
 - *Adding plumbing the inside of homes would be included in this project and therefore would be subsidized by the money available for project construction. The cost of operating will be high, and we will consider sources for subsidies.*
- What would our share of the cost be?
 - *This is dependent on the subsidies available for operating the system. We are optimistic that subsidies are available but unfortunately do not know the specifics of that.*
- I don't think NSEDC will contribute to W&S.
- I don't think we would use 50 gpd, maybe 15 to 30 gpd.
 - *ANTHC design standards are 75 gpcd which we have reduced to 50 gpcd based on other communities use. Installing piped water will change the amount of water consumed by the community for many reasons. Demand may increase with time as young people grow up with piped water. We want to design a system that allows for conveniences like in-home laundry and showers. If the community does use less water than planned, that may decrease the operating cost slightly.*
- If the solid waste gets used for energy, would we factor that into the cost?
 - *Yes, waste to energy could offset some of the operating cost associated with fuel to run the system. Other renewable power sources, like wind or solar, will also offset the cost of running the system.*
- Diomed best practice score needs to go up, has to be NSHC's priority getting the score up. Have to hold monthly meeting including utility reports to raise scores.
- I raised the score when I had time at the city, now I'm pulled over to infrastructure projects. The best practice score matrix doesn't work for dio.
- Because of Starlink we can push our work, it has really improved things for dio, compared to DSL.
- Have any communities done this satellite system?

- *While the satellite system is similar to how other communities use utility delivery and collection, it is specific to Diomedede to have the dispersed satellite stations instead of using trucks or 4-wheelers.*
- So these hoses from Arctic box A, B, and C could reach all the way to the houses near that box?
 - *Yes, that is the plan.*
- How much fuel would the WTP use w/ satellite alternative? We need fuel estimates to know how much to order. Do we have enough fuel storage?
 - *The exact fuel needed will be thoroughly examined during design but at this stage we believe there is enough storage for the additional fuel needed for the treatment and circulation systems.*
- We've heard of PASS, it was supposed to happen, Fatima at VSW. Some PASS units sitting in Nome, so will likely be installed for a few years before water and sewer system.
 - *The units waiting in Nome are only separating toilets but could be a great interim solution while this project is developed.*
- The no action estimated monthly cost is over \$100k more than current operating cost, currently 74,000.
 - *The no action alternative includes the operating cost for the WTP that has not been constructed yet. We included this cost because it will be the future operating cost for treated water.*
- The raw water has 3x more bacteria than the treated water.
- Have you seen the sediment that settles out of the water?
 - *We have not but the new WTP will address many of the water quality concerns.*
- We can use solid waste for energy savings.
- People might rather haul water than shovel out the satellite stations.
- Several people agreed with Richard's ideas to improve water intake with a conical debris diverter.
- You have taken time to study Dio and prepare, you are building a partnership with city and community.
- Not enough is said about the hardships of mothers to keep children and families safe in the home. Can't keep water at room temp too long before sediment and bacteria are a problem.
- The community expressed support for Alternative 2 (fully piped) and Alternative 4 (Satellite delivery and gravity sewer).

Brainstormed list

- End user cost
- Ease of maintenance – cost of shipping materials
- Longevity
- Corrosion resistance
- Replacement cost
- Ground instability
- Water conservation
- Energy savings
- Small footprint or vertical construction given limited space

- Homeowner maintenance/burden

Attachment 2: Community Sign-in

Sign-in Sheet

Community Meeting: Diomedede Sanitation Improvements

August 17, 2023 | 6:00 – 8:00 pm | Diomedede School

Name (Please write neatly)	Phone	Email
Robert Larsen	686-8179	larsenrob24@gmail.com
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Ann Soelock	686 8179	
Samantha Menadelock		
Harry Goldsberry		
John Ahkvaluk		
Frances Ozenna	686-2232	Sistugofdiomedede@gmail.com
Roger A. Kunayak SA		
Robert Corbett		
Anna Ozenna	686 2232	cityofdiomedede@gmail.com
Eric Iyapana	727-3475	
John Iyapana		
Cynthia Snowball	2184	
Jack Ahking	684-1013	dia.eny103@yahoo.com
Kylie Ahkvaluk		
Aurora Ahkinga		
Nova Ahkvaluk		

