

**Preliminary Environmental Investigation
Howards Pass**

prepared for:
**Arctic Environmental Strategy
Indian and Northern Affairs Canada**

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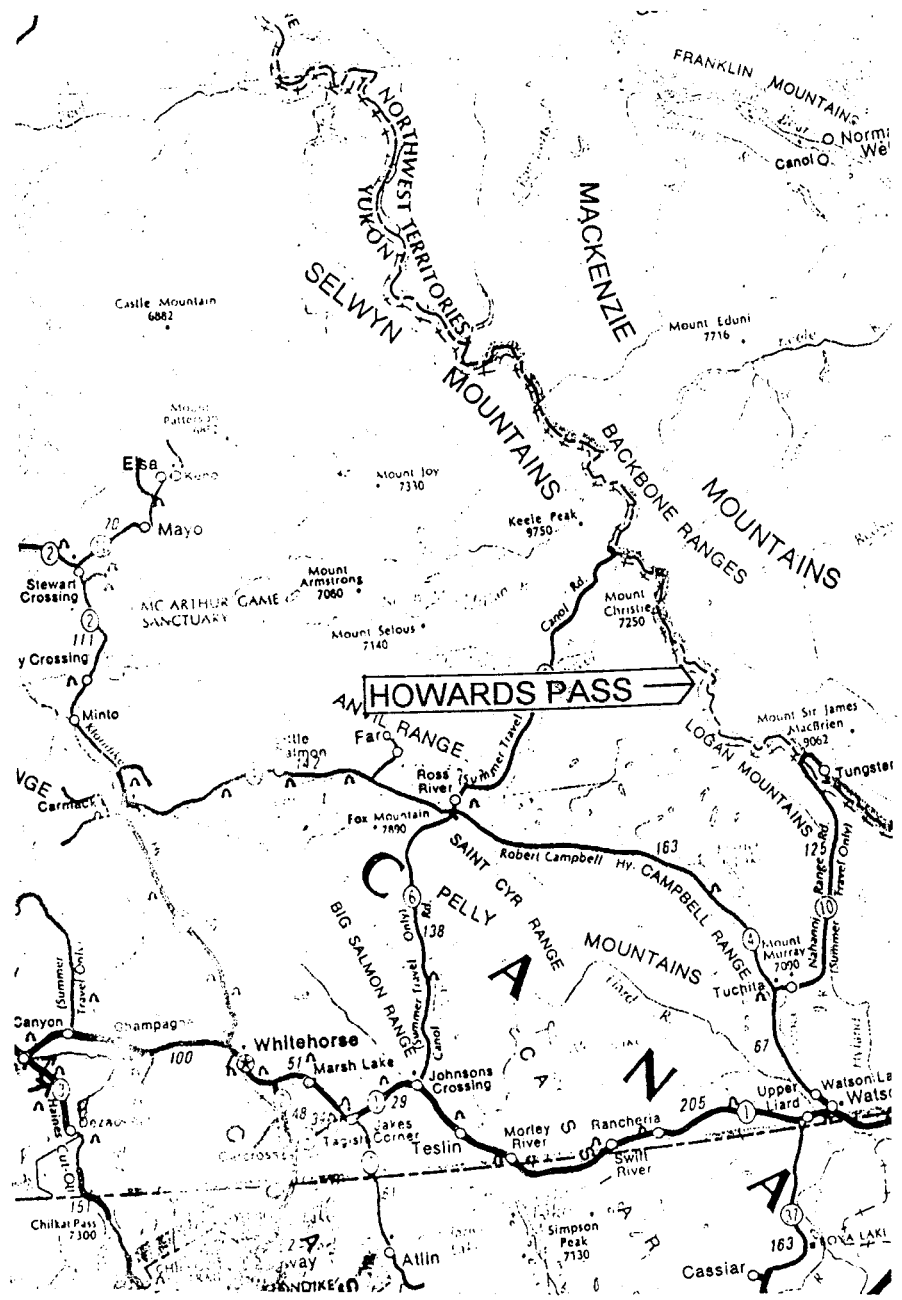


Figure One - Location of Howards Pass

Introduction

This report is a preliminary investigation into environmental conditions at Howards Pass. It includes a listing of available archival material, interviews of individuals who have been or who have knowledge of the area and a recommended course for future action.

