

Field Monitoring Report
-- Pebble Copper/Gold Exploration Project --

Personnel: Jeanette Alas and Josh Brekken - ADF&G, Jeff Norberg - PLP	Inspection Date: 10/17/2012
	Site Contact: Jeff Norberg
	APMA #: A126118
<ul style="list-style-type: none"> ■ Inspection Type: 	<ul style="list-style-type: none"> ■ Wildlife Observed:
<ul style="list-style-type: none"> ○ Complete: Inspected four active drill rigs and 1 abandoned site. 	<ul style="list-style-type: none"> ○ Bear: None
<ul style="list-style-type: none"> ○ Partial: 	<ul style="list-style-type: none"> ○ Caribou: None
<ul style="list-style-type: none"> ○ Follow-up: 	<ul style="list-style-type: none"> ○ Moose: None
<ul style="list-style-type: none"> ○ Response to Public Complaint: 	<ul style="list-style-type: none"> ○ Waterfowl: One loon of unknown species observed while flying.
<ul style="list-style-type: none"> ■ Weather Conditions: 	<ul style="list-style-type: none"> ○ Fish: None
<ul style="list-style-type: none"> ○ Temperature: Approximately 25° F 	<ul style="list-style-type: none"> ○ Other: Red fox ran by us at Rig #6 location
<ul style="list-style-type: none"> ○ Wind: 20-30 mph North wind 	<ul style="list-style-type: none"> ■ Water level at Frying Pan Lake:
<ul style="list-style-type: none"> ○ Precipitation: None 	<ul style="list-style-type: none"> ○ Observed inflow: Not observed
<ul style="list-style-type: none"> ○ Visibility: Excellent 	<ul style="list-style-type: none"> ○ Observed outflow: Not observed
<ul style="list-style-type: none"> ○ Sky Conditions: Mostly Cloudy/High Clouds 	<p>Most ponds and lakes were frozen, including $\frac{3}{4}$ of Big Wiggly Lake, but we did not observe Frying Pan Lake.</p>
<ul style="list-style-type: none"> ○ Ground Conditions: Mostly frozen, light snow cover with deeper drifts in specific areas 	
<p>Comments: Operations were mostly in compliance with sites being generally clean, mostly tidy, and contained on tundra mats, but there were a few exceptions:</p> <ul style="list-style-type: none"> • Crews are potentially trying to place generator, fuel, and heater as close to water sources as possible to keep lines from freezing. Water Take Action #7 in the State-approved Pebble Project Water Withdrawal Plan states that "Gas fueled pumps and related equipment will not be fueled or serviced within 100 feet of a water body unless the pumps are situated within a catch basin designed to contain any spills." <ul style="list-style-type: none"> ○ At Rig #2 the fuel tank (inside secondary containment) was exactly 100 feet from the water source, but the generator and water heater used for water withdrawal were within 100 feet of the water source (87 to 95 feet) and were located directly on the rig mats and not in secondary containment. ○ Crews at Rig #5 had set-up the water withdrawal fuel tank, generator, and heater 66 feet away from surface water. Rig operations had not yet started at this location and water withdrawal had not yet occurred. After it was pointed out to J. Norberg that the fuel and equipment were too close to the stream, he immediately spoke with the drill rig supervisor and they located a suitable new location >100 feet from water (crew and helicopter were in the process of moving fuel, generator, and water heater as we left the site). • The water-take source location did not contain a water-take label or proper signage with water point number for Rig #2 (DDH-12561). A sign and stake were located next to the fuel tank and generator, but the water point number was for a different site (DDH-12556). Based on the State-approved Water Withdrawal Plan, PLP will only take water from a source that is marked and 	

clearly labeled with the water take point number.

- Several loose items were scattered on the tundra (especially downwind) around Rig #6, including cardboard boxes, a vent section, cords/lines, and safety glasses. Some of these items were partially buried by snow. Additionally, the stockpiled squares of tundra mat on-site were desiccated, overturned, broken and flaking apart, and scattered by the wind with no apparent effort to cover or protect them.
- There was a sizeable amount of Ice Melt piled and scattered on the tundra around and underneath the rig mats at Rig #2.

