

Patrick Duxbury

From: Lorraine Seale [sealel@inac-ainc.gc.ca]
Sent: April 5, 2007 4:59 PM
To: Alan Ehrlich; Patrick Duxbury
Cc: Ginger Arnold; David Livingstone; Lionel Marcinkoski
Subject: RTL Ice Road Break-through Report

Attachments: RTL spill report and EC letter.pdf; 2006-03-21 SDC email re ice road accident
MV2003C0023-EmailsfromSnowfield-Apr06.pdf



RTL spill report and EC letter...
2006-03-21 SDC email re ice ro...

Hi Alan and Pat,

As undertaken by INAC during yesterday's Sidon and Consolidated hearing, attached is the report concerning the RTL equipment that went through the ice road on Great Slave Lake in March 2006. A letter from Environment Canada to RTL is also in the file.

I've also attached a relevant email from the MVLWB website (on the Snowfields MV2003C0023 permit page, in the file called "Emails from Snowfields Apr06").

Cheers,
Lorraine

Lorraine Seale
Environment & Conservation
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Lisa Hurley

From: Bob Wooley [bwooley@mvlwb.com]
Sent: Monday, March 27, 2006 3:41 PM
To: Lisa Hurley
Subject: FW: Ice Road Accident Report - RTL - Snowfield Mud Lake Kimberlite Sampling Program

From: Mike Beauregard [mailto:mbeau@internorth.com]
Sent: Monday, March 27, 2006 3:22 PM
To: Bob Wooley
Subject: Fw: Ice Road Accident Report - RTL - Snowfield Mud Lake Kimberlite Sampling Program

----- Original Message -----

From: [Mike Beauregard](#)
To: [Brent Edmunds](#)
Cc: [Robert Paterson](#) ; [Larry Fairbairn](#) ; [Peter Lennie-Misgeld](#) ; [Kenneth Dahl](#) ; [Louie Azzolini](#)
Sent: Tuesday, March 21, 2006 11:46 PM
Subject: Ice Road Accident Report - RTL - Snowfield Mud Lake Kimberlite Sampling Program

Attn: NWT WCB Mine Safety

Land Use Permit Holder: Snowfield Development Corp of Vancouver
Contractor: RTL - Robinson Enterprises Ltd of Yellowknife

Dear Mr. Edmunds

During mid-afternoon of Tuesday March 14th a semi-truck and back-hoe belonging to RTL fell through 3 ft+ of ice and into 65 ft of water. The driver was fortunately able to step away from the plunging equipment without injury. Damage to the cabs of both back-hoe and truck were apparently sustained. I did not witness the accident but I was on the ice road on that day, going by the unit while on its way out and later meeting the RTL crew during their return.

The accident occurred approximately 43 km out from Yellowknife on an ice-road that follows the shore of Great Slave Lake to the southeast of Yellowknife. This ice-road of 65 km length commences near the School Draw ramp in town and ends at Snowfield Development Corp's exploration camp south of Burnt Island. The 2006 ice-road was the initial step in the proposed extraction of a 500 ton sample from the Mud Lake kimberlite sill to be carried out by RTL.

The initial pass on the ice road route was conducted by RTL on Weds March 8 by Hagland tracked vehicle, operated by Donnie Robinson and profiler, operated by Shane Langois. While an abundance of rough ice was noted, the ice thickness was determined to be between 30 and 40 inches from radar profiling and augering.

The plowing of the ice road under the direction of RTL foreman Wayne Thompson commenced March 9. Plowing was temporarily stopped by a pressure ridge at km 46. This spot was bridged by a set of steel ramps on Saturday March 11.

During the return of the plow truck on March 11, a new pull-apart crack was noted at km 43, which was then bridged by a set of steel ramps in the morning of Sunday March 12. Pickup trucks were subsequently able to cross the crack without resorting to the ramp bridge. The ramp bridge at km 43 was used repeatedly by plow trucks to finish the last 20 km of the ice road. An airstrip on the lake ice offshore of the camp was also plowed. A semi-truck carrying a D4 Cat went to the camp in the afternoon of March 12.

The D4 Cat then tramped down an already established 1 km long access winter trail between the camp and the sample site. A working meeting on the morning of Tuesday March 14 was held at the sample site and attended by Land Use, RTL, NWT Rock and Snowfield representatives. A representative from YK Dene Land and Environment was unable to attend.

Following the accident, RTL informed Snowfield on Friday March 17, of their withdrawal from the bulk sample program citing insufficient amount of time available to attempt:

1. an alternate ice-road routing
2. removal of 10,000 to 12,000 yards of overburden/rock
3. extraction of bulk sample with top of sill lying at 45 ft depth.
4. demobilization of equipment and trailer camp.
5. Site remediation.

The initial limiting factor would have been the loss of the winter access trail, once the thaw landed.

On Sunday March 19, RTL walked its D4 Cat from the camp and pulled the set of ramps from the km 46 pressure ridge. Four persons working for Snowfield brought two pickups back to town March 19.

The D4 Cat and one set of pulled ramps are presently on the far side of the hole at km 43. The ramps at km 43 have yet to be removed.

I am presently trying to re-establish ice road access beyond km 43 in order to get back out to camp by pickup truck following two days of blowing snow. Should you have further questions, please call or email.

Regards
Mike Beauregard
Contract Geologist

Environment
CanadaEnvironnement
Canada

Environmental Enforcement Division
Suite 301, 5204-50th Ave Yellowknife NT
X1A 1E2

August 30, 2006
Shane Langlois
Project Manager
RTL – Robinson Enterprises Ltd.
PO Box 1807 – 350 Old Airport Rd.
Yellowknife NT - X1A 2P4

Shane:

**Re: Truck and Excavator Thru Ice – Great Slave Lake
File # 4408 2006 03 15 001**

This is to inform you of Environment Canada's decision with respect to an incident in which a 1970 Hayes tandem axle, 6X6 plow truck, a 1998 John Deere excavator and a 16 wheel lowboy and pony owned by RTL – Robinson Enterprises Ltd. (RTL) broke through the ice of Great Slave Lake, NT on March 14, 2006, at approximately 3.5 km southeast of Pilot Islands (62° 11' 57" N - 114° 04' 23" W).

