O'CONNOR ASSOCIATES ENVIRONMENTAL INC.
SITE MONITORING REPORT

File C.0005

CLIENT: PETRO-CANADA JOB NUMBER: 10-1177

ATTN: MR. A. MACRAE

cc:

PROJECT: PETRO-CANADA SERVICE STATION, 208 ST. ANNE'S ROAD

LOCATION: WINNIPEG, MANITOBA STATION NO: 63955

MONITORING DATE: 93/11/30

SITE DESCRIPTION (see Drawings No. 1.1 and 1.2)

Total no. piezometers installed 22
Total no. piezometers existing on this date 19
Total no. piezometers monitored on this date 18

BH8 - not monitored

PROJECT STATUS
GROUNDWATER

Average piezometric surface elevation outside tank backfill:
Falling 0.41 m over interval 93/09/09 to 93/11/30

Average groundwater elevation within tank backfill:
Falling 0.36 m over interval 93/09/09 to 93/11/30

Depth to groundwater table outside tank backfill:
Min. depth 1.54 m at BH3 Previous min depth 0.10 m at BH1
Max. depth 2.34 m at BH14 Previous max depth 3.47 m at BH1

Depth to groundwater within tank backfill:
Min. depth 1.43 m at P3 Previous min depth 1.08 m at P3
Max. depth 1.83 m at P2 Previous max depth 2.90 m at PZ2

Principal direction of groundwater flow: East

QUID PLUME

No. of piezometers with liquid product: 0
No. of piezometers without liquid product: 17

Greatest apparent thickness: None

Product was last detected on 92/11/26

VAPOUR PLUME (see Table 1.1 and Drawing No. 1.3)

Vapour Concentrations	Piezometers	MHs & CBs
≤2% LEL :	15	8
>2% LEL to 5% LEL :	1	0
>5% LEL to 10% LEL :	1	0
>10% LEL to 100% LEL :	0	0
>100% LEL :	1	0

Tank Backfill vapour concentrations:
Maximum 15 ppm in P2. Minimum 5 ppm in P3

SAMPLING AND CHEMICAL ANALYSIS

Location/Type:
Analyzed For:

SITE MONITORING SCHEDULE

Unless otherwise requested,
Regular (every 12 weeks)
Next Monitoring Date: WEEK ENDING 94/02/26

CB: MTB/DHL AIC: RDK

For Further Information Contact:

D.H. LEE, P.Geol.

Date: 94/01/10

EQUIPMENT ON-SITE

Type	Location	Status
On Arrival - 93/10/12		
VES 154	U/G Header	Operative
On Departure - 93/10/12		
VES 154	U/G Header	Deactivated
On Arrival and Departure - 93/11/30		
VES 154	U/G Header	Inoperative

LIQUID RECOVERY

Date	Recovery Unit	Location	Flow Rate (L/min)	Recovery (L)

Date	Purging/Bailing	Location	Volume Recovered (L)

Volume recovered between _____ and _____ : _____ L
Total volume recovered since 89/05/31 : 0.05 L

VAPOUR EXTRACTION (see Table 1.2)

Date	Extraction Unit	Location	Estimated Extraction Rate (L/day)
93/10/12	VES 154	U/G Header	<0.1

Volume extracted between 93/09/09 and 93/11/30 : 3 L
Total volume extracted since 89/05/31 : 2397 L

TOTAL PRODUCT REMOVED TO DATE: 2397 L
(includes pumping, bailing and vapour extraction)

COMMENTS

- a vapour concentration exceeding 100% LEL persisted in BH7 near the former pump islands
- VES 154 was deactivated on 93/10/12 due to the low extraction rate

PROVINCE OF MANITOBA
R. D. KING
REGISTERED PROFESSIONAL ENGINEER

Received March 23/94 from Andy for Mac Rae!

TABLE 1.1
SUBSURFACE VAPOUR CONCENTRATIONS
(% LEL)

DATE	BH1	BH2	BH3	BH5	BH6	BH7	BH8	BH9	BH11	BH12
93/05/05	NM	NM	NM	NM	NM	>100	NM	NM	NM	NM
93/05/20	<1	1	14	4	2	>100	<1	<1	<1	<1
93/07/16	1	1	NM[r]	20	2	NM[r]	NM[r]	<1	<1	2
93/09/09	<1	1	<1	2	1	>100	NM	<1	<1	ND
93/11/30	<1	<1	<1	10	<1	>100	NM	<1	<1	<1

DATE	BH13	BH14	BH16	BH17	BH18	P1	P2	P3	P4
93/05/05	NM	NM	11	<1	NM	NM	NM	NM	NM
93/05/20	1	2	14	2	<1	<1	<1	<1	<1
93/07/16	1	2	10	2	1	<1	<1	<1	4
93/09/09	1	2	3	2	2	<1	<1	<1	<1
93/11/30	<1	<1	2	<1	<1	<1	<1	<1	<1

ND - not detected (<5 ppm)
NM - not monitored

r - piezometer flooded

NOTES: Vapour concentrations less than 5% LEL were measured in ppm but reported in % LEL.
All reported values are rounded to the nearest whole number.

