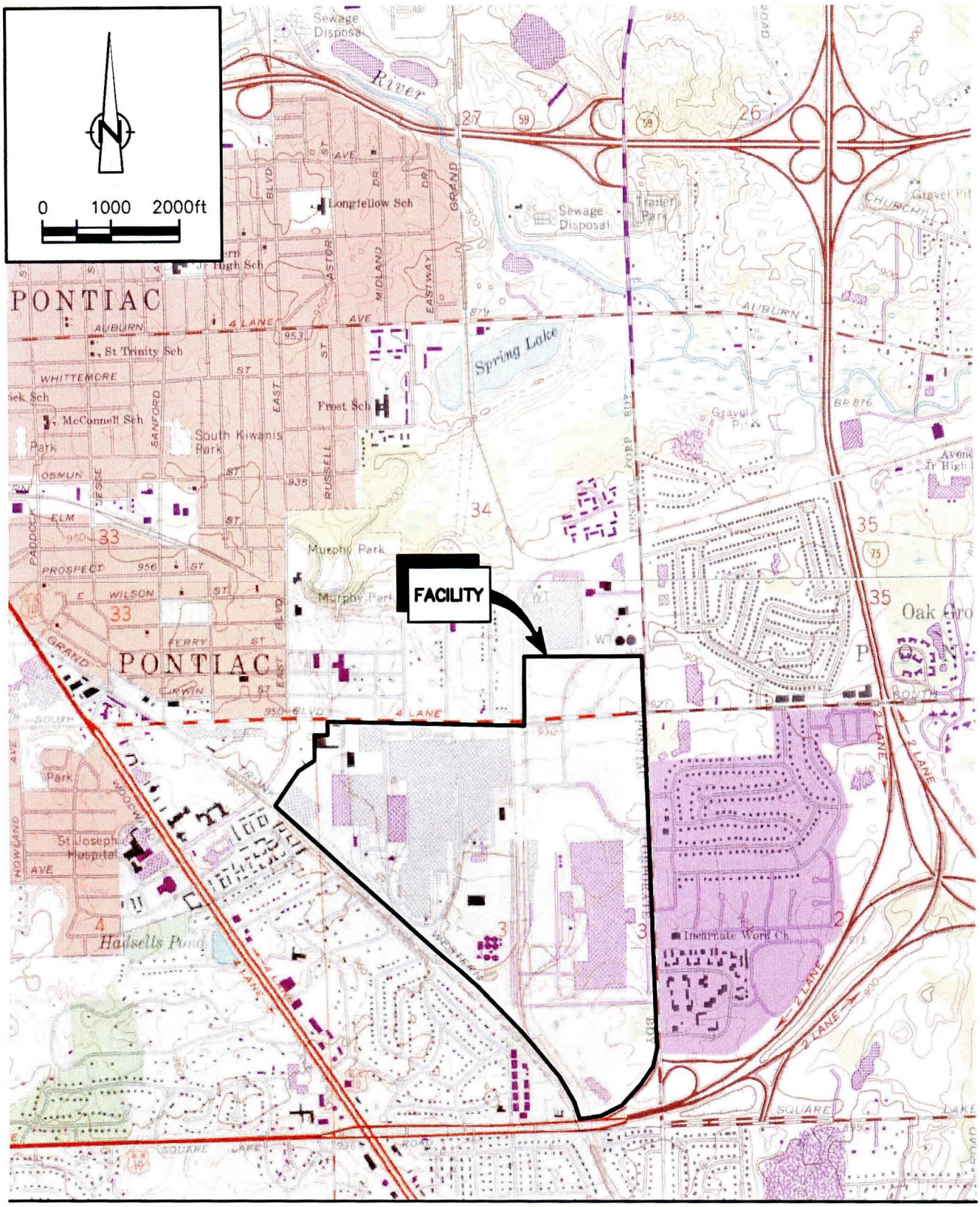



SOURCE: USGS QUADRANGLE MAPS;
BIRMINGHAM, ROCHESTER, PONTIAC NORTH,
AND PONTIAC SOUTH, MICHIGAN

figure 1.1

FACILITY LOCATION
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-DE016 NOV 30/2000

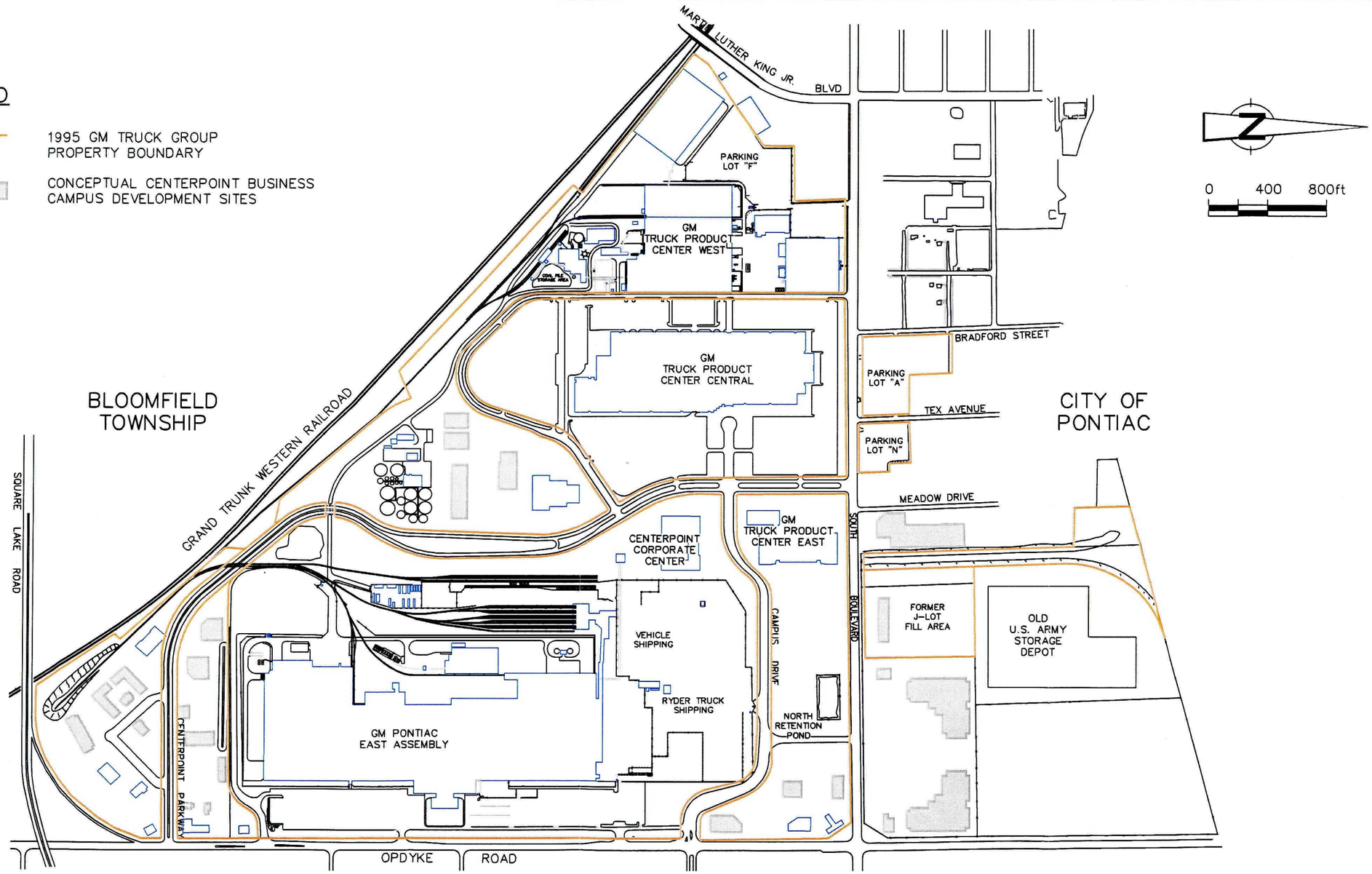
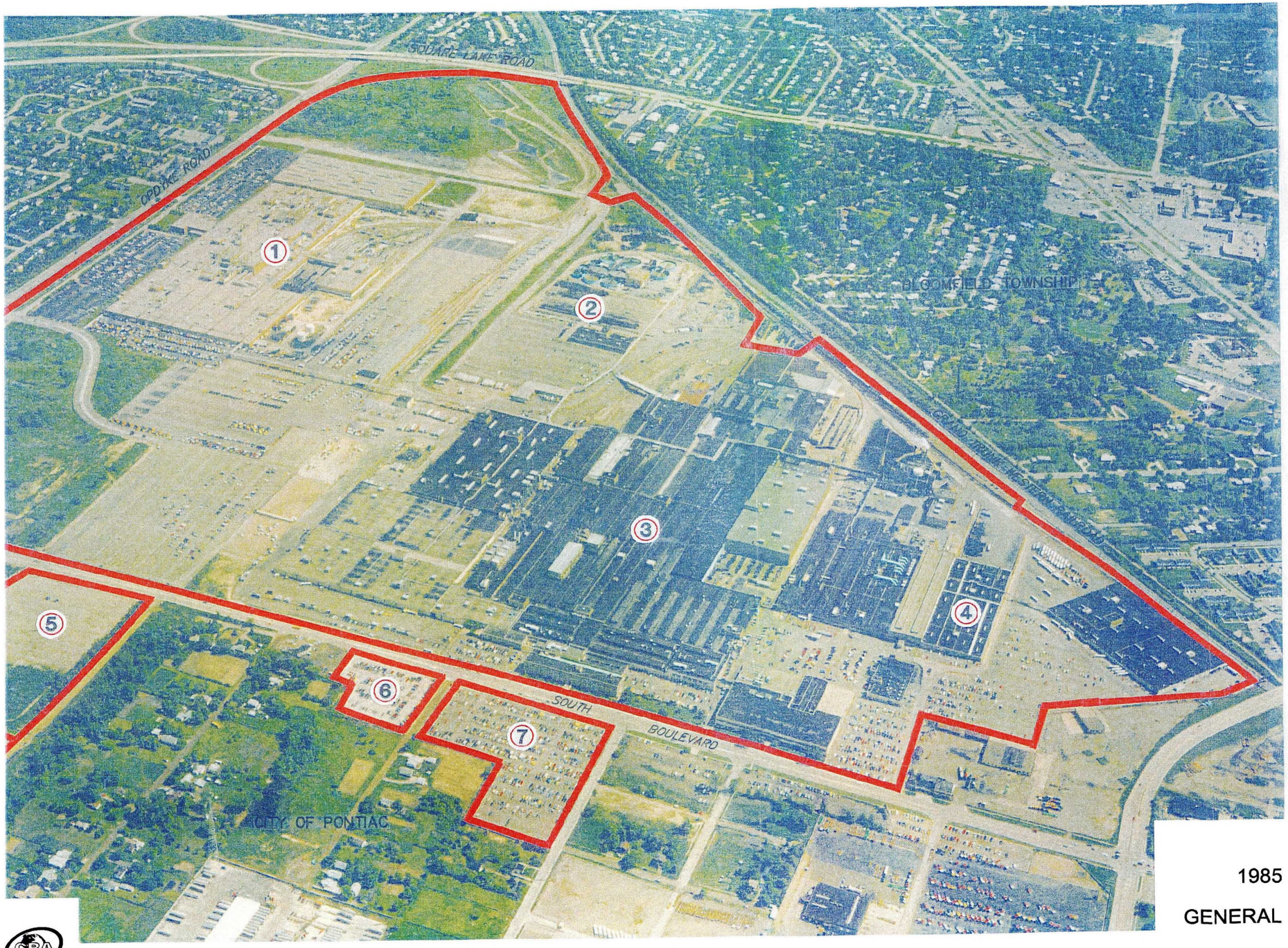



figure 1.2

FACILITY PLAN
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-DE002 NOV 30/2000




LEGEND

- PROPERTY BOUNDARY
- 1 PONTIAC EAST ASSEMBLY PLANT
- 2 WASTE WATER TREATMENT PLANT
- 3 PONTIAC CENTRAL MANUFACTURING AND ASSEMBLY PLANT
- 4 ENGINEERING
- 5 PARKING LOT "J"
- 6 PARKING LOT "I"
- 7 PARKING LOT "A"

SOURCE:
GENERAL MOTORS PONTIAC.

figure 1.3

1985 FACILITY AERIAL PHOTO
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA002 NOV 30/2000

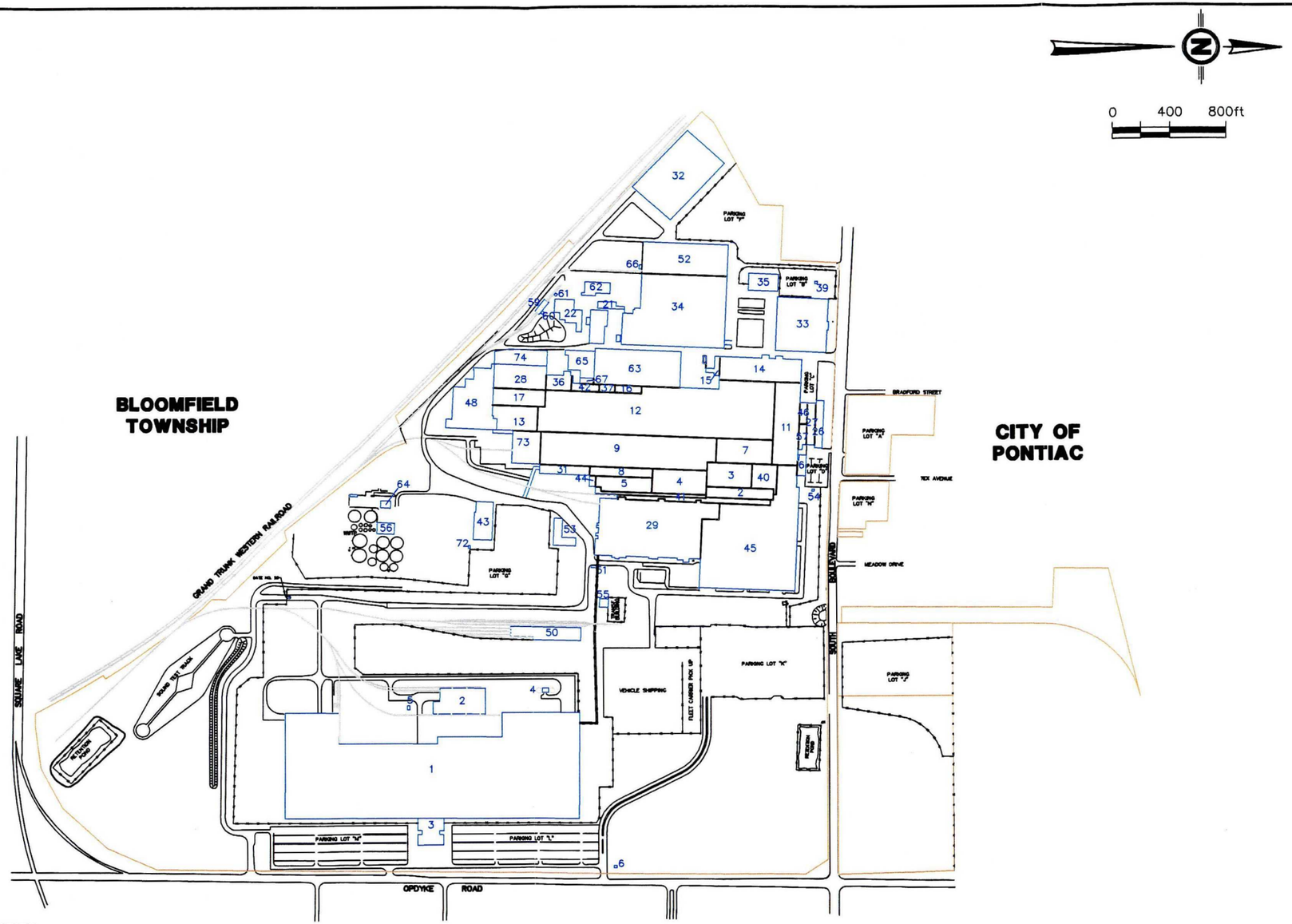



figure 1.4

1987 FACILITY PLAN
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA001 NOV 30/2000

figure 1.5

1995 TPC CENTRAL AERIAL PHOTO
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

## LEGEND

| | |
|---|---|
| A | FORMERLY PART OF "PONTIAC CENTRAL", CURRENTLY SOLD TO A THIRD PARTY, LEASED BACK TO GM AMD OPERATED AS "GM TRUCK PRODUCT CENTER". |
| B1,B2,B3 | FORMERLY PART OF PONTIAC TRUCK GROUP FACILITIES, CURRENTLY OWNED BY GM AND LEASED TO DEVELOPER. |
| C1,C2,C3,C4 | CURRENTLY OWNED AND OPERATED BY THE GM TRUCK GROUP. |

PROPERTY BOUNDARY

APPROXIMATE LIMIT OF PARCEL BOUNDARY

EXISTING, UNDER CONSTRUCTION AND PROPOSED BUILDINGS

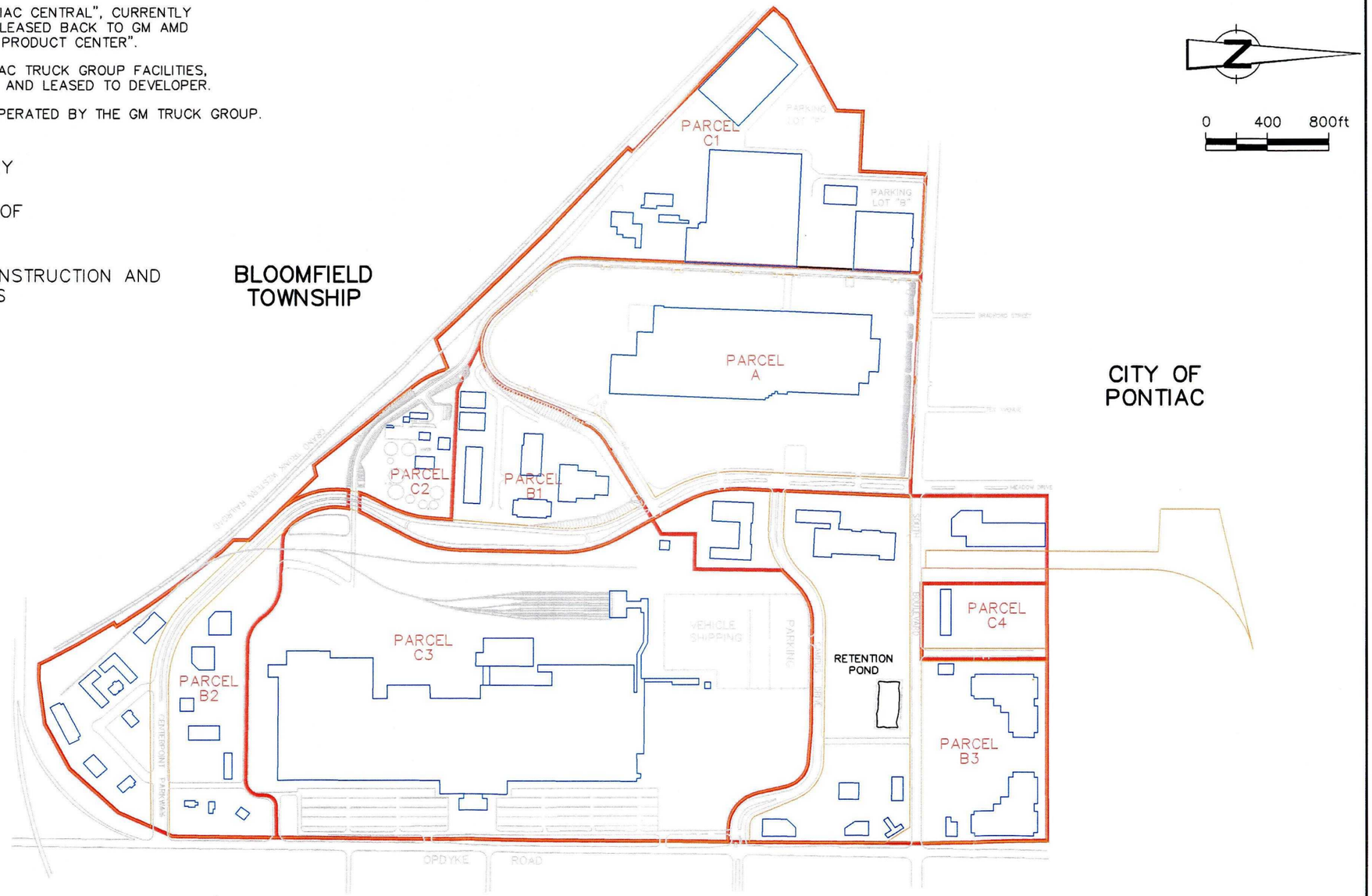



figure 1.6
PARCEL SUMMARY PLAN
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-DE017 NOV 30/2000

CENTERPOINT
BUSINESS CAMPUS

This thriving 350-acre business campus is home to a multitude of world-class corporations, several restaurants, a retail marketplace and three Marriott hotels. Located on the border of Bloomfield Township and Auburn Hills at the southernmost point of Pontiac, Centerpoint is the only *close-in*, mixed-use development in Oakland County. Available sites within the first phase of the campus are very limited. Development is progressing north of South Boulevard into the final North Campus phase which encompasses over 100 acres.

1. Applebee's
2. Full Service Marriott Hotel and Conference Center
3. Papa Vino's Italian Kitchen
4. Prodigy Child Development
5. Residence Inn by Marriott
6. The Courtyard by Marriott
7. Marketplace at Centerpoint
   - Coffee Beanery
   - Leo's Coney Island
   - Lemon Grass Thai
   - Shirley Berney Salon
   - Flagstar Bank
   - Dairy Queen
   - Quizno's Classic Subs
   - Guido's Pizza
   - AppleOne
   - Royal Cleaners
8. Burger King
9. GM Pontiac East Assembly
10. Herberts Automotive Systems, Inc.
11. Hawtal Whiting
12. Truck Product Center – West (TPC-West)
13. Truck Product Center – Central (TPC-C)
14. Centerpoint Corporate Center
    - Aerotek, Inc.
    - Modern Engineering
    - Etkin Equities (Campus management office)
    - Lear Corporation
    - RCO Engineering
    - MSX International
    - Kelly Services
    - Isuzu Motors America, Inc.
15. Truck Product Center – East (TPC-East)
16. adcor Data Services
17. Wendy's/Tim Horton's
18. British Petroleum
19. GM Truck Product Center – North (TPC-North)
20. Centerpoint Business Campus North – Building One
21. General Motors University (GMU)

SOURCE: ETKIN EQUITIES, SOUTHFIELD, MICHIGAN

figure 1.7

CENTERPOINT BUSINESS CAMPUS: VIEW 1
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

CRA

07097-00(012)GN-WA005 NOV 30/2000

SOURCE: ETKIN EQUITIES,
SOUTHFIELD, MICHIGAN

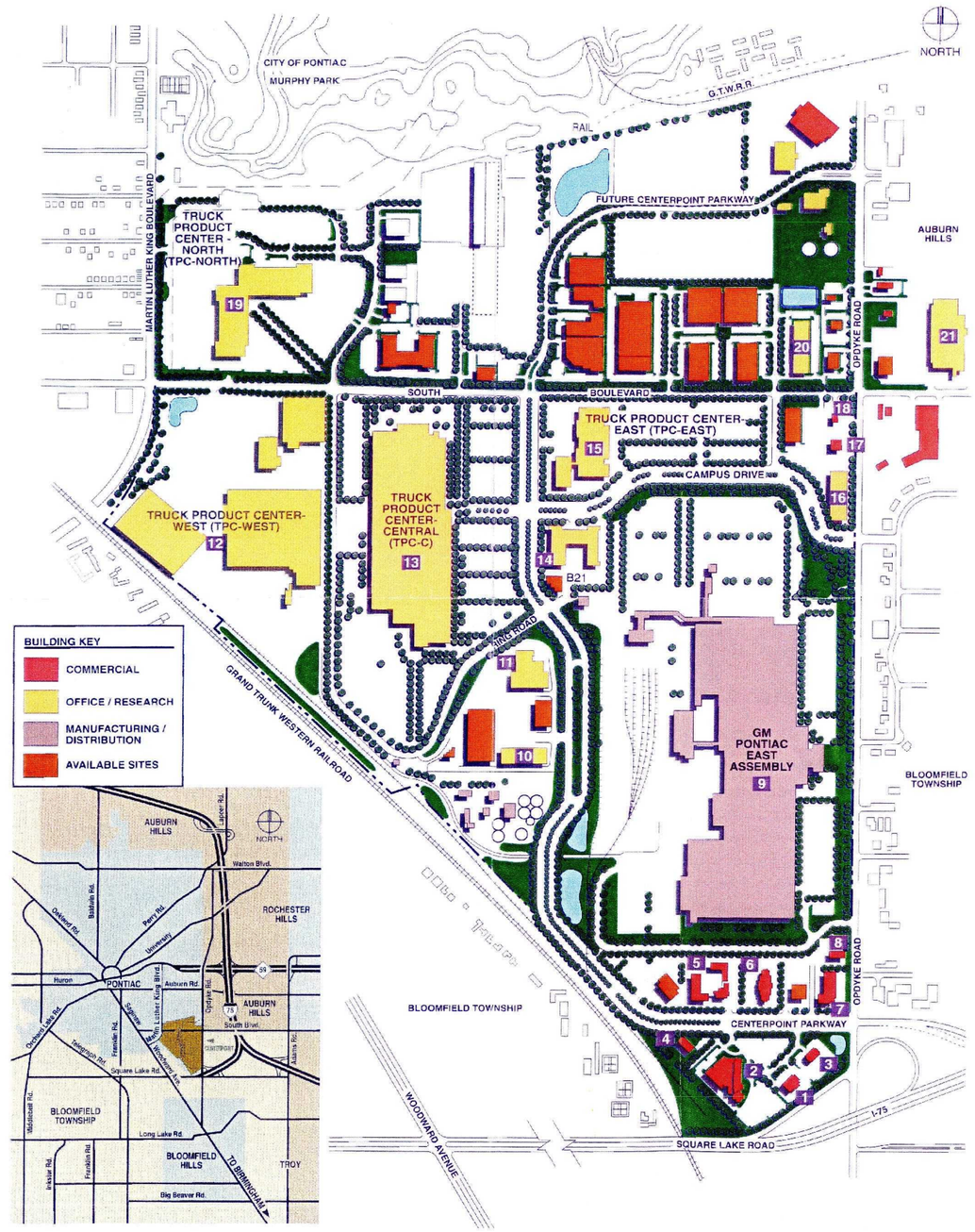
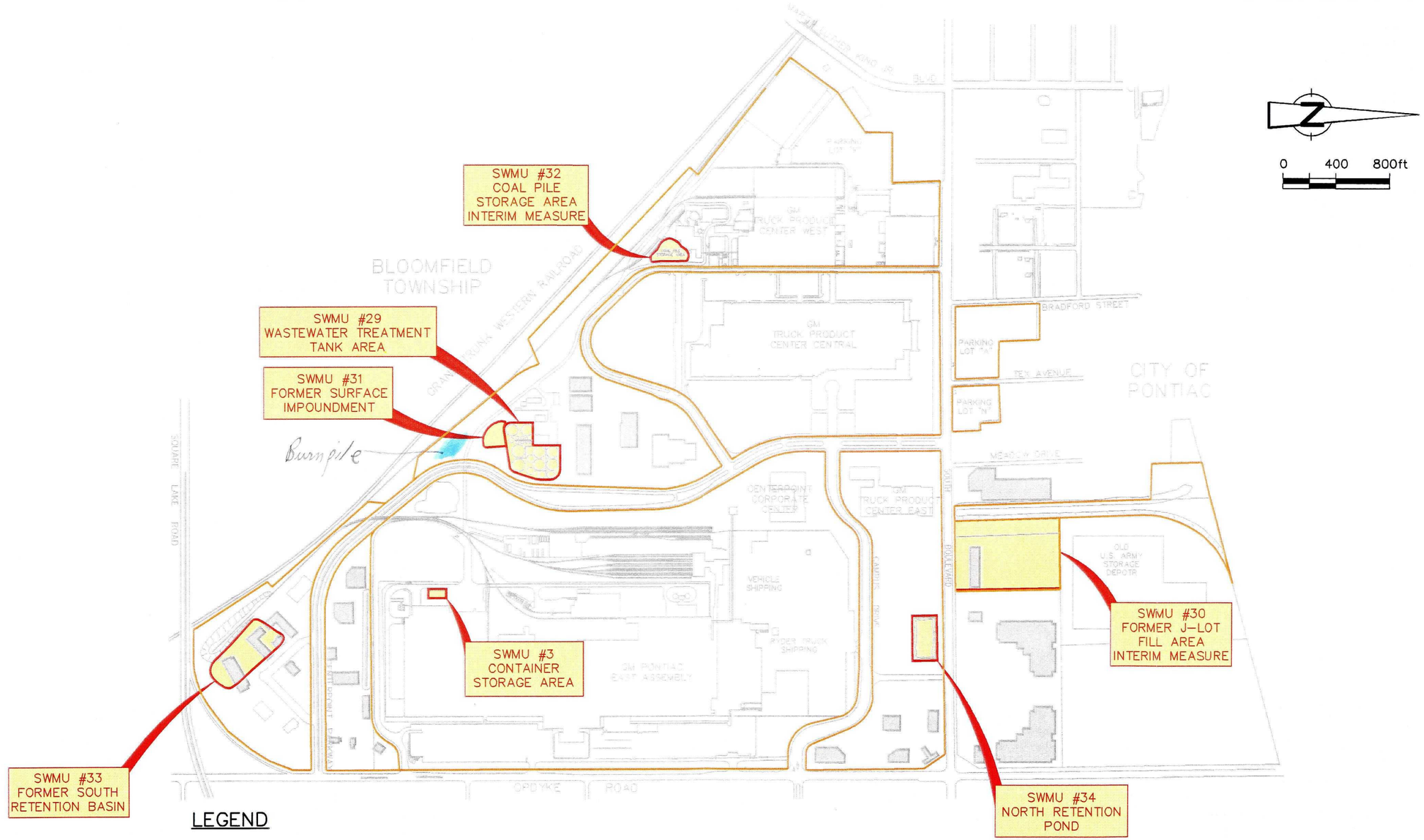


figure 1.8
CENTERPOINT BUSINESS CAMPUS: VIEW 2
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA008 NOV 30/2000




## LEGEND

1995 GM TRUCK GROUP PROPERTY BOUNDARY

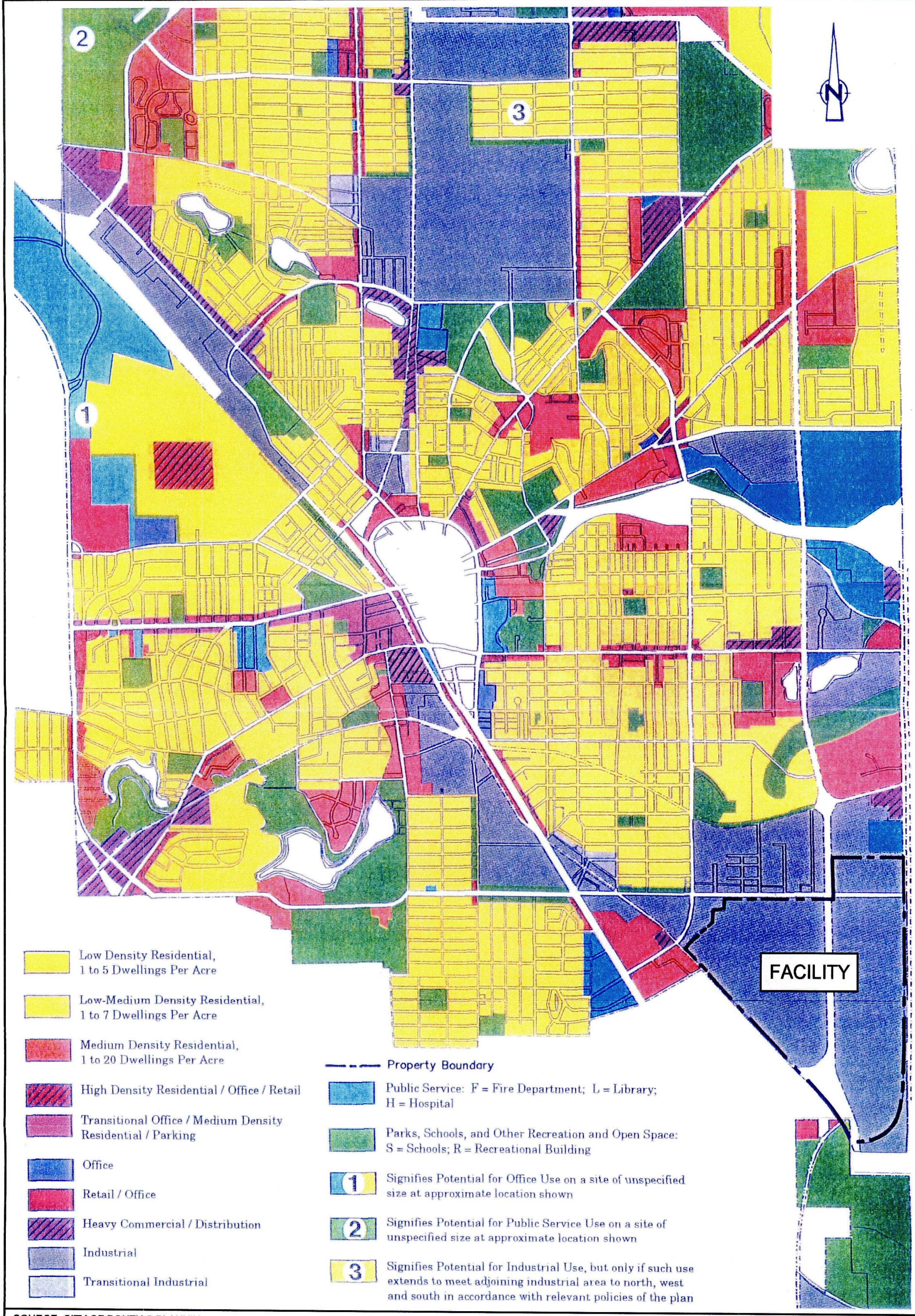
CONCEPTUAL CENTERPOINT BUSINESS CAMPUS DEVELOPMENT SITES

SWMU #32 COAL PILE STORAGE AREA — U.S. EPA SWMU LOCATION

figure 1.9

U.S. EPA SWMU LOCATION
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-DE003 NOV 30/2000




SOURCE: CITY OF PONTIAC PLANNING COMMISSION

figure 2.1

CITY OF PONTIAC LAND USE MAP
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

CRA

07097-00(012)GN-WA015 NOV 30/2000

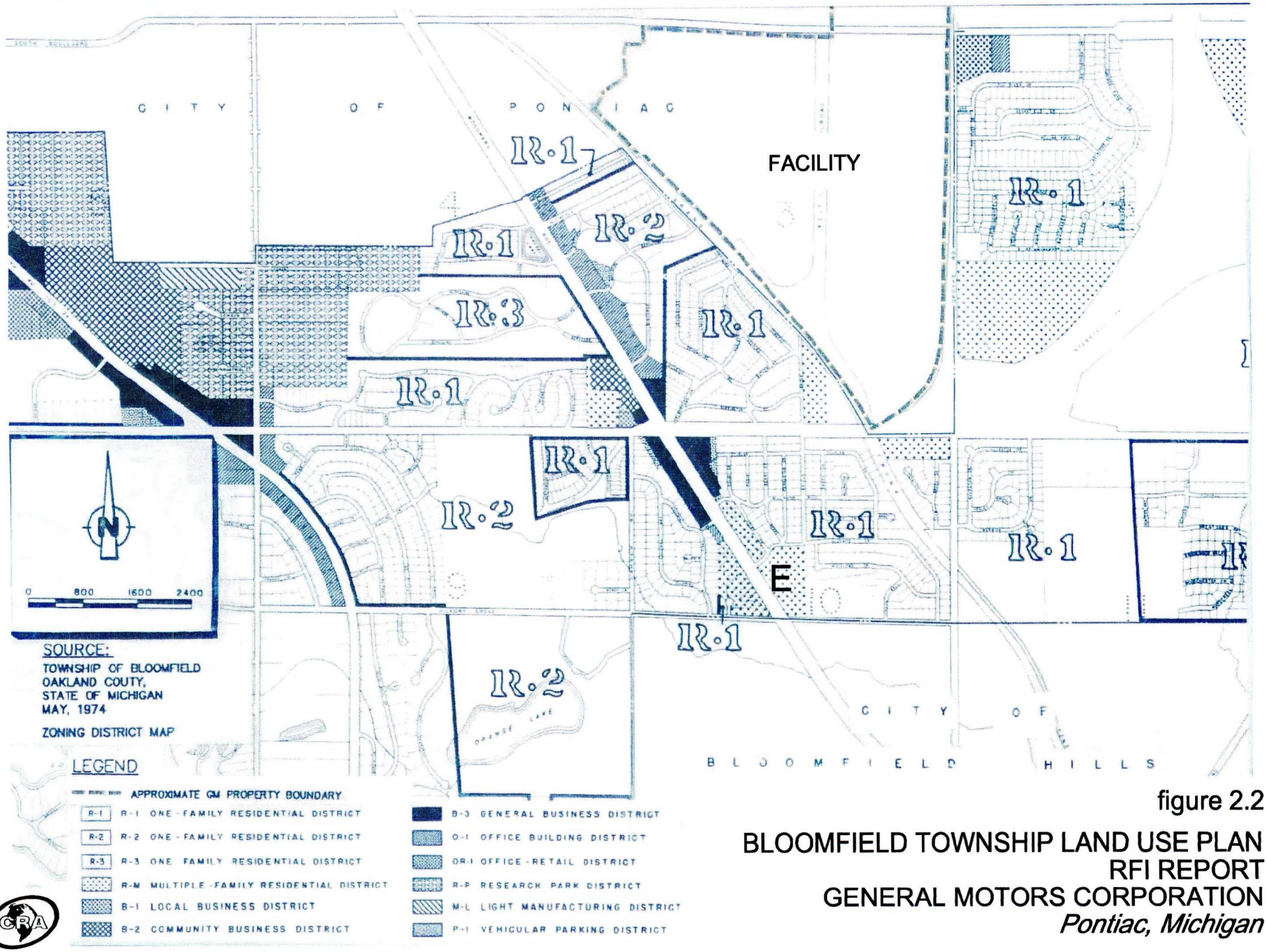



figure 2.2

BLOOMFIELD TOWNSHIP LAND USE PLAN
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA004 NOV 30/2000

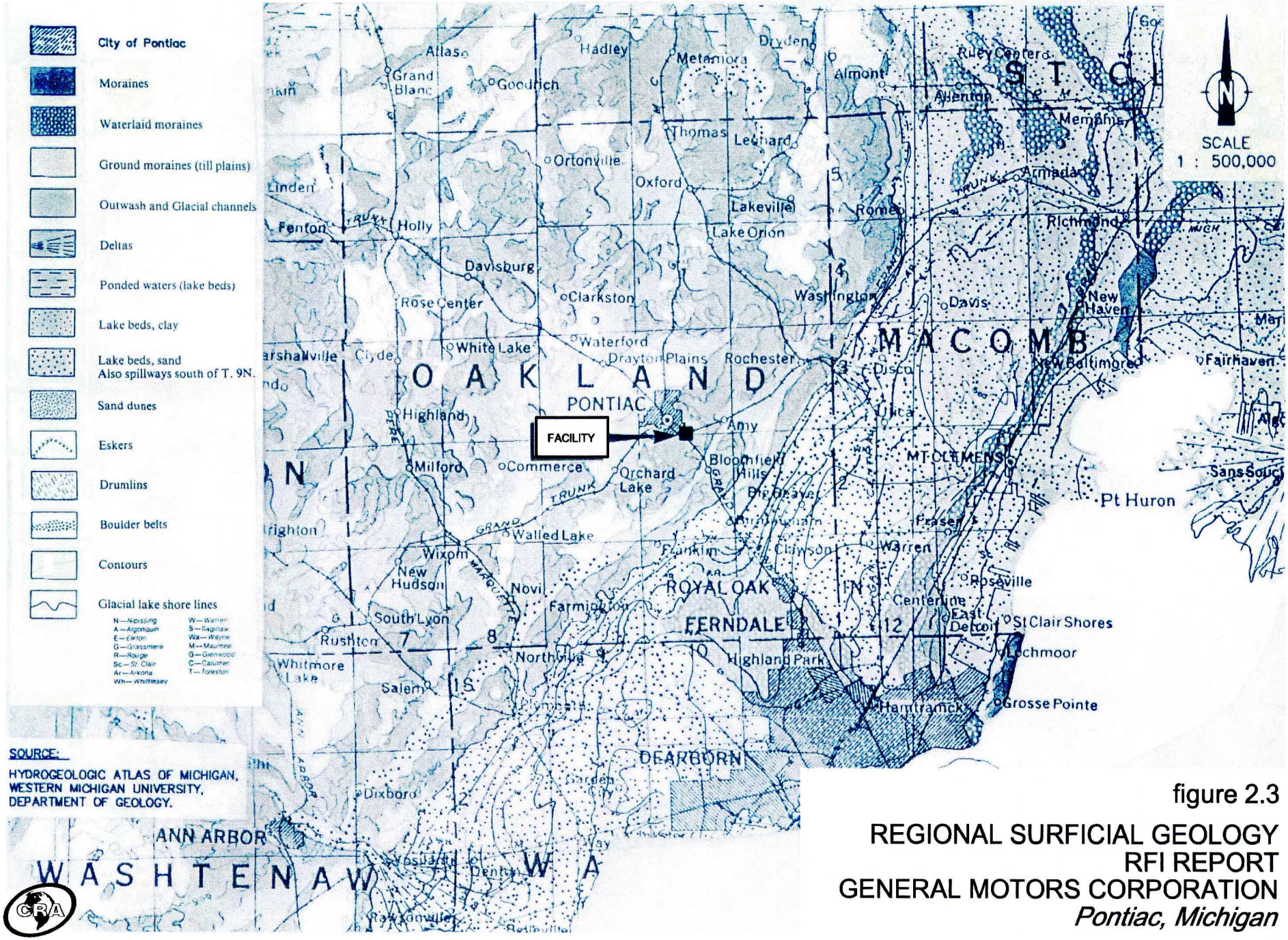



figure 2.3

REGIONAL SURFICIAL GEOLOGY
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA006 NOV 30/2000

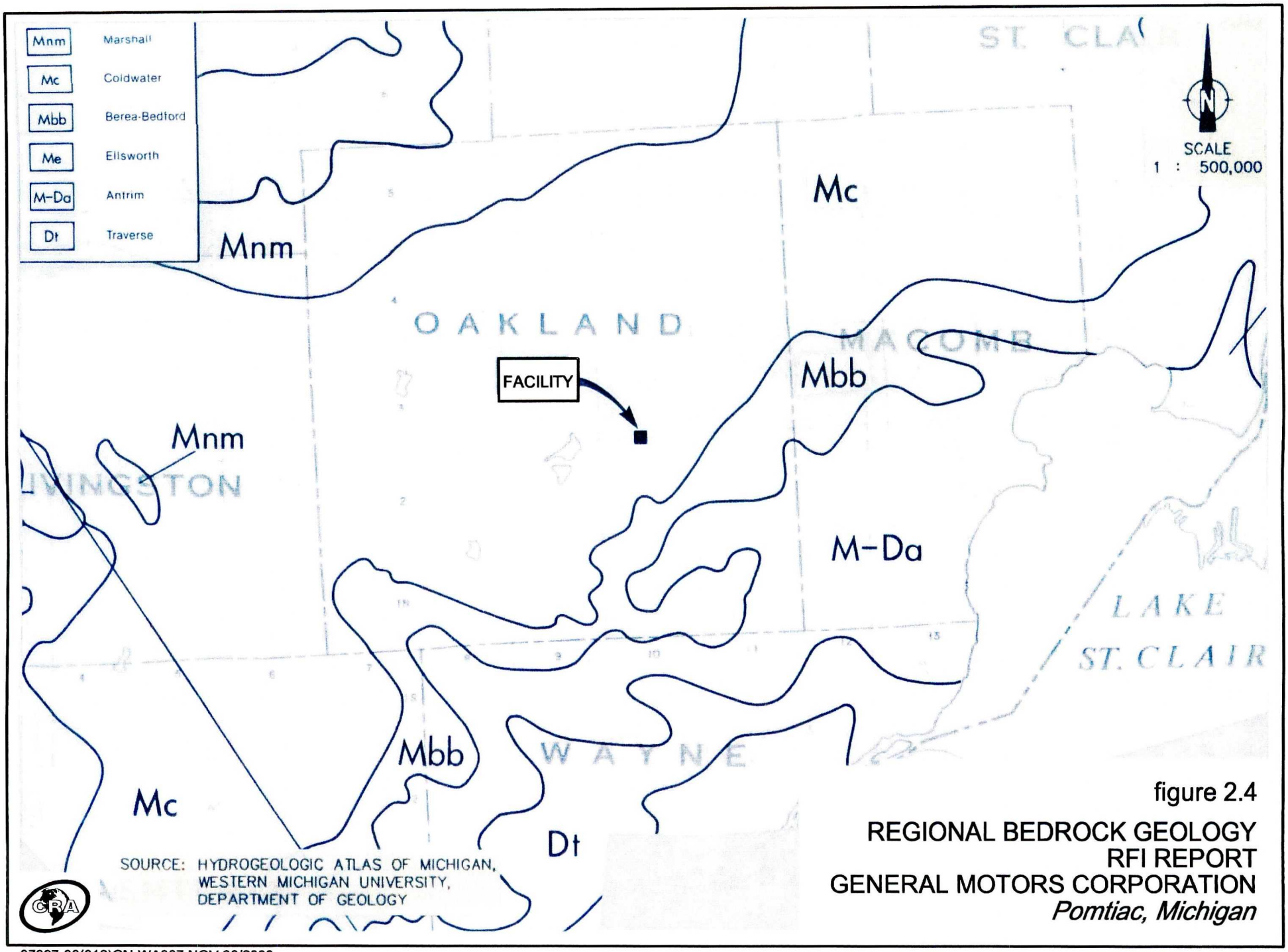
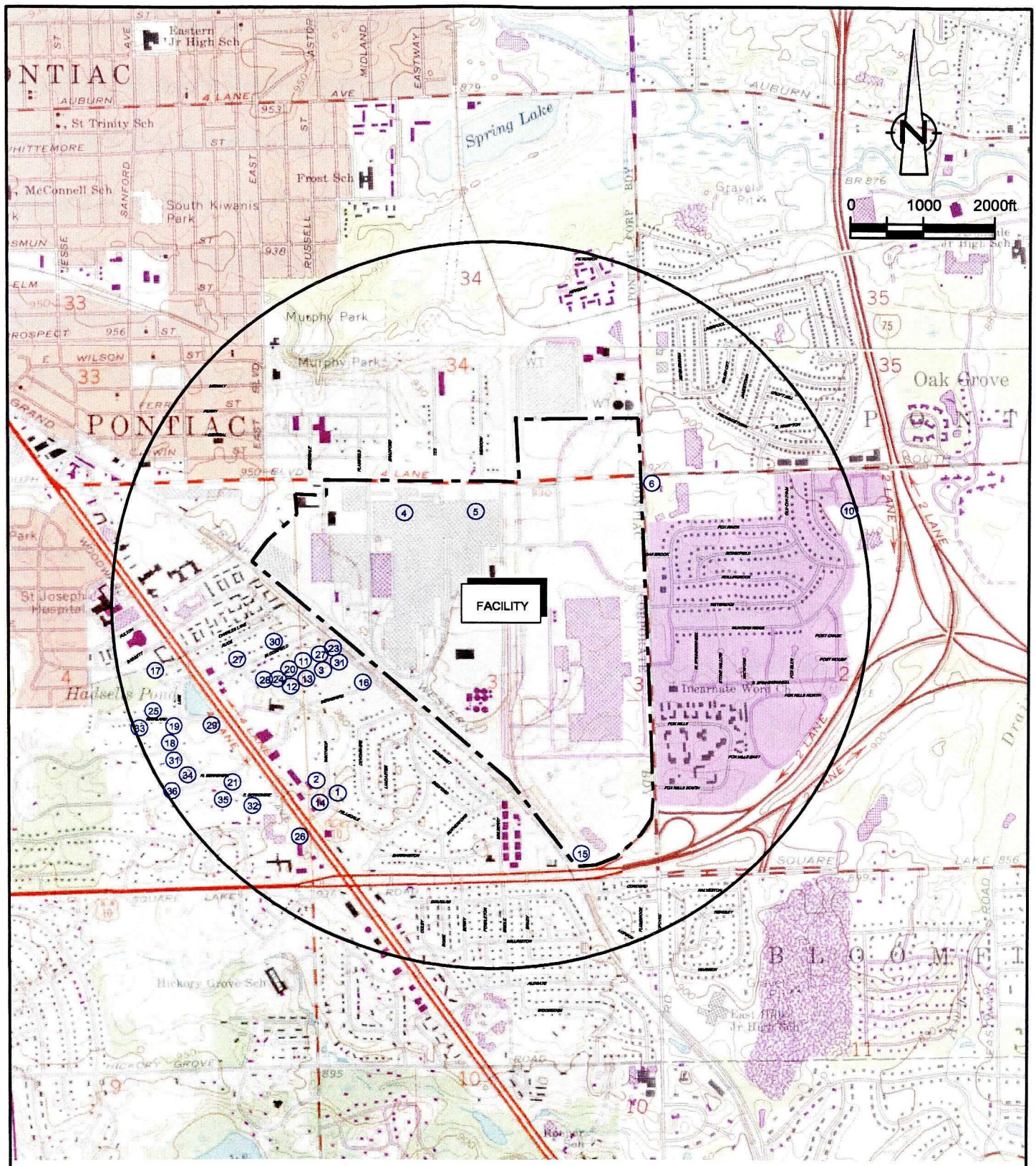



figure 2.4

REGIONAL BEDROCK GEOLOGY
RFI REPORT
GENERAL MOTORS CORPORATION
*Pomtiac, Michigan*

07097-00(012)GN-WA007 NOV 30/2000




LEGEND

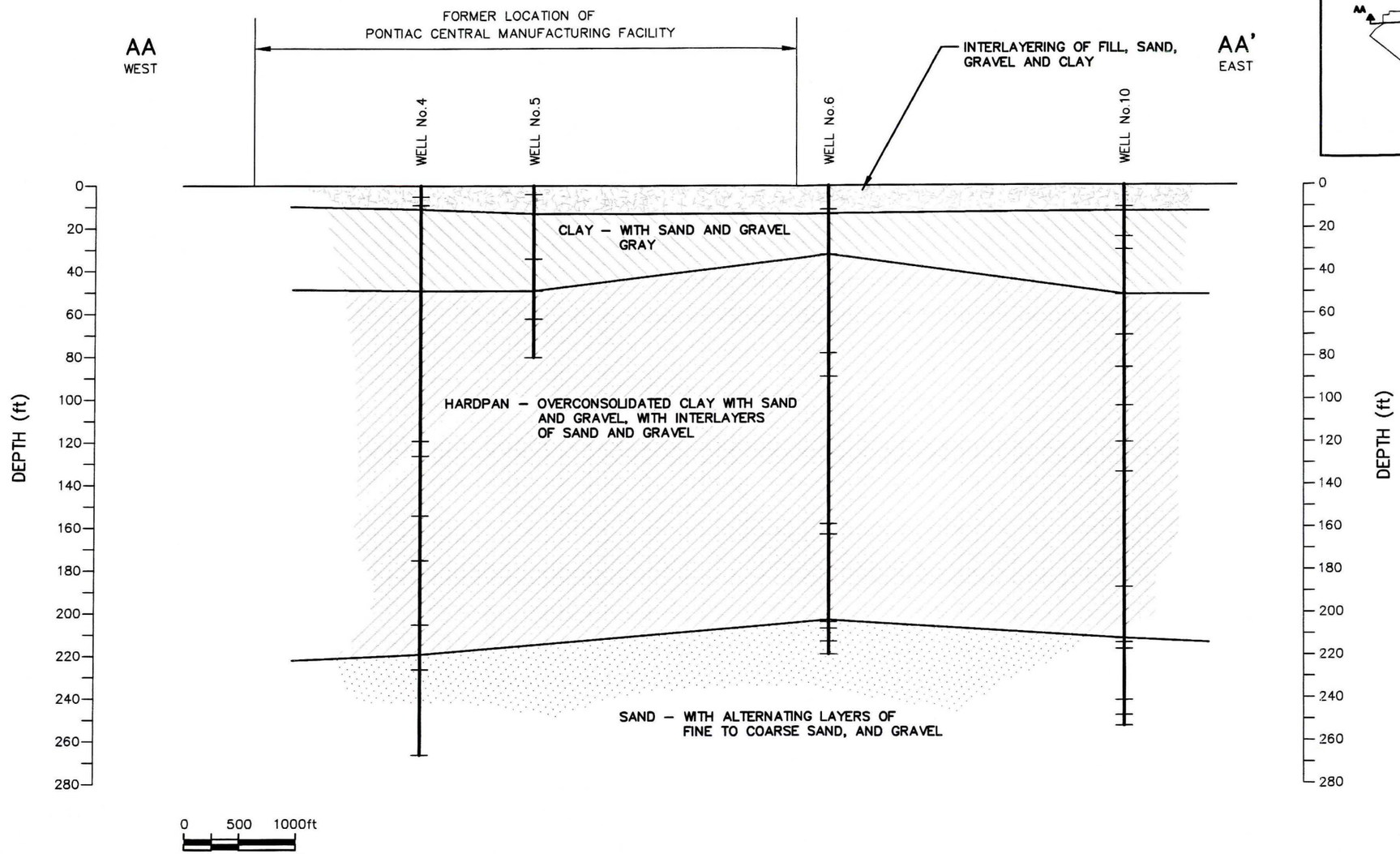
(35) OFF-FACILITY WELL LOCATION

figure 2.5

OFF-FACILITY WELL LOCATION PLAN
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(012)GN-WA013 NOV 30/2000



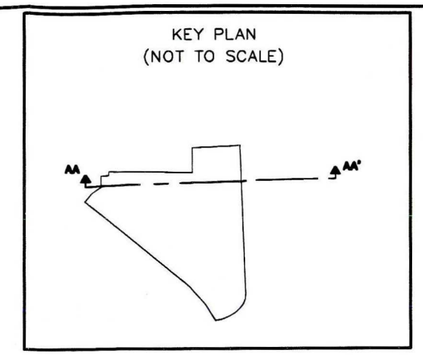




figure 2.6

REGIONAL CROSS–SECTION AA – AA'
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097–00(012)GN–DE004 NOV 30/2000