Reports provided by RTL identified that the above mentioned equipment is submerged and is resting on the bottom of Great Slave Lake in approximately 20 meters of water. That during the weeks after that incident, five "in-situ burns" in conjunction with absorbent pad deployment was conducted by RTL to destroy and remove hydrocarbons leaking from the submerged equipment. Additionally, it was reported that RTL drilled several holes in the ice surrounding the "break thru" area in an effort to identify if any released hydrocarbons were migrating away from the spill site. RTL reported that inspections of the spill site conducted during "open water" did not identify any hydrocarbon products on the surface of Great Slave Lake. Subsequently, RTL is now of the opinion that, the vast majority of the hydrocarbons associated with the submerged equipment has been removed.

Furthermore, RTL has committed in writing to drill additional test holes during the winter of 2007 in an effort to identify any residual hydrocarbon pockets which may have formed under the ice. Additionally RTL has committed to monitoring the site by boat during open water seasons every year.

At the request of Environment Canada, RTL explored options to extract the submerged equipment. RTL identified that the removal of the equipment during the winter of 2006 was problematic due to inconsistent ice conditions and pressure ridges prevalent in the immediate area, resulting in safety concerns for divers and equipment operators associated with an extraction process.

Additionally RTL identified that extraction of the equipment would be possible during open water by a combination of airbag and barge process. However, weight restrictions make it impossible to break the surface of the water thus requiring the equipment to be floated near the shore of Great Slave Lake and then dragged onto land. RTL has suggested that this process would cause safety concerns to divers an increased risk of residual hydrocarbon release and potential fish habitat damage.

Based on the above information, RTL has requested that all submerged equipment remain as is on the bottom of Great Slave Lake, near Pilot Islands.

Canada

Environment Canada's mandate is to identify any possible *Fisheries Act* issues related to deleterious substances which may impact fish habitat. In particular, Environment Canada enforces section 36(3) of the *Fisheries Act*, R.S.C., 1985, cF-14 which states... "Subject to subsection (4), no person shall deposit or permit the deposit of a deleterious substance of any type in water frequented by fish or in a place under any conditions where the deleterious substance or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water".

The *Fisheries Act* defines a "deleterious substance" as (a) any substance that, if added to any water, would degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water...".

Based on Environment Canada's review of the reports provided by RTL and discussions held with the Department of Indian and Northern Affairs and Fisheries and Oceans Canada, Environment Canada accepts RTL's proposal to leave the above identified submerged equipment in place, as is.

Environment Canada's decision was based on the facts of this occurrence, taking into consideration the volume and toxicity of the released substances and the potential impact on the environment and human health. It should be noted that, any future occurrences of this nature will be evaluated on their own merit and may require additional mitigation by the responsible party.

It is understood that RTL will uphold the commitment to perform the 2007 drilling inspection as well as yearly open water inspections. That RTL will substantiate the inspection results in the form of a written report(s) to Environment Canada which should be provided within 30 days of the inspection.

It is understood that RTL is the owner of the submerged equipment and the responsible party. If it is identified or determined that the submerged equipment is leaking a deleterious substance into the waters of Great Slave Lake, or if complaints are raised at a latter date, RTL will be responsible for any and all mitigative measures required and may be liable to enforcement action pursuant to the *Fisheries Act*.

If you require any additional information regarding Section 36(3) of the *Fisheries Act*, or need further clarification concerning this matter, please feel free to contact the undersigned.

Sincerely

Ken Russell
Enforcement Officer
Environmental Enforcement Division
Suite 301 - 5204 - 50th Ave
Yellowknife NT, X1A 1E2
867 669 4731

Cc: Craig Broom Environment Canada
Ken Dahl Indian and Northern Affairs Canada
Ernie Watson Fisheries and Oceans Canada



ROBINSON Enterprises Ltd.

**RTL Robinson Enterprises Ltd.
Evaluation of Recovery Options
Drybones Break-Thru
Prepared by S. Langlois
June 27, 2006**

Presented to:

Ken Dahl – INAC
Clint Ambrose – INAC
Ed Hornby – INAC
Craig Broome – EC
Ernie Watson – Fisheries

Copy Provided to:
Ken Cooper – Coast Guard

RTL Robinson Enterprises Ltd.
Evaluation of Recovery Options
Prepared by S. Langlois, shane_langlois@rtl.ca
June 27, 2006

Brief History:

Date of Incident: March 14, 2006

Location: Great Slave Lake, Grid: UTM, Datum: NAD 83, 11 V 652266 6899832
(approximately 3.5 km SE of Pilot Islands)

Depth of Water: approximately 20+ meters

Equipment Lost:

- 1970 Hayes tandem axle, 6x6 plow truck
- 1998 John Deere tracked excavator
- 16 wheel lowboy & pony

Approximate weight of Equipment: 50,000 kg's

Fuel onboard Equipment: 900 liters (approximate) *combined*

Hydraulic Oil onboard Equipment: 160 liters+/- of Imperial MD 30 is sealed
pressurized container

Recovery Options

Winter Removal:

Removing the equipment from a frozen lake surface has been considered, however, the weight of the excavator is approximately 67,000 lb's and is consequently, too heavy to be safely supported by a crane on the ice for such a lift. This area is known to have prevalent pressure ridges throughout; this is problematic as it produces inconsistent ice conditions which further complicate the operation and safety of both crews and heavy equipment.

Pros:

- None

Cons:

- Safety hazard for crews on the ice
- Safety hazard for divers working under the ice

Summer Removal:

It is possible to lift the equipment to the surface of the lake with either a barge carrying a crane, or by using air bags. However, it is not possible to break the surface of the water with a heavy load of this physical size. Depending on what location the lifting lines will be secured to, the excavator will draw between 10 to 20 feet of water. Once the excavator is finally brought to the surface it will be secured to the barge and brought to shore. As the barge approaches land, it will run aground relative to the draught of the equipment. The equipment will then be released to settle on the bottom. Winching equipment such as a large bulldozer will be mobilized to land and anchored on shore. Divers will re-attach the cable to the equipment and it will be dragged along the lake bottom to shore. Once on land, it will be disconnected from the bulldozer and re-connected to a winch system on the barge, where it will subsequently be pulled back onto the flatbed surface of the barge for final delivery to Yellowknife.

Pros:

- The equipment is removed from the lake

Cons:

- There is risk to under water divers who have to manipulate slings and cables in an attempt to connect to the equipment which is sitting on its side, and submerged in silt at the lake bottom
- By moving the equipment, residual fluids that are contained in the equipment will be released into the environment and will not be controllable.
- The equipment is submerged in silt, this material will be disturbed.
- Depending on how close the equipment can be moved to shore with the barge, excessive damage will be created to the lake bottom when the excavator is winched to land.
- There will be some adverse affects to the shoreline where the equipment will be pulled to shore, also, the bulldozer will have to traverse the shoreline to anchor itself, and this too will cause damage.