Recommendations:

- Ensure crews are establishing fuel and fueled equipment at least or greater than 100 feet from water sources.
- Protect or cover tundra mat stockpiles at sites where high winds are possible.
- Keep Ice Melt off of the tundra (possibly place Visqueen under/around rig mats when using Ice Melt and the tundra is frozen/dormant).
- Keep loose items and trash contained, especially in high winds.

Actions Needed:

Drill Hole/Site No.: DDH-12551	Rig No.: 3 (Foundex)
Activity: Hole complete – not presently drilling, but rig remains active – preparing for air lift test Current Depth: 3006' Initial Target Depth: 3000'	Date: 10/17/2012 Time: 1040-1150
■ Condition of Drilling Site: Well kept	■ Sump Pit (continued):
○ Distance from waterbody: ~600 feet to water withdrawal lake, ~300 feet to groundwater seeps and small ponds	○ Location and extent of discharged material: Sump pits located adjacent to drill; discharged via hose and pump ~600' to the west to tundra (ice layer forming over the tundra)
○ Location of fuel storage: Adjacent to rig and adjacent to generator near water withdrawal location	○ Topsoil, muck, tundra stockpiled: Yes, tundra vegetation mats frozen in piles above ground
○ Sorbent pads present: Yes	○ Hose color: White
○ Tundra mat: Yes	■ Drill Water Supply: unable to estimate – totalizers not working
○ Pipe off tundra: Yes, on mats	○ Stream, lake, kettle pond: Lake ("Lincoln Lake")
○ Litter: None	○ Location: ~600' east of drill rig
○ Trash containment: Yes, Aluminum dumpster	○ Adequate water flow and depth for fish passage in streams: Yes
○ Sanitary facilities: Yes, seat w/ collection bags	○ Evidence of significant impacts to riparian vegetation or stream banks: No
○ Any spills or staining: None	○ General impression of water body, i.e. clear, turbid, tannic: Frozen
○ General impression: Good, mostly well contained on mats	○ Intake structure: Yes, typical/approved design
Drilling Activity: Began drilling August 16, not actively drilling deeper, hole complete but rig kept active – preparing for air lift test	○ Structure clear of debris: Presumably
■ Drill additives in use: None presently	○ Mesh size: 1 mm x 12 mm (consistent with 0.04 inch mesh size for Group A fish)
○ Recirculation tank: empty and not in use	○ Submerged: Yes
○ Water discharged: Pumping water from withdrawal source to keep lines from freezing – discharged approx. 600' west of rig	○ Pump/fuel location to source: >100 feet (approx. 125' to 150')
○ Artesian zone encountered: None	○ Catch basin for fuel supply: Yes, dbl-wall tank
○ Sump Pit: Yes, four	○ Sorbent pads: Present
Location: ~40 ft. east of drill rig	○ Hose color: Yellow
■ Discharge trench: Adjacent	■ Other Comments: Totalizer on water withdrawal line was broken or frozen and consequently withdrawal rates were not able to be estimated.
○ Dimensions of pit: 4 pits ~5'x15'	
○ In use: Yes – discharge from water source which is being pumped just to keep lines from freezing	



Figure 1. Overview of Drill Rig #3 on DDH-12551 – water withdrawal source identified with blue arrow; generator and fuel for intake pump indicated by green arrow.



Figure 2. Pipe rack on tundra mats at Drill Rig #3 on DDH-12551.



Figure 3. Fuel tank, sorbent barrels, and scrubber barrel at Drill Rig #3 on DDH-12551.



Figure 4. Sump pit three at Drill Rig #3 on DDH-12551 with sheen on water (PLP indicated that the sheen is likely from linseed oil).



Figure 5. Generator, fuel tank, and sorbent pads (blue barrels) for water withdrawal with Drill Rig #3 on DDH-12551 in background.



Figure 6. Totalizer connected to water intake line for Drill Rig #3 on DDH-12551 – totalizer was broken or frozen and consequently water withdrawal rate was not estimated.



Figure 7. Signage at water withdrawal source for Drill Rig #3 on DDH-12551 – yellow hose leads to intake structure under the ice at stake location (visible just right of sign).

