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Via Facsimile

December 18, 2000

Mr. Ron Stannard, P.E.
Bureau of Solid Waste & Land Management
NYSDEC Division of Solid & Hazardous Materials
50 Wolf Road
Albany, New York 12233-7258

RE: Methane Survey Results
Portions of the former Orangeburg Pipe Manufacturing Facility
Orangetown, Rockland County, New York

Dear Mr. Stannard:

On December 4, 2000, HydroScience, Inc. ("HydroScience") performed a subsurface methane survey at the above-referenced property (the "Site"). The survey was performed to satisfy the landfill closure requirements of 6 NYCRR 360-2.15. A letter dated October 31, 2000, outlining a proposed scope of work for the methane survey, was submitted to your office and to the Rockland County Department of Health ("RCDOH"). The proposed scope of work was approved via email on November 10, 2000. Representatives from both NYSDEC and RCDOH were on-Site to observe the methane survey on December 4, 2000.

Field Methods

The methane survey was performed using a direct-push, Geoprobe-mounted soil vapor extraction system (Photograph 1). At each borehole location, a rod fitted with an expendable point was advanced to a depth of four feet below ground surface (bgs). The expendable point was then released from the rod, and the rod was pulled back to a depth of two feet bgs, allowing soil vapor from the two- to four-foot bgs interval to enter the open borehole. A length of tubing was then inserted through the rod and connected via a vacuum tight seal to an opening in the bottom of the rod. The upper end of the tubing was attached to a vacuum pump to evacuate approximately two liters of air from the boring. The upper end of the tubing was then attached to a Landtec GA-90 hand-held infrared gas analyzer to

analyze soil vapor for methane, carbon dioxide, and oxygen (Photograph 2). Soil vapor was analyzed for at least one minute, and then until readings stabilized. Measurements were recorded in a site-specific field book and in the Landtec GA-90's built-in data logger.

Where conditions mandated and time permitted, the GeoProbe was repositioned approximately one foot away from the initial hole for screening of soil vapor from successively deeper intervals. Each screened interval consisted of a two-foot span from the final rod depth (using four-foot rods) to the rod's retracted depth (e.g. 6-8 feet bgs, 10-12 feet bgs). The process continued at each location until the bottom of the fill horizon was reached, until water in the borehole prevented collection of a soil vapor sample, or until methane was positively identified, whichever occurred first.

The scope of work proposed for the methane survey entailed installation of approximately 24 methane survey points across the Site. Although not stipulated in the proposed scope of work, HydroScience also performed a soil survey at each point to determine whether soil vapor samples were being extracted from fill material or from native soil. Due to the time spent surveying the soil at each location, the actual survey included only 14 methane survey points. Towards the end of the workday, soil sampling was abandoned in favor of collecting more methane readings across the Site.

Results

The results of the methane survey are summarized in Table 1. The locations of methane survey points are shown in Figure 1. Methane was detected at boring locations 04, 07, 08, 09, and 12 at concentrations ranging from 0.5 to 31.9%. As anticipated, methane generation at the Site appears to be associated with native material rather than fill material at the Site. Fill material at the Site is composed primarily of Orangeburg pipe fragments and other materials which would not be expected to generate methane. Conversely, native soil along the eastern portion of the Site has been documented¹ to contain a layer of organic and fine-grained marsh deposits. Decomposition of organic material in marsh deposits commonly produces methane and other gases. Boring locations 04, 07, 08, and 09 are located within portions of the Site documented by LMS to contain marsh deposits; therefore, the methane detected at these locations is attributed to natural soil deposits and not to fill material. The open borehole at boring location 08 emitted a strong hydrogen sulfide odor (i.e. rotten eggs odor) also commonly associated with the decomposition of organic material. Boring location 12 is located west of the documented marsh deposits, yet a methane concentration of 0.5 % was detected in the two-four feet bgs interval. Due to time constraints, no deeper intervals were sampled to confirm or to rebut the presence of methane at this location.

