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Kivalliq Inuit Association
ᑎᑎᖅᑲᐅᓯᐊᖓ/P.O. Box 340, ᑲᖏᕿᓂᖅRankin Inlet, Nunavut X0C 0G0
ᐅᖄᓚᐅᑖ/Tel: (867) 645- 5725 ᓱᑲᔪᒃ/Fax: (867) 645-2348 Toll free: 1-800-220-6581

KVX11N01 /3-Mar-11

March 3, 2011

COPY

Grant Gilchrist
Environment Canada- NWRC
1125 Colonel By Dr.
Ottawa, ON
K1A 0H3

Dear Mr. Gilchrist:

Re: Application for Certificate of Exemption No. KVX11N01

Please consider this an acknowledgment of receipt of your application for a Land Use License dated March 3, 2011. All future correspondence on this application should be addressed to the Lands Administrator and should refer to the above file number.

Your application will be reviewed and, if approved, your license will be issued within a reasonable period of time.

Should you have any questions or concerns, you can contact our office at (867) 645-5734 or fax at 645-3855 or email: vtattuinee@kivalliqinuit.ca

Yours truly,

V. Tattuinee

Veronica Tattuinee
Lands Administrator

Enclosure

Veronica Tattuinee

From: Black,Amie [NCR] [Amie.Black@ec.gc.ca]
Sent: Thursday, March 03, 2011 1:09 PM
To: Veronica Tattuinee
Subject: Black/Gilchrist Land Use application for Certificate of Exemption 2011
Attachments: Black-Gilchrist KIA Land Use application 2011.pdf

Hello Veronica,

Attached is an application for a certificate of exemption for our shorebird studies at East Bay, Southampton Island. Please let me know if you need further information.

Have a great day,
Amie
<<Black-Gilchrist KIA Land Use application 2011.pdf>>

11. QUANTITY OF WATER INVOLVED

Please include the quantity of water will use during the Land Use activity

Quantity of water to be used: 3 m3/year

Quantity of water to be used: m3/year

Comments:

12. WASTE

Describe the type of waste produced by the activity

- [ ] Bulk Items/Scrap metals
- [x] Grey Water
- [ ] Hazardous
- [x] Sewage
- [ ] Sludge
- [ ] Solid waste
- [ ] Waste Oil
- [ ] Other/Specify

13. LAND USE PERMIT

Select Land Use Permit Issued

[ ] DIANDs	If not, date expected	
[x] Kivalliq Inuit Association	If not, date expected	May 2011
[ ] Commissioner	If not, date expected	
[ ] Department of Environment	If not, date expected	

14. IMPACT

Predicted environmental impacts of undertaking and proposed mitigation measures (direct, cumulative impacts)

We do not anticipate to impact the environment significantly due to the small number of people and the low-impact activities carried out on the land .
We use small amounts of gas to run a generator, snowmobile, and an ATV, and use kerosene for cooking. A fuel spill would be detrimental to wildlife and water resources in the area. We have a spill contingency plan (attached) in the event of a spill.

Proposed Time Schedule

- [x] Same as the Land Use
- [ ] Check for **Annual Work**, specify the days of operation (leave unchecked for multi- year

Start day _____ Completation day _____

15. On a separate page, provide a NON-TECHNICAL project summary. This should include a non-technical description of the project proposal, no more than 300 words, in English and Inuktitut (Inuinaktun, in the West Kitikmeot). The project description should outline the project activities and their necessity, method of transportation, any structures that will be erected, expected duration of activity and alternatives considered. If the proposed activity fits into any long-term developments, please describe the projected outcome of the development for the area and its timeline.

16. **Attach a detailed project description as outlined in APPENDIX A.**

17. **Land Use Application Fees:**

- ☐ Land Use License I
  - ☐ Inuit $0.00
  - ☐ Non-Inuit $100.00
- ☐ Land Use License II $250.00
- ☐ Land Use License III $500.00
- ☐ Residential/Recreational Lease
  - ☐ Inuit $0.00
  - ☐ Non-Inuit $250.00
- ☐ Quarry Permit $2000.00 plus Legal fee
- ☐ Commercial Lease I $1000.00
- ☐ Commercial Lease II $2500.00
- ☐ Commercial Lease III $5000.00
- ☐ Production Lease $5000.00
- ☐ Right of Way Agreement $500.00
- ☒ Exemption Certificate $0.00
- ☐ Marble Island Tourism $10.00
  - ☐ Inuit $0.00
  - ☐ Non-Inuit $10.00 per person

Land Use Fee # of Hectar used ☐ $50.00/Hecatare = ☐

Note: The land use fee is for the amount of land used on an annual basis.

18. Water Application Fees:

Water License Application type:

☐ For Land Use License Class I the
corresponding Water Application fee is **$50.00** per year
plus $ 1 for Water use charge,
Volumetric fee, Total **$51** every year

☐ For Land Use License Class II the
corresponding Water Application fee is **$250.00** per year
plus $ 1 for Water use charge,
Volumetric fee, **Total $251** every year

☐ For Land Use License Class III the
corresponding Water Application fee is **$500.00** every 2 years
and $26.35/1000 cubic meters for Water use charge

19.

a) The applicant request a Certificate of Exemption ☒

or

b) The Applicant agrees to be bound by terms and conditions to be attached to the Inuit Owned Land User License or Lease ☐

Sign name in full: Amie Black 3 March 2011

Full Name Date

Amie Black

Signature

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ᐆᒪᔪᓕᕆᓂᕐᒧᑦ ᕿᑐᕐᖏᐅᕐᓂᕆᕙᒃᑕᖏᑕ ᑎᖕᒥᐊᑦ ᓱᓪᓴᒦᕐᐸᒃᑐᑦ ᓂᕐᓕᕐᓇᖅᑑᕐᒥ,
ᓴᓪᓕᖅ, ᓄᓇᕗᑦ

ᑎᖕᒥᐊᑦ ᓱᓪᓴᒦᕐᐸᒃᑐᑦ ᐅᓄᙱᓂᖅᓴᐅᕙᓪᓕᐊᓕᖅᑐᑦ ᑲᓇᑕᒥ, ᐊᒥᐊᓕᑲᒥᐅᑦ ᓄᓇᖓᓂ. ᒫᓯᑯᒥᐅᓪᓗ ᓄᓇᖓᓂ, ᕿᓯᐊᓂ ᖃᐅᔨᒪᙱᑦᑐᒍᑦ ᖃᓄᐃᒻᒪᑦ ᑕᐃᒪᐃᒻᒪᖔᑦ. ᑖᓐᓇ ᐱᓕᕆᐊᒃᓴᖅ ᐃᑲᔪᖅᐸᓪᓕᕈᑎᒋᓂᐊᖅᑕᕗᑦ ᑐᑭᓯᐊᓂᕐᒧᑦ ᑭᓱᑦ ᐱᔾᔪᑕᐅᖕᒪᖔᑕ ᑎᖕᒥᐊᑦ ᓱᓪᓴᒦᕐᐸᒃᑐᑦ ᐅᓄᙱᓂᖅᓴᐅᕙᓪᓕᐊᓂᖓᓄᑦ, ᓄᑐᓇᐃᖅᓯᓂᕐᒧᓪᓗ ᐃᑲᔪᕈᑎᒋᓂᐊᖅᑐᑎᒍᑦ ᐅᓄᙱᓂᖅᓴᐅᓂᖏᑦ ᐱᔾᔪᑎᖃᕐᒪᖔᑕ ᐅᑭᐅᖅᑕᖅᑐᒥ ᐃᕙᕐᕕᒋᕙᒃᑕᖏᑦ ᐊᓯᔾᔨᖅᐸᓪᓕᐊᓂᖏᓄᑦ.