Recommendation

RTL believes that moving this equipment will create more environmental damage than leaving it in its current position.

RTL has investigated the site nearly ten times since March 15, 2006, five of these site visits included in-situ burning and clean up by way absorbent pads. It is our belief that although it is impossible to remove all fluids from the equipment, the vast majority has been removed and the site is posing very little risk to the environment.

In regards to a navigational concern of equipment of this size, we feel that due to the configuration of the equipment (excavator laying on its side) and the soft bottom of the lake, this equipment will extend less than nine feet from the bottom, leaving over 65 feet of clearance to the surface.

This has been an unfortunate incident, though, not un-precedented. It is our understanding that many such incidents have occurred in years past including:

- Tug lost on Great Slave Lake
- Barge load of cars en route to the Mackenzie, lost on Great Slave Lake
- Cat Train, Hardisty Lake
- Plow Truck on the Great Bear Lake ice road
- D8 Cat at Cambridge Bay

With the agreement of all parties, RTL would like to remove the existing buoy marking the accident location, and leave the equipment were it lays.

Although RTL will leave this equipment in its current location, we will not stop monitoring the site, it will be checked every year by boat in the summer and test holes at the incident location will be drilled in the winter of 2007 to look for residual fluids pockets under the ice.

APPENDIX I

**Dimension and Specifications
of
John Deere Excavator**

ENGINE

It's John Deere-engineered and manufactured. Replaceable wet-type cylinder liners are spun cast and machined for uniform wall thickness to assure even heat dissipation. Piston spray cooling contributes to long component life. A dynamically-balanced crankshaft assures smooth operation. Turbocharged for maximum performance.

Engine: John Deere 6076A - Turbocharged and Aftercooled
 Rated power at 2,000 rpm 220 SAE net hp (164 kW)
 232 SAE gross hp (173 kW)
 Cylinders 6
 Displacement 456 cu. in. (7.638 L)
 Maximum net torque at 1,400 rpm 650 lb.-ft. (881 Nm)
 Fuel consumption, typical 4 to 9 gal./hr. (15 to 34 L/h)
 Cooling fan suction-type viscous drive
 Electrical system 24-volt w/45-amp alternator
 Batteries (two 12 volt) reserve capacity: 180 min.

HYDRAULIC SYSTEM

Sophisticated, yet simple; state-of-the-art, yet easy to operate. You get the best of both worlds with the 892E LC's hydraulic system. This closed center system uses two axial piston pumps. A microprocessor ties the system with the engine to allow the operator to tailor hydraulic performance to particular job situations. A soft touch keypad control to the operator's right allows the desired performance to be tuned in with the touch of a button or two. This load sensing, speed sensing, variable flow system delivers smooth response even when the operator uses more than one function at the same time. The operator is in complete control at all times and can override any of the preset hydraulic modes or engine settings with the simple touch of a button.

Main pumps 2 variable-displacement axial pistons
 Maximum rated flow 2 x 72 gpm (2 x 273 L/min.)
 Pilot pump one gear
 Maximum rated flow 9.3 gpm (35 L/min.)
 Pressure setting 668 psi (4605 kPa)
 System operating pressure
 Implement circuits 4,270 psi (29 440 kPa)
 Travel circuits 4,900 psi (34 340 kPa)
 Swing circuits 3,540 psi (26 480 kPa)
 Oil filtration
 One 10-micron full flow return filter with bypass
 One pilot oil filter
 One suction filter

Cylinders	Bore	Rod Diameter	Stroke
Boom (2)	5.7 in. (145 mm)	3.9 in. (100 mm)	60.2 in. (1530 mm)
Arm (1)	5.5 in. (145 mm)	4.3 in. (110 mm)	71.7 in. (1820 mm)
Bucket (1)	5.7 in. (145 mm)	3.7 in. (95 mm)	49.2 in. (1250 mm)

SWING MECHANISM

Multiple planetary gearing is driven by an axial-piston, high-torque hydraulic motor. Ring and pinion gears are induction hardened for long life. The multiple, wet-disk swing brake is spring applied, hydraulically released. The single 90-ball swing bearing is sealed top and bottom.

Swing speed 0-12 rpm

UNDERCARRIAGE

Heavy-duty rollers and chain are designed to stand up to the side-to-side stress of excavator work. The strong box-section track frame comes with a track guide at the front idler location and center of the frame. The track frames are welded to the center section to eliminate any need for periodic tightening and are designed to resist the buildup of mud and debris.

Carrier rollers (per side) 2
 Track rollers (per side) 9
 Idlers (per side) 1
 Shoes, triple semigrouser (per side) 50
 Track guides front and center
 Track adjustment hydraulic
 Travel speed Low Medium High
 mph 0-1.6 0-2.4 0-3.4
 km/h (0-2.6) (0-3.9) (0-5.5)
 Drawbar pull 52,120 lb. (231 kN)
 Tractive gradability 123% (51 deg.)
 Off-level operating limit for oil sump 100% (45 deg.)

Ground Pressure Data

Shoe Width/ Grouser	Average Ground Pressure	Recommended Application
24 in./triple (600 mm)	6.81 psi (46.9 kPa)	Rocky terrain and stumps
32 in./triple (800 mm)	5.62 psi (38.7 kPa)	General/soft terrain

