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US EPA RECORDS CENTER REGION 5
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BASF

Date	June 23, 1994	RSM# 1179
To	Joe McKeon/Parsippany	Keywords: Environmental GC/MS Fuel Oils Riverview
From/Unit	Susan Walkinshaw/Research Services Unit	
Location/Extension	Wyandotte/6588	
Subject	Riverview Well M	
Copies	Mike Martin, Joe Louvar, Laura Neubauer, **Doug Thiel**	

Research Services received a sample from well M at our Riverview property in March 1994. The sample was analyzed using Infrared Spectroscopy(IR) and Gas Chromatography/Mass Spectroscopy(GC/MS) in order to identify what type of oil the sample contained. Samples of Kerosene, Diesel Fuel and Fuel Oil #6 were obtained and analyzed for comparison. According to the IR analysis the well M sample resembles Fuel Oil #6 closely. The GC/MS analysis shows that the well M sample is closest to the Fuel Oil #6 of the three types analyzed for comparison. The major difference is that the more volatile components, or front end, is missing. See attached chromatograms. The more volatile portions of fuels, like gasoline, are known to be more mobile and migrate or dissipate away from the main body of contamination[1]. Therefore, it is possible that well M contains the less volatile fraction of Fuel Oil #6.

Susan Walkinshaw
Susan Walkinshaw

[1] "Pollution Control Engineers Handbook," compiled by Edward Shields, Cahners Publishing Co., 1988, pg. 105

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ANALYTICAL REPORT

PAGINATION : 129235
PROJECT NO. : 5Y0150

PAGINATION	:	129235
DESCRIPTION	:	RIVERVIEW- WELL-M
PROJECT NO.	:	5Y0150
REQUESTOR/ID	:	NEUBAUER, LAURA J. / 19470 **Ext:** 6367
COST CENTER	:	20270
COORDINATOR/ID	:	MARTIN, MICHAEL J / 13283 **Ext:** 6878
DATE ENTERED	:	03/30/94
DATE FINISHED	:	04/12/94
COPIES TO	:	D. Thiel

INFORMATION/INSTRUCTIONS

#32243 SAMPLE FOR IDENTIFICATION

RESULTS

IR AND NMR SPECTROSCOPY W. Floutz, L. Barczewski

The FTIR spectrum and the proton NMR spectrum for the Riverview well sample show that the oily material has mainly a long chain aliphatic hydrocarbon structure. A lower concentration of aromatic hydrocarbons is also present. The latter are toluene and xylene types. There is no indication of any significant level of olefinic hydrocarbons. The spectra do not indicate any non-hydrocarbon components.

FTIR spectra for samples of kerosene, diesel fuel, and No. 6 fuel oil were recorded in order to compare their spectra with the spectrum for the unknown oil. The kerosene and diesel fuel spectra are significantly different from the unknown spectrum. The spectrum for the No. 6 fuel oil is very similar to that of the unknown.

See next page for GS/MS results

APPROVAL: Laura Neubauer

MJM

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ANALYTICAL REPORT

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Gas Chromatography/Mass Spectrometry L. Neubauer