ᐊᕐᕋᒎᓚᐅᖅᑐᓂ, ᑲᓇᑕᒥ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᐋᖅᑭᒃᓯᓯᒪᖕᒪᑕ ᐱᓕᕆᐊᒃᓴᕐᒥᒃ ᓇᐅᑦᑎᖅᓱᖅᑕᐅᓂᖏᓐᓄᑦ ᐅᑭᐅᖅᑕᖅᑐᒥ ᑎᖕᒥᐊᑦ ᓱᓪᓴᒦᕐᐸᒃᑐᑦ, ᐃᒥᖅᑯᑕᐃᓚᐃᑦ, ᐃᖅᑭᓪᓗᒋᐊᕐᔪᐊᓗ ᓂᕐᓕᕐᓇᖅᑑᕐᒥ, ᓴᓪᓕᖅ, ᓄᓇᕗᒻᒥ. 4-5 ᐃᓄᐃᑦ ᓇᐅᑦᑎᖅᓱᖅᐸᒃᐳᑦ ᑎᖕᒥᐊᕐᓂᒃ ᓱᓪᓴᒦᕐᐸᒃᑐᓂᒃ ᐊᕐᕋᒍᑕᒫᑦ ᑎᑎᖅᑲᒃᐸᒃᓗᑎᒃ ᐃᕙᕐᕕᑦ ᖃᔅᓯᐅᓂᖏᓂᒃ ᖃᖓᓗ ᒪᓐᓂᖅᑲᓕᐊᒃᓴᖏᓂᒃ. ᓇᓕᐊᒃᓗ ᑎᖕᒥᐊᑦ ᐊᑎᓚᐅᕐᓂᖏᓂᒃ ᐃᕙᔭᖅᑐᖅᓗᑎᒃ ᐊᕐᕋᒍᓂ. ᖃᐅᔨᓴᖅᑲᑦᑕᓚᐅᕐᒥᔪᑦ ᖃᓄᐃᓕᐅᖅᑲᑦᑕᕐᓂᖏᓂᒃ ᑎᖕᒥᐊᑦ ᑎᓪᓴᒦᕐᐸᒃᑐᑦ ᕿᑐᕐᖏᐅᕐᓴᓯᓕᕐᒪᑕ.

ᒪᑭᒪᑎᑦᑎᔪᒧᑦ ᒥᑭᑦᑐᒥᒃ ᓄᓇᓕᖅᕿᓛᕐᒥᒃ, ᐊᒃᑐᐊᙳᕐᓂᖅᓴᐅᔾᔪᑕᐅᓗᓂ ᓄᓇᒥᒃ. ᓄᓇᓕᖅᕿᓛᖅ ᐱᖓᓱᓂᒃ ᑐᐱᑯᑖᓕᒃ (ᑕᐃᑲᓂ ᐃᓚᕗᒃᓗᑎᒃ ᓂᕆᕗᒃᓗᑎᓪᓗ, ᖃᐅᔨᓴᖅᐸᒃᓗᑕ, ᓴᓇᕐᕈᑎᓂᓪᓗ ᑐᖅᑯᐃᕗᒃᓗᑎᒃ) ᒥᑭᑦᑐᒥᓪᓗ ᐃᓪᓗᕐᑖᖅᑕᖅᑲᓗᓂ. ᓴᓇᔭᕌᖓᑦ ᐱᓯᒐᔪᖕᓂᖅᓴᐅᔫᒐᓗᐊᑦ, ᕿᓯᐊᓂ ᑎᓴᒪᓕᒃᑯᑦ ᐃᖕᒋᕐᕙᕙᒃᑐᑦ ᐱᕐᑯᑎᓂᒃ ᓇᒃᓴᓕᖕᖑᖕᒐᑕ ᒥᑦᑕᕐᕕᖕᒥᑦ ᒥᑦᑕᕐᕕᖕᒨᓪᓗ ᐅᖓᓯᖕᓂᖅᑲᖅᓗᓂ 1.5 ᑭᓈᒥᑕᓂᒃ ᓄᓇᓕᖅᕿᓛᕐᒥᑦ. ᑎᖕᒥᓯᕿᓛᒃᑰᖅᐸᒃᑐᑦ ᐃᖅᑲᓗᖕᓂᑦ ᐃᖅᑲᓗᖕᓄᓪᓗ. ᓴᓇᔪᑦ ᓄᓇᓕᖅᕿᓛᕐᒦᑉᐸᒃᑐᑦ ᔫᓐ ᐱᒋᐊᕐᓂᖓᓂᑦ ᔪᓚᐃᑉ ᓄᖕᒍᐊᓄᑦ.

Non-technical Project Description
Breeding Biology of the Shorebirds of East Bay,
Southampton Island, Nunavut

Shorebirds are declining throughout North America, but we do not know why. This project will help us better understand the causes of the declines in shorebird populations, and will help us to determine if these declines are due to changes on the northern breeding grounds.

In recent years, Environment Canada has developed a program to monitor arctic shorebirds, Arctic Terns, and Sabine's Gulls at East Bay, Southampton Island, Nunavut. A small crew of 4-5 people monitors the shorebird populations each year by tracking how many nests are laid and when they are laid, as well as which individuals return from the previous year to nest. They also conduct studies of shorebird mating behaviour.

We maintain a small camp, which minimizes the impact it has on the landscape. The camp consists of 3 longhouse tents (cooking and eating, laboratory work, equipment storage) and a small cabin. Work is conducted primarily on foot, but an ATV is also used to shuttle gear to and from an airstrip located 1.5km from the camp. A twin otter airplane is used to transport field crews to and from Iqaluit. The crew stays at the camp from the beginning of June until the end of July.

Appendix A
Detailed Project Description
Breeding Biology of the Shorebirds of East Bay, Southampton Island, Nunavut

1. Outline project activities, their necessity, their expected duration and alternatives considered. If the proposed activity fits into any long-term developments, describe the projected outcome of the development for the area and its timeline.

Our research goals are to provide information on the survival and reproductive ecology of shorebirds, Arctic Terns, and Sabine's Gulls in the northern Hudson Bay. We have been conducting research here for over 10 years because this site supports high numbers of these species. By continuing to monitor these species and initiate new research programs, we are able to document long-term trends in population dynamics and identify research needs.

2. Schedule of activities including both operations and shutdowns.

The crew arrives at East Bay during the last week of May. They remain in the camp until the last week of July. The camp also serves as a staging area and access point for field crews working on East Bay Island (Crown Land) during the same time period that the camp is used by the shorebird researchers (late May to Early/mid August).

3. Provide a preliminary plan showing the location of the lands proposed to be used and an estimate of their area in hectares. The preliminary plan should show the approximate location of all:

Please see attached map.

As these lands are located within the East Bay Migratory Bird Sanctuary, there is no development within the area. We only sporadically use the ATV and there is no set trail. The Twin Otters refuel at Coral Harbour so we don't have a fuel cache, although there is one at the East Strip, which is not used by our project. The airplanes either land on the camp ridge or at the West Strip. These are located on natural gravel ridges, so no air strips were constructed. Aside from some cairns, there are no archaeology sites, and almost everywhere is biologically relevant bird breeding habitat within our study block.