¹ Lawler, Matusky & Skelly Engineers, 1986: *Progress Report: Remedial Investigation Study at Flintkote Site, Orangeburg, NY*, as presented in Lawler, Matusky & Skelly Engineers, 1995: *Report on Soil and Groundwater Investigations Conducted at Parkway Plaza Associates Site*, Appendix B to the Site Plan Environmental Impact Statement (EIS).

Regardless of the source, the presence of methane at the Site mandates that safety measures be implemented to mitigate the explosion hazard created by the accumulation of methane gas beneath planned buildings at the Site. Accordingly, a methane venting system will be included in the design of proposed buildings at the Site. Specifications for the venting system will be stipulated in the Closure Plan for the Site, and this letter report will be incorporated into the Closure Plan as an appendix.

If you have any questions or comments regarding the methane survey, please do not hesitate to contact me.

Sincerely,
HydroScience, Inc.

Elizabeth K.T. Schamberger

Attachments: Photographs

Figure: Methane Survey Results & Depth of Fill Material

Table: Results of Methane Survey

cc: Ms. Catherine Quinn, Rockland County Dept. of Health
Mr. Daniel Miller, Rockland County Dept. of Health
Mr. Steve Bates, New York State Dept. of Health
Mr. Steve Parisio, New York State Dept. of Environmental Conservation
Mr. Scott Furman, Tannenbaum Helpen Syracuse & Hirschtritt, LLP

METHANE SURVEY

14 METHANE SAMPLING
LOCATION - NO METHANE
DETECTED

9.9 % METHANE SAMPLING
LOCATION - METHANE
07 DETECTED (maximum
detection shown in percent)

DEPTH OF FILL MATERIAL

4 INDICATES DEPTH OF
FILL WITH NO PIPE
(IN FEET*)

P INDICATES DEPTH OF
12 FILL CONTAINING PIPE
FRAGMENTS (IN FEET*)