Drill Hole/Site No.: DDH-12561	Rig No.: 2 (Foundex)
Activity: Drilling Current Depth: 557' Initial Target Depth: 1200'	Date: 10/17/2012 Time: 1155-1245
■ Condition of Drilling Site: Well kept	■ Sump Pit (continued):
○ Distance from waterbody: ~400 feet to water withdrawal lake, ~250 feet to closest surface water	○ Location and extent of discharged material: Sump pits located adjacent to drill; discharged via hose and pump ~200' south of rig to tundra, with some leaking out in between at hose connections
○ Location of fuel storage: Adjacent to rig and adjacent to generator near water withdrawal location – both in secondary containment	○ Topsoil, muck, tundra stockpiled: Yes, tundra vegetation mats frozen in piles above ground
○ Sorbent pads present: Yes	○ Hose color: White – discharge water leaking at hose connections
○ Tundra mat: Yes	■ Drill Water Supply: not estimated – totalizer frozen or broken
○ Pipe off tundra: Yes, on mats	○ Stream, lake, kettle pond: Pond/small lake
○ Litter: None	○ Location: ~400' east of drill rig
○ Trash containment: Yes, Aluminum dumpster	○ Adequate water flow and depth for fish passage in streams: Yes
○ Sanitary facilities: Yes, seat w/ collection bags	○ Evidence of significant impacts to riparian vegetation or stream banks: No
○ Any spills or staining: Ice Melt on tundra surrounding mats	○ General impression of water body, i.e. clear, turbid, tannic: Frozen
○ General impression: Clean, well contained on mats except for three large totes on the tundra	○ Intake structure: Yes, typical/approved design
Drilling Activity: Active - began drilling October 14	○ Structure clear of debris: Yes
■ Drill additives in use: Extreme Number 1, Quik-Trol, Quik-Gel	○ Mesh size: 1 mm x 12 mm (consistent with 0.04 inch mesh size for Group A fish)
○ Recirculation tank: empty and not in use	○ Submerged: Yes
○ Water discharged: Into sumps and then pumped and discharged to tundra approx. 200' south of rig	○ Pump/fuel location to water source: exactly 100' to fuel tank and containment; water heater and generator are located 87 to 95 feet from water source)
○ Artesian zone encountered: None	○ Catch basin for fuel supply: Yes, dbl-wall tank
○ Sump Pit: Yes, three	○ Sorbent pads: Present
Location: ~40 ft. east of drill rig	○ Hose color: Yellow
■ Discharge trench: Adjacent	■ Other Comments: Identification signage missing from water withdrawal source – we found a sign at fuel and generator location, but for a different site (#DDH-12556).
○ Dimensions of pit: 3 pits ~4'x20'	
○ In use: Yes	