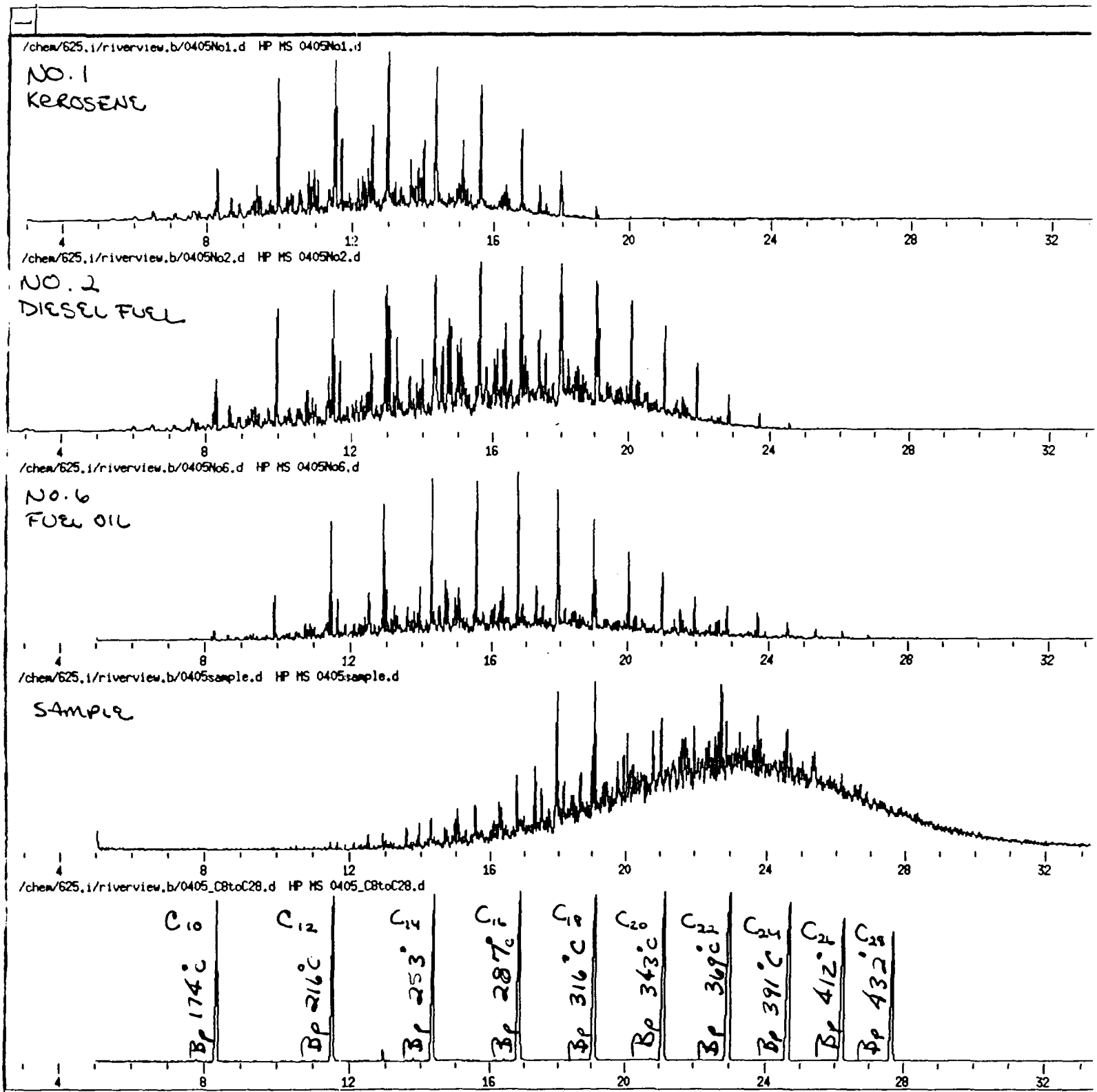
17 mg of the sample was diluted with about 2 ml of methylene chloride and analyzed using GC/MS. For comparison, fuel oils No.1, No.2 and No.6 were similarly prepared and analyzed. To serve as a boiling point reference, a mixture of straight chained hydrocarbons was also analyzed.

	Boiling point ranges	Total Integrated Abundance(x 1,000,000)
No. 1 fuel (Kerosene)	174 - 316 deg C	626
No. 2 fuel (Diesel)	174 - 369 deg C	954
No. 6 fuel (from steam plant)	216 - 369 deg C	130
Sample	253 - 432 deg C	98

