IN THE MATTER OF AN APPLICATION BY
THE REGIONAL MUNICIPALITY OF HALTON
FOR THE CONTINUED USE OF
THE BURLINGTON LANDFILL SITE

Witness Statement

of

Wessel Lammers, P. Eng.
Chief
Water Resources Assessment
Technical Support Section
Central Region
Ministry of the Environment

# C U R R I C U L U M  V I T A E

Wessel Lammers, P. Eng.

## I. EDUCATION

1. B.A.Sc. Civil Engineering, 1964
   University of Waterloo (specializing in municipal and sanitary engineering with good background in pleistocene geology).

2. M.Sc. (Hydrology), 1971
   University of Guelph

## II. ENGINEERING EXPERIENCE

1. Ministry of the Environment

   Position: Chief, Water Resources Assessment
   Technical Support Section
   Central Region
   1974 - Present

   Job Function:

   - Responsible for water monitoring and water resource assessment programs throughout Central Region, which encompasses an area from Halton to Northumberland and north to Muskoka and Haliburton.

   - Presently coordinator of the Lake Simcoe Environmental Management Strategy Studies.

2. Ministry of the Environment

   Position: Party Chief
   Northern Ontario Water Resources Study
   Surveys and Projects Section
   Water Quality Management Branch
   1971 - 1974

   Job Function:

   - Provided leadership to a six-man study group.

   - Co-ordinated various studies and data collection programs designed to provide water resource information suitable for planning and development decisions.

3. Ontario Water Resources Commission

Position: Hydrologic Engineer
1964 - 1971

Job Function:

- Conducted water resources inventories and water use studies of a number of counties and regions throughout Ontario.

III. PROFESSIONAL AFFILIATION

Member of the Association of Professional Engineers of the Province of Ontario.

IV. PUBLICATIONS

Co-author of the following:

1. T.J. Yakutchik and W. Lammers, Water Resources of the Big Creek Drainage Basin.

2. P.F. McKenna and W. Lammers, Hamilton-Wentworth Study - Availability and Use of Water Resources.

Author of the following:

1. W. Lammers, Model for the Determination of the Natural Streamflow of Venison Creek (M.Sc. Thesis).

2. W. Lammers, Objectives and Scope of Water Resources Study in Northern Ontario by the Ontario Ministry of the Environment.

WITNESS STATEMENT

RE: Burlington Landfill Site
Application for Continued Use

NAME: Wessel Lammers, P. Eng.
Ministry of the Environment
Central Region

LIST OF DOCUMENTS REVIEWED

1. General Review of Documentation for Burlington Landfill Site, Application for Continued Use with specific emphasis on:

   a) Section O 3.4
   Surface Water - Results and Discussion

   b) Section Q 4.2
   Possible Aquatic Impacts

   c) Section R
   Surface Drainage

INVOLVEMENT WITH APPLICATION

I have been a member of the Ministry Review Team charged with the review of the Application for Continued Use since February 1984. In that capacity, I have been responsible for reviewing all supporting documentation relating to surface water. I have participated in on-going discussions with officials of the Regional Municipality of Halton and its consultants. I have visited the Burlington Landfill Site on four occasions.

EVIDENCE

1. Surface Drainage

   a) I visited the site on April 30th and May 2nd, 1984, to inspect the streams in the vicinity. In my opinion, the drainage divide between the Falcon Creek watershed and the Indian Creek watershed is not exactly as shown on Figure 02 of the Hydrogeologic Report. It would appear that the access road to the National Sewer Pipe property actually forms a drainage divide. The drainage to the west of that road flows down to the North Service Road ditch and then along to a culvert just west of the landfill access road and from there under Highway 403. It joins the main flow of Falcon Creek at a point south of Highway 403.

   The drainage to the east of the National Sewer Pipe access road drains easterly and picks up the waters from the intermittent stream incorrectly identified as draining

towards Falcon Creek on Figure 02. This road ditch picks up additional NSP property drainage and eventually flows into a culvert that takes the Indian Creek waters south of 403.

