

# **APPENDIX 10**

## **CONTWOYTO LAKE REMEDIATION PROJECT**

### **MOBILIZATION OPTIONS PLAN AND SUPPLEMENTAL INFORMATION**

# **Contwoyto Lake Weather Station Remediation Project – Mobilization Options Plan & Supplemental Information**

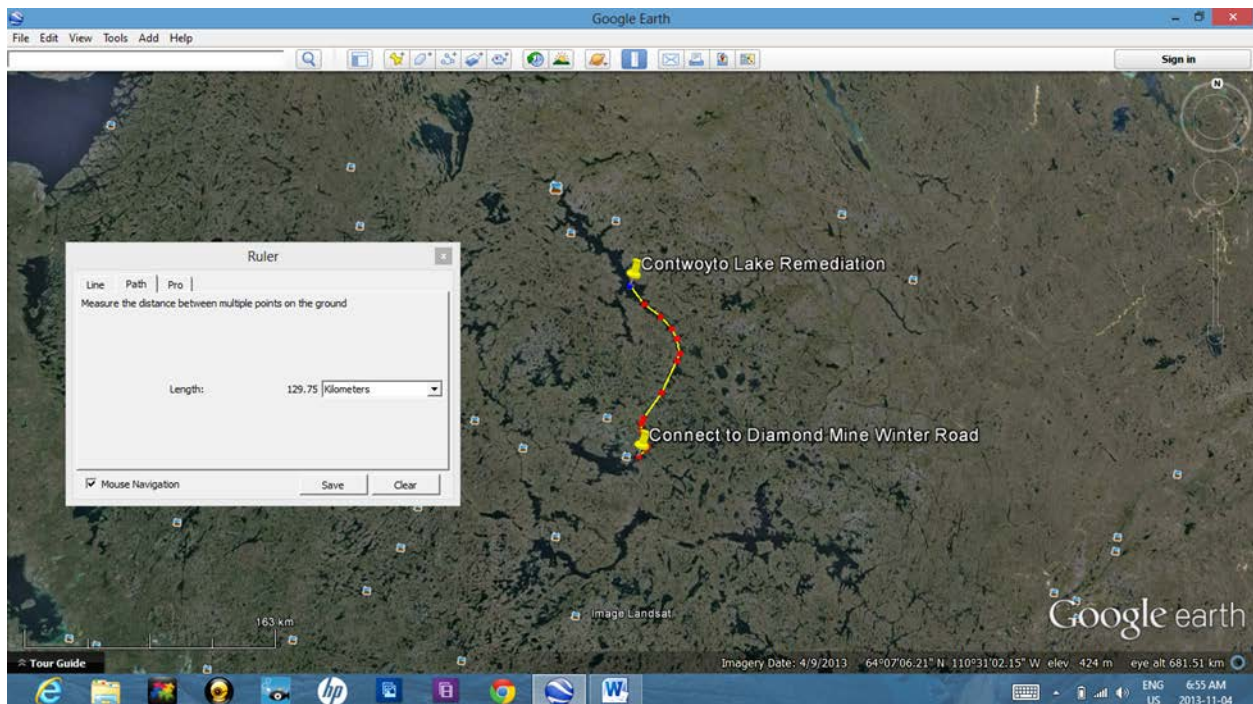
## **Mobilization Methodology**

The mobilization of equipment and supplies to the Contwoyto Lake Weather Station Project will be completed during the months of March/April/May 2014. The method of mobilization will be determined by a number of factors that must be monitored during the winter months to determine the optimal mobilization solution.

### ***Ice Road Delivery Option***

Nuna Logistics has indicated that there is a consideration that an ice road will be constructed in February 2014 to access Lupin and Jericho Mine Sites and will remain open until March 31 2014. It is expected that the decision to construct this road will be made by early December 2013.

All supplies and equipment will be delivered to the site utilizing the Nuna constructed ice road if it is built. In this scenario, mobilization will occur in early march 2014 and will be completed by March 21 2013. A notice to proceed will be delivered to the project by early December 2013.



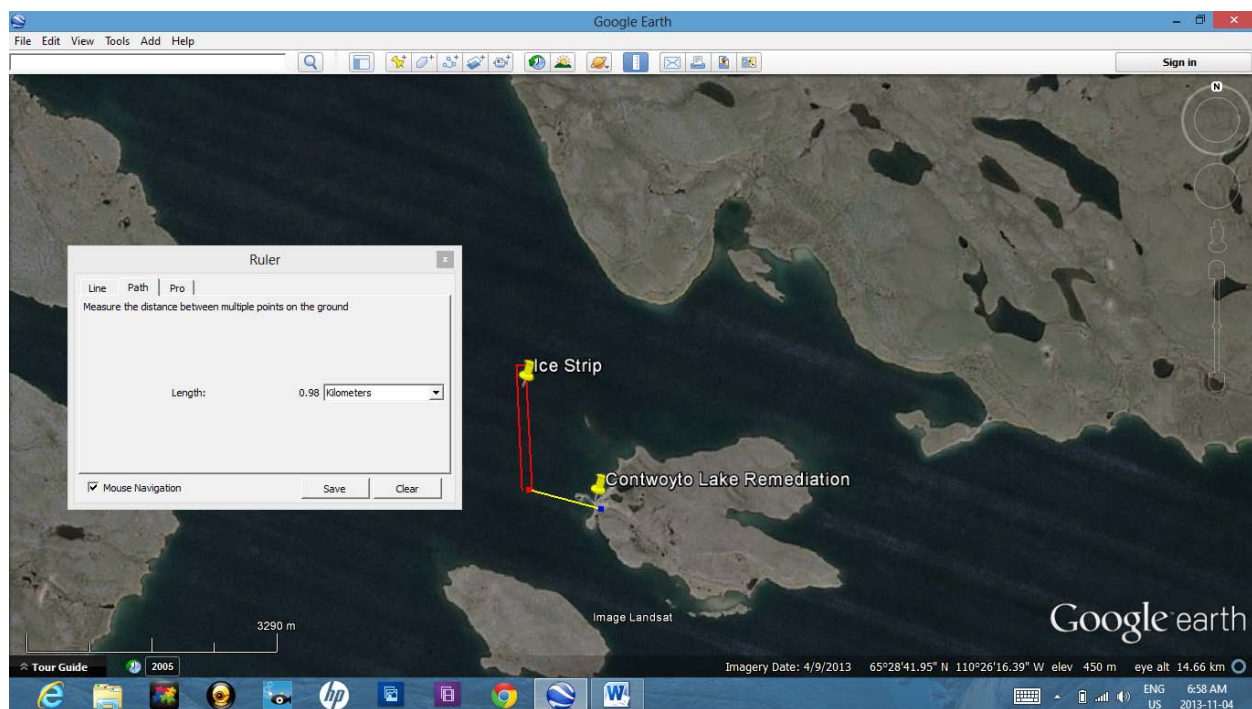
The route would connect to the annually constructed Diamond Mine Ice Road near Diavik on Lac De Gras and would travel for 140km north to access Contwoyto Lake. The route would

travel by the Project Site and provide access for supply. Delta Engineering Ltd. is exploring the options of ice road permits for this route should the project require ice road delivery.

### ***Ice Strip Construction – Delivery of Construction Equipment on Ice***

The means to supply snow removal equipment to the site for ice strip construction will be significantly impacted by the weather conditions over the winter at the project site. The delivery of small snow clearing equipment directly to the ice strip area on Contwoyto Lake during the month of April will only be feasible if the site experiences a winter with low precipitation and average winter temperatures.