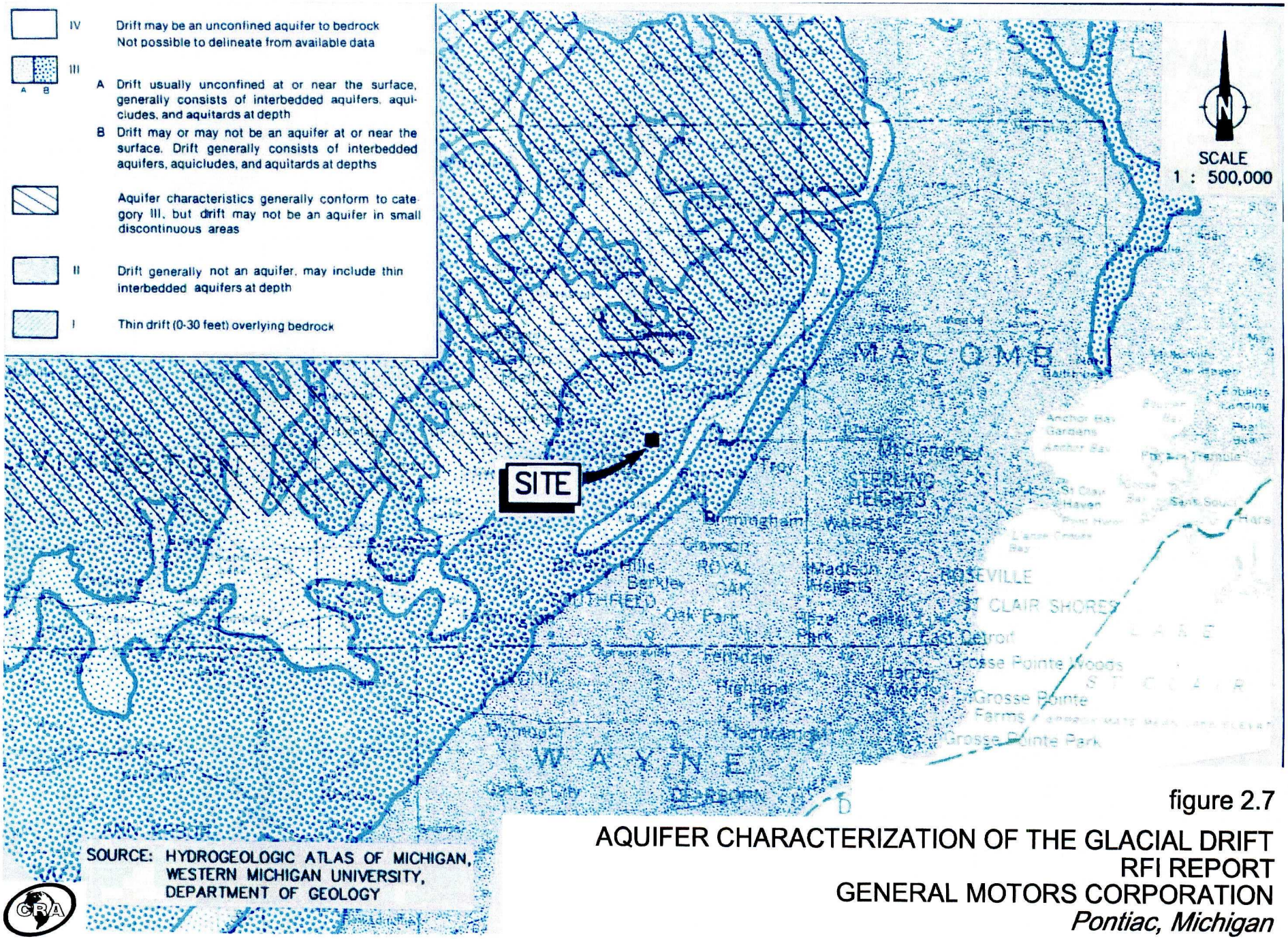
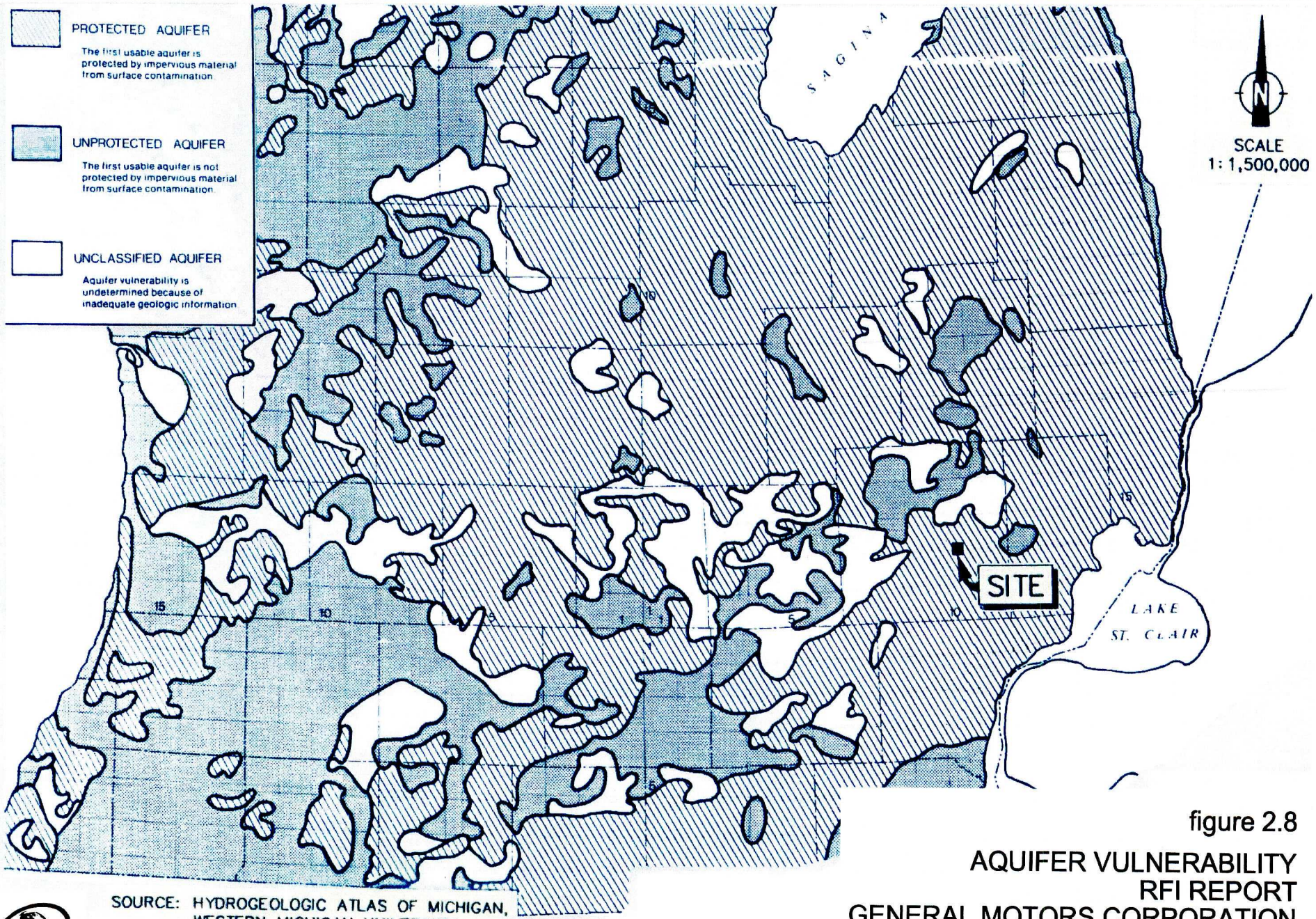



figure 2.7

AQUIFER CHARACTERIZATION OF THE GLACIAL DRIFT
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA010 NOV 30/2000

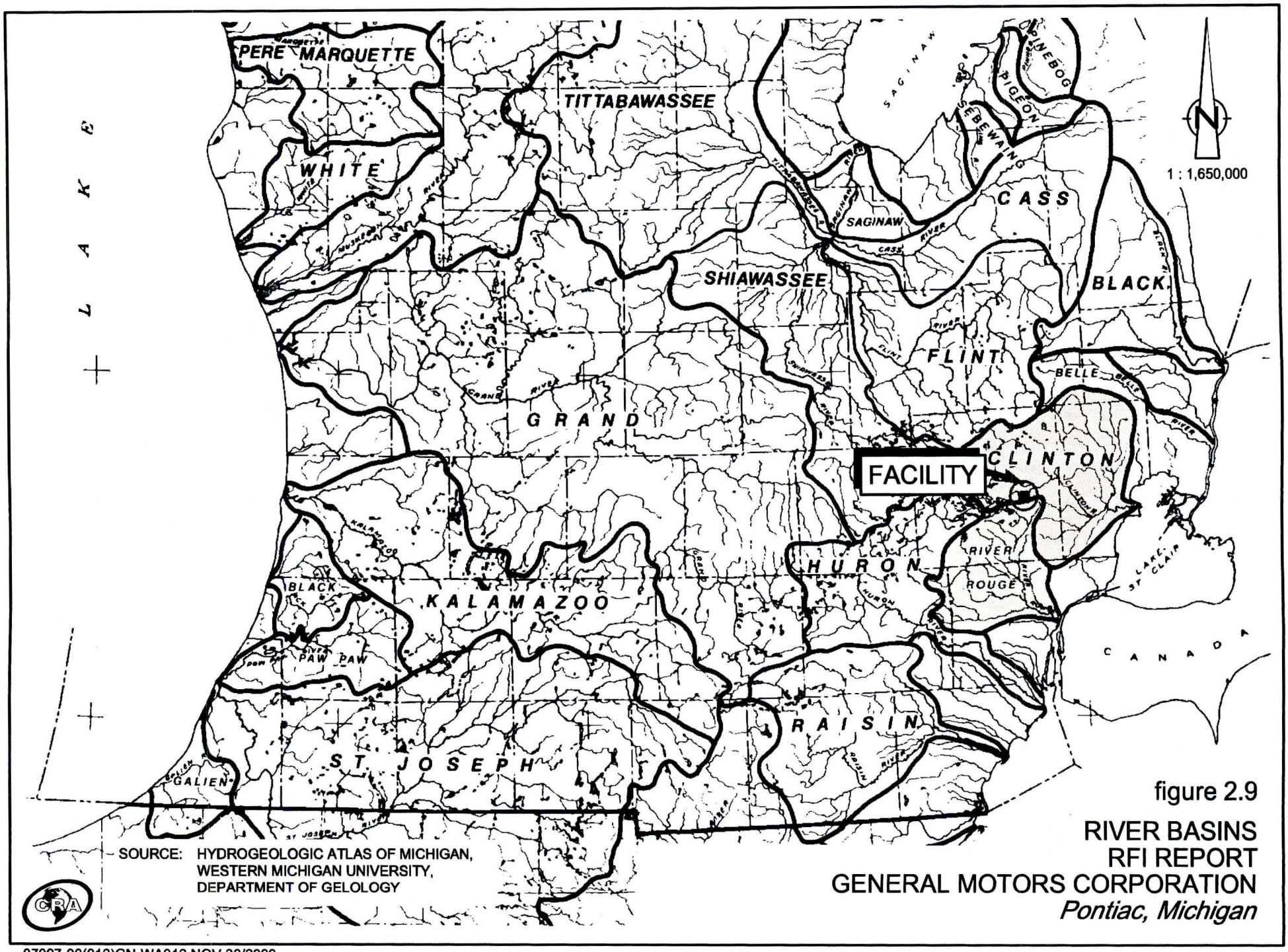



SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN, WESTERN MICHIGAN UNIVERSITY, DEPARTMENT OF GEOLOGY

figure 2.8

AQUIFER VULNERABILITY
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA011 NOV 30/2000

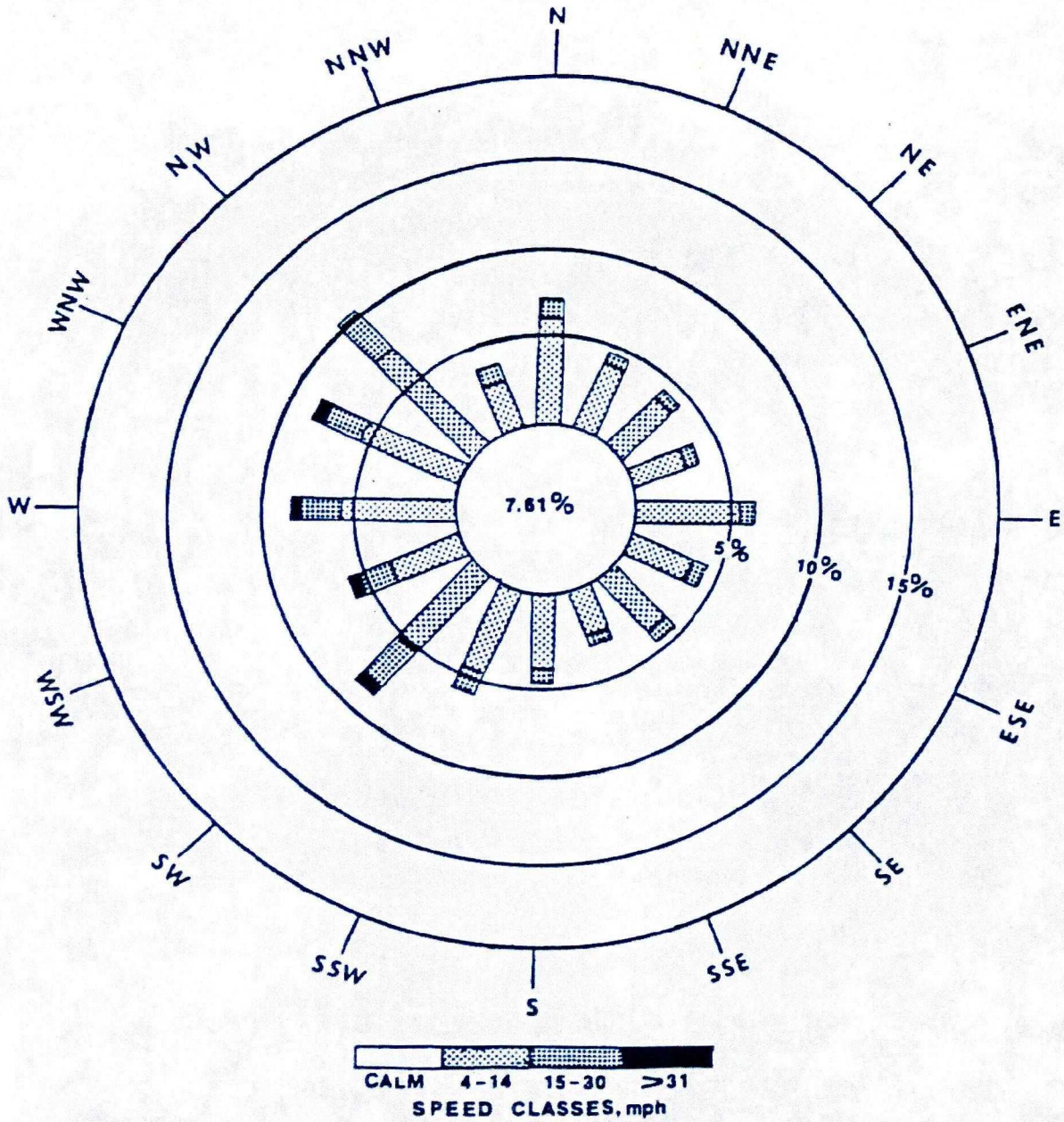



SOURCE: HYDROGEOLOGIC ATLAS OF MICHIGAN, WESTERN MICHIGAN UNIVERSITY, DEPARTMENT OF GELOLOGY

figure 2.9

RIVER BASINS
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-WA012 NOV 30/2000




WIND ROSE FOR DETROIT METRO AIRPORT(5yr)

figure 2.10

WIND ROSE DIAGRAM
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

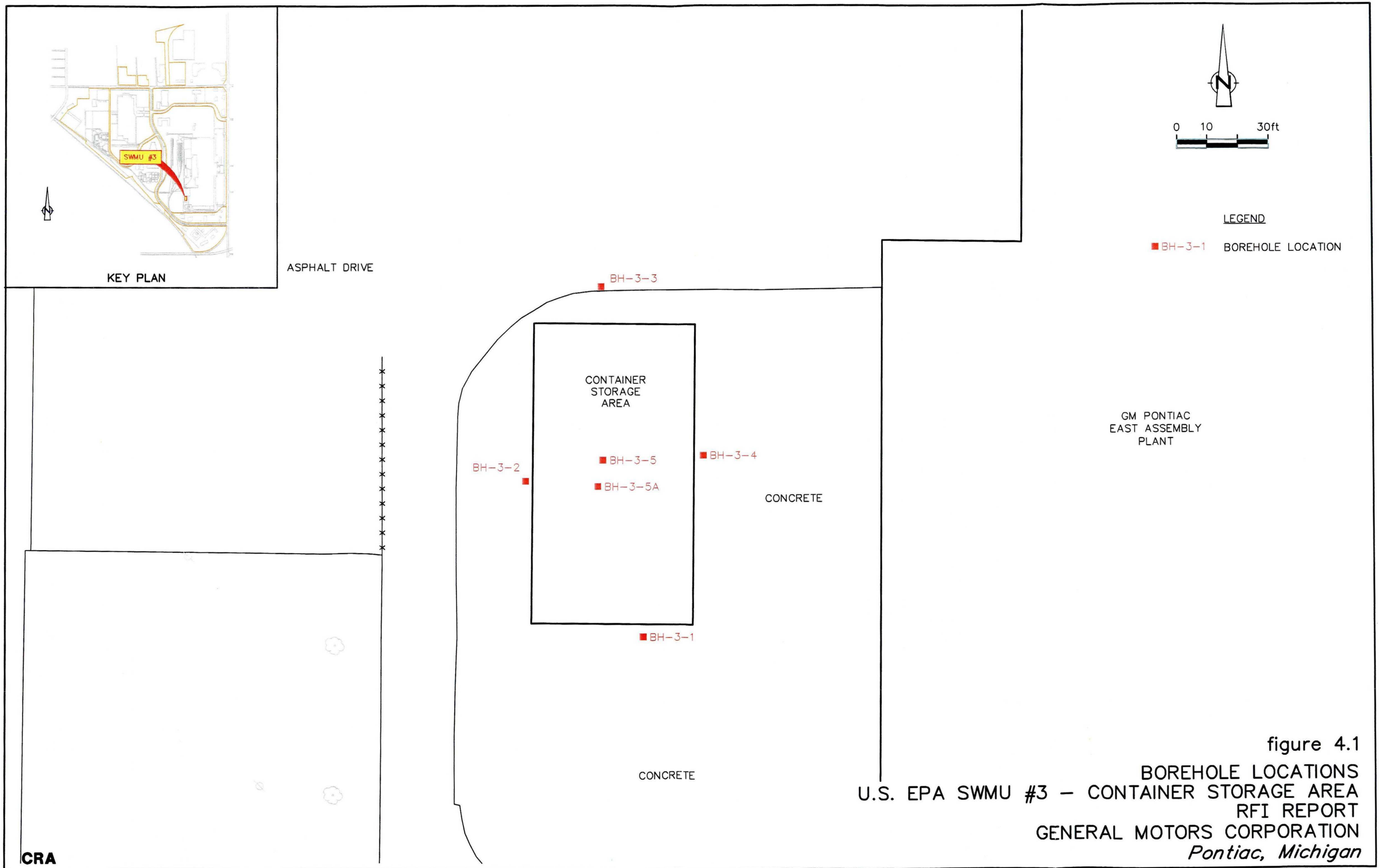



figure 4.1
BOREHOLE LOCATIONS
U.S. EPA SWMU #3 – CONTAINER STORAGE AREA
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-DE005 NOV 30/2000

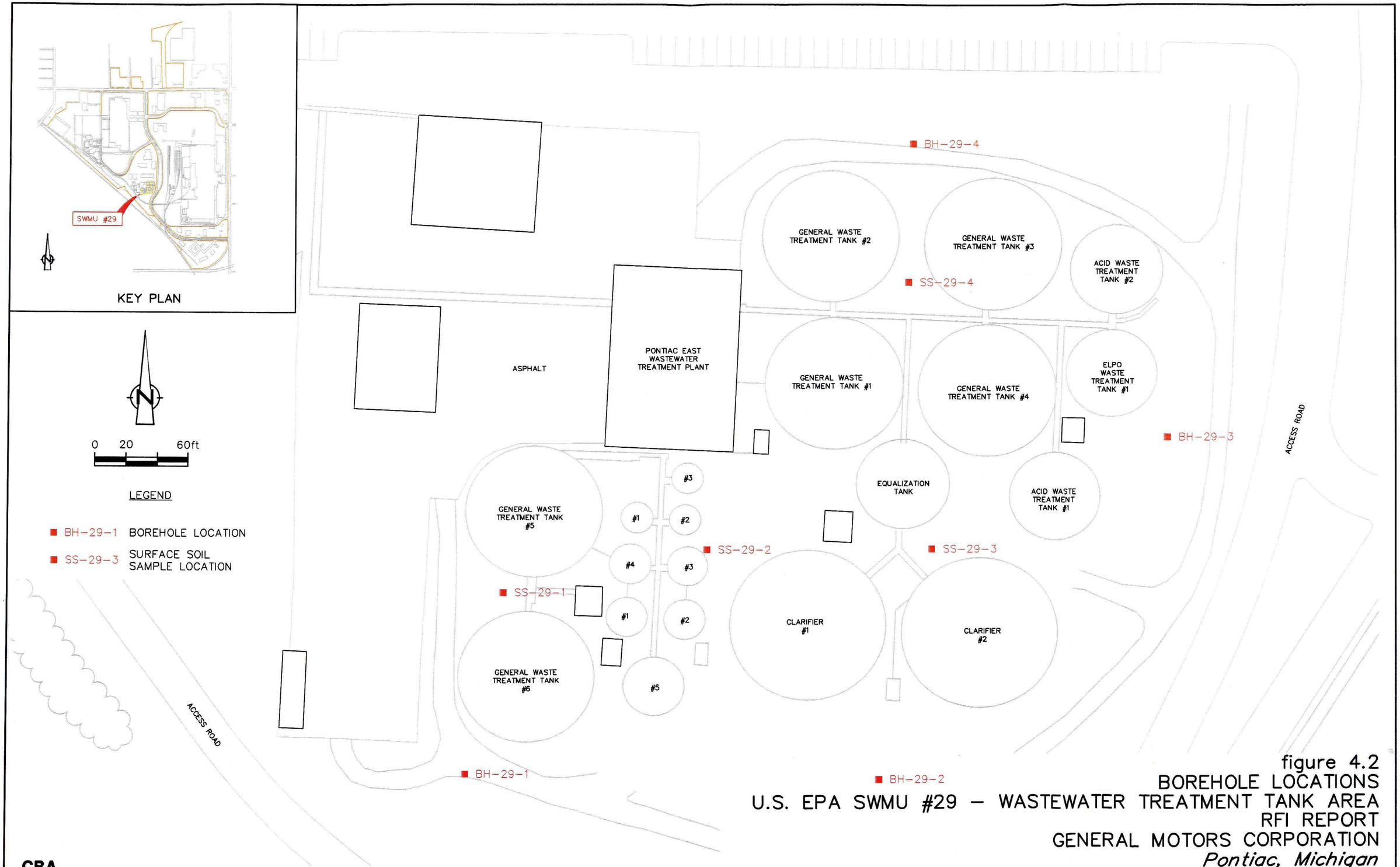



figure 4.2
BOREHOLE LOCATIONS
U.S. EPA SWMU #29 – WASTEWATER TREATMENT TANK AREA
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(012)GN-DE006 NOV 30/2000

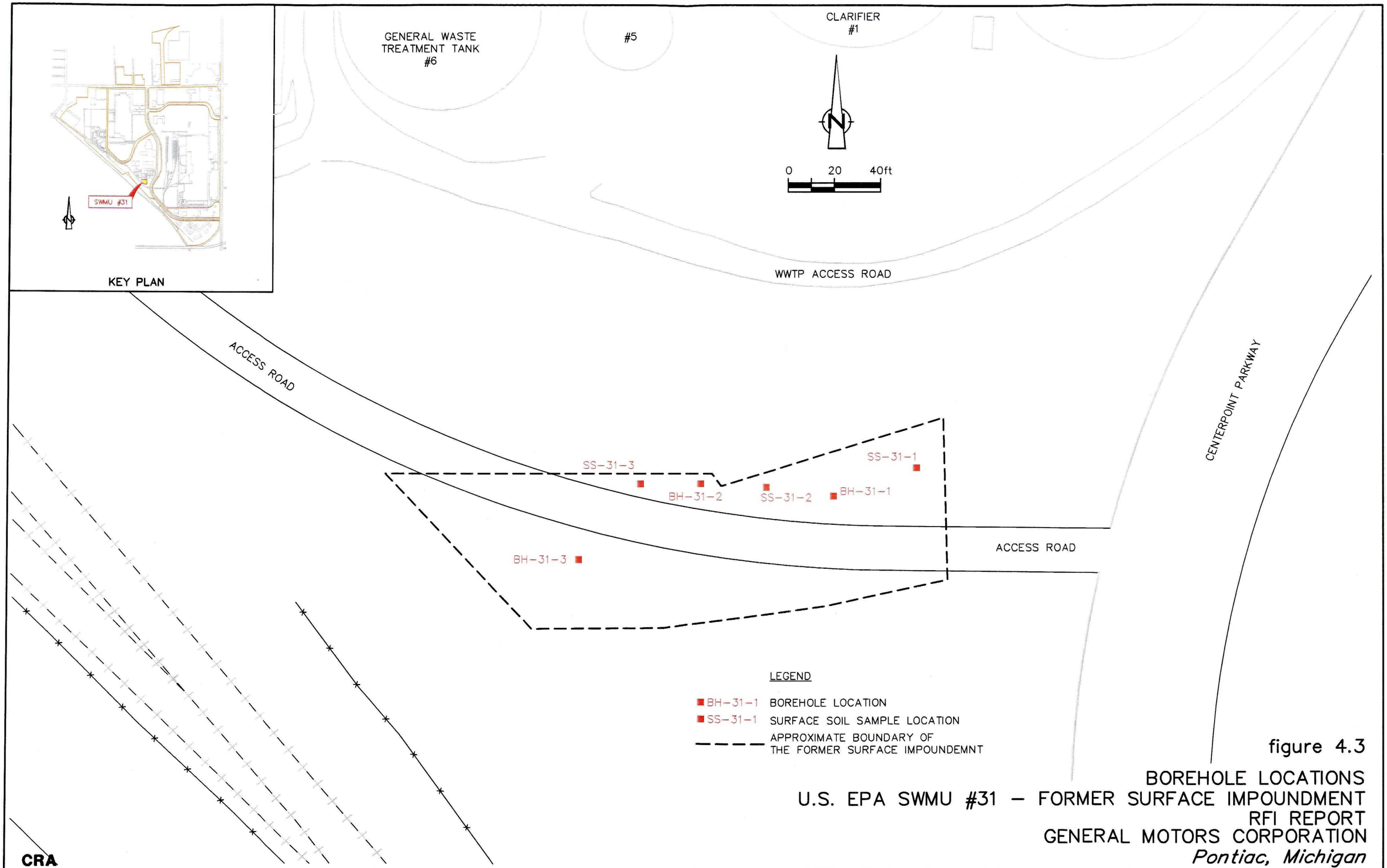



figure 4.3

BOREHOLE LOCATIONS
U.S. EPA SWMU #31 – FORMER SURFACE IMPOUNDMENT
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-DE001 NOV 30/2000

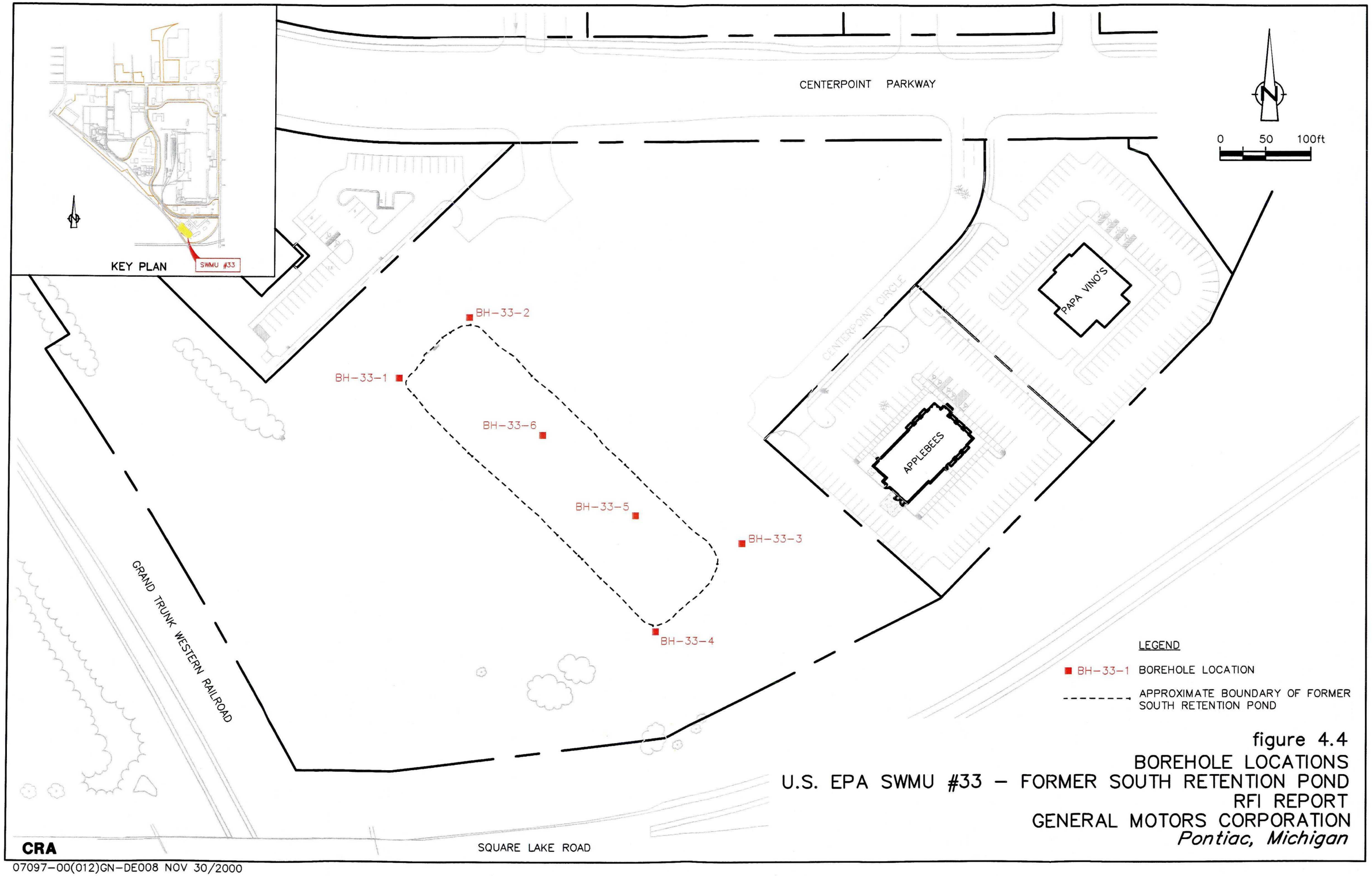
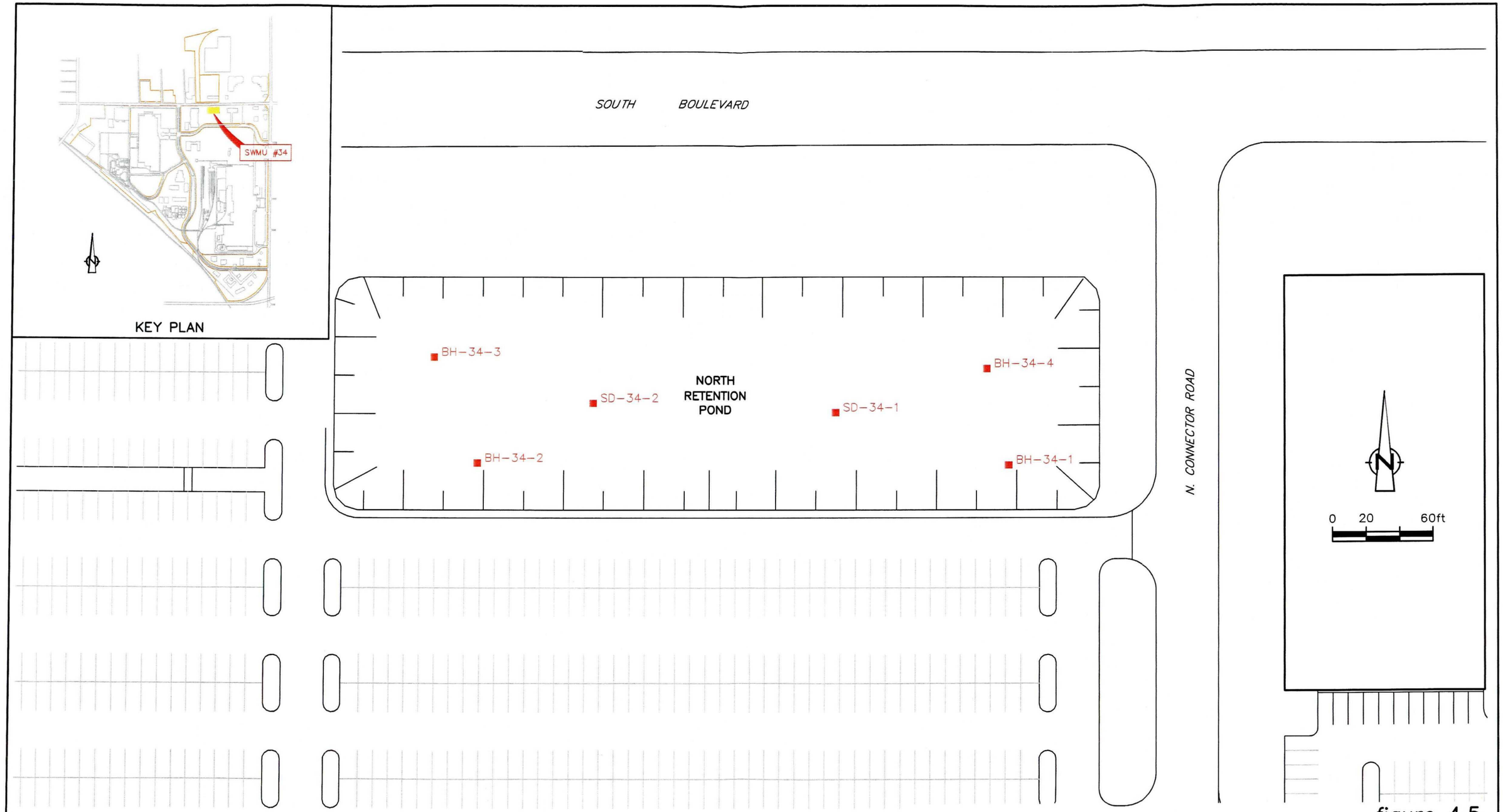



figure 4.4
BOREHOLE LOCATIONS
U.S. EPA SWMU #33 – FORMER SOUTH RETENTION POND
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(012)GN-DE008 NOV 30/2000




LEGEND

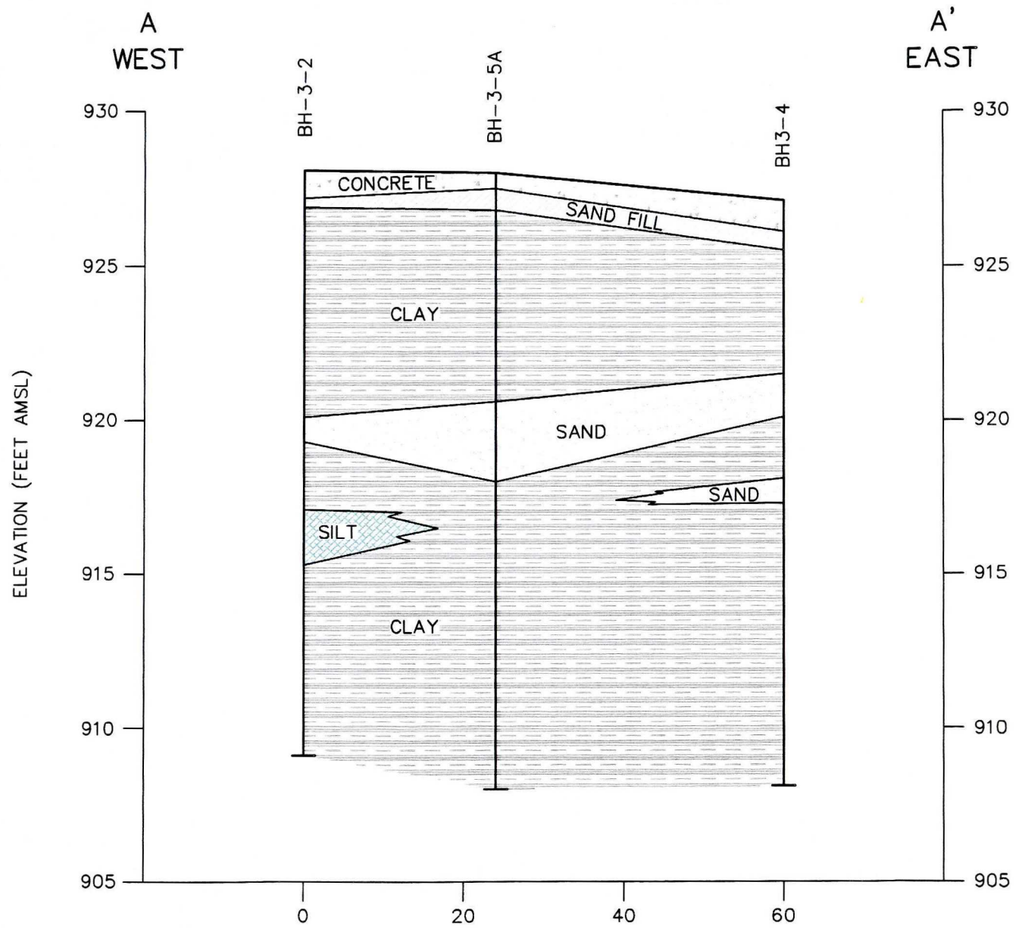
BH-34-4 BOREHOLE LOCATION

SD-34-1 SEDIMENT SAMPLE LOCATION

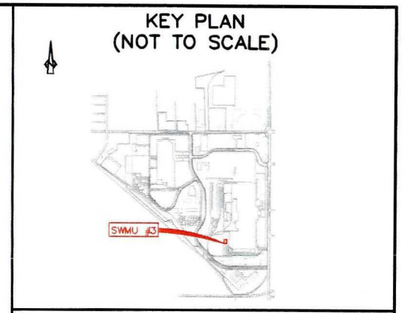
figure 4.5
BOREHOLE LOCATIONS
U.S. EPA SWMU #34-NORTH RETENTION POND
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

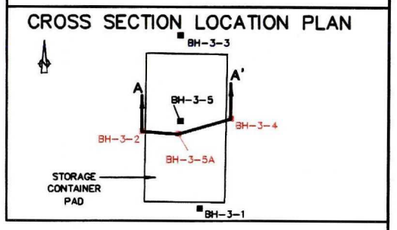
**CRA**

07097-00(012)GN-DE007 NOV 30/2000




HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'




**LEGEND**

- CONCRETE
- SAND FILL
- CLAY
- SAND
- SILT

BH-3-5A — BOREHOLE IDENTIFIER

BOREHOLE LOCATION

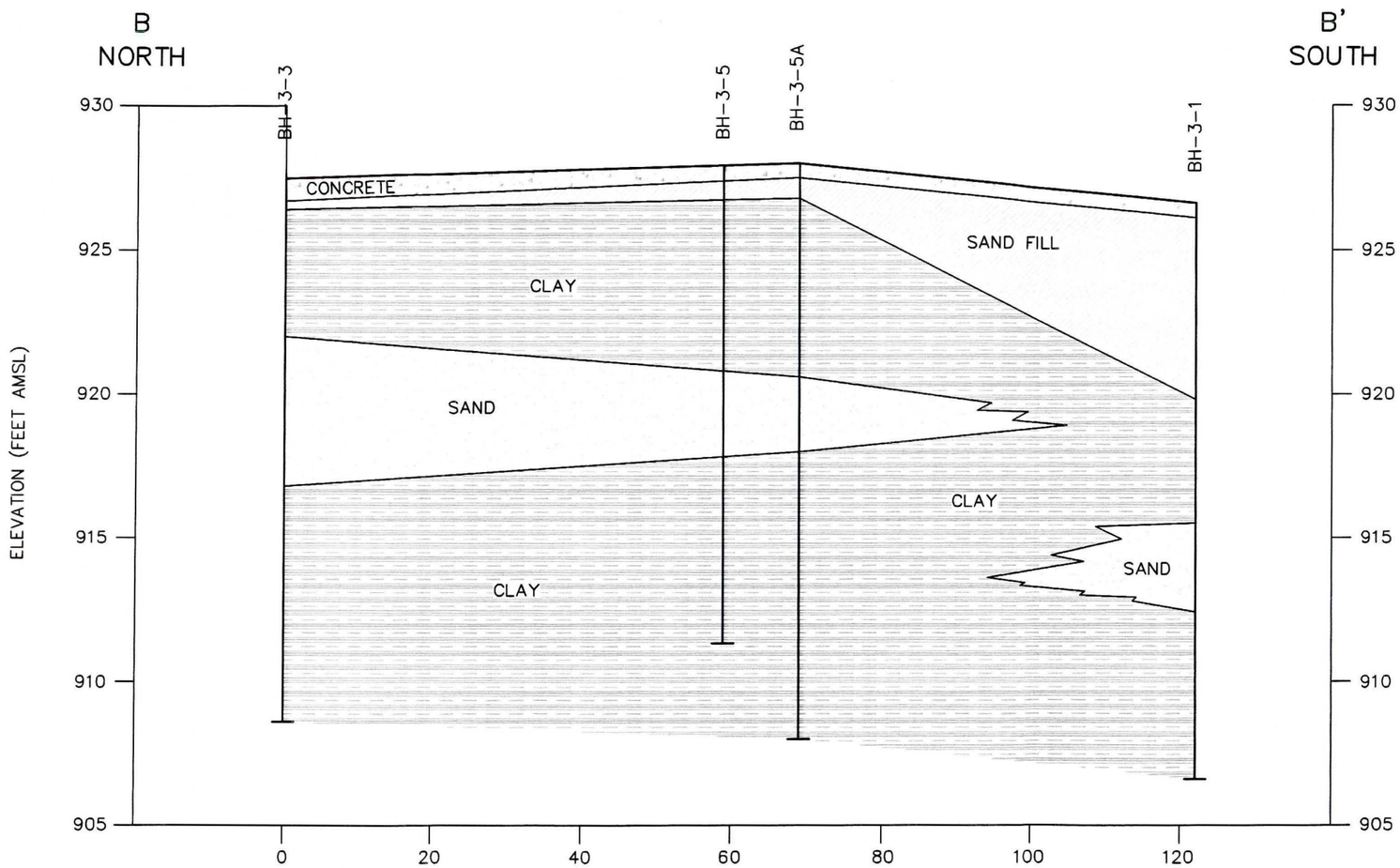
END OF BOREHOLE

figure 5.1

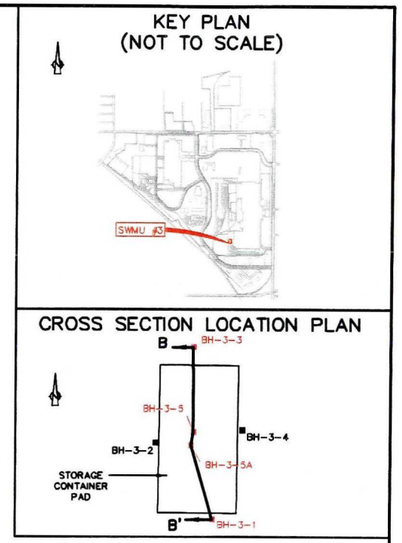
EAST–WEST GEOLOGIC CROSS SECTION A–A'
SWMU #3–CONTAINER STORAGE AREA
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(012)GN-DE009 NOV 30/2000




HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=5'



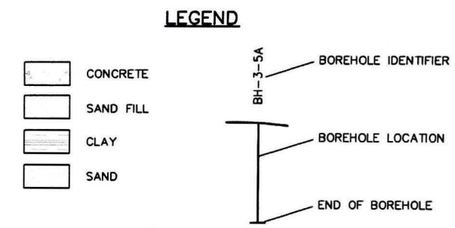
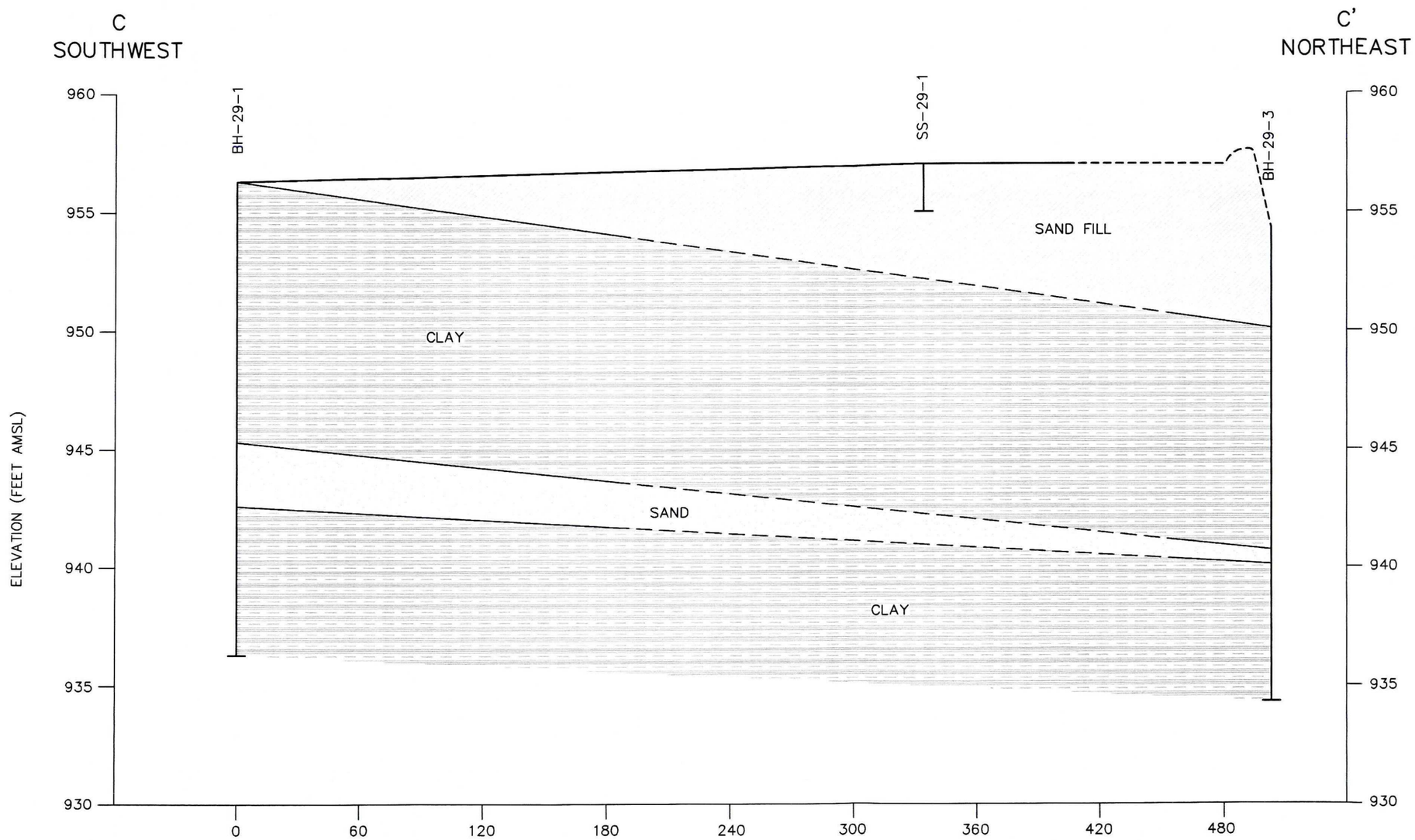
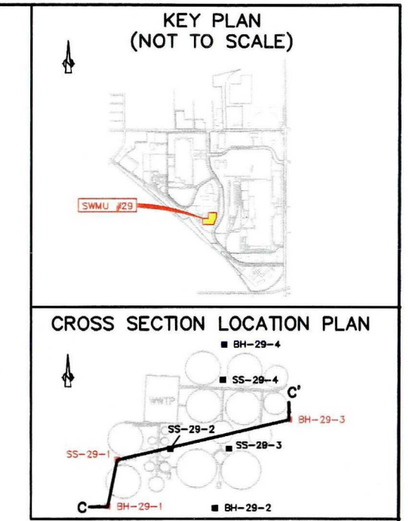




figure 5.2
NORTH-SOUTH GEOLOGIC CROSS SECTION B-B'
SWMU #3-CONTAINER STORAGE AREA
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(012)GN-DE010 NOV 30/2000




**LEGEND**

- SAND FILL
- CLAY
- SAND

BH-29-1 — BOREHOLE IDENTIFIER

BOREHOLE LOCATION

END OF BOREHOLE

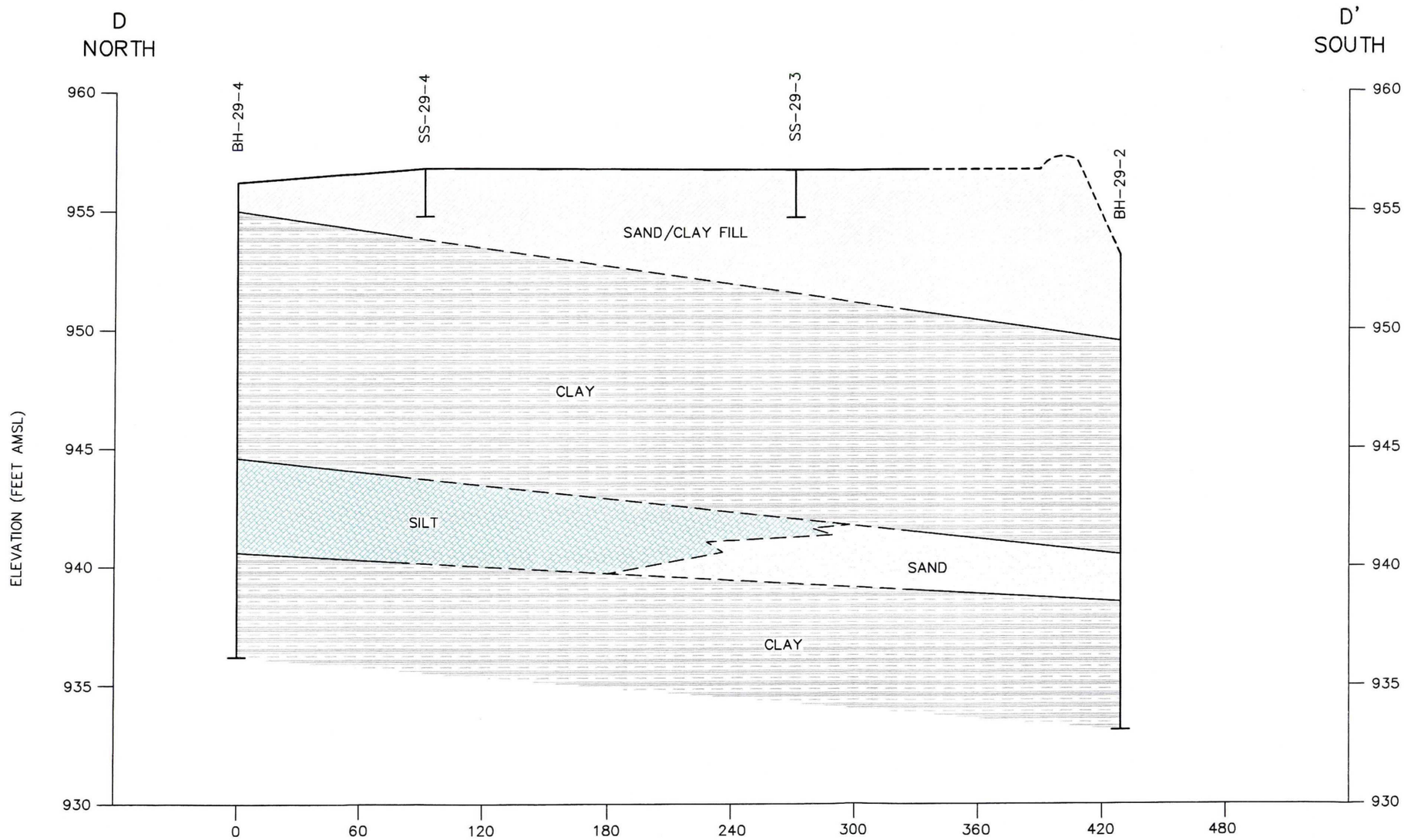
HORIZONTAL SCALE: 1"=60'
VERTICAL SCALE: 1"=5'

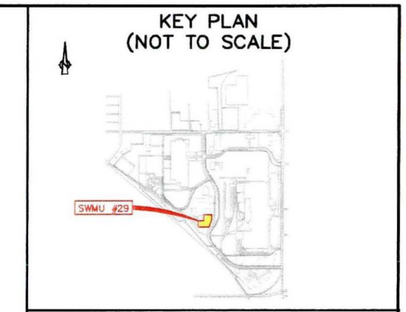
figure 5.3

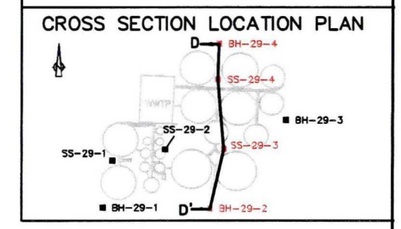
SOUTHWEST–NORTHEAST GEOLOGIC CROSS SECTION C–C'
SWMU #29–WASTEWATER TREATMENT TANK AREA
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(012)GN-DE011 NOV 30/2000




**LEGEND**

- SAND/CLAY FILL
- CLAY
- SAND
- SILT

BH-29-2 — BOREHOLE IDENTIFIER

BOREHOLE LOCATION

END OF BOREHOLE

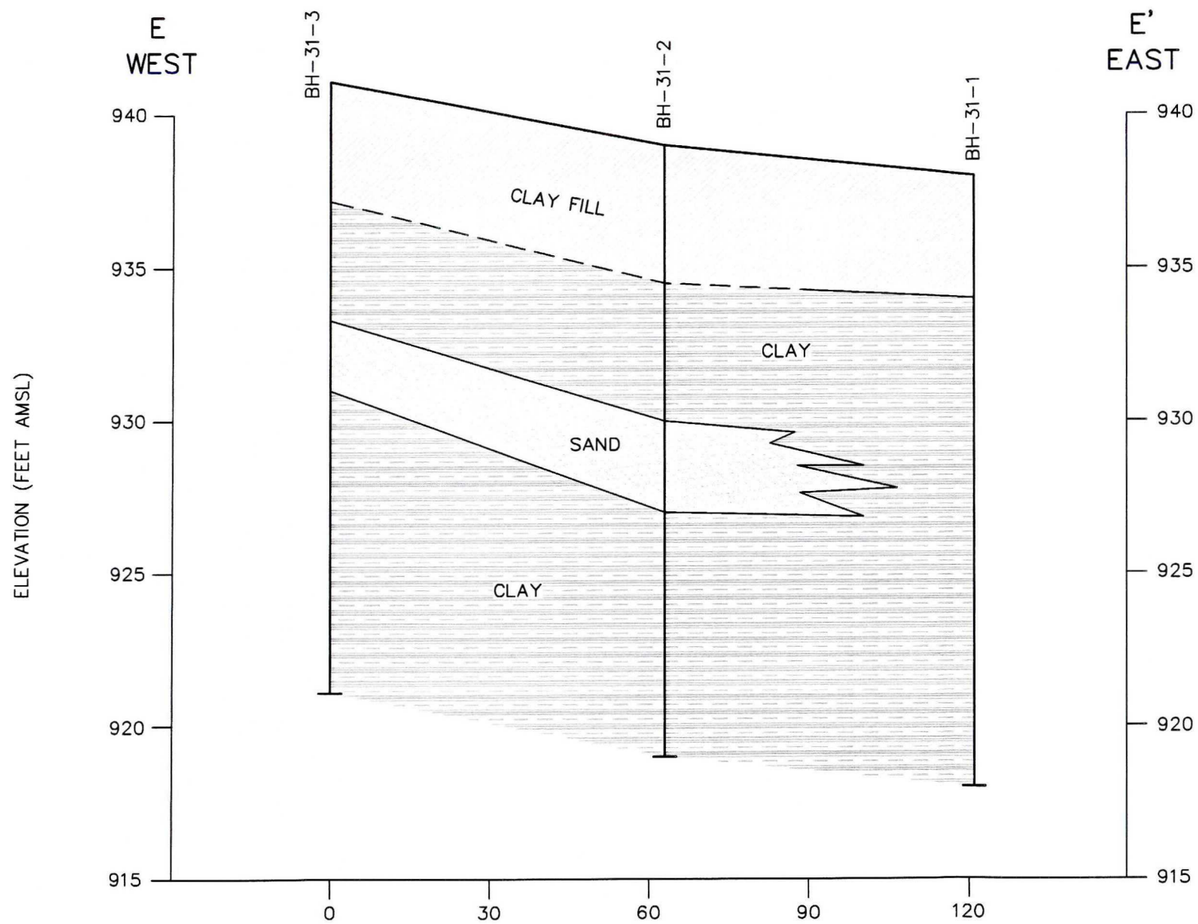
HORIZONTAL SCALE: 1"=60'
VERTICAL SCALE: 1"=5'

figure 5.4

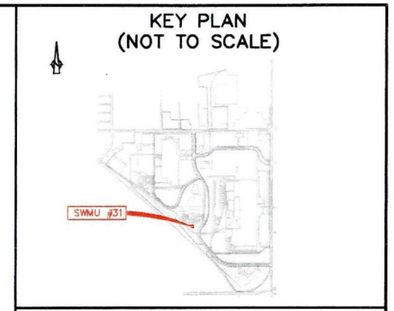
NORTH–SOUTH GEOLOGIC CROSS SECTION D–D'
SWMU #29–WASTEWATER TREATMENT TANK AREA
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

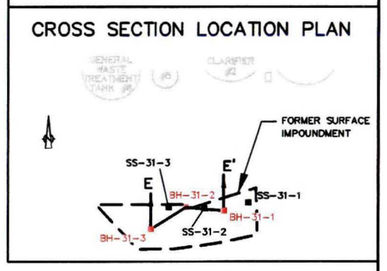
**CRA**

07097-00(012)GN-DE012 NOV 30/2000




HORIZONTAL SCALE: 1"=30'
VERTICAL SCALE: 1"=5'



