

24 February 2012

Ms. Amanda Hanson  
Director, Technical Services  
Nunavut Impact Review Board  
Cambridge Bay, Nunavut  
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Email: [info@nirb.ca](mailto:info@nirb.ca)

**Re: Nanisivik Naval Facility (NNF) Project – Reduction of Scope**

Dear Ms. Hanson:

The Department of National Defence has undertaken a review of the infrastructure requirements of the Nanisivik Naval Facility (NNF). The intent of the NNF will remain – a berthing and refuelling facility for the Arctic Offshore Patrol Ships (AOPS), and other Government of Canada vessels, but the functionality of the site will be reduced. A brief summary of the scope changes is outlined in this letter.

Originally, there were plans to have capacity for a two (2) year supply of Naval distillate fuel. There will now be fuel for one (1) season of operation. This will result in a decrease of the number of fuel storage tanks on site.

Additionally, due to the results of the geotechnical investigation undertaken in the summer of 2011, it has been decided to postpone major upgrades to the existing jetty for several years. Upon the advice of engineering consultants, a monitoring program for the jetty shall be implemented before a decision on major upgrades is made.

Finally, the buildings that were identified in the previous submission (serving the functions of offices, accommodation, and industrial) will be removed from the scope of the project. In its place will be an unheated storage building that will contain the necessary supplies for a re-fuelling facility.

The planned changes result in a significant reduction of the site layout and function plan that was submitted for review in 2011. The facility will only be operational during the navigable (summer) season. All facilities will be shut down and secured when not in use. On-site support will likely be reduced to an as-needed basis. Access to the site will continue to be via the Nanisivik deep-water berth and the Arctic Bay airport (via the existing overland road).

A detailed design is not yet available, as these changes have just recently been determined.



With this, DND is seeking the NIRB's formal guidance as to the next steps in the application process. DND remains committed to collaborating with the NIRB and stakeholders, in completing the review for the NNF project.

Sincerely,

Rodney Watson, P. Eng (ON)  
Project Manager  
Nanisivik Naval Facility

## **NNF Reduced Scope Summary**

The following is a summary of the reduced scope of requirements for the NNF. Additional details for each of these requirements will be refined through detailed design.

### **1. Bulk Fuel Storage System**

#### **1.1. Naval Distillate**

Only one (1) year of fuel supply is now required (or 7,500,000 L). Tank sizing will remain as currently designed. Thus, only two (2) 3,750,000 L capacity tanks will be constructed. The tanks will be located in a lined area complete with perimeter containment berms within the footprint area of the old Nanisivik tank farm. The preference is to keep the 2 northern most tanks in accordance with current design.

#### **1.2. Diesel**

Year-round power is no longer required and most of the permanent shore support buildings and associated services have been removed from the project. Therefore, the diesel fuel requirement for the site has dropped substantially. An assessment of the new diesel fuel demand will be carried out to determine the new storage requirements. However, a very preliminary assessment indicates a yearly storage requirement in the order of 100,000 L. A skid mounted pre-fabricated above ground double-walled horizontal tank(s) would be the preferred option for diesel fuel storage. The tank(s) will be located on a gravel pad in the general location of the currently design diesel tanks.

#### **1.3. Aviation Fuel**

The minimum requirement is 15 drums (or 3,000 L) to be stored in the POL bermed area. The optimum volume to be stored, if the budget permits, is 20 drums (or 4,000 L). A skid mounted fuel storage tank and dispensing package is the preferred option, again if the budget permits.

#### **1.4. Oily Waste Water (OWW)**

The minimum requirement is 50 drums (or 10,000 L) for AOPS vessels plus site generated OWW from the bulk fuel storage system operations & containment berms. The volume of site generated OWW shall be determined through design. As a minimum, all OWW shall be stored in drums within the POL storage area. Alternatively (budget permitting), the preferred approach to handling and storing both site generated and AOPS vessel OWW is using pipeline, pumps and a double-walled storage tank. OWW shall be shipped off site to an approved facility for disposal at the end of each season.



### **1.5. POL Storage**

A secure, lined and bermed area for POL and OWW drums storage will be constructed. The size of the bermed area shall accommodate AOPS OWW drums (if applicable), site generated OWW drums (if applicable), aviation fuel drums and power plant oils, lubricants & waste oils. The optimum size for the POL storage area shall be determined through design. A very preliminary assessment indicates a POL storage area of about 150 m<sup>2</sup> with storage capacity for 250 drums.

### **1.6. Pumping**

Pumping from offloading vessels into storage tanks and back to AOPS is required. Two naval distillate pumps shall be the main design principle. The pumps will be optimally sized and mounted on an outdoor structural steel platform within a lined area. A similar arrangement shall apply for diesel pumps and/or OWW pumps, if required. Durability and physical security will be addressed in the design.

### **1.7. Piping**

Pipelines and associated infrastructure are required for naval distillate. The pipelines will follow the same alignment as the current design between the wharf and the proposed fuel storage tanks. The design will look at reducing the outside diameter of pipes, where possible. Spill containment measures will be implemented where appropriate. Pipelines and associated infrastructure may also be required for diesel and/or OWW, if budget permits and/or design warrants.

### **1.8. Instrumentation & Controls**

Instrumentation consisting of local indication only and manual tank level indication will be either temperature durable or removable for winter storage. All PLC controls for fuel transfers will include a removable system that can be stored securely in a heated area for the winter.

