

Iowa Department of Natural Resources

VAPOR INVESTIGATION BELLE PLAINE, IOWA

Background: On November 17, 2000 the Iowa Department of Natural Resources (DNR) Field Office #1 in Manchester received a complaint about petroleum odors in the Belle Plaine Library and a neighboring warehouse owned by Dan Blanchard. Strong odors were reported from a sump pit in the library. Odors had been observed in the library and warehouse for several weeks. Odors had not been noted before then. Prior to notifying the DNR, the city conducted some vapor monitoring that apparently did not reveal any explosive conditions.

Setting: The library and warehouse are located on the north side of the block on 12th St. between 9th Ave. and 10th Ave. in Belle Plaine. The ground surface falls from north to south. The floor level of both buildings is at the ground level in the front of the buildings, i.e., the south side. The floor level of both buildings is about 4 feet below grade on the north side. Drain tile along the north side of the library enter the sump and a gravity outlet pipe exits the sump towards the northeast, apparently connecting to a storm sewer in the alley behind the library. The Blanchard warehouse does not have a drain tile and has experienced water leakage from the north wall.

Possible vapor sources: Several underground fuel tanks are known to exist or have existed in the immediate vicinity including: a former (e.g., 30+ years ago?) gas station at the southeast corner of 13th St. and 9th Ave. (now the Hair Hut; Peterson Oil, a former gas station located on 12 St. south of the Blanchard Warehouse; and Casey's, an operating gas station located on 13th St. just north of the library and warehouse. The former gas station and Casey's are at a higher elevation than the library and warehouse and the Peterson Oil property is at a lower elevation. No records have been found for the former gas station. The Peterson Oil property has previously identified petroleum contamination from leaking underground storage tanks. Several years ago Casey's removed and replaced underground storage tanks near the southeast corner of their property. No contamination above DNR action levels were reported at that time and current leak detection equipment is operating properly and has not revealed a leak.

Air and water sampling: On November 29, 2000 DNR staff from the Contaminated Sites Section visited Belle Plaine. Faint odors were noticed in the library. Stronger odors were noted in the area of the library's sump and in the neighboring warehouse. Library personnel indicated that the odor intensity varied and was not particularly strong at the time of the visit.

Two air samples was collected for analyses by the University of Iowa Hygienic Laboratory (UHL). These samples were collected air by drawing air through VOC sorbent tubes with a metered air pump. One such sample was collected in the library office area, the room with the sump in the corner. The other was taken in the middle of the western front room of the Blanchard warehouse. Results of these samples are summarized in Table 1. Complete results are attached.

Two additional air samples were collected in 250 ml glass bulbs for analyses with the DNR's portable gas chromatograph (GC). One of the samples was collected at the same time and place as the sample collected for laboratory analysis in the Blanchard warehouse. The other was taken in the headspace of the sump in the library — an area expected to have higher contaminant concentrations and is *not* in the normal breathing zone. Results of these samples are also included in the following table along with some air standards for comparison.

SUMMARY OF BELLE PLAINE AIR SAMPLING

<u>Sample Location</u>	<u>Analyzed By</u>	<u>Concentrations in parts per billion (ppb)</u>				<u>Total¹⁾ VOCs</u>
		<u>Benzene</u>	<u>Toluene</u>	<u>EthylBenzene</u>	<u>Xylenes</u>	
Library Office	UHL	34	79	34	131	2,000
Blanchard Warehouse	UHL	120	260	100	380	6,900
Blanchard Warehouse	DNR	160	500*	200* (EB + Xy)		
Library Sump	DNR	1,300	2,000*	2,000*(EB + Xy)		
OSHA Std. ²⁾		10,000	100,000	200,000	100,000	NA
DNR Std. ³⁾		4	700	1,400	700	NA

1) This is a measure of all organic contaminants including the 4 shown.

2) OSHA standards are based on a workplace exposure of 40 hours a week.

3) DNR standards are based on 567 IAC 137.6(8) and represent an exposure of 24 hours a day, every day for 70 years.

* Ballpark estimates only since the DNR's GC was not calibrated for these compounds.

A water sample was also collected from the standing water in sump in the library for analysis by UHL. The water sample was found to contain the following:

<u>Contaminant</u>	<u>Concentration (µg/l)</u>	<u>Drinking Water Standard (µg/l)</u>
Benzene	23	5
Toluene	94	1,000
Ethylbenzene	16	700
Xylenes	97	10,000
6 unspecified C9H12 aromatics	58 (estimated)	NA
1 unspecified C9H10 aromatic	9 (estimated)	NA

The results of the air and water sampling confirmed the existence of contaminants in the air in the library and warehouse and water from the sump. According to the UHL, the contaminants found in these samples had characteristics similar to gasoline.

The air samples analyzed by UHL are considered to be very accurate. The levels of contaminants found in the air samples analyzed by UHL do not suggest any serious health risk due to short-term exposure. However, according to C. Charles Barton, the State Toxicologist with the Iowa Department of Public Health, the levels found can cause short-term problems like headaches. Long-term exposure to benzene at the level found may pose an increased cancer risk, as reflected in the DNR standard of 4 ppb that is based on an estimated increased risk of developing cancer of one in ten thousand from continuous exposure for 70 years.

The existence of contaminants in the sample of water from the sump raises the question of the source of the contaminants. In the days prior to the sample collection library staff had poured water into the sump, which seemed to reduce the odor problem. However, they did not pour water in the sump the day of the sample collection. Three possible scenarios explaining the contaminants in the water are as follows:

- 1) Infiltration of precipitation through contaminated soils reaching the library's drain tile;
- 2) Contaminated groundwater migrating to the library from another area and entering the library's drain tile; and
- 3) Adsorption of contaminants from the air, via the sump outlet pipe, to water in the sump.