The old section of the landfill site, which is not underdrained, can only impact on the ~~Indian~~ Falcon Creek watershed through the single intermittent stream that drains the east ditch. No recently deposited sediment was observed in that stream bed. There did not appear to be any impact on growth in this intermittent stream bed.

b) There is an intermittent stream that flows through the Wosnick property south of the landfill site and through a swampy area near the sedimentation pond. This stream discharges to the North Service Road ditch. Several leachate outbreaks were noticed on the slope of the landfill site and at the toe of the slope above the swampy area where this intermittent stream rises.

c) I generally concur with Section R of the Application and with the Witness Statement of Mr. Allan Mitchell, with the exception of my comments on drainage noted above. I would agree that there is the possibility of erosion on the National Sewer Pipe property resulting from drainage from the northeast ditch and I would agree that the Region may have to undertake mitigative measures on NSP property.

2. Monitoring

a) I concur with the suggestion made in Section Q4.2 regarding the use of biological indicator organisms to monitor for possible impact of landfill site on aquatic life in adjacent streams. However, as the streams in this area are intermittent, the selection of a suitable indicator organism may be difficult. There will likely be some pools of standing water in the larger streams that may contain such organisms. The matter is further complicated by the fact that the groundwater contributing to the flow is naturally highly mineralized and could pose additional stress on such organisms. In summary, while the concept of benthic organism monitoring is a useful tool in documenting impact of landfill sites, it would likely not be practical for the intermittent streams in the vicinity of the Burlington landfill site.

b) It would be prudent for the Region of Halton to maintain a log book, if it is not doing so already, in which a record is kept of all leachate springs or break-outs that are observed and of the abatement action carried out to rectify such occurrences. Such information is essential if effective site management is to be carried out. It would also provide some insight when unusual sampling results are obtained from surface waters in the vicinity of the site. In my opinion, a summary of this information would be a useful addition to the annual monitoring report.

c) In my opinion, data collected from SW3 does not reflect the impact from the entire landfill site operation. While the data from the station would reflect the impact of groundwater flow from the basin draining to this site and potential leachate springs on Falcon Creek in the reach between SW1 and SW3, it does not reflect the potential total impact of the landfill site. The west ditch discharges via a sedimentation pond to the North Service Road ditch that outlets into Falcon Creek below SW3. In addition, a small intermittent stream drains from the front of the landfill site through the Wosnick property into the North Service Road ditch.

In order to obtain more complete information on the total impact on Falcon Creek from the landfill site during spring run-off conditions, I visited the site on April 19, 1984, and took samples of surface water in four locations. The first sample was taken in the vicinity of the sediment pond discharge. The second sample was from the intermittent stream flowing across the Wosnick property. The third sample was taken where the east ditch flows into the intermittent tributary of Falcon Creek on the NSP property. The fourth sample was taken at the culvert located just west of the landfill site access road. The collected samples were sent to the Ministry of the Environment's Laboratory for heavy metal and trace organics analysis.

The results of the analysis on these four samples are appended to this Witness Statement. Compounds typical of leachate from municipal landfill sites were found in all four samples. Mr. G.A.V. Rees of the Trace Organics Section in the Ministry's Laboratory Services and Applied Research Branch will address the results.

d) The results of the April 19, 1984 sampling confirm my view that some alterations to the surface water monitoring program should be made in order that the impact of leachate break-outs on Falcon Creek can be monitored.

In particular, I would recommend that a water sample be collected from the west ditch under high water table and low flow conditions to prevent dilution from high precipitation events that would mask the impact of any leachate break-outs. I would suggest sampling at the sedimentation pond. This sample should be analyzed for routine leachate parameters as well as for certain trace organic compounds.