TABLE 1.2

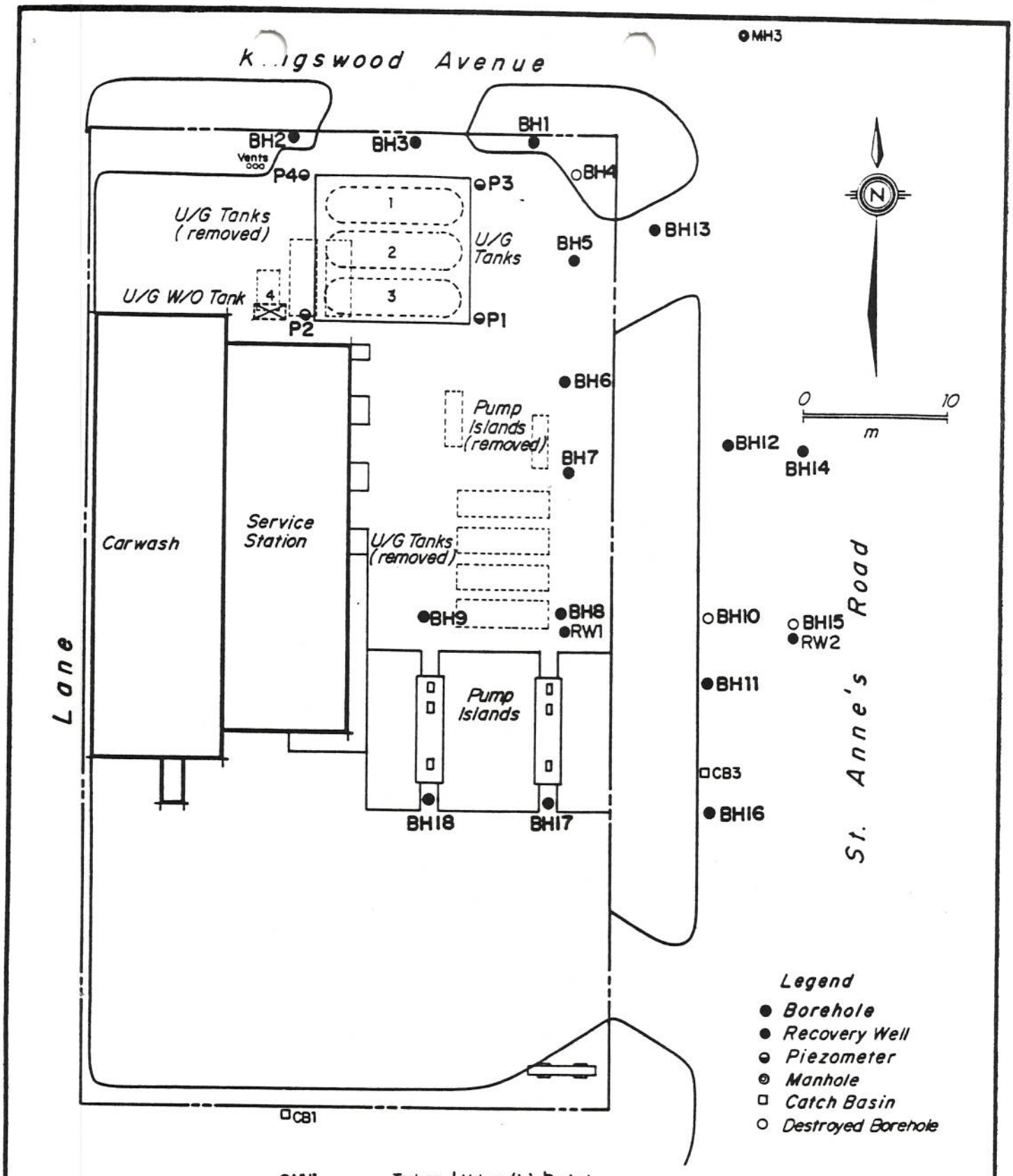
VAPOUR EXTRACTION SYSTEM PERFORMANCE DATA
(connected to Horizontal Header)

(VES 154)