Investigation by DNR Field Office #1: On November 30, 2000, Don Chase from DNR Field Office #1 conducted an investigation using a meter to check for explosive levels of hydrocarbons and hydrocarbon concentrations in the parts per million (ppm) range. No explosive levels or general hydrocarbon levels were found in the library or Blanchard warehouse. Hydrocarbon readings were found in several manholes and storm sewer inlets as described in the field Office's report, which is attached.

Investigation by DNR Contaminated Sites Section: On December 14, 2000, Bob Drustrup and Shelli Grapp of the DNR Contaminated Sites Section conducted additional investigation of the vapor problem. Karen Bergan with the library and Randy Bennett, Belle Plaine Public Works Director assisted the DNR staff. A ppbRae meter made by Rae Systems, Inc., Sunnyvale, CA was used for this investigation. The ppbRae meter is a hand-held unit capable of detecting volatile organic compounds (VOCs), like gasoline, in the parts per billion (ppb) range and higher. The meter was calibrated using isobutylene. The readings on the meter represent only approximate concentrations of VOCs and the meter does not identify individual compounds. However, since the identities of the individual contaminants in the air have been determined previously, the ppbRae meter provides an excellent tool for determining where air contaminants exist and relative concentrations.

Readings in the DNR office prior to visiting Belle Plaine were in the 200-250 ppb range. Outdoor readings in Belle Plaine were generally in the 60-100 ppb range. Readings in the main part of the Belle Plaine Library were in the 150 – 200 ppb range. Readings in the back room where the sump is located were slightly higher, i.e., 250 – 300 ppb. Readings immediately adjacent to the sump were >500 ppb, indicating that a small amount of vapor is still emanating

from the sump. The city had recently sealed off the sump to prevent odors from entering the library from sump. The library staff noticed a marked decrease in odors after the sump was sealed off.

The ppbRae meter was then taken to the Blanchard warehouse next door. Readings >4,000 ppb were immediately detected. On the west half of the warehouse readings generally increased from roughly 4,000 ppb on the south side of the building to 5,000 ppb on the north. The same south-to-north relationship was found on the east side of the warehouse with levels generally 1,000-2000 ppb higher on the east side. Several "hot spots" were detected along the north wall of the warehouse on both the east and west sides. A floor drain on the west side had a >20,000 ppb vapor reading. Similiar readings were below a gas line on the north wall and behind some stored material. On the east side of the warehouse several hot spots were also found. Cracks in the floor in the far northwest corner of the east side had high readings, although when checked later did not (a function of whether or not the furnace was running?). Dan Blanchard, owner of the warehouse, was shown the location of the hot spots. Sealing of cracks along the north wall and floor was suggested as a way to reduce odors in the warehouse.

The ppbRae vapor readings in the warehouse were comparable to the laboratory results from the air sample collected on 11-29-00. This suggests that the ppbRae readings provide a very good indicator of actual VOC concentrations. The VOC readings in the library and warehouse suggest comparable levels of VOCs in the warehouse compared to the 11-29-00 laboratory-analyzed air sample, but a substantially smaller (roughly estimated to be 95% less) concentration of VOCs in the library on 12-14-00 compared to 11-29-00, likely due to sealing the sump. These results suggest that even benzene level in the library air on 12-14-00 was below the level of long-term exposure concern.

The ppbRae was also used to measure vapors in the manhole west of the Peterson Oil property where Field Office #1 had previously found what appeared to be elevated hydrocarbon levels. However, no reading greater than background was found on 12-14-00. A reading was also taken from the storm sewer manhole on 10th Ave. at the alley between 12th St. and 13th St. An elevated VOC reading was found in this manhole.

A soil-gas investigation was then conducted. The purpose of the soil-gas investigation was to attempt to trace the source of contamination by sampling subsurface air, i.e., soil gas. Soil-gas samples were collected as follows:

- One- inch diameter steel rods with an expendable point were driven into the ground to a depth of 4 feet with a Geoprobe®.
- The rods were extracted about 6 inches leaving the expendable tip and opening the bottom of the pipe.
- A gasketed cap with a barbed connection for flexible PVC tubing was placed on the protruding pipe.
- Flexible PVC tubing was placed on the barbed connection and a minimum of 3 liters of air was extracted.
- The PVC tubing from the vacuum pump was removed after any residual vacuum had dissipated.

- A short piece of flexible PVC tubing that was attached to the ppbRae meter was quickly attached to the barbed connection on the protruding pipe.
- A measurement of VOCs was made after readings had stabilized.

Soil-gas sample locations and results are shown in the attached figure and are summarized in the following table.

12-14-00 SOIL-GAS SAMPLING RESULTS

<u>Sample Name</u>	<u>Sample Location</u>	<u>Sample Depth (ft.)</u>	<u>Vacuum Recovery</u>	<u>VOC (ppm) Reading</u>
SG-1-2½	North side of the alley between 12 th and 13 th Sts. 83 ft. west of eastern-most power pole	2.5	fast	1.3 avg.
SG-1-4	Same	4	fast	18 avg. 28 max.
SG-2	49 ft. west of SG-1	4	fast	156 avg.
SG-3	51 ft. west of SG-2 and 14 ft. north of the Blanchard warehouse	4	fast	0.32 max.
SG-4	55 ft. west of SG-3 and 34 ft. west of the east side of the Casey's store	4	fast	0.13 max.
SG-5	63 ft. west of SG-4	4	fast	0.27 max.
SG-6	Grassy area near bushes SE of the SE corner of the library	4	slow	0.04 avg.
SG-7	Just off the south edge of the sidewalk, 45 ft. west of the east side of the Person Oil building	4	slower	0.02 avg.
SG-8	60 ft. east of SG-1	4	slowest	0.015 avg.