In order to assess the total impact on Falcon Creek, it would be preferable to locate a monitoring station south of Highway 403. However, a monitor located in that vicinity would be strongly affected by run-off from the North Service Road and Highway 403. A location even farther south in the Aldershot Community would receive additional influence from the CNR tracks. I would, therefore, not recommend a monitoring station south of Highway 403 at this time. Instead, I would recommend that Falcon Creek and its tributary be monitored at the culverts at the North Service Road.

3. I will attend before the Environmental Assessment Board and be subject to examination and cross-examination on this Witness Statement.

DATED this 23rd day of May, 1984.

Wessel Lammers

APPROVAL REPORT for Sample Class LF

Municipality/Project: B U R L I N G T O N L F S - [illegible]

Sampling Date(s): A P R 1 9, 1 9 8 4

Program..... 0400231
Agency..... 0101030401

LANDFILL
SURFACE WATER UNIT

CE PCSN -MUNICIPAL

Sampled by: DULAY,J.S.

Date Submitted: 19/04/84. Date Received: 19/04/84

Report to..... LAMMERS,W.

MOE CENTRAL REGION

Telephone: [illegible]

C.C.... MEMORY, GOERGE
C.C.... TOMASSINI,P.D

TRADE ORGANIC (SEL)
MOE WATER QUALITY

Telephone: [illegible]
Telephone: [illegible]

| Field Sample | Sampling Location | Sample Description | Lab Sample# | Analysis Date | Analysis Time | Code |
|---|---|---|---|---|---|---|
| 1 | A 210102501 | SEDIMENT POND DISCH. | LF16-0035<br>MY16-0080 | 19/04/84 | | 5 |
| 2 | A 210102502 | PRIVATE PROP.DISCH. | LF16-0036<br>MY16-0081 | 19/04/84 | | 5 |
| 3 | A 210102503 | STORM WATER DISCH. | LF16-0037<br>MY16-0082 | 19/04/84 | | 5 |
| 4 | A 210102504 | NORTH SERVICE RD CULVERT | LF16-0038<br>MY16-0083 | 19/04/84 | | 5 |

Sample Class: Results

LANDFILL (LEACHATES) ITC Enquiries at:

| Field Sample | Sampling Location | Sample Description | Lab Sample# | Rmk | Sampling Date | Time | Zone |
|---|---|---|---|---|---|---|---|
| 1 | A 210102501 | SEDIMENT POND DISCH. | LF16-0035 | | 19/04/84 | | |
| 2 | A 210102502 | PRIVATE PROP.DISCH. | LF16-0036 | | 19/04/84 | | |
| 3 | A 210102503 | STORM WATER DISCH. | LF16-0037 | | 19/04/84 | | |
| 4 | A 210102504 | NORTH SERVICE RD CULVERT | LF16-0038 | | 19/04/84 | | |

| Test Description Code, Units of Measure | Method | | Field Sample Number... 1 LF16-0035 | 2 LF16-0036 | 3 LF16-0037 | 4 LF16-0038 |
|---|---|---|---|---|---|---|
| IRON, UNF.TOTAL FEUT ,MG/L AS Fe | 520AA5 | * | 3.000 | 3.700 | 13 900 | 3.000 |
| MANGANESE, UNF.TOTAL MNUT ,MG/L AS Mn | 520AA1 | * | 1.800 | .490 | 1.600 | .380 |
| ALUMINUM, UNF.TOTAL ALUT ,MG/L AS Al | 520AA5 | * | .370 | 3.800 | 7.000 | 3.100 |
| BARIUM, UNF.TOTAL BAUT ,MG/L AS BA | 520AA5 | * | .180 | .170 | .180 | .084 |
| BERYLLIUM, UNF.TOTAL BEUT ,MG/L AS Be | 520AA5 | * | .005< | .005< | 005< | .005< |
| CADMIUM, UNF.TOTAL CDUT ,MG/L AS CD | 520AA2 | * | .0030< | .0030< | .0030< | .0030< |
| COBALT, UNF. TOTAL COUT ,MG/L AS Co | 520AA2 | * | .010< | .010< | .010< | .010< |
| CHROMIUM, UNF.TOTAL CRUT ,MG/L AS Cr | 520AA5 | * | .010 | .013 | .014 | .007 |
| COPPER, UNF.TOTAL, CUUT ,MG/L AS Cu | 520AA1 | * | .013 | .019 | .019 | .009 |
| MOLYBDENUM, UNF.TOTAL MOUT ,MG/L AS MO | 520AA5 | * | .004 | .007 | .008 | .003 |
| NICKEL, UNF.TOTAL NIUT ,MG/L AS Ni | 520AA2 | * | .015< | .021 | .026 | .015< |

