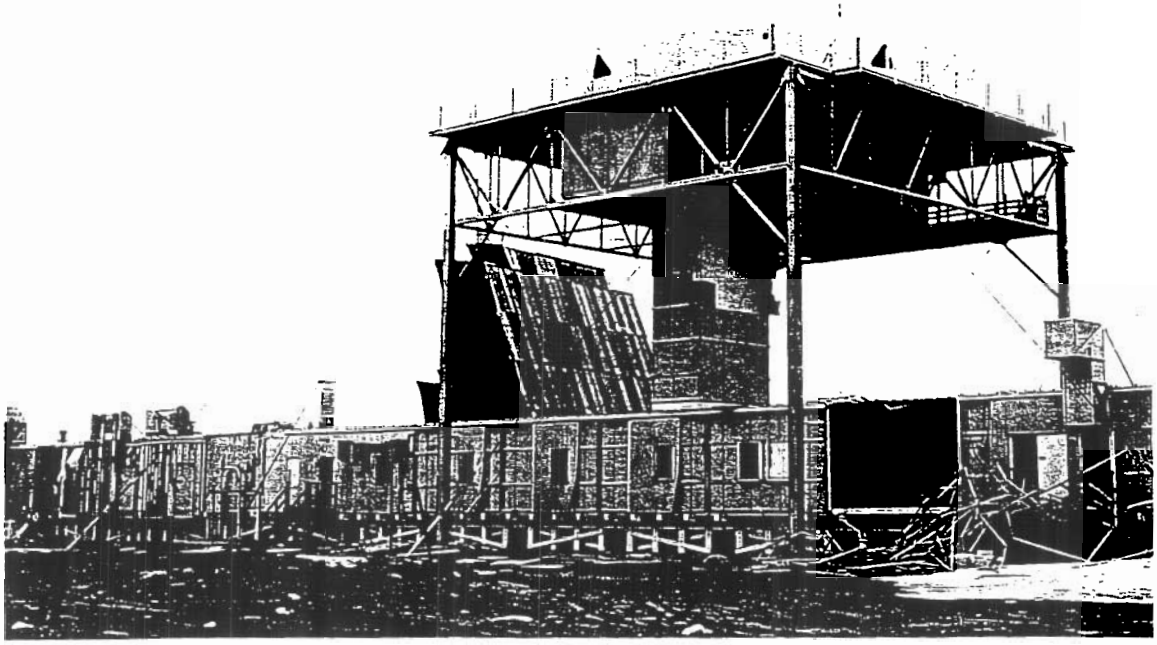
FOX-5 DEW Line Site



Pre-construction Delineation Phase:

NTI Technical Representative Report to NTI

August, 1998

VISTA ENGINEERING

28 August 1998

NTI
Box 1041
Cambridge Bay

Attention: James Eetolook

Dear Mr Eetolook

Re: NTI Technical Representative Report

We are pleased to present five (5) copies of the report entitled "FOX-5 DEW Line Site Pre-construction Delineation Phase: NTI Technical Representative Report to NTI". The report summarizes the site visit in August 1998.

If there are any questions with regard to this report, please contact Sheila Street at (867)873-4894.

Yours sincerely,

Vista Engineering

Sheila Street

cc Nikki Eegeesiak, QIA Iqualuit (2 Copies)
Loasie Audlakiak, QIA Broughton (2 copies)

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1. Executive Summary

The Inuit Organizations of Northern Canada Nunavut Tunngavik Inc.(NTI), the Kitikmeot Corporation (KC) and Qikiqtani Inuit Association (QIA)) have reached an agreement with the Canadian Department of National Defense (DND) as to the procedure for the clean-up of the Distant Early Warning (DEW) Line Sites within the Nunavut Territory.

A section of the agreement outlines the procedure for the pre-construction delineation program, which is generally conducted two years prior to the cleanup of a the DEW Line site. The pre-construction delineation program necessitates the use of community knowledge as well as scientific evidence to delineate and finalize the cleanup requirements of a site.

The pre-construction delineation program for FOX-5, Broughton Island was conducted in August of 1998. The site is scheduled for cleanup by 2001. The Environmental Sciences Group (ESG) of Kingston and UMA Engineering (UMA) of Edmonton, as representatives of DND completed the delineation program. Sheila Street of Vista Engineering visited the site as NTI's technical representative and collected local knowledge about the site. Jaypetee Audlakiak was NTI's Local Representative

The report focuses on the observations and data collected by the NTI representatives during the pre-construction delineation program.

In general, it was found that the DND assessment team provided a thorough investigation of the Fox-5 site with respect to the DEW Line Clean-up Protocol agreed to by DND and NTI. Local knowledge presented contaminated areas that were not previously documented.

1 Introduction

The cleanup of the DEW Line sites has been a concern for Inuit organizations of Northern Canada since the abandonment of the sites in 1993. Recently, Nunavut Tunngavik Incorporated and the Federal Department of National Defense have come to an agreement on the protocol and methodology for the cleanup of DEW Line sites in the Nunavut Territory. The basis for the environmental stipulations in the agreement was developed by an organized group of NTI and DND technical representatives called the DEW Line Environmental Working Group (EWG).

A stipulation in the agreement calls for a pre-construction delineation of contamination on each site, which is to be completed approximately two years prior to cleanup of the site by DND consultants and engineers (currently ESG and UMA). It is agreed that during the delineation phase an NTI technical representative and an NTI local representative will visit the site to ensure that local knowledge is collected and considered during the scientific investigations. It is important that NTI representatives are familiar with the site for discussions with the EWG.

Sheila Street of Vista Engineering was commissioned by NTI to act as the NTI technical representative during the delineation phase of FOX-5 on Broughton Island, which took place during the month of August 1998. Jaypetee Audlakiak was commissioned to act as the NTI local representative. This report summarizes the traditional knowledge collected and the technical observations of the NTI representatives while visiting the FOX-5 DEW Line site.

2 NTI Technical Representative Scope of Work

The role of the NTI Technical Representative is an integral part of DEW Line cleanup negotiations. As a member of the EWG the technical representative must be very familiar with the site so that in addressing the details of the cleanup plans with other members of the EWG, they may come to a consensus on the most effective manner of site remediation. The final cleanup plans must ensure the long-term preservation of the Arctic environment and residents health.

The technical representative must be familiar with the scientific methodologies employed by the consultants of DND in assessing the sites and fully understand the significance of the study results.

The technical representative works closely with the local representative in collecting local and traditional knowledge through interviews with elders and community consultation. This knowledge is used to uncover location of DEW Line contamination that was missed during preceding assessments. The traditional knowledge is also an integral data source for completing the Landfill Risk Evaluation Matrix for each landfill site.

The Technical Representative reports to NTI and is responsible to inform NTI if there are any concerns with the methodology employed by DND during the development of the cleanup plans or if there are any notable concerns of the locals with regard to the site.

3 NTI Local Representative Scope of Work

The Local Representative is usually a person who had worked at the subject DEW Line site during operations and is familiar with the site. He works closely with the NTI Technical Representative to ensure that the DND site assessors address local concerns during the pre-construction delineation phase of the cleanup.