It should be noted that soil-gas samples with low levels of contaminants do not necessarily indicate a lack of contamination at that location. Variability in subsurface materials/conditions with depth may affect the occurrence of contaminants in soil gas. For example, the SG-1-2½ and SG-1-4 soil-gas samples had greater than an order of magnitude difference in VOC concentration with a depth difference of only 1½ feet. The different vacuum recovery rates noted while collecting soil-gas samples at different locations suggest different subsurface materials — the slower recovery rates are associated with tighter soils in which vapors are less likely to move.

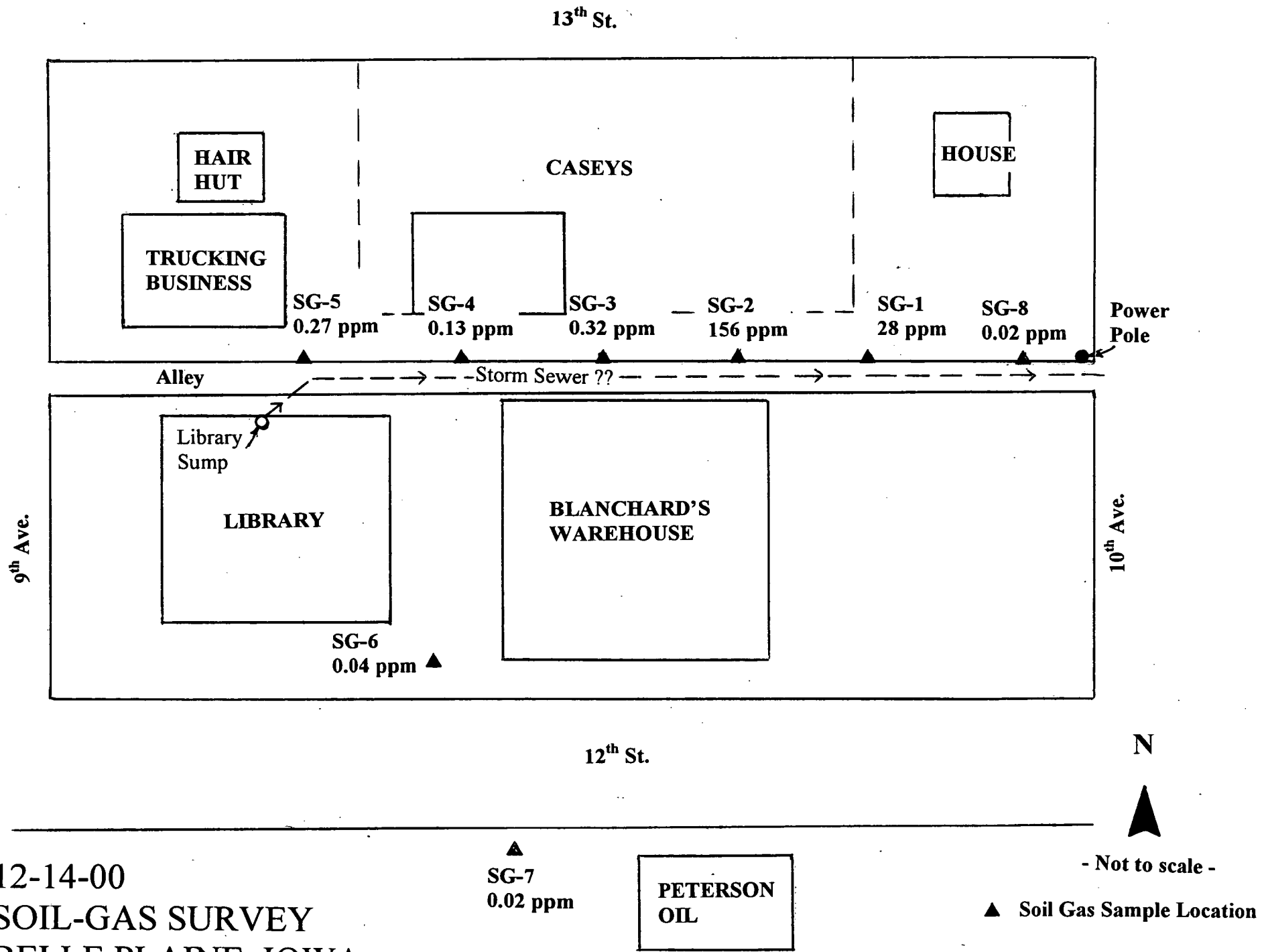
Conclusions: Odor problems in the Belle Plaine Library and neighboring Blanchard warehouse appear to be associated with gasoline. Fumes have entered the library from a sump as confirmed by air sampling. The concentrations of contaminants in the air in the library and warehouse have been found at levels that are not advisable for long-term exposure. Sealing of the sump in the library, however, appears to have substantially reduced contaminant levels in the library such that odors are no longer a significant problem in the library. Elevated concentrations of contaminants still exist in the air in the Blanchard warehouse.

Soil-gas sampling has identified an area of significantly elevated VOCs in the alley adjacent to the southeast corner of the Casey's property. Reportedly Casey's underground storage tanks (USTs) for gasoline are located in this vicinity as were previously removed USTs. Despite the fact that excessive contamination was not identified when Casey's removed the USTs several years ago and there is no indication of leaks from their existing USTs, it is highly likely that a leak or spill associated with Casey's USTs — current or past — is the source of contamination causing the odor problems in the library and warehouse. The storm sewer in the alley between Casey's and the library appears to be the conduit for vapors entering the library, although the exact location of the storm sewer has not been confirmed. While leaking USTs are known to exist at the nearby Person Oil property, air and soil-gas sampling information suggests a contaminant source north of the library and warehouse.