Background

This Background section is a summary of reference material (see Appendix A), interviews and research (see Appendix B) and Mining Recorder Information (see Appendix C).

Howards Pass refers to a region composed of three main areas: a main camp (Lat. 62°28'10"N, Long. 129°12'42"W); an airstrip (Lat. 62°34'N, Long. 129°35'W); and Summit Lake (Lat. 62°20'N, Long. 129°20'W). Howards Pass is located in both the Yukon and Northwest Territories. Most of Howards Pass is in the Yukon. The main deposit zones in Howards Pass are named Anniv, OP, XY and Clea.

Placer Development (which became Placer Dome in 1987) carried out extensive exploration in the Howards Pass area throughout the 1970's and early 1980's. The Summit Lake region was used as a staging area before the airstrip was built. A main camp at this airstrip became the central point of activity and the Summit Lake site was abandoned. The airstrip has since been rendered inoperable.

There was road access to the main camp at Howards Pass through the NWT from the Tungsten Road. The access road is now impassable due to bridge removal and landslides. The NWT government would have required land use permits for any road sections built in the NWT.

There are open claims in the Howards Pass area held by Archer Cathro & Associates, Placer Dome Canada Limited and Cygnus Mines Limited (see Appendix C). Placer Dome has not conducted physical exploration in Howards Pass since the early 1980's. Placer Dome performed some cleanup work during 1991 but no report is available from them. According to the Placer Dome corporate communications department a cleanup of an unspecified nature is scheduled for 1997; no details on extent, type or exact location of the proposed cleanup were provided.

In Howards Pass there was extensive trenching, drilling and installation of an underground adit. In the summer of 1995 a number of people observed surface waste and abandoned buildings at unknown locations in Howards Pass. It is also known that trenches and reserve material from an underground adit remain exposed.

Due to the interjurisdictional nature of Howards Pass the corresponding paperwork (claim records, hydrometric studies etc.) is located in various locations: Yellowknife, Fort Simpson, Whitehorse, Watson Lake. There are no aerial photographs available of the area at the Federal Government Forestry office.

Reasons for Concern

There are four main reasons why the environmental conditions at Howards Pass are of concern.

- 1. There is contradictory evidence pertaining to the extent of the 1991 cleanup.** Some individuals observed surface debris and abandoned buildings at unknown locations at Howards Pass in 1995.
- 2. Disposal of hazardous and commercial waste associated with camp and mining operations may have caused unreported contamination.** During the peak of activity at Howards Pass hundreds of drums of diesel and jet fuel were on-site daily. One individual observed drums floating on Summit Lake in 1995.
- 3. Due to the mineralogy of the area the underground adit, the trenches and the reserve pile may be a potential source of acid generation.** This is due to the geological presence of sulphide ore bodies in the area. The deposit in Howards Pass hosts fine grained pyrites, sphalerite and galena which are sulfide bearing rocks. Sulphides are present throughout the area and may have been left exposed by exploration.
- 4. Important wildlife and fisheries resources in the area may be impacted.** Howards Pass drains into two main watersheds: the Pelly River in the Yukon Territory and the South Nahanni River in the Northwest Territories. Contamination could adversely affect the fisheries of these watersheds. Moose, caribou, grizzly bears and wolves are found in this area.

Recommended Action

- 1. An on site reconnaissance be conducted.** CCSG Associates recommends that a site reconnaissance of Howards Pass be conducted in order to reliably assess the nature of this site. Due to the size of Howards Pass, it is recommended that at the very least, the main camp, the airstrip and Summit Lake be investigated. Due to the snowfall experienced in the region this reconnaissance will have to occur in mid to late summer. This will allow for small-scale soil and water testing and for a visual examination of the physical status of the area.
- 2. Clarify Placer Dome's work plans.** Placer Dome should be contacted and the plan for their 1997 clean-up operations for the area clarified. It may be beneficial for governmental stakeholders to work in conjunction with Placer Dome.
- 3. Initiate communications with stakeholders.** Various governments and departments are involved: Federal Government, Yukon Territorial Government, Northwest Territories Government, Ross River First Nation, Fort Liard First Nation and Watson Lake First Nation. Because of the wide jurisdictional nature of the site communication channels must be established between all stakeholders.