A winter with low precipitation and average temperatures will result in open areas of ice for access with skyvan aircraft which will supply a skid steer for snow removal. The skid steer will open a strip that will accommodate a DHC5 Buffalo which will then supply a small loader to support the skid steer. The two machines will open a 1500 meter runway to facilitate the delivery of the C130 Hercules and the main mobilization will commence.

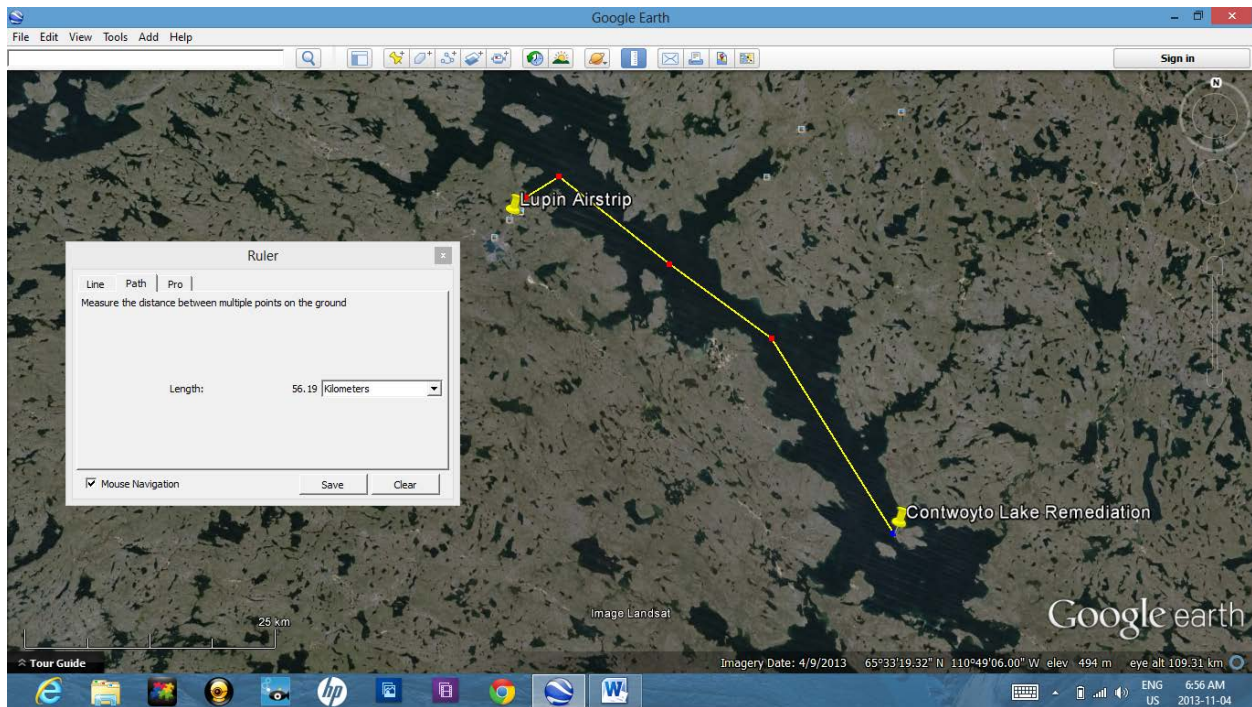


The ice strip will be oriented N/S and will be constructed 1500m in length and 100m in width. A short access road from the strip to the island will be constructed for delivery of supplies to the island.

### ***Ice Strip Construction – Delivery of Construction Equipment to Lupin***

Weather patterns in the North are changing and predicting the weather is no longer as successful as before. The north is also experiencing changes to weather patterns that have not been experienced in recorded history and the project should be prepared for unseasonably warm weather and higher than expected precipitation.

High precipitation and warm weather will cause concerns with ice strip construction since the ice clearing equipment will need to be larger to remove more snow and the offloading aprons may need to be flooded. The project team will monitor the site conditions and should unseasonable weather be observed an alternative mobilization option will be implemented which will include the supply of loaders and snow removal equipment onto the airstrip at Lupin. The equipment will then push across Contwoyto Lake from the north to construct the ice strip. The decision to initialize an optional mobilization into Lupin will be made in late February 2014.



The Loader and Skid Steer will be delivered to the Lupin Site by Skyvan and Hercules aircraft. They will then travel down existing roads to Contwoyto Lake and push down the lake to the project site.

## Fuel Management

### Mobilization of Fuel

Fuel will be supplied to the site in drums on a C130 Hercules Aircraft. Fuel will be offloaded on the ice strip and transported to the project site with the use of the loader where it will be stored in a lined facility.

Residual fuel will be hauled off the site during demobilization with the support of an ice strip and Hercules aircraft.

### Quantities

The remediation project will require the use of Diesel, Gasoline, Aviation Fuel and Propane.

FUEL TYPE	QUANTITY	CONTAINER Type/Quantity/Capacity	METHOD OF STORAGE
Diesel	69,700 litres	Drums/349/205L transfer to Fuel Bladder/1/189,300 L	On Pallets, 4 drums each, strapped Transfer to fuel bladder
Gasoline	4,920 litres	Drums/24/205 litres	On Pallets, 4 drums each, strapped
Aviation Fuel	2050 litres	Drums/10/205 litres	On Pallets, 4 drums each, strapped
Propane	3000 litres	cylinders/40/ 75 litres	Upright, banded together

### Secondary Containment

All fuels will be stored in a lined facility constructed on site. Liners and “pop-up” berm containment facilities will be constructed for storage of barrels. The barrels will be strapped to pallets and stacked two high in the containment area.

The liner will be an 10mil poly liner or equivalent.



## Fuel Transfer

All fuels will be transferred from the barrels and into equipment with the use of 12 volt fuel transfer pumps. The barrels will remain within the containment facility during fuel transfer and the barrels will remain in the containment area after they have been drained. Empty drums will be staked and stored for demobilization when the project is completed.