It is recommended that the problem be referred to the DNR Underground Storage Tank Section for resolution.

Prepared by: Bob Drustrup
Iowa DNR Contaminated Sites Section
502 E. 9th
Des Moines, IA 50319-0034
Phone: (515) 281-8900
FAX: (515) 281-8895
e-mail: Bob.Drustrup@dnr.state.ia.us

December 20, 2000



12-14-00
SOIL-GAS SURVEY
BELLE PLAINE, IOWA

H.A. Wallace Building
East Grand, Des Moines, Iowa 50319-0034
515/281-5371 Fax: 515/243-1349



Hygienic Laboratory

The University of Iowa

Page 2
Sample Number 200012038

GC/MS Volatiles in Air

Analyte	Concentration ppb	Quantitation Limit
o-Xylene	130 E	5
1,1,2,2-Tetrachloroethane	<5	5
1,3,5-Trimethylbenzene	64 E	5
1,2,4-Trimethylbenzene	110 E	5
1,3-Dichlorobenzene	<5	5
1,4-Dichlorobenzene	<5	5
1,2-Dichlorobenzene	<5	5
1,2,4-Trichlorobenzene	<5	5
Hexachlorobutadiene	<5	5
Total VOC's as Toluene	6900	
Comments	<i>One or more compounds not included on the target compound list were observed in the GC/MS analysis of this sample. These compounds were tentatively identified via searching the laboratory's mass spectral data base. A form tabulating the tentatively identified compounds and their associated retention times and estimated concentrations accompanies this report. E - The concentration for this compound exceeded the calibration range for this analysis. The concentration should be considered estimated.</i>	

Date Analyzed: 12-04-2000
Method: EPA TO-17

Analyst: JN
Verified: TC

Description of units used within this report

ppb - Parts per Billion

Quant Limit - Lowest concentration reliably measured

Iowa Laboratory Certification No. 027. AIHA, ICR, NVLAP, USEPA and other credentials available upon request.

If you have any questions please call Sherri Marine at 800/421-IOWA (4692) or 319/335-4500. Thank you.

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Warehouse

Lab Name: University Hygienic Lab Contract: _____

Project No.: Iowa Site: _____ Location: _____ Group: _____

Matrix: Air Lab Sample ID: 200012038

Sample wt/vol: 1.08 L Lab File ID: 1339V04.D

Level: (low/med) _____ Date Received: 11/30/2000

% Moisture: not dec. _____ Date Analyzed: 12/04/2000

GC Column: DB-5MS ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Concentration Units:

Number TICs found: 19 ppb

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 000115-11-7	1-Propene, 2-methyl-	5.13	75	
2. 000078-78-4	Butane, 2-methyl-	6.32	150	
3. 000109-66-0	Pentane	6.85	82	
4. 000107-83-5	Pentane, 2-methyl-	8.73	180	
5. 000096-14-0	Pentane, 3-methyl-	9.26	99	
6. 000110-54-3	Hexane	9.81	110	
7. 000096-37-7	Cyclopentane, methyl-	11.00	80	
8. 000565-59-3	Pentane, 2,3-dimethyl-	12.40	160	
9. 000589-34-4	Hexane, 3-methyl-	12.58	210	
10.	unknown hydrocarbon	13.13	390	
11. 000142-82-5	Heptane	13.45	190	
12.	unknown hydrocarbon	13.54	78	
13. 000111-66-0	1-Octene	14.53	140	
14. 000108-87-2	Cyclohexane, methyl-	14.63	180	
15. 000565-75-3	Pentane, 2,3,4-trimethyl-	15.39	190	
16.	unknown hydrocarbon	15.68	190	
17.	C9H12 Aromatic	21.81	81	
18.	C9H12 Aromatic	23.15	65	
19.	C10H14 Aromatic	23.65	44	
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Hygienic Laboratory

The University of Iowa

Page 2
Sample Number 200012039

GC/MS Volatiles in Air

Analyte	Concentration ppb	Quantitation Limit
o-Xylene	44 E	2
1,1,2,2-Tetrachloroethane	<2	2
1,3,5-Trimethylbenzene	24 E	2
1,2,4-Trimethylbenzene	41 E	2
1,3-Dichlorobenzene	<2	2
1,4-Dichlorobenzene	<2	2
1,2-Dichlorobenzene	<2	2
1,2,4-Trichlorobenzene	<2	2
Hexachlorobutadiene	<2	2
Total VOC's as Toluene	2000	

Comments	<i>One or more compounds not included on the target compound list were observed in the GC/MS analysis of this sample. These compounds were tentatively identified via searching the laboratory's mass spectral data base. A form tabulating the tentatively identified compounds and their associated retention times and estimated concentrations accompanies this report. E - The concentration for this compound exceeded the calibration range for this sample. The concentration should be considered estimated.</i>
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Date Analyzed: 12-04-2000

Method: EPA TO-17

Analyst: JN

Verified: TC

Description of units used within this report

ppb - Parts per Billion

Quant Limit - Lowest concentration reliably measured

Iowa Laboratory Certification No. 027. AIHA, ICR, NVLAP, USEPA and other credentials available upon request.

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

SAMPLE NO.