APPENDIX A - REFERENCE MATERIAL

Reports

The following publications and materials refer to Howards Pass:

Archibald, P.L. and B.E. Burns. January 1981. *A Baseline Survey of the Water Quality and Biological Conditions in the Streams of the Howards Pass Area, Yukon Territory*. Environment Canada, Environmental Protection Service, Yukon Branch, Pacific Region, Manuscript Report 81-13. Available from Environmental Protection, Environment Canada, Whitehorse, Yukon. A copy of this manuscript is included in the AES file.

This study was conducted in July 1980 as a "pre-development survey of water quality and biological conditions in the streams of Howards Pass." It provides a brief history of the Howards Pass area up to 1980 including a map of the ANNIV, OP and XY deposit areas. This study indicated high cadmium concentration in water and high zinc concentration in sediment. It was found that the benthic macroinvertebrates and fish sampling results were representative of generally clear, unpolluted mountain streams.

Farnell, Richard. 1981. *Moose Caribou Investigations in the Macmillan/Howards Pass Development Area*. Yukon Department of Renewable Resources, Whitehorse, Yukon. Available from the Yukon Renewable Resources library: YWRR: WM 644. A copy of this manuscript is included in the AES file.

This 1981 study was initiated because the level of mineral exploration and development in the MacMillan Pass/Howards Pass area at the time had the potential to impact upon wildlife populations. The above interim report presents the results of the first half of a two part inventory based on aerial surveys and radio-collaring. The post-rut (October-November) and late winter (March-April) distribution of moose and caribou are documented. Population status, general movement trends and seasonal habitat selection are indicated.

Moose were found in high densities at the headwaters of major water systems in the study area with the exception of upper reaches of the west fork of the North MacMillan River where heavy exploration had been occurring. Moose were also found in high densities at or near treelines, in burn areas, in the Itsi Lakes area in July and in flood plain areas in March.

Caribou in this area occupied most alpine regions in the summer (June-September). High concentrations of caribou generally occurred along the continental divide of the Mackenzie Mountains. Caribou did occupy the Howards Pass area during the summer. They appeared to be absent from the immediate MacMillan Pass/Howards Pass areas during post-rut.

Wolf sightings and wolf track observations as well as incidental grizzly sightings are noted.

Environcon. 1976. *Environmental Overview, Howards Pass Access Road*. Prepared for Camex Placer Ltd. by Environcon Ltd. Available from the Yukon Archives: YWA: 333.7821 Env

This report was done to comply with the environmental requirements of the Department of Indian and Northern Affairs and the Northwest Territorial Government. It is an overview impact assessment of the proposed routes from Tungsten, N.W.T. to the Howards Pass mine site. The report evaluates proposed access routes and identifies major resource concerns associated with each. It presents recommendations for minimizing environmental disturbances.

Topographic Maps

Little Nahanni River	105-I (1:250 000)
Placer Creek	105-I/6 (1:50 000)
Title Unknown	105-I/12 (1:50 000)

Active Claims

The mining recorder list of claims is available from Watson Lake DIAND. A recent listing is in Appendix C.

APPENDIX B - INTERVIEWS AND RESEARCH

The following questions were used in the majority of interviews. Questions for companies and government departments were based on the extent of each organization's involvement.

Background

1. During what years were you in (and out) of this area?
2. What were you doing there?
3. Who did you work for?
4. What are the names of individuals whom you worked for or with whom you worked and how can they be contacted?
5. What are the names of other individuals who also worked in the area and who might be good contacts?

Activity

1. Which locations in the area were explored and/or impacted?
2. How many companies/people were active in the area?
3. What types of disturbance did you observe?

Contaminants

1. Did you see or are you aware of the presence of any fuels and/or dangerous goods in the area?
2. How much of the above was brought into the area and over what time period?
3. Any spills, accidents?
4. Any unusual or suspicious activities, events?

Personal Opinion

1. At the time of your involvement in the area, did anything disturb you personally or strike you as particularly destructive, dangerous etc.?
2. Base on what you know of the area, what state was it left in and do you think it requires environmental investigation?

Interviews were conducted with people and organizations which had some connection to Howards Pass. The following information is organized chronologically by date and is summarized not transcribed.

Yukon Conservation Society

Tel: (403) 668-5678

Contact: Bob van Dijken

Date: September 13, 1996

Mr. van Dijken was not very familiar with the history of Howards Pass. He suggested talking to Jesse Duke and Ken Galambos who were former employees of Placer Dome.