4. Provide a list of structures that will be erected.

3-4 canvas tents will be erected to serve as eating and cooking areas, laboratory, and gear storage. A small cabin exists out there for sleeping,

and we would like to erect another this summer to provide space for lab and office work. The cabin would be 12'x24', built on cobble, and painted a muted grey to blend in with the surrounding rock.

5. Equipment to be used, indicating type and number, size and ground pressure and proposed use. Include all drills, pumps, vehicles etc.

We use 1 Honda ATV and Bombardier skidoo to move gear from the campsite to the airstrip, located 1.5km away. Otherwise, no heavy equipment is used.

6. Fuels to be used, capacity of containers and number of litres. Include diesel, gasoline, aviation fuel, propane and other fuel types. Describe method of fuel transfer.

There is a minimal amount of propane used to run the Coleman Stove (4 x 20lb tanks). Propane tanks are hooked directly to the stove using a rubber hose. We use approximately 4-6 jerry cans of gasoline to run the ATV and snowmobile (5 gallon cans). Gasoline is poured into the ATV using a plastic spout designed for use with Jerry Cans.

7. Provide a copy of fuel spill contingency plan.

See attached document.

8. Proposed disposal methods for garbage, sewage, grey water, overburden (organic soil, waste material, tailings etc.), hazardous waste and other waste products. Describe the acid rock drainage potential of waste rock materiel and testing methods, if applicable. List the type, estimated quantities, and storage methods of any hazardous materials that are going to be stored on the property.

Combustible garbage is burned on site as needed in a SmartAsh incinerator, which reduces the garbage to a very small amount of ash. Garbage that can not be burned is transported out of the camp mid-season during a re-supply flight, as well as at the end of July. Grey water from cleaning dishes and clothes is poured into a sump and buried at the end of the season. No hazardous materials are used on site. Toilet facilities consist of a composting toilet.

9. Describe the methods of transportation.

The crew is flown in and out of the site using a Twin Otter airplane. The airplane lands on a raised gravel beach used as an airstrip, and gear is shuttled to the camp (1.5km from the airstrip) using an ATV or snowmobile. Most work activities are carried out on foot, except for the

occasional use of the ATV and snowmobile (less than 1 trip per week) to access sites far from camp.

10. Indicate the components of the environment that are near the project area, as applicable. Include the type of species, the important habitat area (calving, staging, denning, migratory pathways, spawning, nesting etc.), and the critical time periods (calving, post-calving, spawning, nesting, breeding etc.). Also, include information on eskers, communities, and historical/archaeological sites.

The work will be performed in the East Bay Migratory Bird Sanctuary. It is a breeding and nesting area for many migratory birds, including seabirds, shorebirds, ducks, and geese. The area is also used by arctic fox and grazing caribou, although it is not a calving ground for the caribou. There are a few cairns in the area, although they are not disturbed during the course of our research.

11. Summary of potential environmental, wildlife and resource impacts and mitigation measures to be used. Describe the effects of the proposed program on lands, water, flora and fauna.

Potential impacts on lands, flora, and fauna:
We keep a small amount of fuel (gas and kerosene) in camp. There is potential for a fuel spill. We keep our fuel in a flat area surrounded by a berm. There is an Emergency Spill Kit at the camp at all times, and the crew is aware of the Spill Contingency Plan prior to entering the field site.

We use sumps to discard grey water, which could leave unsightly holes in the ground. We cover our grey water sumps over at the end of the field season to match the contours of the landscape. All sumps are located high above the high water mark and far from flowing water to avoid tainting water bodies.

We use an ATV to transport crew and gear to and from the airstrip, which potentially damages flora and disturb fauna. We mitigate this by keeping our ATV use to a minimum, and walk almost everywhere.

12. Reclamation cost analysis for advanced exploration activities.

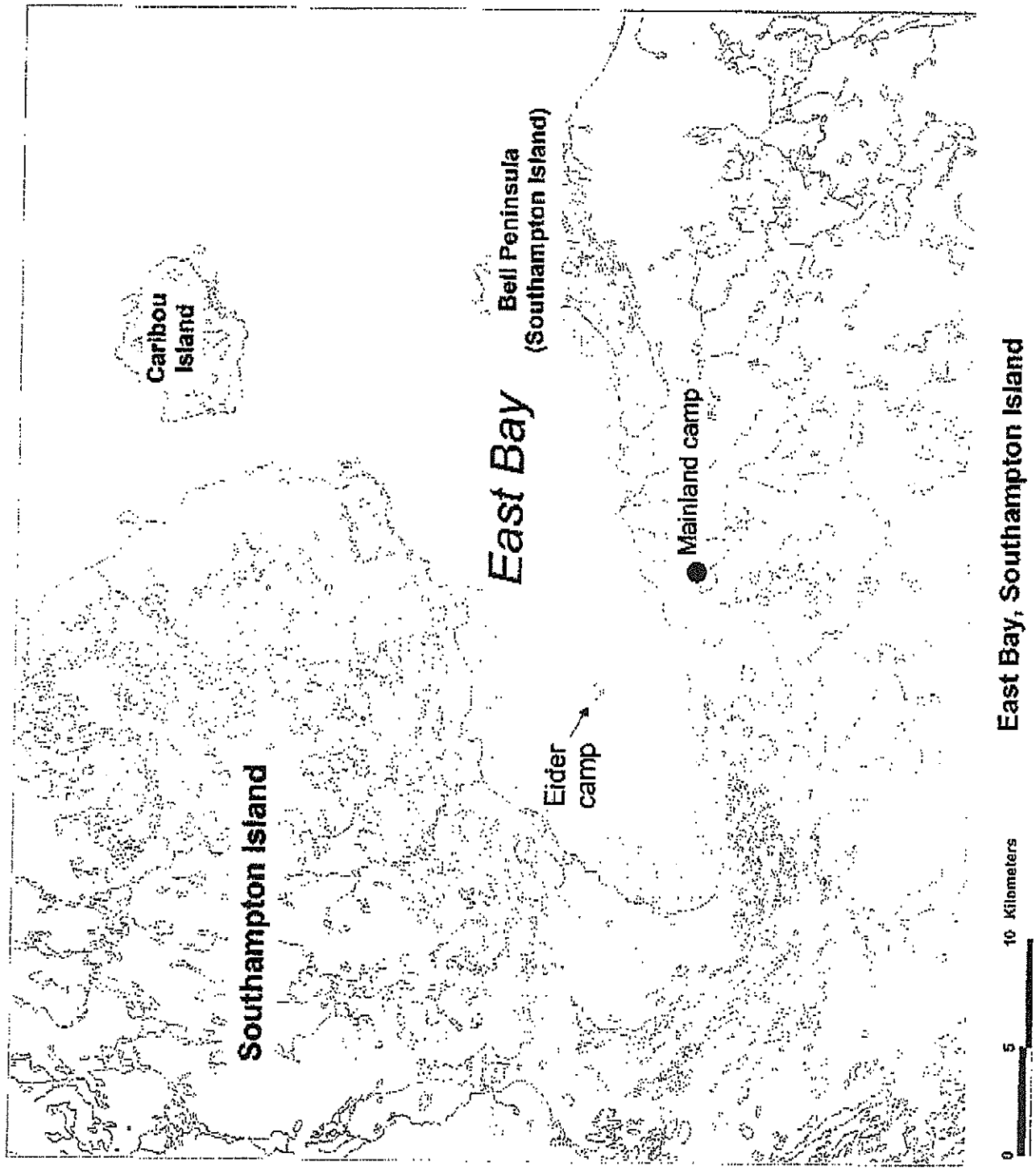
Not applicable

13. Proposed reclamation plan, that includes, but is not limited to the proposed methods and procedures for the progressive:

Not applicable

14. Indicate the number of Inuit to be employed, the Inuit firms to be contracted, and the socio-economic benefits to the area.