Other responsibilities of the Local Representative are as follows:

- Will tour the DEW Line facility and comment on past infractions or 'offences' of which he is aware, such as dumping, burying, spills etc.
- Will assist in organizing meetings with elders in the closest, most impacted community.
- Will assist in arranging a community meeting to inform the residents of the current work being done at the site and assist in retaining any additional knowledge the community members might have with regard to the DEW site.
- Will act as translator for the NTI Technical Representative and the ESG/UMA crew if needed.

4 Summary of DND Consultants Assessment Methodology

The results from the scientific and engineering studies conducted concurrently during the summer of 1998 will develop the basis for the final clean-up tender documents FOX-5. ESG and UMA have developed a partnership whereby ESG performs the scientific investigations and UMA performs the engineering and design of the site cleanup. The findings and conclusions of each group are of equal importance in the resulting tender document.

The following describes the general methodology of each group during the final assessment of the sites of concern to the Inuit organizations.

4.1 ESG Contributions

The Environmental Sciences Group (ESG), headed by Dr. Ken Reimer, is a group from the Royal Military College of Canada located in Kingston, Ontario. The group is academically based and incorporates scientific research in their work on the DEW Line sites. ESG provides scientific and technical advice to DND.

During the FOX-5 delineation, ESG was responsible for delineating the chemical contamination at the site. The final outcome of their studies determines the quantity, type and levels of contamination of soil at each site. This is an essential part of the final tender documents since the amount of soil to be excavated or treated, determines the need for and the size of the containment or method of treatment.

Soils are sampled at surface, and at depth where required, on a grid laid over an area that has been sampled in previous assessments and deemed contaminated. The grid size is determined by the size of the area suspected of contamination. Contamination at the DEW Line sites is generally confined to sewage outfalls, landfills and fuel storage areas including pallet lines, beaches and to a lesser degree around site buildings.

Soil samples are tested in an on-site laboratory for inorganic contamination levels using an x-ray fluorescence unit (XRF) and tested for organic contamination using field test kits for poly-chlorinated biphenyls (PCB), polycyclic aromatic hydrocarbons (PAH) and total petroleum hydrocarbons (TPH) levels. All field techniques are generally accepted methods for estimating contamination levels in the field.

Results are compared to Quebec Tier I and Tier II criteria as well as Canadian Environmental Protection Act (CEPA) criteria to ensure that the samples at the edge of the grid are below criteria, thus ensuring that the quantity of contaminated soil is estimated. In some cases, test pits confirm the depth of contamination. Samples are also sent to an accredited laboratory for analysis in order to coordinate with field results.

Water and sediment samples are collected from leachate ponds at the base of dumps and from leachate receptor streams and lakes. These samples are analyzed in a laboratory for inorganic and organic contamination. The results from the water analyses helps to determine if leachate from dumps and outfalls are entering the aquatic environment and thus drinking water and fish habitat.

ESG is also responsible for specific sampling and analysis requested by UMA for example paint, transformer oil, asbestos and concrete. These samples are taken judgmentally based on visual observation. Each paint color found on-site is sampled as well as stained concrete. Bulk paint samples are also collected in order to perform leachate tests on the paint. Leachate tests will help determine the likelihood of PCB leachate from landfilled building material. Tests to date indicate that PCBs do not leach from paint.

ESG is following the pre-construction delineation program as agreed to by NTI and DND.

4.2 UMA Contributions

UMA is a prime consultant for the Department of National Defence, Director General of the Environment. The firm was commissioned to complete the engineering and design aspects of the DEW Line clean-up project. During the pre-construction delineation phase, UMA is on-site to complete the following tasks:

1. Confirm the hazardous and non-hazardous inventory on each site. This involved the identification of building materials including asbestos, estimated quantity of painted surfaces, record of the equipment on site including generators, kitchen equipment, etc.
2. Assess and locate debris piles on site. Identify hazardous and non-hazardous materials in the debris piles.
3. Locate landfills that were identified in previous assessments and by local consultation and confirm the boundary of the landfill using magnetometer and electromagnetic equipment (EM) that detects anomalies under the fill.
4. Install piezometers in order to assess the quantity, direction and quality of the ground water flowing through and away from contaminated areas.
5. Survey the ESG sample locations in order to produce a map.
6. Survey topography for use in the remediation and planning of landfills and other design projects.
7. Reassess and in some cases assess new locations proposed for construction of the NDF and engineered landfills. Survey the boundaries of the proposed landfills and NDF.
8. Reevaluate the decision to either engineer cover, leachate control or excavate each dump.
9. Locate and evaluate sources of borrow on each site.

UMA is responsible for designing the new landfills and northern disposal facilities and provides recommendations to DND that a dump either is filled, leachate controlled or excavated. UMA considers the results of the ESG sampling program, erosion potential and down stream receptors when developing conclusions.

UMA is responsible for developing the final specifications and tender documents based on scientific information acquired by ESG, information acquired during the subsequent site visits and on the outcome of negations within the DEW Line Cleanup Environmental Working Group.

5 FOX – 5, Broughton Island Pre-Construction Delineation Phase

The FOX-5 Broughton Island site was visited by ESG and UMA personnel during the month of August 1998. The NTI Representatives worked with on site August 8, 9 and 10.

5.1 Site Description

FOX-5 is located on the eastern edge of Broughton Island. The station is situated on a high point overlooking Davis Strait and is connected by a 9 km road to the community of Broughton Island.

FOX-5 was an auxiliary station within the original DEW Line station system. It has been decommissioned, but currently has a remotely operated NWS Short Range Radar Station in its vicinity. The boundary of the FOX-5 site encompasses an area of approximately 1320 hectares.

The upper site consists of a dormatory, module train, shop, POL station, hot water storage tanks, two billboards, two satellite dishes and the foundation of the garage. It was reported that the Hamlet dismantled and moved the garage for use in the community. There is one main landfill and two barrel-dump areas at the upper site.

The lower site consists of a POL station, an airstrip apron, and a vehicle storage building, which is currently in use by the Hamlet. The first construction campsite of the DEW Line employees is located near the present Hamlet landfill where numerous fuel drums are strewn and partially buried. There are two notable dumps; one located at the end of the current airstrip and one located across the road and adjacent to the old camp-site.

Areas of contaminated soil include two outfalls at the upper site; the upper and lower POL berm and garage pad; Upper main landfill; and Lower main landfill.

5.2 Landfill Risk Evaluation Matrix Data Collection

For purposes of the "Receptors" section of the Landfill Risk Evaluation Matrix (Appendix C), it was important to collect information about the communities native food consumption, drinking water locations and hunting customs. The local representative was interviewed to obtain the knowledge necessary to complete that section of the matrix.

