Line site and traditional use of the area will be chosen by the relevant Regional Inuit Association to be on-site during the pre-construction delineation phase of each clean up. The Inuit representative will work closely with the EWG to identify Inuit use of the area, wildlife patterns and past activities and occurrences that may have impacted on landfills (i.e., dumping, hazardous waste storage, natural occurrences). This information will be used in order to assist in the scoring of the landfill matrix (the scoring methodology is described in the EWG reports included with this submission).

Additionally, DND and the NTI will attempt to establish a community DEW Line Clean Up committee which will facilitate the flow of local knowledge to the EWG prior to and during each site visit. To effect this, the EWG will visit local communities most affected by each DEW Line site and conduct one on one interviews with a number of residents, the Hamlet Administrative Officer and/or Mayor, the local HTA and other relevant community organizations.

Project Design - Development of the DEW Line Clean Up Criteria and Protocol and DND/NTI Agreement on the Environmental Provisions for the project

The purpose of the DEW Line Clean Up project is to:

- Demolish and remove existing facilities that are not required for the operation of the North Warning System;
- Remove contaminated soils from the sensitive Arctic food chain;
- Clean up surface debris; and
- Physically restore the unused portion of the site to as natural a state as possible.

In cooperation with several federal departments (Environment Canada, Fisheries and Oceans, Indian and Northern Affairs) and the Government of the Northwest Territories (Renewable Resources and Health departments), DND initially drafted the *General Protocol for DEW Line Clean Up*. This protocol served as the basis for the DND/NTI Agreement on environmental provisions for the clean up of these sites (Annex D). As there are no established standards for the Arctic, existing federal guidelines, such as the Interim Canadian Environmental Quality Criteria for Contaminated Sites, have been modified to account for the unique northern environment. These adjustments to existing guidelines reflect both the sensitivity of the Arctic food chain to ecological processes such as biomagnification and the close dependence of the Inuit on the land for food. In addition, a secondary, barrel specific, protocol has been promulgated. The barrel protocol outlines the process for dealing with barrels and barrel contents found on the DEW Line sites.

The protocol outlined in the DND/NTI Agreement (Annex D), was developed from the conclusions and recommendations resulting from the biophysical, socio-economic, and engineering site assessments (mediated through the DND/NTI EWG). The end result of the

protocol development process is the documenting of contaminant clean up criteria and specific physical actions that are to be undertaken, if required at a particular site. These criteria have been developed based on existing federal and provincial criteria in conjunction with studies that show the functional relationships and/or pathways for biological uptake from soil. The resulting protocol defines two concentration tiers of soil contamination (see Appendix E of Annex D). Soil substrates containing Tier I concentrations may be placed in appropriate on-site landfills while those soils in excess of the Tier II standard are to be disposed of in a manner that provides additional measures to permanently segregate these contaminants from the Arctic ecosystem. Soils exceeding federal legislative limits (i.e., *Canadian Environmental Protection Act* and *Chlorobiphenyl Regulations*) will be disposed of off-site at a licensed disposal or destruction facility. On-site containment measures are discussed below.

Project Design – Engineering

The elements of the engineering design are directly related to specific clean up requirements as established by the DND/NTI Agreement.

Visible debris in the vicinity of each station will be removed and sorted. Non-hazardous debris will be placed in an on-site engineered landfill. Hazardous materials will be removed from the site and disposed of at a licensed hazardous material disposal facility. All facilities at the site which are not required for the operation of the North Warning System will be wither sold (where building conditions permit and if a suitable buyer can be identified) demolished and placed on-site in suitable landfills (in accordance with the limitations placed by federal legislation). Portions of the previously disturbed areas of the site will also be recontoured to establish natural drainage patterns.

Specific activities for the 15 DEW Line sites include the following:

Landfill Development

- Landfills will be developed at this site to accommodate non-hazardous site and demolition debris. Where available, existing landfills are to be used.

Landfill Closure

- Closure of all former DEW Line landfills not being used by the North Warning System will be in accordance with Section 6.0 and Appendix B of the DND/NTI Agreement (Annex D).

Disposal of Site Debris

- All visible debris will be collected and sorted. Non-hazardous debris will be placed in an engineered landfill on-site provided a suitable location and sufficient borrow materials can be found. Materials suitable for landfill have been examined by the EWG and are shown in the

DND/NTI Agreement. This listing is summarised in Appendix C of Annex D. Hazardous debris will be shipped disposed of in accordance with federal legislation.