APPROVAL REPORT

Printed 02/05/04

Sample Class:

Results

LANDFILL (LEACHATES) ITC

Enquiries at:

| Field Sample Number... | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Test Description Code, Units of Measure | Method | LF16-0035 | LF16-0036 | LF16-0037 | LF16-0038 |
| LEAD, UNF,TOTAL PBUT ,MG/L AS Pb | 520AA2 * | .010< | .010< | 010< | .010< |
| STRONTIUM, UNF, TOTAL SRUT ,MG/L AS Sr | 520AA5 * | 1.600 | 1.500 | .450 | 1.200 |
| TITANIUM, UNF,TOTAL TIUT ,MG/L AS Ti | 520AA5 * | .025< | .053 | .120 | .120 |
| VANADIUM,UNF,TOTAL VVUT ,MG/L AS V | 510AA5 * | .005 | .010 | .015 | .007 |
| ZINC, UNF,TOTAL ZNUT ,MG/L AS Zn | 520AA2 * | .071 | .069 | 250 | .052 |

## REMARK CODE EXPLANATIONS

| RMK | DESCRIPTION |
|---|---|
| < | ACTUAL RESULT IS LESS THAN THE REPORTED VALUE |

*** END OF REPORT ***

248-3031

Laboratory Services & Applied Research Branch
125 Resources Road, Rexdale

May 7, 1984

**MEMORANDUM**

TO:
Central Region

FROM: M.G. Foster
Chief, Mass Spectrometry Systems
Organic Characterization Section

RE: GC/MS Analysis of Leachate samples from Burlington Landfill Site (Sub #CE05509)

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Four leachate samples were received in this submission for GC/MS analysis and assigned the following lab sample numbers:

| | |
|---|---|
| STA #501 | MY16 - 0080 |
| STA #502 | MY16 - 0081 |
| STA #503 | MY16 - 0082 |
| STA #504 | MY16 - 0083 |

The samples were subjected to GC/MS analysis. They were first analysed by a purge and trap technique followed by GC/MS to separate, identify and quantitate the volatile organics. The compounds found and their concentrations are indicated in the attached Tables I and II. Many of the components isolated have only an approximate concentration marked. This approximation is based on three major assumptions which are:

1. The purging efficiency of the compound is identical to that of the internal standard added to each sample.

2. The GC behaviour of the compound is identical to that of the internal standard.

3. The MS response of the compound is identical to that of the internal standard.

These assumptions may not hold, and any deviation will affect the estimate of concentration.

The samples were also extracted under both basic and acid conditions and the extracts concentrated prior to capillary GC/MS analysis of the extractable fractions. Internal standards were added to the samples prior to extraction and similar assumptions apply for the estimates made of the

concentrations of components. Table III indicates the individual compounds and compound classes observed in the samples and estimated to be at levels of 1 ug/L or greater. The samples showed several compounds that were isomeric or were from the same compound class and these are also indicated in the tables.