## Fuel Storage Location

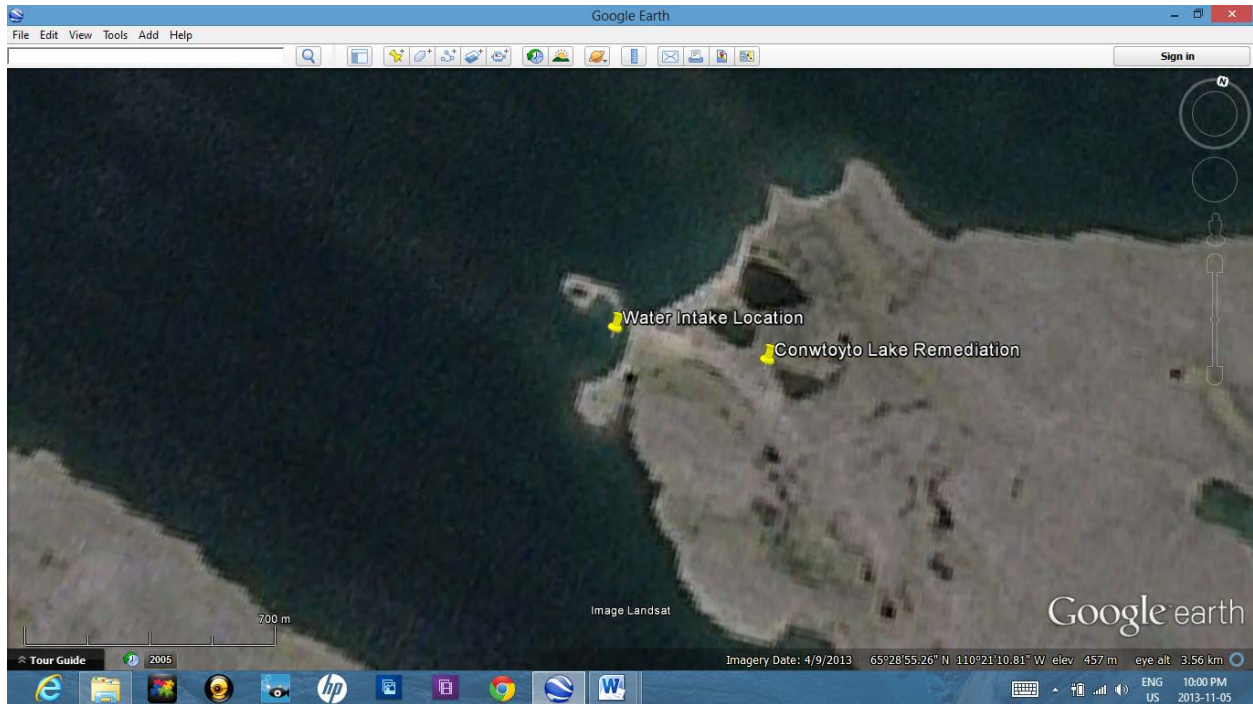


## End of Section

## Fresh Water Usage

### Water Intake Methodology

Camp water will be sourced from Contwoyto Lake from the location indicated on the attached map from Google Earth. The suction line will be located at 65 29 05N and 110 22 45 W.



The suction line will consist of a 2" line placed in the lake and connected to a 2" pump on the shore. The pump will be positioned and ran to transfer the water into tanks which will be transported to the camp using quads and trailers.

The suction hose will have a screen connected to the end with a nominal screen size of 1mm to protect local fish from entering the suction line. The suction line will be suspended off the bottom of the lake a distance of 1.0 meters to ensure that there is no damage to the lake bottom and fish habitat.

## **Water Consumption**

The camp loading is reduced with the removal of the barrel processing on site. The new camp load is expected to be 10 people.

The camp peak water usage is estimated at 75 liters per day per person which indicates a water consumption rate of 750 liters per day. The Project is expected to take 120 days which would result in a total water consumption rate for the camp of 90,000 liters.

There will be no barrel processing on the site so the demand of water by barrel processing is removed.

## **End of Section**

## **Waste Management**

### ***Camp Grey Water Management***

Grey water generated from the camp operation will be processed through a bio-barrier membrane and transferred to containment bladders. The bladders capacity is 20,000 liters and will be tested to meet applicable criteria prior to discharge. Biodegradable detergents and soaps will be supplied to the camp to reduce the impacts of the camp operation on the local environment.

Discharged treated grey water will be discharged at a rate less than 1 liter per second onto sandy or granular natural local deposits located more than 100 meters from any water body. It is expected that the camp will generate approximately 1000 liters of grey water per day.

### ***Black Water Management***

Human waste will be collected from portable toilets daily and incinerated in the dual chambered CY14A incinerator. The waste will be completely incinerated by following the suppliers recommended incineration durations. Ash will be collected, containerized in over-pack containers and shipped off site for disposal.

It is expected that incineration 5 liters of ash from human waste incineration will be generated on a daily basis.

### ***Camp Waste – food, plastic, tin cans***

The project will implement a recycling program to reduce incineration demands and minimize the environmental impact of the camp operations. Waste from camp operation will be managed as follows;

- Food – will be incinerated on site in a dual chambered on a daily basis and will generate 10 liters of ash daily. Ash will be collected and disposed off-site.
- Plastics – will be separated and containerized for recycling off-site,
- Tin Cans – will be washed, separated and containerized for recycling off-site.

### ***Hazardous Waste***

Hazardous waste will be collected and containerized by trained HAZWOPPER crews. The collection and containerization will be completed under the supervision of the supervisor. Hazardous waste will be collected before any demolition or debris collection is completed. The work area will be deemed clean after inspection by the superintendent and the DR.

Hazardous waste will be collected and containerized as required by guidelines for containment and transport. The containment may include bonobags and wooden crates. All hazardous waste containers will be inventoried, logged and numbered for storage. It is expected that 5m<sup>3</sup> of hazardous waste will be collected and containerized for disposal.

### ***Bulky Materials/Scrap Metal***

Debris collected throughout the site will be containerized in bonobag and stored for off-site disposal. Heavier debris which cannot safely be handled in bags may be stored in wooden crates. The debris will include building demolition debris and surface debris.

Clean wood will be incinerated on site.

It is expected that 50m<sup>3</sup> of debris will be collected for disposal.

### ***Drums and Contents***

The drums on site will be collected and shipped off site for processing and disposal. It is expected that heating and hoarding will be required to release some of the drums which are frozen into the ground.

Drums will be inspected for damage before they are shipped off site. Damaged drums which contain liquids will be containerized in over-pack containers for shipment.

### ***Waste Oil***

Waste oils located on site or from servicing equipment will be collected and stored in drums for disposal off site. Waste oils from equipment are expected to be minimal and is estimated at 300 liters.

### ***Contaminated Soils***

Soils contaminated with metals will be identified, collected and shipped off site for disposal at a licensed facility. The soils will be collected into double lined bonobags and stored in the Temporary Hazardous Waste Disposal Area for removal.

The collection of the soils will be completed under the direction of the superintendent. It is expected that 48m<sup>3</sup> of metal impacted soils will be collected for shipment.

## **End of Section**

## **Hydrocarbon Impacted Soil Excavation and Treatment**

### ***Survey Excavation Areas***

Delta will survey the layout of each soil excavation area to the extents indicated on the drawings. These layouts will be field verified by the Department Representative prior to any excavation work.

### ***Environmental Concerns***

To prevent excessive equipment contamination when performing excavation work on large pits, Delta will put a layer of clean material on the path where the excavator and trucks are to be loaded. This will help to prevent PHCs and other contaminants from getting into the tracks/tires of the equipment doing the work.

Delta will develop a water management plan for the excavation. The plan will be excavation specific as each area has individual concerns. Delta will develop a plan for each excavation that will ensure the protection of excavation from surface runoff, protection of ground water and protection of local water bodies. It is possible that Delta will have to complete a detailed topographic survey of the area to assist with the development of the water management plan. The plan will be submitted to the DR for review and comments before the excavation will commence. The plan will include:

- ***Plan for controlling surface runoff from entering the excavation.*** Delta will pay special attention to the potential of surface runoff. The surface runoff may be controlled utilizing surface ditches, earth dams and pumping stations.
- ***Degradation of Permafrost.*** Any time ground is disturbed over permafrost, especially when this changes surface or ground water characteristics, there is significant potential for permafrost

degradation. In-order to control permafrost degradation, the ground and surface water must be properly managed. Delta has a geo-technical engineer with over 20 years experience in cold regions, this individual will assist with the development of the water management plan to reduce impacts to permafrost.

- ***Precipitation Mitigation.*** Delta will outline steps to follow when precipitation is encountered that may impact the excavation. Delta will not excavate during rain.
- ***Plan for controlling sediments created by the excavation.*** Delta will use a water management plan to ensure the protection of all local water bodies. Delta will plan for the unforeseen events and will install silt curtains, silt fences and/or hydrocarbon booms to ensure that the excavations will not impact the local water bodies or streams.

