



28 February 2022

W2018L2-0003

**Ryan Fequet, Executive Director**

Wek'èezhìi Land and Water Board

#1-4905 48th St.

Yellowknife, NWT X1A 3S3

**ADDITIONAL JULY SURVEILLANCE NETWORK PROGRAM RESULTS, DAMOTI LAKE**

Dear Mr. Fequet,

Nighthawk Gold Corporation (Nighthawk) was required by the GNWT Water Resource Officer for Water Licence W2018L2-0003 to undertake an additional Surveillance Network Program (SNP) water quality sampling program at the Damoti Lake Site in July 2021. This was in addition to the two scheduled SNP events in June and September, and an additional SNP water quality sampling program in August 2021. The results of the June and September SNP sampling events were submitted to the Wek'èezhìi Land and Water Board (the Board) in the spring and fall SNP reports, and the results of the August 2021 SNP water quality sampling program were submitted to the Board in a letter titled 'Pre- and Post-Treatment Results at SNP 5-10, Damoti Lake' on 3 December 2021. The July data were mistakenly omitted from that letter and are presented herein per the request from the GNWT Waters Inspector during the Technical Session.

The following attached documents present the results of the July 2021 sampling activities:

- Damoti Lake July SNP Field Report for 29 July 2021
- Table 1: Surveillance Network Program Results in the Water Rock Area Compared to the Water Licence Limits, 29 July 2021
- Table 2: Surveillance Network Program Results Downstream of the Waste Pile Rock Area Compared to CCME Guidelines, 29 July 2021

Should you have any questions or need any additional information, please feel free to contact the undersigned.

Regards,

**Nighthawk Gold Corp.**

**Denise Lockett**

**Manager, Stakeholder Relations, Licensing and Permitting**

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**Nighthawk Gold Corp.**

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Damoti Lake July SNP Project: 21464738 Phase: 6000	
<b>Field Program Date:</b>	29 July 2021
<b>Field Crew:</b>	Sarah Beattie (Golder), Kevin Rattray (Golder), Denise Lockett (Nighthawk)
<b>Hours:</b>	12 hours
<b>Daily conditions:</b>	<ul style="list-style-type: none"> <li>■ Air temperature: 20°C</li> <li>■ Wind: &lt;10 km/h</li> <li>■ Sunny</li> <li>■ Lots of bugs at Site</li> </ul>
<b>Work completed:</b>	<ul style="list-style-type: none"> <li>■ Arrived Colomac camp via float plane around 10:45.</li> <li>■ Arrived at Damoti Site via helicopter around 11:30</li> <li>■ All SNP sampling completed, with the following exceptions:               <ul style="list-style-type: none"> <li>– SNP 5-7 was dry</li> <li>– SNP 5-14 had very low volumes of water in the pooled areas. This station was not sampled as it would have been difficult to collect a sample without incorporating fine sediment.</li> </ul> </li> <li>■ The pH at SNP 5-10 was 3.2. The last treatment was conducted on 14 July, which suggests that a single-day treatment with soda ash does not increase pH over a multi-week time period. Field measurements for SNP stations sampled on 29 July are provided in Table 1.</li> </ul>
<b>Health and safety incidents, hazards, or other concerns to report:</b>	<ul style="list-style-type: none"> <li>■ Slippery rocks and soft, uneven ground made sampling at and hiking to some of the stations difficult.</li> </ul>
<b>Wildlife sightings:</b>	<ul style="list-style-type: none"> <li>■ None</li> </ul>

**Table 1: Field Data Collected for the Damoti Lake Surveillance Network Program, 29 July 2021.**

Station Name	Sample Date	Sample Time	UTM Sampling Coordinates (NAD83, 11V)		Total Depth (m)	Sample Depth (m)	Temp (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductivity (µS/cm)	pH
			Easting	Northing							
SNP 5-4	29-Jul-21	15:45	591832	7113642	0.2	0.1	22.5	5.5	65.4	135	7.0
SNP 5-5	29-Jul-21	15:00	591762	7113639	0.2	0.1	19.6	10.6	119.4	85	8.8
SNP 5-6	29-Jul-21	16:15	591876	7113873	0.2	0.2	15.4	2.0	19.8	276	6.6
SNP 5-7 <sup>(a)</sup>	29-Jul-21	16:30	591896	7113903	-	-	-	-	-	-	-
SNP 5-8	29-Jul-21	12:30	591858	7113984	0.1	0.1	6.3	2.8	23.5	183	6.7
SNP 5-9	29-Jul-21	12:50	591898	7113982	0.1	0.1	16.0	3.8	38.0	440	6.5
SNP 5-10	29-Jul-21	13:15	591930	7113992	0.1	0.1	20.6	9.6	110.8	742	3.2 <sup>(b)</sup>
SNP 5-11	29-Jul-21	13:35	591905	7113951	0.1	0.1	20.5	10.4	119.5	816	7.1
SNP 5-12	29-Jul-21	13:50	591908	7113938	0.1	0.1	20.0	7.1	80.5	431	6.5
SNP 5-13	29-Jul-21	14:30	591908	7113938	0.1	0.1	19.9	4.9	55.6	408	6.8
SNP 5-14 (FB-100) <sup>(c)</sup>	29-Jul-21	16:00	591813	7113751	-	-	-	-	-	-	-