- All debris which is attributable to the operation of each DEW Line site and is within two metres of the surface at low tide or within tow meters of the surface on an inland water body will be removed by DND.

- Where there is reasonable evidence of additional off site contamination and/or debris which is solely attributable to the operation of the DEW site, DND will undertake testing to determine the extent of contamination in consultation with the NTI and remediate the site in accordance with the DND/NTI Agreement.

Disposition of Contaminated Soils

- Soils containing DCC-I and DCC-II contamination are present at all DEW Line sites within the Nunavut Settlement Area. They will be disposed of in accordance with the DND/NTI Agreement.

Removal of Hazardous Materials

- Materials identified in the DND/NTI Agreement as not suitable for landfill or are otherwise designated as hazardous (see Appendix C of Annex D of this submission) are to be disposed of in an appropriate (licensed if required) disposal facility off-site.

Demolition of Facilities

- All structures not required for the operation of the North Warning System are to be demolished and /or removed to the top of their concrete foundations, sorted into non-hazardous and hazardous components and treated as described in subsections above (Disposal of Site Debris and Removal of Hazardous Materials).

- Prior to demolition, DND will attempt to sell or otherwise transfer ownership of certain facilities through the Crown Assets Disposal Corporation (CADC). These transactions will occur in accordance with existing legislation or CADC policies governing these activities. Normally, other federal government departments, followed by territorial and municipal governments are offered these facilities before they are put up for sale to private individuals or organisations.

Transportation of Hazardous Materials Off Site

- Hazardous materials are to be removed by air or sealift in compliance with the *Transportation of Dangerous Goods Act* and the *Transportation of Dangerous Goods Regulations*. These materials may be temporarily stored in order to transport them in

conjunction with other material. Storage will meet the requirements of applicable legislation, such as the *Storage of PCB Materials Regulation*.

General Site Grading

- The purpose of site grading is to restore the natural landscape of areas that have been disturbed as a result of either previous DEW Line operations or the clean up itself. Site grading will serve to restore the natural contours of the area in order to re-establish driainage.

- Areas to be graded include:

  - Landfills that are to be closed.
  - All areas disturbed by demolition activities.
  - Debris and contaminated soil excavation areas.
  - Borrow areas for granular material.
  - Locations disturbed by the contractor during on-site operations.

Development of Borrow Sources

- Existing on-site gravel sources are to be used where sufficient gravel of the proper quality is available. Otherwise, off-site or commercial sources will be used. Where required, the project will obtain appropriate land use and/or quarrying permits in order to use off site sources.

Contractor Support Activities

- Beach landing areas, roads and existing airstrips/airports will be used for equipment and personnel transport, as well as on-site movement between work areas.

- Potential equipment storage areas are to be shown on the contract drawings, accounting for sensitive biophysical, social and/or cultural sensitivities.

- All labour and equipment will be demobilised from the site following the termination of the project.

- Potential construction camp areas are shown on the site plans included with this submission (Annex D).

Decommissioning Activities

Site decommissioning activities will involve the demobilisation of all contractor equipment, camp infrastructure (if used) and materials no longer required at the site. The requirement for the contractor to undertake these decommissioning activities will be a contractual obligation written into the project specifications.

Timetable of Activities

The expected timetable for effecting the clean up, is provided for in the DND/NTI Agreement (Appendix A of Annex D).

It is expected that the clean up of this site will occur during the summer construction period (June - October) each year. Decommissioning of the clean up camp/crew/etc., is expected to occur in the second half of the last construction season.

Off site activities

Off site activities in support of this project will be in the form of transportation (sea and air) associated with the transport of materials, equipment and personnel to the site. These two activities are described below:

- Air transport - most transportation by air is expected to utilise existing commercial and charter services in and out of each site . Depending on the contractor's schedule, minimal use of chartered aircraft will occur at remote sites (i.e., one flight per week using Twin Otter). No rotary wing flying activity directly to the site by the clean up contractor is anticipated.

- Sealift transport - it is anticipated that contractors will utilise sea lift support to transport bulk materials and equipment (vehicles, heavy equipment, etc) to the sealift beach. This would potentially result in the increase in sealift traffic by one or two sailings per year (one early and one late summer), only if a specific, dedicated trip is made for DEW Line Clean Up purposes. Otherwise, no additional vessel traffic is anticipated.

Number of personnel on-site

The total anticipated number of personnel on-site will vary with the size and scope of the clean up. The estimated average number of personnel on-site is 40 personnel. At times these numbers may be increased owing to existing North Warning System requirements.