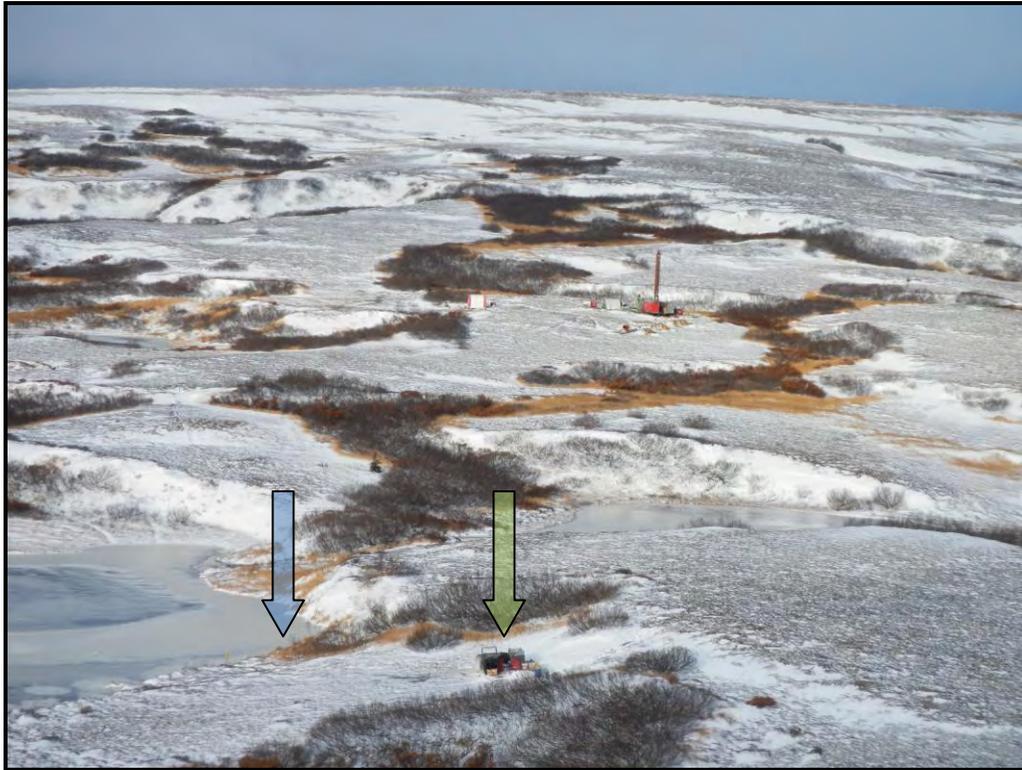


Figure 8. Overview of Drill Rig #2 on DDH-12561 – water withdrawal source identified with blue arrow; generator and fuel for intake pump indicated by green arrow.



Figure 9. Drill Rig #2 on DDH-12561 – sumps and stockpiled soil visible in lower right-hand corner of photo with white discharge hose heading from sumps and across photo to the left (green arrow).



Figure 10. Pipe rack at Drill Rig #2 on DDH-12561.



Figure 11. Discharge trench and first sump at Drill Rig #2 on DDH-12561.



Figure 12. Discharge hose with leaky connections at Drill Rig #2.



Figure 13. Discharge from drilling sumps to tundra at Drill Rig #2 (~200 feet south of rig).



Figure 14. Sign post at water withdrawal location for Drill Rig #2 on DDH-12561.



Figure 15. Water withdrawal equipment (water heater, fuel tank, generator, and water tank) for Drill Rig #2 – water withdrawal source is behind the photographer. Note: fuel tank (in secondary containment) is exactly 100 feet from water source, with heater and generator closer (95 to 87 feet from water) and within 100 foot buffer for surface water (gas fueled generator is directly on tundra mat/not in secondary containment basin).



Figure 16. Intake pump at water withdrawal location for Drill Rig #2 on DDH-12561.

Drill Hole/Site No.: DDH-12560	Rig No.: 6 (Quest)
Activity: Drilling Current Depth: 918' Initial Target Depth: 2000'	Date: 10/17/2012 Time: 1255-1325
<ul style="list-style-type: none"> ■ Condition of Drilling Site: Generally well-kept and tidy, some loose items/trash on tundra around site 	<ul style="list-style-type: none"> ■ Sump Pit (continued):
<ul style="list-style-type: none"> ○ Distance from waterbody: no water bodies in site – water withdrawal source approx. 4,000 feet away, over a ridge to the west 	<ul style="list-style-type: none"> ○ Location and extent of discharged material: Sump pits located south of drill; discharged via hose and pump ~200' south of rig to tundra
<ul style="list-style-type: none"> ○ Location of fuel storage: Adjacent to rig and adjacent to generator near water withdrawal location – both in secondary containment 	<ul style="list-style-type: none"> ○ Topsoil, muck, tundra stockpiled: Yes, tundra vegetation mats frozen in piles above ground – some of the mats were loose and overturned by the wind (scattered from initial piles)
<ul style="list-style-type: none"> ○ Sorbent pads present: Yes 	<ul style="list-style-type: none"> ○ Hose color: White
<ul style="list-style-type: none"> ○ Tundra mat: Yes 	<ul style="list-style-type: none"> ■ Drill Water Supply: Water withdrawal rate not determined – aerial observation of water withdrawal site only.