a) Water Licence SNP 5-7 location was dry.

b) Confirmed with handheld pH meter.

c) Water level was too low to collect a representative sample.

SNP = Surveillance Network Program; GNWT - Government of Northwest Territories

**Table 1: Surveillance Network Program Results in the Waste Rock Area Compared to the Water Licence Limits, 29 July 2021**

Parameter	Unit	Maximum Concentration of Any Grab Sample <sup>(a)</sup>	Maximum Average Concentration <sup>(b)</sup>	Station <sup>(c)</sup>						
				SNP 5-6	SNP 5-8	SNP 5-9	SNP 5-10	SNP 5-11	SNP 5-12	SNP 5-13
<b>Field Measured Parameters</b>										
pH	-	6.0 to 9.5	-	6.6	6.7	6.5	<b>3.2</b>	7.1	6.5	6.8
Specific conductivity	µS/cm	-	-	276	183	440	742	816	431	408
Temperature	°C	-	-	15	6.3	16	21	21	20	20
Dissolved oxygen	mg/L	-	-	2.0	2.8	3.8	9.6	10	7.1	4.9
Dissolved oxygen	%	-	-	20	24	38	111	120	81	56
<b>Conventional Parameters</b>										
pH	-	6.0 to 9.5	-	7.4	7.4	7.9	3.4	7.5	7.3	7.4
Specific conductivity	µS/cm	-	-	359	219	525	902	977	506	497
Hardness, as CaCO <sub>3</sub> <sup>(d)</sup>	mg/L	-	-	157	96	254	267	495	227	220
Total suspended solids	mg/L	30	15	<b>47</b>	1.4	1.7	3.1	<b>23</b>	2.8	1.7
<b>Major Ions</b>										
Sulphate	mg/L	-	-	124	45	127	400	482	215	204
<b>Nutrients</b>										
Total ammonia	mg-N/L	-	12	<0.005	0.018	0.049	<0.005	0.018	0.011	0.011
Total phosphorus	mg-P/L	-	-	0.020	0.0074	0.013	<0.002	0.014	0.0063	0.0076
Dissolved phosphorus	mg-P/L	-	-	0.0064	0.0040	0.0082	<0.002	0.0055	0.0028	0.0053
<b>Total Metals</b>										
Aluminum	mg/L	-	-	0.15	0.086	0.027	3.5	0.034	0.032	0.022
Antimony	mg/L	-	-	<0.0001	<0.0001	0.0011	<0.0001	<0.0001	<0.0001	<0.0001
Arsenic	mg/L	0.2	0.1	0.0014	0.00070	0.00091	0.0036	0.00084	0.00091	0.0010
Barium	mg/L	-	-	0.018	0.017	0.050	0.037	0.028	0.017	0.017
Beryllium	mg/L	-	-	0.000024	<0.00002	<0.00002	0.0011	0.000022	<0.00002	<0.00002
Bismuth	mg/L	-	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Boron	mg/L	-	-	0.034	0.013	0.035	0.090	0.085	0.056	0.053
Cadmium	mg/L	0.01	0.005	0.000013	0.000021	0.0000062	0.00013	0.000043	0.0000077	0.000010
Calcium	mg/L	-	-	40	27	69	56	124	55	53
Cesium	mg/L	-	-	0.00074	0.00015	0.00019	0.0030	0.00055	0.00099	0.0010
Chromium	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cobalt	mg/L	-	-	0.0058	0.00044	0.00069	0.074	0.0035	0.0010	0.00083
Copper	mg/L	0.2	0.1	0.0017	0.0041	0.0035	0.0050	0.0022	0.0016	0.0015
Iron	mg/L	-	-	2.5	0.46	1.1	4.7	1.5	1.7	1.2
Lead	mg/L	0.16	0.08	0.00033	0.00019	0.00010	0.0028	0.00033	0.000096	0.000072
Lithium	mg/L	-	-	0.012	0.0042	0.014	0.050	0.033	0.025	0.023
Magnesium	mg/L	-	-	14	6.9	20	31	45	22	21
Manganese	mg/L	-	-	0.53	0.086	0.11	2.9	0.33	0.12	0.10
