From: Matkowski, Shelley <smatkowski@hydro.mb.ca>
Sent: August-31-17 2:47 PM
To: Innes, Kris (SD)
Cc: Rospad, Warren (SD); Fagan, Paul (SD); Gill, Bob; Miles, Terry; Brown, Cameron
Subject: Red River at Sutherland - update
Attachments: 2017 08 31 K. Innes.pdf

Good Afternoon

Attached on behalf of Bob Gill is an update on the monitoring and sampling that has been conducted where bubbling activity was noticed in the Red River near Manitoba Hydro's Sutherland Avenue facility recently.

Bob is away until September 8th, however if you require any additional information before he returns please contact Cameron Brown at the email address above.

Thank you.

Shelley Matkowski
Manager, Environmental Licensing & Protection Department
Manitoba Hydro
360 Portage Avenue (15th Floor)
Winnipeg, MB, R3C 0G8
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Manitoba Hydro

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bgill@hydro.mb.ca

2017 08 31

Mr. Kris Innes
Environment Officer
Manitoba Sustainable Development
Environmental Compliance and Enforcement
Central Region
446 Main Street
Selkirk MB R1A 1V7

Dear Mr. Innes:

RED RIVER BUBBLING AND SURFACE WATER SHEEN

Manitoba Hydro is respectfully submitting this letter to follow-up with the report we made to the Manitoba Sustainable Development Emergency Response Line on August 21, 2017. This is with regard to the bubbling and sheen on the surface of the Red River, near the Disraeli pedestrian bridge in Winnipeg, and to our subsequent communications.

Chronology of Events

Monday August 21, 2017

- Environmental Licensing & Protection Department was notified by telephone, at approximately 15:00 on Monday, August 21, by Manitoba Hydro Sutherland Gas District of bubbling and rainbow sheens on the surface of the Red River, near the Disraeli pedestrian bridge. We understand that the event was initially reported by the public to the City of Winnipeg, who in turn contacted Manitoba Hydro. The Winnipeg Police River Patrol Unit was at the scene, which was drawing public attention. Manitoba Hydro confirmed the bubbling was not related to a natural gas leak.

- B.Gill contacted River Patrol Unit Officer Bryson Labossiere at 16:07 to inform him that B. Gill would be visiting the site.

- B. Gill informed Mr. Raymond Reichelt, Manitoba Sustainable Development, Contaminated Sites Coordinator at 16:35 of the bubbling, that the River Patrol Unit was at the scene, and that he would be visiting the site. R. Reichelt asked B. Gill to report the apparent release to the Manitoba Emergency Response Line if deemed appropriate after inspecting the site.

- B. Gill arrived on site by 17:00. He observed on-going bubbling and sheens, below the Disraeli pedestrian bridge on the downstream side (west), in between the first and second peers closest to the south bank.

- The River Patrol Unit transported B. Gill by boat in the vicinity of the bubbling and sheens for

a water-level view and for photographing.

- B. Gill notified Mr. Paul Fagan, Manitoba Sustainable Development, Emergency Response Line at 19:10 of the bubbling, noting that: the River Patrol Unit and members of the public had been present, and because of the proximity to the Manitoba Hydro 33-38 Sutherland Avenue Facility (which is a contaminated site being managed under Director's Oder DI-230). Additional conversations and email exchange occurred with P. Fagan and Kris Innes, Manitoba Sustainable Development. Mr. Innes inspected and photographed the site and requested that Manitoba Hydro conduct water quality sampling as soon as possible, preferably on August 22, 2017.

Tuesday August 22, 2017

- On behalf of Manitoba Hydro, KGS Group conducted water quality sampling of the Red River on Tuesday, August 22, 2017.

- B. Gill informed Manitoba Sustainable Development (K. Innes, P. Fagan and R. Reichelt) at 08:20 August 22, that KGS would be conducting water sampling.

Wednesday August 23, 2017

- B. Gill informed Manitoba Sustainable Development (K. Innes, P. Fagan and R. Reichelt) that water quality sampling had been completed and a report would be provided to them.