<ul style="list-style-type: none"> ○ Pipe off tundra: Yes 	<ul style="list-style-type: none"> ○ Stream, lake, kettle pond: Stream
<ul style="list-style-type: none"> ○ Litter: Some – e.g. safety glasses, bungee cord, cardboard (partially buried in snow) 	<ul style="list-style-type: none"> ○ Location: ~4,000' west of drill rig (with 2 pump stations in between)
<ul style="list-style-type: none"> ○ Trash containment: Yes, Aluminum dumpster 	<ul style="list-style-type: none"> ○ Adequate water flow and depth for fish passage in streams: Yes
<ul style="list-style-type: none"> ○ Sanitary facilities: Yes, seat w/ collection bags 	<ul style="list-style-type: none"> ○ Evidence of significant impacts to riparian vegetation or stream banks: No
<ul style="list-style-type: none"> ○ Any spills or staining: None 	<ul style="list-style-type: none"> ○ General impression of water body, i.e. clear, turbid, tannic: partially frozen, clear
<ul style="list-style-type: none"> ○ General impression: Clean, well contained on tundra mats 	<ul style="list-style-type: none"> ○ Intake structure: Yes, typical/approved design
Drilling Activity: Active - began drilling October 10	<ul style="list-style-type: none"> ○ Structure clear of debris: Yes
<ul style="list-style-type: none"> ■ Drill additives in use: Extreme Number 1 	<ul style="list-style-type: none"> ○ Mesh size: 1 mm x 12 mm (consistent with 0.04 inch mesh size for Group A fish)
<ul style="list-style-type: none"> ○ Recirculation tank: Intermittent use 	<ul style="list-style-type: none"> ○ Submerged: Yes
<ul style="list-style-type: none"> ○ Water discharged: ~200 feet downslope 	<ul style="list-style-type: none"> ○ Pump/fuel location to water source: Appeared ≥100' (visual observation) and a second pump set-up several thousand feet to east and upslope
<ul style="list-style-type: none"> ○ Artesian zone encountered: None 	<ul style="list-style-type: none"> ○ Catch basin for fuel supply: Yes, dbl-wall tank
<ul style="list-style-type: none"> ○ Sump Pit: Yes, three 	<ul style="list-style-type: none"> ○ Sorbent pads: Present
Location: ~60 ft. south of drill rig	<ul style="list-style-type: none"> ○ Hose color: Yellow
<ul style="list-style-type: none"> ■ Discharge trench: Adjacent – leads south to sumps 	<ul style="list-style-type: none"> ■ Other Comments: Some cardboard boxes and other debris blown from drill site and scattered on tundra downwind. Tundra mats for reveg in poor condition – desiccated and flaking apart in wind
<ul style="list-style-type: none"> ○ Dimensions of pit: 3 pits ~4'x20' 	
<ul style="list-style-type: none"> ○ In use: Yes 	