The water management plan will protect the environment from contaminants which will be exposed during the excavation process.

There are some areas that will not be excavated during the freshette to reduce the potential pathway of contaminants to the environment. Delta understands that some areas will have natural pathways of high water flow during the freshette season and these areas are best to be left until after the high water runoff. July and August are dry months at Contwoyto and Delta will delay excavations of these areas until this time. Delta will identify these areas prior to the excavation any materials.

Delta will ensure that all surface debris and buildings have been collected and demolished in the area before any excavation commences.

When excavating in the vicinity of a body of water or a drainage path, silt fences, silt curtains, or containment berms will be installed to prevent sediment and/or contaminated soil migration into the water, this requirement will be outlined in a water management plan. Delta will plan each work area so as to remove surface runoff from entering the excavated area. Delta will attempt to minimize disturbance by completing this work during the dry months.

### ***Excavation of PHC Contaminated Soil***

The procedures for the PHC contaminated soil removal will be as follows:

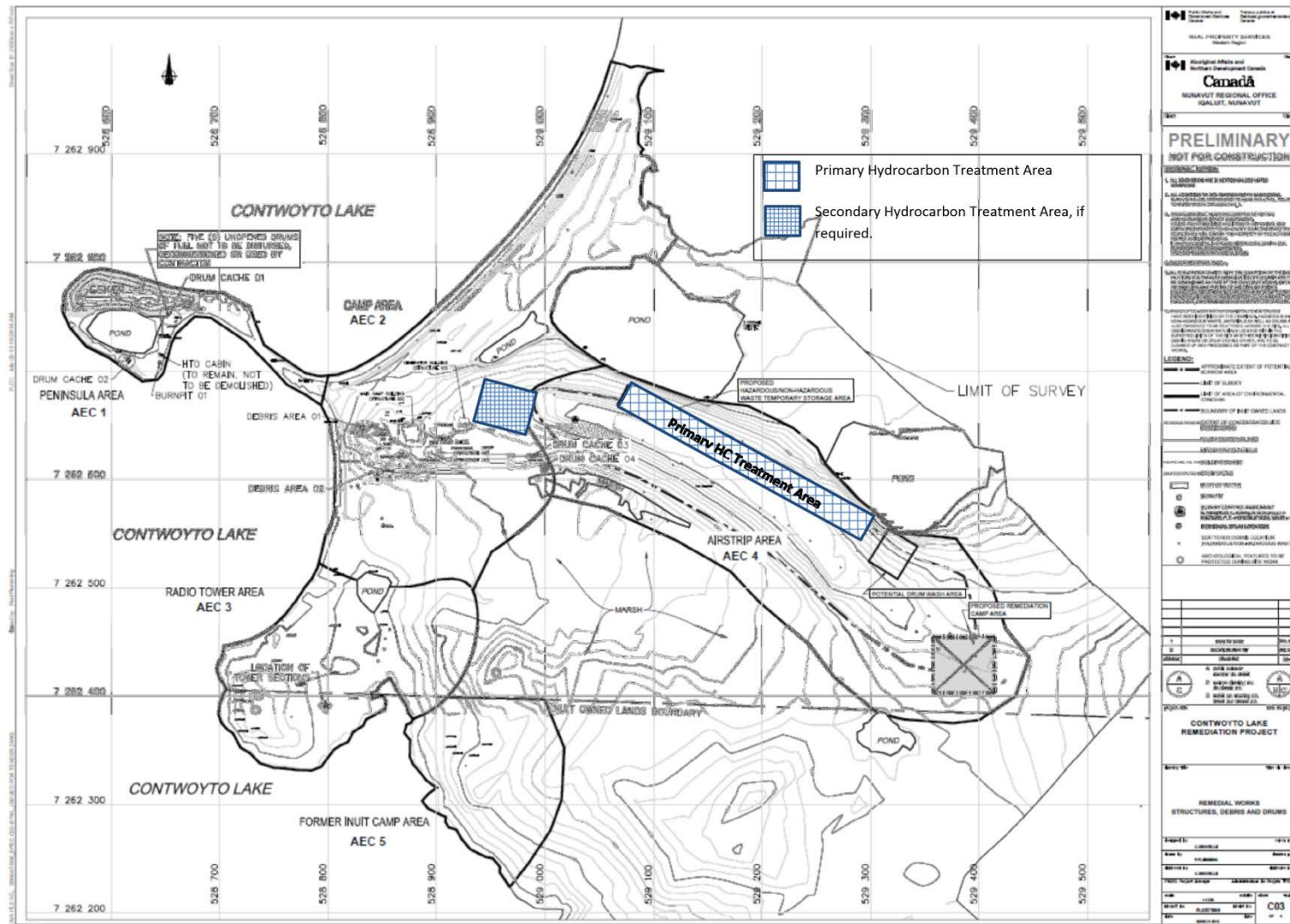
1. Eliminate any surface debris at the excavation site and set aside for collection as surface debris
2. Survey excavation site and field verify by Departmental Representative
3. Install water and erosion control system, if deemed necessary
4. Begin excavation work
5. If soil is saturated with water, stockpile to allow to drain
6. Transport soil to treatment facility
7. Notify Departmental Representative once excavations have reached the depths and extents shown on drawings, and Departmental Representative to collect confirmatory soil samples. Field crews may use petroflag testing to assist with the delineation of the excavation limits.
8. Backfill with clean material within one day of receipt of test results showing that no further excavation is required, or else go back to step 5 and re-follow procedures attempting to collect any perimeter soils that are still contaminated.

All excavation sides will be sloped at 2:1 when depths are great than 1.0m.

Delta may construct and use a screening/grizzly system to remove oversized boulders however it is not expected to be required.

Delta may be sampling with a PetroFlag to accurately delineate the extents of the contamination. This will be performed with the Departmental Representative so that direction may be given to Delta on if the perimeters of the excavation have been achieved. The idea is that the excavation will be left open a shorter duration if we are more accurate with the limits of contamination.

### Construction and Layout of Treatment Farm



### **TREATMENT FACILITY PROPOSED LOCATIONS**

<i>PRIMARY TREATMENT CELL</i>	
7 262 690 N	529 075 W
7 262 670 N	529 060 W
7 262 565 N	529 300 W
7 262 550 N	529 285 W
<i>SECONDARY TREATMENT CELL, if req'd</i>	
7 262 695 N	526 940 W
7 262 660 N	526 930 W
7 262 680 N	526 990 W
7 262 635 N	526 980 W

### **TREATMENT CELL CO-ORDINATES**

The Primary Location has been selected parallel to the existing airstrip while providing sufficient room for operation and maintenance of the airstrip. A secondary location has been selected northwest of the airstrip, near the work site, should additional space be required.

The Soil Treatment Facility will be constructed at site in consultation with the Departmental Representative to satisfy AHJ requirements. Baseline samples will be collected to ensure that no hydrocarbons are present prior to land farm construction and to confirm that no contamination has seeped into the ground from land farming activities as there is no liner proposed in the cells. Completion of the hydrocarbon treatment and closure of the facility will also require collection of samples for confirmation that there has not been any contamination of hydrocarbon above acceptable limits in the vicinity of the treatment facility. This concern will also be monitored during the operation of the treatment farm.

Signage will be posted at access points to the Soil Treatment Facility. The sign will read “CAUTION, CONTAMINATED SOIL TREATMENT AREA – RESTRICTED ACCESS”. If practical to do so, flagging and fencing of area will also be reinforced as an added caution.

The Soil Treatment Facility will be bermed. The berms will be a minimum of 0.5 meters high and will be used limit access and spillage during treatment.