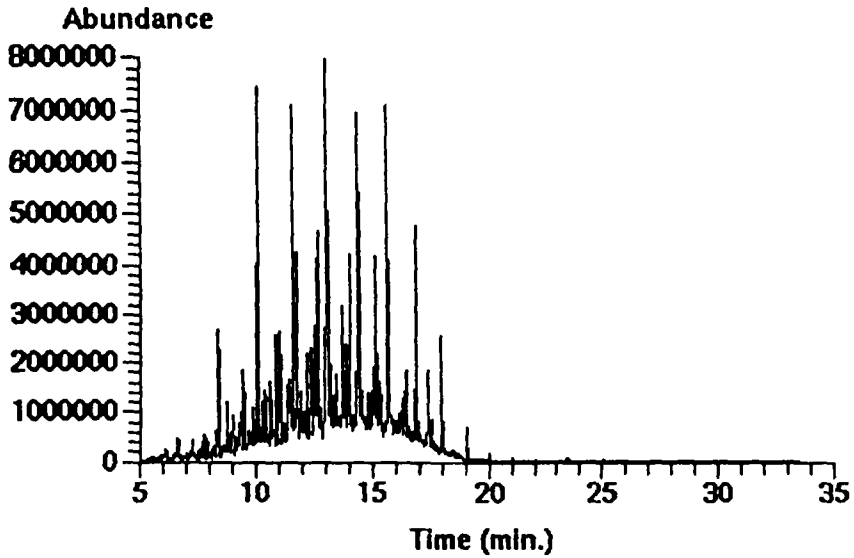
Boiling points for the 3 fuel oils were found in the CRC Handbook, the estimate of boiling point for the sample was made based on a mixture of normal hydrocarbons analyzed at the same time as the sample. Note that the CRC boiling ranges do not include the entire range where sample elutes, see attached chromatogram.

APPROVAL: Laura Neubauer

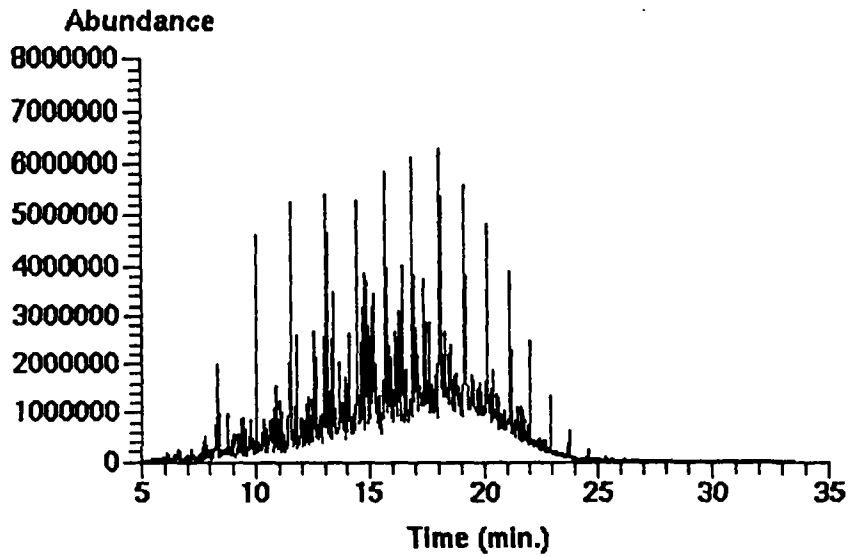
MJM


/chem/625.i/riverview.b/0405No1.d HP MS 0405No1.d
NO. 1
KEROSENE
/chem/625.i/riverview.b/0405No2.d HP MS 0405No2.d
NO. 2
DIESEL FUEL
/chem/625.i/riverview.b/0405No6.d HP MS 0405No6.d
NO. 6
FUEL OIL
/chem/625.i/riverview.b/0405sample.d HP MS 0405sample.d
SAMPLE
/chem/625.i/riverview.b/0405_C8toC28.d HP MS 0405_C8toC28.d
C10 Bp 174°C
C12 Bp 216°C
C14 Bp 253°
C16 Bp 287°C
C18 Bp 316°C
C20 Bp 343°C
C22 Bp 369°C
C24 Bp 391°C
C26 Bp 412°C
C28 Bp 432°C
4
8
12
16
20
24
28
32