DATE	TIMER READING (hours)	VAPOUR CONCENTRATION (% LEL)	FLOW VELOCITY (m/s)	TEMPERATURE (°C)	ESTIMATED EXTRACTION RATE (L/DAY)	CUMULATIVE VOLUME EXTRACTED (L)
89/06/10-92/11/26	6486.0					2267
93/01/19	7753.0	0.3	23.8	0.0	0.8	2309
93/04/23	6031.8	0.4	24.2	14.0	0.8	2309
93/05/05	6304.0	0.2	23.3	20.0	0.4	2314
93/05/20	6646.0	0.6	22.6	23.0	1.3	2332
93/06/15[a,b,c]	7242.0	0.2	22.7	30.0	0.4	2364
93/07/16[d]	NR	0.3	22.9	21.0	0.6	2382
93/08/09[d,e]	NR	0.1	24.9	28.0	0.3	2388
93/09/09[f]	9142.9	0.1	24.0	20.0	0.3	2394
93/10/12[e]	9932.3	<0.1	21.2	17.0	<0.1	2397
93/11/30[g]	9932.7				<0.1	2397

a - VES 154 was inoperative on arrival; operated for 25 of a possible 26 days
b - parameters recorded after 20 minutes of operation
c - the volume extracted was calculated using the previous estimated extraction rate
d - timer reading not recorded, assume continuous operation
e - VES 154 deactivated on trial basis
f - VES 154 operating on arrival; activated by persons other than OAEI
g - VES 154 remains inactive on-site
NR - no reading

NOTE: Vapour concentrations less than 5% LEL were measured in ppm but are reported in % LEL.



Tank no.	Volume (L)	Product
1	36365	PUL
2	36365	RUL
3	36365	MUL
4	2273	W/O

Site Plan

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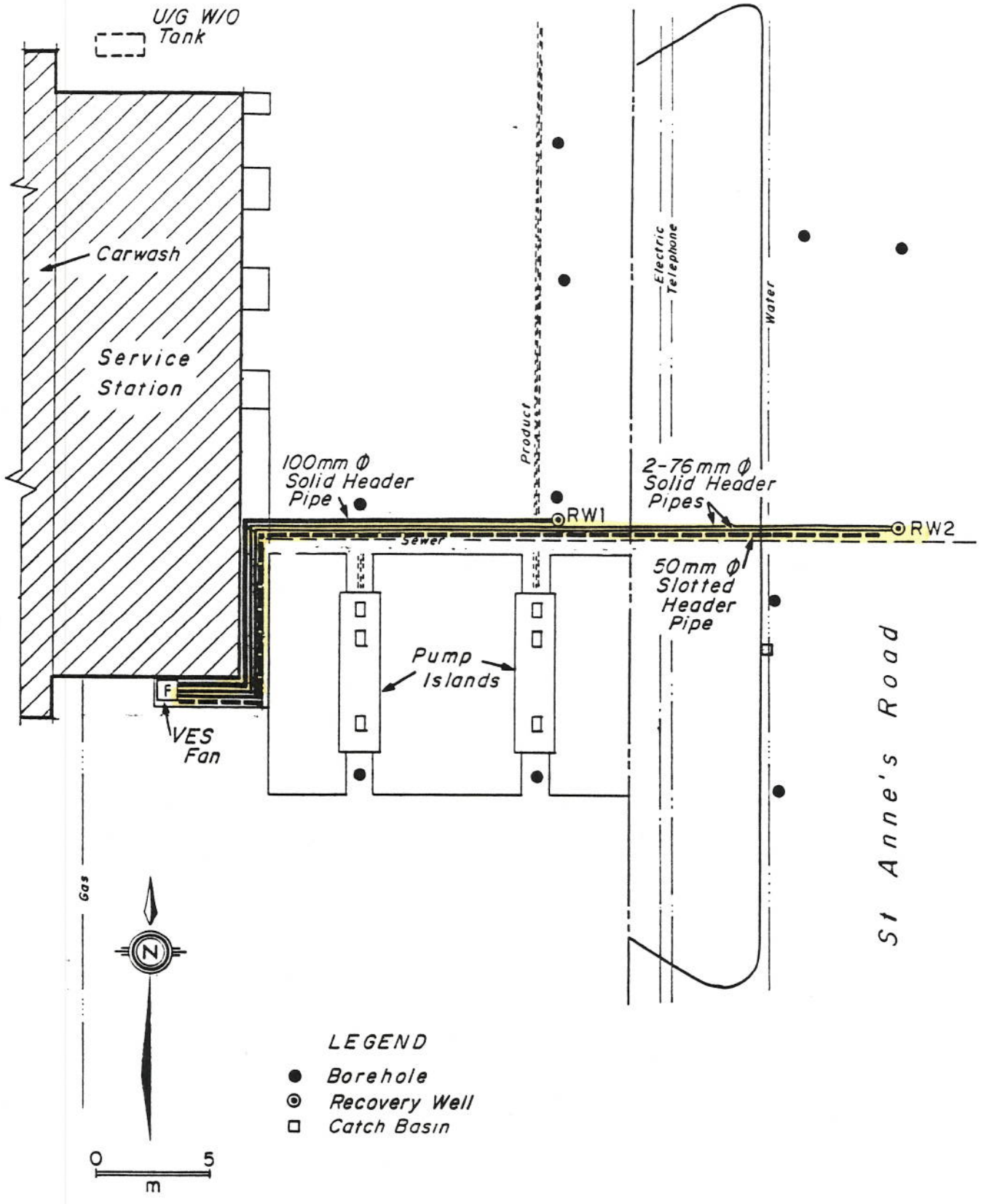
JOB NO.: 10-1177	DATE: 93/07/07
DRAWN BY: JR	DWG. NO.: 1