Two of the samples were diluted by a factor of ten prior to the analysis of volatiles because of their complexity. The major components in the volatile fraction of sample STA #501 were two ketones. These are commonly used solvents. The other volatile organics seen were at low ug/L levels and the only chlorinated organics seen were chloroform and dichloro benzene. The major extractable organics in these samples were carboxylic acids with a mixture of aromatic and aliphatic acids being seen. These are commonly found as degradation products of waste materials. Another prominent group of organics was the group of terpenes which together with the other oxygen-containing organics may have derived from plastics, varnishes or solvents. The phthalate esters and the phosphates are widely used as plasticizers.

In sample STA #502, all the volatile organics were at levels below 1 ug/L. The major components in the extractable fractions were aliphatic acids, terpenes and oxygen containing compounds. The three unidentified compounds are of note because none of them are chlorinated, but little other information is available on their structure.

Sample STA #503 contained low ug/L levels of volatile organics. The major ones were again a series of ketones. The extractable organics fractions again contained high levels of carboxylic acids, mainly aliphatic. Other major components were aliphatic alcohols. Low levels of plasticizers were seen together with low levels of terpenes and other oxygen containing compounds.

Sample STA #504 contained only methyl ethyl ketone at a level above 1 ug/L among the volatile organics. A variety of other oxygenated compounds and hydrocarbons were seen at sub-ug/L levels. Carboxylic acids were again the major components in the extractable fractions. Two plasticizers were seen and a few other compounds at close to the detection limit.

In general, many of the compounds seen could be derived from plastics, varnishes and solvents. Many products would have household as well as industrial uses. Most of the organics could be found in domestic waste or relatively light industrial waste. Few of the organics seen are chlorinated and most of the compounds identified would be readily biodegradable.

MFG:mly

M.G. Foster

cc: O. Meresz
LIS

Table I

Ministry of the Environment
Ontario

Burlington L-/F

Components Found & Their Concentration in ug/L

Date sampled: 840419

Date Analyzed: 840424

Sample MY16-0080 to 83

VOLATILES

| Compound MY16 | STA #501 -0080 | | STA #503 -0082 | | |
|---|---|---|---|---|---|
| Methylene Chloride | ND+ | | ND+ | | |
| 1,1-Dichloroethane | ND | | ND | | |
| Chloroform | 1.5 | | 0.9 | | |
| 1,2-Dichloroethane | ND | | ND | | |
| 1,1,1-Trichloroethane | ND | | ND | | |
| Carbontetrachloride | ND | | ND | | |
| Dichlorobromomethane | ND | | ND | | |
| 1,2-Dichloropropane | ND | | ND | | |
| Trichloroethylene | ND | | ND | | |
| Chlorodibromomethane | ND | | ND | | |
| Benzene | ND | | ND | | |
| I.S. 1,3-Dichlorobutane | ✓ | | ✓ | | |
| Bromoform | ND | | ND | | |
| Tetrachloroethylene | ND | | ND | | |
| Toluene | 1.1 | | ND | | |
| Chlorobenzene | ND | | ND | | |
| Ethylbenzene | ND | | ND | | |
| m-Xylene | ND | | 0.5 | | |
| o- or p-Xylene | 1.0 | | 1.2 | | |
| 1,2-dichlorobenzene | 1.6 | | ND | | |
| a Trichlorobenzene * | ND | | 0.9 | | |

NOTES
ND - not detected - less 05 ug/litre
ND+ - not detected - less than .25 ug/litre
~~tr - trace~~ - less than 0.1 ug/litre
* - approximate - response of

Table I cont'd.
Burlington L.