New technology and methods to be utilised

Development of Tier II Soil Disposal Facilities

Based on engineering field surveys conducted at the sites in 1992 and 1993, it became apparent that a potentially large volume of Tier II contaminated soil (estimated at 30,000 m^3) would require segregation in a manner which precludes their continued contact with (and thereby

protecting) the Arctic ecosystem. A number of disposal options/technologies were considered by the DEW Line Cleanup Project team; of these, the most environmentally and economically viable was determined to be the development of engineered Tier II soil disposal facilities at specific sites. These facilities utilise a double containment system, consisting of permafrost and synthetic liners which limit leachate generation and prevent contaminant migration.

The Tier II soil disposal facilities are designed to provide a contained facility for the disposal of Tier II contaminated soil. One of the major concerns with respect to the facilities is the possible leakage of contaminants from soils placed in the facility and the potential impact on the surrounding ecosystem and nearby communities. The double containment system developed for the Tier II soil disposal facilities is designed to prevent contents from leaking and migrating into the surrounding environment. The design has been based on the characterisation of the contaminants in the soils and the geothermal properties of the permafrost. Permafrost will provide the primary containment barrier in which the frozen substrate will advance (freeze-back) and encapsulate the contents in the facility. Extensive geothermal analysis on the time required for freeze-back, thermal regime in the ground surrounding the facilities and the depth of the active layer in the cover material, has been used to determine the thickness of both the cover and base as well as the time required to provide adequate permafrost encapsulation. Synthetic liners provide secondary containment. A PVC (polyvinyl chloride) liner will be placed at the base and side slopes of the facility; this liner is chemically compatible with the contaminated soils (i.e. not adversely affected by exposure to hydrocarbons), and will prevent the potential movement of moisture during the period required for permafrost aggradation. The second liner, a geocomposite clay liner (GCL), is to be installed in the cover of the facility, which will prevent drainage from percolating down through the cover fill which might otherwise impact the time required for permafrost freeze-back. The geocomposite clay liner provides the required flexibility for accommodating settlement or disturbance. The GCL consists of a sandwiched composite of geotextiles and bentonite clay.

Careful consideration has also been given to the characterization of waste soils being placed in the Tier II soil disposal facilities. Contaminated soils, which contain levels of contaminants in violation of the *Canadian Environmental Protection Act* (CEPA) and associated regulations, are considered hazardous material and will not be placed in the Tier II soil disposal facilities. These materials are to be removed from the site to a licensed disposal facility along with other hazardous wastes. Some of the soils may also contain petroleum hydrocarbons - often where lead and PCB contamination have occurred as a result of waste oil and/or fuel spills. These hydrocarbons will be contained within the soil matrix and will not exist as free liquids which could potentially leach. Leachate testing has also been conducted on most of the more highly contaminated soil samples as set forth in *Ontario Regulation 347*.

Another environmental concern during the development of these facilities is the possible requirement of explosives for use in some excavation activities. In addition to the obvious danger to human health, other possible impacts could include damage to surrounding areas (including waterbodies, environmentally sensitive areas and hazardous material storage facilities) from shock waves and blasting scatter, and the disturbance of nearby wildlife by sudden peak noise

levels. Blasting, where required, will be conducted by authorised personnel in accordance with all required permits, licenses and applicable laws and regulations, and as dictated by regulatory authorities.

Selection of the areas for Tier II soil disposal facility development is based on a number of technical factors including:

- Topography, drainage and geology;
- Minimisation of disturbance to natural drainage patterns;
- Appropriate distances from marine and freshwater systems and communities, as well as other biologically-sensitive areas;
- Ensure drainage away from ocean and domestic water supplies, distances from beaching areas and locations of contaminated soil, and accessibility.

Future activities

As an environmental clean up project, there are no future uses/activities associated with this project, outside of the ongoing environmental monitoring program agreed to in the DND/NTI Agreement (Appendix H and I of Annex D).

Emergency Response Plan

Contingency plans associated with the clean up of each site are to be outlined in site- specific Environmental Protection Plans (see Annex E for Cambridge Bay). One section of these plans outline generic contingency plans for the prescribed course of action to be followed in the event of fuel or chemical spills, potentially dangerous wildlife encounter and the discovery of heritage resources. These plans will enable persons that encounter a particular contingency situation to maximise the effectiveness of the environmental protection response and meet regulatory requirements for reporting to the appropriate agencies. Associated with this document is the detailed spill response plan for the North Warning System, which has operational control of the site. This spill response plan also forms part of the contractual obligations of the successful contractor.