We hire 1 Inuit assistant that spends time helping to set up the camp on East Bay Island (Eider Island, federal lands) as well as the Mainland Camp. We hire a second Inuit scientific research assistant to spend the summer assisting in the research. We purchase all groceries and some equipment in Iqaluit. Crews flying in and out of the site spend time in Iqaluit, where they spend money on meals and accommodations, as well as local arts and crafts. Some crew fly into Iqaluit with Canadian North.



East Bay, Southampton Island

SPILL CONTINGENCY PLAN

East Bay, Southampton Island

Grant Gilchrist
National Wildlife Research Centre, Carleton University
1125 Colonel By Drive
Ottawa, Ontario

Amie Black
National Wildlife Research Centre, Carleton University
1125 Colonel By Drive
Ottawa, Ontario

17 September 2008
Updated 3 March 2011

Table of Contents

Land Use Permit/Reserve:
Land Use Reserve DIAND #46 A/4-1-2 (Island camp)
Land Use Permit Kivalliq Inuit Association KVX09N08 (Mainland camp)

Site: East Bay Island, Southampton Island
East Bay Mainland, Southampton Island

Location: 64°01'47 N, 81° 47'16 W (Island)
63°54'25 N, 81°48'43 W (mainland)

Person in Charge: Grant Gilchrist, Research Scientist
National Wildlife Research Centre, Carleton University
1125 Colonel By Drive
Ottawa, Ontario
(613) 998-7364

Person Responsible for Activating Spill Plan: Camp Crew Leader; will change annually. For 2011: Justin Buller (mainland), Mike Janssen (Island), telephone number not applicable because the remote camp does not have telephone land lines. Crew leader will notify appropriate agencies via satellite telephone or 2-way radio.

Spill Plan Effective Period: 15 May – 30 August annually

Description:

The site is located on a gravel ridge at East Bay, Southampton Island. The camp is supplied by twin otter on skis in May. The base camp will consist of a small cabin (~2.5m x 3m), and 3-4 canvas tents erected for cooking and equipment storage each year. These structures will rest on cobble-sized stones surrounded by little vegetation (a small amount of moss).

Fuel (gasoline, propane) will be stored near the camp (above the ocean high water line), in small, 25L gerry cans and 20lb tanks. These materials will be located on a flat location, with a small berm built around them in the event of a fuel spill. An emergency spill kit with absorbent materials and protective gloves will be kept at the camp near the fuel storage in the event of a spill (we have had none in > 30 years of high arctic seabird work). When practical, all sumps will be located 30m above the high water line, and will be back-filled, mounded, and contoured to match surrounding landscape prior to leaving the camp. Current MSDS will be kept in a central location (the cabin office area) so as to be accessible to all personnel.

To reduce solid waste, packaging of material brought to the island will be kept to a minimum, and will be reused whenever possible.

Spill Kit Contents:

30 Absorbent Pads (Oil, Gas)
15 Universal Absorbent Pads
2 18" x 18" Oil Absorbent Pillows
3 3" x 4' Absorbent Socks (Oil, Gas & Diesel)
6 HD Hazmat Disposal Bags
2 Pairs of Nitrile Gloves
1 Spill Instruction Sheet
1 Laminated List of Contents
1 jar of "Plug N' Dike" hazardous leak sealant

General Actions:

In advance of any possible spill and upon arrival at the field camp, all people at the field site will be made aware of the protocols below, proper protocols for handling, storing, and pouring fuel and the contact information should a spill occur.

In the event of a fuel spill by the cabin;

- Notify research crew leader of the spill and it's location so that they can activate the spill plan
- Do not flush materials into water courses
- Ensure berm is performing to stop any movement of fuel
- Spills will be inherently small because little is stored at the site, so use absorbent materials in spill kit to soak up
- Notify Polar Shelf via 2-way radio, and have them notify the Spill Line
- Fill out the Nunavut Spill Report Form (http://www.nunavutwaterboard.org)

Contacts:

In the event of a spill, the following agencies **must** be contacted:

Polar Shelf in Resolute:	(867) 252-3872, or use 2-way radio
24-hourNunavut Spill Line:	(867) 920-8130 Ph., (867) 873-6924 Fx
Peter Kusugac, INAC Manager of field operations:	(867) 975-4295 Ph, (867) 975-6445 Fx
Environment Canada in Iqaluit:	(867) 975-4644
Department of Fisheries and Oceans, Central and Arctic Regional Office	(204) 983-5000
Kivalliq Inuit Association	(867) 645-2800

Nunavut

NUNAVUT SPILL REPORT (Oil, Gas, Hazardous Chemicals or other Materials)

24-Hour Report Line
Phone (867) 920-8130
Fax (867) 873-6924

A Report Date and Time	**B** Date and Time of Spill (if known)	**C** ☐ Original Report ☐ Update No. ________	Spill Number

D Location and Map Coordinates (if known) and Direction (if moving)

E Party Responsible for Spill (Full Name and Address)

F Product(s) Spilled and Estimated Quantities (provide metric volumes/weights if possible)

G Cause of Spill

H Is Spill Terminated? ☐ Yes ☐ No	**I** If Spill is Continuing, Give Estimated Rate	**J** Is Further Spillage Possible? ☐ Yes ☐ No	**K** Extent of Contaminated Area (in square metres if possible)

L Factors Affecting Spill or Recovery (weather conditions, terrain, snow cover, etc.)	**M** Containment (natural depression, dykes, etc.)

N Action, if any, taken or Proposed to Contain, Recover, Clean Up or Dispose of Product(s) and Contaminated Materials

O Do You Require Assistance? ☐ No ☐ Yes, describe:	**P** Possible Hazards to Persons, Property or Environment e.g. fire, drinking water, fish or wildlife

Q Comments and/or Recommendations

FOR SPILL LINE USE ONLY

Lead Agency ....

Spill Significance ....

Lead Agency Contact and Time ....

Is this file now closed? ....

Reported By	Position, Employer, Location	Telephone
Reported To	Position, Employer, Location	Telephone

PETRO-CANADA

Material Safety Data Sheet

WHMIS (Pictograms)	WHMIS (Classification)	Protective Clothing	TDG (pictograms)
	B-2, D-2A, D-2B		

Section 1. Chemical Product and Company Identification

Product Name	**GASOLINE, UNLEADED**	**Code**	W102E
Synonym	Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, Super Premium (94 RO)	**Validated on**	7/4/2005.
Manufacturer	PETRO-CANADA P.O. Box 2844 Calgary, Alberta T2P 3E3	**In case of Emergency**	Petro-Canada: 403-296-3000 Canutec Transportation: 613-996-6666 Poison Control Centre: Consult local telephone directory for emergency number(s).
Material Uses	Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.		

Section 2. Composition and Information on Ingredients

Name	CAS #	% (W/W)	Exposure Limits (ACGIH) TLV-TWA(8 h)	STEL	CEILING
Gasoline	8006-61-9	85-100	300 ppm	500 ppm	Not established
Methyl tert-butyl ether	1634-04-4	0-15	50 ppm	Not established	Not established
Benzene	71-43-2	<1.5	0.5 ppm	2.5 ppm	Not established
Note: Petro-Canada does not use MTBE in the manufacturing of its gasoline, however MTBE can be introduced from time to time through the use of external gasoline blendstocks.					