Library

Lab Name: University Hygienic Lab Contract: _____

Project No.: Iowa Site: _____ Location: _____ Group: _____

Matrix: Air Lab Sample ID: 200012039

Sample wt/vol: 2.75 L Lab File ID: 1339V05.D

Level: (low/med) _____ Date Received: 11/30/2000

% Moisture: not dec. _____ Date Analyzed: 12/04/2000

GC Column: DB-5MS ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Concentration Units:

Number TICs found: 19 ppb

CAS Number	Compound Name	RT	Est. Conc.	Q
1. 000106-97-8	Butane	5.27	34	
2. 000078-78-4	Butane, 2-methyl-	6.38	65	
3. 000109-66-0	Pentane	6.91	36	
4. 000107-83-5	Pentane, 2-methyl-	8.77	67	
5. 000096-14-0	Pentane, 3-methyl-	9.29	33	
6. 000110-54-3	Hexane	9.83	31	
7. 000096-37-7	Cyclopentane, methyl-	11.01	26	
8. 000565-59-3	Pentane, 2,3-dimethyl-	12.41	35	
9. 000589-34-4	Hexane, 3-methyl-	12.59	41	
10.	unknown hydrocarbon	13.13	91	
11. 000142-82-5	Heptane	13.45	29	
12. 000111-66-0	1-Octene	14.54	23	
13. 000108-87-2	Cyclohexane, methyl-	14.64	36	
14. 000565-75-3	Pentane, 2,3,4-trimethyl-	15.40	43	
15.	unknown hydrocarbon	15.68	46	
16.	C9H12 Aromatic	21.81	36	
17.	C10H14 Aromatic	23.92	27	
18.	unknown aromatic	24.01	23	
19.	C10H14 Aromatic	23.65	16	
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Date of report: 12-06-2000

DES MOINES IA 50319-0034

Results of Analyses

Analyte	Concentration ppb	Quantitation Limit
Dichlorodifluoromethane	<5	5
Freon 114	<5	5
Chloromethane	<5	5
Vinyl chloride	<5	5
Bromomethane	<5	5
Chloroethane	<5	5
Trichlorofluoromethane	<5	5
Freon 113	<5	5
1,1-Dichloroethene	<5	5
Methylene chloride	<5	5
1,1-Dichloroethane	<5	5
cis-1,2-Dichloroethene	<5	5
Chloroform	<5	5
1,1,1-Trichloroethane	<5	5
1,2-Dichloroethane	<5	5
Benzene	<5	5
Carbon tetrachloride	<5	5
Trichloroethene	<5	5
1,2-Dichloropropane	<5	5
cis-1,3-Dichloropropene	<5	5
trans-1,3-Dichloropropene	<5	5
Toluene	<5	5
1,1,2-Trichloroethane	<5	5
Tetrachloroethene	<5	5
1,2-Dibromoethane	<5	5
Chlorobenzene	<5	5
Ethyl benzene	<5	5
m & p-Xylenes	<5	5
Styrene	<5	5

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Hygienic Laboratory

The University of Iowa

Page 2
Sample Number 200012040

GC/MS Volatiles in Air

Analyte	Concentration ppb	Quantitation Limit
o-Xylene	<5	5
1,1,2,2-Tetrachloroethane	<5	5
1,3,5-Trimethylbenzene	<5	5
1,2,4-Trimethylbenzene	<5	5
1,3-Dichlorobenzene	<5	5
1,4-Dichlorobenzene	<5	5
1,2-Dichlorobenzene	<5	5
1,2,4-Trichlorobenzene	<5	5
Hexachlorobutadiene	<5	5
Total VOC's as Toluene	27	5

Comments	<i>One or more compounds not included on the target compound list were observed in the GC/MS analysis of this sample. These compounds were tentatively identified via searching the laboratory's mass spectral data base. A form tabulating the tentatively identified compounds and their associated retention times and estimated concentrations accompanies this report.</i>
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Date Analyzed: 12-04-2000

Method: EPA TO-17

Analyst: JN

Verified: TC

Description of units used within this report

ppb - Parts per Billion

Quant Limit - Lowest concentration reliably measured

Iowa Laboratory Certification No. 027. AIHA, ICR, NVLAP, USEPA and other credentials available upon request.

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Hygienic Laboratory

The University of Iowa

Page 2
Sample Number 200012023

GC/MS Volatiles

Analyte	Concentration ug/L	Quantitation Limit
Toluene	94	5
Chlorobenzene	<5	5
Ethylbenzene	16	5
Styrene	<5	5
Xylene (total)	97	5

Comments: One or more compounds not included on the target compound list were observed in the GC/MS analysis of this sample. These compounds were tentatively identified via searching the laboratory's mass spectral data base. A form tabulating the tentatively identified compounds and their associated retention times and estimated concentrations accompanies this report.

Date Analyzed: 12-04-2000

Method: UHL 8260

Analyst: JN

Verified: TC

Description of units used within this report

ug/L - Micrograms per Liter

Quant Limit - Lowest concentration reliably measured

Iowa Laboratory Certification No. 027. AIHA, ICR, NVLAP, USEPA and other credentials available upon request.

If you have any questions please call Sherri Marine at 800/421-IOWA (4692) or 319/335-4500. Thank you.

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

Belle Plaine

Lab Name: University Hygienic Lab Contract: _____

Lab Code: IOWA Case No.: _____ SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 200012023

Sample wt/vol: 5.0 (g/ml) ML Lab File ID: 2339V04.D

Level: (low/med) LOW Date Received: 11/30/2000

% Moisture: not dec. _____ Date Analyzed: 12/04/2000

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/LNumber TICs found: 7

CAS NO.	COMPOUND NAME	RT	EST. CONC.	Q
1.	C9H12 Aromatic	17.40	10	J
2.	C9H12 Aromatic	17.48	7	J
3.	C9H12 Aromatic	17.60	9	J
4.	C9H12 Aromatic	18.10	7	J
5.	C9H12 Aromatic	18.44	14	J
6.	C9H12 Aromatic	19.31	11	J
7.	C9H10 Aromatic	19.71	9	J