Water Quality Sampling Results

The results of the water quality sampling conducted by KGS Group on Tuesday, August 22, 2017 are summarized below. Detailed results are provided in the attachment.

Methodology

Surface water samples were collected approximately 30 to 40 m from the shoreline at the following four sites (in order):

1. Upstream sample taken in area with no visible sheen between Annabella and McFarlane Street;
2. Downstream sample taken in area with no visible sheen downstream of Disraeli Bridge;
3. Source sample taken at location observed to be "bubbling"; and
4. A second source sample taken at location observed to be "bubbling".

Samples at each site were collected from three depths within the water column: surface, 2.5 meters (midway) and 5 meters (near river bottom), plus one field duplicate, for a total of 13 samples (**Table 1**). Surface water samples were collected by hand with bottles filled from the bow of the boat on the upstream side of the boat. Samples collected midway in the water column and near the bottom of the river were collected with a Kemmerer water sampler. Field parameter monitoring included the simultaneous measurement of dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, temperature, and electrical conductivity (EC) using an YSI Pro Multi-Parameter Meter. All samples were submitted to ALS Laboratories for analysis of BTEX, PHC Fractions F1-F4, and PAH parameters.

Results

The field and laboratory results are summarized in **Tables 2 to 4**. A total of four surface water samples were found to contain detectable concentrations of at least one of the measured parameters. All four of the samples that contained detectable concentrations were collected at surface and summarized as follows:

- SW2A: benzo(a) anthracene (0.013 µg/L), benzo(a)pyrene (0.0098 µg/L), benzo (b&j) flouranthene (0.011 µg/L), fluoranthene (0.031 µg/L), pyrene (0.025 µg/L);
- SW3A: toluene (1 µg/L), xylenes (0.73 µg/L), benzo(a) anthracene (0.011 µg/L), benzo(a)pyrene (0.0073 µg/L), fluoranthene (0.039 µg/L), phenanthrene 0.076 µg/L), pyrene (0.030 µg/L);
- SW4A: xylene (0.71 µg/L);
- SW-100 (field duplicate for SW-4A): toluene (6.20 µg/L), ethylbenzene (1.24 µg/L), xylene (9.15 µg/L).

The pyrene concentration identified in SW-3A and the toluene concentration identified in SW-100 were above the CCME Fresh Water Aquatic Life guidelines (0.025 µg/L and 2 µg/L, respectively). All other parameters were below the CCME Fresh Water Aquatic Life guidelines. Concentrations of BTEX, PHC Fractions F1 to F4 and PAHs parameters were below laboratory detection limits in the remaining nine samples.

As requested by Manitoba Sustainable Development, these results will be incorporated into Manitoba Hydro's annual Long Term Remedial Monitoring Program and on-going assessment of site conditions.

On-Going Monitoring

Manitoba Hydro has been observing the site daily, and photographing and video recording bubbling activity, in the vicinity of coordinates Latitude 49; 54; 29 and longitude -97; 7; 14. It appears that the frequency and magnitude of bubbling has diminished significantly since August 21, 2017.

Next Steps

In accordance with Director's Order D1-230 and the process identified in Manitoba Hydro's Long Term Remedial Monitoring Program for results that may fall outside of historical ranges, Manitoba Hydro is undertaking the following immediate and long term steps:

Immediate Action

- Gather further information through the review of historical reports and documents of previous sediment investigations in the area of concern;
  - Assess the need for acquiring further sediment and bathymetric information;
  - Assess potential short-term containment measures, such as installing a boom to collect sheen from the surface of the Red River, if warranted.

Long Term Action

- Review potential remedial options to have a contingency plan available in the event that the problem persists and further action is deemed necessary.

Please contact me at 360-3314 if you would like to discuss this study further.

Yours truly,

Robert (Bob) Gill
Senior Environmental Specialist
Environmental Licensing & Protection Department
Power Planning
Generation & Wholesale

BG/20170831

c W. Rospad
P. Fagan

Att.