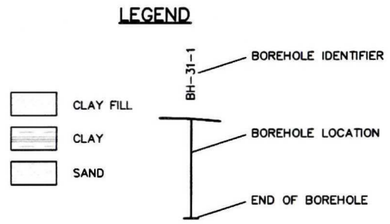
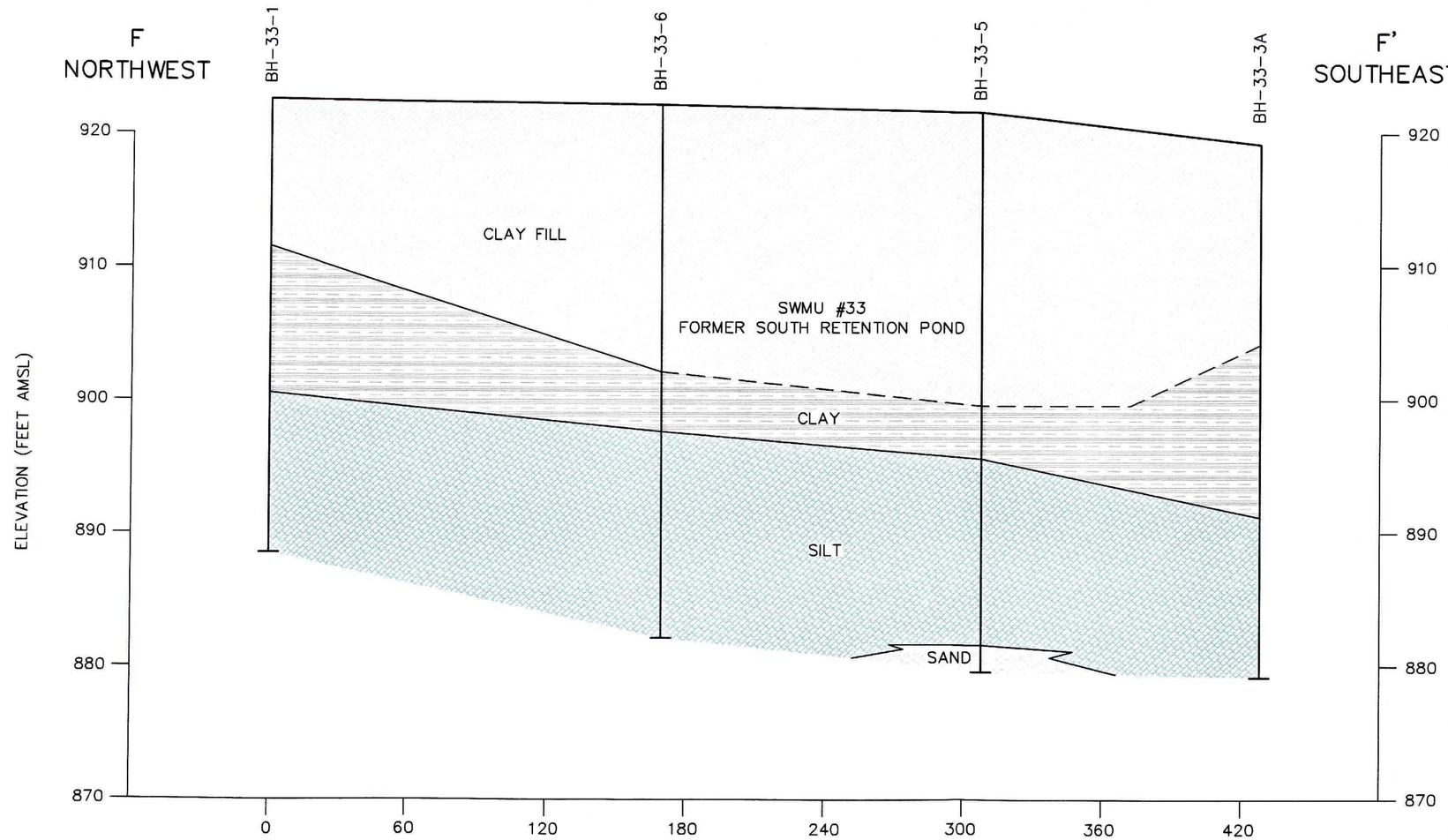
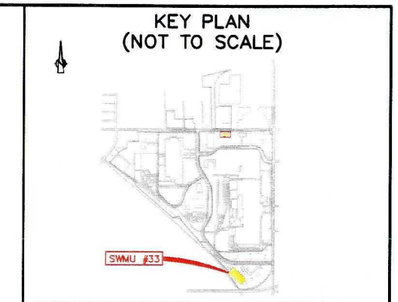



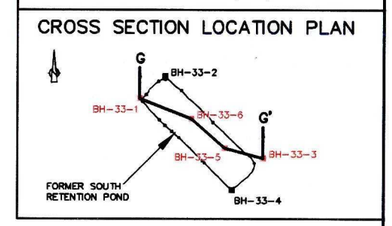

figure 5.5
EAST-WEST GEOLOGIC CROSS SECTION E-E'
SWMU #31-FORMER SURFACE IMPOUNDMENT
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(012)GN-DE013 NOV 30/2000




**LEGEND**

- CLAY FILL
- CLAY
- SILT
- SAND

BH-33-1 — BOREHOLE IDENTIFIER
BOREHOLE LOCATION
END OF BOREHOLE

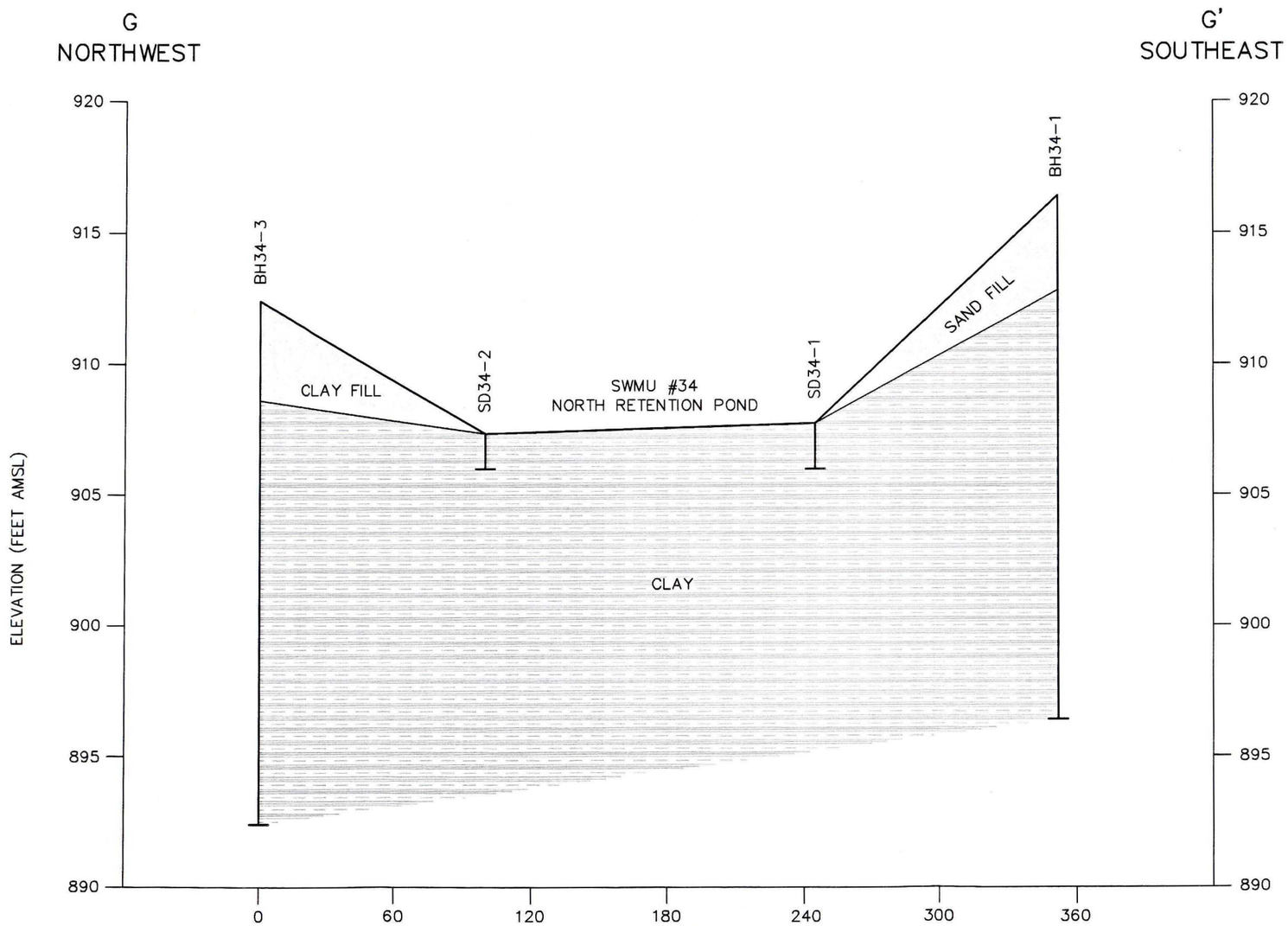
HORIZONTAL SCALE: 1"=60'
VERTICAL SCALE: 1"=5'

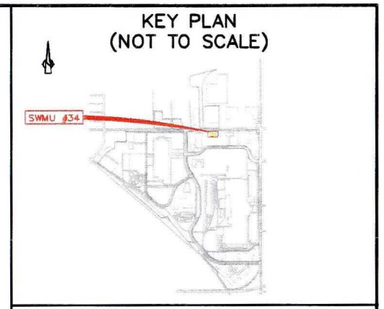
figure 5.6

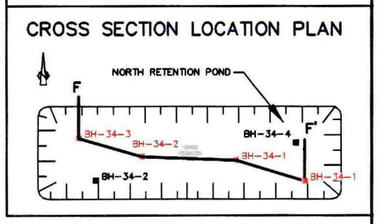
NORTHWEST–SOUTHEAST GEOLOGIC CROSS SECTION F–F'
SWMU #33–FORMER SOUTH RETENTION POND
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

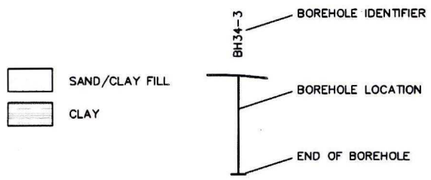
07097-00(012)GN-DE015 NOV 30/2000




**LEGEND**




HORIZONTAL SCALE: 1"=60'
VERTICAL SCALE: 1"=5'

figure 5.7
NORTHWEST–SOUTHEAST GEOLOGIC CROSS SECTION G–G'
SWMU #34–NORTH RETENTION POND
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

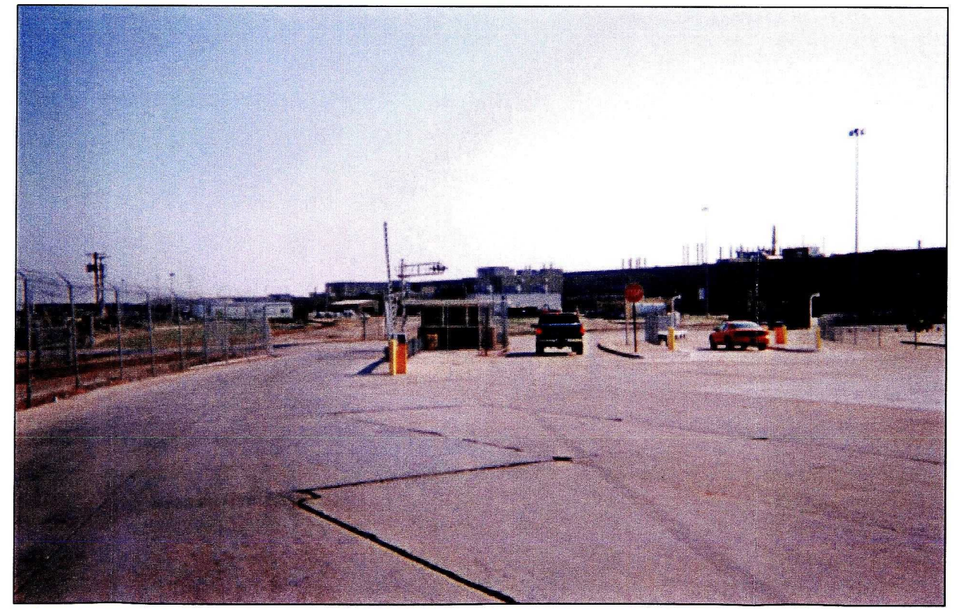
**CRA**

07097–00(012)GN–DE014 NOV 30/2000

LOOKING EAST AT GUARD HOUSE RESTRICTING ACCESS THROUGH SWMU #31

LOOKING NORTH AT SWMU #31 NORTH OF GUARD HOUSE
(ROAD RUNS UNDERNEATH CENTERPOINTE PARKWAY THROUGH SWMU #31)

LOOKING NORTHEAST AT ROAD THROUGH SWMU #31 FROM TOP OF HILL (WWTP IN BACKGROUND)



STANDING NEAR WWTP LOOKING SOUTHWEST TOWARD SWMU #31 AND TUNNEL UNDER
CENTERPOINTE PARKWAY (GUARD HOUSE BEYOND TUNNEL NOT SHOWN)

figure 6.1

SITE PHOTOGRAPHS
RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(012)GN-DE018 NOV 30/2000

TABLE 4.1

INVESTIGATION SUMMARY
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *SWMU # (1)* | *Description* | *Number of Boreholes* | *Number of Sediment Samples* | *Number of Surface Soil Samples* | *Number of Subsurface Soil Samples* | *Number of Perched Groundwater Samples* | *Number of QC Samples (Duplicate MS/MSD or Rinsate) (2)* | *Total Number of Investigative Samples* | *Analytical Parameters (4)* |
|---|---|---|---|---|---|---|---|---|---|
| #3 | Container Storage Area | 6 (5) | 0 | 5 | 5 | 1 | 1 (6) | 10 | TCL/TAL (3), Appendix IX (7) |
| #29 | Wastewater Treatment Tank Area | 8 | 0 | 3 | 4 | 0 | 3 | 10 | TCL/TAL (3), Appendix IX |
| #31 | Former Surface Impoundment | 6 | 0 | 4 | 2 | 1 | 2 | 8 | TAL Inorganics, Appendix IX (7) |
| #33 | Former South Retention Pond (AOC) | 7 (5) | 0 | 4 | 6 | 0 | 3 | 13 | TCL/TAL (3), Appendix IX |
| #34 | North Retention Pond (AOC) | 4 | 2 | 0 | 4 | 0 | 2 | 8 | TCL/TAL (3), Appendix IX |
| TOTAL | | 31 | 2 | 16 | 21 | 2 | 11 | 49 | |

Notes:

(1) - See "Removal Action Design Report", March 1997, for a summary of SWMU #30 investigation activity (Appendix I). Consistent with the April 29, 1998 meeting between the U.. EPA and GM, the Coal Pile Storage Area (SWMU #32) will be addressed as an IM under separate cover.
(2) - QA/QC samples (see QAPP, Appendix C, for frequency).
(3) - TCL/TAL - Target Compound List/Target Analyte List (with the exception of pesticides/herbicides).
(4) - RCRA Appendix IX samples (excluding pesticides, herbicides, dioxin, and furans) will be collected at a frequency of 1 per 10 investigative samples (or a minimum of one at each SWMU).
(5) - Includes additional boring installed after one of the original borings was terminated after auger refusal conditions were encountered.
(6) - Duplicate sample collected for perched groundwater.
(7) - Perched groundwater samples were not analyzed for RCRA Appendix IX parameters.

TABLE 4.2

SAMPLE KEY
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Sample Identification* | *Sample Location* | *Sample Interval (ft. bgs)* | *QA/QC* | *Analysis* |
|---|---|---|---|---|
| *A. Phase I: Soil Investigation* | | | | |
| S-7097-120198-TJ-019 | BH-29-4 | 4 - 6 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120198-TJ-020 | BH-29-3 | 4 - 6 | MS/MSD | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120198-TJ-021 | BH-29-2 | 4 - 6 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120198-TJ-022 | BH-29-1 | 10 - 12 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| W-7097-120198-TJ-023 | Split Spoon Sampler | | Field Rinsate | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120298-TJ-024 | SS-29-4 | 10" - 2 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120298-TJ-025 | SS-29-4 | 10" - 2 | Duplicate | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120298-TJ-026 | SS-29-3 | 10" - 2 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120298-TJ-027 | SS-29-2 | 10" - 2 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120298-TJ-028 | SS-29-1 | 10" - 2 | | Appendix IX |
| SS-7097-120298-TJ-029 | BH-3-3 | 1 - 3 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120298-TJ-030 | BH-3-3 | 5 - 7 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120298-TJ-031 | BH-3-2 | 1 - 3 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120298-TJ-032 | BH-3-2 | 7 - 9 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120298-TJ-033 | BH-3-1 | 6" - 2 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120298-TJ-034 | BH-3-1 | 6 - 8 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SS-7097-120398-TJ-035 | BH-3-4 | 1 - 3 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120398-TJ-036 | BH-3-4 | 3 - 5 | | Appendix IX |
| SS-7097-120798-TJ-044 | BH-3-5 | 8" - 2' | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120798-TJ-045 | BH-3-5 | 4 - 6' | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| W-7097-120398-TJ-037 | Split Spoon Sampler | | Field Rinsate | Appendix IX |
| S-7097-120398-TJ-038 | BH-34-3 | 2 - 4 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120498-TJ-039 | BH-34-2 | 2 - 4 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SD-7097-120498-TJ-040 | SD-34-1 | 0 - 1 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| SD-7097-120498-TJ-041 | SD-34-2 | 0 - 1 | | Appendix IX |
| S-7097-120498-TJ-042 | BH-34-1 | 2 - 4 | Duplicate | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120498-TJ-043 | BH-34-1 | 2 - 4 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120898-TJ-046 | BH-34-4 | 2 - 4 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120998-DS-047 | BH-33-5 | 28 - 30 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-120998-DS-048 | BH-33-3 | 15 - 16 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| W-7097-121098-DS-049 | BH-33-3 | Split Spoon Sampler | Field Rinsate | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121098-DS-052 | BH-33-3 | 26 - 28 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121198-DS-057 | BH-33-6 | 22 - 24 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121698-DS-058 | BH-33-4 | 16 - 18 | | Appendix IX |

TABLE 4.2

SAMPLE KEY
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Sample Identification* | *Sample Location* | *Sample Interval (ft. bgs)* | *QA/QC* | *Analysis* |
|---|---|---|---|---|
| S-7097-121698-DS-059 | BH-33-4 | 20 - 22 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121698-DS-060 | BH-33-4 | 20 - 22 | Duplicate | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121798-DS-063 | BH-33-2 | 16 - 18 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121798-DS-064 | BH-33-2 | 34 - 36 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121898-DS-065 | BH-33-1 | 14-16 | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| S-7097-121898-DS-066 | BH-33-1 | 18-20 | | Appendix IX |
| S-7097-121898-DS-067 | BH-33-1 | 18-20 | Duplicate | Appendix IX |
| S-7097-121098-DS-050 | BH-31-1 | 8 - 10 | | TAL Inorganics |
| S-7097-121098-DS-051 | BH-31-1 | 8 - 10 | Duplicate | TAL Inorganics |
| S-7097-121198-DS-053 | BH-31-3 | 4 - 6 | | TAL Inorganics |
| S-7097-121198-DS-054[1] | SS-31-1 | 0 - 2 | | TAL Inorganics |
| S-7097-121198-DS-055[1] | SS-31-2 | 0 - 2 | | TCL VOC/TAL Inorganics |
| S-7097-121198-DS-056[1] | SS-31-3 | 0 - 2 | | TAL Inorganics |
| S-7097-121798-DS-061 | BH-31-2 | 1 - 1.5 | | Appendix IX |
| W-7097-121798-DS-062 | BH-31-2 | Split Spoon Sampler | Field Rinsate | TCL VOC/TAL Inorganics |
| ***B Phase II: Perched Groundwater Investigation*** | | | | |
| GW-7097-081700-TJ-001 | MW3-1 | groundwater | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| GW-7097-081700-TJ-002 | MW3-1 | groundwater | Duplicate | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |
| GW-7097-081700-TJ-003 | MW31-1 | groundwater | | TCL VOCs/TCL SVOCs/TCL PCBs/TAL Inorganics |

*Note:*
1 - Labelled as "S" during field activities

**TABLE 5.1**

**SWMU #3**
**CONTAINER STORAGE AREA**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *BH-3-1* | *BH-3-1* | *BH-3-2* |
|---|---|---|---|---|
| *Sample Interval:* | | *0.5-2 ft.* | *6-8 ft.* | *1-3 ft.* |
| *Sample ID:* | | *SS-7097-120298-TJ-033* | *S-7097-120298-TJ-034* | *SS-7097-120298-TJ-031* |
| *Sample Date:* | | *12/2/98* | *12/2/98* | *12/2/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| ACENAPHTHENE | 200,000 | 0.08 J | ND(0.3) | 0.09 J |
| ANTHRACENE | 1,000,000 | 0.2 J | ND(0.3) | 0.3 J |
| BENZ0(A)ANTHRACENE | 100 | 0.4 | 0.1 J | 0.5 |
| BENZO(A)PYRENE | 10 | 0.4 | 0.1 J | 0.5 |
| BENZO(B)FLUORANTHENE | 100 | 0.4 | 0.1 J | 0.5 |
| BENZO(G,H,I)PERYLENE | 9,100 | 0.2 J | 0.06 J | 0.3 J |
| BENZO(K)FLUORANTHENE | 1,000 | 0.4 | 0.09 J | 0.5 |
| BIS(2-ETHYLHEXYL) PHTHALATE | 10,000 | ND(0.3) | ND(0.3) | 0.1 J |
| CARBAZOLE | 3,700 | 0.09 J | ND(0.3) | 0.2 J |
| CHRYSENE | 10,000 | 0.5 | 0.1 J | 0.6 |
| DIBENZ(A,H)ANTHRACENE | 10 | 0.06 J | 0.07 J | 0.06 J |
| DIBENZOFURAN | ID | ND(0.3) | ND(0.3) | 0.1 J |
| FLUORANTHENE | 180,000 | 1.2 | 0.3 J | 1.4 |
| FLUORENE | 130,000 | 0.08 J | ND(0.3) | 0.2 J |
| INDENO(1,2,3-CD)PYRENE | 100 | 0.3 J | ND(0.3) | 0.3 |
| NAPHTHALENE | 80,000 | ND(0.3) | ND(0.3) | 0.09 J |
| PHENANTHRENE | 8,000 | 0.9 | 0.2 J | 1.2 |
| PHENOL | 12,000 | 0.3 J | 0.1 J | ND(0.3) |
| PYRENE | 110,000 | 1.1 | 0.3 J | 1.2 |
| TCL - Polychlorinated Biphenyls (PCBs) (mg/kg) | | | | |
| AROCLOR 1254 | 9.9 (3) | ND(0.33) | ND(0.33) | 0.05 J |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 5,160 | 5,600 | 6,660 |
| ANTIMONY, TOTAL | 1,200 | 0.03 J | 0.03 J | 0.08 J |
| ARSENIC, TOTAL | 61 | 5.3 | 3.5 | 6.4 |
| BARIUM, TOTAL | 250,000 | 27 | 32 | 59 |
| BERYLLIUM, TOTAL | 3,100 | 0.28 | 0.22 | 0.45 |
| CADMIUM, TOTAL | 4,100 | 0.22 | 0.16 | 0.33 |
| CALCIUM, TOTAL | NR | 69,500 | 78,500 | 153,000 |
| CHROMIUM, TOTAL | 17,000 (2) | 8.2 | 9.0 | 36 |
| COBALT, TOTAL | 18,000 | 4.54 | 3.77 | 3.23 |
| COPPER, TOTAL | 140,000 | 9.98 | 7.5 | 9.1 |
| IRON, TOTAL | 1,000,000 | 8,570 | 11,000 | 8,140 |
| LEAD, TOTAL | 900 | 9.44 | 8.19 | 16.2 |
| MAGNESIUM, TOTAL | 1,000,000 | 10,300 | 24,800 | 17,800 |
| MANGANESE, TOTAL | 170,000 | 286 | 380 | 397 |
| MERCURY, TOTAL | 1,100 | 0.02 J | 0.03 J | 0.04 J |
| NICKEL, TOTAL | 270,000 | 11.6 | 9.6 | 11.2 |
| POTASSIUM, TOTAL | NR | ND(400) | 650 | 699 |
| SELENIUM, TOTAL | 18,000 | U(0.6) | U(0.6) | U(0.7) |
| SILVER, TOTAL | 17,000 | 0.04 | 0.05 | 0.07 |
| SODIUM, TOTAL | 1,000,000 | 192 | 234 | 450 |
| THALLIUM, TOTAL | 240 | 0.14 | 0.13 | 0.10 |
| VANADIUM, TOTAL | 10,000 | 14 | 15 | 16 |
| ZINC, TOTAL | 1,000,000 | 28 | 38 | 42 |
| General Chemistry (mg/kg) | | | | |
| CYANIDE, TOTAL | 250 | ND(0.5) | ND(0.5) | ND(0.5) |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.1**

**SWMU #3**
**CONTAINER STORAGE AREA**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *BH-3-2* | *BH-3-3* | *BH-3-3* |
|---|---|---|---|---|
| *Sample Interval:* | | *7-9 ft.* | *1-3 ft.* | *5-7 ft.* |
| *Sample ID:* | | *S-7097-120298-TJ-032* | *SS-7097-120298-TJ-029* | *S-7097-120298-TJ-030* |
| *Sample Date:* | | *12/2/98* | *12/2/98* | *12/2/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| ACENAPHTHENE | 200,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| ANTHRACENE | 1,000,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZ0(A)ANTHRACENE | 100 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(A)PYRENE | 10 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(B)FLUORANTHENE | 100 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(G,H,I)PERYLENE | 9,100 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(K)FLUORANTHENE | 1,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| BIS(2-ETHYLHEXYL) PHTHALATE | 10,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| CARBAZOLE | 3,700 | ND(0.3) | ND(0.3) | ND(0.3) |
| CHRYSENE | 10,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| DIBENZ(A,H)ANTHRACENE | 10 | ND(0.3) | ND(0.3) | ND(0.3) |
| DIBENZOFURAN | ID | ND(0.3) | ND(0.3) | ND(0.3) |
| FLUORANTHENE | 180,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| FLUORENE | 130,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| INDENO(1,2,3-CD)PYRENE | 100 | ND(0.3) | ND(0.3) | ND(0.3) |
| NAPHTHALENE | 80,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| PHENANTHRENE | 8,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| PHENOL | 12,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| PYRENE | 110,000 | ND(0.3) | 0.07 J | ND(0.3) |
| TCL - Polychlorinated Biphenyls (PCBs) (mg/kg) | | | | |
| AROCLOR 1254 | 9.9 (3) | ND(0.33) | ND(0.33) | ND(0.33) |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 8,020 | 9,040 | 2,500 |
| ANTIMONY, TOTAL | 1,200 | 0.03 J | 0.03 J | 0.07 J |
| ARSENIC, TOTAL | 61 | 5.2 | 4.2 | 5.4 |
| BARIUM, TOTAL | 250,000 | 39 | 115 | 12 |
| BERYLLIUM, TOTAL | 3,100 | 0.52 | 0.40 | 0.16 |
| CADMIUM, TOTAL | 4,100 | 0.32 | 0.19 | 0.27 |
| CALCIUM, TOTAL | NR | 72,500 | 72,400 | 49,200 |
| CHROMIUM, TOTAL | 17,000 (2) | 13.3 | 16 | 4.9 |
| COBALT, TOTAL | 18,000 | 8.79 | 7.75 | 3.55 |
| COPPER, TOTAL | 140,000 | 15.9 | 12.9 | 13.3 |
| IRON, TOTAL | 1,000,000 | 14,600 | 16,000 | 7,120 |
| LEAD, TOTAL | 900 | 9.85 | 8.44 | 5.16 |
| MAGNESIUM, TOTAL | 1,000,000 | 20,800 | 22,300 | 11,100 |
| MANGANESE, TOTAL | 170,000 | 300 | 344 | 196 |
| MERCURY, TOTAL | 1,100 | 0.02 J | 0.02 J | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 24.1 | 21.3 | 11.1 |
| POTASSIUM, TOTAL | NR | 1,500 | 1,900 | ND(400) |
| SELENIUM, TOTAL | 18,000 | U(0.5) J | U(0.8) | U(0.5) J |
| SILVER, TOTAL | 17,000 | 0.06 | 0.07 | 0.04 |
| SODIUM, TOTAL | 1,000,000 | 166 | 2,440 | 307 |
| THALLIUM, TOTAL | 240 | 0.26 | 0.26 | 0.23 |
| VANADIUM, TOTAL | 10,000 | 21 | 23 | 10 |
| ZINC, TOTAL | 1,000,000 | 36 | 42 | 44 |
| General Chemistry (mg/kg) | | | | |
| CYANIDE, TOTAL | 250 | ND(0.5) | ND(0.5) | ND(0.5) |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.1**

**SWMU #3**
**CONTAINER STORAGE AREA**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | BH-3-4 | BH-3-5 | BH-3-5 |
|---|---|---|---|---|
| *Sample Interval:* | | *1-3 ft.* | *4-6 ft.* | *0.7-2 ft.* |
| *Sample ID:* | | *SS-7097-120298-TJ-035* | *S-7097-120798-TJ-045* | *SS-7097-120798-TJ-044* |
| *Sample Date:* | | *12/2/98* | *12/7/98* | *12/7/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | 0.3 | ND(0.3) | ND(0.3) |
| ACENAPHTHENE | 200,000 | 1.5 | ND(0.3) | ND(0.3) |
| ANTHRACENE | 1,000,000 | 2.6 | ND(0.3) | ND(0.3) |
| BENZ0(A)ANTHRACENE | 100 | 3.2 | ND(0.3) | ND(0.3) |
| BENZO(A)PYRENE | 10 | 2.6 | ND(0.3) | ND(0.3) |
| BENZO(B)FLUORANTHENE | 100 | 3.3 | ND(0.3) | ND(0.3) |
| BENZO(G,H,I)PERYLENE | 9,100 | 1.2 | ND(0.3) | ND(0.3) |
| BENZO(K)FLUORANTHENE | 1,000 | 1.4 | ND(0.3) | ND(0.3) |
| BIS(2-ETHYLHEXYL) PHTHALATE | 10,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| CARBAZOLE | 3,700 | 1.6 | ND(0.3) | ND(0.3) |
| CHRYSENE | 10,000 | 2.9 | ND(0.3) | ND(0.3) |
| DIBENZ(A,H)ANTHRACENE | 10 | 0.4 | ND(0.3) | ND(0.3) |
| DIBENZOFURAN | ID | 1.2 | ND(0.3) | ND(0.3) |
| FLUORANTHENE | 180,000 | 9.7 | ND(0.3) | ND(0.3) |
| FLUORENE | 130,000 | 1.8 | ND(0.3) | ND(0.3) |
| INDENO(1,2,3-CD)PYRENE | 100 | 1.4 | ND(0.3) | ND(0.3) |
| NAPHTHALENE | 80,000 | 0.8 | ND(0.3) | ND(0.3) |
| PHENANTHRENE | 8,000 | 12 | ND(0.3) | ND(0.3) |
| PHENOL | 12,000 | 0.4 | ND(0.3) | ND(0.3) |
| PYRENE | 110,000 | 8.3 | ND(0.3) | ND(0.3) |
| TCL - Polychlorinated Biphenyls (PCBs) (mg/kg) | | | | |
| AROCLOR 1254 | 9.9 (3) | 0.13 J | ND(0.33) | ND(0.02) |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 5,500 | 7,990 | 2,370 |
| ANTIMONY, TOTAL | 1,200 | 0.12 | U(0.03) J | U(0.03) J |
| ARSENIC, TOTAL | 61 | 5.4 | 5.2 | 4.7 |
| BARIUM, TOTAL | 250,000 | 45 | 43 | 13 |
| BERYLLIUM, TOTAL | 3,100 | 0.42 | 0.42 | 0.18 |
| CADMIUM, TOTAL | 4,100 | 0.26 | 0.23 | 0.19 |
| CALCIUM, TOTAL | NR | 108,000 | 70,600 | 70,200 |
| CHROMIUM, TOTAL | 17,000 (2) | 9 | 14 | 5.3 |
| COBALT, TOTAL | 18,000 | 4.7 | 6.74 | 3.61 |
| COPPER, TOTAL | 140,000 | 10 | 13.9 | 8.28 |
| IRON, TOTAL | 1,000,000 | 8,940 | 15,600 | 6,030 |
| LEAD, TOTAL | 900 | 14 | 7.33 | 5.14 |
| MAGNESIUM, TOTAL | 1,000,000 | 20,600 | 21,300 | 15,600 |
| MANGANESE, TOTAL | 170,000 | 334 | 260 | 205 |
| MERCURY, TOTAL | 1,100 | ND(0.1) | ND(0.1) | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 12.6 | 20.9 | 10.6 |
| POTASSIUM, TOTAL | NR | 710 | 1,400 | ND(400) |
| SELENIUM, TOTAL | 18,000 | 0.9 | 0.5 J | 0.3 J |
| SILVER, TOTAL | 17,000 | 0.05 | 0.06 J | 0.04 J |
| SODIUM, TOTAL | 1,000,000 | 338 | 137 | 268 |
| THALLIUM, TOTAL | 240 | 0.13 | 0.24 | 0.12 |
| VANADIUM, TOTAL | 10,000 | 15 | 20 | 8 |
| ZINC, TOTAL | 1,000,000 | 39 | 42 | 26 |
| General Chemistry (mg/kg) | | | | |
| CYANIDE, TOTAL | 250 | ND(0.5) | 0.4 | 0.3 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.2**

**SWMU #3**
**CONTAINER STORAGE AREA**
**SUMMARY OF DETECTED APPENDIX IX RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| | | |
|---|---|---|
| ***Location:*** | | ***BH-3-4*** |
| ***Sample Interval:*** | | ***3-5 ft.*** |
| ***Sample ID:*** | | ***S-7097-120398-TJ-036*** |
| ***Sample Date:*** | | ***12/3/98*** |
| ***Parameter*** | ***GIDCV (1)*** | |
| Appendix IX - Semi-Volatile Organics (mg/kg) | | |
| ACENAPHTHENE | 200,000 | 0.2 J |
| ANTHRACENE | 1,000,000 | 0.4 |
| BENZ0(A)ANTHRACENE | 100 | 0.5 |
| BENZO(A)PYRENE | 10 | 0.4 |
| BENZO(B)FLUORANTHENE | 100 | 0.3 |
| BENZO(G,H,I)PERYLENE | 9,100 | 0.3 J |
| BENZO(K)FLUORANTHENE | 1,000 | 0.3 |
| CHRYSENE | 10,000 | 0.5 |
| DIBENZ(A,H)ANTHRACENE | 10 | 0.06 J |
| DIBENZOFURAN | ID | 0.2 J |
| FLUORANTHENE | 180,000 | 1.7 |
| FLUORENE | 130,000 | 0.3 J |
| INDENO(1,2,3-CD)PYRENE | 100 | 0.3 J |
| NAPHTHALENE | 80,000 | 0.06 J |
| PHENANTHRENE | 8,000 | 1.7 |
| PYRENE | 110,000 | 1.1 |
| Appendix IX - Metals (mg/kg) | | |
| ANTIMONY, TOTAL | 1,200 | 0.09 |
| ARSENIC, TOTAL | 61 | 8.1 |
| BARIUM, TOTAL | 250,000 | 20.0 |
| BERYLLIUM, TOTAL | 3,100 | 0.31 |
| CADMIUM, TOTAL | 4,100 | 0.46 |
| CHROMIUM, TOTAL | 17,000 (2) | 9.0 |
| COBALT, TOTAL | 18,000 | 6.05 |
| COPPER, TOTAL | 140,000 | 15.2 |
| LEAD, TOTAL | 900 | 9.48 |
| NICKEL, TOTAL | 270,000 | 21.9 |
| SELENIUM, TOTAL | 18,000 | 0.4 J |
| THALLIUM, TOTAL | 240 | 0.42 |
| VANADIUM, TOTAL | 10,000 | 15.0 |
| ZINC, TOTAL | 1,000,000 | 65.0 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.3

SWMU #3
CONTAINER STORAGE AREA
SUMMARY OF DETECTED TIC RESULTS IN SOIL
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | *BH-3-1* | *BH-3-1* | *BH-3-2* |
|---|---|---|---|
| *Sample Interval:* | *0.5-2 ft.* | *6-8 ft.* | *1-3 ft.* |
| *Sample ID:* | *SS-7097-120298-TJ-033* | *S-7097-120298-TJ-034* | *SS-7097-120298-TJ-031* |
| *Sample Date:* | *12/2/98* | *12/2/98* | *12/2/98* |
| *Parameter* | | | |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| 1,1'-BIPHENYL, 2-METHYL- A | NI | NI | NI |
| 11H-BENZOFLUORENE ISOMER A | NI | NI | NI |
| 11H-BENZOFLUORENE ISOMER B | NI | NI | NI |
| 2-PROPANOL, 1-BUTOXY- A | NI | NI | NI |
| BENZO(G,H,I)FLUORANTHENE A | NI | NI | 0.2 NJ |
| D-LIMONENE A | NI | NI | NI |
| DODECANE A | NI | NI | NI |
| EICOSANE A | 0.2 NJ | NI | NI |
| ETHANOL, 2-BUTOXY-, PHOSPHATE (3:1) A | NI | NI | NI |
| HEPTADECANE A | 0.3 NJ | 0.2 NJ | 0.2 NJ |
| HEXADECANE A | 0.3 NJ | 0.2 NJ | NI |
| NONADECANE A | 0.3 NJ | NI | NI |
| OCTADECANE A | NI | NI | NI |
| PENTADECANE A | NI | NI | NI |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NI | 0.2 NJ | NI |
| PROPANOL ISOMER A | NI | NI | NI |
| PROPANOL ISOMER B | NI | NI | NI |
| TETRADECANE A | NI | NI | 0.2 NJ |
| TRIDECANE A | NI | NI | NI |
| UNDECANE A | NI | NI | NI |
| UNKNOWN A | 0.7 NJ | 0.4 NJ | 0.5 NJ |
| UNKNOWN B | 0.2 NJ | 0.8 NJ | 0.3 NJ |
| UNKNOWN C | 0.4 NJ | 0.2 NJ | NI |
| UNKNOWN D | NI | 0.7 NJ | NI |
| UNKNOWN E | NI | 0.3 NJ | NI |
| UNKNOWN ALCOHOL A | NI | 0.5 NJ | NI |
| UNKNOWN ALCOHOL B | NI | 1.1 NJ | NI |
| UNKNOWN ALCOHOL C | NI | NI | NI |
| UNKNOWN ALKANE A | 0.2 NJ | NI | 0.2 NJ |
| UNKNOWN ALKANE B | 0.3 NJ | NI | 0.2 NJ |
| UNKNOWN ALKANE C | 0.2 NJ | NI | 0.2 NJ |
| UNKNOWN ALKANE D | NI | NI | NI |
| UNKNOWN PAH A | NI | NI | 0.2 NJ |
| UNKNOWN PAH B | NI | NI | 0.2 NJ |
| UNKNOWN PAH C | NI | NI | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| BENZO(E)PYRENE A | NA | NA | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA | NA | NA |
| UNKNOWN A | NA | NA | NA |
| UNKNOWN B | NA | NA | NA |
| UNKNOWN C | NA | NA | NA |
| UNKNOWN ALKANE A | NA | NA | NA |
| UNKNOWN ALKANE B | NA | NA | NA |
| UNKNOWN PAH A | NA | NA | NA |
| UNKNOWN PAH B | NA | NA | NA |
| UNKNOWN PAH C | NA | NA | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively identified compound (TIC) and represents an estimated value.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

TABLE 5.3

SWMU #3
CONTAINER STORAGE AREA
SUMMARY OF DETECTED TIC RESULTS IN SOIL
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | *BH-3-2* | *BH-3-3* | *BH-3-3* |
|---|---|---|---|
| *Sample Interval:* | *7-9 ft.* | *1-3 ft.* | *5-7 ft.* |
| *Sample ID:* | *S-7097-120298-TJ-032* | *SS-7097-120298-TJ-029* | *S-7097-120298-TJ-030* |
| *Sample Date:* | *12/2/98* | *12/2/98* | *12/2/98* |
| *Parameter* | | | |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| 1,1'-BIPHENYL, 2-METHYL- A | NI | NI | NI |
| 11H-BENZOFLUORENE ISOMER A | NI | NI | NI |
| 11H-BENZOFLUORENE ISOMER B | NI | NI | NI |
| 2-PROPANOL, 1-BUTOXY- A | NI | NI | 0.7 NJ |
| BENZO(G,H,I)FLUORANTHENE A | NI | NI | NI |
| D-LIMONENE A | NI | 0.7 NJ | NI |
| DODECANE A | 0.5 NJ | 0.4 NJ | NI |
| EICOSANE A | NI | NI | NI |
| ETHANOL, 2-BUTOXY-, PHOSPHATE (3:1) A | NI | NI | NI |
| HEPTADECANE A | 0.5 NJ | 0.4 NJ | 0.3 NJ |
| HEXADECANE A | 0.5 NJ | NI | NI |
| NONADECANE A | NI | NI | NI |
| OCTADECANE A | 0.4 NJ | NI | 0.3 NJ |
| PENTADECANE A | 0.6 NJ | NI | 0.2 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | 0.6 NJ | 0.6 NJ | 0.4 NJ |
| PROPANOL ISOMER A | NI | NI | NI |
| PROPANOL ISOMER B | NI | NI | NI |
| TETRADECANE A | NI | NI | NI |
| TRIDECANE A | 0.4 NJ | 0.4 NJ | NI |
| UNDECANE A | 0.5 NJ | NI | NI |
| UNKNOWN A | 1.1 NJ | 0.9 NJ | 0.7 NJ |
| UNKNOWN B | 0.6 NJ | NI | NI |
| UNKNOWN C | NI | NI | NI |
| UNKNOWN D | NI | NI | NI |
| UNKNOWN E | NI | NI | NI |
| UNKNOWN ALCOHOL A | NI | NI | 0.6 NJ |
| UNKNOWN ALCOHOL B | NI | NI | 1.1 NJ |
| UNKNOWN ALCOHOL C | NI | NI | 0.4 NJ |
| UNKNOWN ALKANE A | NI | 0.5 NJ | 0.3 NJ |
| UNKNOWN ALKANE B | NI | 0.5 NJ | NI |
| UNKNOWN ALKANE C | NI | 0.4 NJ | NI |
| UNKNOWN ALKANE D | NI | 0.5 NJ | NI |
| UNKNOWN PAH A | NI | NI | NI |
| UNKNOWN PAH B | NI | NI | NI |
| UNKNOWN PAH C | NI | NI | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| BENZO(E)PYRENE A | NA | NA | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA | NA | NA |
| UNKNOWN A | NA | NA | NA |
| UNKNOWN B | NA | NA | NA |
| UNKNOWN C | NA | NA | NA |
| UNKNOWN ALKANE A | NA | NA | NA |
| UNKNOWN ALKANE B | NA | NA | NA |
| UNKNOWN PAH A | NA | NA | NA |
| UNKNOWN PAH B | NA | NA | NA |
| UNKNOWN PAH C | NA | NA | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively identified compound (TIC) and represents an estimated value.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

TABLE 5.3

SWMU #3
CONTAINER STORAGE AREA
SUMMARY OF DETECTED TIC RESULTS IN SOIL
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | *BH-3-4* | *BH-3-4* | *BH-3-5* |
|---|---|---|---|
| *Sample Interval:* | *1-3 ft.* | *3-5 ft.* | *4-6 ft.* |
| *Sample ID:* | *SS-7097-120298-TJ-035* | *S-7097-120398-TJ-036* | *S-7097-120798-TJ-045* |
| *Sample Date:* | *12/2/98* | *12/3/98* | *12/7/98* |
| *Parameter* | | | |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| 1,1'-BIPHENYL, 2-METHYL- A | 0.3 NJ | NA | NI |
| 11H-BENZOFLUORENE ISOMER A | 0.5 NJ | NA | NI |
| 11H-BENZOFLUORENE ISOMER B | 0.3 NJ | NA | NI |
| 2-PROPANOL, 1-BUTOXY- A | NI | NA | NI |
| BENZO(G,H,I)FLUORANTHENE A | 0.3 NJ | NA | NI |
| D-LIMONENE A | NI | NA | NI |
| DODECANE A | NI | NA | NI |
| EICOSANE A | NI | NA | NI |
| ETHANOL, 2-BUTOXY-, PHOSPHATE (3:1) A | NI | NA | NI |
| HEPTADECANE A | NI | NA | 0.4 NJ |
| HEXADECANE A | NI | NA | 0.4 NJ |
| NONADECANE A | NI | NA | 0.3 NJ |
| OCTADECANE A | NI | NA | 0.3 NJ |
| PENTADECANE A | NI | NA | 0.5 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NI | NA | 0.5 NJ |
| PROPANOL ISOMER A | NI | NA | NI |
| PROPANOL ISOMER B | NI | NA | NI |
| TETRADECANE A | NI | NA | 0.3 NJ |
| TRIDECANE A | NI | NA | NI |
| UNDECANE A | NI | NA | NI |
| UNKNOWN A | 0.5 NJ | NA | 0.9 NJ |
| UNKNOWN B | 0.4 NJ | NA | 0.3 NJ |
| UNKNOWN C | NI | NA | 0.3 NJ |
| UNKNOWN D | NI | NA | NI |
| UNKNOWN E | NI | NA | NI |
| UNKNOWN ALCOHOL A | NI | NA | NI |
| UNKNOWN ALCOHOL B | NI | NA | NI |
| UNKNOWN ALCOHOL C | NI | NA | NI |
| UNKNOWN ALKANE A | 0.3 NJ | NA | NI |
| UNKNOWN ALKANE B | NI | NA | NI |
| UNKNOWN ALKANE C | NI | NA | NI |
| UNKNOWN ALKANE D | NI | NA | NI |
| UNKNOWN PAH A | 0.3 NJ | NA | NI |
| UNKNOWN PAH B | 1 NJ | NA | NI |
| UNKNOWN PAH C | 1.8 NJ | NA | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| BENZO(E)PYRENE A | NA | 0.3 NJ | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA | 0.3 NJ | NA |
| UNKNOWN A | NA | 0.6 NJ | NA |
| UNKNOWN B | NA | 0.3 NJ | NA |
| UNKNOWN C | NA | 0.2 NJ | NA |
| UNKNOWN ALKANE A | NA | 0.2 NJ | NA |
| UNKNOWN ALKANE B | NA | 0.2 NJ | NA |
| UNKNOWN PAH A | NA | 0.2 NJ | NA |
| UNKNOWN PAH B | NA | 0.2 NJ | NA |
| UNKNOWN PAH C | NA | 0.3 NJ | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively identified compound (TIC) and represents an estimated value.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

**TABLE 5.3**

**SWMU #3**
**CONTAINER STORAGE AREA**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| | |
|---|---|
| ***Location:*** | *BH-3-5* |
| ***Sample Interval:*** | *0.7-2 ft.* |
| ***Sample ID:*** | *SS-7097-120798-TJ-044* |
| ***Sample Date:*** | *12/7/98* |
| ***Parameter*** | |
| TCL Semi-volatile Organics TIC (mg/kg) | |
| 1,1'-BIPHENYL, 2-METHYL- A | NI |
| 11H-BENZOFLUORENE ISOMER A | NI |
| 11H-BENZOFLUORENE ISOMER B | NI |
| 2-PROPANOL, 1-BUTOXY- A | NI |
| BENZO(G,H,I)FLUORANTHENE A | NI |
| D-LIMONENE A | NI |
| DODECANE A | NI |
| EICOSANE A | NI |
| ETHANOL, 2-BUTOXY-, PHOSPHATE (3:1) A | 1.6 |
| HEPTADECANE A | NI |
| HEXADECANE A | NI |
| NONADECANE A | NI |
| OCTADECANE A | NI |
| PENTADECANE A | NI |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NI |
| PROPANOL ISOMER A | 0.5 |
| PROPANOL ISOMER B | 0.3 |
| TETRADECANE A | NI |
| TRIDECANE A | NI |
| UNDECANE A | NI |
| UNKNOWN A | 0.5 E |
| UNKNOWN B | 0.2 |
| UNKNOWN C | 0.2 |
| UNKNOWN D | 2 |
| UNKNOWN E | 0.2 |
| UNKNOWN ALCOHOL A | NI |
| UNKNOWN ALCOHOL B | NI |
| UNKNOWN ALCOHOL C | NI |
| UNKNOWN ALKANE A | NI |
| UNKNOWN ALKANE B | NI |
| UNKNOWN ALKANE C | NI |
| UNKNOWN ALKANE D | NI |
| UNKNOWN PAH A | NI |
| UNKNOWN PAH B | NI |
| UNKNOWN PAH C | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | |
| BENZO(E)PYRENE A | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA |
| UNKNOWN A | NA |
| UNKNOWN B | NA |
| UNKNOWN C | NA |
| UNKNOWN ALKANE A | NA |
| UNKNOWN ALKANE B | NA |
| UNKNOWN PAH A | NA |
| UNKNOWN PAH B | NA |
| UNKNOWN PAH C | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively identified compound (TIC) and represents an estimated value.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

TABLE 5.4

SWMU #29
WASTEWATER TREATMENT TANK AREA
SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | | *BH-29-1* | *BH-29-2* | *BH-29-3* |
|---|---|---|---|---|
| *Sample Interval:* | | *10-12 ft.* | *4-6 ft.* | *4-6 ft.* |
| *Sample ID:* | | *S-7097-120198-TJ-022* | *S-7097-120198-TJ-021* | *S-7097-120198-TJ-020* |
| *Sample Date:* | | *12/1/98* | *12/1/98* | *12/1/98* |
| *Parameter* | GIDCV (1) | | | |
| TCL Volatile Organics (mg/kg) | | | | |
| ETHYLBENZENE | 140 | ND(0.05) | ND(0.05) | 0.12 |
| M,P-XYLENES | 150 | ND(0.10) | ND(0.10) | 0.63 |
| O-XYLENE | 150 | ND(0.05) | ND(0.05) | 0.22 |
| TETRACHLOROETHENE (PCE) | 88 | ND(0.05) | ND(0.05) | 0.04 J |
| TOLUENE | 250 | ND(0.05) | ND(0.05) | 0.043 J |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| ACENAPHTHENE | 200,000 | ND(0.3) | 0.6 | ND(0.3) |
| ANTHRACENE | 1,000,000 | ND(0.3) | 0.5 | ND(0.3) |
| BENZ0(A)ANTHRACENE | 100 | ND(0.3) | 0.8 | ND(0.3) |
| BENZO(A)PYRENE | 10 | ND(0.3) | 0.7 | ND(0.3) |
| BENZO(B)FLUORANTHENE | 100 | ND(0.3) | 0.7 | ND(0.3) |
| BENZO(G,H,I)PERYLENE | 9,100 | ND(0.3) | 0.3 | ND(0.3) |
| BENZO(K)FLUORANTHENE | 1,000 | ND(0.3) | 0.4 | ND(0.3) |
| CARBAZOLE | 3,700 | ND(0.3) | 0.2 J | ND(0.3) |
| CHRYSENE | 10,000 | ND(0.3) | 0.7 | ND(0.3) |
| DIBENZ(A,H)ANTHRACENE | 10 | ND(0.3) | 0.08 J | ND(0.3) |
| DIBENZOFURAN | ID | ND(0.3) | 0.8 | ND(0.3) |
| FLUORANTHENE | 180,000 | 0.1 J | 1.7 | ND(0.3) |
| FLUORENE | 130,000 | ND(0.3) | 0.5 | ND(0.3) |
| INDENO(1,2,3-CD)PYRENE | 100 | ND(0.3) | 0.4 | ND(0.3) |
| NAPHTHALENE | 80,000 | ND(0.3) | 0.1 J | ND(0.3) |
| PHENANTHRENE | 8,000 | 0.08 J | 1.5 | ND(0.3) |
| PYRENE | 110,000 | 0.08 J | 2 | ND(0.3) |
| TCL - Polychlorinated Biphenyls (PCBs) (mg/kg) | | | | |
| AROCLOR 1254 | 9.9 (3) | ND(0.33) | 0.38 | 0.21 J |
| AROCLOR 1260 | 9.9 (3) | ND(0.33) | 0.04 J | 0.03 J |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 4,160 | 6,800 | 6,310 |
| ANTIMONY, TOTAL | 1,200 | 0.04 J | 0.09 J | 0.03 J |
| ARSENIC, TOTAL | 61 | 2.7 | 4.9 | 4.5 |
| BARIUM, TOTAL | 250,000 | 18 | 43 | 34 |
| BERYLLIUM, TOTAL | 3,100 | 0.14 | 0.30 | 0.28 |
| CADMIUM, TOTAL | 4,100 | 0.18 | 0.32 | 0.15 |
| CALCIUM, TOTAL | NR | 33,100 | 39,700 | 72,100 |
| CHROMIUM, TOTAL | 17,000 (2) | 10 | 12 | 10 |
| COBALT, TOTAL | 18,000 | 2.95 | 5.33 | 5.4 |
| COPPER, TOTAL | 140,000 | 8.1 | 13.3 | 12.3 |
| IRON, TOTAL | 1,000,000 | 8,370 | 12,600 | 13,100 |
| LEAD, TOTAL | 900 | 4.13 | 24.1 | 6.47 |
| MAGNESIUM, TOTAL | 1,000,000 | 11,800 | 11,000 | 18,200 |
| MANGANESE, TOTAL | 170,000 | 244 | 299 | 290 |
| MERCURY, TOTAL | 1,100 | ND(0.1) | ND(0.1) | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 7.6 | 13.4 | 15.6 |
| POTASSIUM, TOTAL | NR | ND(400) | 660 | 720 |
| SELENIUM, TOTAL | 18,000 | ND(0.5) | 0.7 | 0.4 J |
| SILVER, TOTAL | 17,000 | 0.05 | 0.06 | 0.04 |
| SODIUM, TOTAL | 1,000,000 | 112 | 113 | 132 |
| THALLIUM, TOTAL | 240 | 0.09 | 0.18 | 0.18 |
| VANADIUM, TOTAL | 10,000 | 12 | 19 | 16 |
| ZINC, TOTAL | 1,000,000 | 31 | 45 | 37 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.4

SWMU #29
WASTEWATER TREATMENT TANK AREA
SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | | *BH-29-4* | *SS-29-2* | *SS-29-3* |
|---|---|---|---|---|
| *Sample Interval:* | | *4-6 ft.* | *0.8-2 ft.* | *0.8-2 ft.* |
| *Sample ID:* | | *S-7097-120198-TJ-019* | *SS-7097-120298-TJ-027* | *SS-7097-120298-TJ-026* |
| *Sample Date:* | | *12/1/98* | *12/2/98* | *12/2/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Volatile Organics (mg/kg) | | | | |
| ETHYLBENZENE | 140 | ND(0.05) | ND(0.05) | ND(0.05) |
| M,P-XYLENES | 150 | ND(0.10) | ND(0.10) | ND(0.10) |
| O-XYLENE | 150 | ND(0.05) | ND(0.05) | ND(0.05) |
| TETRACHLOROETHENE (PCE) | 88 | ND(0.05) | ND(0.05) | ND(0.05) |
| TOLUENE | 250 | ND(0.05) | ND(0.05) | ND(0.05) |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| ACENAPHTHENE | 200,000 | ND(0.3) | 0.2 J | 0.07 J |
| ANTHRACENE | 1,000,000 | ND(0.3) | 0.3 | 0.09 J |
| BENZ0(A)ANTHRACENE | 100 | ND(0.3) | 1.1 | 0.3 J |
| BENZO(A)PYRENE | 10 | ND(0.3) | 1 | 0.2 J |
| BENZO(B)FLUORANTHENE | 100 | ND(0.3) | 1 | 0.3 J |
| BENZO(G,H,I)PERYLENE | 9,100 | ND(0.3) | 0.5 | 0.2 J |
| BENZO(K)FLUORANTHENE | 1,000 | ND(0.3) | 0.8 | 0.2 J |
| CARBAZOLE | 3,700 | ND(0.3) | 0.1 J | 0.04 J |
| CHRYSENE | 10,000 | ND(0.3) | 1.2 | 0.3 |
| DIBENZ(A,H)ANTHRACENE | 10 | ND(0.3) | 0.2 J | 0.04 J |
| DIBENZOFURAN | ID | ND(0.3) | 0.1 J | ND(0.3) |
| FLUORANTHENE | 180,000 | ND(0.3) | 1.8 | 0.7 |
| FLUORENE | 130,000 | ND(0.3) | 0.2 J | 0.07 J |
| INDENO(1,2,3-CD)PYRENE | 100 | ND(0.3) | 0.6 | 0.2 J |
| NAPHTHALENE | 80,000 | ND(0.3) | 0.07 J | ND(0.3) |
| PHENANTHRENE | 8,000 | ND(0.3) | 1.7 | 0.5 |
| PYRENE | 110,000 | ND(0.3) | 1.9 | 0.7 |
| TCL - Polychlorinated Biphenyls (PCBs) (mg/kg) | | | | |
| AROCLOR 1254 | 9.9 (3) | ND(0.33) | 0.17 J | 0.56 |
| AROCLOR 1260 | 9.9 (3) | ND(0.33) | 0.03 J | 0.1 J |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 8,250 | 2,680 | 4,600 |
| ANTIMONY, TOTAL | 1,200 | 0.05 J | 0.2 | 0.09 J |
| ARSENIC, TOTAL | 61 | 6.1 | 4 | 6 |
| BARIUM, TOTAL | 250,000 | 45 | 147 | 46 |
| BERYLLIUM, TOTAL | 3,100 | 0.47 | 0.19 | 0.31 |
| CADMIUM, TOTAL | 4,100 | 0.23 | 1.06 | 0.66 |
| CALCIUM, TOTAL | NR | 82,100 | 129,000 | 87,600 |
| CHROMIUM, TOTAL | 17,000 (2) | 13 | 41 | 13.9 |
| COBALT, TOTAL | 18,000 | 9.62 | 2.67 | 4.86 |
| COPPER, TOTAL | 140,000 | 19.4 | 9.5 | 15.9 |
| IRON, TOTAL | 1,000,000 | 15,600 | 7,760 | 9,980 |
| LEAD, TOTAL | 900 | 10.9 | 67.9 | 31.0 |
| MAGNESIUM, TOTAL | 1,000,000 | 18,600 | 59,400 | 37,000 |
| MANGANESE, TOTAL | 170,000 | 361 | 194 | 249 |
| MERCURY, TOTAL | 1,100 | ND(0.1) | 0.07 J | 0.05 J |
| NICKEL, TOTAL | 270,000 | 23.9 | 45.8 | 15.5 |
| POTASSIUM, TOTAL | NR | 1,100 | ND(400) | 570 |
| SELENIUM, TOTAL | 18,000 | 0.4 | U(1.0) | U(0.7) |
| SILVER, TOTAL | 17,000 | 0.06 | 0.12 | 0.05 |
| SODIUM, TOTAL | 1,000,000 | 156 | 122 | 136 |
| THALLIUM, TOTAL | 240 | 0.27 | 0.17 | 0.21 |
| VANADIUM, TOTAL | 10,000 | 20 | 9 | 14 |
| ZINC, TOTAL | 1,000,000 | 40 | 224 | 55 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
– Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.4**