There are two main landfills of concern; the main upper site landfill, which drains over a cliff to Davis Strait and the lower airstrip landfill, which drains into Broughton Channel

The following summarizes the data collected for the matrix:

1. The community receives its water from a reservoir located away from any potential DEW Line station drainage. The water is delivered by truck. There are no reported seasonal fresh water sources in the vicinity of the DEW Line station or down gradient of the site.
2. There is extensive seal, narwhal, walrus and char fishing in both David Strait and Broughton Channel. The populations remain year around thus spawning, and calving occurs in the area.
3. Mussels and sculpins are frequently collected in Broughton Channel, but not in Davis Strait.
4. Berries and plants are not collected in the area of either landfill.
5. There are very rare sighting of terrestrial mammals on Broughton island with the exception of avifauna (birds) and rodents. Caribou do not come on the island and bear are very rare.
6. The locals rarely visit the upper site except to obtain building supplies. They do not camp at the upper site. The lower site is frequented. A narrow quad trail that runs over the lower site landfill, has been worn into the tundra.

5.3 Local Representative and Local Residents Concerns and Comments

The Local Representative hired for the FOX-5 site visit was Jaypetee Auldlakiak, a local resident of Broughton Island. Jaypetee had worked at FOX-5 and other DEW sites off and on for 15 years. He was employed as a light equipment operator for the United States Air Force (USAF) and for a short time with Frontec. Jaypetee was not working on site during the USAF or the Frontec final clean up of FOX-5.

Jaypetee's knowledge of the FOX-5 site was extensive and helpful to ESG and UMA. He had taken the initiative to talk to other local people about the site and was able to pass on information to ESG, UMA and the technical representative that was not previously known.

A community consultation was held on August 10th. Approximately 15 local residents attended the meeting to share information about the site with representatives of NTI and ESG. They were also informed of the status of the site and the purpose of the site visit.

One Elder by the name of Joanasie Kakka was interviewed. Through translation, he was able to share his knowledge about the site from about 1961 when he first moved to Broughton Island.

The following outlines the information gathered from the interviews with the local representative, elders and community members of Broughton Island.

5.3.1 Lower Site Concerns and Comments

1. Through interviews it was discovered that the old campsite, located near the present Hamlet landfill, had not been noted in past assessments. As a result, ESG and UMA were to investigate the area and include it in the clean-up plans. According to locals, the campsite was utilized for approximately 3 years during the construction of the DEW Line Site.
2. Hamlet employees discovered the landfill adjacent to and across the road from the old camp when they were taking borrow material for a Hamlet construction project. They stopped borrowing from that area because they kept encountering buried material. The Hamlet is currently borrowing adjacent to the dump.
3. The Hamlet is currently using the lower vehicle storage buildings and intends to take over the buildings from DND.
4. An airstrip building had been constructed adjacent to the lower vehicle storage building, as is evident by the partially buried concrete foundation. A fire destroyed the building in the 1980's.
5. The locals are not aware of any ocean dumping having occurred during the site operations.
6. Mr. Kakka remembers observing extensive oil sheen coming from the old vehicles that were buried at the airstrip landfill. The sheen covered the water at the time, but is no longer visible. The debris being uncovered at the landfill is being carried away every year.
7. Locals informed NTI and ESG that the DEW Site operators had left numerous empty drums on Baffin Island directly across from the community. Mr. Kakka confirmed that the Hamlet had crushed and removed the drums that were located there.

5.3.2 Upper Site Concerns and Comments

1. The residents and the community Senior Administrative Officer were very concerned as to when the cleanup was to begin at FOX-5. ESG informed the community residents present at the meeting that it cleanup was expected to begin in 2001. The community is pleased to know that FOX-5 will be cleaned before DYE-M.
2. During the tour of the facility, the local representative pointed out where lubricating oil was stored on the pallet line near the POL tanks.
3. NTI and ESG were informed that the remaining fuel was burned in a dump truck bucket and in a metal tank that was cut in half. The metal tank was then buried. At present time, the tank is partially buried in the pallet line located adjacent to the horizontal POL tanks. The truck bucket was deposited at the main landfill.
4. The locals report that the landfill is eroding, exposing more debris every year.
5. The horizontal POL tanks were used as a refilling station.
6. A barrel dump is located half way between the horizontal POL tanks and the landfill. There are approximately 50 drums in this area that have not been noted on the cleanup specs to date. ESG was informed of the debris.
7. The vehicle storage garage was dismantled in 1997 and relocated to the community for use by the Hunters and Trappers Association. The garage had not been reassembled at the time of the site visit.

5.4 NTI Technical Representative Observations and Concerns

It is the purpose of the Technical Representative to observe the site and note any technical concerns that may have been overlooked by the DND consultants. Note that the technical representative was on site for three days only and did not, at the time of writing this report, have access to the results of the scientific study completed by ESG.

Specific recommendations for the cleanup of a particular landfill or contaminated area can not be made at this time. It is the duty of the Environmental Working Group to come to a conclusion on these issues.

Observations made by the NTI Technical Representative during the site visit were shared with ESG so that an investigation could be made of the issues while ESG was on site. The following comments are based on visual observations and field results:

5.4.1 Upper Site Concerns and Comments

1. Contaminated soil appeared to be delineated by ESG as accurately as possible. The sewage outfalls, POL stations, pallet lines, garage pads, stained concrete, painted material and landfills were analyzed according to the protocol agreed to by DND and NTI.

2. Concerns and findings of the Local Representative were noted and will be included in the final cleanup design.
3. The upper site buildings are extensively damaged. Paint flakes as large as 15 cm in diameter are scattered throughout the site due to wind erosion. This problem should be addressed as soon as possible to reduce the scatter of PCB paint. The physical breakdown of the paint is the main concern with regard to PCB contamination from paint.
4. The main landfill does not appear to be physically stable. It is on an incline that receives runoff that is causing erosion and is exposing the buried contents of the dump. At least two of the runoff channels that flow through the dump were flowing during the site visit.
5. ESG noted the drum dump located down-gradient of the MOGAS tanks and had intended on investigating the area before leaving the site.

5.4.2 Lower Site Concerns and Comments

1. Contaminated soil appeared to be delineated by ESG as accurately as possible. The POL station, garage pads, apron, stained concrete, painted material and landfills were analyzed according to the protocol agreed to by DND and NTI.
2. The old camp located near the current Hamlet landfill is a concern because it had not been documented in past DND assessments. The debris is extensive and includes at least 100 drums that are exposed or partially buried. ESG agreed to thoroughly investigate the area prior to leaving the site.
3. The buried material in the hamlet borrow area is a concern because it affects the operations of the Hamlet. The borrow area should be searched and debris removed.
4. Located on the airstrip apron is a power pole with an old pole-mount transformer attached to it. It is very likely that this transformer contains PCB contaminated mineral oil and should be handled prior to dismantling the poles.
5. Also located on the apron is a beacon light stand. The beacon is no longer in tact on the pole and may have been damaged prior to removal. The light ballasts in these beacons commonly contained PCBs and the concern was noted by ESG. Further studies of the soil beneath the stand were to have been completed while the team was on site.
6. The beach POL station appears extensively stained. Test results were not available during the site visit. If results of the study show that the soil is in fact contaminated it is recommended that the soil from the berm be relocated away from Broughton Channel.
7. The airstrip landfill is in a very unstable location and is currently leaching contaminants.

6 Closure

1998 is the second year that NTI has taken the initiative of retaining technical and local representatives during the pre-construction delineation phase of DEW Line cleanup. It is an effective method of working with DND and provides an opportunity for the people who are affected the most by the presence and cleanup of the sites, to voice their concerns and ensure that the cleanup is effective.