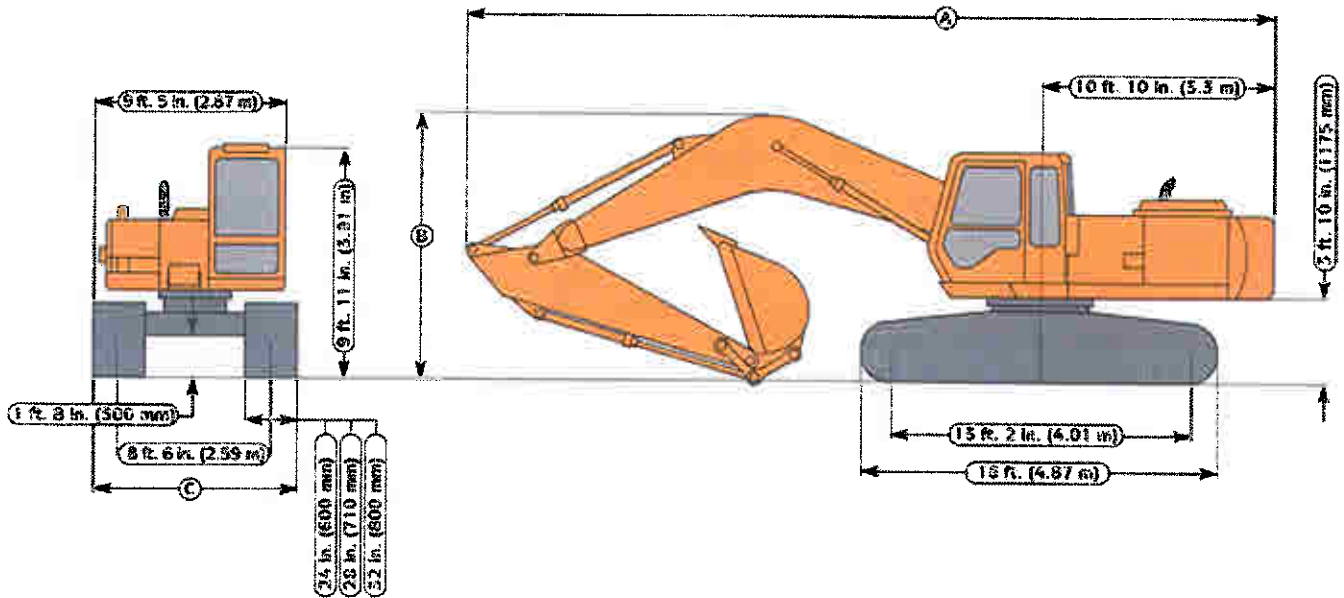
CAPACITIES

Fuel tank 135 gal. (510 L)
 Cooling system 34 qt. (32 L)
 Engine lubrication, including filter 6.3 gal. (24 L)
 Hydraulic system 82 gal. (310 L)
 Planetary propel drive (each) 6.3 qt. (6 L)
 Swing drive 13.8 qt. (13 L)

OPERATING WEIGHTS

Weights	lb.	kg
Operating weight with full fuel tank, 175-lb. (79 kg) operator, 54-in. (1372 mm) bucket, 13 ft. 1 in. (4.0 m) arm, 14,770-lb. (6700 kg) counterweight and 32-in. (800 mm) triple grouser shoes	67,450	30 595
Undercarriage		
Shoe width:		
24-in. (600 mm) triple grouser shoes	22,465	10 190
32-in. (800 mm) triple grouser shoes	24,515	11 120
Component Weights:		
Upperstructure with full fuel tank (less front attachments and 14,770-lb. [6700 kg] counterweight)	14,380	6523
One-piece boom (with arm cylinder)	5,838	2647
Arm, 8 ft. 9 in. (2.7 m) with bucket cylinder and linkage	3,435	1558
Arm, 10 ft. 6 in. (3.2 m) with bucket cylinder and linkage	3,673	1665
Arm, 13 ft. 1 in. (4.0 m) with bucket cylinder and linkage	3,907	1772
Boom lift cylinders (2) total weight	1,318	598
Counterweight	14,770	6700
2.3 cu. yd. (1.76 m ³), 54 in. (1370 mm) bucket	2,557	1160

DIMENSIONS



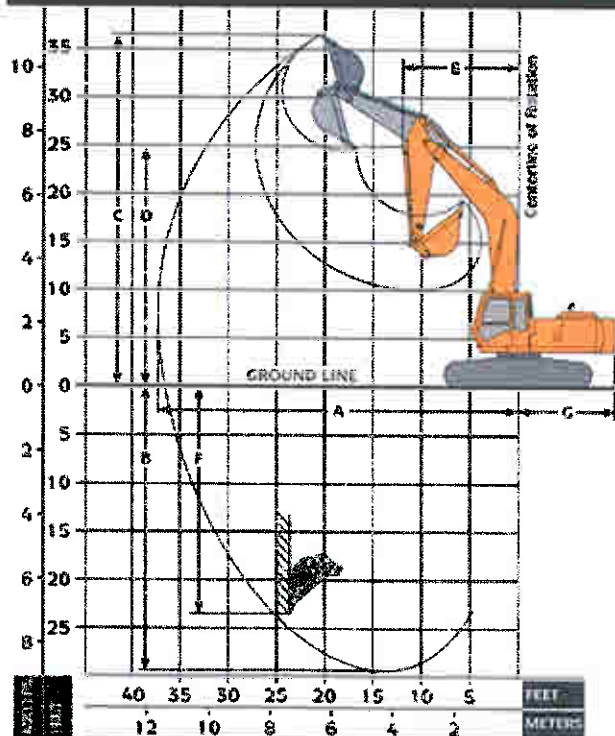
A) With 8 ft. 9 in. (2.7 m) arm 36 ft. 3 in. (11.06 m)
 With 10 ft. 6 in. (3.2 m) arm 35 ft. 11 in. (10.94 m)
 With 13 ft. 1 in. (4.0 m) arm 36 ft. 1 in. (11.01 m)

B) With 8 ft. 9 in. (2.7 m) arm 11 ft. 2 in. (3.41 m)
 With 10 ft. 6 in. (3.2 m) arm 10 ft. 6 in. (3.20 m)
 With 13 ft. 1 in. (4.0 m) arm 11 ft. 5 in. (3.49 m)
 C) With 8 ft. 6 in. (2.59 m) undercarriage and
 24-in. (600 mm) shoes 10 ft. 6 in. (3.19 m)
 32-in. (800 mm) shoes 11 ft. 1 in. (3.39 m)