**SWMU #29**
**WASTEWATER TREATMENT TANK AREA**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *SS-29-4* | *SS-29-4* |
|---|---|---|---|
| *Sample Interval:* | | *0.8-2 ft.* | *0.8-2 ft.* |
| *Sample ID:* | | *SS-7097-120298-TJ-024* | *SS-7097-120298-TJ-025* |
| *Sample Date:* | | *12/2/98* | *12/2/98* |
| | | | *Duplicate* |
| *Parameter* | *GIDCV (1)* | | |
| TCL Volatile Organics (mg/kg) | | | |
| ETHYLBENZENE | 140 | ND(0.05) | ND(0.05) |
| M,P-XYLENES | 150 | ND(0.10) | ND(0.10) |
| O-XYLENE | 150 | ND(0.05) | ND(0.05) |
| TETRACHLOROETHENE (PCE) | 88 | ND(0.05) | ND(0.05) |
| TOLUENE | 250 | ND(0.05) | ND(0.05) |
| TCL Semi-volatile Organics (mg/kg) | | | |
| ACENAPHTHENE | 200,000 | ND(0.3) | ND(0.3) |
| ANTHRACENE | 1,000,000 | 0.05 J | ND(0.3) |
| BENZ0(A)ANTHRACENE | 100 | 0.1 J | ND(0.3) |
| BENZO(A)PYRENE | 10 | 0.1 J | ND(0.3) |
| BENZO(B)FLUORANTHENE | 100 | 0.1 J | ND(0.3) |
| BENZO(G,H,I)PERYLENE | 9,100 | 0.08 J | ND(0.3) |
| BENZO(K)FLUORANTHENE | 1,000 | 0.1 J | ND(0.3) |
| CARBAZOLE | 3,700 | ND(0.3) | ND(0.3) |
| CHRYSENE | 10,000 | 0.2 J | ND(0.3) |
| DIBENZ(A,H)ANTHRACENE | 10 | ND(0.3) | ND(0.3) |
| DIBENZOFURAN | ID | 0.09 | ND(0.3) |
| FLUORANTHENE | 180,000 | 0.3 J | 0.09 J |
| FLUORENE | 130,000 | ND(0.3) | ND(0.3) |
| INDENO(1,2,3-CD)PYRENE | 100 | 0.08 J | ND(0.3) |
| NAPHTHALENE | 80,000 | ND(0.3) | ND(0.3) |
| PHENANTHRENE | 8,000 | 0.2 J | ND(0.3) |
| PYRENE | 110,000 | 0.3 | 0.09 J |
| TCL - Polychlorinated Biphenyls (PCBs) (mg/kg) | | | |
| AROCLOR 1254 | 9.9 (3) | ND(0.33) | ND(0.33) |
| AROCLOR 1260 | 9.9 (3) | ND(0.33) | ND(0.33) |
| TAL Metals (mg/kg) | | | |
| ALUMINUM, TOTAL | 660,000 | 3,240 | 1,670 |
| ANTIMONY, TOTAL | 1,200 | 0.1 | 0.2 |
| ARSENIC, TOTAL | 61 | 4.4 | 2.1 |
| BARIUM, TOTAL | 250,000 | 85 | 50 |
| BERYLLIUM, TOTAL | 3,100 | 0.26 | 0.21 |
| CADMIUM, TOTAL | 4,100 | 0.58 | 0.31 |
| CALCIUM, TOTAL | NR | 158,000 | 184,000 |
| CHROMIUM, TOTAL | 17,000 (2) | 5.6 | 2.8 |
| COBALT, TOTAL | 18,000 | 3.17 | 1.98 |
| COPPER, TOTAL | 140,000 | 8.40 | 4.88 |
| IRON, TOTAL | 1,000,000 | 4,690 | 2,450 |
| LEAD, TOTAL | 900 | 22.2 | 11.5 |
| MAGNESIUM, TOTAL | 1,000,000 | 78,200 | 98,200 |
| MANGANESE, TOTAL | 170,000 | 182 | 126 |
| MERCURY, TOTAL | 1,100 | 0.02 J | 0.02 J |
| NICKEL, TOTAL | 270,000 | 11.8 | 8.9 |
| POTASSIUM, TOTAL | NR | ND(400) | ND(400) |
| SELENIUM, TOTAL | 18,000 | U(1.0) | U(1.0) |
| SILVER, TOTAL | 17,000 | 0.03 | 0.04 |
| SODIUM, TOTAL | 1,000,000 | 131 | 154 |
| THALLIUM, TOTAL | 240 | 0.17 | 0.13 |
| VANADIUM, TOTAL | 10,000 | 11 | 7 |
| ZINC, TOTAL | 1,000,000 | 27 | 17 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.5

SWMU #29
WASTEWATER TREATMENT TANK AREA
SUMMARY OF DETECTED APPENDIX IX RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| | | |
|---|---|---|
| *Location:* | | *SS-29-1* |
| *Sample Interval:* | | *0.8-2 ft.* |
| *Sample ID:* | | *SS-7097-120298-TJ-028* |
| *Sample Date:* | | *12/2/98* |
| *Parameter* | *GIDCV (1)* | |
| Appendix IX - Semi-Volatile Organics (mg/kg) | | |
| BENZO(G,H,I)PERYLENE | 9,100 | 0.04 J |
| FLUORANTHENE | 180,000 | 0.1 J |
| INDENO(1,2,3-CD)PYRENE | 100 | 0.04 J |
| PYRENE | 110,000 | 0.1 J |
| Appendix IX - Polychlorinated Biphenyls (PCBs) (mg/kg) | | |
| AROCLOR 1254 | 9.9 (3) | 0.14 J |
| AROCLOR 1260 | 9.9 (3) | 0.03 J |
| Appendix IX - Metals (mg/kg) | | |
| ANTIMONY, TOTAL | 1,200 | 0.09 J |
| ARSENIC, TOTAL | 61 | 2.3 |
| BARIUM, TOTAL | 250,000 | 52 |
| BERYLLIUM, TOTAL | 3,100 | 0.98 |
| CADMIUM, TOTAL | 4,100 | 0.28 |
| CHROMIUM, TOTAL | 17,000 (2) | 10.2 |
| COBALT, TOTAL | 18,000 | 2.28 |
| COPPER, TOTAL | 140,000 | 6.9 |
| LEAD, TOTAL | 900 | 13.4 |
| MERCURY, TOTAL | 1,100 | 0.03 J |
| NICKEL, TOTAL | 270,000 | 7.3 |
| SELENIUM, TOTAL | 18,000 | U(1.0) |
| SILVER, TOTAL | 17,000 | 0.07 |
| THALLIUM, TOTAL | 240 | 0.06 |
| VANADIUM, TOTAL | 10,000 | 11.0 |
| ZINC, TOTAL | 1,000,000 | 38.0 |
| Appendix IX - General Chemistry (mg/kg) | | |
| SULFIDE, TOTAL | NR | 13.0 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
☐ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.6

SWMU #29
WASTEWATER TREATMENT PLANT
SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | *BH-29-1* | *BH-29-2* | *BH-29-3* |
|---|---|---|---|
| *Sample Interval:* | *10-12 ft.* | *4-6 ft.* | *4-6 ft.* |
| *Sample ID:* | *S-7097-120198-TJ-022* | *S-7097-120198-TJ-021* | *S-7097-120198-TJ-020* |
| *Sample Date:* | *12/1/98* | *12/1/98* | *12/1/98* |
| *Parameter* | | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | | |
| 4-NONANONE, 2,6,8-TRIMETHYL- A | NI | NI | 0.37 NJ |
| UNKNOWN A | NI | NI | 0.4 NJ |
| UNKNOWN ALKANE A | NI | NI | 0.15 NJ |
| UNKNOWN BRANCHED ALKANE A | NI | NI | 0.22 NJ |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| 4H-CYCLOPENTA[DEF]PHENANTHRENE A | NI | 0.3 NJ | NI |
| BENZENEDICARBOXYLIC ACID ISOMER A | 0.1 NJ | NI | NI |
| BENZENEDICARBOXYLIC ACID ISOMER B | 0.2 NJ | NI | NI |
| BENZENEDICARBOXYLIC ACID ISOMER C | 0.2 NJ | NI | NI |
| DIBENZOTHIOPHENE A | NI | 0.2 NJ | NI |
| HEPTADECANE A | NI | 0.3 NJ | NI |
| SULFUR A | NI | NI | NI |
| SULFUR, MOL. (S8) A | NI | NI | NI |
| UNKNOWN A | 0.6 NJ | 0.7 NJ | 0.6 NJ |
| UNKNOWN B | 0.4 NJ | 0.3 NJ | 0.2 NJ |
| UNKNOWN C | NI | 0.2 NJ | NI |
| UNKNOWN D | NI | 0.5 NJ | NI |
| UNKNOWN E | NI | NI | NI |
| UNKNOWN F | NI | NI | NI |
| UNKNOWN G | NI | NI | NI |
| UNKNOWN H | NI | NI | NI |
| UNKNOWN ALCOHOL A | NI | NI | NI |
| UNKNOWN ALKANE A | NI | 0.2 NJ | 0.3 NJ |
| UNKNOWN ALKANE B | NI | 0.5 NJ | NI |
| UNKNOWN ALKANE C | NI | 0.4 NJ | N I |
| UNKNOWN HALOGENATED HYDROCARBON A | 0.2 NJ | NI | 0.3 NJ |
| UNKNOWN PAH A | NI | NI | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| SULFUR, MOL. (S8) A | NA | NA | NA |
| UNKNOWN A | NA | NA | NA |
| UNKNOWN B | NA | NA | NA |
| UNKNOWN C | NA | NA | NA |
| UNKNOWN D | NA | NA | NA |
| UNKNOWN E | NA | NA | NA |
| UNKNOWN F | NA | NA | NA |
| UNKNOWN ALCOHOL A | NA | NA | NA |
| UNKNOWN ALCOHOL B | NA | NA | NA |
| UNKNOWN ALCOHOL C | NA | NA | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively identified compound (TIC) and represents an estimated value.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

**TABLE 5.6**

**SWMU #29**
**WASTEWATER TREATMENT PLANT**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | *BH-29-4* | *SS-29-1* | *SS-29-2* |
|---|---|---|---|
| *Sample Interval:* | *4-6 ft.* | *0.8-2 ft.* | *0.8-2 ft.* |
| *Sample ID:* | *S-7097-120198-TJ-019* | *SS-7097-120298-TJ-028* | *SS-7097-120298-TJ-027* |
| *Sample Date:* | *12/1/98* | *12/2/98* | *12/2/98* |
| ***Parameter*** | | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | | |
| 4-NONANONE, 2,6,8-TRIMETHYL- A | NI | NA | NI |
| UNKNOWN A | NI | NA | NI |
| UNKNOWN ALKANE A | NI | NA | NI |
| UNKNOWN BRANCHED ALKANE A | NI | NA | NI |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| 4H-CYCLOPENTA[DEF]PHENANTHRENE A | NI | NA | NI |
| BENZENEDICARBOXYLIC ACID ISOMER A | NI | NA | NI |
| BENZENEDICARBOXYLIC ACID ISOMER B | NI | NA | NI |
| BENZENEDICARBOXYLIC ACID ISOMER C | NI | NA | NI |
| DIBENZOTHIOPHENE A | NI | NA | NI |
| HEPTADECANE A | NI | NA | NI |
| SULFUR A | NI | NA | NI |
| SULFUR, MOL. (S8) A | NI | NA | NI |
| UNKNOWN A | 0.4 NJ | NA | 0.4 NJ |
| UNKNOWN B | 0.4 NJ | NA | 0.4 NJ |
| UNKNOWN C | 0.2 NJ | NA | 0.5 NJ |
| UNKNOWN D | NI | NA | 0.6 NJ |
| UNKNOWN E | NI | NA | 1.4 NJ |
| UNKNOWN F | NI | NA | 5.8 NJ |
| UNKNOWN G | NI | NA | 0.7 NJ |
| UNKNOWN H | NI | NA | 0.6 NJ |
| UNKNOWN ALCOHOL A | NI | NA | 0.6 NJ |
| UNKNOWN ALKANE A | NI | NA | NI |
| UNKNOWN ALKANE B | NI | NA | NI |
| UNKNOWN ALKANE C | NI | NA | NI |
| UNKNOWN HALOGENATED HYDROCARBON A | 0.2 NJ | NA | NI |
| UNKNOWN PAH A | NI | NA | 0.3 NJ |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| SULFUR, MOL. (S8) A | NA | 1.4 NJ | NA |
| UNKNOWN A | NA | 0.1 NJ | NA |
| UNKNOWN B | NA | 0.7 NJ | NA |
| UNKNOWN C | NA | 0.2 NJ | NA |
| UNKNOWN D | NA | 0.4 NJ | NA |
| UNKNOWN E | NA | 0.2 NJ | NA |
| UNKNOWN F | NA | 1 NJ | NA |
| UNKNOWN ALCOHOL A | NA | 0.3 NJ | NA |
| UNKNOWN ALCOHOL B | NA | 0.8 NJ | NA |
| UNKNOWN ALCOHOL C | NA | 0.2 NJ | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively identified compound (TIC) and represents an estimated value.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

**TABLE 5.6**

**SWMU #29**
**WASTEWATER TREATMENT PLANT**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | *SS-29-3* | *SS-29-4* | *SS-29-4* |
|---|---|---|---|
| *Sample Interval:* | *0.8-2 ft.* | *0.8-2 ft.* | *0.8-2 ft.* |
| *Sample ID:* | *SS-7097-120298-TJ-026* | *SS-7097-120298-TJ-024* | *SS-7097-120298-TJ-025* |
| *Sample Date:* | *12/2/98* | *12/2/98* | *12/2/98* |
| | | | *Duplicate* |
| *Parameter* | | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | | |
| 4-NONANONE, 2,6,8-TRIMETHYL- A | NI | NI | NI |
| UNKNOWN A | NI | NI | NI |
| UNKNOWN ALKANE A | NI | NI | NI |
| UNKNOWN BRANCHED ALKANE A | NI | NI | NI |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| 4H-CYCLOPENTA[DEF]PHENANTHRENE A | NI | NI | NI |
| BENZENEDICARBOXYLIC ACID ISOMER A | NI | NI | NI |
| BENZENEDICARBOXYLIC ACID ISOMER B | NI | NI | NI |
| BENZENEDICARBOXYLIC ACID ISOMER C | NI | NI | NI |
| DIBENZOTHIOPHENE A | NI | NI | NI |
| HEPTADECANE A | NI | NI | NI |
| SULFUR A | NI | 0.2 NJ | NI |
| SULFUR, MOL. (S8) A | NI | NI | 0.2 NJ |
| UNKNOWN A | 0.1 NJ | 0.4 NJ | 0.6 NJ |
| UNKNOWN B | 0.5 NJ | 0.3 NJ | 0.3 NJ |
| UNKNOWN C | 0.4 NJ | 0.2 NJ | 0.2 NJ |
| UNKNOWN D | 0.1 NJ | NI | NI |
| UNKNOWN E | 0.4 NJ | NI | NI |
| UNKNOWN F | NI | NI | NI |
| UNKNOWN G | NI | NI | NI |
| UNKNOWN H | NI | NI | NI |
| UNKNOWN ALCOHOL A | NI | NI | NI |
| UNKNOWN ALKANE A | NI | NI | NI |
| UNKNOWN ALKANE B | NI | NI | NI |
| UNKNOWN ALKANE C | NI | NI | NI |
| UNKNOWN HALOGENATED HYDROCARBON A | NI | NI | NI |
| UNKNOWN PAH A | NI | NI | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| SULFUR, MOL. (S8) A | NA | NA | NA |
| UNKNOWN A | NA | NA | NA |
| UNKNOWN B | NA | NA | NA |
| UNKNOWN C | NA | NA | NA |
| UNKNOWN D | NA | NA | NA |
| UNKNOWN E | NA | NA | NA |
| UNKNOWN F | NA | NA | NA |
| UNKNOWN ALCOHOL A | NA | NA | NA |
| UNKNOWN ALCOHOL B | NA | NA | NA |
| UNKNOWN ALCOHOL C | NA | NA | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively identified compound (TIC) and represents an estimated value.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

TABLE 5.7

SWMU #31
FORMER SURFACE IMPOUNDMENT
SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | | *BH-31-1* | *BH-31-1* | *BH-31-3* |
|---|---|---|---|---|
| *Sample Interval:* | | *8-10 ft.* | *8-10 ft.* | *4-6 ft.* |
| *Sample ID:* | | *S-7097-121098-DS-050* | *S-7097-121098-DS-051* | *S-7097-121198-DS-053* |
| *Sample Date:* | | *12/10/98* | *12/10/98* | *12/11/98* |
| | | | *Duplicate* | |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Volatile Organics (mg/kg) | | | | |
| ACETONE | 110,000 | -- | -- | -- |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 5,650 | 4,950 | 38,800 |
| ANTIMONY, TOTAL | 1,200 | 0.06 | 0.04 J | 44.6 |
| ARSENIC, TOTAL | 61 | 4.3 | 4.5 | 140 |
| BARIUM, TOTAL | 250,000 | 31 | 30 | 689 |
| BERYLLIUM, TOTAL | 3,100 | 0.29 | 0.29 | 5.45 |
| CADMIUM, TOTAL | 4,100 | 0.23 | 0.19 | 37.5 |
| CALCIUM, TOTAL | NR | 72,900 | 71,800 | 98,600 |
| CHROMIUM, TOTAL | 17,000 (2) | 11 | 10 | [illegible] |
| COBALT, TOTAL | 18,000 | 5.24 | 5.19 | 30.4 |
| COPPER, TOTAL | 140,000 | 12 | 11.9 | 228 |
| IRON, TOTAL | 1,000,000 | 11,600 | 10,800 | 15,900 |
| LEAD, TOTAL | 900 | 6.54 | 6.92 | 2,780 |
| MAGNESIUM, TOTAL | 1,000,000 | 22,400 | 21,500 | 15,100 |
| MANGANESE, TOTAL | 170,000 | 285 | 274 | 670 |
| MERCURY, TOTAL | 1,100 | ND(0.02) | ND(0.02) | 7.2 |
| NICKEL, TOTAL | 270,000 | 14.7 | 15.1 | 613 |
| POTASSIUM, TOTAL | NR | 110 | 900 | 1,700 |
| SELENIUM, TOTAL | 18,000 | 0.4 J | 0.5 J | 25.3 |
| SILVER, TOTAL | 17,000 | 0.07 J | 0.05 J | 16.8 J |
| SODIUM, TOTAL | 1,000,000 | 174 | 176 | 1,700 |
| THALLIUM, TOTAL | 240 | 0.23 | 0.22 | 5.10 |
| VANADIUM, TOTAL | 10,000 | 17 | 14 | 58 |
| ZINC, TOTAL | 1,000,000 | 35 | 49 | [illegible] |
| General Chemistry (mg/kg) | | | | |
| CYANIDE, TOTAL | 250 | ND(1) UJ | ND(1) UJ | 2.6 J |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
UJ - Report limit is an estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.7

SWMU #31
FORMER SURFACE IMPOUNDMENT
SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | | *SS-31-1* | *SS-31-2* | *SS-31-3* |
|---|---|---|---|---|
| *Sample Interval:* | | *0-2 ft.* | *0-2 ft.* | *0-2 ft.* |
| *Sample ID:* | | *S-7097-121198-DS-054* | *S-7097-121198-DS-055* | *S-7097-121198-DS-056* |
| *Sample Date:* | | *12/11/98* | *12/11/98* | *12/11/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Volatile Organics (mg/kg) | | | | |
| ACETONE | 110,000 | -- | 11 | -- |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 11,100 | 6,540 | 11,500 |
| ANTIMONY, TOTAL | 1,200 | 0.9 J | 0.2 | 1.7 |
| ARSENIC, TOTAL | 61 | 27.3 | 5.7 | 20.7 |
| BARIUM, TOTAL | 250,000 | 102 | 59 | 315 |
| BERYLLIUM, TOTAL | 3,100 | 1.04 | 0.42 | 1.40 |
| CADMIUM, TOTAL | 4,100 | 5.60 | 0.63 | 5.79 |
| CALCIUM, TOTAL | NR | 65,900 | 67,500 | 51,800 |
| CHROMIUM, TOTAL | 17,000 (2) | 341 | 51 | 167 |
| COBALT, TOTAL | 18,000 | 12.1 | 5.39 | 9.46 |
| COPPER, TOTAL | 140,000 | 93.4 | 17.1 | 40.9 |
| IRON, TOTAL | 1,000,000 | 17,100 | 12,300 | 15,700 |
| LEAD, TOTAL | 900 | 765 | 51.1 | 279 |
| MAGNESIUM, TOTAL | 1,000,000 | 17,000 | 20,200 | 14,500 |
| MANGANESE, TOTAL | 170,000 | 372 | 367 | 431 |
| MERCURY, TOTAL | 1,100 | 0.09 J | 0.06 J | 1.8 |
| NICKEL, TOTAL | 270,000 | 259 | 24.6 | 39.1 |
| POTASSIUM, TOTAL | NR | 1,400 | 1,100 | 1,500 |
| SELENIUM, TOTAL | 18,000 | 4.1 | 0.6 | 3.4 |
| SILVER, TOTAL | 17,000 | 0.73 J | 0.36 J | 2.47 J |
| SODIUM, TOTAL | 1,000,000 | 335 | 511 | 3,450 |
| THALLIUM, TOTAL | 240 | 0.81 | 0.24 | 1.12 |
| VANADIUM, TOTAL | 10,000 | 24 | 17 | 29 |
| ZINC, TOTAL | 1,000,000 | 896 | 222 | 750 |
| General Chemistry (mg/kg) | | | | |
| CYANIDE, TOTAL | 250 | ND(1) UJ | ND(1) UJ | ND(1) UJ |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
UJ - Report limit is an estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
☐ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.8**

**SWMU #31**
**FORMER SURFACE IMPOUNDMENT**
**SUMMARY OF DETECTED APPENDIX IX RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| | | |
|---|---|---|
| ***Location:*** | | ***BH-31-2*** |
| ***Sample Interval:*** | | ***1-1.5 ft.*** |
| ***Sample ID:*** | | ***S-7097-121798-DS-061*** |
| ***Sample Date:*** | | ***12/17/98*** |
| ***Parameter*** | ***GIDCV (1)*** | |
| Appendix IX - Semi-Volatile Organics (mg/kg) | | |
| 4-CHLOROANILINE | NR | 0.3 |
| ACENAPHTHENE | 200,000 | 0.07 J |
| ACENAPHTHYLENE | 8,000 | 0.06 J |
| ANTHRACENE | 1,000,000 | 0.06 J |
| BIS(2-ETHYLHEXYL) PHTHALATE | 10,000 | 4.3 |
| BUTYL BENZYL PHTHALATE | 310 | 0.2 J |
| DI-N-BUTYL PHTHALATE | 760 | 0.5 J |
| DIBENZOFURAN | ID | 0.1 J |
| FLUORANTHENE | 180,000 | 0.2 J |
| NAPHTHALENE | 80,000 | 0.5 |
| PHENANTHRENE | 8,000 | 0.3 |
| PYRENE | 110,000 | 0.3 J |
| Appendix IX - Pesticides/Herbicides (mg/kg) | | |
| AROCLOR 1254 | 9.9 (3) | 0.1 J |
| Appendix IX - Metals (mg/kg) | | |
| ANTIMONY, TOTAL | 1,200 | 34.5 |
| ARSENIC, TOTAL | 61 | 117 |
| BARIUM, TOTAL | 250,000 | 657 |
| BERYLLIUM, TOTAL | 3,100 | 3.28 |
| CADMIUM, TOTAL | 4,100 | 34.1 |
| CHROMIUM, TOTAL | 17,000 (2) | [illegible] |
| COBALT, TOTAL | 18,000 | 20 |
| COPPER, TOTAL | 140,000 | 155 |
| LEAD, TOTAL | 900 | 1,790 |
| MERCURY, TOTAL | 1,100 | 5 |
| NICKEL, TOTAL | 270,000 | 486 |
| SELENIUM, TOTAL | 18,000 | 10.9 |
| SILVER, TOTAL | 17,000 | 15.3 |
| THALLIUM, TOTAL | 240 | 4.12 |
| TIN, TOTAL | NR | 153 |
| VANADIUM, TOTAL | 10,000 | 52 |
| ZINC, TOTAL | 1,000,000 | [illegible] |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
☐ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.9**

**SWMU #31**
**FORMER SURFACE IMPOUNDMENT**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| | | |
|---|---|---|
| *Location:* | *BH-31-2* | *SS-31-2* |
| *Sample Interval:* | *1-1.5 ft.* | *0-2 ft.* |
| *Sample ID:* | *S-7097-121798-DS-061* | *S-7097-121198-DS-055* |
| *Sample Date:* | *12/17/98* | *12/11/98* |
| ***Parameter*** | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | |
| ISOPROPYL ALCOHOL A | NA | 0.3 NJ |
| Appendix IX - Semi-volatile TIC (mg/kg) | | |
| PENTADECANE A | 0.6 NJ | NA |
| TETRADECANE A | 0.6 NJ | NA |
| UNKNOWN A | 1.1 NJ | NA |
| UNKNOWN B | 0.9 NJ | NA |
| UNKNOWN C | 0.7 NJ | NA |
| UNKNOWN D | 2.5 NJ | NA |
| UNKNOWN E | 5 NJ | NA |
| UNKNOWN F | 8.8 NJ | NA |
| UNKNOWN ALCOHOL A | 6.5 NJ | NA |
| UNKNOWN ALKANE A | 0.8 NJ | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively indentifed compound (TIC) and represents an estimated value.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

**TABLE 5.10**

**SWMU #33**
**FORMER SOUTH RETENTION POND**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *BH-33-1* | *BH-33-1* | *BH-33-1* |
|---|---|---|---|---|
| *Sample Interval:* | | *14-16 ft.* | *18-20 ft.* | *18-20 ft.* |
| *Sample ID:* | | *S-7097-121898-DS-065* | *S-7097-121898-DS-066* | *S-7097-121898-DS-067* |
| *Sample Date:* | | *12/18/98* | *12/18/98* | *12/18/98* |
| | | | | *Duplicate* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | ND(0.3) | 0.2 J | 0.2 J |
| PHENANTHRENE | 8,000 | ND(0.3) | 0.1 J | 0.09 J |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 6,400 | -- | -- |
| ANTIMONY, TOTAL | 1,200 | 0.07 | 0.08 J | 0.09 J |
| ARSENIC, TOTAL | 61 | 4.2 | 8.5 | 8.3 |
| BARIUM, TOTAL | 250,000 | 38 | 41 | 40 |
| BERYLLIUM, TOTAL | 3,100 | 0.29 | 0.30 | 0.31 |
| CADMIUM, TOTAL | 4,100 | 0.19 | 0.66 | 0.31 |
| CALCIUM, TOTAL | NR | 82,300 | -- | -- |
| CHROMIUM, TOTAL | 17,000 (2) | 12 | 12 | 11 |
| COBALT, TOTAL | 18,000 | 5.99 | 7.20 | 7.66 |
| COPPER, TOTAL | 140,000 | 13.4 | 17.2 | 16.3 |
| IRON, TOTAL | 1,000,000 | 15,100 | -- | -- |
| LEAD, TOTAL | 900 | 7.00 | 8.04 | 12.4 |
| MAGNESIUM, TOTAL | 1,000,000 | 23,900 | -- | -- |
| MANGANESE, TOTAL | 170,000 | 369 | -- | -- |
| MERCURY, TOTAL | 1,100 | ND(0.1) | ND(0.1) | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 17.1 | 22.2 | 23.3 |
| POTASSIUM, TOTAL | NR | 1,100 | -- | -- |
| SELENIUM, TOTAL | 18,000 | 0.23 | 0.3 | 0.4 |
| SILVER, TOTAL | 17,000 | 0.06 | 0.08 | 0.07 |
| SODIUM, TOTAL | 1,000,000 | 141 | -- | -- |
| THALLIUM, TOTAL | 240 | 0.23 | 0.50 | 0.50 |
| VANADIUM, TOTAL | 10,000 | 18 | 18 | 17 |
| ZINC, TOTAL | 1,000,000 | 39 | 65 | 65 |
| Miscellaneous (%) | | | | |
| SOLIDS, TOTAL | NR | 83.1 | 88.1 | 88.5 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.10

SWMU #33
FORMER SOUTH RETENTION POND
SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | | *BH-33-2* | *BH-33-2* | *BH-33-3* |
|---|---|---|---|---|
| *Sample Interval:* | | *16-18 ft.* | *34-36 ft.* | *15-16 ft.* |
| *Sample ID:* | | *S-7097-121798-DS-063* | *S-7097-121798-DS-064* | *S-7097-120998-DS-048* |
| *Sample Date:* | | *12/17/98* | *12/17/98* | *12/9/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| PHENANTHRENE | 8,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 6,020 | 1,750 | 6,060 |
| ANTIMONY, TOTAL | 1,200 | 0.1 | 0.06 J | 0.05 J |
| ARSENIC, TOTAL | 61 | 6.1 | 2.3 | 4.4 |
| BARIUM, TOTAL | 250,000 | 34 | 12 | 30 |
| BERYLLIUM, TOTAL | 3,100 | 0.31 | 0.07 | 0.37 |
| CADMIUM, TOTAL | 4,100 | 0.30 | 0.1 | 0.19 |
| CALCIUM, TOTAL | NR | 79,900 | 70,400 | 74,800 |
| CHROMIUM, TOTAL | 17,000 (2) | 11 | 5 | 12 |
| COBALT, TOTAL | 18,000 | 6.27 | 2.15 | 6.12 |
| COPPER, TOTAL | 140,000 | 13.3 | 5.6 | 13.0 |
| IRON, TOTAL | 1,000,000 | 13,900 | 5,310 | 13,100 |
| LEAD, TOTAL | 900 | 7.57 | 3.04 | 7.08 |
| MAGNESIUM, TOTAL | 1,000,000 | 26,100 | 14,600 | 22,700 |
| MANGANESE, TOTAL | 170,000 | 311 | 235 | 306 |
| MERCURY, TOTAL | 1,100 | ND(0.1) | ND(0.1) | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 17.5 | 6.7 | 18.3 |
| POTASSIUM, TOTAL | NR | 1,200 | ND(400) | 1,200 |
| SELENIUM, TOTAL | 18,000 | ND(0.5) | ND(0.5) | 0.6 |
| SILVER, TOTAL | 17,000 | 0.06 | 0.02 | 0.08 |
| SODIUM, TOTAL | 1,000,000 | 167 | 110 | 123 |
| THALLIUM, TOTAL | 240 | 0.27 | 0.08 | 0.26 |
| VANADIUM, TOTAL | 10,000 | 17 | 7 | 17 |
| ZINC, TOTAL | 1,000,000 | 54 | 26 | 43 |
| Miscellaneous (%) | | | | |
| SOLIDS, TOTAL | NR | 90.1 | 97.4 | -- |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.10**

**SWMU #33**
**FORMER SOUTH RETENTION POND**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *BH-33-3* | *BH-33-4* | *BH-33-4* |
|---|---|---|---|---|
| *Sample Interval:* | | *26-28 ft.* | *16-18 ft.* | *20-22 ft.* |
| *Sample ID:* | | *S-7097-121098-DS-052* | *S-7097-121698-DS-058* | *S-7097-121698-DS-059* |
| *Sample Date:* | | *12/10/98* | *12/16/98* | *12/16/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | 0.1 J | ND(0.3) | 0.1 J |
| PHENANTHRENE | 8,000 | 0.09 J | ND(0.3) | ND(0.3) |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 7,010 | 4,780 | 5,920 |
| ANTIMONY, TOTAL | 1,200 | 0.05 J | 0.1 | 0.1 |
| ARSENIC, TOTAL | 61 | 6.7 | 3.8 | 6.6 |
| BARIUM, TOTAL | 250,000 | 43 | 26 | 36 |
| BERYLLIUM, TOTAL | 3,100 | 0.42 | 0.22 | 0.28 |
| CADMIUM, TOTAL | 4,100 | 0.39 | 0.18 | 0.27 |
| CALCIUM, TOTAL | NR | 73,700 | 71,100 | 71,600 |
| CHROMIUM, TOTAL | 17,000 (2) | 14 | 9 | 13 |
| COBALT, TOTAL | 18,000 | 9.01 | 5.12 | 6.21 |
| COPPER, TOTAL | 140,000 | 22.1 | 10.9 | 14.2 |
| IRON, TOTAL | 1,000,000 | 16,400 | 11,000 | 15,200 |
| LEAD, TOTAL | 900 | 10.2 | 5.65 | 6.97 |
| MAGNESIUM, TOTAL | 1,000,000 | 24,500 | 20,900 | 24,200 |
| MANGANESE, TOTAL | 170,000 | 340 | 279 | 292 |
| MERCURY, TOTAL | 1,100 | 0.02 J | ND(0.1) | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 27.2 | 14.2 | 18.9 |
| POTASSIUM, TOTAL | NR | 1400 | 730 | 1,200 |
| SELENIUM, TOTAL | 18,000 | 0.7 | ND(0.5) | 0.5 |
| SILVER, TOTAL | 17,000 | 0.09 | 0.05 | 0.06 |
| SODIUM, TOTAL | 1,000,000 | 138 | 105 | 120 |
| THALLIUM, TOTAL | 240 | 0.61 | 0.20 | 0.38 |
| VANADIUM, TOTAL | 10,000 | 19 | 14 | 18 |
| ZINC, TOTAL | 1,000,000 | 49 | 39 | 42 |
| Miscellaneous (%) | | | | |
| SOLIDS, TOTAL | NR | -- | 90.5 | 89.8 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.10**

**SWMU #33**
**FORMER SOUTH RETENTION POND**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *BH-33-4* | *BH-33-5* | *BH-33-6* |
|---|---|---|---|---|
| *Sample Interval:* | | *20-22 ft.* | *28-30 ft.* | *22-24 ft.* |
| *Sample ID:* | | *S-7097-121698-DS-060* | *S-7097-120998-DS-047* | *S-7097-121198-DS-057* |
| *Sample Date:* | | *12/16/98* | *12/9/98* | *12/11/98* |
| | | *Duplicate* | | |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | 0.1 J | ND(0.3) | 0.2 J |
| PHENANTHRENE | 8,000 | 0.08 J | ND(0.3) | 0.08 J |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 6,280 | 4,080 | 6,750 |
| ANTIMONY, TOTAL | 1,200 | 0.2 | 0.05 J | 0.05 J |
| ARSENIC, TOTAL | 61 | 8.0 | 4.4 | 7.2 |
| BARIUM, TOTAL | 250,000 | 38 | 30 | 38 |
| BERYLLIUM, TOTAL | 3,100 | 0.31 | 0.23 | 0.42 |
| CADMIUM, TOTAL | 4,100 | 0.28 | 0.22 | 0.37 |
| CALCIUM, TOTAL | NR | 71,700 | 77,200 | 76,100 |
| CHROMIUM, TOTAL | 17,000 (2) | 12 | 9 | 13 |
| COBALT, TOTAL | 18,000 | 7.24 | 5.13 | 7.41 |
| COPPER, TOTAL | 140,000 | 16.1 | 10.3 | 15.5 |
| IRON, TOTAL | 1,000,000 | 15,200 | 10,200 | 14,900 |
| LEAD, TOTAL | 900 | 9.10 | 4.94 | 8.52 |
| MAGNESIUM, TOTAL | 1,000,000 | 21,700 | 23,000 | 21,000 |
| MANGANESE, TOTAL | 170,000 | 314 | 317 | 284 |
| MERCURY, TOTAL | 1,100 | ND(0.1) | ND(0.1) | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 23.0 | 12.7 | 22.7 |
| POTASSIUM, TOTAL | NR | 1,200 | 680 | 1,500 |
| SELENIUM, TOTAL | 18,000 | 0.4 J | 0.4 J | 0.7 |
| SILVER, TOTAL | 17,000 | 0.08 | 0.06 | 0.09 J |
| SODIUM, TOTAL | 1,000,000 | 122 | 140 | 140 |
| THALLIUM, TOTAL | 240 | 0.54 | 0.19 | 0.51 |
| VANADIUM, TOTAL | 10,000 | 18 | 14 | 20 |
| ZINC, TOTAL | 1,000,000 | 45 | 35 | 48 |
| Miscellaneous (%) | | | | |
| SOLIDS, TOTAL | NR | 89.3 | -- | -- |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.11

SWMU #33
FORMER SOUTH RETENTION POND
SUMMARY OF DETECTED APPENDIX IX RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | | *BH-33-1* | *BH-33-1* |
|---|---|---|---|
| *Sample Interval:* | | *18-20 ft.* | *18-20 ft.* |
| *Sample ID:* | | *S-7097-121898-DS-066* | *S-7097-121898-DS-067* |
| *Sample Date:* | | *12/18/98* | *12/18/98* |
| | | | *Duplicate* |
| *Parameter* | *GIDCV (1)* | | |
| Appendix IX - Semi-Volatile Organics (mg/kg) | | | |
| 2-METHYLNAPHTHALENE | 40,000 | 0.2 J | 0.2 J |
| NAPHTHALENE | 80,000 | 0.07 J | 0.07 J |
| PHENANTHRENE | 8,000 | 0.1 J | 0.09 J |
| Appendix IX - Metals (mg/kg) | | | |
| ANTIMONY, TOTAL | 1,200 | 0.08 J | 0.09 J |
| ARSENIC, TOTAL | 61 | 8.5 | 8.3 |
| BARIUM, TOTAL | 250,000 | 41 | 40 |
| BERYLLIUM, TOTAL | 3,100 | 0.3 | 0.31 |
| CADMIUM, TOTAL | 4,100 | 0.66 | 0.31 |
| CHROMIUM, TOTAL | 17,000 (2) | 12 | 11 |
| COBALT, TOTAL | 18,000 | 7.2 | 7.66 |
| COPPER, TOTAL | 140,000 | 17.2 | 16.3 |
| LEAD, TOTAL | 900 | 8.04 | 12.4 |
| NICKEL, TOTAL | 270,000 | 22.2 | 23.3 |
| SELENIUM, TOTAL | 18,000 | 0.3 J | 0.4 J |
| SILVER, TOTAL | 17,000 | 0.08 | 0.07 |
| THALLIUM, TOTAL | 240 | 0.5 | 0.5 |
| VANADIUM, TOTAL | 10,000 | 18 | 17 |
| ZINC, TOTAL | 1,000,000 | 65 | 65 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.12**

**SWMU #33**
**FORMER SOUTH RETENTION POND**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | *BH-33-1* | *BH-33-1* | *BH-33-1* |
|---|---|---|---|
| *Sample Interval:* | *14-16 ft.* | *18-20 ft.* | *18-20 ft.* |
| *Sample ID:* | *S-7097-121898-DS-065* | *S-7097-121898-DS-066* | *S-7097-121898-DS-067* |
| *Sample Date:* | *12/18/98* | *12/18/98* | *12/18/98* |
| | | | *Duplicate* |
| *Parameter* | | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | | |
| ISOPROPYL ALCOHOL A | NI | NA | NA |
| SUBSTITUTED ALKANE A | NI | NA | NA |
| SUBSTITUTED ALKANE #1 A | NI | NA | NA |
| UNDECANE A | NI | NA | NA |
| UNKNOWN ALKANE A | NI | NA | NA |
| UNKNOWN ALKANE #1 A | NI | NA | NA |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| DECANE A | NI | NA | NA |
| HEPTADECANE A | 0.5 NJ | NA | NA |
| HEXADECANE A | 0.5 NJ | NA | NA |
| NONADECANE A | 0.5 NJ | NA | NA |
| PENTADECANE A | 0.6 NJ | NA | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL A | NI | NA | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | 0.7 NJ | NA | NA |
| TETRADECANE A | 0.6 NJ | NA | NA |
| TRIDECANE A | 0.5 NJ | NA | NA |
| TRIDECANE B | NI | NA | NA |
| UNKNOWN A | 0.7 NJ | NA | NA |
| UNKNOWN B | NI | NA | NA |
| UNKNOWN C | NI | NA | NA |
| UNKNOWN ALKANE A | 0.5 NJ | NA | NA |
| UNKNOWN ALKANE B | 0.5 NJ | NA | NA |
| UNKNOWN ALKANE C | NI | NA | NA |
| UNKNOWN ALKANE D | NI | NA | NA |
| UNKNOWN ALKANE E | NI | NA | NA |
| UNKNOWN ALKANE #1 A | NI | NA | NA |
| UNKNOWN ALKANE #2 A | NI | NA | NA |
| UNKNOWN HALOGENATED HYDROCARBON A | NI | NA | NA |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| DECANE A | NA | 0.8 NJ | 0.8 NJ |
| HEPTADECANE A | NA | 0.8 NJ | 0.8 NJ |
| HEXADECANE A | NA | 0.7 NJ | 0.8 NJ |
| ISOPROPYL ALCOHOL A | NA | NI | NI |
| NONADECANE A | NA | NI | 0.7 NJ |
| PENTADECANE A | NA | 1 NJ | 1 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA | 1.2 NJ | NI |
| TETRADECANE A | NA | 1 NJ | 1 NJ |
| TRIDECANE A | NA | 1 NJ | 1.2 NJ |
| TRIDECANE B | NA | 0.7 NJ | NI |
| UNKNOWN A | NA | NI | NI |
| UNKNOWN B | NA | NI | NI |
| UNKNOWN ALKANE A | NA | 0.1 NJ | 0.26 NJ |
| UNKNOWN ALKANE B | NA | 0.7 NJ | 1.2 NJ |
| UNKNOWN ALKANE C | NA | 0.7 NJ | 0.7 NJ |
| UNKNOWN ALKANE D | NA | NI | 0.7 NJ |
| UNKNOWN ALKANE #1 A | NA | 0.13 NJ | 0.29 NJ |
| UNKNOWN ALKANE #2 A | NA | NI | 0.15 NJ |
| UNKNOWN ALKANE #3 A | NA | NI | 0.17 NJ |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively indentified compound (TIC) and represents an estimated value.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified

TABLE 5.12

SWMU #33
FORMER SOUTH RETENTION POND
SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | *BH-33-2* | *BH-33-2* | *BH-33-3* |
|---|---|---|---|
| *Sample Interval:* | *16-18 ft.* | *34-36 ft.* | *15-16 ft.* |
| *Sample ID:* | *S-7097-121798-DS-063* | *S-7097-121798-DS-064* | *S-7097-120998-DS-048* |
| *Sample Date:* | *12/17/98* | *12/17/98* | *12/9/98* |
| *Parameter* | | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | | |
| ISOPROPYL ALCOHOL A | NI | NI | NI |
| SUBSTITUTED ALKANE A | NI | NI | NI |
| SUBSTITUTED ALKANE #1 A | NI | NI | NI |
| UNDECANE A | NI | NI | NI |
| UNKNOWN ALKANE A | NI | NI | NI |
| UNKNOWN ALKANE #1 A | NI | NI | NI |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| DECANE A | NI | NI | NI |
| HEPTADECANE A | 0.4 NJ | NI | 0.5 NJ |
| HEXADECANE A | 0.4 NJ | NI | 0.5 NJ |
| NONADECANE A | NI | 0.1 NJ | NI |
| PENTADECANE A | 0.5 NJ | NI | 0.7 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL A | NI | NI | 0.8 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NI | NI | NI |
| TETRADECANE A | 0.5 NJ | NI | 0.6 NJ |
| TRIDECANE A | 0.5 NJ | NI | 0.7 NJ |
| TRIDECANE B | NI | NI | NI |
| UNKNOWN A | 0.7 NJ | 0.6 NJ | 1.5 NJ |
| UNKNOWN B | NI | 0.2 NJ | NI |
| UNKNOWN C | NI | NI | NI |
| UNKNOWN ALKANE A | 0.12 NJ | 0.2 NJ | 0.5 NJ |
| UNKNOWN ALKANE B | 0.7 NJ | NI | 0.5 NJ |
| UNKNOWN ALKANE C | 0.4 NJ | NI | 0.5 NJ |
| UNKNOWN ALKANE D | 0.4 NJ | NI | NI |
| UNKNOWN ALKANE E | 0.4 NJ | NI | NI |
| UNKNOWN ALKANE #1 A | NI | NI | NI |
| UNKNOWN ALKANE #2 A | NI | NI | NI |
| UNKNOWN HALOGENATED HYDROCARBON A | NI | 0.2 NJ | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| DECANE A | NA | NA | NA |
| HEPTADECANE A | NA | NA | NA |
| HEXADECANE A | NA | NA | NA |
| ISOPROPYL ALCOHOL A | NA | NA | NA |
| NONADECANE A | NA | NA | NA |
| PENTADECANE A | NA | NA | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA | NA | NA |
| TETRADECANE A | NA | NA | NA |
| TRIDECANE A | NA | NA | NA |
| TRIDECANE B | NA | NA | NA |
| UNKNOWN A | NA | NA | NA |
| UNKNOWN B | NA | NA | NA |
| UNKNOWN ALKANE A | NA | NA | NA |
| UNKNOWN ALKANE B | NA | NA | NA |
| UNKNOWN ALKANE C | NA | NA | NA |
| UNKNOWN ALKANE D | NA | NA | NA |
| UNKNOWN ALKANE #1 A | NA | NA | NA |
| UNKNOWN ALKANE #2 A | NA | NA | NA |
| UNKNOWN ALKANE #3 A | NA | NA | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively indentified compound (TIC) and represents an estimated value.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified

**TABLE 5.12**

**SWMU #33**
**FORMER SOUTH RETENTION POND**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | *BH-33-3* | *BH-33-4* | *BH-33-4* |
|---|---|---|---|
| *Sample Interval:* | *26-28 ft.* | *16-18 ft.* | *20-22 ft.* |
| *Sample ID:* | *S-7097-121098-DS-052* | *S-7097-121698-DS-058* | *S-7097-121698-DS-059* |
| *Sample Date:* | *12/10/98* | *12/16/98* | *12/16/98* |
| ***Parameter*** | | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | | |
| ISOPROPYL ALCOHOL A | 3 NJ | NA | NI |
| SUBSTITUTED ALKANE A | 0.16 NJ | NA | NI |
| SUBSTITUTED ALKANE #1 A | 0.24 NJ | NA | NI |
| UNDECANE A | 0.27 NJ | NA | NI |
| UNKNOWN ALKANE A | 0.15 NJ | NA | NI |
| UNKNOWN ALKANE #1 A | 0.47 NJ | NA | NI |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| DECANE A | 0.7 NJ | NA | 0.7 NJ |
| HEPTADECANE A | 0.9 NJ | NA | 0.6 NJ |
| HEXADECANE A | 0.7 NJ | NA | 0.6 NJ |
| NONADECANE A | NI | NA | NI |
| PENTADECANE A | 1 NJ | NA | 0.8 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL A | 1.3 NJ | NA | NI |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NI | NA | 1 NJ |
| TETRADECANE A | 1 NJ | NA | 0.7 NJ |
| TRIDECANE A | 0.9 NJ | NA | 0.9 NJ |
| TRIDECANE B | 0.8 NJ | NA | NI |
| UNKNOWN A | NI | NA | 0.7 NJ |
| UNKNOWN B | NI | NA | NI |
| UNKNOWN C | NI | NA | NI |
| UNKNOWN ALKANE A | 0.7 NJ | NA | 0.12 NJ |
| UNKNOWN ALKANE B | 0.7 NJ | NA | 0.6 NJ |
| UNKNOWN ALKANE C | NI | NA | 0.6 NJ |
| UNKNOWN ALKANE D | NI | NA | NI |
| UNKNOWN ALKANE E | NI | NA | NI |
| UNKNOWN ALKANE #1 A | NI | NA | 0.14 NJ |
| UNKNOWN ALKANE #2 A | NI | NA | NI |
| UNKNOWN HALOGENATED HYDROCARBON A | NI | NA | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| DECANE A | NA | NI | NA |
| HEPTADECANE A | NA | 0.4 NJ | NA |
| HEXADECANE A | NA | 0.4 NJ | NA |
| ISOPROPYL ALCOHOL A | NA | 0.61 NJ | NA |
| NONADECANE A | NA | NI | NA |
| PENTADECANE A | NA | 0.5 NJ | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA | 0.6 NJ | NA |
| TETRADECANE A | NA | 0.5 NJ | NA |
| TRIDECANE A | NA | 0.4 NJ | NA |
| TRIDECANE B | NA | NI | NA |
| UNKNOWN A | NA | 1 NJ | NA |
| UNKNOWN B | NA | 0.4 NJ | NA |
| UNKNOWN ALKANE A | NA | 0.4 NJ | NA |
| UNKNOWN ALKANE B | NA | 0.4 NJ | NA |
| UNKNOWN ALKANE C | NA | NI | NA |
| UNKNOWN ALKANE D | NA | NI | NA |
| UNKNOWN ALKANE #1 A | NA | NI | NA |
| UNKNOWN ALKANE #2 A | NA | NI | NA |
| UNKNOWN ALKANE #3 A | NA | NI | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively indentified compound (TIC) and represents an estimated value.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified

**TABLE 5.12**

**SWMU #33**
**FORMER SOUTH RETENTION POND**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | *BH-33-4* | *BH-33-5* | *BH-33-6* |
|---|---|---|---|
| *Sample Interval:* | *20-22 ft.* | *28-30 ft.* | *22-24 ft.* |
| *Sample ID:* | *S-7097-121698-DS-060* | *S-7097-120998-DS-047* | *S-7097-121198-DS-057* |
| *Sample Date:* | *12/16/98* | *12/9/98* | *12/11/98* |
| | *Duplicate* | | |
| *Parameter* | | | |
| TCL Volatile Organic Compounds TIC (mg/kg) | | | |
| ISOPROPYL ALCOHOL A | NI | NI | NI |
| SUBSTITUTED ALKANE A | NI | NI | 0.13 NJ |
| SUBSTITUTED ALKANE #1 A | NI | NI | NI |
| UNDECANE A | NI | NI | 0.14 NJ |
| UNKNOWN ALKANE A | NI | NI | 0.26 NJ |
| UNKNOWN ALKANE #1 A | NI | NI | 0.25 NJ |
| TCL Semi-volatile Organics TIC (mg/kg) | | | |
| DECANE A | 0.7 NJ | NI | 0.8 NJ |
| HEPTADECANE A | 0.8 NJ | NI | 0.8 NJ |
| HEXADECANE A | 0.7 NJ | NI | 0.7 NJ |
| NONADECANE A | NI | NI | NI |
| PENTADECANE A | 0.9 NJ | NI | 1 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL A | NI | NI | NI |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | 1.2 NJ | NI | NI |
| TETRADECANE A | 0.9 NJ | NI | 0.9 NJ |
| TRIDECANE A | 1 NJ | NI | 0.9 NJ |
| TRIDECANE B | 0.7 NJ | NI | 0.7 NJ |
| UNKNOWN A | 0.9 NJ | 0.8 NJ | NI |
| UNKNOWN B | NI | 0.2 NJ | NI |
| UNKNOWN C | NI | 0.2 NJ | NI |
| UNKNOWN ALKANE A | 0.17 NJ | NI | 1.2 NJ |
| UNKNOWN ALKANE B | 0.7 NJ | NI | 0.7 NJ |
| UNKNOWN ALKANE C | NI | NI | 0.7 NJ |
| UNKNOWN ALKANE D | NI | NI | NI |
| UNKNOWN ALKANE E | NI | NI | NI |
| UNKNOWN ALKANE #1 A | 0.17 NJ | NI | NI |
| UNKNOWN ALKANE #2 A | 0.12 NJ | NI | NI |
| UNKNOWN HALOGENATED HYDROCARBON A | NI | 0.6 NJ | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| DECANE A | NA | NA | NA |
| HEPTADECANE A | NA | NA | NA |
| HEXADECANE A | NA | NA | NA |
| ISOPROPYL ALCOHOL A | NA | NA | NA |
| NONADECANE A | NA | NA | NA |
| PENTADECANE A | NA | NA | NA |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NA | NA | NA |
| TETRADECANE A | NA | NA | NA |
| TRIDECANE A | NA | NA | NA |
| TRIDECANE B | NA | NA | NA |
| UNKNOWN A | NA | NA | NA |
| UNKNOWN B | NA | NA | NA |
| UNKNOWN ALKANE A | NA | NA | NA |
| UNKNOWN ALKANE B | NA | NA | NA |
| UNKNOWN ALKANE C | NA | NA | NA |
| UNKNOWN ALKANE D | NA | NA | NA |
| UNKNOWN ALKANE #1 A | NA | NA | NA |
| UNKNOWN ALKANE #2 A | NA | NA | NA |
| UNKNOWN ALKANE #3 A | NA | NA | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is a tentively indentified compound (TIC) and represents an estimated value.
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified

**TABLE 5.13**

**SWMW #34**
**NORTH RETENTION POND**
**SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *SD-34-1* | *BH-34-1* | *BH-34-1* |
|---|---|---|---|---|
| *Sample Interval:* | | *0-1 ft.* | *2-4 ft.* | *2-4 ft.* |
| *Sample ID:* | | *SD-7097-120498-TJ-040* | *S-7097-120398-TJ-043* | *S-7097-120398-TJ-042* |
| *Sample Date:* | | *12/4/98* | *12/3/98* | *12/3/98* |
| | | | | *Duplicate* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | 0.2 J | ND(0.3) | ND(0.3) |
| ACENAPHTHENE | 200,000 | 1.9 | ND(0.3) | ND(0.3) |
| ANTHRACENE | 1,000,000 | 4.5 | ND(0.3) | ND(0.3) |
| BENZ0(A)ANTHRACENE | 100 | 12 | 0.1 J | ND(0.3) |
| BENZO(A)PYRENE | 10 | 12 | 0.1 J | ND(0.3) |
| BENZO(B)FLUORANTHENE | 100 | 13 | 0.1 J | ND(0.3) |
| BENZO(G,H,I)PERYLENE | 9,100 | 4.2 | 0.1 J | ND(0.3) |
| BENZO(K)FLUORANTHENE | 1,000 | 11 | 0.1 J | ND(0.3) |
| BIS(2-ETHYLHEXYL) PHTHALATE | 10,000 | 4.1 | ND(0.3) | ND(0.3) |
| CARBAZOLE | 3,700 | 2.9 | ND(0.3) | ND(0.3) |
| CHRYSENE | 10,000 | 14 | 0.2 J | ND(0.3) |
| DI-N-OCTYL PHTHALATE | 28,000 | 0.1 J | ND(0.3) | ND(0.3) |
| DIBENZ(A,H)ANTHRACENE | 10 | 1.4 | ND(0.3) | ND(0.3) |
| DIBENZOFURAN | ID | 1.3 | ND(0.3) | ND(0.3) |
| FLUORANTHENE | 180,000 | 33 | 0.4 | ND(0.3) |
| FLUORENE | 130,000 | 2.8 | ND(0.3) | ND(0.3) |
| INDENO(1,2,3-CD)PYRENE | 100 | 7 | 0.1J | ND(0.3) |
| NAPHTHALENE | 80,000 | 0.3 | ND(0.3) | ND(0.3) |
| PHENANTHRENE | 8,000 | 26 | 0.2J | ND(0.3) |
| PYRENE | 110,000 | 28 | 0.3J | ND(0.3) |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 2,320 | 6,540 | 6,680 |
| ANTIMONY, TOTAL | 1,200 | U(0.04) J | U(0.05) J | U(0.03) J |
| ARSENIC, TOTAL | 61 | 3.9 | 5.7 | 4.3 |
| BARIUM, TOTAL | 250,000 | 15 | 32 | 35 |
| BERYLLIUM, TOTAL | 3,100 | 0.17 | 0.28 | 0.23 |
| CADMIUM, TOTAL | 4,100 | 0.33 | 0.21 | 0.23 |
| CALCIUM, TOTAL | NR | 58,400 | 37,600 | 49,800 |
| CHROMIUM, TOTAL | 17,000 (2) | 6 | 10 | 11 |
| COBALT, TOTAL | 18,000 | 4.12 | 4.69 | 4.76 |
| COPPER, TOTAL | 140,000 | 10.1 | 10.7 | 10.4 |
| IRON, TOTAL | 1,000,000 | 6,440 | 11,500 | 13,000 |
| LEAD, TOTAL | 900 | 15.5 | 11 | 6.38 |
| MAGNESIUM, TOTAL | 1,000,000 | 11,900 | 11,800 | 13,600 |
| MANGANESE, TOTAL | 170,000 | 228 | 323 | 353 |
| MERCURY, TOTAL | 1,100 | ND(0.1) | 0.03 J | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 11.4 | 12.9 | 13.1 |
| POTASSIUM, TOTAL | NR | ND(400) | 660 | 680 |
| SELENIUM, TOTAL | 18,000 | 0.6 | 0.7 | 0.9 |
| SILVER, TOTAL | 17,000 | 0.03 | 0.06 | 0.05 |
| SODIUM, TOTAL | 1,000,000 | 510 | 187 | 262 |
| THALLIUM, TOTAL | 240 | 0.16 | 0.19 | 0.18 |
| VANADIUM, TOTAL | 10,000 | 9 | 17 | 17 |
| ZINC, TOTAL | 1,000,000 | 59 | 44 | 39 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not -detect at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

TABLE 5.13

SWMW #34
NORTH RETENTION POND
SUMMARY OF DETECTED TCL/TAL RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | | *BH-34-2* | *BH-34-3* | *BH-34-4* |
|---|---|---|---|---|
| *Sample Interval:* | | *2-4 ft.* | *2-4 ft.* | *2-4 ft.* |
| *Sample ID:* | | *S-7097-120398-TJ-039* | *S-7097-120398-TJ-038* | *S-7097-120898-TJ-046* |
| *Sample Date:* | | *12/3/98* | *12/3/98* | *12/8/98* |
| *Parameter* | *GIDCV (1)* | | | |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| 2-METHYLNAPHTHALENE | 40,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| ACENAPHTHENE | 200,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| ANTHRACENE | 1,000,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZ0(A)ANTHRACENE | 100 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(A)PYRENE | 10 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(B)FLUORANTHENE | 100 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(G,H,I)PERYLENE | 9,100 | ND(0.3) | ND(0.3) | ND(0.3) |
| BENZO(K)FLUORANTHENE | 1,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| BIS(2-ETHYLHEXYL) PHTHALATE | 10,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| CARBAZOLE | 3,700 | ND(0.3) | ND(0.3) | ND(0.3) |
| CHRYSENE | 10,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| DI-N-OCTYL PHTHALATE | 28,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| DIBENZ(A,H)ANTHRACENE | 10 | ND(0.3) | ND(0.3) | ND(0.3) |
| DIBENZOFURAN | ID | ND(0.3) | ND(0.3) | ND(0.3) |
| FLUORANTHENE | 180,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| FLUORENE | 130,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| INDENO(1,2,3-CD)PYRENE | 100 | ND(0.3) | ND(0.3) | ND(0.3) |
| NAPHTHALENE | 80,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| PHENANTHRENE | 8,000 | ND(0.3) | ND(0.3) | ND(0.3) |
| PYRENE | 110,000 | 0.06 J | ND(0.3) | ND(0.3) |
| TAL Metals (mg/kg) | | | | |
| ALUMINUM, TOTAL | 660,000 | 6,960 | 6,390 | 6,370 |
| ANTIMONY, TOTAL | 1,200 | U(0.08) J | 0.07 | U(0.03) J |
| ARSENIC, TOTAL | 61 | 5.4 | 5.08 | 6.5 |
| BARIUM, TOTAL | 250,000 | 35 | 28 | 37 |
| BERYLLIUM, TOTAL | 3,100 | 0.32 | 0.24 | 0.31 |
| CADMIUM, TOTAL | 4,100 | 0.22 | 0.29 | 0.19 |
| CALCIUM, TOTAL | NR | 64,400 | 64,500 | 70,300 |
| CHROMIUM, TOTAL | 17,000 (2) | 12 | 11 | 11 |
| COBALT, TOTAL | 18,000 | 5.52 | 4.85 | 6.39 |
| COPPER, TOTAL | 140,000 | 12.8 | 12.5 | 31.2 |
| IRON, TOTAL | 1,000,000 | 13,700 | 15,900 | 15,300 |
| LEAD, TOTAL | 900 | 8.94 | 7.08 | 7.41 |
| MAGNESIUM, TOTAL | 1,000,000 | 18,300 | 20,500 | 20,800 |
| MANGANESE, TOTAL | 170,000 | 277 | 298 | 306 |
| MERCURY, TOTAL | 1,100 | 0.03 J | ND(0.1) | ND(0.1) |
| NICKEL, TOTAL | 270,000 | 15.7 | 15.3 | 18.2 |
| POTASSIUM, TOTAL | NR | 1,040 | 1,070 | 1,230 |
| SELENIUM, TOTAL | 18,000 | 0.6 | 0.4 J | 0.4 J |
| SILVER, TOTAL | 17,000 | 0.06 | ND(0.02) | 0.07 J |
| SODIUM, TOTAL | 1,000,000 | 189 | 410 | 131 |
| THALLIUM, TOTAL | 240 | 0.20 | 0.27 | 0.35 |
| VANADIUM, TOTAL | 10,000 | 19 | 19 | 16 |
| ZINC, TOTAL | 1,000,000 | 44 | 50 | 43 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not -detect at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.14**

**SWMU #34**
**NORTH RETENTION POND**
**SUMMARY OF DETECTED APPENDIX IX RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| | | |
|---|---|---|
| *Location:* | | *SD-34-2* |
| *Sample Interval:* | | *0-1 ft.* |
| *Sample ID:* | | *SD-7097-120398-TJ-041* |
| *Sample Date:* | | *12/3/98* |
| *Parameter* | *GIDCV (1)* | |
| Appendix IX - Semi-Volatile Organics (mg/kg) | | |
| BENZ0(A)ANTHRACENE | 100 | 0.2 J |
| BENZO(A)PYRENE | 10 | 0.3 |
| BENZO(B)FLUORANTHENE | 100 | 0.3 |
| BENZO(G,H,I)PERYLENE | 9,100 | 0.2 J |
| BENZO(K)FLUORANTHENE | 1,000 | 0.3 |
| BIS(2-ETHYLHEXYL) PHTHALATE | 10,000 | 0.1 J |
| CHRYSENE | 10,000 | 0.4 |
| DIBENZ(A,H)ANTHRACENE | 10 | 0.04 J |
| FLUORANTHENE | 180,000 | 0.9 |
| INDENO(1,2,3-CD)PYRENE | 100 | 0.3 J |
| PHENANTHRENE | 8,000 | 0.4 |
| PYRENE | 110,000 | 0.6 |
| Appendix IX - Metals (mg/kg) | | |
| ANTIMONY, TOTAL | 1,200 | U(0.04) J |
| ARSENIC, TOTAL | 61 | 5.4 |
| BARIUM, TOTAL | 250,000 | 36 |
| BERYLLIUM, TOTAL | 3,100 | 0.31 |
| CADMIUM, TOTAL | 4,100 | 0.21 |
| CHROMIUM, TOTAL | 17,000 (2) | 13 |
| COBALT, TOTAL | 18,000 | 6.35 |
| COPPER, TOTAL | 140,000 | 13.3 |
| LEAD, TOTAL | 900 | 8.25 |
| MERCURY, TOTAL | 1,100 | 0.02 J |
| NICKEL, TOTAL | 270,000 | 17.1 |
| SELENIUM, TOTAL | 18,000 | 0.9 |
| SILVER, TOTAL | 17,000 | 0.05 |
| THALLIUM, TOTAL | 240 | 0.24 |
| VANADIUM, TOTAL | 10,000 | 20 |
| ZINC, TOTAL | 1,000,000 | 55 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
U ( ) - Parameter is qualified as not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

**TABLE 5.15**

**SWMU #34**
**NORTH RETENTION POND**
**SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | *SD-34-1* | *SD-34-2* | *BH-34-1* |
|---|---|---|---|
| *Sample Interval:* | *0-1 ft.* | *0-1 ft.* | *2-4 ft.* |
| *Sample ID:* | *SD-7097-120498-TJ-040* | *SD-7097-120398-TJ-041* | *S-7097-120398-TJ-043* |
| *Sample Date:* | *12/4/98* | *12/3/98* | *12/3/98* |
| *Parameter* | | | |
| TCL Volatile Organic Compounds (mg/kg) | | | |
| UNKNOWN A | 0.29 NJ | NA | NI |
| UNKNOWN ALKANE A | NI | NA | NI |
| UNKNOWN ALKANE #1 A | NI | NA | NI |
| UNKNOWN ALKANE #2 A | NI | NA | NI |
| UNKNOWN ALKANE #3 A | NI | NA | NI |
| TCL Semi-volatile Organics (mg/kg) | | | |
| (6H)CYCLOBUTA[JK]PHENANTHRENE A | 4.9 NJ | NA | NI |
| .GAMMA.-SITOSTEROL A | NI | NA | 0.4 NJ |
| 11H-BENZOFLUORENE ISOMER A | 4.8 NJ | NA | NI |
| 11H-BENZOFLUORENE ISOMER B | 3.7 NJ | NA | NI |
| 2-PROPENOIC ACID, 2-METHYL-, DODECY A | 3.8 NJ | NA | NI |
| 7H-BENZ[DE]ANTHRACEN-7-ONE A | 2.5 NJ | NA | NI |
| 9,10-ANTHRACENEDIONE A | 2.1 NJ | NA | NI |
| BENZO(E)PYRENE A | 8 NJ | NA | NI |
| DODECANE A | NI | NA | NI |
| HEPTADECANE A | NI | NA | NI |
| HEXADECANE A | NI | NA | NI |
| METHYLPYRENE ISOMER A | 1.9 NJ | NA | NI |
| NONADECANE A | NI | NA | NI |
| PENTADECANE A | NI | NA | 0.3 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NI | NA | NI |
| TETRADECANE A | NI | NA | NI |
| TRIDECANE A | NI | NA | NI |
| UNKNOWN A | 2.3 NJ | NA | 0.6 NJ |
| UNKNOWN B | NI | NA | 0.3 NJ |
| UNKNOWN C | NI | NA | 0.5 NJ |
| UNKNOWN ALDEHYDE A | NI | NA | 0.3 NJ |
| UNKNOWN ALKANE A | NI | NA | 0.4 NJ |
| UNKNOWN ALKANE B | NI | NA | 0.5 NJ |
| UNKNOWN ALKANE C | NI | NA | 0.5 NJ |
| UNKNOWN ALKANE D | NI | NA | 0.3 NJ |
| UNKNOWN PAH A | 3.1 NJ | NA | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | |
| HEPTADECANE A | NA | 0.4 NJ | NA |
| HEXADECANE A | NA | 0.3 NJ | NA |
| PENTADECANE A | NA | 0.4 NJ | NA |
| TETRADECANE A | NA | 0.4 NJ | NA |
| UNKNOWN A | NA | 0.8 NJ | NA |
| UNKNOWN ALKANE A | NA | 0.5 NJ | NA |
| UNKNOWN ALKANE B | NA | 0.3 NJ | NA |
| UNKNOWN ALKANE C | NA | 0.3 NJ | NA |
| UNKNOWN ALKANE D | NA | 0.3 NJ | NA |
| UNKNOWN ALKANE E | NA | 0.4 NJ | NA |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
NJ - Parameter is tentively identified compound (TIC) and represents an estimated value.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

TABLE 5.15

SWMU #34
NORTH RETENTION POND
SUMMARY OF DETECTED TIC RESULTS IN SOIL SAMPLES
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Location:* | *BH-34-1* | *BH-34-2* | *BH-34-3* | *BH-34-4* |
|---|---|---|---|---|
| *Sample Interval:* | *2-4 ft.* | *2-4 ft.* | *2-4 ft.* | *2-4 ft.* |
| *Sample ID:* | *S-7097-120398-TJ-042* | *S-7097-120398-TJ-039* | *S-7097-120398-TJ-038* | *S-7097-120898-TJ-046* |
| *Sample Date:* | *12/3/98* | *12/3/98* | *12/3/98* | *12/8/98* |
| | *Duplicate* | | | |
| *Parameter* | | | | |
| TCL Volatile Organic Compounds (mg/kg) | | | | |
| UNKNOWN A | 0.36 NJ | NI | NI | 0.14 NJ |
| UNKNOWN ALKANE A | NI | NI | NI | 0.36 NJ |
| UNKNOWN ALKANE #1 A | NI | NI | NI | 0.39 NJ |
| UNKNOWN ALKANE #2 A | NI | NI | NI | 0.22 NJ |
| UNKNOWN ALKANE #3 A | NI | NI | NI | 0.21 NJ |
| TCL Semi-volatile Organics (mg/kg) | | | | |
| (6H)CYCLOBUTA[JK]PHENANTHRENE A | NI | NI | NI | NI |
| .GAMMA.-SITOSTEROL A | NI | NI | NI | NI |
| 11H-BENZOFLUORENE ISOMER A | NI | NI | NI | NI |
| 11H-BENZOFLUORENE ISOMER B | NI | NI | NI | NI |
| 2-PROPENOIC ACID, 2-METHYL-, DODECY A | NI | NI | NI | NI |
| 7H-BENZ[DE]ANTHRACEN-7-ONE A | NI | NI | NI | NI |
| 9,10-ANTHRACENEDIONE A | NI | NI | NI | NI |
| BENZO(E)PYRENE A | NI | NI | NI | NI |
| DODECANE A | NI | NI | NI | 0.9 NJ |
| HEPTADECANE A | 0.2 NJ | 0.3 NJ | 0.2 NJ | 0.7 NJ |
| HEXADECANE A | 0.2 NJ | NI | 0.2 NJ | 0.7 NJ |
| METHYLPYRENE ISOMER A | NI | NI | NI | NI |
| NONADECANE A | NI | NI | NI | 0.6 NJ |
| PENTADECANE A | 0.3 NJ | 0.4 NJ | 0.2 NJ | 0.9 NJ |
| PENTADECANE, 2,6,10,14-TETRAMETHYL- A | NI | 0.5 NJ | 0.4 NJ | 1.1 NJ |
| TETRADECANE A | 0.2 NJ | 0.3 NJ | NI | 0.9 NJ |
| TRIDECANE A | NI | 0.3 NJ | NI | 0.9 NJ |
| UNKNOWN A | 0.5 NJ | 0.6 NJ | 0.3 NJ | 1 NJ |
| UNKNOWN B | 0.3 NJ | 0.4 NJ | 0.3 NJ | NI |
| UNKNOWN C | 0.2 NJ | 0.6 NJ | NI | NI |
| UNKNOWN ALDEHYDE A | NI | NI | NI | NI |
| UNKNOWN ALKANE A | 0.4 NJ | 0.4 NJ | 0.2 NJ | 0.6 NJ |
| UNKNOWN ALKANE B | 0.3 NJ | 0.5 NJ | 0.2 NJ | NI |
| UNKNOWN ALKANE C | 0.3 NJ | NI | 0.2 NJ | NI |
| UNKNOWN ALKANE D | NI | NI | 0.2 NJ | NI |
| UNKNOWN PAH A | NI | NI | NI | NI |
| Appendix IX - Semi-volatile TIC (mg/kg) | | | | |
| HEPTADECANE A | NA | NA | NA | NA |
| HEXADECANE A | NA | NA | NA | NA |
| PENTADECANE A | NA | NA | NA | NA |
| TETRADECANE A | NA | NA | NA | NA |
| UNKNOWN A | NA | NA | NA | NA |
| UNKNOWN ALKANE A | NA | NA | NA | NA |
| UNKNOWN ALKANE B | NA | NA | NA | NA |
| UNKNOWN ALKANE C | NA | NA | NA | NA |
| UNKNOWN ALKANE D | NA | NA | NA | NA |
| UNKNOWN ALKANE E | NA | NA | NA | NA |

Notes:
ND ( ) - Parameter not-detected at the limit statec
NJ - Parameter is tentively identified compound (TIC) and represents an estimated value.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
NA - Parameter not analyzed.
NI - Not identified.

TABLE 5.16

SUMMARY OF DETECTED ANALYTES
IN PERCHED GROUNDWATER
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Sample Location*<br>*Sample ID # GW-7097-081700*<br>*Date Sampled*<br>*QA/QC* | *Federal Maximum Contaminant Level* | *Industrial & Commercial Drinking Water Criteria*[1] | *Groundwater Contact Criteria*[2] | *MW3-1 -TJ-001 8/17/00 Groundwater* | *MW3-1 -TJ-002 8/17/00 Groundwater/Duplicate* | *MW31-1 -TJ-003 8/17/00 Groundwater* |
|---|---|---|---|---|---|---|
| **Volatile Organic Compounds (µg/L)** | | | | | | |
| Benzene | 5 | 5 | 11,000 | ND(0.50)[4] | ND(0.50) | 3.0 |
| cis-1,2-Dichloroethene | 70 | 70 | 200,000 | ND(0.50) | ND(0.50) | 1.0 |
| Vinyl Chloride | 2 | 2 | 570 | ND(0.50) | ND(0.50) | *14* (610) |
| **Semi-Volatile Organic Compounds (µg/L)** | | NA[5] | NA | ND | ND | ND |
| **Polychlorinated Biphenyls (PCBs) (µg/L)** | 0.5 | 0.5 | 3.3 | ND(0.08) | ND(0.08) | ND(0.08) |
| **Total Metals (µg/L)** | | | | | | |
| Aluminum | 50-200 (SMCL)[6] | 50 | 64,000,000 | *116* | ND(50) | *1,220* (64,000,000) |
| Antimony | 6 | 6 | 68,000 | 0.25 | ND(0.25) | ND(0.25) |
| Arsenic | 50 | 50 | 4,300 | 24.2 | 25.8 | 33.3 |
| Barium | 2000 | 2,000 | 14,000,000 | 429 | 434 | 252 |
| Calcium | NV | ID[3] | ID | 323,000 | 327,000 | 186000 J |
| Copper | 1,000 (AL)[7] | 1,000 | 7,400,000 | ND(10) | ND(10) | 12.3 |
| Iron | 300 (SMCL) | 300 | 58,000,000 | 11,100 | 11,300 | 14,700 (58,000,000) |
| Lead | 15 (AL) | 4 | ID | 0.75 | 0.56 | 5.06 |
| Magnesium | NV | 1,100,000 | 1,000,000,000 | 95,400 | 95,000 | 52,600 |
| Manganese | 50 (SMCL) | 50 | 9,100,000 | *1,360* | *1,330* | *1,340* (9,100,000) |
| Nickel | NV | 100 | 74,000,000 | 224 | 228 | ND(20) (74,000,000) |
| Potassium | NV | NV | NV | 9,200 | 9,290 | 7,770 |
| Selenium | 50 | 50 | 970,000 | 23.3 | 27.4 | ND(10) |
| Silver | 100 (SMCL) | 98 | 1,500,000 | 0.36 | ND(0.25) | ND(0.25) |
| Sodium | NV | 350,000 | 1,000,000,000 | 790,000 | 810,000 | 570,000 |
| Zinc | 5000 (SMCL) | 5,000 | 110,000,000 | ND(10) | ND(10) | 33.5 |

TABLE 5.16

SUMMARY OF DETECTED ANALYTES
IN PERCHED GROUNDWATER
RCRA FACILITY INVESTIGATION REPORT
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| *Sample Location*<br>*Sample ID # GW-7097-081700*<br>*Date Sampled*<br>*QA/QC*<br>**Dissolved Metals (µg/L)** | *Federal Maximum Contaminant Level* | *Industrial & Commercial Drinking Water Criteria* [1] | *Groundwater Contact Criteria* [2] | *MW3-1 -TJ-001 8/17/00 Groundwater* | *MW3-1 -TJ-002 8/17/00 Groundwater/Duplicate* | *MW31-1 -TJ-003 8/17/00 Groundwater* |
|---|---|---|---|---|---|---|
| Antimony | 6 | 6 | 68,000 | 0.39 | 1.2 | 0.93 |
| Arsenic | 50 | 50 | 4,300 | 25.9 | 25.8 | 37.6 |
| Barium | 2000 | 2,000 | 14,000,000 | 455 | 444 | 251 |
| Calcium | NV | ID | ID | 335,000 | 310,000 | 176,000 |
| Copper | 1,000 (AL) | 1,000 | 7,400,000 | ND(10) | ND(10) | 15.4 |
| Iron | 300 (SMCL) | 300 | 58,000,000 | 11,800 | 11,000 | 10,600 |
| Lead | 15 (AL) | 4 | ID | 0.32 | 0.37 | ND(0.10) |
| Magnesium | NV | 1,100,000 | 1,000,000,000 | 98,100 | 90,300 | 49,900 |
| Manganese | 50 (SMCL) | 50 | 9,100,000 | *1,400* | *1,370* | *1,280* |
| Nickel | NV | 100 | 74,000,000 | 244 | 196 | ND(20) |
| Potassium | NV | ID | ID | 9,430 | 10,100 | 7,830 |
| Selenium | 50 | 50 | 970,000 | 29.4 | 29.7 | 13.7 |
| Sodium | NV | 350,000 | 1,000,000,000 | 835,000 | 775,000 | 562,000 |
| Zinc | 5000 (SMCL) | 5,000 | 110,000,000 | ND(10) | 10.4 | ND(10) |

*Notes:*

NV - No Value
[1] Industrial & Commercial Drinking Water Criteria - MDEQ Operational Memorandum #18, June 6, 2000
[2] Groundwater Contact Criteria - MDEQ Operational Memorandum #18, June 6, 2000
[3] ID - Insufficient Data
[4] ND - Not detected at or above the detection limit in parentheses
[5] NA - Not Applicable
[6] SMCL - Secondary Maximum Contaminant Level
[7] AL - Action Level
Underlined value exceeds Act 451, Part 201 Industrial/Commercial Drinking Water Criteria
*Italicized value exceeds Federal Maximum Contaminant Level*
Boxed value exceeds Act 451, Part 201 Industrial Groundwater Contact Criteria

TABLE 5.17

SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) FOR SWMU #3
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| Parameter | Units | DETECTION FREQUENCY (1) Detects / Total | RANGE OF DETECTS (1) Min. - Max. | MEAN (1) | 95% UCL (1) | Screening Level GIDCV (2) | COPC |
|---|---|---|---|---|---|---|---|
| Semi-volatile Organics | | | | | | | |
| 2-METHYLNAPHTHALENE | mg/kg | 1 / 10 | 0.3 | 0.17 | 0.19 | 40,000 | |
| ACENAPHTHENE | mg/kg | 4 / 10 | 0.08 J - 1.5 | 0.28 | 0.50 | 200,000 | |
| ANTHRACENE | mg/kg | 4 / 10 | 0.2 J - 2.6 | 0.44 | 0.87 | 1,000,000 | |
| BENZO(A)ANTHRACENE | mg/kg | 5 / 10 | 0.1 J - 3.2 | 0.55 | 1.42 | 100 | |
| BENZO(A)PYRENE | mg/kg | 5 / 10 | 0.1 J - 2.6 | 0.48 | 1.13 | 10 | |
| BENZO(B)FLUORANTHENE | mg/kg | 5 / 10 | 0.1 J - 3.3 | 0.54 | 1.30 | 100 | |
| BENZO(G,H,I)PERYLENE | mg/kg | 5 / 10 | 0.06 J - 1.2 | 0.28 | 0.53 | 9,100 | |
| BENZO(K)FLUORANTHENE | mg/kg | 5 / 10 | 0.09 J - 1.4 | 0.34 | 0.70 | 1,000 | |
| BIS(2-ETHYLHEXYL) PHTHALATE | mg/kg | 1 / 10 | 0.1 J | 0.15 | 0.16 | 10,000 | |
| CARBAZOLE | mg/kg | 3 / 9 | 0.09 J - 1.6 | 0.31 | 0.62 | 3,700 | |
| CHRYSENE | mg/kg | 5 / 10 | 0.1 J - 2.9 | 0.54 | 1.47 | 10,000 | |
| DIBENZO(A,H)ANTHRACENE | mg/kg | 5 / 10 | 0.06 - 0.4 | 0.14 | 0.23 | 10 | |
| DIBENZOFURAN | mg/kg | 3 / 10 | 0.1 J - 1.2 | 0.26 | 0.41 | ID | |
| FLUORANTHENE | mg/kg | 5 / 10 | 0.3 J - 9.7 | 1.51 | 11.02 | 180,000 | |
| FLUORENE | mg/kg | 4 / 10 | 0.08 J - 1.8 | 0.33 | 0.62 | 130,000 | |
| INDENO(1,2,3-CD)PYRENE | mg/kg | 4 / 10 | 0.3 J - 1.4 | 0.32 | 0.55 | 100 | |
| NAPHTHALENE | mg/kg | 3 / 10 | 0.06 J - 0.8 | 0.20 | 0.33 | 80,000 | |
| PHENANTHRENE | mg/kg | 5 / 10 | 0.2 J - 12 | 1.68 | 11.88 | 8,000 | |
| PHENOL | mg/kg | 3 / 10 | 0.1 J - 0.4 | 0.19 | 0.24 | 12,000 | |
| PYRENE | mg/kg | 6 / 10 | 0.07 J - 8.3 | 1.27 | 9.10 | 110,000 | |
| Polychlorinated Biphenyls (PCBs) | | | | | | | |
| AROCLOR 1254 | mg/kg | 2 / 10 | 0.05 J - 0.13 J | 0.13 | 0.40 | 9.9 (3) | |
| Metals | | | | | | | |
| ALUMINUM, TOTAL | mg/kg | 9 / 9 | 2,370 - 9,040 | 5,871.11 | 7,326.97 | 660,000 | |
| ANTIMONY, TOTAL | mg/kg | 8 / 10 | 0.03 J - 0.12 | 0.05 | 0.07 | 1,200 | |
| ARSENIC, TOTAL | mg/kg | 10 / 10 | 3.5 - 8.1 | 5.34 | 6.06 | 61 | |
| BARIUM, TOTAL | mg/kg | 10 / 10 | 12 - 115 | 40.50 | 73.80 | 250,000 | |
| BERYLLIUM, TOTAL | mg/kg | 10 / 10 | 0.16 - 0.52 | 0.34 | 0.41 | 3,100 | |
| CADMIUM, TOTAL | mg/kg | 10 / 10 | 0.16 - 0.46 | 0.26 | 0.31 | 4,100 | |
| CALCIUM, TOTAL | mg/kg | 9 / 9 | 49,200 - 153,000 | 82,655.56 | 104,385.94 | NR | |
| CHROMIUM, TOTAL | mg/kg | 10 / 10 | 4.9 - 36 | 12.47 | 19.53 | 17,000 | |
| COBALT, TOTAL | mg/kg | 10 / 10 | 3.23 - 8.79 | 5.27 | 6.40 | 18,000 | |
| COPPER, TOTAL | mg/kg | 10 / 10 | 7.5 - 15.9 | 11.61 | 13.34 | 140,000 | |
| IRON, TOTAL | mg/kg | 9 / 9 | 6,030 - 16,000 | 10,666.67 | 12,995.32 | 1,000,000 | |
| LEAD, TOTAL | mg/kg | 10 / 10 | 5.14 - 16.2 | 9.32 | 11.35 | 900 | |
| MAGNESIUM, TOTAL | mg/kg | 9 / 9 | 10,300 - 24,800 | 18,288.89 | 21,405.65 | 1,000,000 | |
| MANGANESE, TOTAL | mg/kg | 9 / 9 | 196 - 397 | 300.22 | 344.36 | 170,000 | |
| MERCURY, TOTAL | mg/kg | 5 / 9 | 0.02 J - 0.04 J | 0.04 | 0.05 | 1,100 | |
| NICKEL, TOTAL | mg/kg | 10 / 10 | 9.6 - 24.1 | 15.49 | 19.94 | 270,000 | |
| POTASSIUM, TOTAL | mg/kg | 6 / 9 | 650 - 1,900 | 828.78 | 1,219.26 | NR | |
| SELENIUM, TOTAL | mg/kg | 4 / 10 | 0.3 J - 0.9 | 0.40 | 0.51 | 18,000 | |
| SILVER, TOTAL | mg/kg | 9 / 9 | 0.04 J - 0.07 | 0.05 | 0.06 | 17,000 | |
| SODIUM, TOTAL | mg/kg | 9 / 9 | 137 - 2,440 | 503.56 | 1,106.34 | 1,000,000 | |
| THALLIUM, TOTAL | mg/kg | 10 / 10 | 0.1 - 0.42 | 0.20 | 0.26 | 240 | |
| VANADIUM, TOTAL | mg/kg | 10 / 10 | 8 - 23 | 15.70 | 18.41 | 10,000 | |
| ZINC, TOTAL | mg/kg | 10 / 10 | 26 - 65 | 40.20 | 46.35 | 1,000,000 | |
| General Chemistry | | | | | | | |
| CYANIDE, TOTAL | mg/kg | 2 / 10 | 0.3 - 0.4 | 0.27 | 0.30 | 250 | |

Notes:
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Insufficient data to develop criterion.
– Not Applicable
COPC - Chemical of Potential Concern
(1) Based on data collected from SWMU #3 sampling locations : BH-3-1, BH-3-2, BH-3-3, BH-3-4, BH-3-5.
(2) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(3) - Criteria for total PCB's.
(4) - Value is for Chromium VI.
(5) - Criteria for total xylenes.
☐ - Exceed Screening level

TABLE 5.18

SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SWMU #29
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| Parameter | Units | DETECTION FREQUENCY (1) Detects / Total | RANGE OF DETECTS (1) Min. - Max. | MEAN (1) | 95% UCL (1) | Screening Level GIDCV (2) | COPC |
|---|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | | |
| ETHYLBENZENE | mg/kg | 1 / 8 | 0.12 | 0.04 | 0.06 | 140 | |
| M,P-XYLENES | mg/kg | 1 / 7 | 0.63 | 0.13 | 0.46 | 150 (5) | |
| O-XYLENE | mg/kg | 1 / 7 | 0.22 | 0.05 | 0.14 | 150 (5) | |
| TETRACHLOROETHENE (PCE) | mg/kg | 1 / 8 | 0.04 J | 0.03 | 0.03 | 88 | |
| TOLUENE | mg/kg | 1 / 8 | 0.043 J | 0.03 | 0.03 | 250 | |
| Semi-volatile Organics | | | | | | | |
| ACENAPHTHENE | mg/kg | 3 / 8 | 0.07 J - 0.6 | 0.20 | 0.36 | 200,000 | |
| ANTHRACENE | mg/kg | 4 / 8 | 0.05 J - 0.5 | 0.20 | 0.34 | 1,000,000 | |
| BENZ0(A)ANTHRACENE | mg/kg | 4 / 8 | 0.1 J - 1.1 | 0.37 | 1.00 | 100 | |
| BENZO(A)PYRENE | mg/kg | 4 / 8 | 0.1 J - 1 | 0.33 | 0.80 | 10 | |
| BENZO(B)FLUORANTHENE | mg/kg | 4 / 8 | 0.1 J - 1 | 0.34 | 0.85 | 100 | |
| BENZO(G,H,I)PERYLENE | mg/kg | 5 / 8 | 0.04 J - 0.5 | 0.20 | 0.30 | 9,100 | |
| BENZO(K)FLUORANTHENE | mg/kg | 4 / 8 | 0.1 J - 0.8 | 0.27 | 0.50 | 1,000 | |
| CARBAZOLE | mg/kg | 3 / 7 | 0.04 J - 0.02 J | 0.13 | 0.17 | 3,700 | |
| CHRYSENE | mg/kg | 4 / 8 | 0.2 J - 1.2 | 0.37 | 0.95 | 10,000 | |
| DIBENZ(A,H)ANTHRACENE | mg/kg | 3 / 8 | 0.04 J - 0.2 J | 0.13 | 0.22 | 10 | |
| DIBENZOFURAN | mg/kg | 3 / 8 | 0.09 - 0.8 | 0.22 | 0.40 | ID | |
| FLUORANTHENE | mg/kg | 6 / 8 | 0.09 J - 1.8 | 0.61 | 4.39 | 180,000 | |
| FLUORENE | mg/kg | 3 / 8 | 0.07 J - 0.5 | 0.19 | 0.31 | 130,000 | |
| INDENO(1,2,3-CD)PYRENE | mg/kg | 5 / 8 | 0.04 J - 0.6 | 0.23 | 0.61 | 100 | |
| NAPHTHALENE | mg/kg | 2 / 8 | 0.07 J - 0.1 J | 0.13 | 0.17 | 80,000 | |
| PHENANTHRENE | mg/kg | 5 / 8 | 0.08 J - 1.7 | 0.55 | 3.17 | 8,000 | |
| PYRENE | mg/kg | 6 / 8 | 0.08 J - 2 | 0.66 | 6.03 | 110,000 | |
| Polychlorinated Biphenyls (PCBs) | | | | | | | |
| AROCLOR 1254 | mg/kg | 5 / 8 | 0.14 J - 0.56 | 0.24 | 0.38 | 9.9 (3) | |
| AROCLOR 1260 | mg/kg | 5 / 8 | 0.03 J - 0.1 J | 0.09 | 0.25 | 9.9 (3) | |
| Metals | | | | | | | |
| ALUMINUM, TOTAL | mg/kg | 7 / 7 | 1,670 - 8,250 | 5,036.43 | 6,629.51 | 660,000 | |
| ANTIMONY, TOTAL | mg/kg | 8 / 8 | 0.03 J - 0.2 | 0.09 | 0.13 | 1,200 | |
| ARSENIC, TOTAL | mg/kg | 8 / 8 | 2.1 - 6.1 | 4.22 | 5.17 | 61 | |
| BARIUM, TOTAL | mg/kg | 8 / 8 | 18 - 147 | 56.56 | 101.63 | 250,000 | |
| BERYLLIUM, TOTAL | mg/kg | 8 / 8 | 0.14 - 0.98 | 0.36 | 0.36 | 3,100 | |
| CADMIUM, TOTAL | mg/kg | 8 / 8 | 0.15 - 1.06 | 0.42 | 0.62 | 4,100 | |
| CALCIUM, TOTAL | mg/kg | 7 / 7 | 33,100 - 184,000 | 87,800.00 | 123,532.19 | NR | |
| CHROMIUM, TOTAL | mg/kg | 8 / 8 | 2.8 - 41 | 14.29 | 26.62 | 17,000 (4) | |
| COBALT, TOTAL | mg/kg | 8 / 8 | 1.98 - 9.62 | 4.46 | 6.11 | 18,000 | |
| COPPER, TOTAL | mg/kg | 8 / 8 | 4.88 - 19.4 | 11.51 | 14.56 | 140,000 | |
| IRON, TOTAL | mg/kg | 7 / 7 | 2,450 - 15,600 | 10,140.00 | 13,086.90 | 1,000,000 | |
| LEAD, TOTAL | mg/kg | 8 / 8 | 4.13 - 67.9 | 21.84 | 67.86 | 900 | |
| MAGNESIUM, TOTAL | mg/kg | 7 / 7 | 11,000 - 98,200 | 34,885.71 | 56,285.93 | 1,000,000 | |
| MANGANESE, TOTAL | mg/kg | 7 / 7 | 126 - 361 | 255.86 | 306.45 | 170,000 | |
| MERCURY, TOTAL | mg/kg | 4 / 8 | 0.02 J - 0.07 J | 0.05 | 0.06 | 1,100 | |
| NICKEL, TOTAL | mg/kg | 8 / 8 | 7.3 - 45.8 | 17.43 | 31.83 | 270,000 | |
| POTASSIUM, TOTAL | mg/kg | 4 / 7 | 570 - 1,100 | 521.43 | 773.29 | NR | |
| SELENIUM, TOTAL | mg/kg | 3 / 8 | 0.4 J - 0.7 | 0.45 | 0.54 | 18,000 | |
| SILVER, TOTAL | mg/kg | 8 / 8 | 0.03 - 0.12 | 0.06 | 0.08 | 17,000 | |
| SODIUM, TOTAL | mg/kg | 7 / 7 | 112 - 156 | 130.50 | 142.29 | 1,000,000 | |
| THALLIUM, TOTAL | mg/kg | 8 / 8 | 0.06 - 0.27 | 0.16 | 0.21 | 240 | |
| VANADIUM, TOTAL | mg/kg | 8 / 8 | 7 - 20 | 13.75 | 16.61 | 10,000 | |
| ZINC, TOTAL | mg/kg | 8 / 8 | 17 - 224 | 61.50 | 120.92 | 1,000,000 | |

Notes:
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Insufficient data to develop criterion.
-- Not Applicable
COPC - Chemical of Potential Concern
(1) Based on data collected from SWMU #29 sampling locations : BH-29-1, BH-29-2, BH-29-3, BH-29-4, SS-29-1, SS-29-2, SS-29-3, SS-29-4.
(2) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(3) - Criteria for total PCB's.
(4) - Value is for Chromium VI.
(5) - Criteria for total xylenes.
☐ - Exceed Screening level

TABLE 5.19

SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) FOR SWMU #31
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| Parameter | Units | DETECTION FREQUENCY (1) Detects / Total | RANGE OF DETECTS (1) Min. - Max. | MEAN (1) | 95% UCL (1) | Screening Level GIDCV (2) | COPC |
|---|---|---|---|---|---|---|---|
| Volatile Organics | | | | | | | |
| ACETONE | mg/kg | 1 / 2 | 11 | 6.00 | -- | 110,000 | |
| Semi-Volatile Organics | | | | | | | |
| 4-CHLOROANILINE | mg/kg | 1 / 1 | 0.3 | 0.30 | -- | NR | |
| ACENAPHTHENE | mg/kg | 1 / 1 | 0.07 J | 0.07 | -- | 200,000 | |
| ACENAPHTHYLENE | mg/kg | 1 / 1 | 0.06 J | 0.06 | -- | 8,000 | |
| ANTHRACENE | mg/kg | 1 / 1 | 0.06 J | 0.06 | -- | 1,000,000 | |
| BIS(2-ETHYLHEXYL) PHTHALATE | mg/kg | 1 / 1 | 4.3 | 4.30 | -- | 10,000 | |
| BUTYL BENZYL PHTHALATE | mg/kg | 1 / 1 | 0.2 J | 0.20 | -- | 310 | |
| DI-N-BUTYL PHTHALATE | mg/kg | 1 / 1 | 0.5 J | 0.50 | -- | 760 | |
| DIBENZOFURAN | mg/kg | 1 / 1 | 0.1 J | 0.10 | -- | ID | |
| FLUORANTHENE | mg/kg | 1 / 1 | 0.2 J | 0.20 | -- | 180,000 | |
| NAPHTHALENE | mg/kg | 1 / 1 | 0.5 | 0.50 | -- | 80,000 | |
| PHENANTHRENE | mg/kg | 1 / 1 | 0.3 | 0.30 | -- | 8,000 | |
| PYRENE | mg/kg | 1 / 1 | 0.3 J | 0.30 | -- | 110,000 | |
| Pesticides/Herbicides | | | | | | | |
| AROCLOR 1254 | mg/kg | 1 / 1 | 0.1 J | 0.10 | -- | 9.9 (3) | |
| Metals | | | | | | | |
| ALUMINUM, TOTAL | mg/kg | 5 / 5 | 4,950 - 38,800 | 14,648.00 | 69,034.55 | 660,000 | |
| ANTIMONY, TOTAL | mg/kg | 6 / 6 | 0.04 J - 44.6 | 13.66 | 45,254,650.85 | 1,200 | |
| ARSENIC, TOTAL | mg/kg | 6 / 6 | 4.3 - 140 | 52.52 | 101.83 | 61 | √ |
| BARIUM, TOTAL | mg/kg | 6 / 6 | 30 - 689 | 308.75 | 555.11 | 250,000 | |
| BERYLLIUM, TOTAL | mg/kg | 6 / 6 | 0.29 - 5.45 | 1.98 | 3.64 | 3,100 | |
| CADMIUM, TOTAL | mg/kg | 6 / 6 | 0.19 - 37.5 | 13.97 | 103,678.59 | 4,100 | |
| CALCIUM, TOTAL | mg/kg | 5 / 5 | 51,800 - 98,600 | 71,230.00 | 87,538.18 | NR | |
| CHROMIUM, TOTAL | mg/kg | 6 / 6 | 10 - 4,970 | 1,184.92 | 26,566,861.88 | 17,000 (4) | |
| COBALT, TOTAL | mg/kg | 6 / 6 | 5.19 - 30.4 | 13.76 | 21.82 | 18,000 | |
| COPPER, TOTAL | mg/kg | 6 / 6 | 11.9 - 228 | 91.06 | 161.91 | 140,000 | |
| IRON, TOTAL | mg/kg | 5 / 5 | 10,800 - 17,100 | 14,440.00 | 16,864.86 | 1,000,000 | |
| LEAD, TOTAL | mg/kg | 6 / 6 | 6.54 - 2,780 | 945.31 | 1,864.04 | 900 | √ |
| MAGNESIUM, TOTAL | mg/kg | 5 / 5 | 14,500 - 22,400 | 17,750.00 | 20,831.83 | 1,000,000 | |
| MANGANESE, TOTAL | mg/kg | 5 / 5 | 274 - 670 | 423.90 | 564.84 | 170,000 | |
| MERCURY, TOTAL | mg/kg | 5 / 6 | 0.06 J - 7.2 | 2.36 | 4.87 | 1,100 | |
| NICKEL, TOTAL | mg/kg | 6 / 6 | 14.7 - 613 | 239.43 | 453.13 | 270,000 | |
| POTASSIUM, TOTAL | mg/kg | 5 / 5 | 110 - 1,700 | 1,241.00 | 1,684.29 | NR | |
| SELENIUM, TOTAL | mg/kg | 6 / 6 | 0.4 J - 25.3 | 7.46 | 15.30 | 18,000 | |
| SILVER, TOTAL | mg/kg | 6 / 6 | 0.05 J - 16.8 | 5.95 | 104,519.24 | 17,000 | |
| SODIUM, TOTAL | mg/kg | 5 / 5 | 174 - 3,450 | 1,234.20 | 2,546.74 | 1,000,000 | |
| THALLIUM, TOTAL | mg/kg | 6 / 6 | 0.22 - 5.1 | 1.94 | 3.68 | 240 | |
| TIN | mg/kg | 1 / 1 | 153 | 153.00 | -- | NR | |
| VANADIUM, TOTAL | mg/kg | 6 / 6 | 14 - 58 | 32.58 | 47.50 | 10,000 | |
| ZINC, TOTAL | mg/kg | 6 / 6 | 35 - 10,000 | 3,325.00 | 6,757.18 | 1,000,000 | |
| General Chemistry | | | | | | | |
| CYANIDE, TOTAL | mg/kg | 1 / 6 | 2.6 J | 1.27 | 6.25 | 250 | |

Notes:
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Insufficient data to develop criterion.
-- Not Applicable
COPC - Chemical of Potential Concern
(1) Based on data collected from SWMU #31 sampling locations : BH-31-1, BH-31-2, BH-31-3, SS-31-1, SS-31-2, SS-31-3.
(2) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(3) - Criteria for total PCB's.
(4) - Value is for Chromium VI.
(5) - Criteria for total xylenes.
☐ - Exceed Screening level

TABLE 5.20

SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) FOR SWMU #33
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| Parameter | Units | DETECTION FREQUENCY (1) Detects / Total | RANGE OF DETECTS (1) Min. - Max. | MEAN (1) | 95% UCL (1) | Screening Level GIDCV (2) | COPC |
|---|---|---|---|---|---|---|---|
| Semi-volatile Organics | | | | | | | |
| 2-METHYLNAPHTHALENE | mg/kg | 5 / 11 | 0.1 J - 0.2 J | 0.15 | 0.18 | 40,000 | |
| NAPHTHALENE | mg/kg | 1 / 11 | 0.07 J | 0.14 | 0.16 | 80,000 | |
| PHENANTHRENE | mg/kg | 5 / 11 | 0.08 J - 0.1 J | 0.13 | 0.15 | 8,000 | |
| Metals | | | | | | | |
| ALUMINUM, TOTAL | mg/kg | 9 / 9 | 1,750 - 7,010 | 5,438.89 | 6,470.78 | 660,000 | |
| ANTIMONY, TOTAL | mg/kg | 11 / 11 | 0.05 J - 0.2 | 0.08 | 0.10 | 1,200 | |
| ARSENIC, TOTAL | mg/kg | 11 / 11 | 2.3 - 8.5 | 5.75 | 6.86 | 61 | |
| BARIUM, TOTAL | mg/kg | 11 / 11 | 12 - 43 | 33.55 | 38.38 | 250,000 | |
| BERYLLIUM, TOTAL | mg/kg | 11 / 11 | 0.07 - 0.42 | 0.29 | 0.35 | 3,100 | |
| CADMIUM, TOTAL | mg/kg | 11 / 11 | 0.1 - 0.66 | 0.29 | 0.36 | 4,100 | |
| CALCIUM, TOTAL | mg/kg | 9 / 9 | 70,400 - 82,300 | 75,238.89 | 77,758.86 | NR | |
| CHROMIUM, TOTAL | mg/kg | 11 / 11 | 5 - 14 | 10.95 | 12.31 | 17,000 (4) | |
| COBALT, TOTAL | mg/kg | 11 / 11 | 2.15 - 9.01 | 6.25 | 7.22 | 18,000 | |
| COPPER, TOTAL | mg/kg | 11 / 11 | 5.6 - 22.1 | 13.89 | 16.20 | 140,000 | |
| IRON, TOTAL | mg/kg | 9 / 9 | 5,310 - 16,400 | 12,790.00 | 14,935.72 | 1,000,000 | |
| LEAD, TOTAL | mg/kg | 11 / 11 | 3.04 - 12.4 | 7.50 | 8.76 | 900 | |
| MAGNESIUM, TOTAL | mg/kg | 9 / 9 | 14,600 - 26,100 | 22,183.33 | 24,212.95 | 1,000,000 | |
| MANGANESE, TOTAL | mg/kg | 9 / 9 | 235 - 369 | 304.89 | 328.42 | 170,000 | |
| MERCURY, TOTAL | mg/kg | 1 / 11 | 0.02 J | 0.05 | 0.06 | 1,100 | |
| NICKEL, TOTAL | mg/kg | 11 / 11 | 6.7 - 27.2 | 18.44 | 21.58 | 270,000 | |
| POTASSIUM, TOTAL | mg/kg | 9 / 9 | 680 - 1,500 | 1,023.33 | 1,278.06 | NR | |
| SELENIUM, TOTAL | mg/kg | 8 / 11 | 0.23 - 0.7 | 0.41 | 0.51 | 18,000 | |
| SILVER, TOTAL | mg/kg | 11 / 11 | 0.02 - 0.09 | 0.07 | 0.08 | 17,000 | |
| SODIUM, TOTAL | mg/kg | 9 / 9 | 105 - 167 | 131.67 | 143.44 | 1,000,000 | |
| THALLIUM, TOTAL | mg/kg | 11 / 11 | 0.08 - 0.61 | 0.35 | 0.44 | 240 | |
| VANADIUM, TOTAL | mg/kg | 11 / 11 | 7 - 20 | 16.27 | 19.67 | 10,000 | |
| ZINC, TOTAL | mg/kg | 11 / 11 | 26 - 65 | 46.05 | 52.59 | 1,000,000 | |
| Miscellaneous | | | | | | | |
| SOLIDS, TOTAL | % | 6 / 6 | 83.1 - 97.4 | 89.83 | 93.60 | NR | |

Notes:
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Insufficient data to develop criterion.
-- Not Applicable
COPC - Chemical of Potential Concern
(1) Based on data collected from SWMU #33 sampling locations : BH-33-1, BH-33-2, BH-33-3, BH-33-4, BH-33-5, BH-33-6.
(2) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(3) - Criteria for total PCB's.
(4) - Value is for Chromium VI.
(5) - Criteria for total xylenes.
☐ - Exceed Screening level

TABLE 5.21

SUMMARY OF CHEMICALS OF POTENTIAL CONCERN (COPC) FOR SWMU #34
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| Parameter | Units | DETECTION FREQUENCY (1) Detects / Total | RANGE OF DETECTS (1) Min. - Max. | MEAN (1) | 95% UCL (1) | Screening Level GIDCV (2) | COPC |
|---|---|---|---|---|---|---|---|
| Semi-volatile Organics | | | | | | | |
| 2-METHYLNAPHTHALENE | mg/kg | 1 / 5 | 0.2 J | 0.16 | 0.18 | 40,000 | |
| ACENAPHTHENE | mg/kg | 1 / 5 | 1.9 | 0.50 | 10.63 | 200,000 | |
| ANTHRACENE | mg/kg | 1 / 5 | 4.5 | 1.02 | 230.64 | 1,000,000 | |
| BENZO(A)ANTHRACENE | mg/kg | 3 / 6 | 0.1 J - 12 | 2.13 | 532.54 | 100 | |
| BENZO(A)PYRENE | mg/kg | 3 / 6 | 0.1 J - 12 | 2.15 | 532.89 | 10 | |
| BENZO(B)FLUORANTHENE | mg/kg | 3 / 6 | 0.1 J - 13 | 2.31 | 635.47 | 100 | |
| BENZO(G,H,I)PERYLENE | mg/kg | 3 / 6 | 0.1 J - 4.2 | 0.83 | 20.55 | 9,100 | |
| BENZO(K)FLUORANTHENE | mg/kg | 3 / 6 | 0.1 J - 11 | 1.98 | 379.53 | 1,000 | |
| BIS(2-ETHYLHEXYL) PHTHALATE | mg/kg | 2 / 6 | 0.1 J - 4.1 | 0.80 | 22.93 | 10,000 | |
| CARBAZOLE | mg/kg | 1 / 5 | 2.9 | 0.70 | 42.70 | 3,700 | |
| CHRYSENE | mg/kg | 3 / 6 | 0.2 J - 14 | 2.50 | 694.16 | 10,000 | |
| DI-N-OCTYL PHTHALATE | mg/kg | 1 / 5 | 0.1 J | 0.14 | 0.17 | 28,000 | |
| DIBENZO(A,H)ANTHRACENE | mg/kg | 2 / 6 | 0.04 J - 1.4 | 0.34 | 4.08 | 10 | |
| DIBENZOFURAN | mg/kg | 1 / 5 | 1.3 | 0.38 | 3.70 | ID | |
| FLUORANTHENE | mg/kg | 3 / 6 | 0.4 - 33 | 5.77 | 16,103.37 | 180,000 | |
| FLUORENE | mg/kg | 1 / 5 | 2.8 | 0.68 | 38.40 | 130,000 | |
| INDENO(1,2,3-CD)PYRENE | mg/kg | 3 / 6 | 0.1 J - 7 | 1.31 | 86.31 | 100 | |
| NAPHTHALENE | mg/kg | 1 / 5 | 0.3 | 0.18 | 0.26 | 80,000 | |
| PHENANTHRENE | mg/kg | 3 / 6 | 0.2 J - 26 | 4.50 | 6,724.41 | 8,000 | |
| PYRENE | mg/kg | 4 / 6 | 0.06 J - 28 | 4.86 | 26,918.93 | 110,000 | |
| Metals | | | | | | | |
| ALUMINUM, TOTAL | mg/kg | 5 / 5 | 2,320 - 6,960 | 5,721.00 | 11,585.44 | 660,000 | |
| ANTIMONY, TOTAL | mg/kg | 1 / 6 | 0.07 | 0.03 | 0.07 | 1,200 | |
| ARSENIC, TOTAL | mg/kg | 6 / 6 | 3.9 - 6.5 | 5.21 | 5.90 | 61 | |
| BARIUM, TOTAL | mg/kg | 6 / 6 | 15 - 37 | 30.75 | 45.09 | 250,000 | |
| BERYLLIUM, TOTAL | mg/kg | 6 / 6 | 0.17 - 0.32 | 0.27 | 0.32 | 3,100 | |
| CADMIUM, TOTAL | mg/kg | 6 / 6 | 0.19 - 0.33 | 0.24 | 0.29 | 4,100 | |
| CALCIUM, TOTAL | mg/kg | 5 / 5 | 37,600 - 70,300 | 60,260.00 | 69,955.47 | NR | |
| CHROMIUM, TOTAL | mg/kg | 6 / 6 | 6 - 13 | 10.58 | 12.57 | 17,000 (4) | |
| COBALT, TOTAL | mg/kg | 6 / 6 | 4.12 - 6.39 | 5.33 | 6.09 | 18,000 | |
| COPPER, TOTAL | mg/kg | 6 / 6 | 10.1 - 31.2 | 15.08 | 23.89 | 140,000 | |
| IRON, TOTAL | mg/kg | 5 / 5 | 6,440 - 15,900 | 12,718.00 | 16,329.47 | 1,000,000 | |
| LEAD, TOTAL | mg/kg | 6 / 6 | 6.38 - 15.5 | 9.31 | 12.38 | 900 | |
| MAGNESIUM, TOTAL | mg/kg | 5 / 5 | 11,800 - 20,800 | 16,840.00 | 20,906.26 | 1,000,000 | |
| MANGANESE, TOTAL | mg/kg | 5 / 5 | 228 - 353 | 289.40 | 328.23 | 170,000 | |
| MERCURY, TOTAL | mg/kg | 3 / 6 | 0.02 J - 0.03 J | 0.04 | 0.05 | 1,100 | |
| NICKEL, TOTAL | mg/kg | 6 / 6 | 11.4 - 18.2 | 14.28 | 17.45 | 270,000 | |
| POTASSIUM, TOTAL | mg/kg | 4 / 5 | 660 - 1,230 | 842.00 | 1,236.13 | NR | |
| SELENIUM, TOTAL | mg/kg | 6 / 6 | 0.4 J - 0.9 | 0.62 | 0.78 | 18,000 | |
| SILVER, TOTAL | mg/kg | 5 / 6 | 0.03 - 0.07 J | 0.05 | 0.06 | 17,000 | |
| SODIUM, TOTAL | mg/kg | 5 / 5 | 131 - 510 | 292.90 | 445.55 | 1,000,000 | |
| THALLIUM, TOTAL | mg/kg | 6 / 6 | 0.16 - 0.35 | 0.23 | 0.29 | 240 | |
| VANADIUM, TOTAL | mg/kg | 6 / 6 | 9 - 20 | 16.67 | 19.98 | 10,000 | |
| ZINC, TOTAL | mg/kg | 6 / 6 | 39 - 59 | 48.75 | 54.61 | 1,000,000 | |

Notes:
J - Parameter concentration is estimated value.
NR - No regulartory criteria established.
ID - Insufficient data to develop criterion.
-- Not Applicable
COPC - Chemical of Potential Concern
(1) Based on data collected from SWMU #34 sampling locations : SD-34-1, SD-34-2, BH-34-1, BH-34-2, BH-34-3, BH-34-4
(2) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(3) - Criteria for total PCB's.
(4) - Value is for Chromium VI.
(5) - Criteria for total xylenes.
☐ - Exceed Screening level

TABLE 6.1

SUMMARY OF TOXICOLOGICAL DATA
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

| | | | | *RfD (3)* | | | | *CSF (4)* | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Parameter* | *CASRN* | *IRIS Reference Number* | *Tox. Class (2)* | *Oral (mg/kg-day)* | *Oral to Dermal Adjustment Factor (7)* | *Dermal (5) (mg/kg-day)* | *Inhalation (mg/kg-day)* | *Oral (1/mg/kg-day))* | *Oral to Dermal Adjustment Factor (7)* | *Dermal (6) (1/mg/kg-day))* | *Inhalation (1/mg/kg-day))* |
| Arsenic | 7440-38-2 | 278 | A (1) | 0.0003 (1) | 100% | 0.0003 | -- | 1.5 (1) | 100% | 1.50 | 15 (1) |

NOTES :
-- = Not Available
(1) USEPA Integrated Risk Information System database (IRIS), March 3, 1999.
(2) Tox. Class. : Toxicological Classification
EPA Weight of Evidence Ranking
A - Known human carcinogen.
(3) RfD : Reference Dose
(4) CSF : Cancer Slope Factor
(5) Adjusted Dermal RfD = Oral RfD x Adjustment Factor.
(6) Adjusted Dermal CSF = Oral CSF/Adjustment Factor.
(7) Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Supplemental Guidance, Dermal Risk Assessment, March 14, 1999.