Header Piping Configurations

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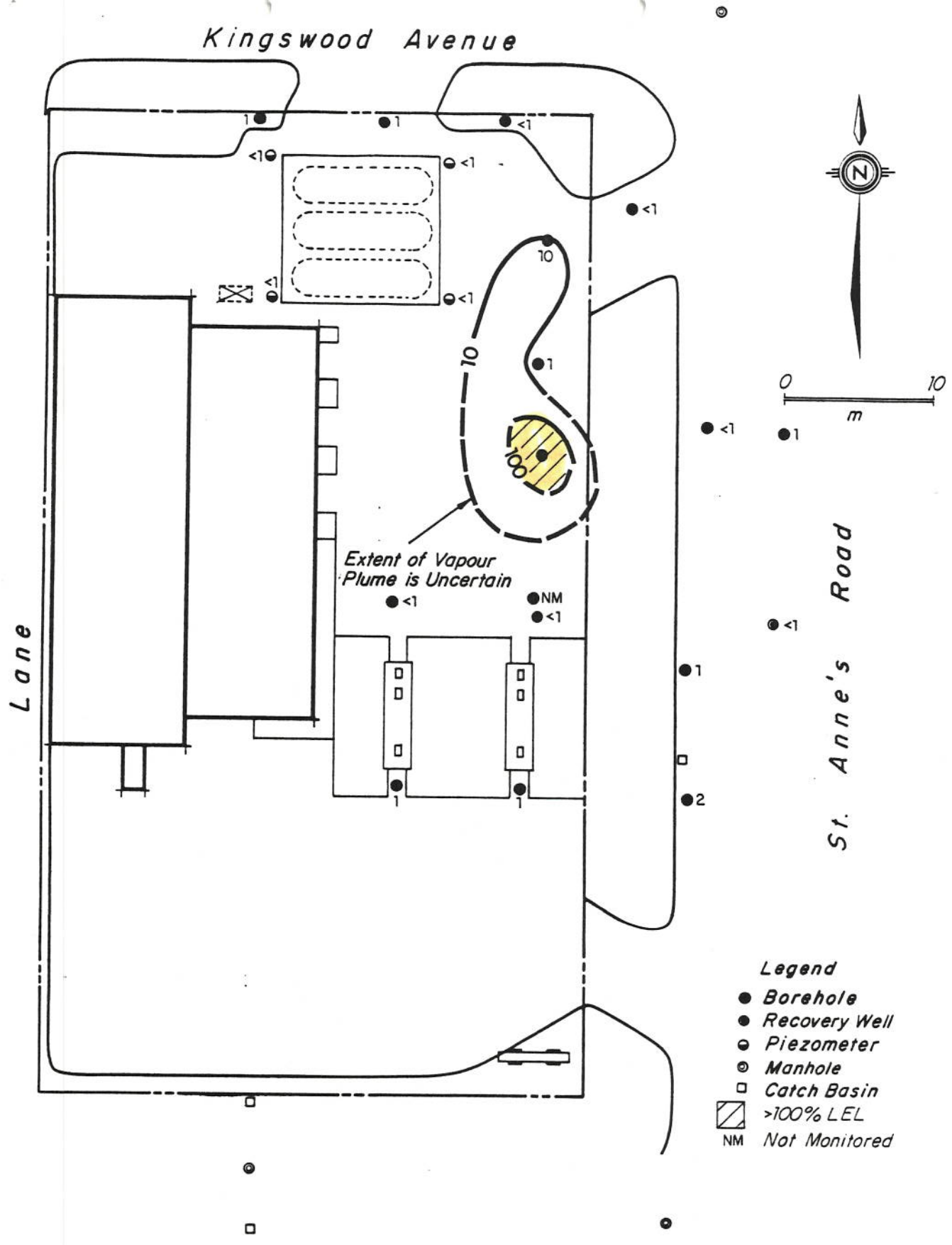
JOB NO.: 10-1177	DATE: 92/10/16
DRAWN BY: MG	DWG. NO.: 1.2



Subsurface Vapour Concentrations
(% LEL)
93/11/30

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JOB NO.: 10-1177	DATE: 93/12/23
DRAWN BY: MG	DWG. NO.: 1.3