7 References

Environmental Sciences Group and UMA Engineering LTD., DND, 1995. *DEW Line Cleanup: Scientific and Engineering Summary Report.*

Environmental Sciences Group and The Chemistry Department University of British Columbia, DND, 1997. *Polychlorinated Biphenyl (PCB) Non-Remediation Waste: Old Paints Containing PCBs in the Demolition Waste Stream.*

Environmental Sciences Group, Royal Roads Military College, DND, 1992. *North Warning System Environmental Study, Volumes One, Two, Three and Four.*

Environmental Sciences Group, Royal Roads Military College, DND, 1993. *The Environmental Impact of the DEW Line on the Canadian Arctic, Volumes One and Two.*

Environmental Sciences Group, Royal Roads Military College, DND, 1993. *Environmental Study of Eleven DEW Line Sites, Volumes One and Two.*

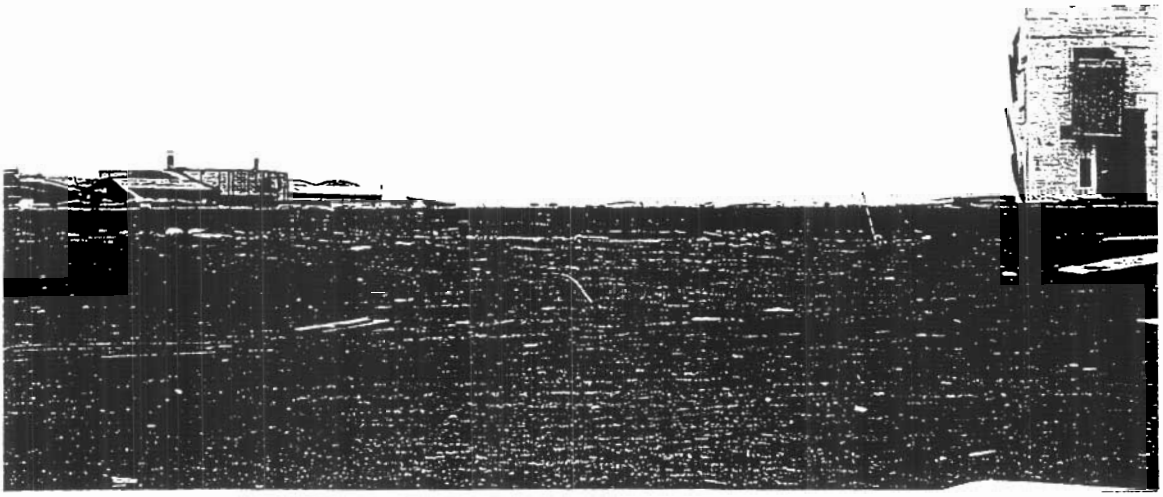
Environmental Sciences Group, Royal Roads Military College, DND, 1994. *Historical Ocean Disposal in the Canadian Arctic: Survey of Materials Disposed in Cambridge Bay and the State of the Marine Environment.*

UMA, 1994. *DEW Line Clean up 95% Design Submission.* Prepared for the Department of Defense, Canada.

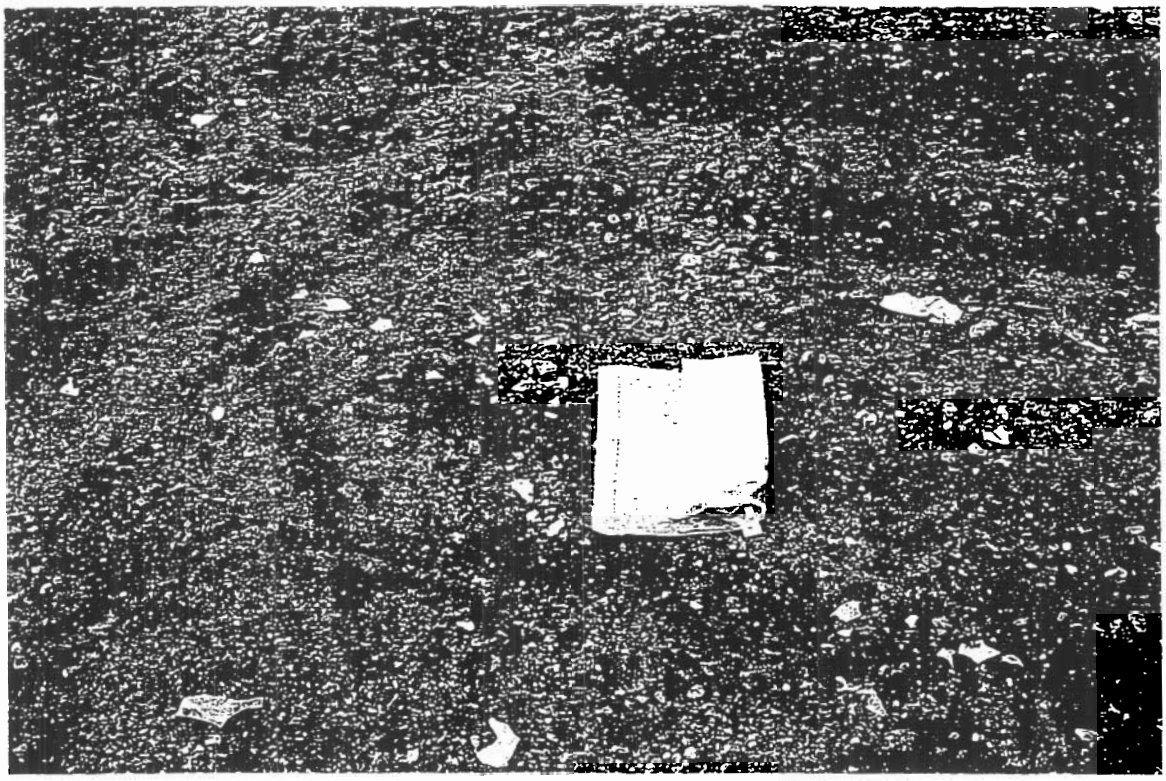
Appendix A: Photographs

1. FOX - 5 upper site. View from access road.

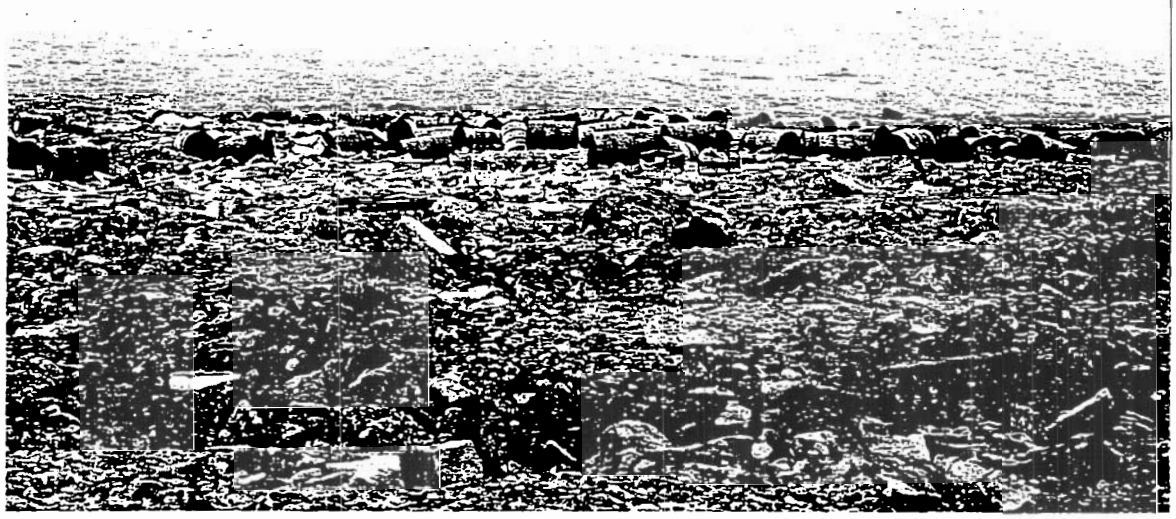
2. Dormitory showing extensive destruction.