Contingency Plan for Alternative Transportation

Given the geographical location of these sites (i.e. no regional road access but, in some cases (Hall Beach, Pelly Bay, Cambridge Bay, Broughton Island) still accessible to a community and airport), the number of technically and economically feasible transportation alternatives becomes limited. The two primary access alternatives, namely sealift and air, are already being utilised.

For two sites (Mackar Inlet and Dewar Lakes, sealift will likely be replaced by Cat trains as these sites are land-locked.

Pollution Control Systems and Environmental Management Procedures

The main focus of the project environmental management program during the clean up is based upon-site specific Environmental Protection Plans (sample in Annex E) and the associated North Warning System spill response plan (Annex F). The requirements outlined in these plans have been the end result of the environmental assessment process and includes those mitigative measures designed to reduce or eliminate potential effects. Disposal methods for solid, liquid or gaseous wastes are shown in this plan.

For the purposes of this project, monitoring is being conducted for two reasons:

Monitoring in relation to the environmental assessment. This monitoring involves a continual on-site review of impact predictions made during the environmental assessment process. The purpose of this monitoring is two fold:

- to confirm the accuracy of impact predictions made if, and when, they occur on-site and to ensure that mitigative action taken is appropriate; and

- to be able to identify impacts that occur on-site that may not have been identified during the assessment process but, none the less, require an appropriate mitigative response.

The results of on-site this assessment of will be reviewed on an annual basis as part of the project quality assurance program. Assessment areas and impact predictions requiring adjustment or re-evaluation are identified at this point and an action plan promulgated.

Monitoring in relation to environmental objectives. As part of the overall DEW Line Clean Up program, DND will undertake an extensive multiple year post clean up monitoring program at each site. This monitoring program is contained in the DND/NTI Agreement (Appendix H and I of Annex D). The purpose of this program will be to ensure that environmental objectives, particularly those related to landfill remediation, continue to be met. The results of this program will be provided to stakeholder organisations. In those cases where agreed to remediation standards are not being maintained, an engineering and/or other solution will be implemented to rectifying the situation.

Project Financing

The clean up of the DEW Line sites in the Nunavut Settlement Area is being financed by the Department of National Defence.

PART 3 - DESCRIPTION OF THE EXISTING ENVIRONMENT SURROUNDING DEW LINE SITES IN THE NUNAVUT SETTLEMENT AREA

As discussed in the section entitled 'Project Components and Alternatives' above, much of the existing environmental conditions along the DEW Line has been based on the studies undertaken by the Environmental Sciences Group (Royal Roads Military College) and the United States Air Force. The purpose of these studies was to provide an overview of the baseline condition of each of the 21 DND DEW Line sites.

This section of the submission will provide an overview of the existing biophysical and socio-economic/cultural environments of the regions surrounding these sites. This section is supplemental to the specific information provided in the environmental assessment reports that accompany this submission.

Description of the Biophysical Environment

Area Ecology

Arctic Archipelago Ecozone

The 15 DEW Line sites in the Nunavut Settlement Area are located within the Arctic Archipelago ecozone. This ecozone, which covers the northern mainland coast of Nunavut (including Boothia Peninsula) as well as the islands to the north of the mainland (i.e., Victoria Island, Jenny Lind Island, King William Island). Biologically, this ecozone is further subdivided into two ecoprovinces, five ecoregions and 21 ecodistricts.

Terrestrial Environment

Flora

Most sites are characterised by undulating hills which are typically well drained and sustain 100 percent vegetation cover. The sloped areas are dominated by *Dryas* spp., grasses, *Salix* spp., and *Cassiope* spp., with lesser amounts of sedges, *Saxifrage* spp., *Empetrum nigrum* and lichens. Low lying organic terrain between hilly areas are dominated by sedges and *Equisetum* spp., with lesser amounts of grasses, *Dryas* spp., and *Salix* spp.

Flat areas are often caharacterized by organic terrain with numerous small pools of water. The vegetative cover in this area is typically 100 percent and comprised of grasses, sedges, *Salix* spp., *Vaccinium vitis-idaea, Ledum palustre, Dryas* spp., and *Betula* spp.