* TOTAL DEPTH BAR = 15 FEET

PROPERTY INFORMATION

PROPERTY LINES

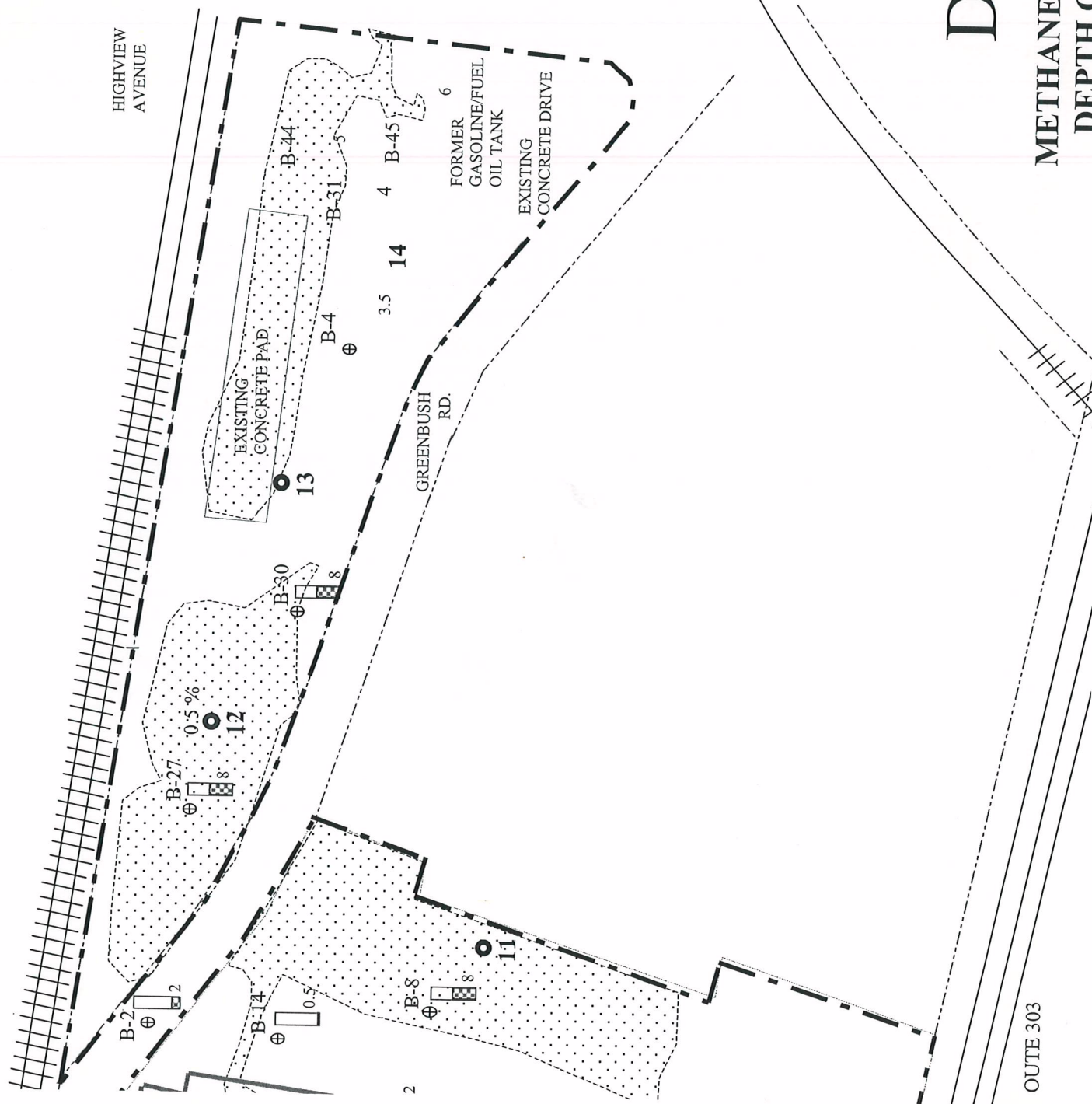
SITE BOUNDARIES

PROPOSED BUILDING

ACCESSIBLE AREAS
(DIRT ROADS, CONCRETE,
PAVED AREAS, ETC.)

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METHANE SURVEY RESULTS & DEPTH OF FILL MATERIAL



LEGEND

METHANE SURVEY

- METHANE SAMPLING
14 LOCATION - NO METHANE DETECTED
 9.9 % METHANE SAMPLING LOCATION - METHANE DETECTED
07 DETECTED (maximum detection shown in percent)