TABLE 1
SAMPLE SITE LOCATIONS
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE

Station ID	UTM Zone	Easting (m)	Northing (m)	Description
SW1	14U	0635050	5529992	Upstream of pedestrian bridge approx. 160 m; in line with McFarlane St. N
SW2	14U	0634869	5530148	Downstream of Disraeli Bridge by approx. 20 m; directly downstream from source location
SW3	14U	0634915	5530109	Source location; downstream of pedestrian bridge approx. 5 m; near light standard located midway between pier 1 and pier 2 from south shore
SW4	14U	0634913	5530102	Source location; downstream of pedestrian bridge approx. 2 m; near light standard located midway between pier 1 and pier 2 from south shore; 5 m south-west of SW3
SW100	14U	0634913	5530102	Replicate of SW4

TABLE 2
GENERAL SURFACE WATER CHEMISTRY
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE

Station ID	Location	Site Depth (m)	Depth	Date	pH (units)	E.C. (µS/cm)	D.O. (mg/L)	ORP	Temp. (°C)
SW1A	**Upstream**	**5.8**	**Surface**	22-Aug-17	7.70	1,045	7.02	28.3	21.7
SW1B	**Upstream**	**5.8**	**Middle (3.0 m)**	22-Aug-17	7.93	1,038	6.04	9.9	20.7
SW1C	**Upstream**	**5.8**	**Bottom (5.5 m)**	22-Aug-17	7.48	1,049	5.36	17.3	21.1
SW2A	**Downstream**	**5.3**	**Surface**	22-Aug-17	7.10	1,056	5.06	28.7	21.1
SW2B	**Downstream**	**5.3**	**Middle (2.5 m)**	22-Aug-17	7.30	1,052	4.90	8.8	21.4
SW2C	**Downstream**	**5.3**	**Bottom (5.0 m)**	22-Aug-17	7.04	1,065	4.80	9.6	21.1
SW3A	**Source**	**5.2**	**Surface**	22-Aug-17	6.65	1,068	5.60	9.0	21.2
SW3B	**Source**	**5.2**	**Middle (2.5 m)**	22-Aug-17	8.22	1,045	4.91	-18.7	21.0
SW3C	**Source**	**5.2**	**Bottom (4.9 m)**	22-Aug-17	7.89	1,050	4.89	-17.4	21.0
SW4A	**Source**	**4.8**	**Surface**	22-Aug-17	8.37	1,038	4.72	-17.5	20.6
SW4B	**Source**	**4.8**	**Middle (2.5 m)**	22-Aug-17	7.76	1,060	5.30	-17.2	20.9
SW4C	**Source**	**4.8**	**Bottom (4.5 m)**	22-Aug-17	8.42	1,044	4.72	-17.9	20.8

Notes:

"-" = No Data

D.O. = Dissolved Oxygen

E.C. = Electrical Conductivity

ORP = Oxidation-Reduction Potential

TABLE 3

PETROLEUM HYDROCARBONS IN WATER

FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE

Sample Number	Date	Parameter [1]								
		Benzene	Toluene [3a, 3b]	Ethyl-benzene [4a, 4b]	Xylenes (-o,-m,-p) [5a, 5b]	F1 (C6 - C10)	F2 (C10 - C16)	F3 (C16 - C34)	F4 (C34 - C50)	Total Hydrocarbons (C6 - C50)
SW1A	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW1B	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW1C	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW2A	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW2B	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW2C	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW3A	22/Aug/17	<0.50	1.0	<0.50	0.73	<100	<100	<250	<250	<380
SW3B	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW3C	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW4A	22/Aug/17	<0.50	<1.0	<0.50	0.71	<100	<100	<250	<250	<380
SW4B	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW4C	22/Aug/17	<0.50	<1.0	<0.50	<0.71	<100	<100	<250	<250	<380
SW100 (dup of SW4A)	22/Aug/17	<0.50	**6.20**	1.24	9.15	<100	<100	<250	<250	<380
EQL		*0.50*	*1.0*	*0.50*	*0.71*	*100*	*100*	*250*	*250*	*380*
CCME [2]										
Canadian Water Quality Guidelines for the Protection of Aquatic Life										
Freshwater Aquatic Life		370	2	90	-	-	-	-	-	-

Notes:

EQL = Estimated Quantitation Limit = Lowest level of the parameter that can be quantified with confidence.