Molybdenum	mg/L	-	-	<0.00005	0.00078	0.00018	0.000076	0.0028	<0.00005	<0.00005
Nickel	mg/L	0.50	0.25	0.018	0.0087	0.014	<b>0.29</b>	0.041	0.022	0.019
Potassium	mg/L	-	-	3.4	2.5	2.9	6.3	6.8	4.0	4.0
Rubidium	mg/L	-	-	0.0087	0.0041	0.0070	0.021	0.018	0.0097	0.0097
Selenium	mg/L	-	-	0.000083	0.000055	0.000086	0.000087	0.00010	0.000080	<0.00005
Silicon	mg/L	-	-	4.3	3.2	0.34	19	2.1	6.0	6.0
Silver	mg/L	-	-	<0.00001	0.000014	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Sodium	mg/L	-	-	5.0	3.2	7.1	31	8.4	5.6	5.4
Strontium	mg/L	-	-	0.12	0.059	0.18	0.26	0.34	0.18	0.17
Sulphur	mg/L	-	-	40	14	44	129	158	70	67
Tellurium	mg/L	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Thallium	mg/L	-	-	<0.00001	<0.00001	<0.00001	0.000015	0.000010	<0.00001	<0.00001
Thorium	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Tin	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium	mg/L	-	-	0.00073	0.00060	0.00046	<0.0003	<0.0003	<0.0003	<0.0003
Tungsten	mg/L	-	-	<0.0001	0.00062	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Uranium	mg/L	-	-	0.00015	0.00097	0.00057	0.00059	0.00021	0.00010	0.000092
Vanadium	mg/L	-	-	0.00057	0.00057	0.00058	<0.0005	0.00060	0.00068	0.00068
Zinc	mg/L	0.8	0.4	<0.003	0.0032	<0.003	0.066	0.0083	0.0031	<0.003
Zirconium	mg/L	-	-	<0.0002	<0.0002	0.00029	<0.0002	<0.0002	<0.0002	<0.0002
<b>Dissolved Metals</b>										
Aluminum	mg/L	-	-	0.022	-	-	-	-	-	-
Antimony	mg/L	-	-	<0.0001	-	-	-	-	-	-
Arsenic	mg/L	-	-	0.00066	-	-	-	-	-	-
Barium	mg/L	-	-	0.012	-	-	-	-	-	-
Beryllium	mg/L	-	-	<0.00002	-	-	-	-	-	-
Bismuth	mg/L	-	-	<0.00005	-	-	-	-	-	-
Boron	mg/L	-	-	0.032	-	-	-	-	-	-
Cadmium	mg/L	-	-	0.0000055	-	-	-	-	-	-
Cesium	mg/L	-	-	0.00070	-	-	-	-	-	-
Chromium	mg/L	-	-	<0.0005	-	-	-	-	-	-
Cobalt	mg/L	-	-	0.00054	-	-	-	-	-	-
Copper	mg/L	-	-	0.00086	-	-	-	-	-	-
Iron	mg/L	-	-	0.43	-	-	-	-	-	-
Lead	mg/L	-	-	<0.00005	-	-	-	-	-	-
Lithium	mg/L	-	-	0.013	-	-	-	-	-	-
Manganese	mg/L	-	-	0.098	-	-	-	-	-	-
Molybdenum	mg/L	-	-	<0.00005	-	-	-	-	-	-
Nickel	mg/L	-	-	0.011	-	-	-	-	-	-
Rubidium	mg/L	-	-	0.0079	-	-	-	-	-	-
Selenium	mg/L	-	-	<0.00005	-	-	-	-	-	-
Silicon	mg/L	-	-	4.2	-	-	-	-	-	-
Silver	mg/L	-	-	<0.00001	-	-	-	-	-	-
Strontium	mg/L	-	-	0.11	-	-	-	-	-	-
Sulphur	mg/L	-	-	43	-	-	-	-	-	-
Tellurium	mg/L	-	-	<0.0002	-	-	-	-	-	-
Thallium	mg/L	-	-	<0.00001	-	-	-	-	-	-
Thorium	mg/L	-	-	<0.0001	-	-	-	-	-	-
Tin	mg/L	-	-	<0.0001	-	-	-	-	-	-
Titanium	mg/L	-	-	<0.0003	-	-	-	-	-	-
Tungsten	mg/L	-	-	<0.0001	-	-	-	-	-	-
Uranium	mg/L	-	-	0.000073	-	-	-	-	-	-
Vanadium	mg/L	-	-	<0.0005	-	-	-	-	-	-
Zinc	mg/L	-	-	0.0015	-	-	-	-	-	-
Zirconium	mg/L	-	-	<0.0003	-	-	-	-	-	-