DEPTH OF FILL MATERIAL

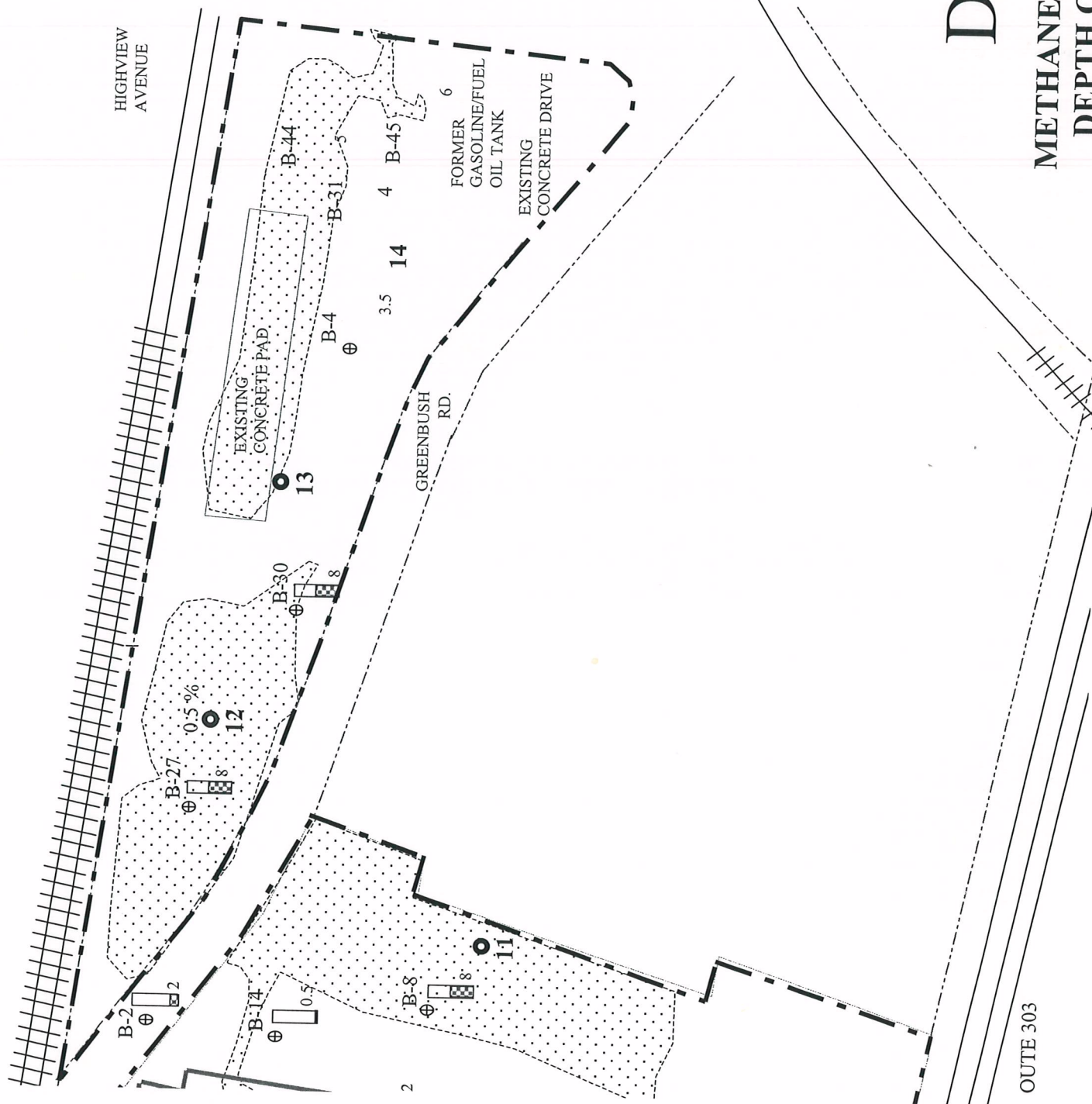
- INDICATES DEPTH OF FILL WITH NO PIPE (IN FEET*)
4
 P INDICATES DEPTH OF FILL CONTAINING PIPE
12 FRAGMENTS (IN FEET*)
 * TOTAL DEPTH BAR = 15 FEET

PROPERTY INFORMATION

- PROPERTY LINES
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METHANE SURVEY RESULTS & DEPTH OF FILL MATERIAL



Results of Methane Survey
Former Orangeburg Pipe Manufacturing Facility,
Orangetown, Rockland County, New York