Manufacturer Recommendation	Not applicable
Other Exposure Limits	Consult local, state, provincial or territory authorities for acceptable exposure limits.

Section 3. Hazards Identification.

Potential Health Effects	Flammable liquid. Exercise caution when handling this material. May cause cancer. May cause heritable genetic effects (mutagenicity). This product contains an ingredient or ingredients, which have been shown to cause chronic toxic effects. Contact with this product may cause skin and eye irritation. Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include: weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death. Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. For more information refer to Section 11 of this MSDS.

Section 4. First Aid Measures

Eye Contact	Avoid direct contact. Quickly and gently blot or brush away chemical. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes or until the chemical is removed, while holding the eyelid(s) open. Take care not to rinse contaminated water into the unaffected eye or onto the face. Obtain medical attention immediately.
Skin Contact	Avoid direct contact. Wear chemical resistant protective clothing if necessary. Quickly and gently, blot or brush away excess chemical. Wash gently and thoroughly with warm water and non-abrasive soap for 20 minutes or until chemical is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g., watch bands, belts, etc.). Obtain medical attention immediately. Completely decontaminate clothing, shoes and leather goods before reuse or discard.

Continued on Next Page

Inhalation	Take proper precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately transport victim to an emergency care facility.
Ingestion	NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 240 to 300 mL (8 to 10 oz) of water to dilute material in stomach. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Repeat administration of water. If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Quickly transport victim to an emergency care facility.
Note to Physician	Not available

Section 5. Fire-fighting Measures

Flammability	Flammable liquid (NFPA).	**Flammable Limits**	Lower: 1.3%; Upper: 7.6% (NFPA).
Flash Points	Closed Cup: -50 to -38°C (-58 to -36°F), ASTM D56 Standard Test Method for Flash Point by Tag Closed Tester.	**Auto-Ignition Temperature**	257°C (495°F) (NFPA).
Fire Hazards in Presence of Various Substances	Extremely flammable in presence of open flames, sparks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.	**Explosion Hazards in Presence of Various Substances**	Do not cut, weld, heat, drill or pressurize empty container. Containers may explode in heat of fire. Vapours may form explosive mixtures with air.
Products of Combustion	Carbon oxides (CO, CO2), nitrogen oxides (NOx), polynuclear aromatic hydrocarbons, phenols, smoke and irritating vapours as products of incomplete combustion. See Section 11 (Other Considerations) for information regarding the toxicity of the combustion products.		
Fire Fighting Media and Instructions	NAERG2004 GUIDE 128, Flammable liquids (Non-polar/Water-immiscible). CAUTION: This product has a very low flash point: Use of water spray when fighting fire may be inefficient. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. SMALL FIRES: Dry chemical, CO2, water spray or regular foam. LARGE FIRES: Water spray, fog or regular foam. Do not use straight streams. Move containers from fire area if you can do it without risk. Fires Involving Tanks or Car/Trailer Loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting devices or any discolouration of tank. ALWAYS stay away from the ends of tanks. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection.		

Section 6. Accidental Release Measures

Material Release or Spill	IN THE EVENT OF A LARGE SPILL CONSIDER THE FOLLOWING CONTROL MEASURES: Consult current National Emergency Response Guide Book (NAERG) for appropriate spill measures if necessary. Extinguish all ignition sources. Stop leak if safe to do so. Evacuate non-essential personnel. Ventilate area. Dike spilled material. Use appropriate inert absorbent material to absorb spilled product. Collect used absorbent for later disposal. Ensure clean-up personnel wear appropriate personal protective equipment. Avoid contact with spilled material. Avoid contaminating sewers, streams, rivers and other water courses with spilled material. Avoid breathing vapours or mists of material. Ground and bond all equipment used to clean up the spilled material, as it may be a static accumulator. Notify appropriate authorities immediately.

Section 7. Handling and Storage

Handling	FLAMMABLE MATERIAL. Handle with care. Avoid contact with any sources of ignition, flames, heat, and sparks. Avoid skin contact. Avoid eye contact. Avoid inhalation of product vapours or mists. Wear proper personal protective equipment (See Section 8). Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse containers without commercial cleaning and/or reconditioning. Personnel who handle this material should practice good personal hygiene during and after handling to help prevent accidental ingestion of this product. Ensure all equipment is grounded/bonded. Avoid confined spaces and areas with poor ventilation. Do not ingest this product.
Storage	Store as flammable material. Store away from incompatible and reactive materials (See section 5 and 10). Store away from heat and sources of ignition. Store in dry, cool, well-ventilated area. Keep container tightly closed. Ensure the storage containers are grounded/bonded. Avoid direct sunlight.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	For normal application, special ventilation is not necessary. If user's operations generate vapours or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Make-up air should always be supplied to balance air removed by exhaust ventilation. Ensure that eyewash station and safety shower are close to work-station.
Personal Protection - ***The selection of personal protective equipment varies, depending upon conditions of use.***	
Eyes	As a minimum, safety glasses with side shields should be worn when handling this material.
Body	If this material may come in contact with the body during handling and use, we recommend wearing appropriate protective clothing to prevent contact with the skin. (Contact your PPE provider for more information.)
Respiratory	A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
Hands	If this material may come in contact with the hands during handling and use, we recommend wearing gloves of the following material(s): polyvinyl alcohol (PVA), fluoro-elastomer. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns.
Feet	Wear appropriate footwear to prevent product from coming in contact with feet and skin.

Section 9. Physical and Chemical Properties

Physical State and Appearance	Clear liquid.	**Viscosity**	Not available
Colour	Clear to slightly yellow, undyed liquid. May be dyed red for taxation purposes.	**Pour Point**	Not applicable.
Odour	Gasoline. MTBE has a terpene-like odour.	**Softening Point**	Not applicable.
Odour Threshold	Less than 1 ppm.	**Dropping Point**	Not applicable.
Boiling Point	25 to 220°C (77 to 428°F) Initial boiling point by ASTM D86 Standard Test Method.	**Penetration**	Not applicable.
Density	0.685 - 0.80 kg/L @ 15°C (59°F).	**Oil / Water Dist. Coefficient**	Not available
Vapour Density	3 to 4 (Air = 1) (NFPA).	**Ionicity (in water)**	Not available
Vapour Pressure	<107 kPa @ 37.8°C (100°F)	**Dispersion Properties**	Not available
Volatility	Volatile.	**Solubility**	Hydrocarbon components virtually insoluble in water. Soluble in alcohol, ether, chloroform, and benzene. Dissolves fats, oils and natural resins.

Section 10. Stability and Reactivity

Corrosivity	Non corrosive.		
Stability	The product is stable under normal handling and storage conditions.	**Hazardous Polymerization**	Will not occur under normal working conditions.
Incompatible Substances / Conditions to Avoid	Reactive with oxidizing agents, acids, interhalogens and uranium hexafluoride.	**Decomposition Products**	May release COx, NOx, phenols, polynuclear aromatic hydrocarbons, acrid smoke and irritating vapours when heated to decomposition.