Notes:

**Bolded** results are outside the pH range or above a limit specified in the Water Licence (WLWB 2019)

a) Maximum concentration of any grab sample as per Type B Water Licence W2018L2-0003 (WLWB 2019).

b) Maximum average concentration as per Type B Water Licence W2018L2-0003 (WLWB 2019).

c) Sample not collected at SNP 5-7 because the station was dry at the time of the July 2021 sampling program.

d) Hardness was calculated using the following formula: hardness [mg equivalent CaCO<sub>3</sub>/L] = 2.497[calcium in mg/L] + 4.118[magnesium in mg/L]

WLWB = Wek'eezhii Land and Water Board; CaCO<sub>3</sub> = calcium carbonate; µS/cm = microsiemens per centimetre; mg/L = milligrams per litre; mg-N/L = milligrams of nitrogen

**Table 2: Surveillance Network Program Results Downstream of the Waste Pile Rock Area Compared to CCME Guidelines, 29 July 2021**

Parameter	Unit	Guidelines for the protection of:			Station	
		Aquatic Life		Wildlife Health (Livestock)	SNP 5-4	SNP 5-5
		Acute	Chronic			
<b>Field Measured</b>						
pH	-	-	6.5 - 9.0	-	7.0	8.8
Specific conductivity	µS/cm	-	-	-	135	85
Temperature	°C	-	-	-	23	20
Dissolved oxygen	mg/L	-	6.5	-	<b>5.5</b>	11
Dissolved oxygen	%	-	-	-	65	119
<b>Conventional Parameters</b>						
pH	-	-	6.5 - 9.0	-	7.3	7.7
Specific conductivity	µS/cm	-	-	-	128	105
Hardness, as CaCO <sub>3</sub> <sup>(a)</sup>	mg/L	-	-	-	55	47
Total suspended solids	mg/L	-	-	-	75	3.9
<b>Major Ions</b>						
Calcium	mg/L	-	-	1,000	15	13
Magnesium	mg/L	-	-	-	4.6	3.7
Potassium	mg/L	-	-	-	1.3	1.3
Sodium	mg/L	-	-	-	2.8	2.2
Sulphate	mg/L	-	-	1,000	18	12
<b>Nutrients</b>						
Total ammonia	mg-N/L	-	0.080 - 3.3 <sup>(b)</sup>	-	0.20	0.048
Total phosphorus	mg-P/L	-	-	-	0.057	0.011
Dissolved phosphorus	mg-P/L	-	-	-	0.0078	0.0047
<b>Total Metals</b>						
Aluminum	mg/L	-	0.10 <sup>(c, d)</sup>	5.0	<b>0.14</b>	0.078
Antimony	mg/L	-	-	-	<0.0001	<0.0001
Arsenic	mg/L	-	0.0050	0.025	0.00039	0.00036
Barium	mg/L	-	-	-	0.011	0.0067
Beryllium	mg/L	-	-	0.10	<0.00002	<0.00002
Bismuth	mg/L	-	-	-	<0.00005	<0.00005
Boron	mg/L	29	1.5	5.0	0.010	<0.01
Cadmium	mg/L	0.00096 - 0.0011 <sup>(e)</sup>	0.000084 - 0.000097 <sup>(e)</sup>	0.080	0.000064	<0.000005
Calcium	mg/L	-	-	-	16	13
Cesium	mg/L	-	-	-	0.000032	0.000030
Chromium	mg/L	-	0.0010 <sup>(f)</sup>	0.050	<0.0005	<0.0005
Cobalt	mg/L	-	-	1.0	0.00025	<0.0001
Copper	mg/L	-	0.0020 <sup>(g)</sup>	0.50	0.0013	0.0013
Iron	mg/L	-	0.30	-	0.28	0.029
Lead	mg/L	-	0.0010 <sup>(g)</sup>	0.10	0.00010	<0.00005
Lithium	mg/L	-	-	-	0.0033	0.0022
Magnesium	mg/L	-	-	-	4.7	3.7
Manganese	mg/L	-	-	-	0.082	0.024
Mercury	mg/L	-	0.000026	0.0030	0.0000021	0.0000013
Molybdenum	mg/L	-	0.073	0.50	0.00011	0.000099
Nickel	mg/L	-	0.025 <sup>(e)</sup>	1.0	0.0018	0.0013
Potassium	mg/L	-	-	-	1.4	1.4
Rubidium	mg/L	-	-	-	0.0025	0.0024