Disturbed areas at these sites have variable degrees of vegetative cover consisting of grasses, *Dryas* spp., and *Salix* spp. Areas down-gradient from the sewage outfall areas are dominated by sedges with incidental occurrences of *Dryas* spp., *Salix* spp. and *Senecio congestus.*

Endangered Plant Species. A review of the most recently published 'Canadian Species at Risk' by COSEWIC (1997 edition) shows that there are no plants present on the sites that are currently listed as at risk.

Mammals

The primary terrestrial animal species of concern in the Eastern Arctic are foxes, bears, muskoxen and caribou.

The Arctic Fox is present throughout the Arctic year-round. Its diet consists of lemmings, the eggs and young of many different species of birds and carrion. In some cases, foxes will dig young Ringed Seals out of their dens for food. These foxes are solitary except when breeding. Foxes are usually found on land but can go out on the sea ice, following polar bears and scavenging off of seal carcasses.

Polar Bears are the largest carnivorous land animals, although they spend much of their time at sea. These bears are permanent residents of the areas along the DEW Line. Migrations are localised in conjunction with the migration of food sources. Young are born in snow dens either on land or (rarely) at sea. Their diet mainly consists of Ringed Seals, Bearded Seals and Walrus. Occasionally, Beluga Whales and Arctic Cod will be consumed. An important facet of their feeding behaviour is that they often eat the blubber of their prey, leaving the carrion for other species of mammals.

Caribou spend winters in the more southern boreal forest and migrate to Arctic tundra in summer to bear young and forage. They travel in large herds, sometimes across to islands. Often, they will cross open water.

Muskoxen remain in Arctic tundra throughout the year. In summer, they congregate in grassy river valleys, lakeshores and meadows where sedges, grasses, willows and heath plants are found. In winter, muskox inhabitat wind-swept hilltops and slopes where vegetation (woody plants) is exposed. Muskoxen can be found around DEW Line sites, especially on the more southern islands of the Arctic archipelago. Muskox travel in closely packed herds up to 100 individuals. Migration is localized.

Marine Environment

In undertaking development activities in the Nunavut Settlement Area, it is important to note the complexity of the regions ecosystem. This complex system results in a number of relationships between species of the Arctic. The major focus of these relationships is the need for all species to consume others within the ecosystem. Given the complex food web that is present, most mammals and birds have a varied diet.

Primary producers in the region along the DEW Line include phytoplankton and macroalgae both rooted on ocean bottoms and floating in the water column. These primary producers result in a large amount of biomass that feeds an assortment of animals.

Plants in the region are consumed by herbivores, including small invertebrates in zooplankton. These animals are primarly eaten by crusteaceans (amphipods and copepods) and molluscs (benthic bivalves and pelagic pteropods).

Primary carnivores in the Nunavut region include a large number of species of zooplankton that feed on herbivorous crustaceans. The main groups of zooplankton include two types of crustaceans (pelagic euphausids (or krill) and decapods (shrimps and crabs). Secondary carnivores consume small carnivorous and herbivorous invertebrates. Species in this category include all large pelagic invertebrates (fish, birds and mammals). The most abundant fish in the region of the DEW Line sites are Arctic Cod, Arctic Char, Cisco and Whitefish. Prevalent bird species include a number of ducks, geese, auks and loons.

Top carnivores at the top of the food web include Polar Bears, baleen whales, large toothed whales and birds of prey (i.e., Peregrine falcon and Snowy Owls). These predators consume a variety of organisms from lower levels, including fish, birds and smaller mammals (i.e., seals). Polar Bears catch seals when the opportunity permits (i.e., in shallow waters and shallow pools on the surface of ice floes. In rare cases, beluga whales are also a source of food for Polar Bears. Some birds become prey to certain mammals, such as the Arctic Fox and whales (which consume them when feeding on surface plankton). In many cases, birds eat other birds (young and eggs).

At the highest end of the food chain, humans consume food from many levels of the food chain, including fish, birds and mammals.

Biological Seasons

For the most part, biological seasons and associated activities are closely linked to ice conditions. It is these conditions that determine animal distribution and behaviour. The following section provides an outline of biological change that occurs immediately before and during the clean up of these sites.

Spring

For this period, ice occupies coastal areas and offshore areas. In the western areas of the Nunavut Settlement Area, bowhead and beluga whales migrate eastward in offshore waters. Marine mammals and birds start to accumulate along ice edges to feed and await breakup in order to migrate towards summer ranges. During this period, seal pups are born and caribou migrate northward towards the Coronation Gulf area.