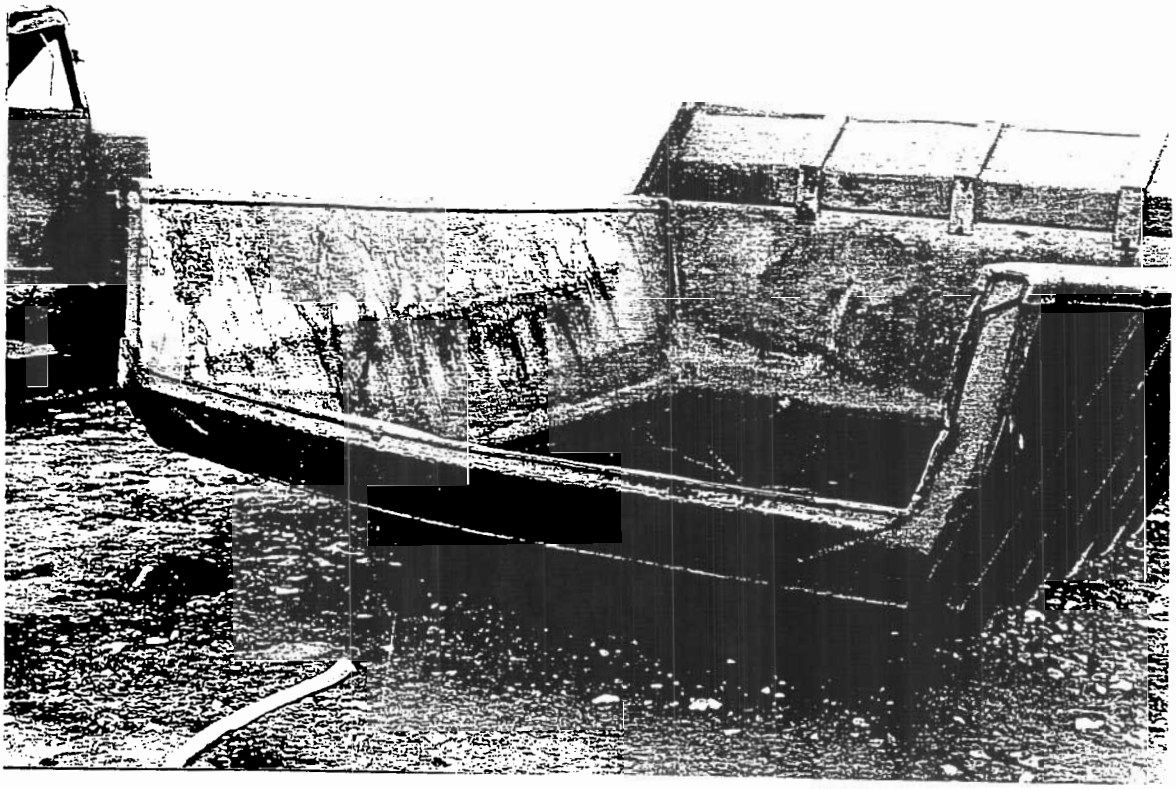
3. Concrete foundation of the warehouse now relocated to the Hamlet.



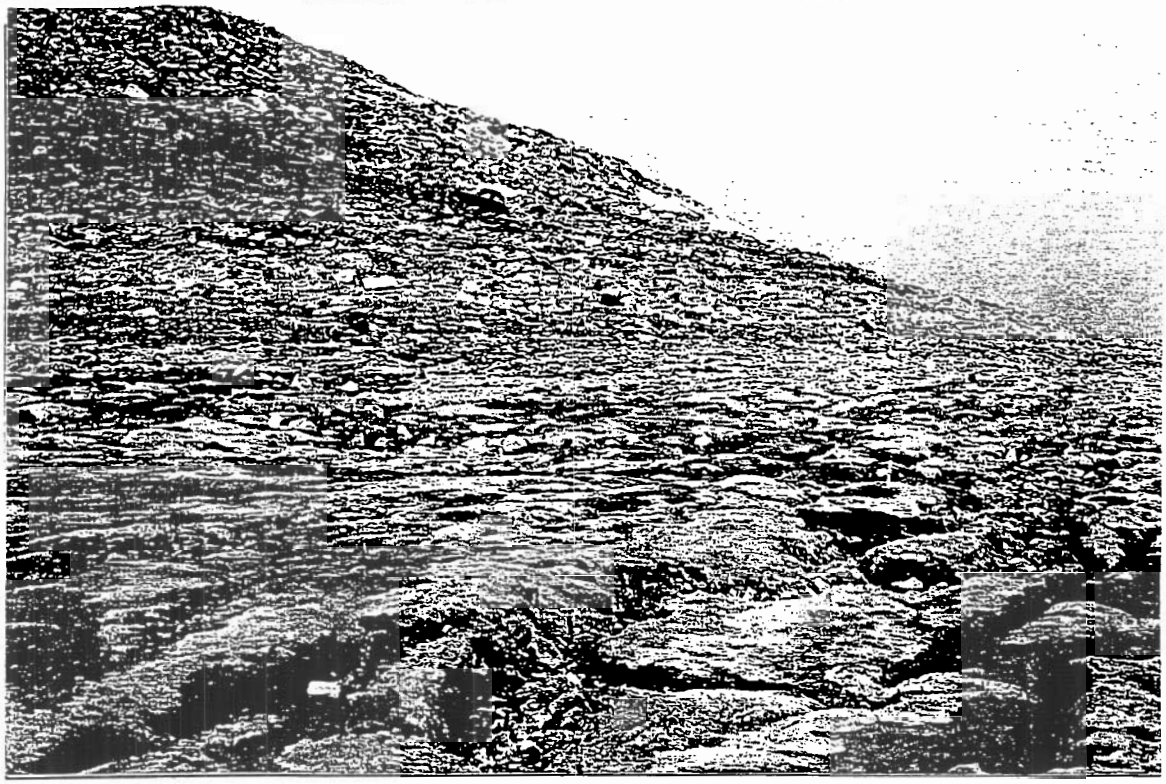
4. Extensive paint scattered throughout the site (grey). Papers for scale.