Attachment 3: Tri-Org Meeting Notes

Tri-Org Meeting Notes 8/30/2023

Attendees: Opik Marlene Akinga, Robert Soolook (Mayor), Robert Larsen (Operator), JoAnn Kaningok, Ann Soolook, Ahna Ozenna

Chase Nelson, Brita Mjos, Maya Wharton, Richard Kuzuguk, Curtis Fincher



Figure 1 Photo of Tri-Org Meeting

The available Tri-Org Council members met at approximately 10:00 am on Wednesday, August 30, 2023, to discuss the priority considerations to decide on the preferred water and sewer system for the community of Diomede. Below is the full list of priority factors discussed at the community meeting the night before. The top four non-monetary factors are highlighted in yellow below and are as follows:

- End user cost,
- Ease of maintenance,
- Environmental concerns, and
- Homeowner responsibility.

Factors that have been struck out were combined with more general priorities. The comments in relation to each factor by community members are below.

1. End user cost

- a. End user cost and replacement cost can also group together.
- b. Diomede is signed up with CUAP recently (a format of subsidy) EMI's Helmsley funds going to CUAP and must be spent.
- c. Sharon McConnell helping with Kawerak's support of taxes and workman's comp – Richard Kuzuguk
- d. Everyone agrees end user cost is a top factor.

2. Ease of maintenance

- a. Need to have the best of the best here to not require constant maintenance.
- b. Build system with parts that won't freeze up or require RMW's or technicians.

- c. City's sewage system overflows every winter, smells in the washeteria. New pump was left sitting outside last winter.
- d. If the city is responsible for the system, which they will be, there needs to be training for the residents.

~~3. Longevity~~ Environmental Concerns

- a. We're moving westward, daily, annually, we don't feel it but we are moving.
- b. Agreement to lump ground stability, permafrost, climate change, storm surges, and salt exposure into "Environmental Concerns."
- c. Sewage lagoon location should be moved to other end of town to avoid impacting seaweed and crab harvesting areas.
- d. Environmental factors (ground movement, storm surge, corrosion) can be grouped into Longevity and is considered a top factor.

~~4. Corrosion resistance~~

~~5. Replacement cost~~

~~6. Ground instability~~

7. Water conservation

- a. School is metered, clinic was supposed to have meter.
- b. Some confusion about how much water is being used.

8. Energy savings

9. Small footprint or vertical construction given limited space.

- a. Pipes will be aboveground under boardwalks as much as possible but will be exposed for service connections. The arctic pipe is large and will be between 12"-22".
- b. Pipes to houses won't be a problem as far as obstacles, we're an island of rocks and anywhere can be a trail.
- c. Proposed locations for new WST are not concrete since sites were identified in winter.

10. Operator demands.

11. Homeowner maintenance/burden

- a. Create a list of homeowner/building responsibilities for each alternative.
- b. Homeowner responsibility should be clearly communicated for community to understand before planning.
- c. Richard Kuzuguk – Request flexible service connections to homes to reduce maintenance.
- d. Homeowner maintenance requirements should be minimized and made a priority.

12. Water source improvement

- a. Not included in discussion because each alternative will address this equally.

13. Collaboration with other funding agencies

- a. Grants and funding are always available so collaborating with other funders is not a top priority.

Attachment 4: Tri-Org Sign-in

Tri-Org Meeting: Diomedes Sanitation Improvements Sign-in Sheet

Friday, August 18, 2023 | 10:00 am – 12:00 pm | Tribal Council Office

Please write neatly – thank you 😊!

Name

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Robert F. Soolook J.

Ann Soolook

Anna Ozema

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