The number of cells required will be a function of the quantity of material excavated and number of cells required for soil treatment, but we estimate that a total of 250 linear meters of cells 11 meters wide will be required.

The cells will be constructed with a 1% interior slope, with a sump at the end to collect the water. This will assist with controlling water which may collect in the cells of the Soil Treatment Facility. Water within the cells can be collected in tanks and transported to a holding tank (bladder) for testing. If it does not achieve discharge criteria, the water will be treated prior to discharge.

If there are periods of excessive rainfall (greater than 20mm precipitation), the soil piles will be tarped to prevent water from contacting the soil.

### ***Treatment of hydrocarbons and Testing Regimen***

The soil treatment process will be supervised and directed by the superintendent.

Soil particles greater than 300mm will be removed by screening if required. Monoammonium phosphate (MAP) will be provided to assist with the treatment of the hydrocarbons. The MAP will be mixed with water at a ratio of 5-10 liters per 1000 liters of water. The MAP will be misted over the soil; application rate of 2-4 liters per cubic meter, every 3 days and the soils will be mixed and aerated.

Soil will be placed in the treatment cells to a maximum of 1m deep so that an excavator with a finishing bucket will have proper access for turning over the soil. Treatment details of MAP application rate and frequency may alter slightly based on site conditions.

Testing will be performed regularly. This will include a baseline sampling and analysis program in the stockpile and treatment areas to verify existing conditions, and a confirmation soil sampling program. The first confirmatory sampling will occur within the first week of treatment and again every 2 weeks until the hydrocarbons are treated to acceptable criteria.

Delta will sample every 250 cubic meters of hydrocarbon soils for confirmation of treatment criteria. Once a lot of 250 cubic meters has reached criteria it will be removed from the treatment cell.

At least ten percent of the samples extracted for confirmatory sampling will be submitted to the Departmental Representative to sample for verification of results.

## **End of Section**



## Clean, Clear Re-Freshed Water from Wastewater

### *In Harmony with Nature™*



Now you can use water and return it to the environment cleaner than before it was used.

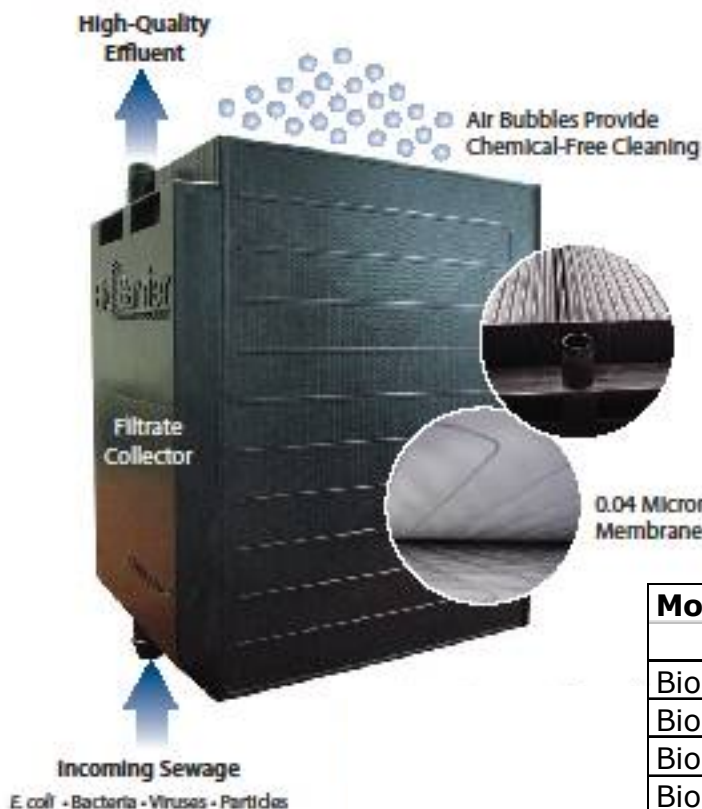
Let's put water back safely for the next generations.

Better water makes for a better world for all to share and enjoy.

#### **CERTIFICATION**

The BioBarrier® is accredited under the National Standards of Canada system through the Standards Council of Canada as meeting the NSF International Standard 40, Class 1, NSF International Standard 245 for nitrogen reduction and the NSF International Standard 350 for reclaimed water for surface discharge pursuant to the USA Environmental Protection Agency. (NSF means the National Sanitation Foundation)

#### How our MBR technology works



#### **Effluent Test Results**

(Standards Council of Canada)

BOD5 < 2 mg/l

TSS < 2 mg/l

Fecal Coliform < 2 CFU /100 ml

#### **INSTALLATION**

Each BioBarrier® membrane pack is approximately 18" x 18" x 24" and is placed into a typical 2 chamber concrete, Fibreglass or polyethylene tank.

Contact your local trained, licensed or registered sanitarian (septic) installation contractor who is able to supply the complete system.

#### **Standard Models**

(high strength waste and higher flow rates available on request)

Model No.	Daily Flow Rates		
	Litres	Imp Gals	US Gals
BioBarrier® 0.5	1,900	420	500
BioBarrier® 1.0	3,785	834	1,000
BioBarrier® 1.5	5,678	1,250	1,500
BioBarrier® 2.0	7,570	1,668	2,000
BioBarrier® 2.5	9,464	2,082	2,500
BioBarrier® 3.0	11,356	2,500	3,000



## *In Harmony with Nature™*



Meets the stringent requirements of Fisheries and Oceans Canada

- The highest treatment level available over that of any other treatment technology. Cannot be matched or exceeded by any other product.
- No ultra-violet needed for removal of fecal Coliform as the BioBarrier® does it internally.
- Consistently meets the most stringent effluent requirements.
- Subject to regulations, may discharge the effluent into a surface body of water.
- The latest scientific achievement in sewage wastewater treatment technology and a proven track record.
- Smallest drain field size possible therefore less land required.

BioBarrier® is a 21st Century technology to meet today's needs for water sustainability.

Water is an important resource that we need to protect and enhance for our future generations.

Contact Pinnacle Environmental Technologies Inc. for your nearest trained Registered Onsite Wastewater Practitioner or Professional Engineer to assist you design, selection, installation and maintenance.



## **Pinnacle Environmental Technologies Inc.**

### Mailing Address

P. O. Box 12112  
Langley, B.C. V3A 9J5

### Location Address

22867 Fraser Hwy.  
Langley, BC.

### Contact Numbers

Ph: 604-514-7555  
T/F 866-514-7555  
Fx: 604-514-7595

WebSite: [www.pinnacleenvironmental.com](http://www.pinnacleenvironmental.com) Email: [info@pinnacleenvironmental.com](mailto:info@pinnacleenvironmental.com)



**KETEK  
MANUFACTURING**  
MEMBER OF KETEK GROUP INC.

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- Dual Chamber, Controlled Air Operation
- Built In Safety Features
- "Load-and-Go" Operation
- Meets Clean Air Guidelines in Most Areas
- Economical Operation
- Optional Dry Scrubber

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Fax: (780) 447-4912  
info@ketek.ca



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## ***Designed for use in Permanent Locations for Types 1, 2, 3 and 4 Wastes***

### ***Capacity Combustion Chambers***

- 0.40 m<sup>3</sup> Primary and Secondary Chambers

### ***Power Requirements***

- 125/250 V, 30A, 60 Hz

### ***Stack***

- 23 cm diameter
- 2.4 m high w/o spark arrester
- 3 m high w/ spark arrester
- Refractory lined stack
- Spark arrester

### ***Casing***

- 10 gauge steel.
- Lining: high heat duty castable refractory over high temperature insulation.