5. Undocumented barrel dump area down-gradient of the MOGAS Tank

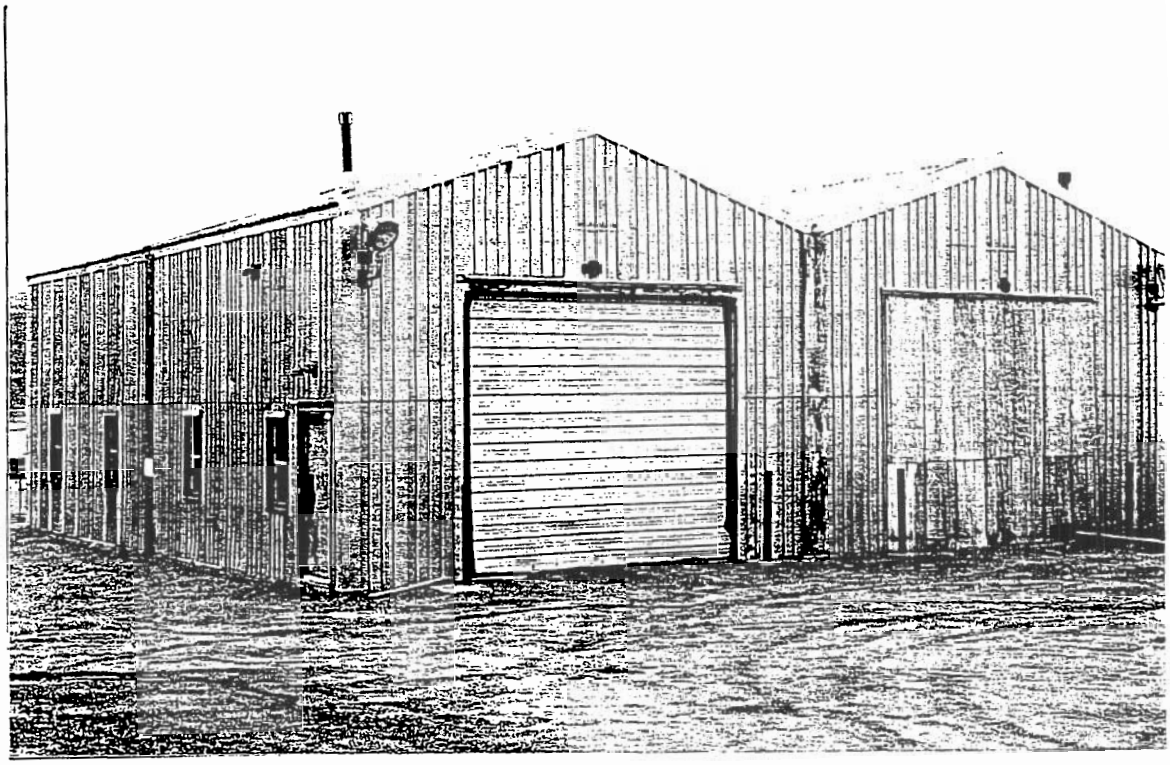


6. Dump truck bucket used to burn excess fuel during site close-out

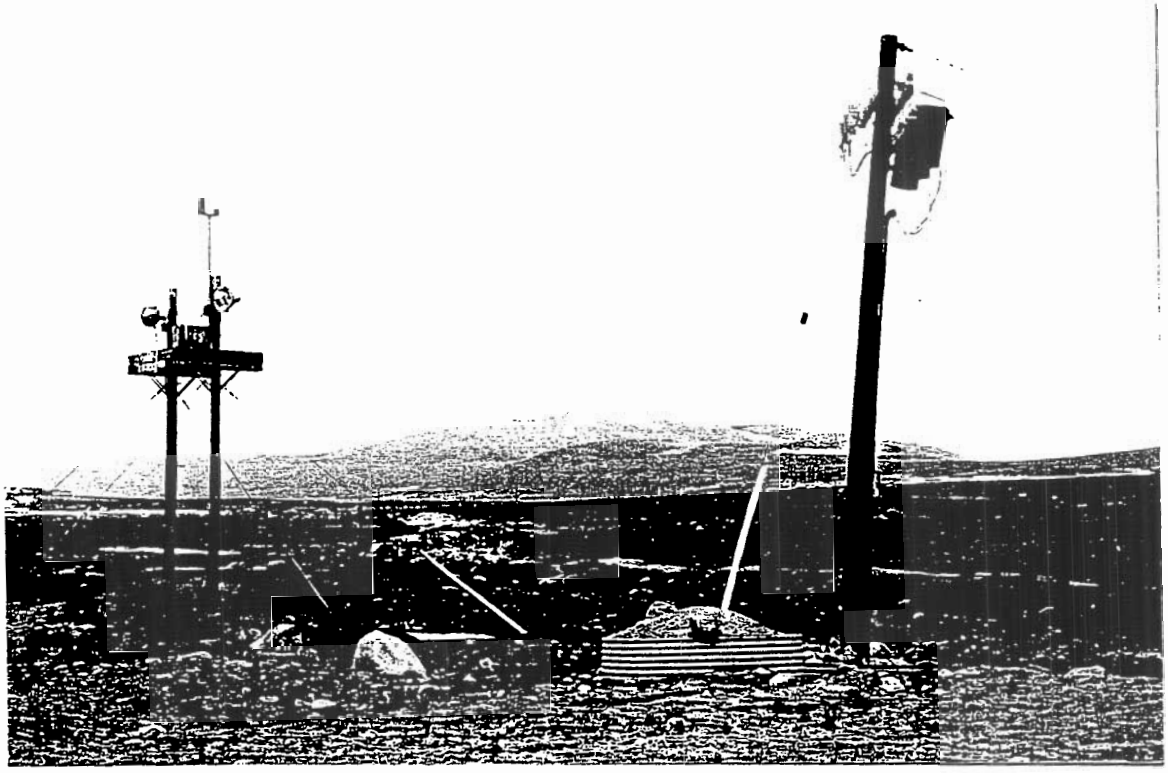


7. View of main landfill showing erosion and slope. Davis Strait in the background.