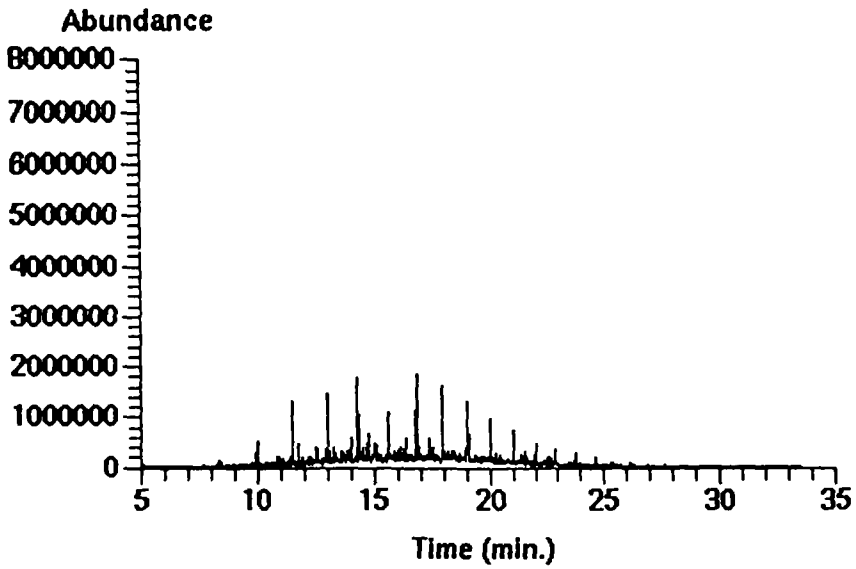
TIC of 0405No1.d
17mg to ~ 2ml MeCl2; Run at 11:57 AM EDT on Tue Apr 05, 1994



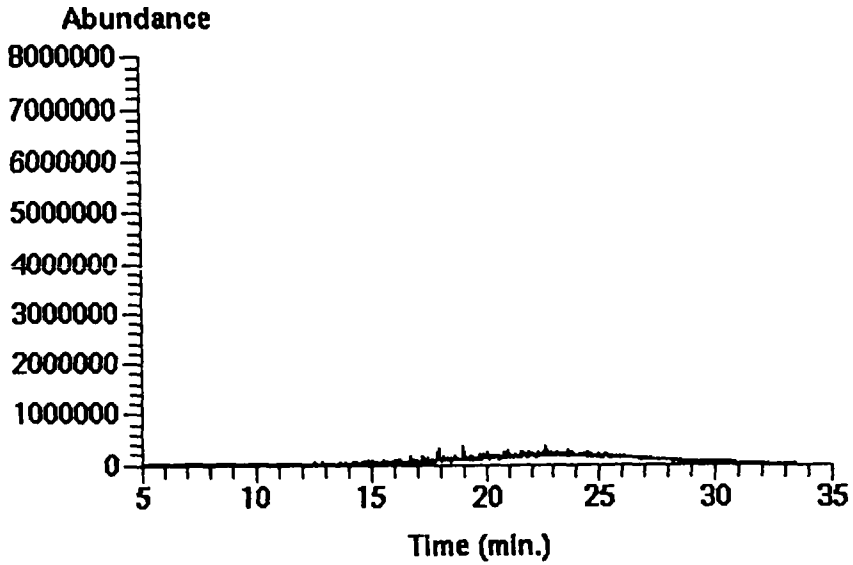
TIC of 0405No2.d
17mg deisel fuel in ~2ml MeCl2; Run at 01:19 PM EDT on Tue Apr 05



TIC of 0405No6.d
Fuel oil #6 17mg to ~ 2 ml MeCl2; Run at 02:10 PM EDT on Tue Apr C



TIC of 0405sample.d
17mg sample in ~ 2ml MeCl2; Run at 03:05 PM EDT on Tue Apr 05, 1!