## **2. Berthing Infrastructure**

### **2.1. Geotechnical Considerations**

Based on the geotechnical information obtained in 2011, improvements to the existing wharf structure should minimize any additional loads to the soils below the wharf and causeway. Preferably improvements to the wharf should try to decrease loads. Monitoring of the existing structure for both horizontal and vertical movements is recommended for at least 5 years before sufficient settlement data can be collected to better predict the structure's movements in the future. Enhancement of the existing permafrost regime below the wharf is



recommended to decrease the current rate of movement and prolong the life of the structure.

## **2.2. Berthing**

The existing wharf structure will be used, as is (no expansion), with very minor improvements to maintain or improve its functionality. Upgrades will include normal wharf hardware such as fenders, bollards, lighting, ladders, guardrails, safety equipment, spill boom, flag mast and any other required amenities to meet applicable codes or DND standards. Very little work will be carried out in or near the water along the outside of the existing wharf structure. General area lighting will be used for basic navigational lights, when site is occupied only.

## **2.3. Fuelling**

A fuelling manifold is required for naval distillate. If budget permits or the design warrants, the manifold may include piping for diesel and/or OWW. The location of the manifold will be determined based on the existing wharf configuration, AOPS specifications, cargo loading/offloading requirements and the protection of the environment. The most probable location for the manifold is anticipated to be on the western cell of the existing wharf.

## **2.4. Corrosion Protection**

A cathodic protection system is required to control corrosion. The presence of microbial corrosion is a significant concern that impacts the life of the existing wharf. Since year-round power is no longer available, an impressed current corrosion protection system is not possible. The design will include a passive cathodic protection system, such as sacrificial anodes, to limit corrosion and extend the life of the existing structure.

## **2.5. Permafrost Protection/Enhancement**

A thermosyphon system will be designed to preserve or enhance the permafrost regime below the existing wharf and causeway, to prolong the life of the structure. The thermosyphons will be installed in the soils below the wharf at depths that are in and near the critical shear zone as recommended by the geotechnical consultant to optimize the impact of the system.

# **3. Shore Support Buildings, Services and Utilities**

## **3.1. Buildings and Shelters**

Permanent accommodations at the NNF are no longer required. The existing DND trailers will be used to support on-site personnel during fuelling operations (minor upgrades to the trailers may be required). The trailers will require support from the local community for potable water and wastewater management. A general purpose storage building and a wharf operator shelter are still required.



The general purpose storage building will be sized approximately 20% larger than the currently designed vehicle wash/winter storage building. The exact storage volume and shelving requirements shall be confirmed through design. The structure will be stick-built, unheated and located near the bulk liquids storage facility for functionality.

The wharf operator shelter will be a skid mounted module with viewing window on three sides, similar to the current design. The module will be electrically powered during occupancy only (for lighting, unit heater, and laptop), and include a work station, an EDS button and eyewash station.

### **3.2. Power Generation Plant**

There is no requirement for year-round uninterrupted power. Power generation is required for fuel pumps, various heaters, motor-operated valves/instrumentation, the general purpose storage building, the wharf operator shelter and area lighting during fuelling operations. Two self-sufficient redundant generator modules will be the design basis for the power plant. The generators will only operate when the site is occupied. A new load study will confirm generator sizing and fuel requirements. All temperature sensitive electrical equipment will be removable for the winter storage. The power plant will be located near the bulk liquids storage facility for functional practicality.

### **3.3. Electrical Distribution Building**

A modular type electrical house complete with required equipment and amenities to control distribution of power throughout the site will be provided. The unit will either be a dedicated module or attached to the generator modules. All temperature sensitive electrical equipment will be removable for the winter storage. The electrical house will be located near or attached to the generator modules.

### **3.4. Telecommunications**

Permanent telecommunications infrastructure is not required. Hand held radios and satellite phones will be used to communicate.

### **3.5. Site Infrastructure**

The overall site plan will be reviewed, based on the revised project scope, to ensure efficient serviceability of the NNF whenever possible. Existing roads will be used to the extent possible. However, some modifications will be required for pipeline crossings and associated culverts. Pipeline guard rails will be included as required to protect against potential vehicle impacts.

### **3.6. Site Services**

Since most of the permanent shore support buildings have been removed from the project, the associated site services such as wastewater treatment and lagoon, waste incinerators, raw water storage tanks and potable water treatment system are no longer required. The NNF will require support from the local community



for potable water and wastewater management. Solid waste will be 3R managed on-site, stored in ISO shipping containers and shipped off-site to an approved disposal facility at the end of each season.

### **3.7. Lighting**

General area lighting will be provided through permanent lighting towers to be installed in the tank farm area and the wharf area.

### **3.8. Helicopter Landing**

The minimum requirement for helicopter landing is a large flat area free of any obstructions and marked accordingly. If budget permits, the helicopter landing pad shall meet all DND code requirements including lighting, wind sock, etc.

### **3.9. Miscellaneous**

A portable pump will be used to manage accumulated water from the bermed areas. The NNF site is no longer required to be self-sufficient. Miscellaneous services and support from the local community shall be considered in the design process. Year-round heating of buildings is no longer required. All facilities will be shut down and secured when not in use. Vehicle storage or support facilities are not required as no permanent vehicles shall be stationed at the NNF.