OPERATING INFORMATION

	8 ft. 9 in. (2.7 m) Arm Length	10 ft. 6 in. (3.2 m) Arm Length	13 ft. 1 in. (4.0 m) Arm Length
Arm force with 54-in. (1370 mm) heavy-duty bucket.....	36,970 lb. (164.4 kN)	30,645 lb. (136.3 kN)	26,340 lb. (117.2 kN)
Bucket tangential force with 54-in. (1370 mm) heavy-duty bucket.....	41,620 lb. (185.1 kN)	41,620 lb. (185.1 kN)	41,620 lb. (185.1 kN)
Lifting capacity over front @ ground level 20-ft. (6.1 m) reach.....	23,401 lb. (10,615 kg)	22,977 lb. (10,422 kg)	22,147 lb. (10,046 kg)
A Max. reach.....	34 ft. 8 in. (10.57 m)	36 ft. 5 in. (11.10 m)	38 ft. 11 in. (11.86 m)
A' Max. reach @ ground level.....	34 ft. 0 in. (10.36 m)	35 ft. 9 in. (10.90 m)	39 ft. 4 in. (11.68 m)
B Max. digging depth.....	22 ft. 5 in. (6.84 m)	24 ft. 3 in. (7.36 m)	26 ft. 10 in. (8.18 m)
B' Max. digging depth @ 8 ft. (2.44 m) flat bottom.....	21 ft. 10 in. (6.65 m)	23 ft. 8 in. (7.21 m)	26 ft. 5 in. (8.05 m)
C Max. cutting height.....	32 ft. 4 in. (9.85 m)	33 ft. 6 in. (10.22 m)	34 ft. 9 in. (10.60 m)
D Max. dumping height.....	22 ft. 4 in. (6.81 m)	23 ft. 4 in. (7.12 m)	24 ft. 7 in. (7.49 m)
E Min. swing radius.....	14 ft. 11 in. (4.54 m)	14 ft. 7 in. (4.45 m)	14 ft. 4 in. (4.38 m)
F Max. vertical wall.....	18 ft. 5 in. (5.61 m)	21 ft. 3 in. (6.48 m)	24 ft. 2 in. (7.36 m)
C Tail swing radius.....	10 ft. 10 in. (3.30 m)	10 ft. 10 in. (3.30 m)	10 ft. 10 in. (3.30 m)

DIGGING DEPTH AND REACH



LIFT CAPACITIES

Ratings at bucket lift hook, machine equipped with 52-in. (800 mm) shoes, 2.5 cu. yd. (1.76 m³) 54 in. (1370 mm) wide, 2557 lb. (1160 kg) bucket and situated on firm, uniform supporting surface. Total load includes weight of cables, hook, etc. **Boldface** type indicates hydraulic-limited capacities. **Lightface** type indicates stability-limited capacities, in lb. (kg). Figures do not exceed 87 percent of hydraulic capacities or 75 percent of weight needed to tip machine.

Equipped with 8 ft. 9 in. (2.7 m) arm

○ OVER SIDE □ OVER FRONT

Load Point Height	5 ft. (1.52 m)	10 ft. (3.05 m)	15 ft. (4.57 m)	20 ft. (6.10 m)	25 ft. (7.62 m)	30 ft. (9.15 m)	35 ft. (10.67 m)
20 ft. (6.10 m)					12,222 (5543)	12,669 (5747)	
15 ft. (4.57 m)				15,863 (7198)	15,863 (7198)	11,788 (5347)	13,716 (6222)
10 ft. (3.05 m)				15,908 (7216)	19,237 (8726)	11,170 (5067)	15,337 (6957)
5 ft. (1.52 m)				14,810 (6718)	22,112 (10 030)	10,575 (4757)	16,012 (7671)
Ground Line				14,227 (6453)	23,401 (10 615)	10,161 (4609)	17,063 (7740)
- 5 ft. (- 1.52 m)			22,107 (10 028)	22,107 (10 028)	14,059 (6382)	25,081 (10 470)	9988 (4531)
- 10 ft. (- 3.05 m)		32,205 (14 608)	32,205 (14 608)	20,093 (9114)	20,093 (9114)	14,214 (6447)	21,209 (9620)
- 15 ft. (- 4.57 m)			21,263 (9645)	21,263 (9645)	14,690 (6663)	17,021 (7721)	

Equipped with 10 ft. 6 in. (3.2 m) arm

Load Point Height	5 ft. (1.52 m)	10 ft. (3.05 m)	15 ft. (4.57 m)	20 ft. (6.10 m)	25 ft. (7.62 m)	30 ft. (9.15 m)	35 ft. (10.67 m)
20 ft. (6.10 m)					11,487 (5197)	11,487 (5197)	7481 (3393)
15 ft. (4.57 m)					11,924 (5409)	12,839 (5740)	8445 (3831)
10 ft. (3.05 m)			25,175 (11 419)	25,708 (11 661)	16,241 (7367)	17,842 (8063)	11,379 (5116)
5 ft. (1.52 m)				15,338 (6821)	21,092 (9567)	10,633 (4823)	16,201 (7349)
Ground Line			20,003 (9073)	20,003 (9073)	14,288 (6481)	22,977 (10 422)	10,144 (4601)
- 5 ft. (- 1.52 m)		13,847 (6281)	13,847 (6281)	19,294 (8752)	19,294 (8752)	13,989 (6345)	23,254 (10 548)
- 10 ft. (- 3.05 m)		25,766 (11 688)	25,766 (11 688)	22,393 (10 157)	24,656 (11 184)	14,072 (6350)	21,990 (9975)
- 15 ft. (- 4.57 m)		18,717 (8490)	18,717 (8490)	22,939 (10 405)	23,954 (10 858)	14,358 (6513)	16,764 (7511)

Equipped with 13 ft. 1 in. (4.0 m) arm

Load Point Height	5 ft. (1.52 m)	10 ft. (3.05 m)	15 ft. (4.57 m)	20 ft. (6.10 m)	25 ft. (7.62 m)	30 ft. (9.15 m)	35 ft. (10.67 m)
20 ft. (6.10 m)						9049 (4105)	16,089 (7376)
15 ft. (4.57 m)						8814 (3998)	16,864 (7637)
10 ft. (3.05 m)			21,403 (9709)	21,403 (9709)	15,806 (7170)	15,806 (7170)	11,712 (5313)
5 ft. (1.52 m)			25,971 (10 873)	28,671 (13 065)	15,616 (7083)	19,689 (8843)	10,979 (4980)
Ground Line			22,503 (10 207)	27,538 (12 491)	14,820 (6652)	22,147 (10 044)	10,371 (4704)
- 5 ft. (- 1.52 m)		19,219 (8803)	19,219 (8803)	22,074 (10 013)	36,124 (11 650)	14,097 (6394)	23,277 (10 533)
- 10 ft. (- 3.05 m)	18,303 (8302)	18,303 (8302)	20,237 (9452)	20,837 (9452)	22,125 (10 036)	28,984 (13 198)	13,955 (6330)
- 15 ft. (- 4.57 m)		21,592 (9784)	21,592 (9784)	22,506 (10 208)	27,282 (12 375)	14,122 (6406)	20,800 (9438)
- 20 ft. (- 6.10 m)		38,611 (17 071)	38,611 (17 071)	20,975 (9514)	20,975 (9514)	14,652 (6666)	18,065 (8286)

BUCKETS

A full line of buckets is offered to meet a wide variety of applications. All capacities are SAE heaped* ratings. The buckets have an adjustable bushing feature for side clearance, with the exception of the ditching bucket. Tooth selection includes either the John Deere Fanggs[®], Standard, Tiger, Twin Tiger, Abrasion panel or Flare, or the ESCO (Vertalok) Standard, Tiger, Twin Tiger or Flare tooth. Replaceable cutting edges are available through John Deere parts. Optional side cutters add 6 inches (150 mm) to bucket widths.