DIAND - Whitehorse

Mining Recorder

Tel: (403) 667-3190

Date: September 16, 1996

The mining recorder maps indicate open claims throughout the Howards Pass area in the vicinity of the main

camp (NTS map 105 I/06, Lat. 62 28, Long. 129 12)) and the airport site (NTS map 105 I/12, Lat. 62 34, Long. 129 35). Summit Lake (NTS map 105 I/06, Lat. 62 20, Long. 129 20) does not have any open claims.

Ken Galambos
Tel: (403) 633-6729

Date: September 16, 1996

Mr. Galambos worked as a geologist in Macmillan Pass for the Hudson's Bay Company in the early 1980's. MacMillan Pass is approximately 100 kilometres north of Howards Pass. Mr. Galambos knew little of Howards Pass except that it was a huge low grade deposit. He suggested speaking to Jesse Duke and Robert Stroshein from Mineral Resources Joint Venture. Jesse Duke was formerly a manager for Placer Dome.

Geoscience, Whitehorse
Tel: (403) 667-8513

Contact: Charlie Roots

Date: September 16, 1996

Mr. Roots knew little about the Howards Pass area but suggested Steve Gordey of the Geological Survey in Vancouver and Grant Abbott of the Geoscience office in Whitehorse.

Geological Survey, Vancouver
Tel: (604) 666-2116

Contact: Steve Gordey

Date: September 16, 1996

Steve Gordey worked for Geological Survey mapping in Howards Pass from 1977 to 1980 and again in 1982. Mr. Gordey said Placer Development had an early camp on Summit Lake where drums might have been left as waste. It was his impression that this camp was not used after the airstrip was built and a main camp set up. At the main camp there were several drills in operation, a helicopter, several buildings, a camp size of 40 to 50 people and a cat. There was extensive trenching, underground testing and exploration. Mr. Gordey had not seen the waste dump. Mr. Gordey said there was a large deposit at Howards Pass and that material was stockpiled. However the deposit was low grade and not economical to pursue as a full scale project. He stated that there had been no work done in the area since the mid 1980's.

Mr. Gordey suggested talking to the aviation company BC-Yukon Air in Watson Lake since they used to supply Placer Dome. Mr. Gordey spoke of Placer Dome's Anniv deposit which was 45 kilometres northwest of the main camp and crossed over the NWT border. He suggested speaking to the Yellowknife DIAND office. John Witham from Trans North Air in Ross River was suggested as an excellent source for history of the area.

DIAND
Tel: (403) 667-3866

Contact: Len Mychasiw

Date: September 16, 1996

Mr. Mychasiw went into the region known as Howards Pass once in 1974. He was working for Fish and Wildlife at the time and had been called in to deal with a grizzly bear that was bothering a camp because of a poorly managed landfill site. He did see fuel drums on site. There was a high level of activity in this area in the mid-1970's and a number of companies were involved. A landing strip was built at the time. Howards Pass refers to a locality. Most of the camps were transient camps that were in place for a few weeks. However there was one main area of activity. Helicopters were used to sling supplies to numerous points away from the base camp. Mr. Mychasiw doesn't know if any dangerous goods were brought into the area.

The companies that provided air charter service to the area should be contacted for information. These include BC-Yukon Air which no longer exists. Jim Close and Stan Bridcut are former BC-Yukon Air pilots who now fly for Watson Lake Flying Services. Geological reports filed by the mineral claim holders could also be looked at.

Watson Lake Flying Services
Tel: (403) 536-2231

Contact: Jim Close

Date: September 17, 1996

Mr. Close owns half of Watson Lake Flying Services. Stan Bridcut owns the other half. Mr. Close has been in the flying business for 36 years. Mr. Close worked as a contractor for Placer Development. He flew fixed wing aircraft only into Howards Pass, landing on the airstrip. He thought that the company was based in Howards Pass and would fly their crews to other points for day trips. He primarily flew in groceries but would also carry extra fuel in the aircraft tanks and unload it into fuel tanks in the camp. Mr. Close flew in and out of Howards Pass for four to six years, 20 years ago. He doubted there would be any problems at the site because Placer Dome was very environmentally-minded. He suggested Max Sanderson as an information source. Mr. Sanderson was the company pilot for Placer Development at Howards Pass. Mr. Sanderson would have been one of the last people at the site.