4/11/94

Water Levels
BASF Riverview Property

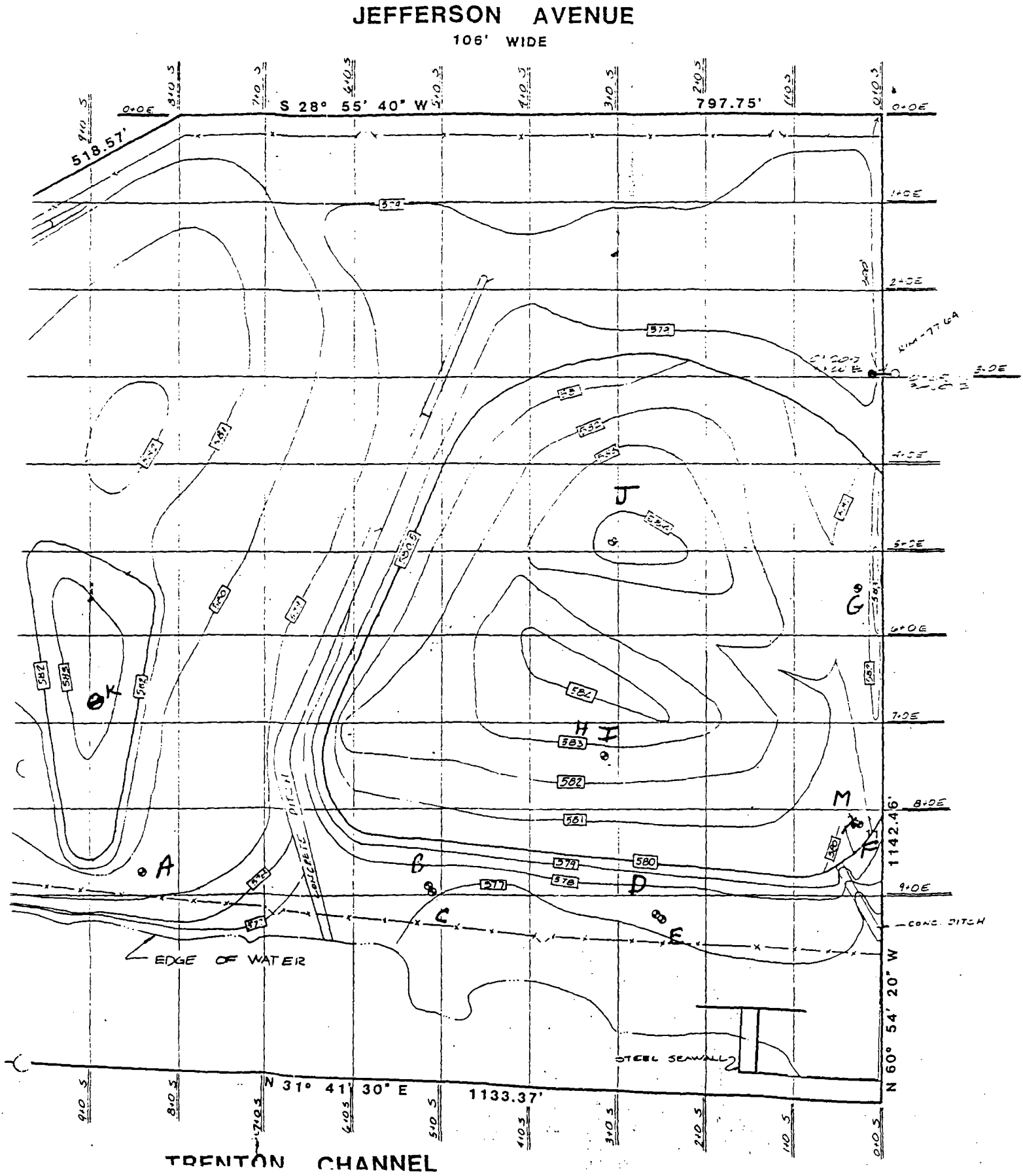
Well	May, 1994	November, 1992
A	574.70	574.79
B	574.47	574.68
C	574.43	574.63
D	575.14	576.22
E	575.10	576.20
F	571.89	571.97
G	576.59	577.24
H	572.95	575.56
I	575.51	576.54
J	575.95	577.07
K	574.86	575.36
L	576.68	577.26
M	No Data	No Data
Stilling Well	583.60	