Type Bucket	Bucket Width		Bucket Capacity*		Weight		Bucket Dig Force		Arm Dig Force 6 ft. 9 in. (2.7 m)		Arm Dig Force 10 ft. 6 in. (3.2 m)		Arm Dig Force 15 ft. 1 in. (4.0 m)		Bucket Tip Radius		No. Teeth
	in.	mm	yd ³	m ³	lb.	kg	lb.	kN	lb.	kN	lb.	kN	lb.	kN	in.	mm	
General Purpose Plate Lip	30	760	1.20	0.92	1770	803	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	4
	36	915	1.48	1.13	1872	849	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	4
	42	1065	1.75	1.34	1998	906	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	5
	48	1220	2.03	1.55	2115	959	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	6
	54	1370	2.30	1.76	2215	1005	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	7
60	1525	2.59	1.98	2338	1060	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	7	
General Purpose High Capacity	30	760	1.26	0.96	2420	1097	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	4
	36	915	1.56	1.19	2550	1156	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	4
	42	1065	1.85	1.41	2710	1229	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	5
	48	1220	2.15	1.64	2815	1277	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	6
	54	1370	2.45	1.87	2982	1352	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	7
60	1525	2.74	2.10	3089	1401	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	7	
Heavy-Duty Plate Lip	36	915	1.48	1.13	2136	970	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	4
	42	1065	1.75	1.34	2210	1002	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	5
	48	1220	2.03	1.55	2324	1054	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	6
	54	1370	2.30	1.76	2557	1160	41,620	185.1	36,970	164.4	30,645	136.3	26,340	117.2	62.5	1588	6
Heavy-Duty High Capacity	30	760	1.26	0.96	2516	1141	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	4
	36	915	1.56	1.19	2781	1261	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	4
	42	1065	1.85	1.41	3120	1415	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	5
	48	1220	2.15	1.64	3318	1505	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	6
54	1370	2.45	1.87	3562	1615	37,430	166.5	35,490	157.9	29,550	131.4	25,525	113.5	69.5	1765	6	
Severe-Duty Cast Lip	42	1065	1.75	1.34	2774	1258	40,020	178.0	36,425	162.0	32,245	134.5	26,045	115.8	65.0	1651	5
	48	1220	2.03	1.55	2815	1277	40,020	178.0	36,425	162.0	32,245	134.5	26,045	115.8	65.0	1651	5
Severe-Duty Plate Lip	30	760	1.26	0.96	2850	1292	35,150	156.3	34,595	153.9	28,885	128.5	25,050	111.3	74.0	1880	5
	36	915	1.56	1.19	3024	1371	35,150	156.3	34,595	153.9	28,885	128.5	25,050	111.3	74.0	1880	4
	42	1065	1.85	1.41	3345	1516	35,150	156.3	34,595	153.9	28,885	128.5	25,050	111.3	74.0	1880	4
48	1220	2.15	1.64	3522	1597	35,150	156.3	34,595	153.9	28,885	128.5	25,050	111.3	74.0	1880	5	
Ditching	72	1830	1.66	1.27	2531	1146	51,005	226.9	39,695	176.6	32,635	145.2	27,795	123.6	51.0	1295	0

BUCKET SELECTION CHART

RECOMMENDED BUCKET SIZE*

lb/yd ³	kg/m ³	MATERIAL (loose weight)	General-Purpose		Heavy-Duty	
			cu. yd.	m ³	cu. yd.	m ³
700	420	Wood chips	9.0	6.9	—	—
750	440	Peat, dry	8.0	6.1	—	—
950	560	Cinders	5.5	4.2	—	—
1170	690	Peat, wet	5.0	3.8	—	—
1600	950	Topsoil	4.0	3.0	—	—
1780	1050	Coal	3.5	2.7	3.25	2.5
2100	1250	Caliche	1.75 to 2.50	1.3 to 1.9	1.50 to 2.50	1.1 to 1.9
2100	1250	Earth, loam	2.75	2.1	2.50	1.9
2250	1350	Shale	2.75	2.1	2.50	1.9
2400	1420	Sand, dry	2.75	2.1	2.50	1.9
2500	1490	Clay, dry	2.00 to 2.50	1.5 to 1.9	1.75 to 2.25	1.3 to 1.7
2550	1510	Earth, dry	2.00 to 2.50	1.5 to 1.9	1.75 to 2.25	1.3 to 1.7
2600	1540	Limestone, broken or crushed	1.65 to 2.25	1.2 to 1.7	1.50 to 2.00	1.1 to 1.5
2700	1600	Earth, wet	2.00 to 2.50	1.5 to 1.9	1.75 to 2.25	1.3 to 1.7
2800	1680	Clay, wet	2.00 to 2.50	1.5 to 1.9	1.75 to 2.25	1.3 to 1.7
2800	1680	Rock, granite, blasted and broken	1.65 to 2.75	1.2 to 2.1	1.50 to 2.50	1.1 to 1.9
2850	1690	Sand, moist	2.25	1.7	2.10	1.6
2900	1720	Sand and gravel, dry	2.25	1.7	2.15	1.6
3100	1840	Sand, wet	2.15	1.6	2.00	1.5
3400	2020	Sand and gravel, wet	2.00	1.5	1.85	1.4

*Contact your John Deere dealer for optimum bucket and attachment selections. These recommendations are for general conditions and average use. Larger buckets may be possible when using light buckets, for flat and level operations, less compacted materials, and volume loading applications such as mass excavation applications in ideal conditions. Smaller buckets are recommended for adverse conditions such as off-level applications and uneven surfaces. Bucket capacity indicated is SAE heaped.