TABLE 6.2

DERIVATION OF THE RISK-BASED REMEDIATION GOAL FOR LEAD
ASSUMING FUTURE SOIL EXCAVATION/CONSTRUCTION ON SITE - CONSTRUCTION WORKERS
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

*RBRG for Lead (PRG) (ug/g)*

$$\frac{(PbB_{adult,central,goal} - PbB_{adult,0}) \bullet AT}{(BKSF \bullet IR_s \bullet AF_s \bullet EF_s)}$$

where:

$$PbB_{adult,\ central,\ goal} = \frac{PbB_{fetal,0.95,\ goal}}{GSD_{i,adult}^{1.645} \bullet R_{fetal\ /\ maternal}}$$

| *Model Parameters* | *units* | *Typical Value* | *Input Values* |
|---|---|---|---|
| 95th Percentile PbB in fetus | (ug/dL) | 10 | 10 |
| Individual geometric standard deviation (GSDi) | -- | 1.8 - 2.1 | 2 |
| Rfetal/maternal | -- | 0.9 | 0.9 |
| Baseline blood lead value (PbBO) | (ug/dL) | 1.7 - 2.2 | 2.0 |
| Biokinetic slope factor (BKSF) | (ug/dL per ug/day) | 0.4 | 0.4 |
| Soil ingestion rate (IRs) | (g/day) | 0.05 - 0.10 | 0.1 |
| Soil Exposure Frequency (EFs) | (days/yr) | 250 | 20 |
| Absolute absorption fraction of lead in soil (AFs) | -- | 0.12 | 0.12 |
| Averaging Time (AT) | (days) | 365 | 365 |

**Risk-Based Remediation Goal for Lead (RBRG) (mg/kg) : 5,904**

# APPENDIX A

## STRATIGRAPHIC AND INSTRUMENTATION LOGS

A.1 Off-Facility Well Logs

A.2 Phase I: Soil Boring Logs

A.3 Phase II: Soil Boring Log/Monitoring Wells

(1) GEOLOGICAL SURVEY NO

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SW¼ NW¼ SW¼ | 3 | 2N/S* | 10 E/W* |

Street And Direction From Road Intersection

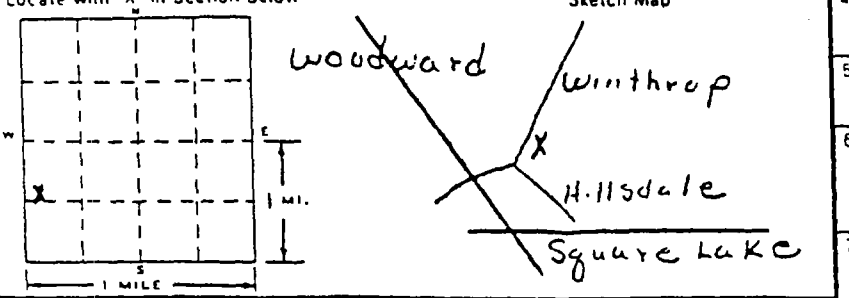
[redacted]6 Winthropp

19-03-301-004-040 BLHL

Street Address & City of Well Location

Locate with "X" in Section Below

Sketch Map




**3 OWNER OF WELL**

Mr. Fred Silverman
1616 Winthrop
Bloomfield Hills 48302

Address

Address Same As Well Location? ☒ Yes ☐ No

**4 WELL DEPTH:** 245 FT. | Date Completed MO 9 DAY 18 YEAR 91 | ☐ New Well ☒ Replacement Well

**5** ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

**6 USE.** ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

**7 CASING** Diameter ☒ Steel ☒ Threaded ☐ Plastic ☐ Welded

4 in to 242 ft depth

____ in to ____ ft depth

Grouted Drill Hole Diameter

____ in to ____ ft depth

____ in to ____ ft depth

Height Above/~~Below~~ Surface 2'2" ft

Weight 11 lbs /ft

Drive Shoe ☒ Yes ☐ No

**2 FORMATION DESCRIPTION**

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Gravel clay | 17' | 17' |
| Yellow gravel | 23' | 40' |
| Gravel hardpan | 55' | 95' |
| Boulder | | 95' |
| [redacted]avel hardpan | 55' | 150' |
| Gravel clay & hardpan | 30' | 180' |
| Gravel w/clay | 20' | 200' |
| Clay w/gravel | 30' | 230' |
| Gravel | 15' | 245' |

USE A 2ND SHEET IF NEEDED

**8 SCREEN** Johnson ☐ Not Installed

Type stainless steel Diameter 4"

Slot/~~Gauge~~ 30 Length 5'

Set between 239'10" ft. and 245' ft

FITTINGS ☐ K-Packer ☐ Lead Packer ☐ Bremer Check

☒ Blank above screen 20" ft. Other ____

**9 STATIC WATER LEVEL** 90 ft below land surface ☐ Flow

**10 PUMPING LEVEL** below land surface

97 ft. after 1 3/4 hrs. pumping at 20 G.P.M

____ ft after ____ hrs. pumping at ____ G.P.M

**11 WELL HEAD COMPLETION** ☒ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☒ Yes From ____ to ____ ft.

☐ Neat cement ☐ Bentonite ☒ Other casing seal

No. of bags of cement ____ Additives ____

**13 Nearest source of possible contamination**

Type septic Distance 70 ft Direction SW

Well disinfected upon completion? ☒ Yes ☐ No

Was old well plugged? ☐ Yes ☒ No

**14 PUMP** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name Red Jacket

Model number 150CN1-CN10G[redacted] HP 1½ Volts 230

Length of Drop Pipe 126 ft. capacity 25 G.P.M

TYPE ☒ Submersible ☐ Jet ____

PRESSURE TANK

Manufacturer's name Wellrite

Model number WR-260 Capacity ____ Gallons

OCT 07 1991

**15 Remarks, elevation, source of data, etc.**

Old well kept as backup

[redacted]

**16 WATER WELL CONTRACTOR'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

O.O. Corsaut, Inc. 0025

REGISTERED BUSINESS NAME REGISTRATION NO

Address 15101 W. 11 Mile Oak Park, MI 48237

Signed [signature] Date 10/2/91

AUTHORIZED REPRESENTATIVE

**17 Rig Operator's Name**

Wayne Hambell

D67d 2/89

Authority: Act 368 PA 1978
Completion Required
Penalty Conviction of a violation

FOR OFFICIAL SURVEY SAMPLE No.

(2)

# WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**1 LOCATION OF WELL**

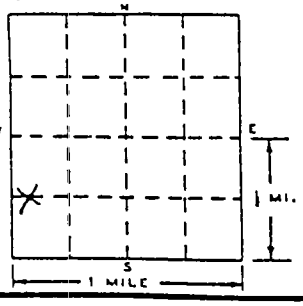
| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| OAKLAND | BLOOMFIELD | ¼ ¼ ¼ | 3 | N/S. | E/W |

Distance And Direction from Road Intersections

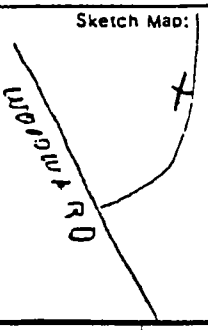
1628 WINTHROP

Street address & City of Well Location

Locate with "X" in section below




Sketch Map:




**3 OWNER OF WELL:** RICHARD SANDERS

Address

**4 WELL DEPTH:** (completed) 169 ft. Date of Completion NOV 84

**5** ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☒ Jetted ☐ Bored ☐ ____

**6 USE:** ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

**7 CASING:** Threaded ☐ Welded ☒ Diam. 4 ____ in. to ____ ft. Depth ____ in. to ____ ft. Depth

Height: Above/Below Surface ____ ft. Weight ____ lbs./ft. Drive Shoe? Yes ☒ No ☐

**8 SCREEN:** Type: S. S. Dia.: 4 Slot/Gauze 15 Length 8 Set between ____ ft. and ____ ft. Fittings: K

**9 STATIC WATER LEVEL** 87 ft. below land surface

**10 PUMPING LEVEL below land surface** 100 ft. after ____ hrs. pumping 20 g.p.m. ____ ft. after ____ hrs. pumping ____ g.p.m.

**11 WATER QUALITY in Parts Per Million:** Iron (Fe) ____ Chlorides (Cl) ____ Hardness ____ Other ____

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

**13 Well Grouted?** ☒ Yes ☐ No ☐ Neat Cement ☒ Bentonite ☐ ____ Depth: From 0 ft. to 144 ft.

**14 Nearest Source of possible contamination** ____ feet ____ Direction ____ Type ____ Well disinfected upon completion ☒ Yes ☐ No

**15 PUMP:** ☐ Not installed Manufacturer's Name WESTBROOK Model Number ____ HP 1 Volts 230 Length of Drop Pipe ____ ft. capacity ____ G.P.M. Type: ☒ Submersible ☐ Jet ☐ Reciprocating

**2 FORMATION**

| FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| RED CLAY | | 25 |
| GRAVEL | | 32 |
| BLUE CLAY ROCKS | | 135 |
| GRAVEL SANDY CLAY | | 159 |
| WATER SAND | ? | 169 |

USE A 2ND SHEET IF NEEDED

**16 Remarks, elevation, source of data, etc.**

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

REGISTERED BUSINESS NAME ____ REGISTRATION NO. 0613

Address 10730 CHARK

Signed ____ AUTHORIZED REPRESENTATIVE Date 84

D67d 100M (Rev. 12-68)

(3) GEOLOGICAL SURVEY NO

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

**1 LOCATION OF WELL**

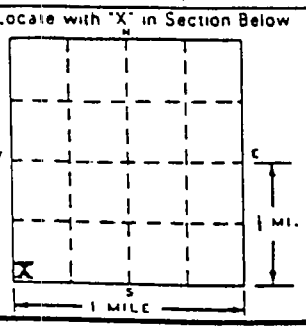
| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SW ¼ SW ¼ SW ¼ | 3 | 2 N/S | 10 E/W |

Distance And Direction From Road Intersection

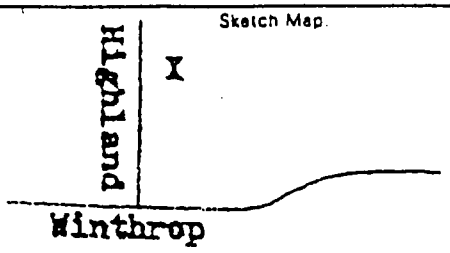
00' N of Winthrop
210 E. Highland Ave.
Bloomfield Hills, MI

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map




**3 OWNER OF WELL**

Ivan Kobosh

Address 210 E. Highland Ave.
Bloomfield Hills, MI 48013

Address Same As Well Location? [X] Yes [ ] No

**4 WELL DEPTH:** 107 FT. Date Completed MO. 7 DAY 29 YEAR 86 [ ] New Well [X] Replacement Well

**5** [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ]

**6 USE** [X] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ]

**7 CASING.** Diameter [ ] Steel [ ] Threaded [X] Plastic [ ] Welded

5 in. to 103 ft. depth
in. to ft. depth

Grouted Drill Hole Diameter
8 in. to 103 ft. depth
in. to ft. depth

Height Above/Below Surface ft.
Weight lbs /ft
Drive Shoe [ ] Yes [ ] No

**2 FORMATION DESCRIPTION**

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sand and gravel | 20 | 20 |
| Gravel | 10 | 30 |
| Clay and gravel | 10 | 40 |
| Clay | 30 | 70 |
| Clay and gravel | 20 | 90 |
| Waterbearing gravel | 17 | 107 |

USE A 2ND SHEET IF NEEDED

**8 SCREEN** [ ] Not Installed

Type stainless Diameter 3"
Slot 15 Length 4'
Set between 103 ft. and 107 ft.
FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check
[ ] Blank above screen ft. Other

**9 STATIC WATER LEVEL:**
50 ft. below land surface [ ] Flow

**10 PUMPING LEVEL:** below land surface
60 ft. after 2 hrs. pumping at 25 G.P.M.
ft. after hrs. pumping at G.P.M.

**11 WELL HEAD COMPLETION** [X] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

**12 WELL GROUTED?** [ ] No [X] Yes From 0 to 103 ft
[ ] Neat cement [X] Bentonite [ ] Other
No. of bags of cement Additives

**13 Nearest source of possible contamination**
Type none Distance ft. Direction
Well disinfected upon completion? [X] Yes [ ] No
Was old well plugged? [X] Yes [ ] No

**14 PUMP** [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name Red Jacket
Model number 75GNW1 HP 3/4 Volts 230
Length of Drop Pipe 90 ft. capacity 15 G.P.M.
TYPE [X] Submersible [ ] Jet
PRESSURE TANK
Manufacturer's name Well-X-Trol
Model number 203 Capacity 9 Gallons


RECEIVED
Oakland County
OCT 30 1986
Office


**15** Remarks, elevation, source of data, etc.

Subcontract - Glenn Eagan 25-1876

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

Bellinger Well Drilling 44-1757
REGISTERED BUSINESS NAME REGISTRATION NO

Address 4020 S. Lapeer Rd. Metamora, MI 48455

Signed [signature] AUTHORIZED REPRESENTATIVE Date 8/12/86

**17** Rig Operator's Name:
Dave Jory

D67d 12/85

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a ...

(4)

# WATER WELL RECORD
ACT 294 PA 1965

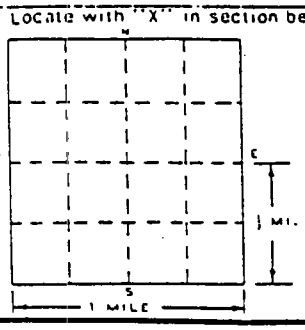
MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Pontiac City | ¼ ¼ ¼ | 27-33 | 3N N/S. | 10E E/W |

Distance And Direction from Road Intersections
40' East of old well #4 - in Southwest corner of property approx. 1400' south of Bldg. No. 29
Street address & City of Well Location

Locate with "X" in section below — Sketch Map:




**3 OWNER OF WELL:**
G.M.C. Truck & Coach Div.
Address 660 South Blvd. East
Pontiac, Mich.

**4 WELL DEPTH:** (completed) 266 ft. Date of Completion 10-20-78

**5** ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

**6 USE:** ☐ Domestic ☐ Public Supply ☒ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

**7 CASING:** Threaded ☐ Welded ☒ Diam. ____ in. to ____ ft. Depth; ____ in. to ____ ft. Depth
Height: Above/Below Surface 1 ft. Weight ____ lbs./ft. Drive Shoe? Yes ☐ No ☒

**8 SCREEN:** Type: Stainless Steel Dia.: 18" & 16"
Slot/Gauze ~~150 & 60~~ Length ~~41'~~
Set between ~~266~~ ft. and ~~236~~ ft. &
Fittings: 126 & 116 ~~Standard~~

**9 STATIC WATER LEVEL** 92 ft. below land surface

**10 PUMPING LEVEL** below land surface
106 ft. after 2 hrs. pumping 1000 g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

**11 WATER QUALITY** in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☐ Pitless Adapter ☐ 12" Above Grade

**13** Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐ ____
Depth: From ____ ft. to ____ ft.

**14** Nearest Source of possible contamination
____ feet ____ Direction ____ Type
Well disinfected upon completion ☐ Yes ☐ No

**15 PUMP:** ☒ Not installed
Manufacturer's Name ____
Model Number ____ HP ____ Volts ____
Length of Drop Pipe ____ ft. capacity ____ G.P.M.
Type: ☐ Submersible ☐ Jet ☐ Reciprocating

**2**

| FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Fill | 0 | 5' |
| Clay | 5' | 9' |
| Sand | 9' | 11' |
| Clay | 11' | 49' |
| Hardpan | 49' | 119' |
| gravel & sand | 119' | 126' |
| Hardpan | 126' | 154' |
| Fine gravel | 154' | 175' |
| Hard pan | 175' | 205' |
| Clay & stones | 205' | 219' |
| Sand | 219' | 226' |
| Sand & Gravel | 226' | 266' |
| | | |
| | | |
| | | |
| | | |

USE A 2ND SHEET IF NEEDED

RECEIVED NOV 20 1978 Health

**16** Remarks, elevation, source of data, etc.

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
~~Dunbar Drilling~~ Inc. 0163
REGISTERED NAME REGISTRATION NO.
Address 307 Broadway, Swanton, Ohio 43558
Signed ____ AUTHORIZED REPRESENTATIVE Date 10-31-78
Dale R. Dunbar, President

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

(5)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

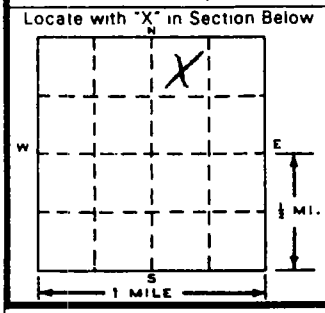
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NW¼ NW¼ NE¼ | 3 | 2 N/S | 10 E/W |

Distance And Direction From Road Intersection

Street Address & City of Well Location: Plant #6 Trucks Bus.

Locate with "X" in Section Below




Sketch Map:

**3 OWNER OF WELL:**

Address: Utley James Inc. 4400 Opdyke Rd. Contract 48056

Address Same As Well Location? ☐ Yes ☒ No

**4 WELL DEPTH: (completed)** 80 ft. Date of Completion 1/85

**5** ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

**6 USE:** ☐ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☒ Construction Office

**7 CASING:** Diameter ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded

5" in. to 75 ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter 7⅞ in. to 75 ft. depth

____ in. to ____ ft. depth

Height: Above/Below Surface 1 ft.

Weight SDR 21 lbs./ft.

Drive Shoe ☐ Yes ☒ No

**8 SCREEN:** ☐ Not Installed

Type Plastic Diameter 4"

Slot/Gauze #15 Length 5'

Set between 75 ft. and 80 ft.

FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check ☒ Blank above screen 1 ft. Other ____

**9 STATIC WATER LEVEL:** 46' ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface

Bottom ft. after ½ hrs. pumping at 25 G.P.M.

____ ft. after ____ hrs pumping at ____ G.P.M.

**11 WELL HEAD COMPLETION:** ☐ Pitless adapter ☒ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☒ Yes From 75 to Top ft.

☐ Neat cement ☐ Bentonite ☒ Other Drilling Fluid

No. of bags of cement ____ Additives ____

**13 Nearest source of possible contamination**

Type Septic Distance ____ ft. Direction E

Well disinfected upon completion? ☒ Yes ☐ No

**14 PUMP:** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name Flint & Walling

Model number 4F10B10 HP 1 Volts 230

Length of Drop Pipe 60 ft. capacity 10 G.P.M.

TYPE ☒ Submersible ☐ Jet ____

PRESSURE TANK Manufacturer's name Well x Trol.

Model number WX 203 Capacity 80 Gallons

**2 FORMATION DESCRIPTION**

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown Sand, Gravel. (Overburden) | | 4' |
| Blue Clay (Some Sands & Gravel) | 9' | 13' |
| Blue Clay | 21' | 34' |
| Blue Clay, Sand & Gravel. | 15' | 49' |
| Black Sand & Gravel. (Some Blue Clay) | 13' | 62' |
| Black Water Sand. | | 80' |

USE A 2ND SHEET IF NEEDED

RECEIVED
Mich. Dept. of Public Health
MAR 27 1985
Bureau of Environmental and Occupational Health - GWQS

**15. Remarks, elevation, source of data, etc.**

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

S. Ward & Son Inc. 0058

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 6253 Cranlane, Clarkston

Signed R Ward Pres. Date 1/85

AUTHORIZED REPRESENTATIVE

D67d 2/84

GEOLOGICAL SURVEY COPY

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

(6)

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**1 LOCATION OF WELL**

| County | Twp. | Fraction | Section No. | Town | Range |
|---|---|---|---|---|---|
| Oakland | Bloomfield | ¼ ¼ ¼ | 2 | N/S. | E/W |

Distance And Direction from Road Intersections: S.E. corner of Epdyke & South Blv'd.

OWNER No.

Street address & City of Well Location

**3 OWNER OF WELL:** Mobil Oil Co.

Address

| 2 FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sand, gravel, clay | 11 | 11 |
| Muddy sand | 2 | 13 |
| Gravel & clay | 19 | 32 |
| Gravel & sand, hardpan | 46 | 78 |
| Coarse sand & clay | 11 | 89 |
| Clay & sand | 69 | 158 |
| Muddy sand & clay | 5 | 163 |
| Clay & coarse sand | 40 | 203 |
| Layer of gravel | 1 | 204 |
| Muddy water sand | 3 | 207 |
| Coarse clean water sand | 6 | 213 |
| Fine clean water ~~sand~~ CANVEL | 6 | 219 |

**4 WELL DEPTH:** (completed) 219 ft. Date of Completion 9-24-69

**5** [X] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Jetted [ ] Bored [ ]

**6 USE:** [ ] Domestic [ ] Public Supply [ ] Industry [ ] Irrigation [ ] Air Conditioning [X] Commercial [ ] Test Well [ ]

**7 CASING:** Diam. 4 in. to 219 ft. Depth; Threaded [X] Welded [ ]; Height: Above/Below surface ____ ft.; Weight 11 lbs/ft.; Drive Shoe? Yes [X] No [ ]

____ in. to ____ ft. Depth

**8 SCREEN:** Type: Stainless Dia.: 4"

Slot/Gauze 25 Length 4'

Set between 114 ft. and 119 ft.

Fittings: Std. W/burlap packer

**9 STATIC WATER LEVEL** 65 ft. below land surface

**10 PUMPING LEVEL** below land surface 70 ft. after 3 hrs. pumping 30 g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

**11 WATER QUALITY** in Parts Per Million: Iron (Fe) ____ Chlorides (Cl) ____ Hardness ____

**12 WELL HEAD COMPLETION:** [ ] In Approved Pit [X] Pitless Adapter [X] 12" Above Grade

**13 GROUTING:** Well Grouted? [ ] Yes [X] No; Material: [ ] Neat Cement [ ] ____; Depth: From ____ ft. to ____ ft.

**14 SANITARY:** Nearest Source of possible contamination 100 feet S Direction Holding TANK Type; Well disinfected upon completion [X] Yes [ ] No

**15 PUMP:** Manufacturer's Name Red Jacket; Model Number 11 MAB HP 1; Length of Drop Pipe 105 ft. capacity 12 G.P.M.; Type: [X] Submersible [ ] ____ [ ] Jet [ ] Reciprocating

**16** Remarks, elevation, source of data, etc.

**17 WATER WELL CONTRACTOR'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

John Cameron & Son — REGISTERED BUSINESS NAME

0414 — REGISTRATION NO.

Address 1800 Butterfield Rd., Troy

Signed [signature] — AUTHORIZED REPRESENTATIVE Date 9-30-69

0670 30M 6-66

7

SURVEY NO

# WATER WELL AND PUMP RECORD

PART 127 ACT 368, P.A. 1978

W86 63 / 6 0 /

PERMIT NUMBER

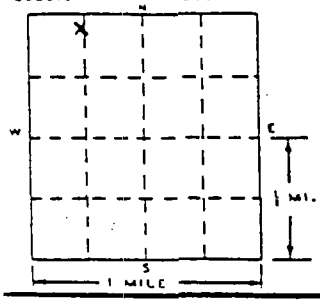
## 1 LOCATION OF WELL

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| OAKLAND | ~~[illegible]~~ PONTIAC | NE 1/4 NW 1/4 NW 1/4 | 35 | 3 N/S | 10 E/W |

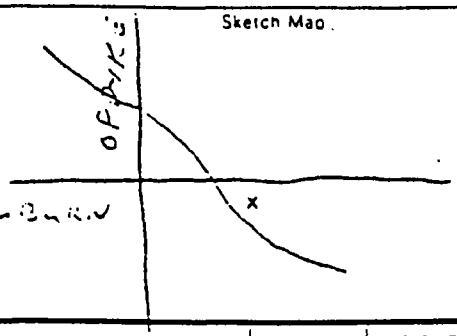
Direction And Direction From Road Intersection: [illegible]OFT SOUTH OF AUBURN Rd 1/4 MI EAST OF OPDYKE

Street Address & City of Well Location: 2[illegible]70 AUBURN Rd

Locate with "X" in Section Below




Sketch Map




## 3 OWNER OF WELL

ART CO CONTRACTING INC

Address: 6966 CROOKS Rd TROY MICH

Address Same As Well Location? ☐ Yes ☒ No

## 4 WELL DEPTH (completed)

52 ft

Date of Completion: MAY 13 - 86

## 5

☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

## 6 USE

☐ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☒ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

## 7 CASING

Diameter: ☒ Steel ☒ Threaded ☐ Plastic ☐ Welded

4 in to 46 ft depth

____ in to ____ ft depth

Grouted Drill Hole Diameter

____ in to ____ ft depth

____ in to ____ ft depth

Height Above/~~Below~~ Surface 1 ft

Weight 11 lbs/ft

Drive Shoe ☒ Yes ☐ No

## 2 FORMATION DESCRIPTION

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| FILL | 5 | 5 |
| SAND | 18 | 23 |
| CLAY | 16 | 39 |
| SAND | 13 | 52 |
| [illegible] SAND & SILT | 8 | 60 |

USE A 2ND SHEET IF NEEDED

## 8 SCREEN

☐ Not Installed

Type S.S. Diameter 4"

Slot/Gauze 25 Length 4'

Set between 48 ft and 52 ft

FITTINGS ☒ K-Packer ☐ Lead Packer ☐ Bremer Check

☒ Blank above screen 2 ft Other ____

## 9 STATIC WATER LEVEL

8 ft below land surface ☐ Flow

## 10 PUMPING LEVEL below land surface

23 ft after ____ hrs. pumping at 50 G.P.M.

____ ft after ____ hrs pumping at ____ G.P.M.

## 11 WELL HEAD COMPLETION

☒ Pitless adapter ☒ 12" above grade ☐ Basement offset ☐ Approved pit

## 12 WELL GROUTED?

☒ No ☐ Yes From ____ to ____ ft

☐ Neat cement ☐ Bentonite ☐ Other ____

No. of bags of cement ____ Additives ____

## 13 Nearest source of possible contamination

Type ____ Distance ____ ft Direction ____

Well disinfected upon completion? ☐ Yes ☐ No

## 14 PUMP

☐ Not Installed ☐ Pump Installation Only

Manufacturer's name RED JACKET

Model number 2 WIRE HP 1 Volts 230

Length of Drop Pipe 27 ft capacity 18 G.P.M.

TYPE ☒ Submersible ☐ Jet ____

PRESSURE TANK

Manufacturer's name WELL X TROL

Model number WX 252 Capacity 86 Gallons

## 15 Remarks, elevation, source of data, etc.

## 16 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

AIRDS PUMP + WELL SERVICE #1584

REGISTERED BUSINESS NAME REGISTRATION NO

Address 5635 COOLEY LK Rd

Signed [signature] Date May 19 - 86

AUTHORIZED REPRESENTATIVE

D67d (Rev. 10-80)

(8)

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**1 LOCATION OF WELL**

| County | Twp. | Fraction | Section No. | Town | Range |
|---|---|---|---|---|---|
| Oakland | Pontiac Auburn Mills | ¼ ¼ ¼ | 35 | 3 N | 10 E |

Distance And Direction from Road Intersections: [redacted]burn Road (SW Corner of Auburn E. of I-75)

Street address & City of Well Location

OWNER No.

**3 OWNER OF WELL:** Clawson Concrete

Address: 15231 Mc Michols, Detroit, Michigan 48235

**4 WELL DEPTH:** (completed) 197 ft. Date of Completion 2-9-70

**5** ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ___

**6 USE:** ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ Transit Mix

**7 CASING:** Diam. Threaded ☒ Welded ☐

6 in. to 195' - 3" ft. Depth

___ in. to ___ ft. Depth

Height: Above ~~Below~~ surface 3½ ft.

Weight 19.45 lbs/ft.

Drive Shoe? Yes ☒ No ☐

**8 SCREEN:** Johnson Stainless

Type: Steel Dia.: 6"

Slot/~~Gauge~~ 80 Length 5'

Set between 192 ft. and 197 ft.

Fittings: 5" x 18" Nipple

**9 STATIC WATER LEVEL** 9 ft. below land surface

**10 PUMPING LEVEL** below land surface

177 ft. after 8 hrs. pumping 37½ g.p.m.

___ ft. after ___ hrs. pumping ___ g.p.m.

**11 WATER QUALITY** in Parts Per Million:

Iron (Fe) 0.5 Chlorides (Cl) 102

Hardness ~~192~~ 204

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

**13 GROUTING:**

Well Grouted? ☐ Yes ☒ No

Material: ☐ Neat Cement ☐ ___

Depth: From ___ ft. to ___ ft.

**14 SANITARY:**

Nearest Source of possible contamination: UNKNOWN

___ feet ___ Direction ___ Type

Well disinfected upon completion ☒ Yes ☐ No

**15 PUMP:**

Manufacturer's Name ___

Model Number ___ HP ___

Length of Drop Pipe ___ ft. capacity ___ G.P.M.

Type: ☐ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

| 2 FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Gray Sandy Clay | 17' | 17' |
| Soft Clay | 20' | 37' |
| Sandy Clay | 11' | 48' |
| Gravely Hardpan | 15' | 63' |
| Clay | 6½' | 69½' |
| Med. Sand | 4½' | 74' |
| Sandy Clay | 6' | 80' |
| Hardpan | 11' | 91' |
| Hard Clay (Gray) | 12' | 103' |
| [redacted]rown Clay | 22' | 125' |
| Gray Clay | 6' | 131' |
| Sandy Hardpan | 29' | 160' |
| Hard Clay | 32' | 192' |
| Sandy Rock | 1' | 193' |
| Coarse Gravel | 4' | 197' |

**16** Remarks, elevation, source of data, etc.

[redacted]#1 No Pump to go in this well

**17 WATER WELL CONTRACTOR'S CERTIFICATION**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

O. O. Corsaut Inc. (REGISTERED BUSINESS NAME) 0025 (REGISTRATION NO.)

Address 15101 W. 11 Mile Road, Oak Park 4 8237

Signed [signature] (AUTHORIZED REPRESENTATIVE) Date June 5, 1970

067D 10UM 6-66

(7)

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**1 LOCATION OF WELL**

| County | Twp. | Fraction | Section No. | Town | Range |
|---|---|---|---|---|---|
| Oakland | Pontiac Auburn Hills | ¼ ¼ ¼ | 35 | 3 N/S | 10 E/W |

Distance And Direction from Road Intersections: W. Corner of I 75 and Auburn Road

Street address & City of Well Location

OWNER No. _____

**3 OWNER OF WELL:** Clawson Concrete Co.

Address: 15331 W. Mc Nichols Road, Detroit, Michigan 48235

| 2 FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Gray Clay | 10' | 10' |
| Fill (Wood, Rocks, Etc.) | 8' | 18' |
| Sandy Clay | 16' | 34' |
| Clay | 5' | 39' |
| Water Sand (Muddy) | 3' | 42' |
| Hard Clay | 3' | 45' |
| Medium Coarse Sand | 6' | 51' |

**4 WELL DEPTH (completed):** 51 ft. **Date of Completion:** 3-18-70

**5** ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ___

**6 USE:** ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ Transit mix

**7 CASING:** Diam. 6 in. 48'-9" ft. Depth; Threaded ☒ Welded ☐; Height: Above surface 3 ft.; Weight 19.45 lbs/ft.; Drive Shoe? Yes ☒ No ☐; ___ in. to ___ ft. Depth

**8 SCREEN:** Johnson Stainless
Type: Steel Dia.: 6"
Slot/Gauge 35 Length 5'
Set between 46 ft. and 51 ft.
Fittings: 5" x 18" Nipple

**9 STATIC WATER LEVEL:** 9 ft. below land surface

**10 PUMPING LEVEL** below land surface: 37 ft. after 4 hrs. pumping 250 g.p.m.
___ ft. after ___ hrs. pumping ___ g.p.m.

**11 WATER QUALITY** in Parts Per Million: Iron (Fe) 1.3 Chlorides (Cl) 34
Hardness 289

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

**13 GROUTING:** Well Grouted? ☐ Yes ☒ No
Material: ☐ Neat Cement ☐ ___
Depth: From ___ ft. to ___ ft.

**14 SANITARY:** Unknown
Nearest Source of possible contamination
___ feet ___ Direction ___ Type
Well disinfected upon completion ☒ Yes ☐ No

**15 PUMP:**
Manufacturer's Name Red Jacket
Model Number 1006R5-4HB6 HP 10
Length of Drop Pipe 31½ ft. capacity 190 G.P.M.
Type: ☒ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

**16 Remarks, elevation, source of data, etc.**

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

O. O. Corsant Inc. — REGISTERED BUSINESS NAME
0025 — REGISTRATION NO.

Address 15101 W. 11 Mile Roadk, Oak Park 48237

Signed ___ AUTHORIZED REPRESENTATIVE Date June 5, 1970

0670 100M 6-66

LOCAL HEALTH DEPT COPY

GEOLOGIC SURVEY NO (10)

# WATER WELL AND PUMP RECORD

PART 127 ACT 368, P A 1978

PERMIT NUMBER

## 1 LOCATION OF WELL

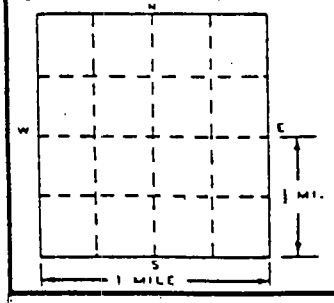
| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | ¼ ¼ ¼ | 2 | N/S | 10 E/W |

Distance And Direction From Road Intersection

The Heathers
Square Lake at I-75

Street Address & City of Well Location

Locate with "X" in Section Below — Sketch Map




## 3 OWNER OF WELL

Robertson Brothers Co.
3883 Telegraph Rd. Suite 202
Address Blfd Hills, Mi 48013

Address Same As Well Location? ☐ Yes ☒ No

## 4 WELL DEPTH (completed)

253 ft

Date of Completion: 6/16/88

## 5

☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug
☐ Hollow rod ☐ Auger ☐ Jetted ☐

## 6 USE

☐ Domestic ☐ Type I Public ☐ Type III Public
☒ Irrigation ☐ Type IIa Public ☐ Heat pump
☐ Test Well ☐ Type IIb Public ☐

## 7 CASING

Diameter ☐ Steel ☒ Threaded
☐ Plastic ☐ Welded

6 in to 223 ft depth
in to ft depth

Grouted Drill Hole Diameter
in to ft depth
in to ft depth

Height Above/~~Below~~ Surface 2 ft

Weight 1945 lbs /ft

Drive Shoe ☒ Yes ☐ No

## 2 FORMATION DESCRIPTION

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Stony sand & gravel (dry) | 10' | 10' |
| Stony sand & gravel | 2' | 12' |
| Stony gravely clay | 12' | 24' |
| 8 slot yellow sand (wet) | 6' | 30' |
| 10 slot grey clay (wet) | 21' | 51' |
| Gravely clay | 19' | 70' |
| Hardpan | 15' | 85' |
| Dry hardpan & gravel (very firm) | 18' | 103' |
| Gravely hardpan (very firm) | 17' | 120' |
| Hardpan & seams of gravel (wet) | 14' | 134' |
| set screen (n.g.) | | |
| hard clay | 54' | 188' |
| Brown clay | 24' | 212' |
| 18 slot sand | 2' | 214' |
| Sand & hardpan | 3' | 217' |
| Very fine sand | 24' | 241' |
| Med. sand | 7' | 248' |
| Very fine sand | 5' | 253' |
| Putty sand | | 253' |

USE A 2ND SHEET IF NEEDED

## 8 SCREEN

Johnson stainless ☐ Not Installed

Type steel Diameter 6"

Slot/Gauze see below Length 30'

Set between 221 ft and 253 ft

FITTINGS ☐ K-Packer ☐ Lead Packer ☐ Bremer Check

☐ Blank above screen 1'4" ft Other

## 9 STATIC WATER LEVEL

11 ft below land surface ☐ Flow

## 10 PUMPING LEVEL below land surface

217 ft after 4 hrs pumping at 80 GPM

ft after hrs pumping at GPM

## 11 WELL HEAD COMPLETION

☐ Pitless adapter ☒ 12" above grade
☐ Basement offset ☐ Approved pit

## 12 WELL GROUTED?

☒ No ☐ Yes From to ft

☐ Neat cement ☐ Bentonite ☐ Other

No of bags of cement Additives

## 13 Nearest source of possible contamination

unknown

Type Distance ft Direction

Well disinfected upon completion? ☒ Yes ☐ No

## 14 PUMP

☐ Not Installed ☐ Pump Installation Only

Manufacturer's name Red Jacket

Model number 766H1-6MR6 HP 7½ Volts 230

Length of Drop Pipe 216 ft capacity 68 GPM

TYPE ☒ Submersible ☐ Jet

PRESSURE TANK

Manufacturer's name

Model number Capacity Gallons

## 15 Remarks elevation source of data etc

1. top 7'
2. middle 5'
3. middle 7'
4. middle 7'
5. middle 18'
6. bottom 7'

## 16 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

O.O. Corsaut Inc. — REGISTERED BUSINESS NAME
0025 — REGISTRATION NO

Address 15101 W. 11 Mile Rd. Oak Park, Mi 48237

Signed — AUTHORIZED REPRESENTATIVE

Date 7/18/88

D67d (Rev. 10-80)

(11)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SW 1/4 SW 1/4 NW 1/4 | 3 | 2 N/S | 10 E/W |

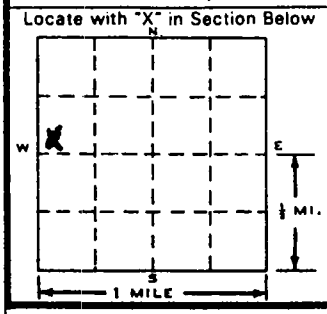
Distance And Direction From Road Intersection

Approx. 500 feet East of intersection of Winthrop and E. Highland

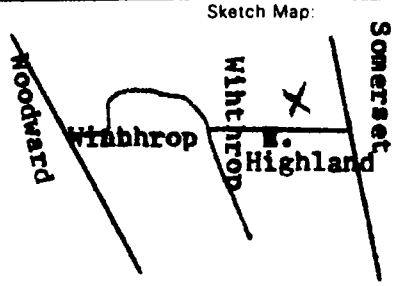
229 E. Highland Avenue, Bloomfield Hills, MI 48302

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map:




**3 OWNER OF WELL:**

Address: Northwest Building Corporation, 7001 Orchard Lake Road, Suite 310-A, West Bloomfield, MI 48322

Address Same As Well Location? ☐ Yes ☐ No

**4 WELL DEPTH:** 99 FT. Date Completed: MO. 9 DAY 13 YEAR 90 ☒ New Well ☐ Replacement Well

**5** ☒ Cable tool ☐ Rotary ☒ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

**6 USE:** ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

**7 CASING:** Diameter ☒ Steel ☐ Threaded ☐ Plastic ☐ Welded

4 in. to 91 ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter

4 in. to 90 ft. depth

____ in. to ____ ft. depth

Height: Above/~~Below~~ Surface 1 ft.

Weight 11 lbs./ft.

Drive Shoe ☒ Yes ☐ No

**2 FORMATION DESCRIPTION**

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Stones, gravel & clay | 25 | 25 |
| Clay/gravel mix | 65 | 90 |
| Water-bearing sand | 9 | 99 |

**8 SCREEN:** ☐ Not Installed

Type Stainless Steel Diameter 4"

Slot/~~Gauze~~ .007; .010 Length 8 feet

Set between 91 ft. and 99 ft.

FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check

☒ Blank above screen 1½ ft. Other 3" plug

**9 STATIC WATER LEVEL:**

60 ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface

75 ft. after 3 hrs. pumping at 20 G.P.M.

____ ft. after ____ hrs. pumping at ____ G.P.M.

**11 WELL HEAD COMPLETION:** ☒ Pitless adapter ☒ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☒ Yes From 0 to 90 ft.

☐ Neat cement ☒ Bentonite ☐ Other ____

No. of bags of cement ____ Additives ____

**13 Nearest source of possible contamination**

Type city sewer line Distance 40 ft. Direction East

Well disinfected upon completion? ☒ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

**14 PUMP:** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name Webtrol

Model number 1025711BSP HP 3/4 Volts 230

Length of Drop Pipe 82 ft. capacity 10 G.P.M.

TYPE: ☒ Submersible ☐ Jet ____

PRESSURE TANK:

Manufacturer's name Well-X-Trol

Model number WX-205 Capacity ____ Gallons

USE A 2ND SHEET IF NEEDED

RECEIVED
Mich. Dept. of Public Health
OCT 03 1990

**15. Remarks, elevation, source of data, etc.**

OCT 12 1990

BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH-GWQS

Rig Operator's Name: Daniel H. Chissus

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Daniel H. Chissus Well & Pump Service, 63-0127

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 4885 Walnut Lake Road, W. Bloomfield, MI 48323

Signed Daniel H. Chissus Date 9-13-90

AUTHORIZED REPRESENTATIVE

D67d 12/85

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

DEQ MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
DRINKING WATER & RADIOLOGICAL PROTECTION DIVISION

# WATER WELL AND PUMP RECORD

Completion is required under authority of Part 127 Act 368 PA 1978
Failure to comply is a misdemeanor

TAX NO: 19 03 153 005

PERMIT NO: 24358

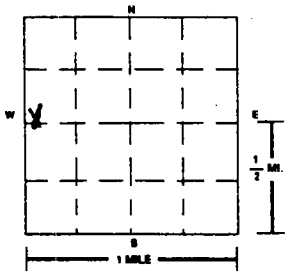
1. LOCATION OF WELL

| County | Township Name | Fraction | Section No. | Town No. | Range No. |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SW1/4 NW 1/4 SW1/4 | 3 | 2N | 10E |

Distance and Direction from Road Intersection

Street Address & City of Well Location

Locate with 'x' in Section Below — Sketch Map




3. OWNER OF WELL
Address: Larry Garner, 246 E. Highland
Address Same as Well Location [X] Yes [ ] No

4. WELL DEPTH: 120 ft. Date Completed 6/21/98 [ ] New Well [X] Replacement Well

5. [X] Cable Tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow Rod [ ] Auger/Bored [ ] Jetted [ ] ____

6. USE: [X] Household [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat Pump [ ] Test Well [ ] Type IIb Public [ ] ____

7. CASING: [X] Steel [ ] Threaded [ ] Plastic [X] Welded [ ] Other ____
Diameter: 4 in. to 116 ft. depth; ____ in. to ____ ft. depth
BORE HOLE: Diameter: ____ in. to ____ ft. depth; ____ in. to ____ ft. depth
Height: Above/Below Surface: ____ ft
Weight: 10/40 lbs./ft.
[X] Drive Shoe [ ] Shale Packer

2. FORMATION DESCRIPTION

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown clay | 0 | 14 |
| Blue clay-gravel-rocks | 96 | 110 |
| Med. sand-gravel-water | 10 | 120 |

USE A 2ND SHEET IF NEEDED

8. SCREEN: [ ] Not Installed [ ] Gravel-Packed
Type Johnson Diameter 3"
Slot/Gauze 12 Length: 48"
Set Between 116 ft. and 120 ft.
FITTINGS: [X] K-Packer [ ] Bremer Check
[ ] Blank Above Screen 1 ft. Other ____

9. STATIC WATER LEVEL: 63 ft. Below Land Surface [ ] Flowing

10. PUMPING LEVEL: Below Land Surface
84 ft. After 2 hrs. Pumping at 65 G.P.M.
[X] Plunger [ ] Bailer [ ] Air [ ] Test Pump

11. WELL HEAD COMPLETION:
[X] Pitless Adapter [X] 12" Above Grade
[ ] Basement Offset [ ] Well House

12. WELL GROUTED? [ ] No [X] Yes From 0 to 109 ft.
[ ] Neat Cement [X] Bentonite [ ] Other ____
No. of Bags 5 1/2 Additives ____

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:
Type Sewers Distance 80 ft. Direction North
Type ____ Distance ____ ft. Direction ____

14. PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's Name Redjacket
Model Number ____ HP 1 Volts 230
Length of Drop Pipe 84 ft. Capacity 12 G.P.M.
TYPE: [X] Submersible [ ] Jet [ ] Other ____
PRESSURE TANK:
Manufacturer's Name Well X-trol
Model Number WX250 Capacity 64 Gallons ____

15. ABANDONED WELL PLUGGED? [X] Yes [ ] No
Casing Diameter 2 in. Depth 100 ft.
PLUGGING MATERIAL: [ ] Neat Cement [ ] Bentonite Slurry [ ] Cement/Bentonite Slurry [ ] Concrete Grout [X] Bentonite Chips
No. of Bags 3 Casing Removed? [ ] Yes [X] No

16. REMARKS: (Elevation, Source of Data, etc.)

17. DRILLING MACHINE OPERATOR:
[X] Employee [ ] Subcontractor
Name Charles Farren

18. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
REGISTERED BUSINESS NAME: Fettig Well Drilling — REGISTRATION NO.: 63-1976
Address 2990 Towering Oaks Dr., White Lake
Signed [signature] AUTHORIZED REPRESENTATIVE Date 7-1-98

GEOLOGICAL SURVEY COPY

EQP 2017 (12/96)

(13)
GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

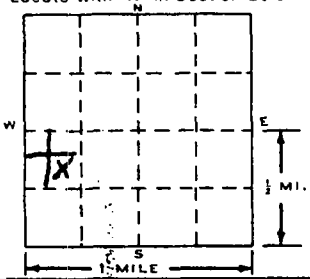
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SE 1/4 NW 1/4 SW 1/4 | 3 | 2N N/S | 10E E/W |

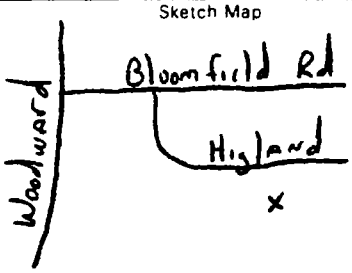
Distance And Direction From Road Intersection
Bloomfield Rd East of Woodward to Highland Rd
228 HIGHLAND RD

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map




3 OWNER OF WELL: NEW CREATIONS
Address 6695 HIGHLAND RD
WATERFORD MI
Address Same As Well Location? ☐ Yes ☒ No

4 WELL DEPTH: 113 FT. Date Completed MO. 11 DAY 23 YEAR 94 ☒ New Well ☐ Replacement Well

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐

6 USE: ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐

7 CASING Diameter ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded
5 in. to ___ ft. depth
___ in. to ___ ft. depth
Grouted Drill Hole Diameter
___ in. to ___ ft. depth
___ in. to ___ ft. depth
Height Above/~~Below~~ Surface 1 ft.
Weight SDR21 lbs./ft.
Drive Shoe ☐ Yes ☒ No

| 2 FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown clay | 13 | 13 |
| Blue clay : Gravel | 77 | 90 |
| SAND | 23 | 113 |

8 SCREEN ☐ Not Installed
Type Stainless Diameter 3"
Slot/~~Gauze~~ 10 Length 4'
Set between 109 ft. and 113 ft.
FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check
☒ Blank above screen 1 ft. Other

9 STATIC WATER LEVEL: 61 ft. below land surface ☐ Flow

10 PUMPING LEVEL below land surface
70 ft. after 1 hrs. pumping at 40 G.P.M.
___ ft. after ___ hrs. pumping at ___ G.P.M.

11 WELL HEAD COMPLETION ☒ Pitless adapter ☒ 12" above grade ☐ Basement offset ☐ Approved pit

12 WELL GROUTED? ☐ No ☒ Yes From Top to Bott ft.
☐ Neat cement ☒ Bentonite ☐ Other
No of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Sewer Distance 50 ft. Direction North
Well disinfected upon completion? ☒ Yes ☐ No
Was old well plugged? ☐ Yes ☐ No

14 PUMP ☐ Not Installed ☐ Pump Installation Only
Manufacturer's name MYERS
Model number ___ HP 1/2 Volts 220
Length of Drop Pipe 80 ft. capacity ___ G.P.M.
TYPE ☒ Submersible ☐ Jet
PRESSURE TANK
Manufacturer's name SMITH
Model number 203 Capacity 82 Gallons

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc.

Rig Operator's Name: Greg LaBonc

16. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Ray LaBonc Well Drilling 63-0140
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 8155 Oakhill Clarkston MI 48348
Signed [signature] Date 11/23/94
AUTHORIZED REPRESENTATIVE

D67d 2/89

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

(14)

TAX NO:

# MICHIGAN DEPARTMENT OF PUBLIC HEALTH
# WATER WELL AND PUMP RECORD

PERMIT NO:

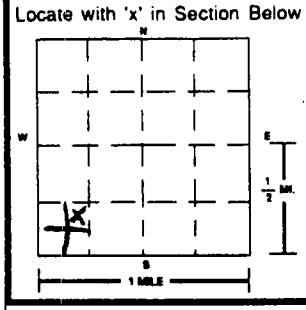
1. LOCATION OF WELL

| County | Township Name | Fraction | Section No. | Town No. | Range No. |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NE 1/4 SW 1/4 SW 1/4 | 3 | 2N | 10E |

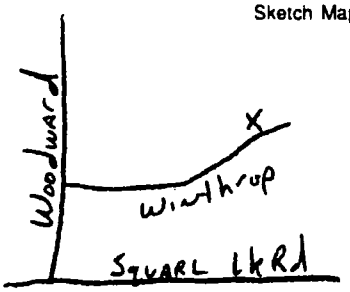
Distance and Direction from Road Intersection: Woodward 1/4 mile north of Square Lk Rd to Winthrop Right 1/4 mile on left

Street Address & City of Well Location: 1526 Winthrop

Locate with 'x' in Section Below




Sketch Map




3. OWNER OF WELL: New Creations
Address: 6695 Highland, Waterford MI
Address Same as Well Location ☐ Yes ☒ No

4. WELL DEPTH: 246 ft. Date Completed 7/17/95 ☒ New Well ☐ Replacement Well

5. ☐ Cable Tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow Rod ☐ Auger/Bored ☐ Jetted ☐

6. USE: ☒ Household ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat Pump ☐ Test Well ☐ Type IIb Public ☐

7. CASING: ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded ☐ Other
Diameter: 5 in. to 242 ft. depth
in. to ft. depth
BORE HOLE: Diameter: 9 in. to 246 ft. depth
in. to ft. depth
Height: Above/~~Below~~ Surface: 1 ft
Weight: SDR21 lbs./ft.
☐ Drive Shoe ☐ Shale Packer

2. FORMATION DESCRIPTION

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Blue clay : Gravel | 130 | 130 |
| Gravel : sand | 11 | 141 |
| Clay : Gravel | 95 | 236 |
| Sand | 10 | 246 |

USE A 2ND SHEET IF NEEDED

8. SCREEN: ☐ Not Installed ☐ Gravel-Packed
Type: Stainless Diameter: 3"
Slot/~~Gauze~~: 15 Length: 4'
Set Between 242 ft. and 246 ft.
FITTINGS: ☒ K-Packer ☐ Bremer Check
☒ Blank Above Screen 1-6' ft. Other

9. STATIC WATER LEVEL: 87 ft. Below Land Surface ☐ Flowing

10. PUMPING LEVEL: Below Land Surface 100 ft. After 1 hrs. Pumping at 100 G.P.M.
☐ Plunger ☐ Bailer ☒ Air ☐ Test Pump

11. WELL HEAD COMPLETION:
☒ Pitless Adapter ☒ 12" Above Grade
☐ Basement Offset ☐ Well House

12. WELL GROUTED? ☐ No ☒ Yes From Top to 232 ft.
☐ Neat Cement ☒ Bentonite ☐ Other
No. of Bags 15 Additives

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:
Type: Septic Distance: 50 ft. Direction: North
Type: Distance: ft. Direction:

14. PUMP: ☐ Not Installed ☐ Pump Installation Only
Manufacturer's Name: Myers
Model Number: HP: 1 Volts: 22
Length of Drop Pipe: 120 ft. Capacity: G.P.M.
TYPE: ☒ Submersible ☐ Jet ☐ Other
PRESSURE TANK:
Manufacturer's Name: Smith
Model Number: 203 Capacity: Gallons: 42

15. ABANDONED WELL PLUGGED? ☐ Yes ☐ No
Casing Diameter in. Depth ft.
PLUGGING MATERIAL: ☐ Neat Cement ☐ Bentonite Slurry ☐ Cement/Bentonite Slurry ☐ Concrete Grout ☐ Bentonite Chips
No. of Bags Casing Removed? ☐ Yes ☐ No

16. REMARKS: (Elevation, Source of Data, etc.)

17. DRILLING MACHINE OPERATOR:
☒ Employee ☐ Subcontractor
Name: Greg Lalonde

15. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Roy Lalonde Well Drilling 63-0140
REGISTERED BUSINESS NAME REGISTRATION NO.
Address: 4155 Oakhill Clarkston, MI 48348
Signed: [signature] Date: 7/17/95
AUTHORIZED REPRESENTATIVE

RECEIVED OAKLAND COUNTY JAN 11 1996

GW-2-228 9/93

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

(15)

GEOLOGICAL SURVEY SAMPLE No.

JAN 12 1973

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

## 1 LOCATION OF WELL

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | ¼ SE ¼ SE ¼ | 3 | 2 N/S | 10 E/W |

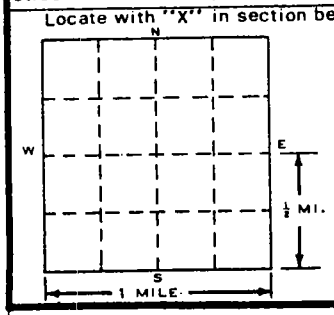
Distance And Direction from Road Intersections

850 Opdyke ( N. of Square Lake, W. off Opdyke for the Grand Trunk Railroad)

Street address & City of Well Location

Locate with "X" in section below

Sketch Map:




## 3 OWNER OF WELL:

Address Orr Brothers Bldg. Inc.
19040 Farmington
Livonia, Michigan 48152

## 4 WELL DEPTH: (completed)

141½ ft. Date of Completion 11-17-72

## 5

[X] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Jetted [ ] Bored [ ] ____

## 6 USE:

[ ] Domestic [X] Public Supply [ ] Industry
[ ] Irrigation [ ] Air Conditioning [ ] Commercial
[ ] Test Well [ ] ____

## 7 CASING:

Threaded [X] Welded [ ]
Diam. 4 in. to 135'7" ft. Depth
___ in. to ___ ft. Depth

Height: Above Below Surface Even ft.
Weight 11 lbs./ft.
Drive Shoe? Yes [X] No [ ]

## 2

| FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Stony Clay | 20' | 20' |
| Very Stiff Clay | 15' | 35' |
| Stony Clay | 15' | 50' |
| Sandy Hardpan Mostly Sand | 50' | 100' |
| Sandy Hardpan | 10 | 110' |
| Sandy Hardpan Mostly Sand | 15' | 125' |
| Sandy Hardpan | 10' | 135' |
| Med Sand & Gravel | 6½' | 141½' |

USE A 2ND SHEET IF NEEDED

## 8 SCREEN:

Johnson Stainless
Type: Steel Dia.: 4"
Slot/Gauze 18 Length 5'
Set between 136'-1" ft. and 141½' ft.
Fittings: 3" x 18" Nipple

## 9 STATIC WATER LEVEL

90 ft. below land surface

## 10 PUMPING LEVEL below land surface

130 ft. after 2 hrs. pumping 20 g.p.m.
___ ft. after ___ hrs. pumping ___ g.p.m.

## 11 WATER QUALITY in Parts Per Million:

Iron (Fe) 2.0 Chlorides (Cl) 34
Hardness 221 Other ____

## 12 WELL HEAD COMPLETION:

[ ] In Approved Pit
[X] Pitless Adapter [ ] 12" Above Grade

## 13

Well Grouted? [ ] Yes [X] No
[ ] Neat Cement [ ] Bentonite [ ] ____
Depth: From ____ ft. to ____ ft.

## 14 Nearest Source of possible contamination

Unknown
____ feet ____ Direction ____ Type
Well disinfected upon completion [X] Yes [ ] No

## 15 PUMP:

[ ] Not installed
Manufacturer's Name Red Jacket
Model Number R150N1-11EC HP 1½ Volts 230
Length of Drop Pipe 126 ft. capacity 18½ G.P.M.
Type: [X] Submersible
[ ] Jet [ ] Reciprocating

## 16 Remarks, elevation, source of data, etc.

Grand Trunk R.R.