"-" = No Data

1. All concentrations in micrograms per litre (µg/L) unless otherwise specified.
2. CCME - Canadian Council of Ministers of the Environment. Canadian Environmental Quality Guidelines 1999. Updated February 6, 2014.
   a. Canadian Water Quality Guidelines for the Protection of Aquatic Life
3. Toluene
   a. Health basis of MAC: Adverse neurological effects, including vibration thresholds, colour discrimination, auditory thresholds, attention, memory and psychomotor functions.
   b. Other Health Considerations: Insufficient information to determine whether toluene is carcinogenic to humans.
4. Ethylbenzene
   a. Health basis of MAC: Effects on the liver and pituitary gland.
   b. Other Health Considerations: Tumour formation at various sites in animals, including kidney, lung, liver and testes.
5. Xylenes
   a. Health basis of MAC: Adverse neuromuscular effects.
   b. Other Health Considerations: Insufficient information to determine whether xylenes are carcinogenic to humans.

BOLD - Exceedance of CCME Criteria

TABLE 4
POLYCYCLIC AROMATIC HYDROCARBONS IN WATER
FORMER SUTHERLAND AVENUE MANUFACTURED GAS PLANT SITE

Sample No.	Date	Parameter [1]																		
		Ace-naphthene	Ace-naphthylene	Acridine	Anthracene	Benzo(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Fluorene	Indeno (1,2,3-c,d) pyrene	1-Methyl-naphthalene	2-Methyl-naphthalene	Naphthalene	Phenanthrene	Pyrene	Quinoline
SW1A	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW1B	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW1C	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW2A	22/Aug/17	<0.020	<0.020	<0.020	<0.010	0.013	0.0098	0.011	<0.020	<0.010	<0.020	<0.0050	0.031	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	0.025	<0.020
SW2B	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW2C	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW3A	22/Aug/17	<0.020	<0.020	<0.020	<0.010	0.011	0.0073	<0.010	<0.020	<0.010	<0.020	<0.0050	0.039	<0.020	<0.010	<0.020	<0.020	<0.050	0.076	**0.030**	<0.020
SW3B	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW3C	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW4A	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW4B	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW4C	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
SW100 (Dup of SW4A)	22/Aug/17	<0.020	<0.020	<0.020	<0.010	<0.010	<0.0050	<0.010	<0.020	<0.010	<0.020	<0.0050	<0.020	<0.020	<0.010	<0.020	<0.020	<0.050	<0.050	<0.010	<0.020
EQL		*0.020*	*0.020*	*0.020*	*0.010*	*0.010*	*0.0050*	*0.010*	*0.020*	*0.010*	*0.020*	*0.0050*	*0.020*	*0.020*	*0.010*	*0.020*	*0.020*	*0.050*	*0.050*	*0.010*	*0.020*
CCME [2]																					
Canadian Water Quality Guidelines for the Protection of Aquatic Life																					
Freshwater Aquatic Life		5.8	-	4.4	0.012	0.018	0.015	-	-	-	-	-	0.04	3.0	-	-	-	1.1	0.4	0.025	3.4

Notes:

EQL = Estimated Quantitation Limit = Lowest level of the parameter that can be quantified with confidence.

"-" = No Data

1. All values are expressed in milligrams per litre (µg/L) unless otherwise specified.
2. CCME - Canadian Council of Ministers of the Environment. Canadian Water Quality Guidelines, 1999. Updated February 6, 2014.
   Canadian Water Quality Guidelines for the Protection of Aquatic Life

BOLD - Exceedance of CCME Criteria