APPENDIX 2

Previously Submitted Reports, Correspondence & Site Visits, Complete with Images

- March 28, 2006 – RTL Drybones Break-thru Summary
- April 28, 2006 – INAC site visit e-mail
- May 1, 2006 – RTL Drybones Break-thru Clean-up Report
- May 10, 2006 – RTL Drybones Break-thru Clean-up Report
- June 6, 2006 – INAC removal Inquiry e-mail & RTL Site Inspection
Report and Meeting Request
- June 27, 2006 – RTL Site Inspection Report e-mail
- June, 27, 2006 – RTL Meeting Request e-mail

**RTL Robinson Enterprises Ltd.
Drybones Break-thru, Summary
Prepared by S. Langlois
March 28, 2006**

Date of Incident: March 14, 2006

Location: Great Slave Lake, Grid: UTM, Datum: NAD 83, 11 V 652266 6899832
(approximately 3.5 km SE of Pilot Islands)

Depth of Water: approximately 20 meters

Equipment Lost:

- 1970 Hayes tandem axle, 6x6 plow truck
- 1998 John Deere tracked excavator
- 16 wheel lowboy & pony

Approximate weight of Equipment: 45,000 kg's

Fuel onboard Equipment: 900 liters (approximate)

Hydraulic Oil onboard Equipment: 160 liters+/- of Imperial MD 30 is sealed
pressurized container

Operator: Paul Clark

Superintendent on Duty: Wayne Thompson

Preliminary Discussions:

RTL was requested by Mike Beauregard of Snowfield Developments to open a road to their site located at Drybones Bay with intent to perform a bulk sample. Mike indicated that the ice was particularly rough this year and it was difficult to get around. Mike did preliminary reconnaissance via snow machine and ultimately established a route from the air via aircraft.

Summary/Timeline

March 7, 2006

- Opened road with two Hildebrand all-terrain vehicles followed by a 4x4 pick-up truck performing an ice profile.

March 8 & 9, 2006

- Widened road with 6 x 6 plow trucks

March 10, 2006

- Continued to plow
- Wayne inspected ice ridges/cracks and erected signage to notify the public that the road was for private use only

March 11, 2006

- Widened road with 6 x 6 plow trucks
- Installed bridge
- Mobilized D4 to Drybones Bay

March 12, 2006

- Widened road with 6 x 6 plow trucks
- Installed second bridge east of accident site

March 13, 2006

- Wayne inspected bridges
- Drilled test holes to establish ice conditions

March 14, 2006

- Widened road with 6 x 6 plow trucks
- Site meeting (prior to accident)
- 15:30 hrs, Lost equipment at location of first bridge (bridge did not sink)
- Wayne marked site with survey stakes, paint and ribbon

March 14, 2006 reporting, performed by Mike Suchlandt, RTL Safety Manager

- Spill report submitted at 15:57 hrs
- Advised Ken Russell via telephone, approximately 16:30 hrs
- Advised Harvey Gaukel via telephone, approximately 16:30 hrs
- Advised Ken Dahl via telephone, approximately 16:30 hrs
- Left message for Davis Jessiman approximately 16:45
- Left messages for Ed Hornby approximately 16:45

March 15, 2006

- Wayne and Shane Langlois inspected the site, drilled 7 holes randomly around the perimeter of the break-thru to establish ice thickness and to check for fuel
- Measurements of the ice recorded between 94 cm and 107 cm
- No fuel was found in the test holes, some fuel was visible in the opening

March 16, 2006

- In-situ burn of the spilled fuel

March 19, 2006

- Site inspection by RTL management
- Another in-situ burn of fuel
- More perimeter holes were drilled
- Water depth was verified and a underwater camera was used to inspect the site
- Bridge located east of accident site was removed

March 20, 2006

- Contacted Dave Tyson at DFO to advise that RTL may have to use light explosives to remove bridge that is froze in at accident site.

March 21, 2006

- Inspect site, excavate ice to allow access for divers
- Underwater investigation of lost equipment by Arctic Divers
- Inspect subsurface of ice for pockets of fuel, none found
- Mike Suchlandt at RTL submitted report to WCB
- Mike Beauregard submitted Ice Road Accident Report to WCB

March 22, 2006

- Removed bridge at accident site, blasting not required
- Demobilized D4

March 23, 2006

- Wayne inspected site, performed minor clean up

Routine inspections ongoing.....

Original route established by Mike Beauregard:



Drill Log performed March 7, 2006:



March 14, 2006 Accident Location:



March 15, 2006 Inspection, Drill holes:



March 15, 2006 Inspection, Drill Hole Log:

Snowfield
March 14, 2006 Breakthrough
March 15, 2006 Inspection Results
Grid: UTM
Datum: NAD 83

Waypoint Name	Date & Time Recorded	Waypoint Location	
11 V 652266 6899832 NAD 83	3/15/2006 3:55:05 PM	11 V 652266 6899832	Theoretical center of breakthru
37"	15-MAR-06 12:46:29PM	11 V 652256 6899834	drill hole
37"	15-MAR-06 12:39:49PM	11 V 652264 6899843	drill hole
38.5"	15-MAR-06 12:50:26PM	11 V 652269 6899822	drill hole
39"	15-MAR-06 12:42:17PM	11 V 652259 6899844	drill hole
40"	15-MAR-06 12:53:08PM	11 V 652261 6899824	drill hole
40"	15-MAR-06 12:57:36PM	11 V 652289 6899839	drill hole
Start of Road	15-MAR-06 2:17:13PM	11 V 638816 6927779	

March 15, 2006 Inspection, Pictures:





March 16, 2006 Inspection, Clean up/Burn:





March 16, 2006 Inspection, "After" picture:



This report will be updated as the clean up progresses.

RTL believes it is not safe to retrieve the equipment this winter due to current ice conditions. It is RTL's intent to recover the equipment in the summer of 2006 using the following equipment:

- "Arctic Duchess", Barge
- "Atha", Tug Boat
- Various barges and cranes

FW: GSL, RTL Truck

-----Original Message-----

From: Kenneth Dahl [mailto:dahlk@inac-ainc.gc.ca]

Sent: April 28, 2006 10:54 AM

To: Shane Langlois

Cc: Clint Ambrose; Kenneth Dahl; donnie@rtl.ca

Subject: GSL, RTL truck

Hi Shane.

Here are a couple pictures for your reference. We were there yesterday.

It would be a good time to go back any time now for additional cleanup. There is fuel apparent at the surface of the ice. It also appears to be coming up at the cracks. A chipper, torch and absorbents would probably go a long way. If you could drill some more holes, that would also tell us what is under the ice.

Please keep us posted Shane. Thanks.