Placer Dome Canada Ltd., Regional Head Office, Vancouver
Tel: (604) 661-1991
Fax: (604) 661-3786

Contact: Lori

Date: September 17, 1996

Lori works in the corporate communications department at Placer Dome. The name Howards Pass did not sound familiar to her but she has only been there one year. She said that she would ask around.

**DIAND, Whitehorse
Federal Land Use
Tel: (403) 667-3173**

Contact: Mark Zrum

Date: September 17, 1996

Mr. Shrum had not heard of any reports on Howards Pass but he used to hunt there. Not much hunting happens in this area because it is close to the border and a hunter would need both Yukon and NWT hunting licenses if the animal crossed over. There might be some First Nation hunting in the area.

From what Mr. Shrum recalled the area looked clean. The access road from Flag Creek was inaccessible but might be driven with a 4-wheel drive or a quad. At least one of the three road bridges has been removed. As the access road was from the NWT he suspects any reports would be with either the NWT government or the Federal Offices in the NWT (probably the Mining Recorder offices in either Fort Simpson or Fort Liard).

**NWT Government
Renewable Resources
Environmental Protection Directorate
Tel: (403) 873-7654**

Contact: Ken Hall

Date: September 17, 1996

Ken Hall suggested Bernie Guatchien (correct spelling unknown) as a contact (403-695-2626).

**NWT Government, Fort Simpson
Renewable Resources
Tel: (402) 695-2626**

Contact: Kent Holverston

Date: September 18, 1996

Mr. Guatchien is no longer with the department. Mr. Holverston had been in Howards Pass in 1995. There were still many barrels and pieces of scrap metal around. There were also some buildings standing. Mr. Holverston remembered a Quonset hut that was full of scrap. He mentioned there were railway tracks near the mine portal. The road in was not very good but it might be passable by a quad or a 4-wheel drive vehicle. There were numerous washouts.

**DIAND, Yellowknife
Natural Resources and Environment
Environment and Conservation
Tel: (403) 920-8233**

Contact: This information was not provided.

Date: September 18, 1996

Some of the information this department has on Howards Pass might be confidential especially if it refers to a private company. The department will consider a request for information. They need the claim company name,

NTS references, latitude and longitude etc. and the request should be addressed to the attention of Annette McRobert, Land Administrator, DIAND. A faxed request for information was sent and a response was received on September 30, 1996.

**Ross River Resident
George Bob**

Date: September 18, 1996

Mr. Bob worked for Dynasty Exploration for 2.5 weeks one November in the 1970's staking in Howards Pass. In the 1970's there were camps all over the place. There had been a staking rush just before Mr. Bob's arrival. He does not know of any spills or accidents in Howards Pass but felt that the companies would have covered any up.

Mr. Bob was also in the area one month ago for personal reasons. At this time he saw old tent frames and a lot of metals at one site: old drilling rods, cans, drums, trucks. Mr. Bob saw drums by the lake and some drums floating in the lake. He could not tell if they contained liquids. Mr. Bob did not think that any of the debris was particularly destructive but that there was a lot of garbage left and it should be cleaned up.

Placer Dome Canada Ltd., Regional Head Office, Vancouver

**Tel: (604) 661-1911
Fax: (604) 661-3786**

Contact: Brenda Radies

Date: September 19, 1996

Ms. Radies returned the September 17, 1996 telephone call made to the Placer Dome corporate communications department. Placer Dome has scheduled a work cleanup in Howards Pass for 1997. Placer Dome still has interests in this area. Ms. Radies said that there were various safety measures on the airstrip. She also said that the operation in Howards Pass was funded as follows: 51% Placer Dome, 49% US Steel.

**Environment Canada, Whitehorse
Environmental Protection
Tel: (403) 667-3400**

Contact: George MacKenzie-Grieve

Date: September 19, 1996

Mr. MacKenzie-Grieve was not in but Environment Canada does have copies of a 1981 Howards Pass water baseline study available to the general public.

**Environment Canada, Whitehorse
Water Survey
Tel: (403) 668-2161**

Contact: Russ Gregory

Date: September 19, 1996

Mr. Gregory thought that the Fort Simpson Water Survey office had done some studies. He suggested Pat Wood at 403-695-2259. The closest Yukon hydrometric study is on Fortin Lake on the Pelly River.