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IOWA DEPARTMENT OF NATURAL RESOURCES
WORK REQUEST

REQUEST TO (field or bureau): FO 1	CONTROL NUMBER:	
REQUESTED BY: Rochelle Cardinale	WORK APPROVAL:	2000 DEC 14 P 11:37 DEPT OF NATURAL RESOURCES
DATE WORK IS NEEDED: 12/15/00		
ROUTE RESPONSE THROUGH: Karen Anderson	DATE WORK RETURNED:	
Belle Plaine Library 12 th Street & 7 th Avenue Belle Plaine, IA 52208 Contact Person: Valerie Coffman (Library Trustee) Phone: 319-444-3863 Library Phone: 319-444-2902 (Karen Bergan)	REGISTRATION NO.: LUST NO.:	
<p>Library has noticed petroleum odor for the last 1½ months, which has been increasing in intensity. The odor has also been noted in a warehouse 50 yards (location unknown) from the library. Have attached map of Belle Plaine, rough map of UST/LUST sites in the vicinity, and a listing of UST/LUST sites in the vicinity. The primary goal of the investigation is to determine a potential source for the vapors.</p> <p>Need the following activities completed:</p> <ol style="list-style-type: none">1. Exact locations of UST/LUST sites should be verified against the city map and general pictures collected.2. PID/explosimeter readings from manholes to see if vapors can be traced to a particular area.3. Leak detection checks of active UST sites in the vicinity.4. Any pertinent field observations. <p>I will fax once received Site Maps of the active LUST sites showing soil and groundwater contamination plumes and groundwater flow direction.</p>		
WORK COMPLETED BY: Don Chan	DATE: 12-1-00	REVIEWER: Don Stellick



Field Office #1

DATE: 12-1-00

TO: Rochelle Cardinale – LUST Section

FROM: Don Chase *DC*

SUBJECT: Belle Plaine Library Work Request

On November 28, 2000, I received a work request from Rochelle Cardinale, LUST Section, to investigate fumes reported in the Belle Plaine Library. I advised the Belle Plaine City Hall I would be visiting the site November ~~28~~³⁰, 2000.

On November 29, 2000, I discussed the site with Ms. Cardinale by phone. Ms. Cardinale noted the fumes have been reported as recurring in the library and the DNR Contaminated Sites Section is also investigating the problem. I discussed the site with Ms. Cardinale by phone at the field office and while on route to Belle Plaine. Ms. Cardinale noted Bob Drustrup, Contaminated Sites, had conducted air sampling and water sampling at the library the night of November ~~28~~²⁹, 2000. Ms. Cardinale and I discussed looking for potential sources where the fumes may originate from in the immediate area of the library.

I noted I would conduct vapor sampling using a GasTech GT 201 meter. The meter is calibrated using 50% explosive level methane. The meter is used to check for explosive levels of hydrocarbons. The meter can also display hydrocarbon levels in PPM. The meter detects hydrocarbons in general. The meter can not differentiate between methane and benzene. A PID meter to check for benzene, which is a main constituent of gasoline, is not currently available for field office use.

After arriving in Belle Plaine, I stopped at City Hall and met with Randy Bennett, Utilities Director. Mayor Judy Carter joined us as we proceeded to the library to conduct air sampling with the GasTech meter. Mr. Bennett and Mayor Carter noted that Mr. Drustrup had collected air and water samples from the library the previous evening. Sampling was also conducted in the Blanchard Building located east of the library.

At the library, Mr. Bennett pointed out the sump area where the vapors had been concentrated. On this date readings with the GasTech were 0% explosive and 0-PPM hydrocarbons. Library workers noted the fumes had been quite strong the previous day and left an aftertaste in their mouths.

Readings were then collected at manholes and storm sewer intakes. The highest reading was taken at the manhole that covers a water system connection for the Pederson Oil property. The manhole is located west of the Pederson property. The readings were 1% explosive and 460-PPM hydrocarbons. Readings collected several minutes later were 0 % explosive and 140-PPM hydrocarbons. See attached location maps.



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During the vapor survey, I explained to Mr. Bennett that the GasTech meter measures hydrocarbons in general. Positive readings could be caused by methane or petroleum.

During the vapor survey, Ms. Carter returned to City Hall. Mr. Bennett was contacted by radio and we were requested to return to the Mayor's office to discuss the vapor survey with Karen Bergan, Librarian. At the Mayor's office we discussed the vapor survey, what the GasTech measures, and the sampling conducted by Mr. Drustrup the previous evening. I noted the sampling conducted by Mr. Drustrup would help determine what the fumes are. Ms. Bergan noted she is very concerned about what health affects the fumes may have on people in the library. I noted the GasTech measures the explosive potential of the fumes. The results obtained from Mr. Drustrup will help determine what health risks the fumes may pose.

After discussing the survey, Mr. Bennett, Ms. Bergan, and I returned to the library to check the area where the water supply line enters the building. The water line enters in the sump area of the building. The readings were 0% explosive and 0-PPM hydrocarbons. Ms. Bergan noted she was provided with the key to the Blanchard building to allow access for vapor sampling. Ms. Bergan unlocked the door to the Blanchard building and returned to the library. Mr. Bennett and I entered the building. Mr. Bennett pointed out that the odor present in the building is the same as the odor previously reported by personnel in the library. I advised Mr. Bennett that I smelled a sweet solvent like odor. I noted the odor did not appear to be fresh gasoline. Although the odor was very strong, the GasTech had a reading of 0% explosive and 0-PPM hydrocarbons. Meter readings did not change during a walk through the building and a vapor survey of the floor sump.

Mr. Bennett and I returned to the library and advised Ms. Bergan of our observations. Plans were made to cover the library sump to prevent fumes from reentering the library. Ms. Bergan noted the occurrence of fumes in the Blanchard building and library seems to coincide.