Ken



**RTL Robinson Enterprises Ltd.
Drybones Break-thru Clean-up Report
Prepared by S. Langlois, shane_langlois@rtl.ca
RTL Incident # RY-06-81**

Clean Up Summary:

May 1, 2006

Location: Great Slave Lake, Grid: UTM, Datum: NAD 83, 11 V 652266 6899832
(approximately 3.5 km SE of Pilot Islands)

On May 1, 2006 Darcy Robinson and I travelled to the site via Turbo Beaver to perform a clean up before the ice becomes unsafe to travel.

At the site we found fuel laying on the surface of the water directly over the break-thru location and where ice sheets were protruding from the surface. This fuel was burned off, the fire burned readily for approximately ten - fifteen minutes.

We then covered any areas that appeared to have fuel or oil covering the surface, over a period of about 4 hrs hours we collected one forty-five gallon drum of absorbent pads (approximately two full bundles)

We also collected some 6 x 6 timbers and some miscellaneous garbage

May 1, 2006 Burn Pix:





We drilled a series of holes around the site to look for pockets of fuel, none was present.

May 1, 2006 Drill Log:

Snowfield
March 14, 2006 Breakthrough
May 1, 2006 Inspection
Datum: WGS 84

Waypoint Name	Date & Time Recorded	Waypoint Location	Comments
Clean	01-MAY-06 12:07:51PM	N62 11.957 W114 04.396	drill hole, no fuel found, ice porous
Clean2	01-MAY-06 12:08:29PM	N62 11.964 W114 04.403	drill hole, no fuel found, ice porous
Clean3	01-MAY-06 12:09:33PM	N62 11.968 W114 04.365	drill hole, no fuel found, ice porous
Clean4	01-MAY-06 12:10:20PM	N62 11.959 W114 04.354	drill hole, no fuel found, ice porous
Clean5	01-MAY-06 12:11:00PM	N62 11.953 W114 04.373	drill hole, no fuel found, ice porous

May 1, 2006 Drill Locations:



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May 2, 2006

I went back to the site once again via Turbo Beaver, some fuel was present on the surface of the water, fuel appears to be trapped under ice sheets and areas that are drifted in by snow. An in-situ burn was completed and two more bundles of absorbent pads were used and taken back to YK for disposal.

The drill holes previously drilled on May 1, 2006 were inspected again, no fuel was found.

May 2, 2006 Burn Pix:



If ice conditions continue to remain safe, RTL has tentatively scheduled a flight for May 8, 2006 to inspect the site one last time.

**RTL Robinson Enterprises Ltd.
Drybones Break-thru Clean-up Report
Prepared by S. Langlois, shane_langlois@rtl.ca
RTL Incident # RY-06-81**

Clean Up Summary:

May 10, 2006

Location: Great Slave Lake, Grid: UTM, Datum: NAD 83, 11 V 652266 6899832
(approximately 3.5 km SE of Pilot Islands)

On May 10, 2006 John Tyler and I travelled to the site via Bell 206 Jet Ranger to perform a clean up.

At the site we found no fuel laying on the surface of the water directly over the break-thru location. We did find one small pocket of fuel in an area that was snow covered on May 1, 2006. This fuel was burned off, the fire burned for approximately five minutes.

There was a non flammable milky residue that was wind blown to the west side of the open water, this was soaked up with absorbent pads and flown to YK.

We also collected the remaining miscellaneous garbage.

The pilot felt it was unsafe to land the helicopter on the ice; we exited the machine while under power and performed the clean up while the chopper waited on shore. The ice had "candled" about 12" from the surface; water is also collecting at this point beneath the rotten ice.

Due to ice conditions, and the fact that it is not safe to land the chopper we will not be performing any further inspections this winter.

May 10, 2006 Burn Pix:



May 10, 2006 Aerial Pix:



May 10, 2006 Clean Up Pix:



May 10, 2006 Ice Condition Pix:



Subject: truck/hoe removal

-----Original Message-----

From: Shane Langlois [mailto:shane_langlois@rtl.ca]
Sent: June 6, 2006 9:35 AM
To: 'Kenneth Dahl'
Cc: 'donnie@rtl.ca'
Subject: RE: truck/hoe removal

Ken

I was actually just going to email you; RTL inspected the site this past weekend, although it was a little windy, the site as marked by the Buoy was circled several times by boat. No oil or fuel was evident on the surface of the water.

RTL will continue to monitor the site.

Are you available to meet in the next few days?

Regards,

Shane

-----Original Message-----

From: Kenneth Dahl [mailto:dahlk@inac-ainc.gc.ca]
Sent: June 6, 2006 9:27 AM
To: Shane Langlois
Cc: Clint Ambrose; donnie@rtl.ca
Subject: truck/hoe removal

Good morning Shane.

Env. Canada was asking if you had a schedule for removing the equipment from GSL. Both parties would like to observe the extraction. Can you give us some idea of when and what is being planned?

Thanks and talk to you soon.

Ken

Subject: Drybones Update

-----Original Message-----

From: Shane Langlois [mailto:shane_langlois@rtl.ca]

Sent: June 27, 2006 10:55 AM

To: 'Kenneth Dahl'

Cc: 'Clint Ambrose'; cheryl@rtl.ca

Subject: Drybones Update

Ken

FYI:

RTL inspected the incident site at Drybones Bay Sunday June 25, 2006. Waves were about 12" high; wind about 7 knots, no leakage was noted. Some pictures were taken; I will include them in tomorrows meeting.

Regards,

Shane



Subject: Meeting

-----Original Message-----

From: Shane Langlois [mailto:shane_langlois@rtl.ca]

Sent: June 27, 2006 11:00 AM

To: CooperK@DFO-MPO.GC.CA; 'Kenneth Dahl'; 'Clint Ambrose'; craig.broome@ec.gc.ca; watson@df-mpo.gc.ca

Cc: cheryl@rtl.ca

Subject: Meeting

Gentleman

I have arranged for a 2pm meeting at RTL's second floor boardroom for Wednesday June 28 to discuss the Drybones Bay Incident. The following have been invited:

- Ken Dahl, Clint Ambrose & Ed Hornby from INAC
- Craig Broome from EC
- Ernie Watson from Fisheries

Unfortunately Ken Cooper from the Coast Guard is not available, however, we did have a discussion about the incident and I will forward him a complete package of the clean up/inspection reports to date.

If there is anyone else that should attend, please let me know.

Regards,

Shane