Ministry of the Environment
Ontario

Components Found & Their Concentration in ug/L

Date Sampled: 84 04 19

Date Analyzed: 840424

Sample MY16-0080 to 83

VOLATILES

| Compound | STA #501 | | STA #503 | | |
|---|---|---|---|---|---|
| MY16 | -0080 | | -0082 | | |
| Acetone * | 16.5 | | 4.3 | | |
| Internal Std. | ✓ | | ✓ | | |
| Methyl ethyl ketone * | 17.4 | | 7.8 | | |
| sec- butanol * | 2.0 | | 1.4 | | |
| Methyl isopropyl ketone * | 0.9 | | 2.4 | | |
| Methyl isobutyl ketone * | N.D | | 4.9 | | |
| Internal Std. | ✓ | | ✓ | | |
| a hexanone * | 1.2 | | 2.5 | | |
| Phenol * | 1.4 | | N.D | | |
| Styrene * | 1.8 | | 0.6 | | |
| Hexanal * | N.D | | 4.4 | | |
| a $C_8H_{16}$ * | N.D | | 2.0 | | |
| a $C_{11}H_{18}O$ ? * | N.D | | 2.5 | | |

NOTES
ND - not detected - less than 05 ug/litre
ND+ - not detected - less than 5 ug/litre
*tr - trace - less than 0.1 ug/litre

Table II

Burlington L/F

Ministry of the Environment
Ontario

Components Found & Their Concentration in ug/L

Date sampled: 84 04 19

Date analyzed: 84 04 24

Sample MY16-0080 to R3

VOLATILES

| Compound MY16 | STA # 502 -0081 | | STA # 504 -0083 | | |
|---|---|---|---|---|---|
| Methylene Chloride | NDt | | NDt | | |
| 1,1-Dichloroethane | ND | | ND | | |
| Chloroform | 0.1 | | tr | | |
| 1,2-Dichloroethane | ND | | ND | | |
| 1,1,1-Trichloroethane | ND | | ND | | |
| Carbontetrachloride | ND | | ND | | |
| Dichlorobromomethane | ND | | ND | | |
| 1,2-Dichloropropane | ND | | ND | | |
| Trichloroethylene | ND | | ND | | |
| Chlorodibromomethane | ND | | ND | | |
| Benzene | ND | | ND | | |
| I.S. 1,3-Dichlorobutane | ✓ | | ✓ | | |
| Bromoform | ND | | ND | | |
| Tetrachloroethylene | ND | | ND | | |
| Toluene | 0.1 | | tr | | |
| Chlorobenzene | ND | | ND | | |
| Ethylbenzene | ND | | ND | | |
| m-Xylene | tr | | ND | | |
| o- or p-Xylene | tr | | tr | | |

NOTES

ND - not detected - less 0.05 ug/litre
NDt - not detected - less than 5 ug/litre
tr - trace - less than 0.1 ug/litre

Table II cont'd
Burlington L/F

Ministry of the Environment
Ontario

Components Found & Their Concentration in ug/L

Date sampled: 840419

Date analyzed: 840424

Sample MY16-0080 to 83

VOLATILES

| Compound | MY16 | STA # 502 -0081 | | STA # 504 -0083 | | |
|---|---|---|---|---|---|---|
| Acetone | * | 0.3 | | 0.8 | | |
| Diethyl ether | * | 0.1 | | ND | | |
| Internal std. | | ✓ | | ✓ | | |
| t-butanol | * | 0.4 | | ND | | |
| Tetrahydrofuran | * | 0.7 | | ND | | |
| Methyl ethyl ketone | * | tr | | 1.6 | | |
| 1,4-dioxan | * | tr | | ND | | |
| Methyl isobutyl ketone | * | 0.1 | | ND | | |
| Dimethoxy methane | * | 0.6 | | ND | | |
| Pentene | * | ND | | tr | | |
| sec-butanol | * | ND | | 0.1 | | |
| Methyl isopropyl ketone | * | ND | | 0.2 | | |
| Internal std. | | ✓ | | ✓ | | |
| Hexanal | * | 0.3 | | 0.7 | | |
| Fenchone | * | 0.9 | | ND | | |
| a $C_8H_{16}$ | * | ND | | 0.2 | | |
| a hexanone | * | ND | | 0.3 | | |
| a $C_9H_{18}$ | * | ND | | 0.3 | | |
| a $C_9H_{20}$ | * | ND | | 0.2 | | |