Figure 17. Aerial view of Drill Rig #6 on DDH-12560.



Figure 18. Ground view of Drill Rig #6 on DDH-12560.



Figure 19. Sumps and stockpiled soils at Drill Rig #6 on DDH-12560 (view to the south).

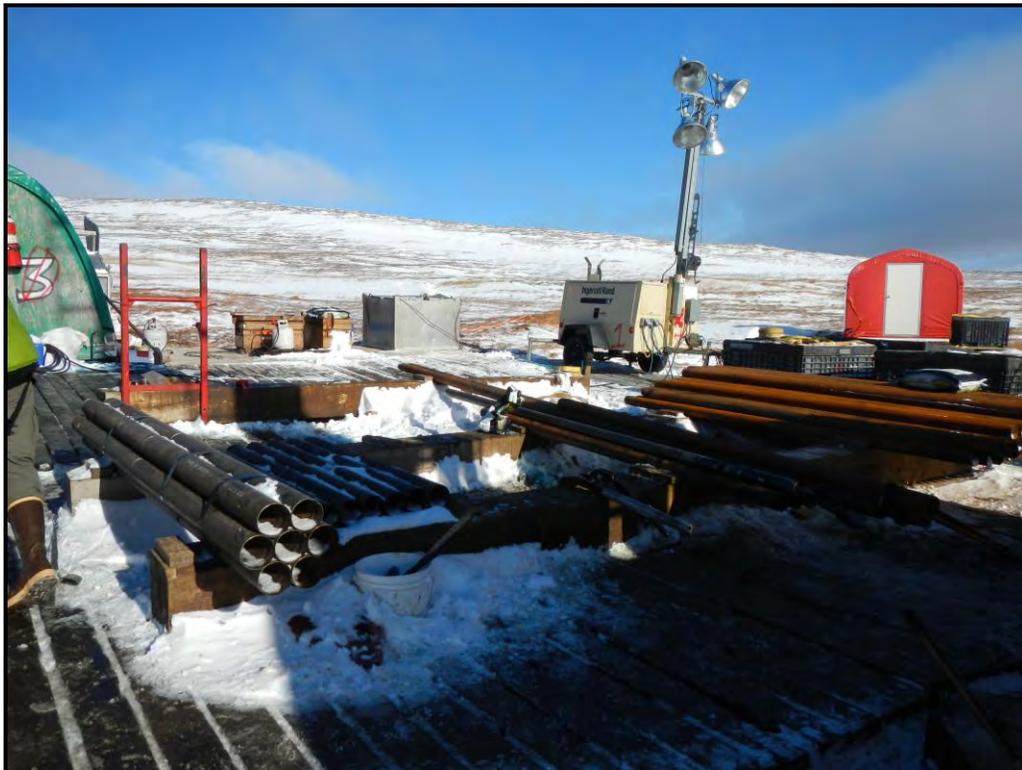


Figure 20. Pipe rack and rig mats at Drill Rig #6 on DDH-12560.



Figure 21. Sump, stockpiled soils, and discharge pump at Drill Rig #6 on DDH-12560.



Figure 22. Water withdrawal source for Drill Rig #6 (rig is on top of hill to the east – indicated by red arrow; generator and fuel for intake pump indicated by green arrow).



Figure 23. Water withdrawal source for Drill Rig #6 – water withdrawal source identified with blue arrow; generator and fuel for intake pump indicated by green arrow.



Figure 24. Generator, water heater, and fuel for Drill Rig #6 water withdrawal – note secondary containment and sorbent pad barrels.

Drill Hole/Site No.: GH-355S	Rig No.: 5 (Quest)
Activity: Drilling Current Depth: 0' (just getting set-up) Initial Target Depth: 250'	Date: 10/17/2012 Time: 1335-1400
■ Condition of Drilling Site: Tidy, just getting set-up	■ Sump Pit (continued):
○ Distance from waterbody: ~500'	○ Location and extent of discharged material: Sump pit located adjacent to rig; discharge hose not set-up yet
○ Location of fuel storage: Adjacent to rig and adjacent to generator near water withdrawal location – both in secondary containment	○ Topsoil, muck, tundra stockpiled: Yes
○ Sorbent pads present: Yes	○ Hose color: White
○ Tundra mat: Yes	■ Drill Water Supply: Just getting set-up – pump not yet in water
○ Pipe off tundra: Yes	○ Stream, lake, kettle pond: Stream
○ Litter: None	○ Location: ~500' west of drill rig
○ Trash containment: Yes, Aluminum dumpster	○ Adequate water flow and depth for fish passage in streams: Yes
○ Sanitary facilities: Yes, seat w/ collection bags	○ Evidence of significant impacts to riparian vegetation or stream banks: No
○ Any spills or staining: None	○ General impression of water body, i.e. clear, turbid, tannic: partially frozen, clear
○ General impression: Clean, well contained on tundra mats	○ Intake structure: Yes, typical/approved design
Drilling Activity: Not yet drilling – just getting set-up	○ Structure clear of debris: Not in water yet
■ Drill additives in use: None yet	○ Mesh size: 1 mm x 12 mm (consistent with 0.04 inch mesh size for Group A fish)
○ Recirculation tank: Not in use	○ Submerged: No (not yet withdrawing water)
○ Water discharged: Not yet discharging	○ Pump/fuel location to water source: 66 feet – after this was pointed out to J. Norberg he immediately spoke with the drill rig supervisor and they located a suitable new location >100 feet from water (crew and helicopter were in the process of moving fuel, generator, and water heater as we left the site).
○ Artesian zone encountered: None	○ Catch basin for fuel supply: Yes, dbl-wall tank
○ Sump Pit: Yes, one	○ Sorbent pads: Present
Location: Adjacent to drill rig	○ Hose color: Yellow
■ Discharge trench: Adjacent – leads to sump	■ Other Comments: Drill rig crew had initially set-up fuel, generator, and water heater system within 100 feet (i.e. 66') of water withdrawal source, but worked to move it the proper distance away after this was pointed out to them.
○ Dimensions of pit: 1 pit ~5'x10'	
○ In use: Not yet	