### ***Doors***

- 806 mm x 806 mm Refractory lined, 6.35 mm steel plate c/w heavy duty toggle clamp
- 619 mm x 619 mm clear opening, Max waste size

### ***Air Supply - Adjustable***

- Forced air fan c/w ducts to secondary flame port air jets.

### ***Auxiliary Burners***

- 455,000 BTU for both chambers; gun type, enclosed in protective steel housing.

### ***Fuel Supply (Oil Fired Unit Only)***

- 1000 l fuel storage tank\* c/w filter and flexible hose type connection.

\* Extra if required.

### ***Transporter***

- Incinerator mounted on skid type frame  
L 1.8 m x W 1.5 m x H 1.5 m (Primary Chamber with skid)
- Secondary Chamber Crated Separate

### ***Height***

- 5.6 m tall with stack (crated separate)  
Constructed of W150 I Beam

### ***Weight***

- 2767 kg (6100 lbs)  
Largest dismantled piece is 900 lbs for helicopter lift

### ***Auxiliary Fuel Options***

- LPG Fired burners
- Diesel Fired burners
- Natural Gas Propane

### ***Control System***

- PLC controller
- "Load-and-Go", One-Button operation for batch operation
- Temperature controllers in primary and secondary chambers
- Real time data logging

### ***Air Emissions***

- Meets Environment Canada design draft guidelines for small incinerator
- Some waste streams may require the use of a scrubber
- Optional dry scrubber guaranteed to meet all emission standards.

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20204-110 Avenue, NW  
Edmonton, Alberta  
Canada T5S 1X8

# Litre Hosen<sup>TM</sup>

## Fuel Transfer Systems

### CPD & CPG Series

## Description

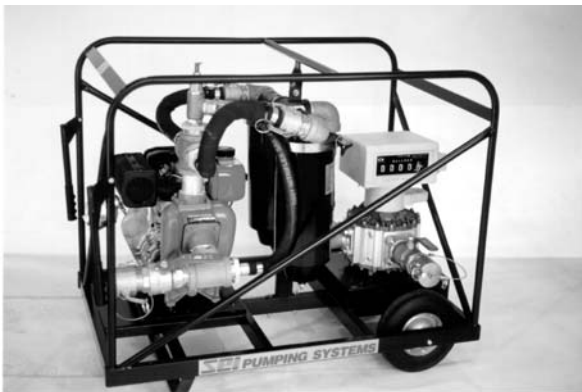
Engineered and fully integrated fuel transfer systems custom made to meet your specific requirements with respect to pumping capacity, filtration and metering.

## Features

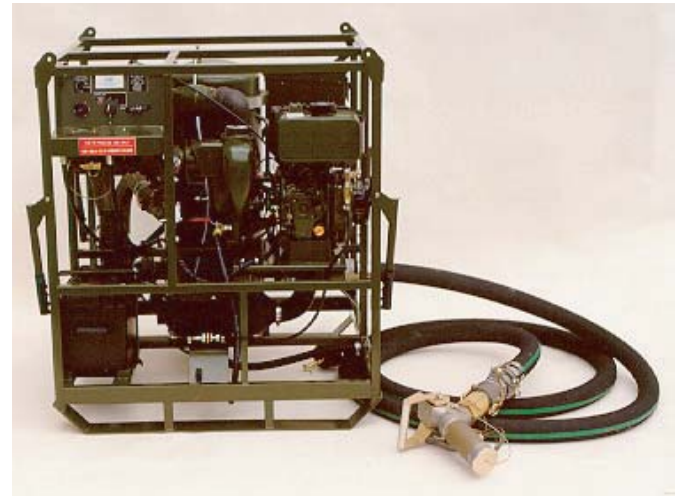
- Low fuel consumption
- Excellent ability to pick up prime quickly
- Standard recoil start
- Self-lubricating pump - no maintenance
- Pressure relief valve
- 2 inch (50 mm) Camlock fittings with dust plugs
- Powder coated roll cage around pump and engine

## Options

- Electric motor drive
- Two levels of filtration available (ground and aviation)
- Inlet and outlet ball valves
- Totalizing flowmeter
- Wheels, handles, and footstand to convert the standard frame to a handcart
- Hose, hose reels and nozzles



Model CPDF100-VAFMW. Diesel driven Litre Hosen<sup>TM</sup> fuel transfer system with pump, filter, totalizing flow meter, pressure relief valve, inlet and outlet ball valves.



A custom designed forward area refuelling equipment (FARE) Litre Hosen<sup>TM</sup> pump transfer unit. NATO Stock No. 4320-21-911-2256. Multi-fuel, 100 GPM pump assembly with hose and closed circuit nozzle.

### Pump Specifications

Suction & discharge	2 inch (50 mm)
Housing material	aluminum
Impeller material	aluminum
Shaft sleeve material	stainless steel
Mechanical seal	carbon, ceramic, stainless steel, & Viton
Performance	100 USGPM at 50 ft. head (380 LPM at 15 M head)
	50 USGPM at 70 ft. head (190 LPM at 21 M head)

### Engine Specifications

Type	Diesel 4-cycle, air-cooled	Gasoline 4-cycle, air-cooled
Displacement	12.14 cu. in (199 cc)	9.0 cu. in. (148 cc)
Output	3.8 hp (2.8 kW) at 3600 RPM	3.5 hp (2.6 kW) at 3600 RPM
Fuel tank cap.	0.66 USG (2.5 l)	0.5 USG (1.9 l)

Litre Hosen<sup>TM</sup> pump transfer systems feature Yanmar diesel engines.

Also available:

- compact 12 or 24 VDC units (11 GPM - 22 GPM)
- trailerized refueling systems to 600 GPM available on a custom basis
- stand alone filtering carts and skids

# Customizing Your Pump

To customize your pump follow the key below or contact SEI Industries for assistance.

CPDF

D = Diesel engine  
G = Gasoline engine

100

F = Fuel  
W = Water  
  
100 = 100 USGPM  
50 = 50 USGPM

VAC

V = Inlet and outlet ball valves with Camlock fittings  
Blank = NPT Connections

FM

F = Single stage filter/separator  
C = Single stage monitor  
CF = Two stage filter/separator and monitor  
Mil Spec = Three stage filter/monitor per Mil-F-8901 and Mil-M-81380  
Blank = None  
Note: Specify diesel, gasoline, or jet fuel

W

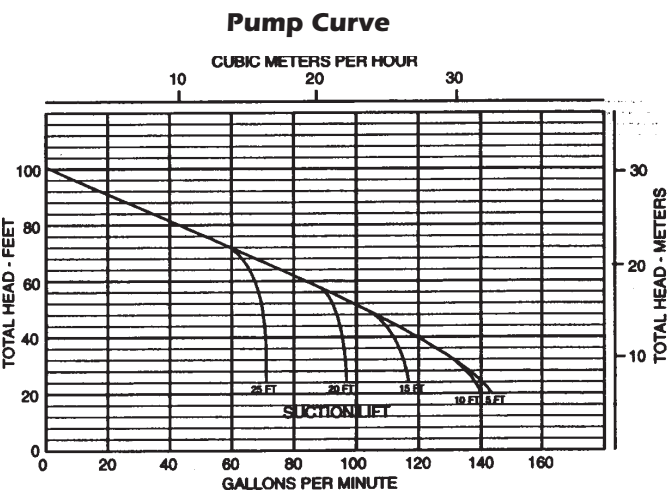
W = Wheels, handles, and footstand  
Blank = none

M

M = Totalizing flowmeter (specify units)

B

A = Auxiliary framework with roll cage  
B = Baseplate only



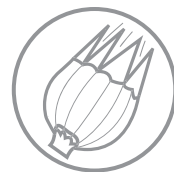
## Auxiliary Equipment

- Hoses
- Nozzles
- Hose reels
- Terra Tank® - collapsible tanks
- Insta-Berm™ - secondary containment systems
- Mini-Berm™ - spill trays

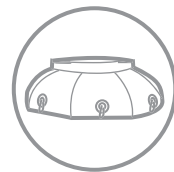
Call SEI Industries to assist you in designing your pump system.