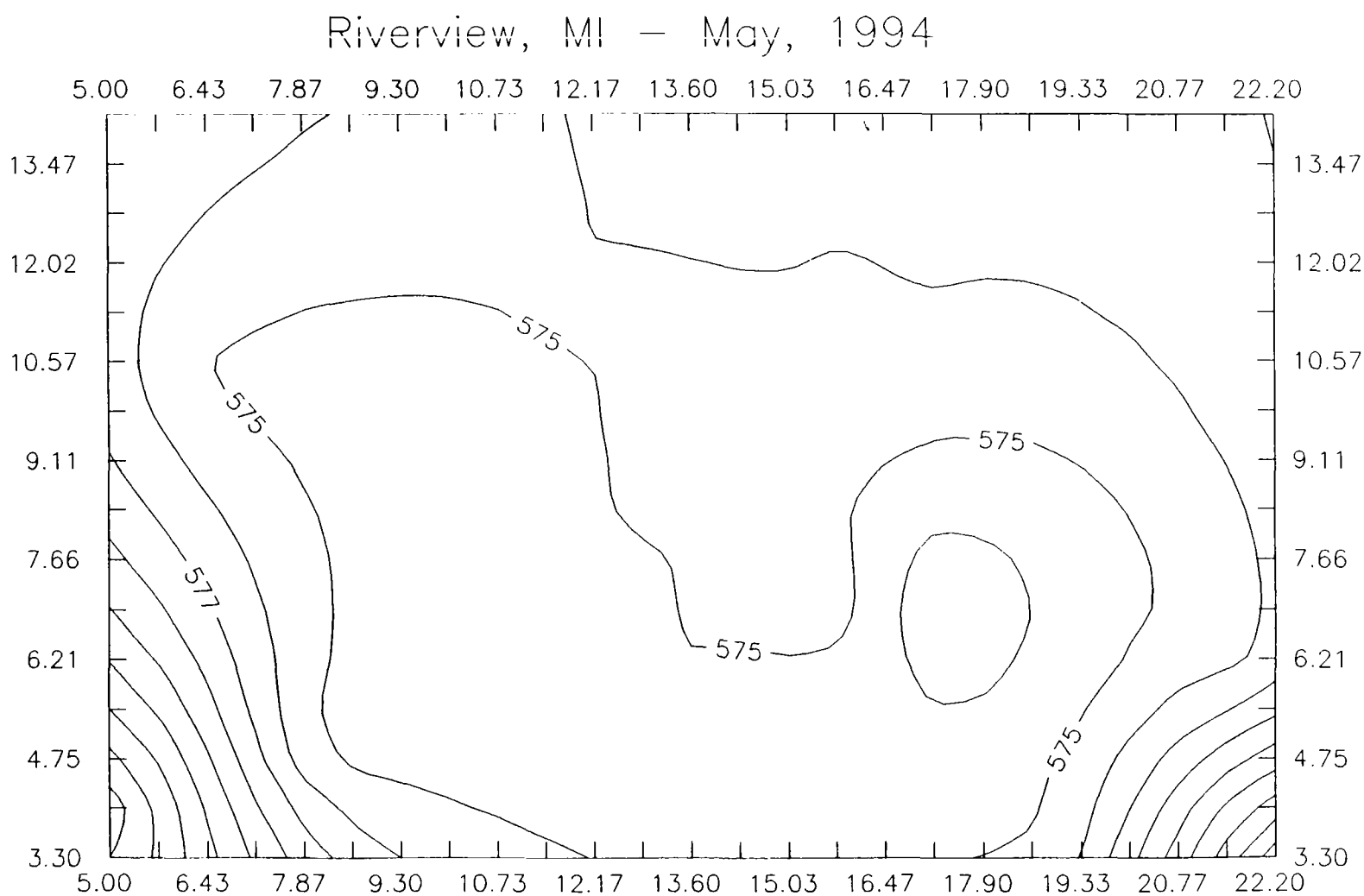
Early characterization of groundwater contamination at the BASF Riverview property identified a different suite of chemical constituents than that found by the IR done on the free phase. The constituents identified by Ecology and Environment during their review of the site are as follows:

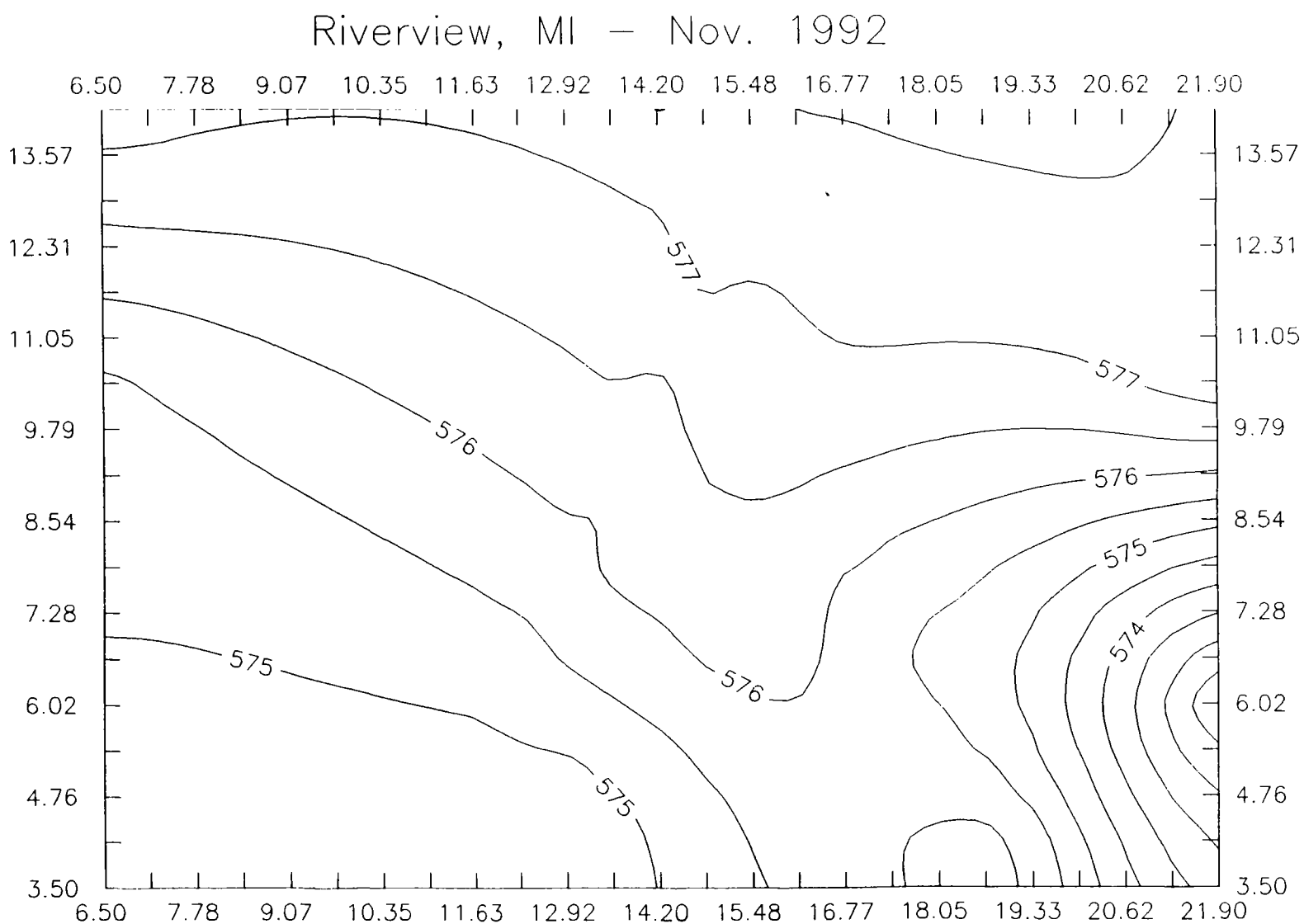
Ecology and Environment Characterization

Agent	Range
phenol	ND - 4,400 ppb
phthalate	ND - 2,700 ppb
toluene	ND - 430 ppb
mercury	ND - 5,000 ppb
benzo (k) fluoranthene	ND - 3,900 ppb
fluoranthene	ND - 15,000 ppb
naphthalene	ND - 24,000 ppb
Araclor 1260	ND - 215 ppb

Based on a review of groundwater flow, the quantity of free phase material present, the nature of contaminants known to be on the site, the location of the free phase and the proximity of petroleum storage tanks on neighboring property, it seems likely that the oil tanks are the most likely source of the free phase material.


JEFFERSON AVENUE
106' WIDE
S 28° 55' 40" W
797.75'
518.57'
N 31° 41' 30" E
1133.37'
N 60° 54' 20" W
1142.46'
EDGE OF WATER
CONCRETE DITCH
CONC. DITCH
STEEL SEAWALL
TRENTON CHANNEL


Riverview, MI – May, 1994
5.00
6.43
7.87
9.30
10.73
12.17
13.60
15.03
16.47
17.90
19.33
20.77
22.20
13.47
12.02
10.57
9.11
7.66
6.21
4.75
3.30
575
577


Riverview, MI – Nov. 1992
6.50
7.78
9.07
10.35
11.63
12.92
14.20
15.48
16.77
18.05
19.33
20.62
21.90
13.57
12.31
11.05
9.79
8.54
7.28
6.02
4.76
3.50
577
577
576
576
576
575
575
575
574