Section 11. Toxicological Information

Routes of Entry	Skin contact, eye contact, inhalation, and ingestion.
Acute Lethality	Gasoline (8006-61-9): Acute Oral toxicity (LD50): 13600 mg/kg (rat) Acute Dermal toxicity (LD50): >5000 mg/kg (rabbit) MTBE (1634-04-4): Acute Oral toxicity (LD50): 2963 mg/kg (rat) Acute Dermal toxicity (LD50): >6800 mg/kg (rabbit) Acute Inhalation toxicity (LC50): 23576 ppm/4h (rat)

	Benzene (71-43-2): Acute Oral toxicity (LD50): 930 mg/kg (rat) Acute Dermal toxicity (LD50): >9400 mg/kg (rabbit) Acute Inhalation toxicity (LC50): 13229 ppm/4h (rat)
Chronic or Other Toxic Effects	
Dermal Route:	Contact may cause skin irritation. Prolonged or repeated contact may defat and dry skin, and cause dermatitis.
Inhalation Route:	Inhalation of this product may cause respiratory tract irritation. Inhalation of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Oral Route:	Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract. Ingestion of this product may cause Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.
Eye Irritation/Inflammation:	Contact may cause eye irritation.
Immunotoxicity:	Not available
Skin Sensitization:	Contact with this product is not expected to cause skin sensitization, based upon the available data and the known hazards of the components.
Respiratory Tract Sensitization:	Contact with this product is not expected to cause respiratory tract sensitization, based upon the available data and the known hazards of the components.
Mutagenic:	This product contains a component(s) at >= 0.1% that has been shown to cause mutagenicity in laboratory tests. Therefore, this product is considered to be a mutagen. (Benzene)
Reproductive Toxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause reproductive toxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a reproductive toxin.
Teratogenicity/Embryotoxicity:	This product is not known to contain any components at >= 0.1% that have been shown to cause teratogenicity and/or embryotoxicity. Therefore, based upon the available data and the known hazards of the components, this product is not expected to be a teratogen/embryotoxin.
Carcinogenicity (ACGIH):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be A1 by the ACGIH. Benzene (71-43-2)] [Considered to be A3 by the ACGIH. Gasoline (8006-61-9), MTBE (1634-04-4)]
Carcinogenicity (IARC):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be carcinogenic to humans (group 1) by IARC. Benzene (71-43-2)] [Considered to be carcinogenic to humans (group 2B) by IARC. Gasoline (8006-61-9)]
Carcinogenicity (NTP):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Known to be a human carcinogen according to NTP. Benzene (71-43-2)]
Carcinogenicity (IRIS):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be carcinogenic by IRIS. Benzene (71-43-2)]
Carcinogenicity (OSHA):	This product contains the following chemical(s) at >=0.1% that are listed as carcinogenic compounds. Therefore this product is considered to be carcinogenic. [Considered to be carcinogenic by OSHA. Benzene (71-43-2)]
Other Considerations	Gasoline engine exhaust is possibly carcinogenic to humans (IARC Group 2B).

Section 12. Ecological Information

Environmental Fate	Not available	**Persistance/ Bioaccumulation Potential**	Not available
BOD5 and COD	Not available	**Products of Biodegradation**	Not available
Additional Remarks	No additional remark.		

Section 13. Disposal Considerations

Waste Disposal Spent/ used/ waste product may meet the requirements of a hazardous waste. Consult your local or regional authorities. Ensure that waste management processes are in compliance with government requirements and local disposal regulations.

Section 14. Transport Information

TDG Classification GASOLINE, 3, UN1203, PGII (CL-TDG)

Special Provisions for Transport See Transportation of Dangerous Goods Regulations.

Section 15. Regulatory Information

Other Regulations This product is acceptable for use under the provisions of WHMIS-CPR. All components of this formulation are listed on the CEPA-DSL (Domestic Substances List).

All components of this formulation are listed on the US EPA-TSCA Inventory.

All components of this product are on the European Inventory of Existing Commercial Chemical Substances (EINECS).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Please contact Product Safety for more information.

DSD/DPD (Europe) Not evaluated.

HCS (U.S.A.) CLASS: Contains material which may cause cancer.
CLASS: Flammable liquid having a flash point lower than 37.8°C (100°F).
CLASS: Irritating substance.
CLASS: Target organ effects.

ADR (Europe) (Pictograms) NOT EVALUATED FOR EUROPEAN TRANSPORT

NON ÉVALUÉ POUR LE TRANSPORT EUROPÉEN.

DOT (U.S.A) (Pictograms) Not evaluated for transport

Non évalué pour le transport

HMIS (U.S.A.)

Health Hazard	2*
Fire Hazard	3
Reactivity	0
Personal Protection	H

NFPA (U.S.A.)

Rating
0 Insignificant
1 Slight
2 Moderate
3 High
4 Extreme

Section 16. Other Information

References Available upon request.
* Marque de commerce de Petro-Canada - Trademark

Glossary

ACGIH - American Conference of Governmental Industrial Hygienists
ADR - Agreement on Dangerous goods by Road (Europe)
ASTM - American Society for Testing and Materials
BOD5 - Biological Oxygen Demand in 5 days
CAN/CGA B149.2 Propane Installation Code
CAS - Chemical Abstract Services
CEPA - Canadian Environmental Protection Act
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act
CFR - Code of Federal Regulations
CHIP - Chemicals Hazard Information and Packaging Approved Supply List
CNS - Central Nervous System
COD5 - Chemical Oxygen Demand in 5 days
CPR - Controlled Products Regulations
DOT - Department of Transport
DSCL - Dangerous Substances Classification and Labeling (Europe)
DSD/DPD - Dangerous Substances or Dangerous Preparations Directives (Europe)
DSL - Domestic Substance List
EEC/EU - European Economic Community/European Union
EINECS - European Inventory of Existing Commercial Chemical Substances
EPA - Environmental Protection Agency
EPCRA - Emergency Planning and Community Right to Know Act
FDA - Food and Drug Administration
FIFRA - Federal Insecticide, Fungicide and Rodenticide Act
HCS - Hazard Communication Standard
HMIS - Hazardous Material Information System
IRIS - Integrated Risk Information System
LD50/LC50 - Lethal Dose/Concentration kill 50%
LDLo/LCLo - Lowest Published Lethal Dose/Concentration
NAERG'96 - North American Emergency Response Guide Book (1996)
NFPA - National Fire Prevention Association
NIOSH - National Institute for Occupational Safety & Health
NPRI - National Pollutant Release Inventory
NSNR - New Substances Notification Regulations (Canada)
NTP - National Toxicology Program
OSHA - Occupational Safety & Health Administration
PEL - Permissible Exposure Limit
RCRA - Resource Conservation and Recovery Act
RTECS - Registry of Toxic Effects of Chemical Substances
SARA - Superfund Amendments and Reorganization Act
SD - Single Dose
STEL - Short Term Exposure Limit (15 minutes)
TDG - Transportation Dangerous Goods (Canada)
TDLo/TCLo - Lowest Published Toxic Dose/Concentration
TLm - Median Tolerance Limit
TLV-TWA - Threshold Limit Value-Time Weighted Average
TSCA - Toxic Substances Control Act
USEPA - United States Environmental Protection Agency
USP - United States Pharmacopoeia
WHMIS - Workplace Hazardous Material Information System

Continued on Next Page

IARC - International Agency for Research on Cancer

For Copy of MSDS Internet: www.petro-canada.ca/msds Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228 For Product Safety Information: (905) 804-4752	Prepared by Product Safety - JDW on 7/4/2005. Data entry by Product Safety - JDW.