Sampling Location ID	Depth of Soil Investigation (feet below ground surface)	Soil Vapor Sampling Interval (feet below ground surface)	Media Encountered	Soil Vapor Survey Results		
				CH ₄ (%)	CO ₂ (%)	O ₂ (%)
01	12	2 - 4	native soil	0.0	8.1	11.5
		6 - 8	native soil	0.0	9.7	10.8
		10 - 12	native soil	0.0	8.0	12.3
02	12	2 - 4	black fill material	0.0	0.2	19.0
		6 - 8	black fill material	0.0	0.3	19.1
		---	black fill material, water	---	---	---
03	5.5 (refusal)	2 - 4	brick, wood, soil	0.0	0.4	19.2
		6 - 8	ND	---	---	---
04	10 (refusal)	2 - 4	black fill material	32.1	22.1	0.0
		6 - 8	black fill material	31.7	22.0	0.5
05	12	2 - 4	black fill material	1.0	9.5	9.4
		6 - 8	black fill material	0.0	0.4	19.4
		10 - 12	native soil	---	---	---
06	12	2 - 4	black fill material	0.0	11.1	9.5
		6 - 8	black fill material	0.0	0.9	19.8
		10 - 12	black fill material, native soil	0.0	0.8	19.4
07	---	2 - 4	black fill material	9.9	11.9	1.6
08	---	2 - 4	---	3.8	15.3	0.3
		0 - 8 (open hole)	native soil, water*	OH = 10.9	H = 17.4	OH = 0.3
09	---	2 - 4	---	9.3	16.8	0.1
		0 - 8 (open hole)	black fill material, water*	OH = 6.8	H = 12.0	OH = 7.9
10	---	2 - 4	---	0.0	2.1	19.2
		6 - 8	---	0.0	0.9	19.6
11	8	0 - 12 (open hole)	native soil, water*	OH = 0.0	OH = 0.6	OH = 20
		2 - 4	black fill material	0.0	0.1	20.4
		6 - 8	black fill material	0.0	17.1	0.6
12	4	2 - 4	black fill material, native soil	0.5	10.0	1.9
13	4	2 - 4	native soil	0.0	1.7	19.1
14	4	2 - 4	native soil	0.0	1.1	19.6

ND = not determined

OH = open hole measurement, with tubing placed approximately one foot down into the open borehole.

"Refusal" indicates that the GeoProbe could not penetrate the ground beyond the depth indicated.

* Material found on tip of sampling rod after rod was extracted from borehole.

ID	CH4	CO2	O2	time	date
OBRG 0104	0.0	8.1	11.5	8:19:29	12/4/00
OBRG 0108	0.0	9.7	10.8	8:27:15	12/4/00
OBRG 0112	0.0	8.0	12.3	8:36:25	12/4/00
OBRG 0204	0.0	0.2	19.0	9:07:46	12/4/00
OBRG 0208	0.0	0.3	19.1	9:18:54	12/4/00
OBRG 0304	0.0	0.4	19.2	9:42:49	12/4/00
OBRG 0404	32.1	22.1	0.0	10:03:04	12/4/00
OBRG 0408	31.7	22.0	0.5	10:11:53	12/4/00
OBRG 0504	1.0	9.5	9.4	10:40:53	12/4/00
OBRG 0508	0.0	0.4	19.4	10:51:47	12/4/00
OBRG WELL	0.0	1.0	18.0	11:41:40	12/4/00
OBRG 0604	0.0	11.1	9.5	11:53:30	12/4/00
OBRG 0608	0.0	0.9	19.8	12:00:42	12/4/00
OBRG 0612	0.0	0.8	19.4	12:15:11	12/4/00
OBRG 0704	9.9	11.9	1.6	12:33:04	12/4/00
OBRG SPAN	13.9	13.9	0.3	12:59:23	12/4/00
OBRG 0804	3.8	15.3	0.3	13:25:26	12/4/00
OBRG 08HL	10.9	17.4	0.3	13:38:07	12/4/00
OBRG 0904	9.3	16.8	0.1	13:51:14	12/4/00
OBRG 09HL	6.8	12.0	7.9	14:03:54	12/4/00
OBRG 1004	0.0	2.1	19.2	14:20:20	12/4/00
OBRG 1008	0.0	0.9	19.6	14:27:22	12/4/00
OBRG 10HL	0.0	0.6	20.0	14:41:10	12/4/00
OBRG 1104	0.0	0.1	20.4	14:59:43	12/4/00
OBRG 1108	0.0	17.1	0.6	15:05:22	12/4/00
OBRG 1204	0.5	10.0	1.9	15:17:16	12/4/00
OBRG 1304	0.0	1.7	19.1	15:41:06	12/4/00
OBRG 1404	0.0	1.1	19.6	15:42:43	12/4/00
OBRG SPN2	14.9	15.2	0.9	16:11:08	12/4/00