Summer

In summer, marine mammals have access to and are found at traditional summering areas. Belugas are found in estauaries in Hudson Bay. Walruses spend a great deal of time at traditional haul out sites. Narwhal and harp seals are found throughout their range. Along the north coast around DEW Line sites, seabirds and waterfowl eggs hatch and the young are reared.

Fall

The onset of this period is characterised by the southward migration of waterfowl and shorebirds, the movement of marine mammals to wintering areas. Caribou migrate southward across sea ice in Coronation Gulf.

Overview of the Socio-economic Environment

Demographics

Approximately 19,500 (1991) people live in the Nunavut Settlement Area. Communities that are in close proximity to the DEW Line sites are shown in the following table:

Community (Local Name)	1991 Population
Qikiqtani Region	
Broughton Island (Qikiqtarjuaq)	461
Clyde River (Kangiqlugaapik)	565
Hall Beach (Sanirajak)	526
Igloolik (Igulik)	936
Iqaluit	3552
Kivalliq Region	
Rankin Inlet	1706
Kitikmeot Region	
Cambridge Bay (Ikaluktutiak)	1116
Kugluktuk	1059
Gjoa Haven (Ursuqtuq)	783
Pelly Bay (Arviliqtuq)	409
Taloyoak	580

Each site may have a number of outpost camps, traditional use areas, camps or other areas of interest. During the community meetings to be held prior to the clean up of each site, the project management office will endeavor to identify these areas with local residents. Where required, applicable mitigation measures (i.e., timing restrictions, etc.) will be included in the site specific environmental protection plan in order to prevent interruption of these activities.

Approximately 80% of the population in this area is Inuit. Non-native populations are concentrated in centres of regional government (Iqaluit, Cambridge Bay and Rankin Inlet). Unemployment among the Inuit population is high compared to the non-native population of the area (30% versus 2%). The cost of living is approximately 1.5 to 2 times that in southern cities, while the average household income is approximately two-thirds of that in the rest of Canada.

Area Economy

Much of the area within close proximity of the DEW Line is currently based on renewable resource harvesting, non-renewable resource extraction and energy development. Additionally, service industries such as tourism and government are becoming increasingly more important facets of the economy, particularly given the imminent formation of the new territorial government in 1999. Wage employment is often available in the mining, oil and gas, construction, tourism and government sectors. Trapping, fishing and traditional arts also provide a portion of the population with regular wage employment. Demand for wage employment still outweighs supply, however. This has resulted in an increased importance for the subsistence economy which supplies food, clothing and raw materials.

Renewable Resource Harvesting

Owing to the high levels of unemployment and the expense of food from southern sources, country foods play an important role in the area's economy. Five out of six households hunt and fish at least part-time. Approximately 60% of households rely on country food for a large proportion of their meat. The main types of country foods are seal, narwhal, caribou, fish and walrus. Additionally, the Inuit use a variety of plants for food and medicinal purposes. In addition to providing food, renewable resource harvesting also satisfies other needs, including clothing.

The DEW Line Clean Up project recognises the need to protect these resources.

Native Land Use

Hunting

It is recognised that hunting and the relationship to the land are of profound cultural and spiritual importance to the Inuit. Hunting itself provides a means for linking modern day lifestyles and culture with the past. Hunting is valued by the Inuit as it contributes to both independence and community well-being.

The harvesting of marine mammals is the foundation of the Inuit subsistence economy and much of the marine mammal harvesting is done from sea ice. There are a large number of routes linking hunting areas, outpost camps and other communities. Of all marine mammals hunted, the ringed seal is the most important. This mammal provides a year round source of food as well as

a cash income. During the clean up of the DEW Line sites (July – October annually), it is expected that these seals will exist on fast ice and open water.

The main terrestrial mammals used for food and other applications are polar bears, caribou and muskoxen. In some communities, these mammals (especially caribou) are a more important source for food than marine mammals. Caribou are hunted year round but most intensely in September when the animal congregate in large herds prior to migrating south. Caribou are shot both on land and from boats as they are crossing water bodies.

Wage Economy

Since the 1950's, an important source of income has been based on waged employment, whether from individual activities or more traditional forms of wage employment (i.e., construction work, oil and gas industry, etc.). Tourism is becoming an increasing important facet of the economy.

It is expected that, for the short term in particular communities and the longer term (i.e., approximately 20 years), a significant number of person-years of employment will be generated as a result of this project. Additionally, further enhancement of the areas' economy is expected resulting from increased local purchases and use of local businesses.