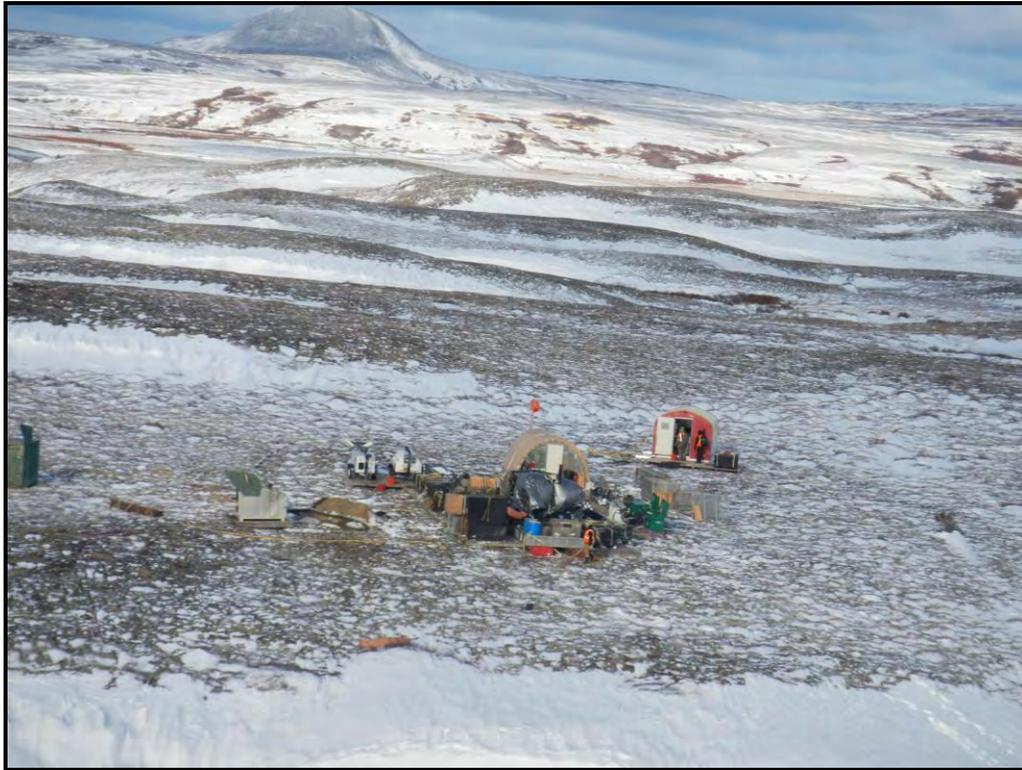


Figure 25. Aerial view of Drill Rig #5 on GH12-355S.



Figure 26. Ground view of Drill Rig #5 on GH12-355S.



Figure 27. Ground view of Drill Rig #5 on GH12-355S and rig mats.



Figure 28. Sump prepared for Drill Rig #5 on GH12-355S.



Figure 29. Water withdrawal source-stream and water intake structure for Drill Rig #5.



Figure 30. Intake screen in good condition at water withdrawal location for Drill Rig #5.



Figure 31. Fuel and generator for Drill Rig #5 water withdrawal being set-up 66 feet from surface water – after this was pointed out to PLP, the crews began moving set-up >100 feet from water near green arrow in picture.

Abandoned Drill Hole/Site No.: DDH12544	Date: 10/17/2012
<ul style="list-style-type: none"> ■ Plugged: Not observed ■ Cemented: Not observed ■ Standing pipe: Casing not visible ■ Sump pit filled in: Yes ■ Water discharge trench filled in: Yes ■ Site revegetated: Unable to determine sufficiently with dormant plants and partial snow cover, but overall impression was that the site looked pretty good and is likely to revegetate. ■ Artesian water present: None ■ Any spills or staining: None visible – most of ground covered in snow. ■ Comments/General impression: Mounds of soil are the main indicator of past drill activity at this site, but do not appear unnatural in present condition. Site was reclaimed six to eight weeks earlier according to J. Norberg. 	



Figure 32. Reclamation site for abandoned drill hole DDH125544 on October 17, 2012 – the location of the drill hole is between the two people in the picture and the location of an old sump is indicated by the green arrow.



Figure 33. Reclamation site for abandoned drill hole DDH125544 on October 17, 2012 – the location of the drill hole is just right (at post) of the two people in the picture and the location of an old sump is indicated by the green arrow.



Figure 34. Remnants of an old monitoring well adjacent to abandoned drill hole DDH125544 on October 17, 2012 – metal pipe and concrete above tundra.