**Environment Canada, Fort Simpson
Water Survey
Tel: (403) 695-2259**

Contact: Pat Wood

Date: September 19, 1996

A hydrometric study station was established at MacKenzie Creek on the access road about five miles before the mine. This station ran from the early 1980's to 1993. No water quality testing was done.

**Yukon Electrical Company Limited
Tel: (403) 633-7000**

Contact: Ron Gee

Date: September 19, 1996

Mr. Gee doesn't recall YECL doing any recent studies in Howards Pass. They might have done some studies a while ago but these would have been limited to hydrometric studies.

**DIAND, Whitehorse
Water Resources
Tel: (403) 667-3147**

Contact: Bill Slater

Date: September 19, 1996

Mr. Slater was not aware of any information pertaining to this area but he asked for company names and said that he would have a look. There should be some information on file since the companies probably needed a water license for the Yukon Territory.

**Julie Hunt
Tel: (403) 667-3829**

Date: September 19, 1996

Ms. Hunt worked as a geologist in MacMillan Pass in 1991. She believes Placer Dome has a policy of conducting a cleanup every ten years and recalls a cleanup was conducted in Howards Pass in 1991. She believes that this would have entailed burning old buildings and left over fuel, and burial of any waste on site.

**Robert Stroshein
Tel: (403) 668-2489**

Date: September 19, 1996

Mr. Stroshein worked as a geologist near Howards Pass but not directly in Howards Pass. He recalls three or four drills working in the area but indicated that he was not a good source of information for Howards Pass.

Geoscience, Whitehorse
Tel: (403) 667-8510

Contact: Grant Abbott

Date: September 20, 1996

Mr. Abbott worked as a geologist in Howards Pass for Geoscience in the early 1980's, 1989 and 1990. He stated that the camp was large and very active in the area in the early 1980's. In 1989 the camp was no longer in operation. He does not recall clearly but believes that most but not all of the buildings had been removed. There were a lot of drums left on site. There were piles of "adit muck" left on site but Mr. Abbot did not feel that these would pose a problem for acid generation because there was not a high pyrite content in the muck and it would be good to keep it visible as a reference point. There were a lot of drill roads, an underground adit, winter roads which may have fallen on claims and trenches. He was not familiar with Summit Lake except that it had been used as a staging area before the airstrip was built. He was not sure about the Anniv zone but suspected it was relatively clean. Mr. Abbott suggested the Minfile maps would show where the road went and whether it fell on claims.

Retired Pilot
Max Sanderson

Date: September 23, 1996

Mr. Sanderson worked as a pilot in Howards Pass for Placer Development for 11 consecutive years starting in 1971. He was stationed at a camp in Howards Pass and flew both helicopter and fixed wing aircraft. He was the first person in in the spring and the last person out in the fall. Mr. Sanderson said that Placer Development did all the work in this area. Mr. Sanderson said that there was access to the site by a winter road.

Mr. Sanderson said that there were three camps in the area. Howards Pass was about 3/4 mile long and 150 feet wide. Drilling actually took place in a 3 acre plot that was quite a small area. Howards Pass is in a rain shadow. It snows there every month of the year. In the summer there was mud everywhere and it was impossible to keep the tents clean. The soil at Howards Pass was alluvial topsoil. Clea is about 30 miles northwest of Howards Pass right at the headwaters of the Pelly where you could step across the stream. Clea was also quite small. All the drilling was done right in the cirque which was barren of vegetation. Anniv was almost equidistant between Howards Pass and Clea. The camps in Clea and Anniv were tent camps. The camp at Howards Pass had commercial trailers.

Each camp had a dump but only kitchen wastes were disposed of in the dumps. There was also a garbage dump south of MacMillan Pass on the road.

At one time there were several hundred drums of diesel and jet fuel on site. In order to avoid a buildup of empty fuel drums the grocery order was flown in once a week in an Otter; this way the Otter could take out 19 empty drums. Mr. Sandersons said that there were no dangerous goods brought into the area.

At one time a drum leaked on the NWT border. 21 environmentalists came to look at it. They all looked at the spill and said it would take years to normalize. However the next year Mr. Sanderson went back and there was not even a stain. There was also an incident of vandalism one winter. Some people from Tungsten on snow machines stole some things and drained a fuel storage tank. The fuel went into the creek and then into the Pelly River. Placer Development reported this. There was a court case or a hearing and in the end Placer Development was fined one dollar.