8. View of main landfill showing flowing erosion channel and exposed debris.

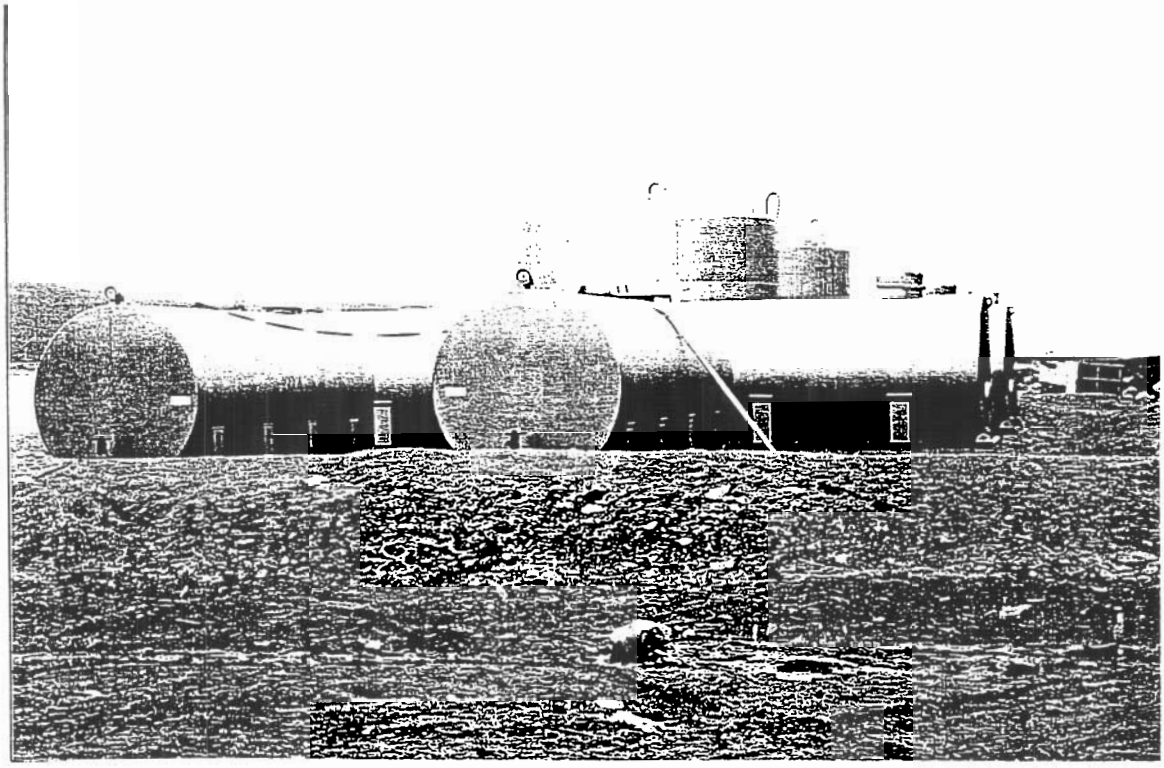


9. View of lower site vehicle storage, currently is use by the Hamlet.

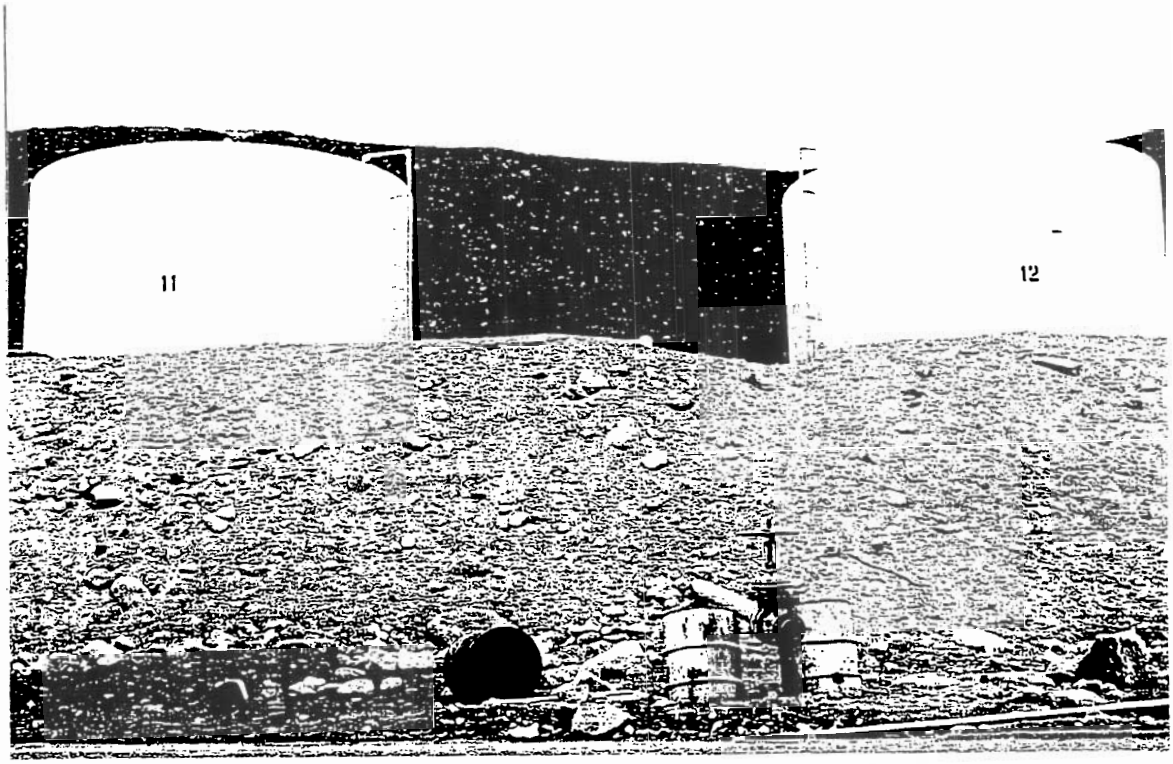


10. Pole-mount transformer and deacon tower located on airstrip apron.

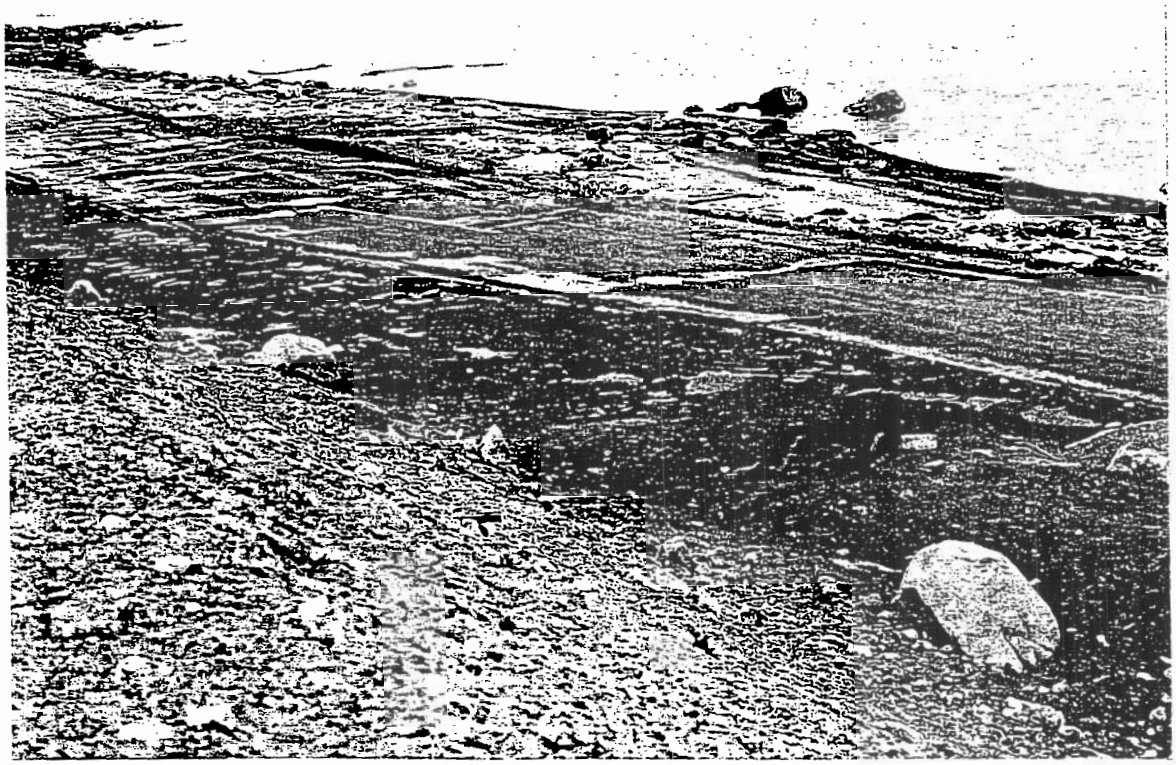
11. View of beach landfill.