**Note:** All specifications subject to change without notice.

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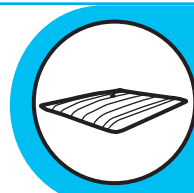
Bambi Bucket



Fireflex



Dragon



Remote Site



Environmental



Emergency Response



**ARCTIC KING**™  
COLLAPSIBLE FABRIC TANK

**SEI**  
INDUSTRIES



# ARCTIC KING™

## COLLAPSIBLE FABRIC TANK

The Arctic King™ collapsible fabric tank is specifically designed for liquid fuel storage in sub-zero climates. Constructed from a proprietary high-durability fabric unique to SEI Industries, the Arctic King™ has excellent UV and hydrolysis resistance for a longer life expectancy than any other urethane collapsible fabric tank in the arctic. With all these features plus its vent system to handle deep snowfalls, the Arctic King™ is ideally suited to even the most extreme arctic conditions.



### COLLAPSIBLE TANK FEATURES

- 100% RF (Radio Frequency) welded
- Fully collapsible
- Rapidly deployable
- Easily foldable, transportable, and relocatable
- Requires minimal site preparation
- Lightweight – saves on transport costs
- Won't rust or corrode

### ADVANCED FABRIC FEATURES

- Exclusive Arctic King™ fabric exceeds US military specifications
- Tank continually adjusts to any volume of liquid so that air cannot accumulate, reducing microbiological growth
- Fuel quality is preserved – extending equipment life and safety
- Suitable for JP-1, JP-4, JP-8, Kerosene, and diesel fuels with less than 60% aromatic content
- 1-year manufacturer's warranty

SEI Industries can supply the Arctic King™ as a stand-alone product or as part of a complete turnkey Arctic Fuel System (pictured above):

- Primary storage tank with arctic vent
- Secondary containment berm
- Rainwater filter system
- Rapid deployability and minimal site preparation
- Fuel transfer, metering, filtration equipment



Arctic Vent



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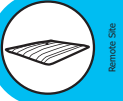
Bomb's Bucket



Firebox



Dragon



Remote Site



Environmental



Emergency Response

# Terra Tank®

## Collapsible Fabric Tank

Terra Tank storage reservoirs solve liquid storage problems. The tank has been specifically designed to combine portability and versatility with economy. The Terra Tank is available in a full range of sizes from 100 to 50,000 USG and larger, if required, for containment of fuel, water, or virtually any liquid.

### Portable & Transportable

The Terra Tank system is easily and quickly installed and can be used immediately. Almost no site preparation is involved. They are lightweight and, because they are fully collapsible, they offer a liquid containment capacity many times larger than their transportable size. The Terra Tank can easily be folded, transported and relocated. Compared to steel tanks, the Terra Tank offers significant cost savings in transportation and site preparation and it won't rust or corrode.

### Proven and Reliable

Terra Tank containers are constructed from high strength industrial fabrics and are crafted to the highest production standards in the industry. The durable fabric of the tank always hugs the surface of the contained fluid so only a few square inches of liquid are exposed directly to the air. This is an important feature for fuel storage, as there is virtually no area where water vapour can condense and contaminate the fuel.



Likewise, dangerous vapours cannot accumulate, as the tank continuously adjusts itself to whatever volume of liquid is in storage. The improved fuel quality provided by Terra Tank storage results in significant cost savings due to longer fuel life and fewer problems with the equipment using the fuel.

### A Terra Tank for your Application

Terra Tank containers are specifically designed for different types of liquid storage and applications. Bladders can be constructed from three types of fabrics: **Petro-Shield™**, **Chem-Shield™**, and **Aqua-Shield™** to contain liquids ranging from jet fuel to chemical solutions. (See specification details on the back.)

# Description of Terra Tanks

## Aqua-Shield™

**Aqua-Shield** tanks are constructed from fabric approved by the National Sanitation Foundation for containment of potable water. **Aqua-Shield** is suitable for containment of some acids, but is not suitable for fuels or oils. **Aqua-Shield** fabric that meets U.S. Military Specification MIL-T-53029C is available.

## Chem-Shield™

**Chem-Shield** tanks are constructed from fabrics which combine excellent durability with resistance to many chemicals. Please contact an SEI representative for specific information on which fluids are acceptable for containment in **Chem-Shield** tanks. This fabric is suitable for containment of sludge, transformer mineral oil, sulphuric acid, PCB transformer oils, 30% chlorine, ammonium hydroxide, ethanol, and fertilizer.

## Petro-Shield™ (Desert King)

**Petro-Shield** tanks are constructed from fabrics which meet U.S. Military Specification MIL-T-52983G for fuel tanks. The following fluids are acceptable for containment in **Petro-Shield** tanks: JP-1, JP-4, JP-8, Kerosene, diesel, fuels with less than 40% aromatic content, and isopropyl alcohol. With optional corrosion proof fittings: Phosphoric acid (10%), sodium hydroxide (60%).

Before ordering, we suggest that you discuss your intended application with an SEI representative. For fuels with more than 40% aromatic content or gasoline, please see the Desert King Tank.

## WARRANTY

The Terra Tank comes with a one year limited warranty and free lifetime annual fabric testing and analysis program.

## Terra Tank Standard Equipment and Optional Fittings

Terra Tanks come standard with a single 2" female NPT fitting for both fill and drain plus a second 2" female NPT fitting at the centre of the tank for vent/overflow protection.

The 2" fill /drain piping kit consists of:

- 1 - 2" nipple
- 1 - 2" 633-A female NPT adaptor
- 1 - 2" 633-B male NPT coupler
- 1 - 2" 90 degree street elbow
- 1- 2" bronze ball valve
- 1- 2" 633-F male NPT adaptor
- 1- 2" 634-B dust cap

The 2" vent/overflow piping kit consists of:

- 1 - 2" nipple
- 1 - 2" 633-A female NPT adaptor
- 1 - 2" 634-B dust cap
- 1 - 2" 633-B male NPT coupler
- 1 - 2" spark-proof vent cap

An optional bottom drain fitting is available. It consists of:

- 1 - 1" nipple
- 1 - 1" 90 degree elbow
- 1- 1" plug

Dry Repair Kit included with all Terra Tanks

Liquid Repair Kit (Dangerous Goods) available at additional cost

A wide range of additional flanges, fittings, valves, etc. can be installed as optional equipment.