Valued Ecosystem Components

Valued Ecosystem Components (VEC's) for each site are outlined in the individual site environmental screening reports included with this submission. This section outlines those VEC's common to each of the 15 sites in the Nunavut Settlement Area.

Physical

- Protection of Permafrost soils
- Surface water, particularly related to the drinking water supply

Biological

- Wetland habitats (lakes and ponds) used by birds for feeding and nesting
- Tundra habitat including:
    1. Feeding and nesting areas for birds
    2. Feeding areas for herbivores
    3. Feeding and calving areas for caribou, bears and muskoxen
- Local vegetation
- Marine mammals off coasts

Socio-economic

- regional employment opportunities
- regional business opportunities
- regional training opportunities
- hunting and fishing in local area

Archaeological, Historical and Cultural

- archaeological sites identified around the station

Land Use

Each of the DEW Line sites has been or is, in general, used exclusively for the purposes of operating a military radar station, which includes on-site operation and maintenance of infrastructure and off-site transportation by air and sealift. Limited local use of the immediate site area occurs (i.e., for hunting and fishing, etc.). In some cases, there are regularly used fishing and hunting areas immediately adjacent to the sites (i.e., Cambridge Bay).

PART 4 - DESCRIPTION OF THE PUBLIC CONSULTATION PROCESS

As part of the DEW Line Clean Up project, a public consultation program has been carried out in communities across the north since August of 1992. In 1992 and 1993 teams from the Department of National Defence and other federal departments conducted a broad range public consultation sessions to consult the local residents about the project and to obtain input regarding specific concerns about the work.

During the public consultation process, meetings were held in those communities in the vicinity of DEW Line sites as well as briefings to government officials in Iqaluit, Cambridge Bay and Yellowknife. Advertisements, information packages and translation services were provided in English as well as Inuktitut. Minutes were recorded at each of the meetings and action items passed on to the responsible agencies.

The purpose of these meetings were several fold, including:

- inform the community of the status and schedule for the project;
- provide information regarding the process for the closure and clean up of the sites as well as providing information for providing socio-economic opportunities (business and employment);
- present information concerning the DEW Line Clean Up protocol which has been adopted for the project;
- provide general information regarding the demolition and disposal of facilities;
- obtain information regarding public concerns through discussions at the meetings and questionnaires; and
- Obtain information regarding local labour and contracting capabilities to assist in developing implementation strategies.

For the DEW Line Clean Up project, DND has sought to integrate the views of all interested stakeholders, including individuals or groups, into the decision making process undertaken by the Department of National Defence. For this project, the approach to public involvement in environmental assessments includes two major elements:

- adequate public notification; and
- appropriate public consultation.

For DEW Line Clean Up, public notification has been used as a secondary source of public consultation, using a one-way exchange of information with the public. The purpose of this particular process is to provide notification of report preparation, decisions that are made and actions that have been or are planned to be taken. For this project, this particular methodology has not been considered 'participation'. Public notification has been used mainly for notifying the public of the results of previous environmental assessments.

Public consultation has been used to involve the public in the environmental assessment process through dialogue between northern residents and the project representatives. This dialogue has proved useful in identifying public concerns, needs and values before final decisions on courses of action were made.

1992 Program

Nine communities were visited in 1992:

- Broughton Island
- Clyde River
- Igloolik
- Hall Beach
- Taloyoak (Spence Bay)
- Pelly Bay
- Gjoa Haven
- Kugluktuk (Coppermine)
- Cambridge Bay

The main goals in 1992 were to present the base clean up protocol and plan as well as hear suggestions and ideas from the public. The objectives of the initial meetings included the following:

a. Provide general information to the community regarding the status and schedule for the project;

b. Provide information regarding the process for closure and cleanup of the DEW Line;

c. Present environmental information regarding the DEW Line Clean Up (DLCU) Protocol adopted for the project;

d. Provide general information regarding the demolition/disposal of facilities;

e. Obtain information regarding public concerns through discussions at the meetings and through questionnaires; and

f. Obtain information regarding local labour and contracting capabilities to assist in developing implementation strategies.

A report prepared by the project management team outlined the information provided to the public and summarised questions/concerns which arose during the meetings.

Many questions and concerns were raised regarding various aspects of the project and almost half of these dealt with two main areas: employment opportunities and environmental impact protection. There is a serious desire among the people in the communities to obtain training and to be involved in the clean up of the sites. The second major issue of environmental impact and protection was expressed as concern about the short and long-term impact on the food chain. Perhaps the most serious concerns expressed centred on previous disposal practices, particularly ocean dumping.