12. Beach POL storage area



13. Beach POL Storage. Note that contamination is observable at the toe of the berm.



14. Contamination at toe of the berm and proximity to Broughton Channel

15. View of Old camp located near the current Hamlet landfill.

16. View of power line and poles to be dismantled

Appendix B: Figures

Appendix C: Landfill Risk Evaluation Matrix

PROPOSED ENVIRONMENTAL RISK EVALUATION MATRIX FOR LANDFILLS IN THE NUNAVUT REGION			
A.	CONTAMINANT SOURCE		Maximum Score
A.1	LANDFILL EXTENT		
	>10,000 m2	10	
	For areas less than 10,000 = Area of Landfill X 10 / 10 000	2-9	
	Minimum Score	1	10
A.2	ESTIMATED DEPTH OF LANDFILL		
	greater than 1.5 m	5	
	less than 1.5 m	2-4	5
A.3	PRESENCE OF LEACHATE		
	Evidence of Leachate	10	
	No Evidence of Leachate	0	10
A.4	PRESENCE OF SURFACE CONTAMINATED SOIL		
	> DCC Tier II Stains	15	
	> DCC Tier I < DCC Tier II. Stains	10	
	Contaminated suspected, no surface contamination noted	5	15
A.5	PRESENCE OF SURFACE DEBRIS AT LANDFILL		
	>50% of surface area	10	
	<50% of surface area, pro-rated	1-9	
	No debris observed	0	10
	SPECIAL CONSIDERATIONS		
		+/- 5	
	TOTAL SCORE - CONTAMINANT SOURCE		*50*

PROPOSED ENVIRONMENTAL RISK EVALUATION MATRIX FOR LANDFILLS IN THE NUNAVUT REGION			
B.	**PATHWAY/TRANSPORT MECHANISMS**		**Maximum Score**
B.1	AERIAL TRANSPORT OF CONTAMINANTS		
	All Landfills Scored as 2 If Surface Soil Contamination (A.4) or leachate (A.3) has been identified		2
B.2	WATER MOVEMENT		
B.2.1	TOPOGRAPHY		
	Steeply Slope (>40 % Grade)	12	
	Sloping (10% to 40% Grade)	4-11	
	Subdued to 10% Slope	2-3	
	Flat (< 3%)	1	12
B.2.2	COVER MATERIALS -DEPTH		
	No to little existing cover	4	
	Greater than 50% exposed/surface debris	3	
	Occasional exposed/surface debris	2	
	Existing cover, minimal debris,	1	
	Cover thickness > average active layer thickness	0	4
B.2.3	COVER MATERIAL - TYPE		
	No cover	5	
	Silty/Sandy Material	4	
	Sandy/Gravel Material	3	
	Gravel Material	1-2	5
B.2.4	SURFACE WATER/RUN-OFF POTENTIAL		
	Very High - evidence of erosion, continuing run-off, or wave action	12	
	High - evidence of erosion, seasonal, widespread, storm waves	10	
	Moderate - % area affected by erosion	3-9	
	Low - no evidence of erosion, slight slopes	1-2	12
B.2.5	PRECIPITATION		
	> 500 mm annual precipitation	5	
	< 500 mm annual precipitation (pro-rated)	1-4	5
B.2.6	DISTANCE TO DOWNGRADIENT PERENNIAL SURFACE/L SEASONAL DRAINAGE CHANNEL		
	0 to 100 m	10	
	100 to 300 m	7-9	
	300 to 1 km	2-6	
	greater than 1 km	1	10
	SPECIAL CONSIDERATIONS		
		+/- 5	
	TOTAL SCORE - PATHWAYS		***50***

PROPOSED ENVIRONMENTAL RISK EVALUATION MATRIX
FOR LANDFILLS IN THE NUNAVUT REGION

C.	RECEPTORS				Maximum Score
C.1	POTENTIAL IMPACT ON RECEIVING FRESHWATER/MARINE HABITAT				
C.1.1	PROXIMITY TO RECEIVING FRESHWATER/MARINE HABITAT				
	0 to 100 m			6	
	100 to 300 m			4-5	
	300 to 1 km			2-3	
	greater than 1 km			1	6
C.1.2	ESTIMATED HABITAT USAGE - FRESHWATER/MARINE				
	High; High Biodiversity/ High Occurrence/Calving or Spawning Area			5-6	
	Moderate; Moderate Biodiversity, Migratory			3-4	
	Low; Low biodiversity; rare sightings			1-2	6
C.2	POTENTIAL IMPACT ON RECEIVING TERRESTRIAL HABITAT				
C.2.1	Extent of Vegetation				
	Extensive vegetation growth, (80 to 100 % ground cover)			6	
	Moderate vegetation growth (40 to 80% ground cover)			4-5	
	Low vegetation growth (20 to 40% ground cover)			2-3	
	Sparse vegetation (<20% ground cover)			1	6
C.2.2	ESTIMATED HABITAT USAGE - TERRESTRIAL/AVIFAUNA				
	High; High Biodiversity/ High Occurrence/Calving, Denning or Nesting Area			5-6	
	Moderate; Moderate Biodiversity, Migratory			3-4	
	Low; Low biodiversity; rare sightings			1-2	6
C.3	POTENTIAL HUMAN EXPOSURE THROUGH LAND USE				
C.3.1	Presence/Occupation	*likehood of contact*			
	Duration of contact	high	moderate	low	
	High - Numerous visits, summer camp	8	6	4	
	Moderate - occasional summer camp	6	4	2	8
	Low - Infrequent visits or winter camp	4	2	1	
C.3.2	Proximity to Drinking Water Source				
	0 to 100 m			8	
	100 to 300 m			5-7	
	300 to 1 km			2-4	
	greater than 1 km			1	8
C.3.3	Food Consumption				
	High quantity of sedentary organisms - marine & plant life			8	
	Moderate quantity of sedentary organisms - marine & plant life			6	
	Low quantity of sedentary organisms - marine & plant life			4	
	No consumption			0	8
	High quantity of migratory organisms			2	
	Moderate quantity of migratory organisms			1	
	Low quantity of migratory organisms			0.5	
	No consumption			0	2
	SPECIAL CONSIDERATIONS				
				+/-5	
	TOTAL SCORE - RECEPTORS				*50*
	TOTAL SCORE				150