ADDED INFO. BY DRILLER, ITEM NO.
CORRECTED BY: RJP
ADDITION TO

## 17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

O. O. Corsaut, Inc. — REGISTERED BUSINESS NAME
0025 — REGISTRATION NO.

Address 15101 W. 11 Mile Road, Oak Park 48237

Signed O. Owen Corsaut — AUTHORIZED REPRESENTATIVE
Date Dec. 19, 1972

D67d 100M (Rev. 12-68)

GEOLOGICAL SURVEY COPY

GEOLOGICAL SURVEY SAMPLE No. (16)

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

**1 LOCATION OF WELL**

| County | Twp. | Fraction | Section No. | Town | Range |
|---|---|---|---|---|---|
| OAKLAND | Bloomfield | ¼NW¼SW¼ | 3 | 2 N/S. | 10 E/W. |

Distance And Direction from Road Intersections

OWNER No.

Street address & City of Well Location

**3 OWNER OF WELL:** Val Schlega

Address 285 E. Berkshire, Pontiac

| 2 FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Muddy sand | 0 | 50 |
| Rock | 5 | 55 |
| Hard pan | 90 | 145 |
| Sandy mud | 40 | 180 |
| water sand | | |
| mixed fine & course | 20 | 200 |

**4 WELL DEPTH:** (completed) 200 ft. Date of Completion 1-9-69

**5** ☑ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ___

**6 USE:** ☑ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ___

**7 CASING:** Diam. 4 in. to ___ ft. Depth; Threaded ☐ Welded ☐; Height: Above/Below surface 2 ft.; Weight 11 lbs/ft.; ___ in. to ___ ft. Depth; Drive Shoe? Yes ☑ No ☐

**8 SCREEN:** Type: Slotted Dia.: 3"; Slot/Gauze 18 Length 4'; Set between 195 ft. and 200 ft.; Fittings: 3" nipple Packer

**9 STATIC WATER LEVEL** 60 ft. below land surface

**10 PUMPING LEVEL** below land surface

___ ft. after ___ hrs. pumping ___ g.p.m.

150 ft. after 8 hrs. pumping 10 g.p.m.

**11 WATER QUALITY** in Parts Per Million: Iron (Fe) ___ Chlorides (Cl) ___ Hardness ___

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☐ Pitless Adapter ☐ 12" Above Grade

**13 GROUTING:** Well Grouted? ☐ Yes ☐ No; Material: ☐ Neat Cement ☐ ___; Depth: From ___ ft. to ___ ft.

**14 SANITARY:** Nearest Source of possible contamination NONE; ___ feet ___ Direction ___ Type; Well disinfected upon completion ☐ Yes ☐ No

**15 PUMP:** Manufacturer's Name ___; Model Number ___ HP ___; Length of Drop Pipe ___ ft. capacity ___ G.P.M.; Type: ☐ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

**16** Remarks, elevation, source of data, etc.

ADDED INFO. BY DRILLER, ITEM NO.

*CORRECTED BY:

**ADDITION BY:

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Roberts Well Drilling — REGISTERED BUSINESS NAME; 0248 — REGISTRATION NO.

Address 21725 Ruth, Farm Mich 48024

Signed [signature] — AUTHORIZED REPRESENTATIVE; Date 2-16-69

D67D 100M 6-66

MAR 3 1969

GEOLOGICAL SURVEY COPY

(17) GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

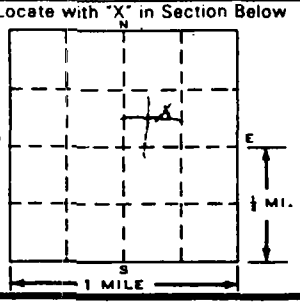
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NE 1/4 SW 1/4 NE 1/4 | 4 | 2 N/S | 10 E/W |

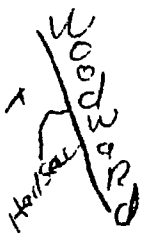
Distance And Direction From Road Intersection: 800' West of Woodward 600' N of Hadsell

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map:




**3 OWNER OF WELL:** MATHIS

Address: 40 HADSELL DR

Address Same As Well Location? [X] Yes [ ] No

**4 WELL DEPTH:** 122 FT. Date Completed MO. DAY YEAR 12 27 91 [ ] New Well [X] Replacement Well

**5** [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ]

**6 USE:** [X] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ]

**7 CASING:** Diameter [ ] Steel [ ] Threaded [X] Plastic [X] Welded

Height: Above/Below Surface 1 ft. Weight 21 lbs./ft.

X in. to X ft. depth

5 in. to 108 ft. depth

Grouted Drill Hole Diameter 8 in. to 13 ft. depth

in. to ft. depth

Drive Shoe [ ] Yes [X] No

| 2 FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sand-Clay | 8 | 8 |
| Clay | 15 | 23 |
| Sand-Clay | 70 | 93 |
| Sand | 29 | 122 |

**8 SCREEN:** [ ] Not Installed

Type Johnson Diameter 4

Slot size 15 Length 5

Set between 113 ft. and 108 ft.

FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check

[ ] Blank pipe below screen 9 ft. Other

**9 STATIC WATER LEVEL:** 100 ft. below land surface [ ] Flow

**10 PUMPING LEVEL:** below land surface

122 ft. after 1 hrs. pumping at 10 G.P.M.

ft. after hrs. pumping at G.P.M.

**11 WELL HEAD COMPLETION:** [X] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

**12 WELL GROUTED?** [ ] No [X] Yes From TOP BOTTOM ft.

[ ] Neat cement [X] Bentonite [ ] Other CUTTINGS

No. of bags of cement Additives

**13 Nearest source of possible contamination**

Type SEPTIC Distance 55 ft. Direction E

Well disinfected upon completion? [X] Yes [ ] No

Was old well plugged? [X] Yes [ ] No

**14 PUMP:** [ ] Not Installed [ ] Pump Installation Only

Manufacturer's name Hydrus

Model number HP 1/2 Volts 230

Length of Drop Pipe 100 ft. capacity 10 G.P.M.

TYPE: [X] Submersible [ ] Jet

PRESSURE TANK:

Manufacturer's name Ekland

Model number 205 Capacity 10 Gallons

USE A 2ND SHEET IF NEEDED

FEB 27 1992 Office

**15. Remarks, elevation, source of data, etc.**

RECEIVED
Mich. Dept. of Public Health
MAR 4 1992
BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH-GWQS

Rig Operator's Name

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Fleming WD 63-1929

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 445 M-15 ORTONVILLE, MI

Signed Don Fleming AUTHORIZED REPRESENTATIVE Date Jan 20, 92

D67d 12/85

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

(18)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NE 1/4 NW 1/4 SE 1/4 | 4 | 2 N/S | 10 E/W |

Distance And Direction From Road Intersection

Street Address & City of Well Location 194 N. Berkshire Rd.

Locate with "X" in Section Below

Sketch Map: South Boulevard; Franklin; N. Berkshire; S. Berkshire

**3 OWNER OF WELL:** Ralph Windeller

Address 194 N. Berkshire Rd. P.O. Box 7396 Bloomfield Hills, 48302

Address Same As Well Location? [X] Yes [ ] No

**4 WELL DEPTH:** 137 FT. Date Completed MO. 9 DAY 3 YEAR 93 [ ] New Well [X] Replacement Well

**5** [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ]

**6 USE:** [X] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ]

**7 CASING** Diameter [ ] Steel [ ] Threaded [X] Plastic [ ] Welded

5 in. to 133 ft. depth

in. to ft. depth

Grouted Drill Hole Diameter

8 1/4 in. to 137 ft. depth

Height Above/~~Below~~ Surface 1 ft.

Weight lbs./ft

Drive Shoe [ ] Yes [X] No

**8 SCREEN:** [ ] Not Installed

Type Johnson Diameter 3"

Slot/~~Gauge~~ 15 Length 4'

Set between 133 ft. and 137 ft.

FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check

[X] Blank above screen 2 ft. Other

**9 STATIC WATER LEVEL** 93 ft. below land surface [ ] Flow

**10 PUMPING LEVEL:** below land surface

ft. after hrs. pumping at 30 G.P.M. AIR

ft. after hrs. pumping at G.P.M.

**11 WELL HEAD COMPLETION** [X] Pitless adapter [X] 12" above grade [ ] Basement offset [ ] Approved pit

**12 WELL GROUTED?** [ ] No [X] Yes From 0 to 110 ft.

[ ] Neat cement [ ] Bentonite [X] Other Bensec

No of bags of cement 250 lbs Additives Super Mud

**13** Nearest source of possible contamination

Type Septic Distance 80 ft. Direction S

Well disinfected upon completion? [X] Yes [ ] No

Was old well plugged? [X] Yes [ ] No

**14 PUMP** [ ] Not Installed [ ] Pump Installation Only

Manufacturer's name Myers

Model number PM2J72-12PB HP 3/4 Volts 230

Length of Drop Pipe 120 ft capacity 12 G.P.M

TYPE [X] Submersible [ ] Jet

PRESSURE TANK

Manufacturer's name His own

Model number Capacity Gallons

**2 FORMATION DESCRIPTION**

| Formation Description | Thickness of Stratum | Depth to Bottom of Stratum |
|---|---|---|
| Sandy Brown Clay | 7 | 7 |
| Brown Clay | 5 | 12 |
| Gray Clay | 22 | 34 |
| Sandy Clay | 6 | 40 |
| Sand | 13 | 53 |
| Gray Clay Rock at 53 | 2 | 55 |
| Gravely Gray Clay | 10 | 65 |
| Gray Clay | 2 | 67 |
| Sand Gray | 20 | 87 |
| Brown Sand Gravel | 13 | 100 |
| Sand | 37 | 137 |

USE A 2ND SHEET IF NEEDED

**15** Remarks, elevation, source of data, etc. Abandoned 3 old wells 4" 30-3" Wells 31 bags Hole Plug

**16 WATER WELL CONTRACTOR'S CERTIFICATION:** This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Adams Well Drilling, Inc. 47-15c

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 422 S. Hacker Rd. Brighto

Signed Daniel Adams Date 9-10-93

AUTHORIZED REPRESENTATIVE

**17** Rig Operator's Name: Tom Browne - Jim Erwin

D67d 2/89

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor.

SEP 03 1993 Health Division North Office

OCT 8 1993 BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH

GEOLOGICAL SURVEY COPY

(19)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

SID WELL NO: 19-04-401-014

PERMIT NUMBER

**1 LOCATION OF WELL**

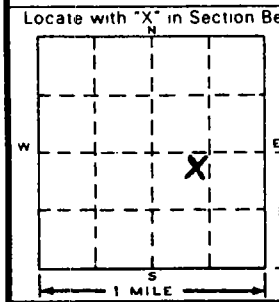
| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| OAKLAND | BLOOMFIELD | NE ¼ NW ¼ SE ¼ | 4 | 2 N/S | 10 E/W |

Distance And Direction From Road Intersection

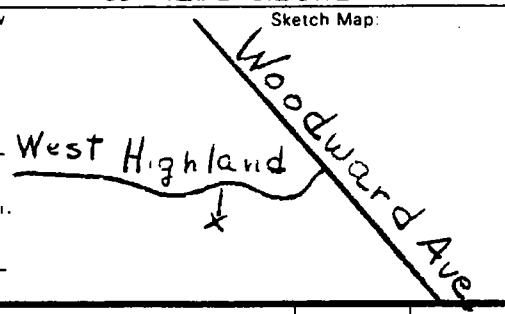
200 FEET SOUTH OF WEST HIGHLAND
1/8 MILE WEST OF WOODWARD AVENUE

Street Address & City of Well Location 49 WEST HIGHLAND

Locate with "X" in Section Below




Sketch Map:




**3 OWNER OF WELL:**
JOSEPH CONSTANT
Address 129 ROANOKE
ROCHESTER, MI 48306
Address Same As Well Location? ☐ Yes ☒ No

**4 WELL DEPTH:** 106 FT. Date Completed MO. 04 DAY 29 YEAR 93 ☒ New Well ☐ Replacement Well

**5** ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

**6 USE:** ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

**7 CASING:** Diameter ☐ Steel ☐ Threaded ☒ Plastic ☐ Welded
5 in. to 102 ft. depth
____ in. to ____ ft. depth
Grouted Drill Hole Diameter 7 7/8 in. to 102 ft. depth
____ in. to ____ ft. depth
Height: Above/~~Below~~ Surface 1½ ft.
Weight 2.926 lbs./ft.
Drive Shoe ☐ Yes ☒ No

**2 FORMATION DESCRIPTION**

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| CLAY | 50 | 50 |
| SAND & GRAVEL | 10 | 60 |
| CLAY | 15 | 75 |
| SAND & GRAVEL | 10 | 85 |
| CLAY | 5 | 90 |
| WATER BEARING GRAVEL | 16 | 106 |

USE A 2ND SHEET IF NEEDED

**8 SCREEN:** ☐ Not Installed
Type STAINLESS Diameter 3"
Slot/Gauze 15 Length 4"
Set between 102 ft. and 106 ft.
FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check
☐ Blank above screen ____ ft. Other ____

**9 STATIC WATER LEVEL:**
84 ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface
100 ft. after 2 hrs. pumping at 15 G.P.M.
____ ft. after ____ hrs. pumping at ____ G.P.M.

**11 WELL HEAD COMPLETION** ☒ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☒ Yes From 0 to 102 ft.
☐ Neat cement ☒ Bentonite ☐ Other ____
No. of bags of cement ____ Additives ____

**13 Nearest source of possible contamination**
Type SEPTIC Distance 100 ft. Direction E
Well disinfected upon completion? ☒ Yes ☐ No
Was old well plugged? ☐ Yes ☐ No

**14 PUMP.** ☐ Not Installed ☐ Pump Installation Only
Manufacturer's name MEYERS
Model number S2N72-N710 HP 3/4 Volts 230
Length of Drop Pipe 95 ft. capacity 10 G.P.M.
TYPE: ☒ Submersible ☐ Jet ____
PRESSURE TANK
Manufacturer's name CHALLENGER
Model number PC 122 Capacity 28 Gallons

RECEIVED OAKLAND COUNTY JUL 09 1993

RECEIVED JUL 14 1993

**15. Remarks, elevation, source of data, etc.**

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

MIDSTATE WELL DRILLING 44-1902
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 1313 IMLAY CITY ROAD, LAPEER, MI 48446
Signed David L. Jory Date 5-11-93
AUTHORIZED REPRESENTATIVE

**17. Rig Operator's Name:**
DAVID L. JORY

D67d 2/89

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

(20)

TAX NO:

# MICHIGAN DEPARTMENT OF PUBLIC HEALTH
# WATER WELL AND PUMP RECORD

PERMIT NO:

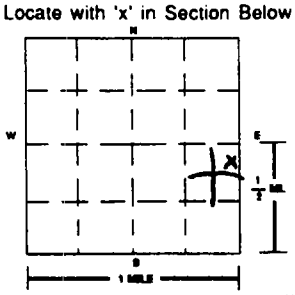
1. LOCATION OF WELL

| County | Township Name | Fraction | Section No. | Town No. | Range No. |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NE 1/4 NE 1/4 SE 1/4 | 4 | 2N | 10E |

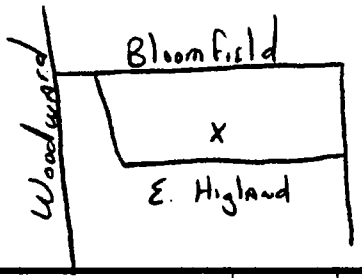
Distance and Direction from Road Intersection: Bloomfield Rd East of Woodward to East Highland Rd job 3rd from last on left. 245 E

Street Address & City of Well Location: HIGHLAND

Locate with 'x' in Section Below



Sketch Map




3. OWNER OF WELL: NEW CREATIONS
Address: 6695 HIGHLAND WATERFORD, MI
Address Same as Well Location ☐ Yes ☒ No

4. WELL DEPTH: 125 ft. Date Completed 8/22/94 ☒ New Well ☐ Replacement Well

5. ☐ Cable Tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow Rod ☐ Auger/Bored ☐ Jetted ☐ ____

6. USE: ☒ Household ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat Pump ☐ Test Well ☐ Type IIb Public ☐ ____

7. CASING: ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded ☐ Other ____
Diameter: 5 in. to 121 ft. depth; ____ in. to ____ ft. depth
Height: Above/~~Below~~ Surface: 1 ft
Weight: SDR21 lbs./ft.
BORE HOLE: Diameter: 9 in. to ____ ft. depth; ____ in. to ____ ft. depth
☐ Drive Shoe ☐ Shale Packer

2. FORMATION DESCRIPTION

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Blue clay & Gravel | 72 | 72 |
| Gravel w/ Blue clay streaks | 20 | 92 |
| Dirty Gravels & sands | 28 | 120 |
| SAND | 5 | 125 |

USE A 2ND SHEET IF NEEDED

8. SCREEN: ☐ Not Installed ☐ Gravel-Packed
Type: Stainless Diameter: 3"
Slot/Gauze: 12 Length: 4'
Set Between 121 ft. and 125 ft.
FITTINGS: ☒ K-Packer ☐ Bremer Check
☒ Blank Above Screen 1 ft. Other ____

9. STATIC WATER LEVEL: 60 ft. Below Land Surface ☐ Flowing

10. PUMPING LEVEL: Below Land Surface 75 ft. After 1 hrs. Pumping at 45 G.P.M.
☐ Plunger ☐ Bailer ☒ Air ☐ Test Pump

11. WELL HEAD COMPLETION: ☒ Pitless Adapter ☒ 12" Above Grade ☐ Basement Offset ☐ Well House

12. WELL GROUTED? ☐ No ☒ Yes From Top to 25 ft. ☐ Neat Cement ☒ Bentonite ☐ Other ____
No. of Bags ____ Additives ____

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:
Type: Sewer Distance: 50 ft. Direction: South
Type ____ Distance ____ ft. Direction ____

14. PUMP: ☐ Not Installed ☐ Pump Installation Only
Manufacturer's Name: MYERS
Model Number ____ HP 1/2 Volts 220
Length of Drop Pipe 80 ft. Capacity 12 G.P.M.
TYPE: ☒ Submersible ☐ Jet ☐ Other ____
PRESSURE TANK:
Manufacturer's Name: SMITH
Model Number 203 Capacity ____ Gallons 86

15. ABANDONED WELL PLUGGED? ☐ Yes ☐ No
Casing Diameter ____ in. Depth ____ ft.
PLUGGING MATERIAL: ☐ Neat Cement ☐ Bentonite Slurry ☐ Cement/Bentonite Slurry ☐ Concrete Grout ☐ Bentonite Chips
No. of Bags ____ Casing Removed? ☐ Yes ☐ No

16. REMARKS: (Elevation, Source of Data, etc.)

17. DRILLING MACHINE OPERATOR:
☒ Employee ☐ Subcontractor
Name: Greg LaLonde

15. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Ray LaLonde Well Drilling 63-0140
REGISTERED BUSINESS NAME REGISTRATION NO.
Address: 8155 Oakhill Clarkston MI 48348
Signed ____ AUTHORIZED REPRESENTATIVE Date 8/22/94

GW-2-228 9/93

GEOLOGICAL SURVEY COPY

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor.

21

GEOLOGICAL SURVEY NO. 19-04-327-008

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

**1 LOCATION OF WELL**

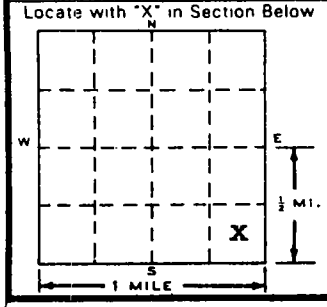
| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | se¼se ¼nw ¼ | 4 | 2 N/S | 10 E/W |

Distance And Direction From Road Intersection

Michael Ross

Street Address & City of Well Location 355 Ni Berkshire

Locate with "X" in Section Below




Sketch Map:

**3 OWNER OF WELL:** Ross Homes Inc.

Address: 4568 Elizabeth Lake Rd. Pontiac Mi.

Address Same As Well Location? ☐ Yes ☒ No

**4 WELL DEPTH:** 137 FT. Date Completed MO 7 DAY 12 YEAR 90 ☒ New Well ☐ Replacement Well

**5** ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

**6 USE:** ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

**7 CASING:** Diameter ☒ Steel ☐ Threaded ☐ Plastic ☒ Welded

4 in. to 133 ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter

____ in. to ____ ft. depth

____ in. to ____ ft. depth

Height: Above/~~Below~~ Surface 1 ft.

Weight 10.40 lbs./ft.

Drive Shoe ☒ Yes ☐ No

**2 FORMATION DESCRIPTION**

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| brown clay | 35 | 35 |
| blue clay-sand | 92 | 127 |
| fine gray sand-water | 10 | 137 |

USE A 2ND SHEET IF NEEDED

**8 SCREEN:** ☐ Not Installed

Type Johnson Diameter 3in.

Slot/~~Gauze~~ 7 Length 48in.

Set between 133 ft. and 137 ft.

FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check

☒ Blank above screen 1 ft. Other ____

**9 STATIC WATER LEVEL:** 78 ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface

105 ft. after 2 hrs. pumping at 60 G.P.M.

____ ft. after ____ hrs. pumping at ____ G.P.M.

**11 WELL HEAD COMPLETION:** ☒ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☒ Yes From 0 to 60 ft.

☐ Neat cement ☒ Bentonite ☐ Other ____

No. of bags of cement 2 Additives ____

**13 Nearest source of possible contamination**

Type septic Distance 80 ft. Direction west

Well disinfected upon completion? ☒ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

**14 PUMP:** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name Myers

Model number ____ HP 3/4 Volts 220

Length of Drop Pipe 105 ft. capacity 10 G.P.M.

TYPE: ☒ Submersible ☐ Jet ____

PRESSURE TANK

Manufacturer's name Well-X-Trol

Model number WX203 Capacity ____ Gallons

RECEIVED Mich. Dept. of Public Health DEC 14 1990

BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH-GWQS

DEC 1 ... OAKLAND ... Hlth Env.

**15. Remarks, elevation, source of data:**

Nit. -0-

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Fettig Well Drilling 0413

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 5575 Jackson Blvd. White Lake 4838

Signed [signature] AUTHORIZED REPRESENTATIVE Date 7-17-90

**17** Rig Operator's Name: Chuck Farren

D67d 2/89

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

GEOLOGICAL SURVEY SAMPLE No.

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

SEP 8 5 1970

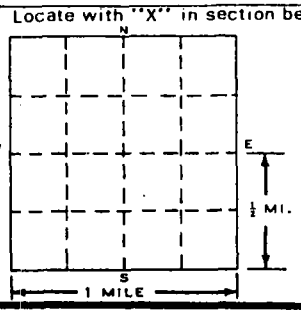
## 1 LOCATION OF WELL

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SW NE | 4 | 2 N/S | 10 E/W |

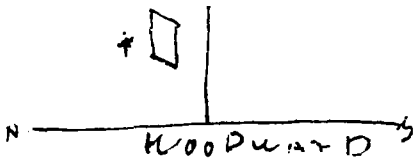
Distance And Direction from Road Intersections: 1/4 Mile From Woodward

Street address & City of Well Location: 28 Bloomfield ST. Pontiac, Mich

Locate with "X" in section below




Sketch Map:




## 2 FORMATION

| FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sandy Clay | 100 | 100 |
| Clay | 10 | 110 |
| water bearing strata | 10 | 120 |

USE A 2nd SHEET IF NEEDED

## 3 OWNER OF WELL: ARI Linney

Address: 28 Bloomfield ST. Pontiac, Mich

## 4 WELL DEPTH: (completed) Date of Completion

120 ft. Nov. 12, 1969

## 5

☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug
☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

## 6 USE:

☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☐ ____

## 7 CASING:

Threaded ☐ Welded ☒ Diam. 4 in.
____ in. to ____ ft. Depth
____ in. to ____ ft. Depth

Height: Above/~~Below~~ Surface 1 ft.
Weight ____ lbs./ft.
Drive Shoe? Yes ☒ No ☐

## 8 SCREEN:

Type: Johnson Dia.: 3 in.
Slot/Gauze 16 Length 4 ft.
Set between 116 ft. and 120 ft.
Fittings: 3 in. Packer & nipple

## 9 STATIC WATER LEVEL

____ ft. below land surface

## 10 PUMPING LEVEL below land surface

____ ft. after ____ hrs. pumping ____ g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

## 11 WATER QUALITY in Parts Per Million:

Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

## 12 WELL HEAD COMPLETION:

☐ In Approved Pit
☐ Pitless Adapter ☐ 12" Above Grade

## 13 Well Grouted?

☐ Yes ☐ No
☐ Neat Cement ☐ Bentonite ☐ ____
Depth: From ____ ft. to ____ ft.

## 14 Nearest Source of possible contamination

____ feet ____ Direction City Sewer Type
Well disinfected upon completion ☒ Yes ☐ No

## 15 PUMP:

☐ Not installed
Manufacturer's Name ____
Model Number ____ HP ____ Volts ____
Length of Drop Pipe ____ ft. capacity ____ G.P.M.
Type: ☐ Submersible
☐ Jet ☐ Reciprocating

## 16 Remarks, elevation, source of data, etc.

## 17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Jo-MAR Well Drilling 1071
REGISTERED BUSINESS NAME REGISTRATION NO.

Address 3599 Overton Pontiac, Mich

Signed John Laing Date May 24, 19[illegible]
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

GEOLOGICAL SURVEY COPY

(23)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

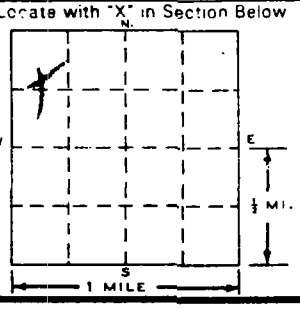
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| OAKLAND | Bloom Field | SW/4 NE/4 NE/4 | 4 | 2 S | 10 E/W |

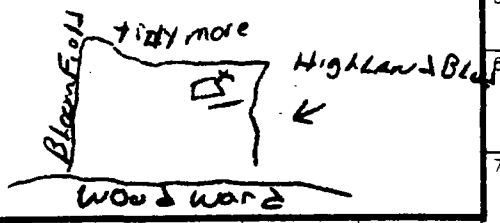
Distance And Direction From Road Intersection: Bloom Field Blvd to tiffany more to Highland Blvd on right hand side

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map




**3 OWNER OF WELL:** Mr Cook

Address: Lot 57 E. Highland Dr

Address Same As Well Location? ☑ Yes ☐ No

**4 WELL DEPTH:** 104 FT. Date Completed: MO. 8 DAY 31 YEAR 88 ☑ New Well ☐ Replacement Well

**5** ☑ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ _____

**6 USE:** ☑ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ _____

**7 CASING:** Diameter ☑ Steel ☐ Threaded ☐ Plastic ☐ Welded

4 in. to 100 ft. depth

_____ in. to _____ ft. depth

Grouted Drill Hole Diameter

_____ in. to _____ ft. depth

_____ in. to _____ ft. depth

Height: Above/Below Surface 1 ft.

Weight 2.79 lbs./ft.

Drive Shoe ☑ Yes ☐ No

| 2 FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown clay | 20 | 20 |
| Blue clay mixed with gravel | 60 | 80 |
| Blue clay | 15 | 95 |
| gray sand very fine | 5 | 100 |
| gray sand medium | 4 | 104 |

**8 SCREEN:** ☐ Not Installed

Type Stainless Diameter 3"

Slot/Gauze 12 Length 4'

Set between 100 ft. and 104 ft.

FITTINGS: ☑ K-Packer ☐ Lead Packer ☐ Bremer Check

☑ Blank above screen 1 ft. Other _____

**9 STATIC WATER LEVEL:** 65 ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface

75 ft. after 2 hrs. pumping at 20 G.P.M.

_____ ft. after _____ hrs. pumping at _____ G.P.M.

**11 WELL HEAD COMPLETION:** ☑ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☐ Yes From _____ to _____ ft.

☐ Neat cement ☐ Bentonite ☐ Other _____

No. of bags of cement _____ Additives _____

**13** Nearest source of possible contamination

Type City Sewer Distance 80 ft. Direction East

Well disinfected upon completion? ☑ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

**14 PUMP:** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name Myers

Model number _____ HP 1/2 Volts 230

Length of Drop Pipe 73 ft. capacity 10 G.P.M.

TYPE: ☑ Submersible ☐ Jet _____

PRESSURE TANK:

Manufacturer's name Well x troll

Model number 203 Capacity 42 Gallons

USE A 2ND SHEET IF NEEDED

NOV 21 1988

**15.** Remarks, elevation, source of data, etc.

**17.** Rig Operator's Name: Charles Layman

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

B.W. Layman & Son's — REGISTERED BUSINESS NAME — 0406 REGISTRATION NO.

Address 4818 Eagle Rd Highland

Signed Charles Layman — AUTHORIZED REPRESENTATIVE — Date 9-17-88

D67d 12/85

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

24

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

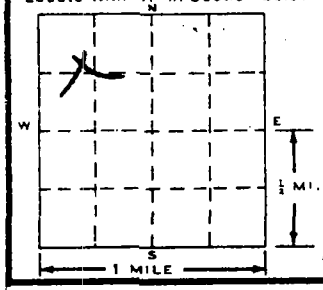
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| OAK LAND | Bloom Field | SW¼ NE¼ NE¼ | 4 | 2 N/S | 10 E/W |

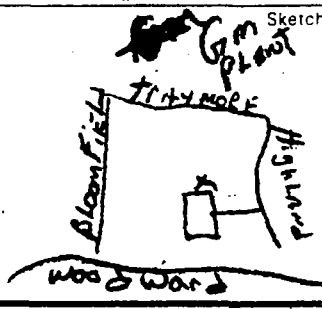
Distance And Direction From Road Intersection: Bloom Field BLUD to Traymore to Highland BLUD on right hand side

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map




**3 OWNER OF WELL:** Mr Cook

Address: Lot 56 E. Highland Dr

Address Same As Well Location? ☐ Yes ☐ No

**4 WELL DEPTH:** 97 FT. Date Completed: MO. 8 DAY 29 YEAR 88 ☑ New Well ☐ Replacement Well

**5** ☑ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

**6 USE:** ☑ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

**7 CASING:** Diameter ☑ Steel ☐ Threaded ☐ Plastic ☑ Welded

4 in. to 93 ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter

____ in. to ____ ft. depth

____ in. to ____ ft. depth

Height: Above/Below Surface 1 ft.

Weight 1079 lbs./ft.

Drive Shoe ☑ Yes ☐ No

**2 FORMATION DESCRIPTION**

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown Clay | 20 | 20 |
| Blue Clay mixed with | | |
| gravel | 50 | 70 |
| Blue Clay | 20 | 90 |
| gray sand medium | 7 | 97 |

**8 SCREEN:** ☐ Not Installed

Type Stainless Diameter 3"

Slot Gauze 15 Length 4'

Set between 93 ft. and 97 ft.

FITTINGS: ☑ K-Packer ☐ Lead Packer ☐ Bremer Check

☑ Blank above screen 1 ft Other ____

**9 STATIC WATER LEVEL:** 65 ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface

75 ft. after 2 hrs. pumping at 20 G.P.M.

____ ft. after ____ hrs. pumping at ____ G.P.M.

**11 WELL HEAD COMPLETION:** ☑ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☐ Yes From ____ to ____ ft.

☐ Neat cement ☐ Bentonite ☐ Other ____

No. of bags of cement ____ Additives ____

**13 Nearest source of possible contamination**

Type City Sewer Distance 30 ft. Direction East

Well disinfected upon completion? ☑ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

**14 PUMP:** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name Myers

Model number ____ HP ½ Volts 230

Length of Drop Pipe 73 ft. capacity ____ G.P.M.

TYPE: ☑ Submersible ☐ Jet ____

PRESSURE TANK:

Manufacturer's name Well x troll

Model number 202 Capacity 42 Gallons

NOV 21 1988

USE 2ND SHEET IF NEEDED

**15. Remarks, elevation, source of data, etc.**

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

B.W. LAYMANESONS 0406

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 4812 Eagle Rd Highland Mi

Signed Charles Laymen Date 9-17-88

AUTHORIZED REPRESENTATIVE

**17. Rig Operator's Name:** Charles Laymen

D67d 12/85

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

GEOLOGICAL SURVEY SAMPLE No. [ ]

FEB 09 1981

# WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

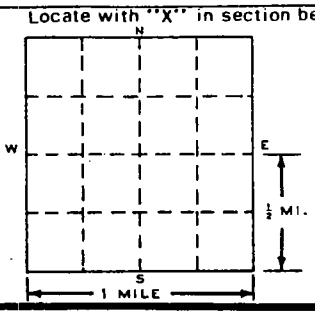
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SW ¼ NE ¼ | 4 | 2 N/S. | 10 E/W. |

Distance And Direction from Road Intersections: 136 W. Highland

Street address & City of Well Location

Locate with "X" in section below — Sketch Map:




**3 OWNER OF WELL:** Charles W. Wolfe, Jana L. Wolfe
Address: 136 W. Highland, Bloomfield Hills, Michigan 48013

**4 WELL DEPTH:** (completed) 137 ft. Date of Completion 1/26/81

**5** [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Jetted [ ] Bored [ ] ____

**6 USE:** [x] Domestic [ ] Public Supply [ ] Industry [ ] Irrigation [ ] Air Conditioning [ ] Commercial [ ] Test Well [ ] ____

**7 CASING:** Threaded [ ] Welded [x]
Diam. 4 in. to 137'6" ft. Depth
____ in. to ____ ft. Depth
Height: Above/~~Below~~ Surface 5'6" ft.
Weight 11 lbs./ft.
Drive Shoe? Yes [x] No [ ]

**8 SCREEN:** Johnson stainless
Type: steel Dia.: 4"
Slot/~~Gauze~~ 15 Length 5'
Set between 132 ft. and 137 ft.
Fittings: 3"x18" nipple

**9 STATIC WATER LEVEL** 95 ft. below land surface

**10 PUMPING LEVEL** below land surface
123 ft. after 2 hrs. pumping 20+ g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

**11 WATER QUALITY** in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

**12 WELL HEAD COMPLETION:** [ ] In Approved Pit [x] Pitless Adapter [ ] 12" Above Grade

**13** Well Grouted? [ ] Yes [x] No
[ ] Neat Cement [ ] Bentonite [ ] ____
Depth: From ____ ft. to ____ ft.

**14** Nearest Source of possible contamination
____ feet ____ Direction Unknown Type
Well disinfected upon completion [ ] Yes [ ] No

**15 PUMP:** [ ] Not installed
Manufacturer's Name Red Jacket
Model Number 75R1-CR12BC HP 3/4 Volts 230
Length of Drop Pipe 122 ft. capacity 11 G.P.M.
Type: [x] Submersible [ ] Jet [ ] Reciprocating

**2 FORMATION**

| FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown clay | 12' | 12' |
| Brown clay & sand | 20' | 32' |
| Grey Clay & gravel | 12' | 44' |
| Gravel some clay | 8' | 52' |
| Black sand some clay | 8' | 60' |
| Hardpan (gravel & clay) | 9' | 69' |
| Dry brown gravel & sand | 23' | 92' |
| Dry gravel & sand | 2' | 94' |
| Brown gravel & some clay & sand | 2' | 96' |
| Gravel & sand (hardpan) | 6' | 102' |
| Wet gravel & sand | 3' | 105' |
| Coarse gravel & sand | 18' | 123' |
| Med. brown sand | 5' | 128' |
| Grey med gravel & sand | 7' | 135' |
| Very fine sand | 2' | 137' |

USE A 2ND SHEET IF NEEDED

**16 Remarks, elevation, source of data, etc.**
ADDED INFO BY DRILLER, ITEM NO.
*CORRECTED BY
**ADDITION BY
ELEVATION
DEPTH TO ROCK
dk

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
O.O. Corsaut, Inc. — REGISTERED BUSINESS NAME
0025 — REGISTRATION NO.
Address 15101 W. 11 Mile Rd. Oak Park, Mi 48237
Signed [signature] — AUTHORIZED REPRESENTATIVE
Date 2/2/81

D67d 100M (Rev. 12-68)

GEOLOGICAL SURVEY COPY

(26)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

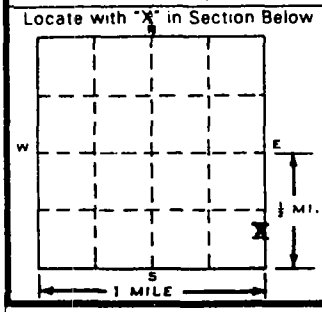
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NE¼ SE¼ SE¼ | 4 | 2 N/S X | 10 E/W X |

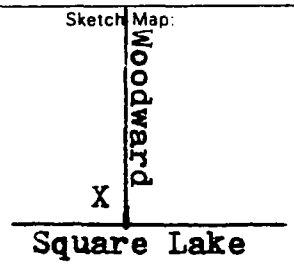
Distance And Direction From Road Intersection: 1/4 mile North of Square Lake - West of Telegraph - 900 Woodward Avenue Pontiac, MI

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map:




**3 OWNER OF WELL:** St. Joseph Mercy Hospital

Address 900 Woodward Avenue Pontiac, MI 48053

Address Same As Well Location? [X] Yes [ ] No

**4 WELL DEPTH: (completed)** 145 ft. **Date of Completion** 8/28/86

**5** [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ] ____

**6 USE:** [ ] Domestic [X] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ] ____

**7 CASING:** Diameter [ ] Steel [ ] Threaded [X] Plastic [ ] Welded

5 in. to 136 ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter

8 in. to 136 ft. depth

____ in. to ____ ft. depth

Height: Above/Below Surface ____ ft.

Weight 2.926 lbs./ft.

Drive Shoe [ ] Yes [X] No

| 2 FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sand and clay | 20 | 20 |
| Clay | 10 | 30 |
| Clay and gravel | 15 | 45 |
| Clay | 40 | 85 |
| Gravel | 10 | 95 |
| Clay and gravel | 30 | 125 |
| Water bearing gravel | 20 | 145 |

USE A 2ND SHEET IF NEEDED

**8 SCREEN:** [ ] Not Installed

Type Stainless Diameter 3"

Slot/Gauge 15 Length 9'

Set between 136 ft. and 145 ft.

FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check

[ ] Blank above screen ____ ft. Other ____

**9 STATIC WATER LEVEL:** 80 ft. below land surface [ ] Flow

**10 PUMPING LEVEL:** below land surface

60 ft. after 2 hrs. pumping at 40 G.P.M.

____ ft. after ____ hrs. pumping at ____ G.P.M.

**11 WELL HEAD COMPLETION:** [X] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

**12 WELL GROUTED?** [ ] No [X] Yes From 0 to 136 ft.

[ ] Neat cement [X] Bentonite [ ] Other ____

No. of bags of cement ____ Additives ____

**13 Nearest source of possible contamination**

Type none Distance ____ ft. Direction ____

Well disinfected upon completion? [X] Yes [ ] No

**14 PUMP:** [ ] Not Installed [ ] Pump Installation Only

Manufacturer's name Flint & Walling

Model number 4F27B15 HP 1½ Volts 230 - 3

Length of Drop Pipe 120 ft. capacity 20 G.P.M.

TYPE: [X] Submersible [ ] Jet ____

PRESSURE TANK

Manufacturer's name Well-X-Trol

Model number 302 Capacity 24 Gallons

OCT 9 1986

**15. Remarks, elevation, source of data, etc.**

Drilled by - Glenn Eagan #25-1876

Drilled 1 dry hole 100'
Cemented off - same location

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

Bellinger Well Drilling - 44-1757

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 4020 S. Lapeer Rd. Metamora, MI 4845

Signed Phil J. Bellinger Date 8/29/86

AUTHORIZED REPRESENTATIVE

D67d 2/84

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

(27)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

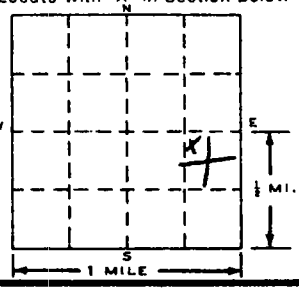
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NW 1/4 NE 1/4 SE 1/4 | 4 | 2N N/S | 10E E/W |

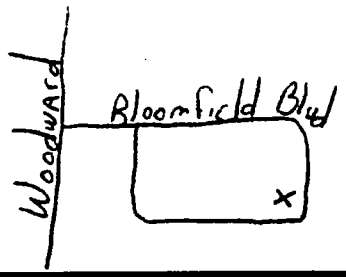
Distance And Direction From Road Intersection

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map:




**3 OWNER OF WELL:** BENSON HOMES

Address 8627 AIRPORT RD DRAYTON PLAINS

Address Same As Well Location? ☐ Yes ☒ No

**4 WELL DEPTH:** 122 FT. Date Completed MO. 6 DAY 19 YEAR 89 ☒ New Well ☐ Replacement Well

**5** ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐ ____

**6 USE:** ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐ ____

**7 CASING:** Diameter ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded

5 in. to 118 ft. depth

____ in. to ____ ft. depth

Grouted Drill Hole Diameter

8.5 in. to ____ ft. depth

____ in. to ____ ft. depth

Height: Above/Below Surface 1 ft.

Weight .0821 lbs./ft.

Drive Shoe ☐ Yes ☒ No

**2 FORMATION DESCRIPTION**

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sand & Gravel | 6 | 6 |
| Brown clay & Gravel | 5 | 11 |
| Blue clay & Gravel | 98 | 109 |
| CLAY | 9 | 118 |
| SAND | 4 | 122 |

USE A 2ND SHEET IF NEEDED

**8 SCREEN:** ☐ Not Installed

Type Stainless Diameter 3"

Slot/~~Gauge~~ 10 Length 4'

Set between 118 ft. and 122 ft.

FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check

☒ Blank above screen 1 ft. Other ____

**9 STATIC WATER LEVEL:** 70 ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface

75 ft. after 1 hrs. pumping at 20 G.P.M.

____ ft. after ____ hrs. pumping at ____ G.P.M.

**11 WELL HEAD COMPLETION:** ☒ Pitless adapter ☒ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☒ Yes From Top to 60 ft.

☐ Neat cement ☒ Bentonite ☒ Other Benseal

No. of bags of cement ____ Additives ____

**13 Nearest source of possible contamination**

Type SEWER Distance 50 ft. Direction S

Well disinfected upon completion? ☒ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

**14 PUMP:** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name MYERS

Model number ____ HP 1/2 Volts 220

Length of Drop Pipe 90 ft. capacity ____ G.P.M.

TYPE: ☒ Submersible ☐ Jet ____

PRESSURE TANK:

Manufacturer's name XTROL

Model number 203 Capacity 42 Gallons

RECEIVED OAKLAND COUNTY APR 10 1990 HEALTH DIVISION Environmental Health

**15. Remarks, elevation, source of data, etc.**

APR 13 1990

Rig Operator's Name: Greg LaLone

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Ray LaLone Well Drilling 63-0140

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 8155 Oakhill Clarkston, MI 48016

Signed ____ AUTHORIZED REPRESENTATIVE Date 6/19/89

D67d 12/85

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

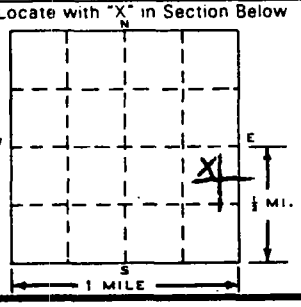
**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NW¼ NE¼ SE¼ | 4 | 2N N/S | 10E E/W |

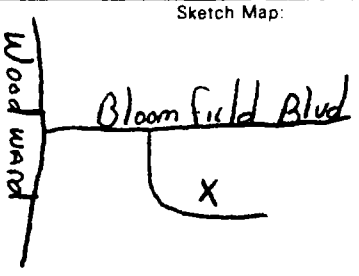
Distance And Direction From Road Intersection

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map:




**3 OWNER OF WELL:** BENSON HOMES

Address 2627 AIRPORT RD DRAYTON PLAINS

Address Same As Well Location? ☐ Yes ☒ No

**4 WELL DEPTH:** 106 FT. Date Completed MO. 6 DAY 17 YEAR 89 ☒ New Well ☐ Replacement Well

**5** ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Auger ☐ Jetted ☐

**6 USE:** ☒ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐

**7 CASING:** Diameter ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded

5 in. to 102 ft. depth

in. to ft. depth

Grouted Drill Hole Diameter 8.5 in. to ft. depth

in. to ft. depth

Height: Above/~~Below~~ Surface 1 ft.

Weight SCH 80 lbs./ft.

Drive Shoe ☐ Yes ☒ No

**2 FORMATION DESCRIPTION**

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown clay & SAND | 11 | 11 |
| Blue clay & gravel | 80 | 91 |
| GRAVEL | 15 | 106 |

USE A 2ND SHEET IF NEEDED

**8 SCREEN:** ☐ Not Installed

Type Stainless Diameter 3"

Slot/~~Gauze~~ 25 Length 4'

Set between 102 ft. and 106 ft.

FITTINGS: ☒ K-Packer ☐ Lead Packer ☐ Bremer Check

☒ Blank above screen 1 ft. Other

**9 STATIC WATER LEVEL:** 75 ft. below land surface ☐ Flow

**10 PUMPING LEVEL:** below land surface

80 ft. after 1 hrs. pumping at 25 G.P.M.

ft. after hrs. pumping at G.P.M.

**11 WELL HEAD COMPLETION:** ☒ Pitless adapter ☒ 12" above grade ☐ Basement offset ☐ Approved pit

**12 WELL GROUTED?** ☐ No ☒ Yes From Top to 60 ft.

☐ Neat cement ☒ Bentonite ☒ Other BRNSIA

No. of bags of cement Additives

**13 Nearest source of possible contamination**

Type SEWER Distance 50 ft. Direction S

Well disinfected upon completion? ☒ Yes ☐ No

Was old well plugged? ☐ Yes ☐ No

**14 PUMP:** ☐ Not Installed ☐ Pump Installation Only

Manufacturer's name MYERS

Model number HP ½ Volts 220

Length of Drop Pipe 90 ft. capacity 10 G.P.M.

TYPE: ☒ Submersible ☐ Jet

PRESSURE TANK:

Manufacturer's name XTROL

Model number 203 Capacity 42 Gallons

RECEIVED OAKLAND COUNTY APR 10 1990 HEALTH DIVISION Environmental Health

**15. Remarks, elevation, source of data, etc.**

APR 13 1990

Rig Operator's Name: Greg LaLonde

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

RAY LALONE Well Drilling 63-0140

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 8155 OAKHILL Clarkston, MI 48016

Signed AUTHORIZED REPRESENTATIVE Date 6/17/89

D67d 12/85

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

TAX NO:

# MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
# WATER WELL AND PUMP RECORD

PERMIT NO:

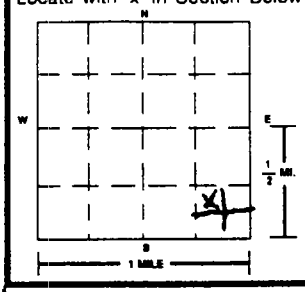
1. LOCATION OF WELL

| County | Township Name | Fraction | Section No. | Town No. | Range No. |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NW 1/4 SE 1/4 SE 1/4 | 4 | 2N | 10E |

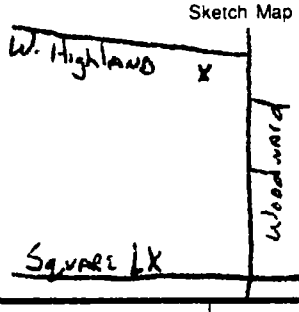
Distance and Direction from Road Intersection: Woodward North of Square Lake 1/4 mile to W. Highland 1st house on left. 411 HIGHLAND RD

Street Address & City of Well Location

Locate with 'x' in Section Below




Sketch Map




3. OWNER OF WELL
Address: KUMMER & ASSOCIATES, 5600 W MAPLE, WEST BLOOMFIELD, MI
Address Same as Well Location ☐ Yes ☒ No

4. WELL DEPTH: 161 ft. Date Completed 3/12/97 ☒ New Well ☐ Replacement Well

5. ☐ Cable Tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow Rod ☐ Auger/Bored ☐ Jetted ☐

6. USE: ☒ Household ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat Pump ☐ Test Well ☐ Type IIb Public ☐

7. CASING: ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded ☐ Other
Diameter: 5 in. to 157 ft. depth
in. to ft. depth
BORE HOLE:
Diameter: 9 in. to 161 ft. depth
in. to ft. depth
Height: Above/~~Below~~ Surface: 1 ft
Weight: SDR21 lbs./ft.
☐ Drive Shoe ☐ Shale Packer

8. SCREEN: ☐ Not Installed ☐ Gravel-Packed
Type: Stainless Diameter: 3"
Slot/Gauze: 15 Length: 4'
Set Between 157 ft. and 161 ft.
FITTINGS: ☒ K-Packer ☐ Bremer Check
☒ Blank Above Screen 1-6' ft. Other

9. STATIC WATER LEVEL: 90 ft. Below Land Surface ☐ Flowing

10. PUMPING LEVEL: Below Land Surface
110 ft. After 1 hrs. Pumping at 75 G.P.M.
☐ Plunger ☐ Bailer ☒ Air ☐ Test Pump

11. WELL HEAD COMPLETION:
☒ Pitless Adapter ☒ 12" Above Grade
☐ Basement Offset ☐ Well House

12. WELL GROUTED? ☐ No ☒ Yes From Top to 150 ft.
☐ Neat Cement ☒ Bentonite ☐ Other
No. of Bags 10 Additives

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:
Type Sewer Distance 50 ft. Direction North
Type Distance ft. Direction

14. PUMP: ☐ Not Installed ☐ Pump Installation Only
Manufacturer's Name STA-RITE
Model Number HP 1.5 Volts 230
Length of Drop Pipe 120 ft. Capacity 22 G.P.M.
TYPE: ☒ Submersible ☐ Jet ☐ Other
PRESSURE TANK:
Manufacturer's Name SMITH
Model Number V260 Capacity 85 Gallons

2. FORMATION DESCRIPTION

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Glucetay: gravel | 65 | 65 |
| Gravels: sand | 68 | 133 |
| Fine sands | 15 | 148 |
| SAND coarse | 13 | 161 |

USE A 2ND SHEET IF NEEDED

RECEIVED
MICH DEPT OF ENVIRONMENTAL QUALITY
DEC 19 1997
Drinking Water & Radiological Protection Division
Ground Water Supply Section
WELL CONSTRUCTION UNIT

15. ABANDONED WELL PLUGGED? ☐ Yes ☐ No
Casing Diameter in. Depth ft.
PLUGGING MATERIAL: ☐ Neat Cement ☐ Bentonite Slurry
☐ Cement/Bentonite Slurry ☐ Concrete Grout ☐ Bentonite Chips
No. of Bags Casing Removed? ☐ Yes ☐ No

16. REMARKS: (Elevation, Source of Data, etc.)

17. DRILLING MACHINE OPERATOR:
☒ Employee ☐ Subcontractor
Name Greg LaBonc

18. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief
Ray LaBonc Well Drilling — REGISTERED BUSINESS NAME
63-0140 — REGISTRATION NO
Address 8155 Oakhill Clarkston, MI 48348
Signed Ray LaBonc — AUTHORIZED REPRESENTATIVE
Date 3/12/97

GW-2-228 9/93

GEOLOGICAL SURVEY COPY

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemenor.

GEOLOGICAL SURVEY SAMPLE No.

(30)

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

5

**1 LOCATION OF WELL**

| County | Twp. | Fraction | Section No. | Town | Range |
|---|---|---|---|---|---|
| Oakland | Bloomfield | ¼ NE¼ SE¼ | 4 | 2 N. | 10 E. |

Distance And Direction from Road Intersections

135 Bloomfield
(Colonial Hills Sub)

Street address & City of Well Location

OWNER No.

**3 OWNER OF WELL:**

Address Mr. Alvin Taylor
135 Bloomfield Blvd.
Bloomfield Hills, Michigan 48013

| 2 FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Yellow Sandy Clay | 18' | 18' |
| Blue Sandy Clay | 32' | 50 |
| Hard Blue Collaring Clay W/Gravel | 14' | 64' |
| Dry Rocky Yellow Sand | 9' | 73' |
| Hard Dry Yellow Sandy & Gravel | 8' | 81' |
| Dry Sand & Gravel | 9' | 90' |
| Hard Dry Sand | 9' | 99' |
| Dry Sand | 12' | 111' |
| Blue Clay | 1' | 112' |
| Med. Coarse Sand | 13' | 125' |

**4 WELL DEPTH:** (completed) 125 ft. Date of Completion 7-8-68

**5** ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ___

**6 USE:** ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ___

**7 CASING:** Diam. 4 in. to 120'4" ft. Depth; Threaded ☒ Welded ☐; ___ in. to ___ ft. Depth; Height: Above/~~Below~~ surface 4" ft.; Weight 11 lbs/ft.; Drive Shoe? Yes ☒ No ☐

**8 SCREEN:** Johnson Stainless
Type: Steel Dia.: 4"
Slot/~~Gauge~~ 20 Length 5'
Set between 120 ft. and 125 ft.
Fittings: 3" x 17" Nipple

**9 STATIC WATER LEVEL** 100 ft. below land surface

**10 PUMPING LEVEL** below land surface
121 ft. after 2½ hrs. pumping 12 g.p.m.
___ ft. after ___ hrs. pumping ___ g.p.m.

**11 WATER QUALITY** in Parts Per Million:
Iron (Fe) 1.6 Chlorides (Cl) 68
Hardness 425

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

**13 GROUTING:**
Well Grouted? ☐ Yes ☒ No
Material: ☐ Neat Cement ☐ ___
Depth: From ___ ft. to ___ ft.

**14 SANITARY:** UNKNOWN
Nearest Source of possible contamination
___ feet ___ Direction ___ Type
Well disinfected upon completion ☒ Yes ☐ No

**15 PUMP:**
Manufacturer's Name Myers
Model Number SF7-21 HP 3/4
Length of Drop Pipe 110 ft. capacity 11½ G.P.M.
Type: ☒ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

**16 Remarks, elevation, source of data, etc.**

ADDED INFO. BY DRILLER, ITEM NO.

CORRECTED BY:

ADDITION BY:

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

O. O. Corsaut Inc. — REGISTERED BUSINESS NAME
0025 — REGISTRATION NO.

Address 15101 W. 11 Mile Rd. Oak Park 48237

Signed Owen Corsaut — AUTHORIZED REPRESENTATIVE Date Jan. 28, 1969

D67D 100M 6-66

FEB 3 1969

GEOLOGICAL SURVEY COPY

GEOLOGICAL SURVEY SAMPLE No. 31

AUG 05 1974

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

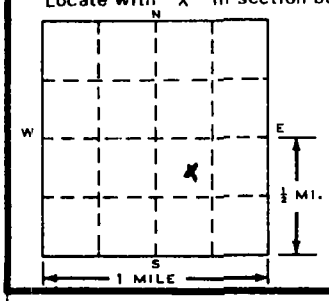
## 1 LOCATION OF WELL

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SE ¼ NW ¼ SE ¼ | 4 | 2 N/S. | 10 E/W. |

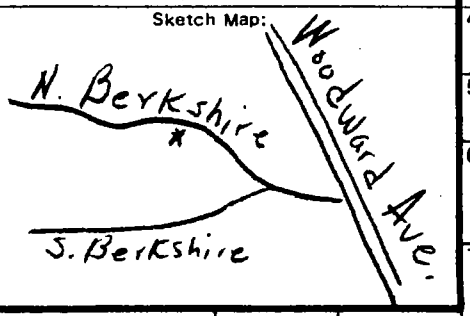
Distance And Direction from Road Intersections: 1/4 mi. w-nw of intersection of N. Berkshire and Woodward Avenue.

Street address & City of Well Location: 163 N. Berkshire, Bloomfield Hills, Mich. 48013

Locate with "X" in section below




Sketch Map:




## 3 OWNER OF WELL:

Address: Mrs. John Killeran, 163 N. Berkshire, Bloomfield Hills, Mich. 48013

## 4 WELL DEPTH: (completed) 208 ft. Date of Completion: July 17, 1974

## 5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☒ Jetted ☐ Bored ☐

## 6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

## 7 CASING: Threaded ☐ Welded ☒

Diam. 4 in. to 201 ft. Depth; in. to ft. Depth

Height: Above/Below Surface 1 ft.

Weight 11 lbs./ft.

Drive Shoe? Yes ☒ No ☐

## 2 FORMATION

| FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Red clay, gravel | 25 | 25 |
| Blue clay, gravel | 30 | 55 |
| Coarse "hard" gravel | 115 | 170 |
| Blue clay, gravel | 20 | 190 |
| Water sand with fine spots | 10 | 200 |
| Coarse sand and gravel | 8 | 208 |

USE A 2ND SHEET IF NEEDED

## 8 SCREEN:

Type: 2 stainless steel Dia.: 4"

Slot: .012 & .015 Length: 4' & 3'

Set between 201 ft. and 208 ft.

Fittings: K packer and 3' 3" nipple

## 9 STATIC WATER LEVEL

100 ft. below land surface

## 10 PUMPING LEVEL below land surface

130 ft. after 4 hrs. pumping 20 g.p.m.

ft. after hrs. pumping g.p.m.

## 11 WATER QUALITY in Parts Per Million:

Iron (Fe) Chlorides (Cl)

Hardness Other

## 12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade

## 13 Well Grouted? ☒ Yes ☐ No

☐ Neat Cement ☒ Bentonite ☐

Depth: From 0 ft. to 175 ft.