Placer Development did a big cleanup at the end of their eleven years at Howards Pass. They contracted Grant Stuart from Watson Lake to clean up the Howards Pass site. A Vancouver company (including or solely

somebody with the first name Peter) flew an hydraulic press into the Clea group of claims (south of MacMillan Pass) and squashed the gas drums that were there and flew them out. Mr. Sanderson thinks that the only thing left to do at this site is to heap up the tent frames and burn them. He believes that environmental investigation of this site is a waste of money. According to Mr. Sanderson the site was clean when it was operating and it is clean now. Placer Development was an environmentally responsible company.

Additional contacts might be John Koalchuk (correct spelling unknown) who was party chief at Clea for three years (Mr. Koalchuk was an employee of GSC) and Grant Stuart of Watson Lake.

DIAND, Land Administration
Yellowknife
Tel: (403) 669-2674

Contact: Gwenda Baizer, Land Operations Clerk

Date: September 30, 1996

Ms. Baizer faxed a response to the telephone/fax enquiry of September 18, 1996. They have old land use files from the early 1980's but nothing for a cleanup in 1991. Ms. Baizer contacted the Water Resources Division and found that they have no record of a water license being issued in the latter years of the operation for a cleanup. They only have copies of licenses issued during the late 1970's and early 1980's.

APPENDIX C - MINING RECORDER INFORMATION

Information Sheet faxed from the Mining Records Office at Indian and Northern Affairs Canada, dated September 27, 1996. The following is a list of claims and their registered owners in the Howards Pass area.

Claim Name	Claim Number	Grant Number	Expiry Date	Registered Owner	% Owned	
OP	17 - 20	Y 64731 - Y 54734	1997/01/02	Cygnus Mines Limited.	49	
	21 - 28	Y 64767 - Y 64774		Placer Dome Canada Limited	51	
	1 - 8	Y 64837 - Y 64844		Cygnus Mines Limited	49	
DON		Y 64845 - Y 64852	2002/01/02	Placer Dome Canada Limited	51	
				Cygnus Mines Limited	49	
OP	9 - 16	Y 64887 - Y 64894	1997/01/02	Placer Dome Canada Limited	51	
	29 - 32	Y 64903 - Y 64906		Cygnus Mines Limited	49	
DON	10 - 17	Y 64911 - Y 64918	2002/01/02	Placer Dome Canada Limited	51	
	29 - 34	Y 64929 - Y 64934		Cygnus Mines Limited.	49	
	21 - 28	Y 64953 - Y 64960		Placer Dome Canada Limited	51	
	101 - 106	Y 64966 - Y 64971		Cygnus Mines Limited.	49	
	109 - 114	Y 64974 - Y 64979		Placer Dome Canada Limited	51	
	115 - 116	Y 64980 - Y 64981		1997/01/02	Cygnus Mines Limited.	49
					Placer Dome Canada Limited	51
OP	41 - 54	Y 70230 - Y 70243		Cygnus Mines Limited.	49	
	101 - 166	Y 93875 - Y 93940		Placer Dome Canada Limited	51	
	167 - 175	Y 93943 - Y 93951		Cygnus Mines Limited.	49	
	208 - 223	Y 94482 - Y 94497		Placer Dome Canada Limited	51	
	200 - 202	Y 94598 - Y 94600		Cygnus Mines Limited.	49	
	203 - 207	YA00001 - YA00005		Placer Dome Canada Limited	51	
	224 - 225	YA00006 - YA00007		Cygnus Mines Limited.	49	
	236 - 247	YA00449 - YA00460		Placer Dome Canada Limited	51	
	230 - 235	YA00765 - YA00770		Cygnus Mines Limited.	49	
		YA20057 - YA20062	1997/05/25	Placer Dome Canada Limited	51	
				Cygnus Mines Limited.	49	
				Placer Dome Canada Limited	51	
	HP	1 - 20	YB46381 - YB46400	1997/02/21	Archer, Cathro & Associates (1981)	100
	21 - 31	YB47301 - YB47311		Archer, Cathro & Associates (1981)	100	
TOP	1 - 20	YB49311 - YB49330	1995/06/09	Archer, Cathro & Associates (1981)	100	
	21 - 26	YB49331 - YB49336	1994/06/09	Archer, Cathro & Associates (1981)	100	
	27 - 54	YB49337 - YB49364	1995/06/09	Archer, Cathro & Associates (1981)	100	