## TYPICAL TERRA TANK SPECIFICATIONS

Capacity	Nominal Dimensions Empty		Nominal Dimensions Filled		Approx. Weight Empty		Approx. Shipping Weight		Approx. Shipping Dimensions	
	U.S. Gal/Liters	Feet	Meters	Feet	Meters	lbs	Kg	lbs	Kg	Inches
100/379	4.5 x 4.8	1.4 x 1.5	3.11 x 4.5	0.9 x 1.3	75	35	100	46	36 x 38 x 17"	92 x 97 x 44
250/946	5.0 x 7.0	1.6 x 2.2	4.3 x 6.3	1.3 x 1.9	92	42	130	59	36 x 38 x 17"	92 x 97 x 44
500/1893	9.0 x 7.0	2.8 x 2.2	8.3 x 6.3	2.5 x 1.9	105	48	140	64	36 x 38 x 17"	92 x 97 x 44
750/2839	8.4 x 9.4	2.6 x 2.9	7.3 x 8.3	2.2 x 2.5	115	53	155	71	36 x 38 x 17"	92 x 97 x 44
1000/3785	10.6 x 9.4	3.3 x 2.9	9.5 x 8.3	2.8 x 2.5	136	62	185	84	36 x 38 x 17"	92 x 97 x 44
1500/5678	14.9 x 9.4	4.6 x 2.9	13.8 x 8.3	4.2 x 2.5	151	69	220	100	48 x 48 x 12"	122 x 122x 31
2000/7571	10.6 x 14.0	3.3 x 4.3	8.11 x 12.8	2.4 x 3.9	170	78	240	109	48 x 48 x 12"	122 x 122x 31
2500/9464	12.6 x 14.0	3.9 x 4.3	12.7 x 12.8	3.8 x 3.9	182	83	265	121	48 x 48 x 12"	122 x 122 x 31
3000/11356	14.6 x 14.0	4.5 x 4.3	12.1 x 12.8	3.6 x 3.9	214	98	270	123	48 x 48 x18"	122 x 122 x 46
4000/15142	18.0 x 14.0	5.5 x 4.3	16.5 x 12.8	5.0 x 3.9	225	103	315	143	48 x 48 x18"	122 x 122 x 46
5000/18927	14.6 x 18.8	4.5 x 5.8	12.8 x 16.7	3.9 x 5.0	257	117	357	162	48 x 48 x 24"	122 x 122 x 61
7500/28391	19.9 x 18.8	6.1 x 5.8	17.8 x 16.7	5.4 x 5.0	332	151	412	187	48 x 48 x 36"	122 x 122 x 92
10000/37854	24.6 x 18.8	7.5 x 5.8	22.3 x 16.7	6.7 x 5.0	372	169	500	227	48 x 48 x 40"	122 x 122 x 102
15000/56781	26.7 x 23.4	8.2 x 7.2	24.1 x 20.1	7.3 x 6.1	434	197	575	261	48 x 48 x 40"	122 x 122x 102
20000/75708	27.11 x 28.0	8.3 x 8.6	25.5 x 25.6	7.7 x 7.8	601	273	670	304	48 x 48 x 40"	122 x 122 x 102
50000/189270	52.0 x 32.8	15.9 x 10.0	49.6 x 30.2	15.1 x 9.2	1241	563	1465	665	48 x 84 x 40"	122 x 214 x 102

# FRAME SUPPORTED INSTA-BERM

## FOR SECONDARY CONTAINMENT & SPILL CONTAINMENT

The Frame Supported Insta-Berm by SEI Industries is your safeguard against toxic spillage. It is a fully collapsible fabric berm made from engineered chemical-resistant materials. For larger applications that require superior environmental protection, count on the Frame-Supported Insta-Berm for durable and reliable secondary containment. A Frame Supported Insta-Berm is recommended for use with fuel tanks.

*Complies with EPA CFR 40 part 112*



### DESIGN FEATURES

- Rugged aluminum frame is easily assembled
- 5-foot (1.2 m) frame sections for easy transport
- Fully collapsible for compact storage and easy transport
- Instant deployment with just one tool
- Wide range of standard sizes and custom sizes available
- Easily cleaned and maintained
- Includes eyelet patches for staking down the berm
- Appropriate for containment of waste water, petroleum products and various chemicals

### BERM OPTIONS

- **Certified drawings**
- **Drain fitting** – this fitting can be opened to let out accumulated rainwater, or connected to a hose to pump out spilled product
- **Over-fill protection** – allows precipitation to be drained from the Insta-Berm while containing spilled chemicals
- **RainDrain** – removed hydrocarbons and additives from capture water through gravity drainage
- **High Wind Stakes**

### FABRIC OPTIONS

- **CHEM-SHIELD** – Chemical-resistant fabric
- **ARCTIC-SHIELD** – Chemical resistant fabric for temperatures to -50 degrees Fahrenheit / -45.6 degrees Celcius (Arctic-Shield fabric is not suitable for acids)



Drain fitting



32" Wall Height



Eyelet patches for staking down berm and optional High Wind Stakes



RainDrain



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Bomb Bucket



Fireflux



Dragon



Removal Site



Environmental



Emergency Response

# FRAME SUPPORTED INSTA-BERM

FOR SECONDARY CONTAINMENT & SPILL CONTAINMENT



Bambu Bucket



Fireflex



Dragon



Remote Site



Environmental



Emergency Response

FRAME SUPPORTED INSTA-BERM SPECIFICATIONS						
MODEL	CAPACITY		INSIDE DIMENSIONS (L x W x H)		SHIPPING WEIGHT	
	USG	LITERS	FT. / IN.	METERS	LBS.	KG.
IBFS101020	1060	4012	10' x 10' x 20 "	3.05 x 3.05 x 0.5	156	71
IBFS102020	2119	8023	10' x 20' x 20 "	3.05 x 6.10 x 0.5	242	110
IBFS202020	4239	16046	20' x 20' x 20 "	6.10 x 6.10 x 0.5	350	159
IBFS203020	6358	24069	20' x 30' x 20 "	6.10 x 9.14 x 0.5	458	208
IBFS204020	8478	32092	20' x 40' x 20 "	6.10 x 12.19 x 0.5	567	257
IBFS205020	10597	40115	20' x 50' x 20 "	6.10 x 15.24 x 0.5	675	306
IBFS303020	9538	36104	30' x 30' x 20 "	9.14 x 9.14 x 0.5	589	267
IBFS304020	12717	48138	30' x 40' x 20 "	9.14 x 12.19 x 0.5	719	326
IBFS305020	15896	60173	30' x 50' x 20 "	9.14 x 15.24 x 0.5	850	386
IBFS404020	16956	64185	40' x 40' x 20 "	12.19 x 12.19 x 0.5	872	396
IBFS405020	21195	80231	40' x 50' x 20 "	12.19 x 15.24 x 0.5	1025	465
IBFS505020	26494	100289	50' x 50' x 20 "	15.24 x 15.24 x 0.5	1200	544
IBFS101032	1808	6843	10' x 10' x 32 "	3.05 x 3.05 x 0.8	242	110
IBFS202032	7231	27373	20' x 20' x 32 "	6.10 x 6.10 x 0.8	515	234
IBFS203032	10847	41059	20' x 30' x 32 "	6.10 x 9.14 x 0.8	662	300
IBFS303032	16270	61589	30' x 30' x 32 "	9.14 x 9.14 x 0.8	832	377
IBFS304032	21694	82119	30' x 40' x 32 "	9.14 x 12.19 x 0.8	1003	455
IBFS404032	28925	109491	40' x 40' x 32 "	12.19 x 12.19 x 0.8	1195	542
IBFS405032	36156	136864	40' x 50' x 32 "	12.19 x 15.24 x 0.8	1387	629
IBFS505032	45195	171080	50' x 50' x 32 "	15.24 x 15.24 x 0.8	1602	727

Shipping weight based on 30 oz. fabrics



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