Mr. Bennett and I continued the vapor survey. Readings were collected in storm sewer inlets, sanitary manholes, manholes filled with sand, and water service manholes/access covers. A reading of 0% explosive and 400-PPM hydrocarbons was found when the manhole lid was lifted in front of the Casey's fill island. The manhole is filled with sand. After the manhole lid was replaced, another reading was collected after several minutes had past. The readings were 0% explosive and 0-PPM hydrocarbons. I noted the original readings may have been caused by gasoline runoff from the near by dispenser area. The vapor dissipated quickly after the manhole lid had been removed.

The remaining positive hydrocarbon readings were 0% explosive and 140-PPM hydrocarbons at a water service access lid located east of the Casey's UST's and 0% explosive and 140-PPM hydrocarbons at the sanitary manhole located east of the Pederson Oil site. These readings were collected during the time period when the GasTech meter would not return to 0-PPM. The reading of 20-PPM was already indicated on the meter before beginning the vapor sampling.

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After returning to City Hall, Ms. Carter requested a vapor survey be conducted in the newspaper building and 2001 Videos. Readings were 0% explosive and 0-PPM hydrocarbon. Vapor odor from the sump located in the basement of the newspaper was obviously from the sanitary sewer. Mr. Bennett and I discussed having the sump properly connected to the storm sewer.

The 2001 business was closed. Efforts to locate the owner were not successful. There was a movie return slot in the door. Vapor sampling was conducted through the slot. Results were 0% explosive and 0-PPM hydrocarbons.

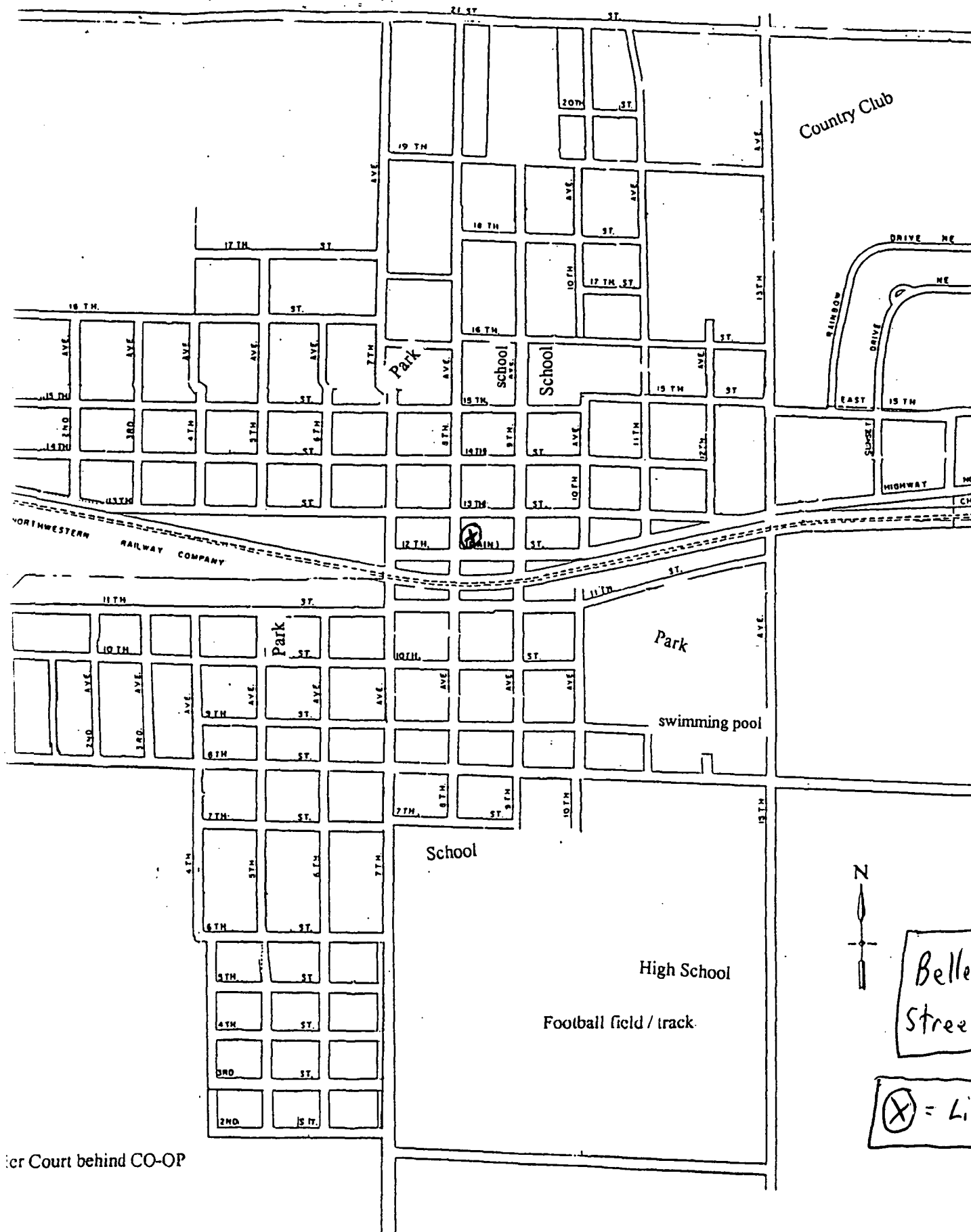
Mr. Bennett and I discussed what the odor in the library and Blanchard building may be. I noted old gasoline or some type of solvent could cause the odor. We discussed the fact that the sampling conducted by Drustrup will help identify what is the cause and concentration level of material causing the odor.

During discussions with the police chief and other citizens, it was noted UST's may have been located at the site now operated as the Hair Hut located west of Casey's. No obvious signs of UST's at the Hair Hut site were observed on this date.