The appearance of the sites, particularly those adjacent to communities, was a concern. The proposed cleanup protocol was generally accepted to be the most practical. Some details related to performance of long term monitoring were yet to be worked out. This will be addressed with the new monitoring plan.

In general, the meetings were well attended, the project team was well received and discussions were wide ranging and lively. People seemed to appreciate the initiative taken by DND to inform the communities regarding DLCU and the public provided valuable insights into the project. In some cases people have unrealistic expectations regarding the project and it was important to correct these. In this region of high unemployment it is important to be truthful and not be too optimistic concerning the economic impact of a one time project such as this clean up.

1993 Program

The same nine communities in the Nunavut Settlement Area were visited in May and June 1993. The objectives for this second round of meetings were as follows:

a. Update the communities on the current status of the project;

b. Present information on the site investigations and the 80% Design Submission for the ten sites studied in 1992;

c. Provide clean up protocol information on the 11 DND sites surveyed in 1993;

d. Present information on the plans for the 21 DIAND sites; and

e. Request suggestions and ideas regarding community concerns with the cleanup plans.

Questions and concerns were raised by the public regarding a variety of aspects of this project. While the majority of concerns were in regards to socio-economic effects and benefits (employment opportunities) there was also a concern over the environmental protection measures that were to be employed during the clean up. The residents of these communites have expressed a desire to obtain job training and to be involved with the clean up of these sites. With respect to environmental protection, concern was expressed as to how the clean up of these sites would impact the food chain over the short and long terms. There were a number of concerns over how previous disposal practices, particularly ocean dumping, was conducted and what the effects have and will be. Another aspect of environmental protection raised by the public was that of aesthetics. Questions were asked about how the sites would look like at the end of the clean up. No major concerns about the effect of the clean up operations were raised.

The issues outlined above were addressed through discussions during the meetings and concerns were alleviated through these consultation sessions.

1994 Program

In 1994, public consultation focused on involvement of both the territorial (GNWT) government and recently formed Inuit organisations. Two meetings were held in late 1994 with Nunavut officials in Cambridge Bay (Kitikmeot Inuit Association/Nunavut Tunngavik Incorporated joint meeting and Nunavut Planning Commission).

1996 Program

In 1996, the DEW Line Clean Up project resumed its public consultation program by holding public meetings at those communities that would be closest to those sites undergoing clean up in 1996. Within the Nunavut Settlement Area, the communities of Broughton Island and Clyde River were invited to participate in a public meeting discussing upcoming DEW Line Clean Up activities.

1997 Program

The DEW Line Clean Up project office followed up on the 1996 community visits in cases where there is local interest to do so. Both Clyde River and Broughton Island hosted a public information session. These meetings focused on providing planning details as to the upcoming work at the site. Community interest continued to be high, especially in the area of employment opportunities, environmental protection and salvage opportunities.

Future Public Involvement Activities Starting in 1998

As the project enters the implementation phase, public involvement will focus on providing communities with an update on clean up activities within their local area. Several community specific activities will be undertaken:

- The project management office will hold a community information briefing in the community or communities closest to each DEW line site just prior to the start of clean up (i.e., 1 to 2 months in advance). The aim of these meetings will be to provide community residents with an overview of final details concerning the start of work at each site. The first such meeting will take place in Cambridge Bay in May, 1998.

- The community closest to each DEW Line site will be invited to form a joint advisory committee with DND. The purpose of this committee, which is expected to typically include the community mayor and another resident plus the on-site representatives from the project, is to serve as a forum for addressing local concerns and questions about the clean up during the period when actual activity is taking place. It is expected that this committee will meet monthly during the summer periods.

- As part of the pre-clean up site delineation work, local communities will be asked to provide traditional local knowledge about the DEW Line site area, particularly related to landfills. Typical questions to be posed are shown in the DND/NTI Agreement (Annex D) and are summarised in Annex M.

DND/NTI Project Review Committee

As part of the Agreement between the Department of National Defence and Nunavut Tunngavik Incorporated (Annex D), there are to be regularly scheduled meetings between these two organisations. These meetings, which will involve senior management from both organisations, are designed to provide a regular forum to discuss the clean up program within the Nunavut Settlement Area and to bring up concerns relating to environmental and/or socio-economic concerns.