VALERO™

MATERIAL SAFETY DATA SHEET

Propane

VALERO MARKETING & SUPPLY COMPANY
and Affiliates
P.O. Box 696000
San Antonio, TX 78269-6000

Emergency Phone Numbers
24 Hour Emergency: 866-565-5220
Chemtrec Emergency: 800-424-9300

General Assistance
General Assistance: 210-345-4593

BRAND NAMES: Valero, Diamond Shamrock, Shamrock, Ultramar, Beacon, Total

Section 1. Chemical Product and Company Identification

Common / Trade name : Propane

Synonym : dimethylmethane; propane (dot); propyl hydride; dimethyl methane

SYNONYMS/COMMON NAMES: This Material Safety Data Sheet applies to the listed products and synonym descriptions for Hazard Communication purposes only. Technical specifications vary greatly depending on the product and are not reflected in this document. Consult specification sheets for technical information. This product contains ingredients that are considered to be hazardous as defined by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Material uses : ORGANIC SYNTHESIS; HOUSEHOLD AND INDUSTRIAL FUEL; MANUFACTURE OF ETHYLENE; EXTRACTANT; SOLVENT; REFRIGERANT; GAS ENRICHER; AEROSOL PROPELLANT; MIXTURE FOR BUBBLE CHAMBERS.

MSDS# : 309

CAS # : 74-98-6

Section 2. Composition, Information on Ingredients

Name	CAS number	Concentration (%)
Propane	74-98-6	90 - 100
Propylene	115-07-1	0 - 10
Ethylene	74-85-1	0 - 1

Section 3. Hazards Identification

Extremely Flammable. Compressed Gas. Narcotic and asphyxiant in high concentrations. Gas or vapor reduces oxygen available for breathing and may cause suffocation. Contact with liquid causes burns similar to frostbite. Wear insulated gloves if contact with liquid cooled equipment is expected. Avoid liquid, mist and vapor contact. Vapors may explode.

Physical state : Gas. (COLORLESS LIQUEFIED COMPRESSED GAS; ODORLESS BUT MAY HAVE SKUNK ODOR ADDED.)

Emergency overview : Danger!

CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: NERVOUS SYSTEM.
POSSIBLE CANCER HAZARD
CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.

Continued on next page

Do not ingest. Avoid shock and friction. Extremely hazardous liquid and vapor under pressure. Do not puncture or incinerate container. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eyes : May cause severe irritation, redness, tearing, blurred vision and conjunctivitis. Contact with compressed liquid may cause permanent damage and frost burns.

Skin : Extreme overexposure to very high concentrations may cause mild skin irritation. Contact with compressed liquid may cause skin to freeze or frost burns.

Inhalation : Simple asphyxiant. Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest and sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm.

Ingestion : This product may cause freeze burns to the mucous membranes. May cause harmful central nervous system effects, similar to those listed under "inhalation".

Medical conditions aggravated by overexposure: : Preexisting eye, skin, heart, central nervous system and respiratory system disorders may be aggravated by exposure to this product. Components have been shown to be weak cardiac sensitizers which can result in cardiac arrhythmia and ventricular fibrillation.

Over-exposure signs/symptoms : Simple asphyxiant. Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest and sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm.

See toxicological information (section 11)

Section 4. First Aid Measures

Eye contact : Remove the victim from the source of contamination. Open eyelids to let the product evaporate, then flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Seek medical advice if pain or redness continues. If the victim cannot tolerate light, protect his eyes with a bandage or handkerchief.

Skin contact : For exposure to liquid, slowly rewarm frostbitten part with lukewarm water. In case of massive exposure, remove clothing while showering with lukewarm water. Call a physician. Remove contaminated clothing promptly and launder before reuse.

Inhalation : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.

Ingestion : This product is a gas at normal temperatures and pressures. Never give anything by mouth to an unconscious person. DO NOT induce vomiting. Keep person warm and quiet. SEEK IMMEDIATE MEDICAL ATTENTION.

Notes to physician : Treat Symptomatically.

Section 5. Fire Fighting Measures

Flammability of the product : Flammable.

Auto-ignition temperature : 449.85°C (841.7°F)

Flash point : Closed cup: -104.45°C (-156°F).

Flammable limits : Lower: 2.3% Upper: 9.5%

Products of combustion : Combustion may produce carbon monoxide, carbon dioxide and reactive hydrocarbons (aldehydes, aromatics, etc.).

Continued on next page

Fire fighting media and instructions : Use an extinguishing agent suitable for surrounding fires.

Extremely Flammable. Do not extinguish fire due to probable explosive reignition. Shut off source of flow, if possible. Use appropriate extinguishing media for any secondary fires. Small fires can be extinguished with dry chemical or carbon dioxide. Water can be used to cool fire-exposed containers, structures and to protect personnel. If a leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Risk of explosion by shock, friction, fire or other sources of ignition.

Special protective equipment for fire-fighters : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode. Fire-fighters' protective clothing will provide limited protection. Dangerous when exposed to heat or flame. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources (pilot lights, welding equipment, electrical equipment, etc.) and flash back. Vapors may accumulate in low areas. Vapors may concentrate in confined areas. Flowing product can be ignited by self generated static electricity. Use adequate bonding and grounding to prevent static buildup. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire. Irritating or toxic substances may be emitted upon thermal decomposition. For fires involving this material, do not enter any enclosed or confined space without proper protective equipment, which may include NIOSH approved self-contained breathing apparatus with full face mask. Clothing, rags or similar organic material contaminated with this product and stored in a closed space may undergo spontaneous combustion. Transfer to and from commonly bonded and grounded containers.

Special remarks on fire hazards : FLAMMABLE.

Special remarks on explosion hazards : No additional remark.

Section 6. Accidental Release Measures

Personal precautions : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Do not touch or walk through spilled material.

Environmental precautions : If facility or operation has an "oil or hazardous substance contingency plan", activate its procedures. Stay upwind and away from spill. Wear appropriate protective equipment including respiratory protection as conditions warrant. Do not enter or stay in area unless monitoring indicates that it is safe to do so. Isolate hazard area and restrict entry to emergency crew. Extremely flammable. Review Fire and Explosion Hazard Data before proceeding with clean up. Keep all sources of ignition (flames, smoking, flares, etc.) and hot surfaces away from release. Contain spill in smallest possible area. Recover as much product as possible (e.g., by vacuuming). Stop leak if it can be done without risk. Use water spray to disperse vapors. Spilled material may be absorbed by an appropriate absorbent, and then handled in accordance with environmental regulations. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment or drainage systems and natural waterways. Contact fire authorities and appropriate federal, state and local agencies. If spill of any amount is made into or upon navigable waters, the contiguous zone, or adjoining shorelines, contact the National Response Center at 800-424- 8802. For highway or railway spills, contact Chemtrec at 800-424-9300.

Continued on next page

Section 7. Handling and Storage

Handling : Do not ingest. Avoid shock and friction. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Extremely hazardous liquid and vapor under pressure. Do not puncture or incinerate container. Wash thoroughly after handling. Use good personal hygiene practices. After handling this product, wash hands before eating, drinking, or using toilet facilities.

Storage : Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

Section 8. Exposure Controls, Personal Protection

Engineering controls : Ventilation is normally required when handling or using this product.

Personal protection

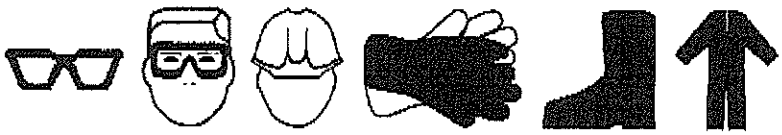
Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Flame Retardant Clothing is recommended.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protective equipment (Pictograms) : Consult your Supervisor or S.O.P. for special handling directions.