NOTES
ND - not detected - less than 0.05 ug/litre
ND - not detected - less than 5 ug/litre
tr - trace - less than 0.1 ug/litre
* - approximate - response of standard

## TABLE III

Extractable Organics Identified and Estimated Concentration Levels (ug/L)

| | MY 16-0080 | -0081 | -0082 | -0083 |
|---|---|---|---|---|
| Carboxylic Acids: | | | | |
| C 4 | | | 5 | |
| C 5 | 269 | | 112;40 | 20;9 |
| C 6 | 15;81;391;1188 | | 196 | 31;120;29 |
| C 7 | 74;1067 | | 275;75 | 75; |
| C 8 | 123 | 16;5 | 193;66;54 | 12;19 |
| C 9 | 20 | | | |
| C16 | | 4 | | 4 |
| C18 | 2 | 4 | | 2 |
| Benzoic | 155 | | 24 | |
| p-t-Butyl benzoic | 2 | | | |
| Phenylacetic | 145 | | | |
| ∠Ethyl phenylacetic | 12 | | 35 | |
| Phenyl propanoic | 128 | | 40 | 4 |
| Dimethyl phenylbutanoic | 15 | | 24 | |
| Cyclohexane | 561 | | 5 | 7 |
| Miscellaneous | 509;59;4;3;6;53;5 | | 13;288;<35;13;43 | 2 |
| Polypropylene glycol derivs | 100;4;5;14 | 3;4 | 2;1;1 | |
| Polyethylene glycol derivs | 1 | 1 | 1 | |
| Resin acids | 9 | | 8 | |
| Aliphatic Hydrocarbons | | | 6 | 2 |
| Alicyclicye hydrocarbons | 4;3;5 | | | |
| Aliphatic alcohols | 27;2 | 6 | <35;39;1;1 | 1 |
| Trimethyl cyclohexanol | | | 4 | |
| Aliphatic/alicyclic ketones/aldehydes | 15 | | 3 | |
| Aromatic H/C | 3;2 | | | |
| Tri methyl cyclohexanone | | 3 | 2 | |
| Tri methyl cyclohexenone (isophorone) | | | 1 | |
| Methyl esters | 3 | | | |
| Miscellaneous -oxygen-containing | 4 | 1 | 4;3 | |
| -cyclic | 4 | | | |

## TABLE III (cont'd)

Extractable Organics Identified and Estimated Concentration Levels (ug/L)

| | MY 16-0080 | -0081 | -0082 | -0083 |
|---|---|---|---|---|
| Acetophenone | 2 | | | |
| α Methyl benzene methanol | 1 | | | |
| Di methyl acetophenone | 1 | | | |
| Indanone | 1 | | | |
| Di ethyl phthalate | 3 | | 2 | 6 |
| Di iso octyl phthalate | 7 | 7 | 5 | 11 |
| Tri butyl phosphate | 3 | | 1 | |
| Di ethyl pentyl phosphate | | 1 | 1 | |
| Sulfur | | | 44 | 2 |
| Cresol | | | 4 | |
| Terpenes: | | | | |
| Camphor | 3 | | 6 | |
| 4-Me-1-i.propyl-bicyclo (3,1,0) hexan-3-one | 2 | | | |
| 4-Me-1-i.propyl-3-cyclohexenol | 7 | | | |
| α-Terpineol | 143 | | | 2 |
| 4-Methylene-cyclohexane methanol | 1 | | | |
| 1,3,3-Trimethyl bicyclo (2,2,1) heptan-2-one | | 2 | 2 | |
| 1,7,7-Tri methyl bicyclo heptan-2,5-dione | | 2 | | |
| Miscellaneous | | 1 | 1;4;7;1 | |
| Nicotine | 3 | | | |
| Caffeine | 1 | | | |
| Aliphatic amides | | | 2 | |
| Unidentified: E1 | 2 | 3 | 1 | 1 |
| K3 | 1 | 1 | 1 | |
| A | | 2 | | |