Selenium	mg/L	-	0.0010	0.050	0.000072	<0.00005
Silicon	mg/L	-	-	-	0.78	0.11
Silver	mg/L	-	0.00025	-	<0.00001	<0.00001
Sodium	mg/L	-	-	-	2.7	2.2
Strontium	mg/L	-	-	-	0.041	0.035
Sulphur	mg/L	-	-	-	6.7	4.7
Tellurium	mg/L	-	-	-	<0.0002	<0.0002
Thallium	mg/L	-	0.00080	-	<0.00001	<0.00001
Thorium	mg/L	-	-	-	<0.0001	<0.0001
Tin	mg/L	-	-	-	<0.0001	<0.0001
Titanium	mg/L	-	-	-	0.0012	<0.0003
Tungsten	mg/L	-	-	-	<0.0001	<0.0001
Uranium	mg/L	0.033	0.015	0.20	0.00013	0.000097
Vanadium	mg/L	-	-	0.10	0.00071	0.00058
Zinc	mg/L	-	-	50	<0.003	<0.003
Zirconium	mg/L	-	-	-	<0.0002	<0.0002
<b>Dissolved Metals</b>						
Aluminum	mg/L	-	-	-	0.064	0.070
Antimony	mg/L	-	-	-	<0.0001	<0.0001
Arsenic	mg/L	-	-	-	0.00029	0.00026
Barium	mg/L	-	-	-	0.0098	0.0065
Beryllium	mg/L	-	-	-	<0.00002	<0.00002
Bismuth	mg/L	-	-	-	<0.00005	<0.00005
Boron	mg/L	-	-	-	0.010	<0.01
Cadmium	mg/L	-	-	-	<0.000005	<0.000005
Cesium	mg/L	-	-	-	0.000028	0.000028
Chromium	mg/L	-	-	-	<0.0005	<0.0005
Cobalt	mg/L	-	-	-	0.00015	<0.0001
Copper	mg/L	-	-	-	0.00083	0.00083
Iron	mg/L	-	-	-	0.10	0.014
Lead	mg/L	-	-	-	<0.00005	<0.00005
Lithium	mg/L	-	-	-	0.0031	0.0021
Manganese	mg/L	3.4 - 4.0 <sup>(e)</sup>	0.10 - 0.50 <sup>(g)</sup>	-	0.059	0.0024
Molybdenum	mg/L	-	-	-	0.000097	0.000092
Nickel	mg/L	-	-	-	0.0015	0.0013
Rubidium	mg/L	-	-	-	0.0026	0.0023
Selenium	mg/L	-	-	-	<0.00005	<0.00005
Silicon	mg/L	-	-	-	0.77	0.076
Silver	mg/L	-	-	-	<0.00001	<0.00001
Strontium	mg/L	-	-	-	0.041	0.034
Sulphur	mg/L	-	-	-	6.3	4.6
Tellurium	mg/L	-	-	-	<0.0002	<0.0002
Thallium	mg/L	-	-	-	<0.00001	<0.00001
Thorium	mg/L	-	-	-	<0.0001	<0.0001
Tin	mg/L	-	-	-	<0.0001	<0.0001
Titanium	mg/L	-	-	-	<0.0003	<0.0003
Tungsten	mg/L	-	-	-	<0.0001	<0.0001
Uranium	mg/L	-	-	-	0.000074	0.000080
Vanadium	mg/L	-	-	-	<0.0005	<0.0005
Zinc	mg/L	0.031 - 0.036 <sup>(h)</sup>	0.0032 - 0.0094 <sup>(h)</sup>	-	0.0010	<0.001
Zirconium	mg/L	-	-	-	<0.0003	<0.0003

Notes:

**Bolded** values indicate concentrations are higher than CCME water quality guidelines or outside the recommended pH, DO or total alkalinity range (CCME 1999)

a) Hardness was calculated using the following formula: hardness [mg equivalent CaCO<sub>3</sub>/L] = 2.497[calcium in mg/L] + 4.118[magnesium in mg/L].

b) The ammonia guideline is pH and temperature dependent. The minimum ammonia guideline (0.080 mg-N/L) is based on the combination of field pH (8.8) and water temperature (20°C).

c) Guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (7.0 to 8.8). The guideline is calculated based on the individual pH for each sample.

d) Guideline is pH dependent: 0.005 mg/L at pH < 6.5 and 0.1 mg/L at pH ≥ 6.5.

e) Guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (47 to 55 mg/L). The guideline is calculated based on the individual hardness value for each sample.

f) Guideline is for chromium VI.