Personal protection in case of a large spill : Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Component	Exposure limits
Propane	**ACGIH TLV (United States, 1/2004). Notes: ACGIH 2004 Adoption** TWA: 1000 ppm 8 hour(s). Form: All forms **NIOSH REL (United States, 6/2001).** TWA: 1000 ppm 10 hour(s). Form: All forms Simple asphyxiant.
Propylene	**ACGIH TLV (United States, 1/2004).** TWA: 500 ppm 8 hour(s). Simple asphyxiant.
Ethylene	Simple asphyxiant.

Consult local authorities for acceptable exposure limits.

Continued on next page

Section 9. Physical and Chemical Properties

Physical state	: Gas. (COLORLESS LIQUEFIED COMPRESSED GAS; ODORLESS BUT MAY HAVE SKUNK ODOR ADDED.)
Color	: Colorless.
Odor	: FAINT GASSY
Molecular formula	: C3-H8
Boiling point	: -41.79°C (-43.2°F)
Melting/freezing point	: -185.89°C (-302.6°F)
Specific gravity	: 0.59 (Water = 1)
Vapor density	: 1.6 (Air = 1)
Volatility	: Essentially 100%
VOC	: 100 (%)
Solubility	: Insoluble in cold water.

Section 10. Stability and Reactivity Data

Stability and reactivity	: The product is stable.
Conditions of instability	: Stable under normal conditions of use. (Ethane)
Incompatibility with various substances	: Extremely reactive or incompatible with oxidizing agents, reducing agents, acids, alkalis.
Hazardous decomposition products	: Combustion may produce carbon monoxide, carbon dioxide and reactive hydrocarbons (aldehydes, aromatics, etc.).
Hazardous polymerization	: Will not occur.

Section 11. Toxicological Information

Toxicity data

LIQUIFIED PETROLEUM GAS acts as a simple asphyxiant, but may also cause central nervous system depression. Concentrations of 100,000 ppm may be tolerated, but cause dizziness within a few minutes. No chronic systemic effect has been reported from occupational exposure to LPG.

IDLH	: 2100 ppm
Chronic effects on humans	: **CARCINOGENIC EFFECTS**: Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Propylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Ethylene]. Causes damage to the following organs: the nervous system.
Other toxic effects on humans	: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Specific effects

Carcinogenic effects	: Contains material which may cause cancer based on animal data. Risk of cancer depends on duration and level of exposure.
Target organs	: Causes damage to the following organs: the nervous system.

Continued on next page

Section 12. Ecological Information

Ecotoxicity data

Products of degradation : carbon oxides (CO, CO_2) and water

Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

Waste disposal : Do not puncture or incinerate container. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Consult your local or regional authorities.

Section 14. Transport Information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1075	PETROLEUM GASES, LIQUEFIED	2.1	Not available.		**Limited quantity** Yes. **Packaging instruction** Passenger Aircraft Quantity limitation: Forbidden. Cargo Aircraft Quantity limitation: 150 kg **Special provisions** T50
TDG Classification	UN1075	PETROLEUM GASES, LIQUEFIED	2.1	Not available.		**Special provisions** 29, 42

Section 15. Regulatory Information

United States

U.S. Federal regulations : TSCA 8(b) inventory: Propane; Propylene; Ethylene

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: Propane
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Propane: Fire hazard, Sudden Release of Pressure; Propylene: Fire hazard, Sudden Release of Pressure

Continued on next page

Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: Propane; Propylene; Ethylene
Clean air act (CAA) 112 regulated flammable substances: Propane; Propylene; Ethylene
Clean air act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	: Propylene	115-07-1	0 - 10
Supplier notification	: Propylene	115-07-1	0 - 10

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Pennsylvania RTK: Propane: (generic environmental hazard); Propylene: (environmental hazard, generic environmental hazard); Ethylene: (environmental hazard, generic environmental hazard)
Massachusetts RTK: Propane; Propylene; Ethylene
New Jersey: Propane; Propylene; Ethylene
California prop. 65: No products were found.

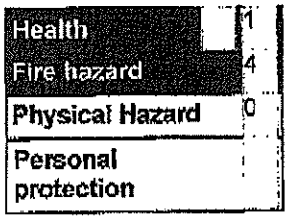
Canada

WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.
CEPA DSL: Propane; Propylene; Ethylene

Section 16. Other Information

Label Requirements : CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: NERVOUS SYSTEM.
POSSIBLE CANCER HAZARD
CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :



National Fire Protection Association (U.S.A.) :

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Definitions of Material Safety Data Sheet Terminology

GOVERNMENT AGENCIES AND PRIVATE ASSOCIATIONS

ACGIH - American Conference of Governmental Industrial Hygienists, (private association)
DOT - United States Department of Transportation
EPA - United States Environmental Protection Agency
IARC - International Agency for Research on Cancer, (private association)
NFPA - National Fire Protection Association, (private association)
MSHA - Mine Safety and Health Administration, U.S. Department of Labor
NIOSH - National Institute of Occupational Safety and Health, U.S. Department of Health and Human Services
NTP - National Toxicology Program, (private association)
OSHA - Occupational Safety and Health Administration, U.S. Department of Labor
WHMIS- Workplace Hazardous Material Information System
CSA- Canadian Standards Association

HAZARD AND EXPOSURE INFORMATION

Acute Hazard - An adverse health effect which occurs rapidly as a result of short term exposure.
CAS # - American Chemical Society's Chemical Abstract service registry number which identifies the product and/or ingredients.
Ceiling - The concentration that should not be exceeded during any part of the working exposure
Chronic Hazard - An adverse health effect which generally occurs as a result of long term exposure or short term exposure with delayed health effects and is of long duration
Fire Hazard - A material that poses a physical hazard by being flammable, combustible, phyrophoric or an oxidizer as defined by 29 CFR 1910.1200
Hazard Class - DOT hazard classification
Hazardous Ingredients - Names of ingredients which have been identified as health hazards
IDLH- Immediately Dangerous to Life and Health, the airborne concentration below which a person can escape without respiratory protection and exposure up to 30 minutes, and not suffer debilitating or irreversible health effects. Established by NIOSH.
mg/m3 - Milligrams of contaminant per cubic meter of air, a mass to volume ratio
N/A - Not available or no relevant information found
NA - Not applicable
PEL - OSHA permissible exposure limit; an action level of one half this value may be applicable
ppm - Part per million (one volume of vapor or gas in one million volumes of air)
Pressure Hazard - A material that poses a physical hazard due to the potential of a sudden release of pressure such as explosive or a compressed gas as defined by 29 CFR 1910.1200
Reactive Hazard - A material that poses a physical hazard due to the potential to become unstable reactive, water reactive or that is an organic peroxide as defined by 29 CFR 1910.1200.
STEL - The ACGIH Short-Term Exposure Limit, a 15-minute Time-Weighted Average exposure which should not be exceeded at any time during a workday, even if the 8-hour TWA is less than the TLV.
TLV - ACGIH Threshold Limit Value, represented herein as an 8-hour TWA concentration.
8-hour TWA - The time weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect.
LD50 – Single dose of a substance that, when administered by a defined route in an animal assay, is expected to the cause the death of 50% of the defined animal population.
LC50 - The concentration of a substance in air that, when administered by means of inhalation over a specified length of time in an animal assay, is expected to cause the death of 50% of a defined animal population.