I also discussed the vapor survey and odor with Dode Jones, Casey's Manager. Ms. Jones noted there has been no release from the Casey's UST's. Leak detection is provided by a Red Jacket RLM-9000 Tank and Piping Monitor. The monitor was operating properly on this date. A review of tank tests conducted by the monitor indicates there has not been a recent release at the site. Ms. Jones noted a sweet sewer gas odor enters the building through the floor drain if water is not maintained in the sump.

At this time an exact source of the odor has not been determined. Casey's is located at a higher elevation than the Library and Blanchard building. The Pederson Oil site is located at a lower elevation than the Library and Blanchard building. During the vapor investigation, I noted that vapor can move upgradient in a chimney effect. I observed this in a previous vapor survey of the Tripoli wastewater system when petroleum had entered the sewer. The odor does not appear to be caused by fresh gasoline. Previous investigations indicate explosive readings would be much higher if the odor was caused by fresh gasoline.

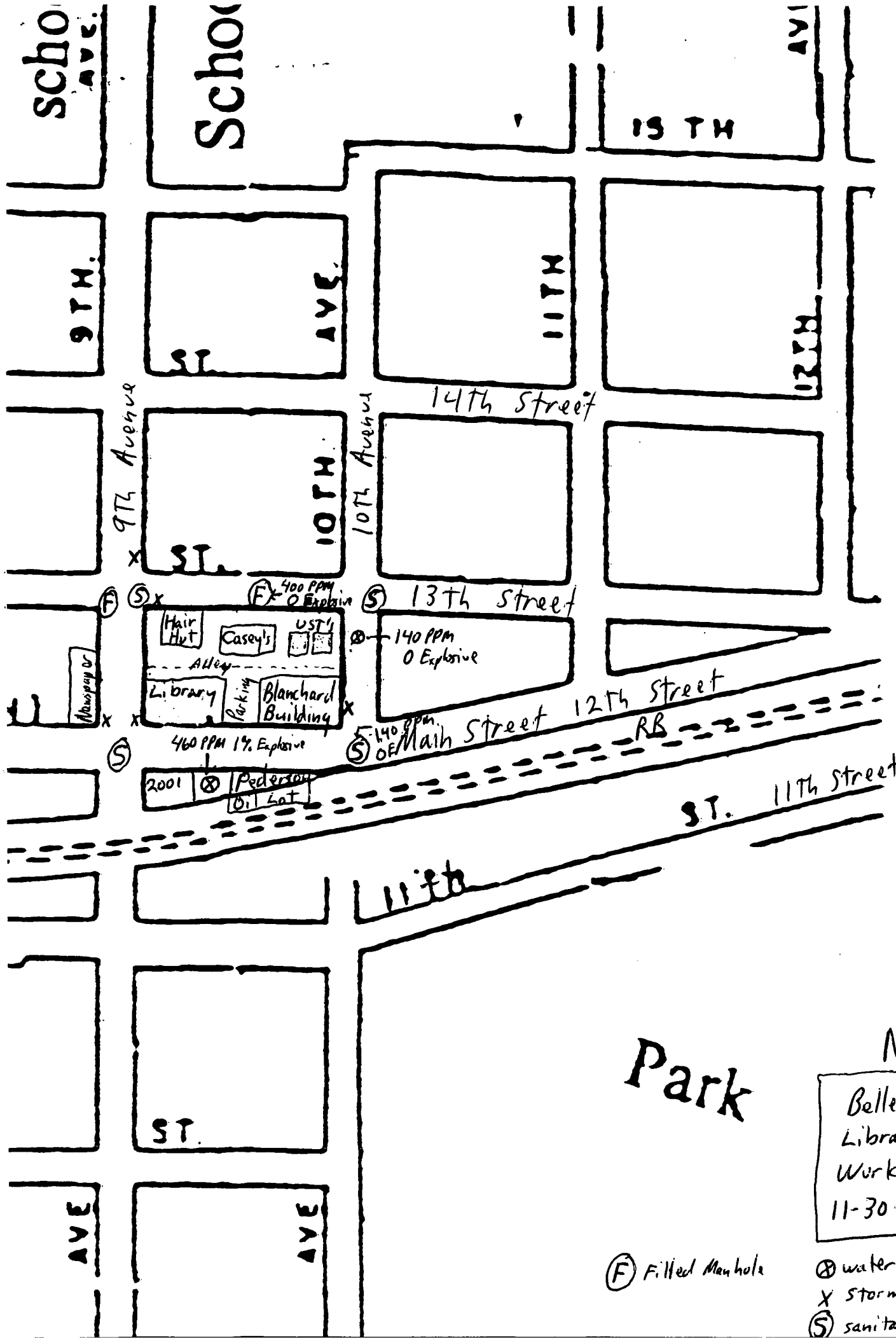
Pederson Oil has been assigned LUST # 7LTV85 due to previously identified petroleum contamination. Casey's original UST's were removed and replaced several years ago. Discussions with Ms. Cardinale indicate closure samples collected at that time were under DNR action levels. After I returned to the field office, Mr. Drustrup contacted me and we discussed the site. Mr. Drustrup noted he would forward the sampling results to the field office when received. Mr. Drustrup noted he is tentatively planning to conduct additional area sampling with a mobile drill rig. Mr. Drustrup noted the equipment would allow positively identification of the source of the fumes. Mr. Drustrup noted he would advise the City of Belle Plaine of his plans and keep the field office informed. I also discussed the site with Ms. Cardinale. Further site work will be determined after the Contaminated Sites and LUST Sections have reviewed the sampling information.



Belle Plaine
Street Map

(X) = Library

er Court behind CO-OP



Belle Plaine
Library
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- (F) Filled Manhole
- (X) water service manhole
- (X) storm sewer
- (S) sanitary manhole