## 14 Nearest Source of possible contamination

75 feet S. Direction septic Type

Well disinfected upon completion ☒ Yes ☐ No

## 15 PUMP: ☐ Not installed

Manufacturer's Name: Myers

Model Number: SG102-10AA HP 1 Volts 230

Length of Drop Pipe 180 ft. capacity 12 G.P.M.

Type: ☒ Submersible ☐ Jet ☐ Reciprocating

## 16 Remarks, elevation, source of data, etc.

ADDED INFO BY DRILLER, ITEM NO. AJM

*CORRECTED BY CP

**ADDITION BY

ELEVATION

DEPTH TO ROCK

## 17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Daniel H. Chissus Well & Pump Service — REGISTERED BUSINESS NAME

0127 — REGISTRATION NO.

4885 Walnut Lake Road, West Bloomfield, Michigan 48033 — Address

Signed Daniel H. Chissus — AUTHORIZED REPRESENTATIVE

Date 7/24/74.

D67d 100M (Rev. 12-68)

GEOLOGICAL SURVEY COPY

TAX NO:

# MICHIGAN DEPARTMENT OF PUBLIC HEALTH
# WATER WELL AND PUMP RECORD

PERMIT NO:

1. LOCATION OF WELL

| County | Township Name | Fraction | Section No. | Town No. | Range No. |
|---|---|---|---|---|---|
| Oakland | Bloomfield | NE 1/4 SE 1/4 SE 1/4 | 4 | 2N | 10E |

Distance and Direction from Road Intersection: Woodward North of Square Lk Rd 1/4 mile to S. Birkshire left 1/8 mile on left.

Street Address & City of Well Location: 71 S Birkshire

Locate with 'x' in Section Below

Sketch Map: S. Birkshire, Woodward, Square Lk Rd

3. OWNER OF WELL: Robert Thompson
Address: 71 S Birkshire, Bloomfield Hills MI
Address Same as Well Location ☒ Yes ☐ No

4. WELL DEPTH: 141 ft. Date Completed 7/15/96 ☒ New Well ☐ Replacement Well

5. ☐ Cable Tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow Rod ☐ Auger/Bored ☐ Jetted ☐

6. USE: ☒ Household ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat Pump ☐ Test Well ☐ Type IIb Public ☐

7. CASING: ☐ Steel ☐ Threaded ☒ Plastic ☒ Welded ☐ Other
Diameter: 5 in. to 133 ft. depth; in. to ft. depth
BORE HOLE: Diameter: 9 in. to 141 ft. depth; in. to ft. depth
Height: Above/~~Below~~ Surface: 1 ft
Weight: SDR21 lbs./ft.
☐ Drive Shoe ☐ Shale Packer

8. SCREEN: ☐ Not Installed ☐ Gravel-Packed
Type: Stainless Diameter: 3"
Slot/~~Gauze~~: 15-18 Length: 8'-8"
Set Between 133 ft. and 141 ft.
FITTINGS: ☒ K-Packer ☐ Bremer Check
☒ Blank Above Screen 1-6" ft. Other

9. STATIC WATER LEVEL: 76 ft. Below Land Surface ☐ Flowing

10. PUMPING LEVEL: Below Land Surface 90 ft. After 1 hrs. Pumping at 40 G.P.M.
☐ Plunger ☐ Bailer ☒ Air ☐ Test Pump

11. WELL HEAD COMPLETION: ☒ Pitless Adapter ☒ 12" Above Grade ☐ Basement Offset ☐ Well House

12. WELL GROUTED? ☐ No ☒ Yes From Top to 128 ft.
☐ Neat Cement ☒ Bentonite ☐ Other
No. of Bags 9 Additives

13. NEAREST SOURCE OF POSSIBLE CONTAMINATION:
Type Septic Distance 50 ft. Direction North
Type Distance ft. Direction

14. PUMP: ☐ Not Installed ☐ Pump Installation Only
Manufacturer's Name: Gould
Model Number HP 1 Volts 220
Length of Drop Pipe 100 ft. Capacity 20 G.P.M.
TYPE: ☒ Submersible ☐ Jet ☐ Other
PRESSURE TANK:
Manufacturer's Name: None used
Model Number Capacity Gallons

2. FORMATION DESCRIPTION

| | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown clay | 29 | 29 |
| Sand | 7 | 36 |
| Blue clay & gravel | 44 | 80 |
| Clay | 22 | 102 |
| Sand & Gravel | 39 | 141 |
| Old 4" steel well plugged - old submersible pump broke off & could not be recovered. 90' of drop pipe was removed from well & 165 gal. bentonite used to plug hole | | |

USE A 2ND SHEET IF NEEDED

RECEIVED Mich. Dept. of Public Health JAN 16 1997

15. ABANDONED WELL PLUGGED? ☒ Yes ☐ No
Casing Diameter 4" in. Depth 2 ft.
PLUGGING MATERIAL: ☐ Neat Cement ☒ Bentonite Slurry ☐ Cement/Bentonite Slurry ☐ Concrete Grout ☐ Bentonite Chips
No. of Bags Casing Removed? ☐ Yes ☒ No

16. REMARKS: (Elevation, Source of Data, etc.)
Another old 4" steel well is in pit but appears to have been filled with dirt.

17. DRILLING MACHINE OPERATOR: ☒ Employee ☐ Subcontractor
Name: Greg LaLone

18. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Ray LaLone Well Drilling — REGISTERED BUSINESS NAME
63-0140 — REGISTRATION NO.
8155 Oakhill Clarkston, MI 48348 — ADDRESS
Signed — AUTHORIZED REPRESENTATIVE
Date 7/15/96

GW-2-228 9/93

GEOLOGICAL SURVEY COPY

Authority: Act 368 PA 1978
Completion: Required
Penalty: Conviction of a violation of any provision is a misdemeanor.

(33)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

**1 LOCATION OF WELL**

| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SW 1/4 NW 1/4 SE 1/4 | 4 | 2N N/S | 10E E/W |

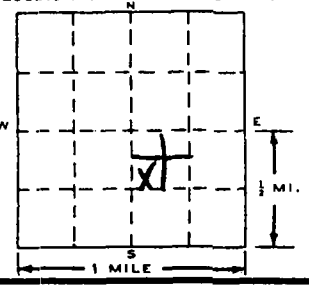
Distance And Direction From Road Intersection: Woodward North of Square LKRd to West Highland

133 W HIGHLAND RD

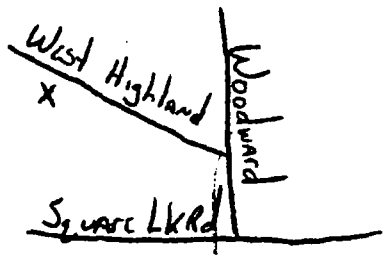
BLOOMFIELD

Street Address & City of Well Location

Locate with "X" in Section Below




Sketch Map




**3 OWNER OF WELL:** STANLEY GAUFF

Address: 133 W HIGHLAND RD BLOOMFIELD MI

Address Same As Well Location? [X] Yes [ ] No

**4 WELL DEPTH:** 178 FT. Date Completed: MO. 3 DAY 4 YEAR 92 [X] New Well [ ] Replacement Well

**5** [ ] Cable tool [X] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ]

**6 USE:** [X] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ]

**7 CASING** Diameter [ ] Steel [ ] Threaded [X] Plastic [X] Welded

5 in. to 174 ft. depth

in. to ft. depth

Grouted Drill Hole Diameter

9 in. to ft. depth

in. to ft. depth

Height: Above/~~Below~~ Surface 1 ft.

Weight SDR21 lbs./ft.

Drive Shoe [ ] Yes [X] No

**8 SCREEN:** [ ] Not Installed

Type Stainless Diameter 3"

Slot/~~Gauze~~ 10 Length 4'

Set between 174 ft. and 178 ft

FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check

[X] Blank above screen 1 ft. Other

**9 STATIC WATER LEVEL:** 92' ft. below land surface [ ] Flow

**10 PUMPING LEVEL** below land surface

100 ft. after 1 hrs. pumping at 25 G.P.M.

105 ft. after 15 hrs. pumping at 35 G.P.M.

**11 WELL HEAD COMPLETION** [X] Pitless adapter [X] 12" above grade [ ] Basement offset [ ] Approved pit

**12 WELL GROUTED?** [ ] No [X] Yes From Top to 25 ft.

[ ] Neat cement [X] Bentonite [ ] Other Basal

No. of bags of cement Additives

**13 Nearest source of possible contamination**

Type Septic Distance 50 ft. Direction South

Well disinfected upon completion? [X] Yes [ ] No

Was old well plugged? [X] Yes [ ] No

**14 PUMP:** [ ] Not Installed [ ] Pump Installation Only

Manufacturer's name BED TACKET

Model number HP 3/4 Volts 220

Length of Drop Pipe 140 ft. capacity 10 G.P.M.

TYPE: [X] Submersible [ ] Jet

PRESSURE TANK

Manufacturer's name NONE (NOT INSTALLED)

Model number Capacity Gallons

**2 FORMATION DESCRIPTION**

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Brown : Blue clay | 33 | 33 |
| Gravel : Blue clay | 60 | 93 |
| Gravel : SAND | 40 | 133 |
| Gravel : clay | 34 | 167 |
| GRAVEL & SAND | 11 | 178 |

OLD 4" WELL 180' Deep WAS PLUGGED 15 BAGS HOLE PLUG - IN WELL PIT FRONT YARD

RECEIVED
Mich. Dept. of Public Health
SEP 10 1992
BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH SWQS

SEP 3 1992

WE INSTALLED OUR NEW PIPE FROM WELL TO OUTSIDE OF HOUSE, WHERE CUSTOMER INSTALLED HIS PIPE FROM THE OUTSIDE WALL - WE ADVISED CUSTOMER THAT HIS PIPE WOULD FREEZE - BUT HE SAID HE WOULD TAKE CARE OF IT!

USE EXTRA SHEET IF NEEDED

**15. Remarks, elevation, source of data:**

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Ray LaLone Well Drilling 63-0140

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 8155 OAKhill Clarkston, MI 48348

Signed [signature] Date 3/4/92

AUTHORIZED REPRESENTATIVE

**17. Rig Operator's Name:** STANLEY GAUFF

Greg LaLone Stanley Gauff

D67d 2/89

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

(34)

GEOLOGICAL SURVEY NO.

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

# WATER WELL AND PUMP RECORD

PERMIT NUMBER

**1 LOCATION OF WELL**

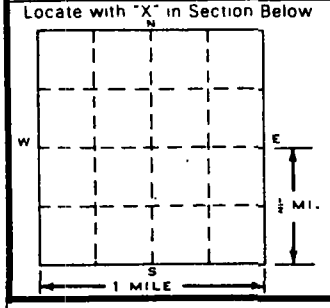
| County | Township Name | Fraction | Section Number | Town Number | Range Number |
|---|---|---|---|---|---|
| Oakland | Bloomfield | ¼ ¼ ¼ | 4 | 2 N/S* | 10 E/W* |

Distance And Direction From Road Intersection: 154 N. Berkshire

Street Address & City of Well Location

Locate with "X" in Section Below

Sketch Map:




**3 OWNER OF WELL:** Harry Cendrowski
154 N. Berkshire
Address: Bloomfield Hills Mi 48013

Address Same As Well Location? [X] Yes [ ] No

**4 WELL DEPTH:** 151 FT. Date Completed: MO. 7 DAY 5 YEAR 90 [ ] New Well [X] Replacement Well

**5** [X] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger [ ] Jetted [ ]

**6 USE:** [X] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type IIa Public [ ] Heat pump [ ] Test Well [ ] Type IIb Public [ ]

**7 CASING:** Diameter [X] Steel [X] Threaded [ ] Plastic [ ] Welded
4 in. to 146 ft. depth
in. to ft. depth
Grouted Drill Hole Diameter
in. to ft. depth
in. to ft. depth

Height: Above/~~Below~~
Surface 1 ft.
Weight 11 lbs./ft.
Drive Shoe [X] Yes [ ] No

**8 SCREEN:** [ ] Not Installed
Type stainless steel Diameter 4"
Slot/~~Gauze~~ 25 Length 5'
Set between 146 ft. and 151 ft.
FITTINGS: [X] K-Packer [ ] Lead Packer [ ] Bremer Check
[ ] Blank above screen 1½ ft. Other

**9 STATIC WATER LEVEL:**
84' ft. below land surface [ ] Flow

**10 PUMPING LEVEL:** below land surface
100 ft. after hrs. pumping at 25 G.P.M.
ft. after hrs. pumping at G.P.M.

**11 WELL HEAD COMPLETION:** [X] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

**12 WELL GROUTED?** [ ] No [X] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other casing seal
No. of bags of cement Additives

**13 Nearest source of possible contamination**
Type Distance unknown ft. Direction
Well disinfected upon completion? [X] Yes [ ] No
Was old well plugged? [X] Yes [ ] No

**14 PUMP:** [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name Tait
Model number 10DL218 HP 1, Volts 230 Ge
Length of Drop Pipe 126' ft. capacity 18 G.P.M.
TYPE: [X] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name Wel-x-trol
Model number 2-WX251 Capacity 62 each Gallons

**2 FORMATION DESCRIPTION**

| FORMATION DESCRIPTION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sandy yellow clay | 19' | 19' |
| Soft yellow clay | 7' | 26' |
| Soft grey clay | 10' | 36' |
| Gravely grey clay | 15' | 51' |
| Yellow gravely hardpan | 52' | 103' |
| Yellow sand (packing) | 18' | 121' |
| Dirty grey fine sand | 22' | 143' |
| Med. coarse water sand & gravel | 8' | 151' |

USE A 2ND SHEET IF NEEDED

RECEIVED OAKLAND COUNTY JUL 12 1990 HEALTH DIVISION Environmental Health

RECEIVED Mich. Dept. of Public Health JUL 17 1990 BUREAU OF ENVIRONMENTAL AND OCCUPATIONAL HEALTH-GWQS

**15. Remarks, elevation, source of data, etc.**
Sub-cont:
Fulmer Well Drilling

**16. WATER WELL CONTRACTOR'S CERTIFICATION:**
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

O.O. Corsaut, Inc. 0025
REGISTERED BUSINESS NAME REGISTRATION NO.
Address 15101 W. 11 Mile Oak Park, Mi 4823
Signed O.O. Corsaut Date 7/9/90
AUTHORIZED REPRESENTATIVE

**17. Rig Operator's Name:**
Charles Fulmer

D67d 2/89

**Authority:** Act 368 PA 1978
**Completion:** Required
**Penalty:** Conviction of a violation of any provision is a misdemeanor.

GEOLOGICAL SURVEY COPY

GEOLOGICAL SURVEY SAMPLE No. 35

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

5

**1 LOCATION OF WELL**

| County | Twp. | Fraction | Section No. | Town | Range |
|---|---|---|---|---|---|
| Oakland | Bloomfield | ¼NW¼SE¼ | 4 | 2 N/S | 10 E/W |

Distance And Direction from Road Intersections — OWNER No.

Lot 37 Berkshire (1 Blk N. of Square Lake Road & 1/4 Mile W. of Woodward

Street address & City of Well Location

**3 OWNER OF WELL:** Homes by Weinberger

Address 3901 Highland Pontiac, Michigan

| 2 FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Sandy Gravely Yellow Clay | 20' | 20' |
| Sandy Hardpan | 27' | 47' |
| Yellow Sandy Hardpan | 10' | 57' |
| Gravely Hardpan Yellow | 2' | 59' |
| Yellow Sandy Hardpan | 81' | 140' |
| Yellow Sandy Hardpan W/Tinge of Gray | 5' | 145' |
| Yellow Sand & Gravel Hardpan W/little Gray Color | 4' | 149' |
| Water Sand & Gravel | 4' | 153' |
| Sand & Gravel Hardpan | 2' | 155' |

**4 WELL DEPTH:** (completed) 155 ft. Date of Completion 4-26-67

**5** ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐

**6 USE:** ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

**7 CASING:** Diam. 4 in. to 150-9" ft. Depth; Threaded ☒ Welded ☐; Height: Above/Below surface 1 ft.; Weight 11 lbs/ft.; Drive Shoe? Yes ☒ No ☐

**8 SCREEN:** Johnson Stainless Screen; Type: Screen; Dia.: 4"; Slot/Gauge 20; Length 5'; Set between 150 ft. and 155 ft.

Fittings: 3" x 17" nipple

**9 STATIC WATER LEVEL** 113 ft. below land surface

**10 PUMPING LEVEL** below land surface 135 ft. after 12 hrs. pumping 22 g.p.m.

ft. after hrs. pumping g.p.m.

**11 WATER QUALITY** in Parts Per Million: Iron (Fe) 5.0 Chlorides (Cl) 102.6 Hardness 427.5

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

**13 GROUTING:** Well Grouted? ☐ Yes ☒ No; Material: ☐ Neat Cement ☐; Depth: From ft. to ft.

**14 SANITARY:** UNKNOWN; Nearest Source of possible contamination feet Direction Type; Well disinfected upon completion ☐ Yes ☒ No

**15 PUMP:** Manufacturer's Name Jacuzzi; Model Number 15S4CS2 HP 1 1/2; Length of Drop Pipe 136 ft. capacity 40 G.P.M.; Type: ☒ Submersible ☐ Jet ☐ Reciprocating

**16** Remarks, elevation, source of data, etc.

ADDED INFO. BY DRILLER. ITEM NO.

CORRECTED BY:

**ADDITION BY: RB

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

O. O. Corsaut Inc. — REGISTERED BUSINESS NAME

0025 — REGISTRATION NO.

Address 15101 W. 11 Mile Road, Oak Park 48237

Signed Owen Corsaut — AUTHORIZED REPRESENTATIVE Date Aug. 29, 1967

D67D 100M 6-66

SEP 18 1967

GEOLOGICAL SURVEY COPY

GEOLOGICAL SURVEY SAMPLE No.

36

# WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

5

**1 LOCATION OF WELL**

| County | Twp. | Fraction | Section No. | Town | Range |
|---|---|---|---|---|---|
| Oakland | Bloomfield | SE ¼ NW ¼ SE ¼ | 4 | T 2 N | R 10 E |

Distance And Direction from Road Intersections: 257 S. Berkshire Bloomfield Hills — 1/4 mile N. of Sq. Lake Rd. + W. off Woodward

Street address & City of well Location

OWNER No.

**3 OWNER OF WELL:**

Address: George Latvo, 257 S. Berkshire, Bloomfield Hills, Michigan

**2**

| FORMATION | THICKNESS OF STRATUM | DEPTH TO BOTTOM OF STRATUM |
|---|---|---|
| Yellow Clay | 10' | 10' |
| Blue Clay | 21' | 31' |
| Stoney Hardpan | 29' | 60' |
| Yellow Sand Hardpan (Very Fine) | 18' | 78' |
| Hardpan | 2' | 80' |
| Hardpan Mixed with Gravel (Dry) | 20' | 100' |
| Stoney Hardpan | 19' | 119' |
| Gravel Coarse) | 5' | 126' |

**4 WELL DEPTH:** (completed) 128 ft. Date of Completion 12-17-66

**5** ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐

**6 USE:** ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

**7 CASING:** Diam. 4 in. to 122'-7" ft. Depth; Threaded ☒ Welded ☐; Height: Below surface 6" ft.; Weight 11 lbs/ft.; Drive Shoe? Yes ☒ No ☐

**8 SCREEN:** Type: Johnson Stainless Steel; Dia.: 4"; Slot 50; Length 5'; Set between 123 ft. and 128 ft.; Fittings: 3" x 15" nipple

**9 STATIC WATER LEVEL** 106 ft. below land surface

**10 PUMPING LEVEL** below land surface: 116 ft. after 8 hrs. pumping 15 g.p.m.; ft. after hrs. pumping g.p.m.

**11 WATER QUALITY** in Parts Per Million: Iron (Fe) Chlorides (Cl) Hardness NONE

**12 WELL HEAD COMPLETION:** ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

**13 GROUTING:** Well Grouted? ☐ Yes ☒ No; Material: ☐ Neat Cement ☐; Depth: From ft. to ft.

**14 SANITARY:** Nearest Source of possible contamination feet Direction Type; Well disinfected upon completion ☒ Yes ☐ No

**15 PUMP:** Manufacturer's Name Fairbanks Morse; Model Number 4E 7509 HP 3/4; Length of Drop Pipe 105 ft. capacity 14½ G.P.M.; Type: ☒ Submersible ☐ Jet ☐ Reciprocating

**16 Remarks, elevation, source of data, etc.**

ADDED INFO. BY DRILLER, ITEM NO.

CORRECTED BY:

**ADDITION BY: RTS 2/21/67

**17 WATER WELL CONTRACTOR'S CERTIFICATION:**

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

O. O. Corsaut Co. — REGISTERED BUSINESS NAME

0025 — REGISTRATION NO.

Address 15101 W. 11 Mile Road, Oak Park

Signed Owen Corsaut — AUTHORIZED REPRESENTATIVE — Date Jan. 25, 1966

D67D 100M 6-66

FEB 8 1967

GEOLOGICAL SURVEY COPY

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-3-1
DATE COMPLETED: DECEMBER 2, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 926.6 | | | | | |
| | CONCRETE, gravel mixed, white gray | 926.1 | | | | | |
| 2.5 | SAND (FILL), little clay and fine subrounded gravel, trace silt, medium grained, well graded, orange brown, very moist, oxidized | | 8"Ø BOREHOLE | 1SS | | 4 | 0.0 |
| | | | | 2SS | | 8 | 0.0 |
| 5.0 | - trace clay and fine subrounded gravel<br>- olive brown to olive gray<br>- medium to coarse grained | | | 3SS | | 10 | 0.0 |
| | | 919.8 | | 4SS | | 8 | 0.0 |
| 7.5 | CL-CLAY (TILL), little silt, trace fine grained sand and fine subrounded gravel, firm to stiff, low plasticity, homogeneous, olive gray, moist | | BENTONITE CHIPS | | | | |
| | - stiff | | | 5SS | | 12 | 0.0 |
| 10.0 | - trace fine and coarse rounded gravel<br>- firm | | | | | | |
| | | 915.6 | | 6SS | | 7 | 0.0 |
| 12.5 | SP-SAND (NATIVE), trace silt, loose, medium grained, poorly graded, orange brown, very moist, oxidized | | 2"Ø SPLIT SPOON | | | | |
| | - dark gray, medium to coarse grained, wet, not oxidized | | | 7SS | | 3 | 0.0 |
| | | 912.4 | | | | | |
| 15.0 | - little silt | | | 8SS | | 10 | 0.0 |
| | CL-CLAY (TILL), little silt, trace fine grained sand and fine subrounded gravel, stiff low plasticity, homogeneous, dark gray, moist | | | | | | |
| 17.5 | - some silt | | | 9SS | | 10 | 0.0 |
| | | | | 10SS | | 12 | 0.0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 906.6 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
## (OVERBURDEN)



PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-3-2
DATE COMPLETED: DECEMBER 2, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 928.1 | | | | | |
| | CONCRETE, gravel mixed, white gray | 927.2 | | | | | |
| 2.5 | SAND (FILL), trace silt and fine subrounded gravel, fine and medium grained, poorly graded, dark gray, moist | 926.9 | 8"Ø BOREHOLE | 1SS | | 10 | 0.8 |
| | CL-CLAY (NATIVE), little silt, trace fine grained sand and fine subrounded gravel, stiff, low plasticity, banded, moist, oxidized | | | 2SS | | 10 | 0.0 |
| 5.0 | - hard (potentially pushing stone) | | | 3SS | | 30 | 0.0 |
| 7.5 | - stiff | 920.1 | BENTONITE CHIPS | 4SS | | 14 | 0.0 |
| | SP-SAND (NATIVE), trace silt, medium dense, medium grained, poorly graded, orange brown, very moist, oxidized | 919.3 | | | | | |
| 10.0 | CL-CLAY (TILL), little silt, trace fine grained sand and fine subrounded gravel, stiff, low plasticity, homogeneous, dark gray, moist | 917.1 | | 5SS | | 14 | 0.0 |
| 12.5 | ML-SILT (TILL), trace clay, fine grained sand and fine subrounded gravel, dense, poorly graded, dark gray, moist | 915.3 | | 6SS | | 48 | 0.0 |
| 15.0 | CL-CLAY (TILL), little silt, trace fine subrounded gravel, stiff, low plasticity, homogeneous, dark gary, moist | | | 7SS | | 13 | 0.0 |
| 17.5 | | | | 8SS | | 11 | 0.0 |
| | | | 2"Ø SPLIT SPOON | 9SS | | 14 | 0.0 |
| | END OF HOLE @ 19.0ft BGS | 909.1 | | | | | |
| 20.0 | | | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-19)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-3-3
DATE COMPLETED: DECEMBER 2, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 927.8 | | | | | |
| | CONCRETE, gravel mixed, white gray | 927.7 | | | | | |
| 2.5 | SAND (FILL), trace silt and fine subrounded gravel, fine and medium grained, poorly graded, dark gray, moist | 926.4 | 8"Ø BOREHOLE | 1SS | | 8 | 1.8 |
| 5.0 | CL-CLAY (NATIVE), little silt, trace fine grained and and fine subrounded gravel, firm to stiff, low plasticity, homogeneous, gray, moist<br>- little fine grained sand, dark brown, oxidized<br>- firm | 922.0 | | 2SS | | 8 | 2.3 |
| 7.5 | SAND (NATIVE), trace silt and fine rounded gravel, fine grained, loose, poorly graded, orange brown, oxidized (utility corridor)<br>- medium grained | | BENTONITE CHIPS | 3SS | | 7 | 3.8 |
| 10.0 | | | | 4SS | | 6 | 2.3 |
| 12.5 | CL-CLAY (TILL), little silt and fine grained sand, trace fine subrounded gravel, stiff, low plasticity, homogeneous, brown gray, moist<br>- some fine grained sand, soft, gray, very moist<br>- stiff | 916.8 | | 5SS | | 5 | 1.3 |
| 15.0 | | | | 6SS | | 11 | 3.4 |
| 17.5 | | | | 7SS | | 3 | 0.8 |
| 20.0 | END OF HOLE @ 19.0ft BGS | 908.8 | 2"Ø SPLIT SPOON | 8SS | | 13 | 0.0 |
| 22.5 | | | | 9SS | | 9 | 0.0 |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-20)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-3-4
DATE COMPLETED: DECEMBER 3, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 927.1 | | | | | |
| | CONCRETE, gravel mixed, white gray | 926.1 | | | | | |
| 2.5 | SAND (FILL), little clay and fine subrounded gravel, trace silt, medium grained, well graded, orange brown, moist, oxidized | 925.5 | 8"Ø BOREHOLE | 1SS | | 8 | 52.0 |
| 5.0 | CL-CLAY (NATIVE), little fine grained sand, trace silt and fine subrounded gravel, firm to stiff, low plasticity, banded, orange brown, moist, oxidized | | | 2SS | | 6 | 18.3 |
| | - firm, dark brown | 921.5 | | 3SS | | 8 | 9.7 |
| 7.5 | SP-SAND (NATIVE), trace silt and fine subrounded gravel, loose, medium grained, poorly graded, light brown, moist | 920.1 | BENTONITE CHIPS | 4SS | | 10 | 0.0 |
| 10.0 | CL-CLAY (TILL), little silt, trace fine grained sand and fine subrounded gravel, stiff, low plasticity, brown gray, moist, slight oxidation | 918.1 | | 5SS | | 4 | 0.0 |
| | SP-SAND (NATIVE), trace silt, loose, medium grained, poorly graded, gray, wet | 917.3 | | | | | |
| 12.5 | CL-CLAY (TILL), little fine grained sand, trace silt and fine subrounded gravel, soft to firm, low plasticity, homogeneous, gray, moist | | | 6SS | | 10 | 0.0 |
| | - stiff | | | 7SS | | 9 | 0.0 |
| 15.0 | - little to some silt | | | 8SS | | 9 | 0.0 |
| 17.5 | | | 2"Ø SPLIT SPOON | 9SS | | 12 | 0.0 |
| | END OF HOLE @ 19.0ft BGS | 908.1 | | | | | |
| 20.0 | | | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-21)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-3-5A
DATE COMPLETED: DECEMBER 8, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 928.0 | | | | | |
| | CONCRETE, gravel mixed, white gray | 927.5 | | | | | |
| | SAND (FILL), little fine subangular gravel, medium grained, well graded, olive brown, moist | 926.8 | | 1SS | | 9 | 3.9 |
| 2.5 | CL-CLAY (NATIVE), little silt, trace fine grained sand and fine to coarse, subrounded gravel, stiff, low plasticity, banded, light brown, moist, oxidized | | 8"Ø BOREHOLE | 2SS | | 13 | 1.1 |
| 5.0 | - very stiff | | | 3SS | | 19 | 2.0 |
| | | | | 4SS | | 23 | 9.8 |
| 7.5 | SP-SAND (NATIVE), trace silt and fine subrounded gravel, medium dense, fine grained, poorly graded, light brown, moist | 920.6 | BENTONITE CHIPS | 5SS | | 19 | 4.1 |
| 10.0 | CL-CLAY (TILL), little silt, trace fine grained sand and fine subrounded gravel, stiff, low plasticity, homogeneous, dark gray, moist | 918.0 | | 6SS | | 24 | NA |
| 12.5 | | | | 7SS | | 9 | 6.4 |
| 15.0 | | | | 8SS | | 25 | 0.8 |
| | - stiff | | | 9SS | | 12 | 0.0 |
| 17.5 | | | | | | | |
| | | | 2"Ø SPLIT SPOON | 10SS | | 10 | 0.0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 908.0 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-01)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-29-1
DATE COMPLETED: DECEMBER 1, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 956.3 | | | | | |
| | CL-CLAY (NATIVE), some sand, trace silt, fine, subrounded gravel and vegetation (grass, roots), stiff, slight plasticity, banded, dark brown, moist, oxidized | | | 1SS | | 14 | 0.0 |
| 2.5 | - no vegetation (grass, roots) | | | 2SS | | 12 | 0.0 |
| 5.0 | | | | 3SS | | 13 | 0.0 |
| | - very stiff | | | 4SS | | 19 | 0.0 |
| 7.5 | | | | | | | |
| | | | 8"Ø BOREHOLE | 5SS | | 15 | 0.0 |
| 10.0 | - soft to firm | | | | | | |
| | SP-SAND (NATIVE), trace silt, loose, medium grained, poorly graded, orange-brown, moist, oxidized | 945.3 | | 6SS | | 4 | 0.0 |
| 12.5 | | | BENTONITE CHIPS | | | | |
| | - trace fine and coarse subrounded gravel, medium dense | 942.6 | | 7SS | | 10 | 0.0 |
| 15.0 | CL-CLAY (TILL), some silt, trace fine grained sand and fine, subrounded gravel, soft, low plasticity, homogeneous, light brown, moist | | | 8SS | | 3 | 0.0 |
| 17.5 | - trace fine grained interbedded sand seams <1/2", firm, moist to very moist | | | 9SS | | 5 | 0.0 |
| | - little fine grained sand, light gray | | | | | | |
| | - gray | | 2"Ø SPLIT SPOON | 10SS | | 7 | 0.0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 938.3 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-22)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-29-2
DATE COMPLETED: DECEMBER 1, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 953.1 | | | | | |
| 2.5 | SAND (FILL), little clay and silt, little to trace fine subangular gravel, fine and medium grained, well graded, dark brown, moist, slight potential black staining | | 8"Ø BOREHOLE | 1SS | | 32 | 0.0 |
| | | | | 2SS | | 39 | 0.0 |
| 5.0 | CL-CLAY (NATIVE), little fine grained sand and coarse subangular gravel, trace silt, stiff, slight plasticity, banded, dark brown, moist, oxidized | 949.5 | | 3SS | | 15 | 0.8 |
| 7.5 | - dark olive gray, potential slight petroleum like staining<br>- some fine grained sand, brown, oxidized, no staining | | BENTONITE CHIPS | 4SS | | 10 | 0.0 |
| 10.0 | - no recovery (pushing coarse subangular stone)<br>- soft to firm | | | 5SS | | 11 | NA |
| | | | | 6SS | | 4 | 0.0 |
| 12.5 | SP-SAND (NATIVE), trace silt, medium dense, medium grained, poorly graded, dark brown, wet | 940.5 | | 7SS | | 16 | 0.0 |
| 15.0 | CL-CLAY (TILL), little silt and fine grained sand, trace fine subrounded gravel, stiff, slight plasticity, homogeneous, dark brown, moist | 938.5 | | 8SS | | 14 | 0.0 |
| 17.5 | - trace fine grained sand | | | 9SS | | 12 | 0.0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 933.1 | 2"Ø SPLIT SPOON | 10SS | | 12 | 0.0 |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-23)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-29-3
DATE COMPLETED: DECEMBER 1, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 954.3 | | | | | |
| | SAND (FILL), little clay and fine subangular gravel and trace silt, medium grained, well graded, grayish brown, moist | | | 1SS | | 32 | 0.0 |
| 2.5 | - trace black staining | | 8"Ø BOREHOLE | 2SS | | 39 | 0.0 |
| | CL-CLAY (NATIVE), little silt, trace fine grained sand and fine subrounded gravel, stiff, low plasticity, banded, moist, oxidized | 950.1 | | 3SS | | 15 | 0.0 |
| 5.0 | | | | 4SS | | 10 | 0.0 |
| 7.5 | - firm to stiff | | BENTONITE CHIPS | 5SS | | 11 | 0.0 |
| 10.0 | - no recovery (pushing coarse, subrounded stone in split spoon) | | | 6SS | | 4 | NA |
| 12.5 | - very stiff (potentially influenced by stone) | | | 7SS | | 18 | 0.0 |
| | SM-SAND (NATIVE), some silt, trace clay, medium dense, fine grained, poorly graded, orange brown, moist | 940.7<br>940.1 | | 8SS | | 14 | 0.0 |
| 15.0 | CL-CLAY (TILL), little silt, trace fine grained sand and fine subrounded gravel, stiff, low plasticity, homogeneous, light gray, moist | | | 9SS | | 12 | 0.0 |
| 17.5 | - no recovery (pushing coarse, subrounded stone in split spoon) | | 2"Ø SPLIT SPOON | 10SS | | 12 | NA |
| 20.0 | END OF HOLE @ 20.0ft BGS | 934.3 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-24)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-29-4
DATE COMPLETED: DECEMBER 1, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 956.2 | | | | | |
| | CLAY (FILL), some sand, trace fine subangular gravel, vegetation (grass) and silt, slight plasticity, brownish black, moist, faint petroleum like odor | 955.0 | | 1SS | | 14 | 5.6 |
| 2.5 | CL-CLAY (NATIVE), little silt and fine grained sand, trace fine subrounded gravel, stiff, slight plasticity, banded, brown, moist, oxidized | | 8"Ø BOREHOLE | 2SS | | 13 | 4.8 |
| 5.0 | - very stiff | | | 3SS | | 21 | 7.8 |
| 7.5 | | | BENTONITE CHIPS | 4SS | | 22 | 0.0 |
| 10.0 | - firm to stiff | | | 5SS | | 18 | 0.0 |
| | | 944.6 | | 6SS | | 8 | 0.0 |
| 12.5 | ML-SILT (TILL), little fine grained sand, trace clay, loose, poorly graded, reddish brown, moist, oxidized | | | 7SS | | 11 | 0.0 |
| | - no clay, medium dense | | | | | | |
| 15.0 | - light gray, very moist (not oxidized) | | | 8SS | | 7 | 0.0 |
| | - loose | 940.6 | | | | | |
| 17.5 | CL-CLAY (TILL), little silt, trcae fine grained sand and fine subrounded gravel, stiff, low plasticity, homogeneous, olive-gray, moist | | | 9SS | | 10 | 0.0 |
| | | | 2"Ø SPLIT SPOON | 10SS | | 12 | 0.0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 936.2 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-25)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: SS-29-1
DATE COMPLETED: DECEMBER 2, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 956.8 | | | | | |
| | GRAVEL (FILL), little fine grained sand, trace silt, fine and coarse well graded, gray, moist, subangular | 958.5 | BENTONITE CHIPS | 1SS | X | 19 | 4.1 |
| 2.5 | SAND (FILL), little fine, subangular gravel, trace silt and clay, medium grained, well graded, brown, moist | 954.8 | 3"Ø SPLIT SPOON | | | | |
| | – little clay | | | | | | |
| 5.0 | END OF HOLE @ 2.0ft BGS | | | | | | |
| 7.5 | | | | | | | |
| 10.0 | | | | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |
| 17.5 | | | | | | | |
| 20.0 | | | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: SS-29-2
DATE COMPLETED: DECEMBER 2, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 957.0 | | | | | |
| | GRAVEL (FILL), little fine grained sand, trace silt, fine and coarse well graded, gray, moist, subangular | 958.7 | BENTONITE CHIPS<br>3"Ø SPLIT SPOON | ISS | X | 11 | 7.1 |
| 2.5 | SAND (FILL), little fine, subangular gravel, trace silt and clay, medium grained, well graded, brown, moist<br>- little clay | 955.0 | | | | | |
| 5.0 | END OF HOLE @ 2.0ft BGS | | | | | | |
| 7.5 | | | | | | | |
| 10.0 | | | | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |
| 17.5 | | | | | | | |
| 20.0 | | | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: SS-29-3
DATE COMPLETED: DECEMBER 2, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 956.7 | | | | | |
| | GRAVEL (FILL), little fine grained sand, trace silt, fine and coarse well graded, gray, moist, subangular | 956.4 | BENTONITE CHIPS<br>3"Ø SPLIT SPOON | ISS | X | 25 | 7.3 |
| 2.5 | SAND (FILL), little fine, subangular gravel, trace silt and clay, medium grained, well graded, brown, moist<br>- little clay | 954.7 | | | | | |
| 5.0 | END OF HOLE @ 2.0ft BGS | | | | | | |
| 7.5 | | | | | | | |
| 10.0 | | | | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |
| 17.5 | | | | | | | |
| 20.0 | | | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)



PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: SS-29-4
DATE COMPLETED: DECEMBER 2, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 956.8 | | | | | |
| | GRAVEL (FILL), little fine grained sand, trace silt, fine and coarse well graded, gray, moist, subangular | 956.5 | BENTONITE CHIPS | ISS | X | 20 | 2.5 |
| 2.5 | SAND (FILL), little fine, subangular gravel, trace silt and clay, medium grained, well graded, brown, moist<br>- little clay | 954.8 | 3"Ø SPLIT SPOON | | | | |
| 5.0 | END OF HOLE @ 2.0ft BGS | | | | | | |
| 7.5 | | | | | | | |
| 10.0 | | | | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |
| 17.5 | | | | | | | |
| 20.0 | | | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)



PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-31-1
DATE COMPLETED: DECEMBER 10, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 938.0 | | | | | |
| | CL-CLAY, some gravel, some silt, little sand, stiff, low plasticity. medium brown, dry to moist, concrete fragments (FILL) | | | 1SS | | 11 | 3.5 |
| 2.5 | | | | 2SS | | 14 | 3.4 |
| | CI-CLAY, some silt, trace gravel, trace sand, firm to very stiff, moderate plasticity, dark gray, moist | 934.0 | | | | | |
| 5.0 | | | BENTONITE CHIPS | 3SS | | 16 | 3.2 |
| 7.5 | | | | 4SS | | 8 | 4.6 |
| | | | | 5SS | | 8 | 6.1 |
| 10.0 | | | 8" Ø BOREHOLE | | | | |
| | | | | 6SS | | 8 | 3.2 |
| 12.5 | | | | 7SS | | 10 | 1.9 |
| 15.0 | | | | 8SS | | 11 | 2.4 |
| 17.5 | - sand seam (moist) | | | 9SS | | 13 | 1.5 |
| | | | | 10SS | | 12 | 1.2 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 918.0 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE: REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-41)
*Page 1 of 1*

PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-31-2
DATE COMPLETED: DECEMBER 17, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 939.0 | | | | | |
| | CL-CLAY (FILL), silty, little gravel, little sand, firm to very stiff, low, plasticity, medium brown, moist | | | 1SS | | 5 | 0 |
| 2.5 | - black staining (1.0-1.9) | | | 2SS | | 9 | 0 |
| | - sand and slag (3.9-4.4) | | | | | | |
| 5.0 | | | BENTONITE CHIPS | 3SS | | 10 | 0 |
| | - saturated | | | 4SS | | 17 | 0 |
| 7.5 | | | | | | | |
| | SW-SAND, gravelly, little silt, medium dense, fine to medium coarse grained, well graded, medium gray, saturated | 930.0 | | 5SS | | 19 | 0 |
| 10.0 | | | 8" Ø BOREHOLE | 6SS | | 28 | 0 |
| 12.5 | CI-CLAY, silty, little sand, trace gravel, firm to hard, moderate plasticity, medium gray, moist | 927.0 | | 7SS | | 8 | 0 |
| 15.0 | | | | 8SS | | 8 | 0 |
| | - thin sand seams | | | | | | |
| 17.5 | | | | 9SS | | 50 | 0 |
| | | | | 10SS | | 14 | 0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 919.0 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-31-3
DATE COMPLETED: DECEMBER 11, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 941.1 | | | | | |
| | CL-CLAY (FILL), silty, little gravel, little sand, very soft to stiff, low, plasticity, dark brown, moist | | | 1SS | | 10 | 0 |
| 2.5 | | | | 2SS | | 7 | 0.1 |
| 5.0 | - black staining (4.5-6.0) | | BENTONITE CHIPS | 3SS | | 2 | 1.7 |
| 7.5 | | | | 4SS | | 8 | 1.3 |
| | SW-SAND, gravelly, little silt, little clay, loose, medium to coarse grained, well graded, gray/brown, wet to saturated | 933.3 | | 5SS | | 9 | 2.1 |
| 10.0 | CI-CLAY, silty, some sand, trace gravel, firm to stiff, moderate plasticity, dark gray, moist | 931.0 | 8" Ø BOREHOLE | 6SS | | 5 | 1.9 |
| 12.5 | | | | 7SS | | 6 | 1.4 |
| 15.0 | | | | 8SS | | 8 | 1.2 |
| 17.5 | | | | 9SS | | 9 | 1.4 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 921.1 | | 10SS | | 8 | 1.1 |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE: REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
## (OVERBURDEN)

(DL-32)
*Page 1 of 1*

PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-33-1
DATE COMPLETED: DECEMBER 18, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 922.5 | | | | | |
| | CL-CLAY, some gravel, some silt, little sand, firm to very stiff, low plasticity, medium brown, moist | | | 1SS | | 27 | 0 |
| 2.5 | | | | 2SS | | 23 | 0 |
| 5.0 | | | BENTONITE CHIPS | 3SS | | 12 | 0 |
| 7.5 | | | | 4SS | | 5 | 0 |
| | | | | 5SS | | 11 | 0 |
| 10.0 | | | 8" Ø BOREHOLE | | | | |
| | CI-CLAY, trace gravel, trace sand, soft to firm, moderate plasticity, dark gray, moist | 911.5 | | 6SS | | 6 | 2.7 |
| 12.5 | | | | 7SS | | 7 | 0 |
| | - native material | | | | | | |
| 15.0 | | | | 8SS | | 6 | 0 |
| 17.5 | | | | 9SS | | 6 | 0 |
| 20.0 | | | | 10SS | | 4 | 3.6 |
| | | | | 11SS | | 6 | 0 |
| 22.5 | ML-SILT, some gravel, little sand, low plasticity, medium brown, dry | 900.5 | | 12SS | | 141 | 0 |
| 25.0 | | | | 13SS | | 25+ | 0 |
| | - trace gravel | | | | | | |
| 27.5 | | | | 14SS | | 35 | 0 |
| 30.0 | | | | 15SS | | 40 | 0 |
| | | | | 16SS | | 59 | 0 |
| 32.5 | - some sand, little gravel | | | 17SS | | 130 | 0 |
| | END OF HOLE @ 34.0ft BGS | 888.5 | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)



PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-33-2
DATE COMPLETED: DECEMBER 17, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | STATE | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 923.4 | | | | | |
| | CL-CLAY, silty, little gravel, little sand, soft to very stiff, low plasticity, medium brown, moist | | | 1SS | | 8 | 0 |
| 2.5 | | | | 2SS | | 14 | 0 |
| 5.0 | | | BENTONITE CHIPS | 3SS | | 12 | 0 |
| 7.5 | | | | 4SS | | 11 | 0 |
| | | | | 5SS | | 12 | NR |
| 10.0 | | | 8" Ø BOREHOLE | 6SS | | 8 | 0 |
| 12.5 | | | | 7SS | | 3 | 0 |
| 15.0 | - dark gray<br>- native material | | | 8SS | | 5 | 0 |
| 17.5 | | | | 9SS | | 11 | 0 |
| 20.0 | | | | 10SS | | 8 | 0 |
| | | | | 11SS | | 5 | 0 |
| 22.5 | | | | 12SS | | 20 | 0 |
| | - silty gravel seam | 899.4 | | | | | |
| 25.0 | ML-SILT, some gravel, some clay, little sand, hard, low plasticity, medium brown, dry | | | 13SS | | 75 | 0 |
| 27.5 | - little gravel | | | 14SS | | 40 | 0.2 |
| 30.0 | | | | 15SS | | 78 | 0.4 |
| 32.5 | | | | 16SS | | 70 | 1.2 |
| | | | | 17SS | | 195 | 0.8 |
| 35.0 | | | | 18SS | | 210 | 1.6 |
| | END OF HOLE @ 36.0ft BGS | 887.4 | | | | | |
| 37.5 | - NOTE:<br>- NR-NO RECOVERY | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE: REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-34)
*Page 1 of 1*

PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-33-3
DATE COMPLETED: DECEMBER 10, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 919.4 | | | | | |
| | ML-SILT, some clay, little sand, trace gravel, very stiff to hard, low plasticity, medium brown, dry to moist | | | 1SS | | 19 | 0 |
| 2.5 | | | | 2SS | | 37 | 0 |
| 5.0 | | | BENTONITE CHIPS | 3SS | | 27 | 0 |
| | CL-CLAY, silty, little sand, trace gravel, soft to very stiff, low plasticity, gray/brown, dry to moist | 913.4 | | 4SS | | 19 | 0.2 |
| 7.5 | - medium gray, low to moderate plasticity | | | 5SS | | 10 | 0 |
| 10.0 | | | 8" Ø BOREHOLE | 6SS | | 11 | 0 |
| 12.5 | - sand seam (moist, 13.0-13.5) | | | 7SS | | 8 | 0.3 |
| 15.0 | - native material | | | 8SS | | 3 | 1.1 |
| 17.5 | | | | 9SS | | 10 | 1 |
| 20.0 | | | | 10SS | | 8 | 0.3 |
| | | | | 11SS | | 28 | 0 |
| 22.5 | | | | 12SS | | 11 | 1.1 |
| 25.0 | | | | 13SS | | 19 | NR |
| | ML-SILT, little sand, little clay, low plasticity, light brown, dry | 893.4 | | 14SS | | 125+ | 2.7 |
| 27.5 | | | | | | | |
| | END OF HOLE @ 28.0ft BGS<br>- NOTE:<br>- NR-NO RECOVERY<br>- OBSTRUCTION ENCOUNTERED AT 28.0 ft. BGS | 891.4 | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-35)
*Page 1 of 1*

PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-33-3A
DATE COMPLETED: DECEMBER 10, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 919.4 | | | | | |
| | (0'-28' BGS) SEE BH-33-3 FOR STRATIGRAPHY | | | | | | |
| 2.5 | | | | | | | |
| 5.0 | | | BENTONITE CHIPS | | | | |
| 7.5 | | | | | | | |
| 10.0 | | | 8" Ø BOREHOLE | | | | |
| 12.5 | | | | | | | |
| 15.0 | | | | | | | |
| 17.5 | | | | | | | |
| 20.0 | | | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | 891.4 | | | | | |
| | ML-SILT, little sand, little clay, low plasticity, light brown, dry | | | 1SS | X | 52 | 0 |
| 30.0 | | | | 2SS | X | 57 | 1.1 |
| 32.5 | | | | 3SS | X | 74 | 1.4 |
| | - some gravel, some sand | | | | | | |
| 35.0 | | | | 4SS | X | 49 | 0 |
| 37.5 | | | | 5SS | X | 105 | 0.5 |
| | | | | 6SS | X | 93 | 0 |
| | END OF HOLE @ 40.0ft BGS | 879.4 | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

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PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-33-4
DATE COMPLETED: DECEMBER 16, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 918.9 | | | | | |
| | CL-CLAY, silty, some sand, little gravel, soft to stiff, low plasticity, medium brown, moist | | | 1SS | | 12 | 0.5 |
| 2.5 | | | | 2SS | | 13 | 2.8 |
| 5.0 | | | BENTONITE CHIPS | 3SS | | 6 | 6.1 |
| 7.5 | | | | 4SS | | 3 | 3.9 |
| | | | | 5SS | | 7 | 4.1 |
| 10.0 | | | 8" Ø BOREHOLE | | | | |
| | | | | 6SS | | 5 | 2.6 |
| 12.5 | | | | 7SS | | 17 | 3.4 |
| | SW-SAND, loose, medium to coarse grained, well graded, medium gray, saturated | 905.4 | | | | | |
| 15.0 | | | | 8SS | | 8 | 4.6 |
| | CI-CLAY, silty, little sand, trace gravel, stif to very stiff, moderate plasticity, dark gray, moist | 902.9 | | | | | |
| 17.5 | - coarse sand seam, wet (17.5-18.0) | | | 9SS | | 13 | 1.4 |
| | | | | 10SS | | 15 | 3 |
| 20.0 | | | | | | | |
| | | | | 11SS | | 11 | 7.5 |
| 22.5 | | | | 12SS | | 12 | 2.5 |
| 25.0 | | | | 13SS | | 15 | 3.7 |
| | - some gravel, little sand, medium brown | | | | | | |
| 27.5 | | | | 14SS | | 18 | 2.1 |
| | ML-SILT, some sand, trace gravel, low plasticity, medium brown, dry | 889.9 | | 15SS | | 27 | 0.5 |
| 30.0 | | | | 16SS | | 37 | 2.6 |
| | END OF HOLE @ 31.5ft BGS | 887.4 | | | | | |
| 32.5 | - NOTE: | | | | | | |
| | - OBSTRUCTION ENCOUNTERED AT 31.5 ft. BGS | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-37)
*Page 1 of 1*

PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-33-5
DATE COMPLETED: DECEMBER 9, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | STATE | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 921.8 | | | | | |
| | OL-CLAY, silty, little sand, trace gravel, low plasticity, medium brown, moist, loam | 920.8 | | 1SS | | 21 | 10.2 |
| 2.5 | ML-SILT, clayey, some sand, trace gravel, very stiff, low plasticity, gray/brown, moist | | | 2SS | | 20 | 6.9 |
| 5.0 | | 916.3 | BENTONITE CHIPS | 3SS | | 16 | 3.4 |
| | CL-CLAY, silty, little sand, trace gravel, firm to very stiff, low plasticity, gray/brown, moist | | | 4SS | | 13 | 4.4 |
| 7.5 | | | | 5SS | | 11 | 5.5 |
| 10.0 | | | 8" Ø BOREHOLE | 6SS | | 6 | 3.8 |
| 12.5 | | | | 7SS | | 13 | 7 |
| 15.0 | | | | 8SS | | 8 | 7.3 |
| 17.5 | | | | 9SS | | 18 | 6.2 |
| 20.0 | - sand seam, medium grained (9.5-9.7) | | | 10SS | | 24 | 8.6 |
| 22.5 | - medium gray, native material | | | 11SS | | 17 | 1.3 |
| | | | | 12SS | | 6 | 7.1 |
| 25.0 | | | | 13SS | | 8 | 2.8 |
| | ML-SILT, sandy, some gravel, little clay, hard, low plastiity, medium gray, moist | 895.8 | | 14SS | | 80+ | 3.9 |
| 27.5 | | | | 15SS | | 124+ | 4.6 |
| 30.0 | | | | 16SS | | 98 | 3.2 |
| 32.5 | | | | 17SS | | 240 | 3.7 |
| 35.0 | | | | 18SS | | 225+ | 1.5 |
| 37.5 | | | | 19SS | | 148 | 0.1 |
| 40.0 | | | | 20SS | | 103+ | 0 |
| | SW-SAND, little silt, trace gravel, extremely dense, fine to coarse grained, well graded, medium brown, moist to wet | 881.8 | | 21SS | | 90 | 0 |
| | END OF HOLE @ 42.0ft BGS | 879.8 | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-38)
*Page 1 of 1*

PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-33-6
DATE COMPLETED: DECEMBER 11, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | STATE | 'N' VALUE | PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 922.1 | | | | | |
| | CL-CLAY, silty, some sand, little gravel, firm to very stiff low plasticity, medium brown, moist | | | 1SS | | 7 | 0.1 |
| 2.5 | | | | 2SS | | 9 | 2.1 |
| 5.0 | | | BENTONITE CHIPS | 3SS | | 9 | 1.9 |
| 7.5 | | | | 4SS | | 11 | 0.9 |
| | | | | 5SS | | 8 | 2.2 |
| 10.0 | | | 8" Ø BOREHOLE | 6SS | | 9 | 1.2 |
| 12.5 | - little sand, dark gray | | | 7SS | | 19 | 0 |
| 15.0 | | | | 8SS | | 12 | 0 |
| 17.5 | | | | 9SS | | 9 | 0 |
| | | | | 10SS | | 24 | 0 |
| 20.0 | - native material | | | 11SS | | 9 | 0 |
| 22.5 | | | | 12SS | | 10 | 3 |
| 25.0 | ML-SILT, some sand, trace gravel, hard, low plasticity, light brown, dry | 897.6 | | 13SS | | 108 | 0 |
| 27.5 | | | | 14SS | | 184 | 0 |
| 30.0 | | | | 15SS | | 100 | 0 |
| | | | | 16SS | | 79 | 1.9 |
| 32.5 | | | | 17SS | | 78 | 1.4 |
| 35.0 | | | | 18SS | | 180 | 0.9 |
| 37.5 | | | | 19SS | | 119 | 0.6 |
| | | | | 20SS | | 168 | 0.2 |
| | END OF HOLE @ 40.0ft BGS | 882.1 | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE: REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-29)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-34-1
DATE COMPLETED: DECEMBER 4, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 916.4 | | | | | |
| | SAND (FILL), little clay and silt, trace vegetation (grass, roots), medium grained, poorly graded, light brown, very moist | | | 1SS | | 2 | 0.0 |
| 2.5 | - little to some clay | | 8"Ø BOREHOLE | 2SS | | 6 | 0.0 |
| | CL-CLAY (TILL), little fine grained sand and silt, trace fine subrounded gravel, stiff, slight plasticity, homogeneous, dark gray, moist | 912.8 | | | | | |
| 5.0 | - trace fine grained sand | | | 3SS | | 10 | 0.0 |
| | - very stiff | | | 4SS | | 17 | 0.0 |
| 7.5 | - trace coarse subangular gravel | | BENTONITE CHIPS | | | | |
| | - little medium grained sand | | | 5SS | | 7 | 0.0 |
| | - firm | | | | | | |
| 10.0 | - stiff | | | 6SS | | 9 | 0.0 |
| 12.5 | | | | 7SS | | 9 | 0.0 |
| | - trace to little fine subrounded gravel, very stiff | | | | | | |
| 15.0 | | | | 8SS | | 16 | 0.0 |
| | - stiff | | | 9SS | | 11 | 0.0 |
| 17.5 | - very stiff | | | | | | |
| | | | 2"Ø SPLIT SPOON | 10SS | | 17 | 0.0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 896.4 | | | | | |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-30)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-34-2
DATE COMPLETED: DECEMBER 4, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 913.9 | | | | | |
| 2.5 | CLAY (FILL), some fine and medium grained sand, trace vegetation (grass, roots) and coarse subrounded gravel, slight plasticity, banded orange brown, moist, oxidized<br>- little medium grained sand | 910.3 | 8"Ø BOREHOLE | 1SS | | 4 | 0.0 |
| | | | | 2SS | | 4 | 0.0 |
| 5.0 | CL-CLAY (NATIVE), little silt, trace fine grained sand and fine subrounded gravel, soft to firm, slight plasticity, banded, brown, moist, oxidized<br>- hard | | | 3SS | | 58 | 0.0 |
| 7.5 | - trace coarse subrounded gravel<br>- very stiff, brown gray | 905.5 | BENTONITE CHIPS | 4SS | | 32 | 0.0 |
| 10.0 | CL-CLAY (TILL), little silt, trace fine grained sand and fine subrounded gravel, very stiff, low plasticity, homogeneous, dark gray, moist<br>- stiff | | | 5SS | | 18 | 0.0 |
| | | | | 6SS | | 13 | 0.0 |
| 12.5 | | | | 7SS | | 13 | 0.0 |
| 15.0 | | | | 8SS | | 9 | 0.0 |
| 17.5 | - very stiff<br>- interbedded medium grained sand, very moist | | 2"Ø SPLIT SPOON | 9SS | | 13 | 0.0 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 893.9 | | 10SS | | 28 | 0.0 |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE: REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

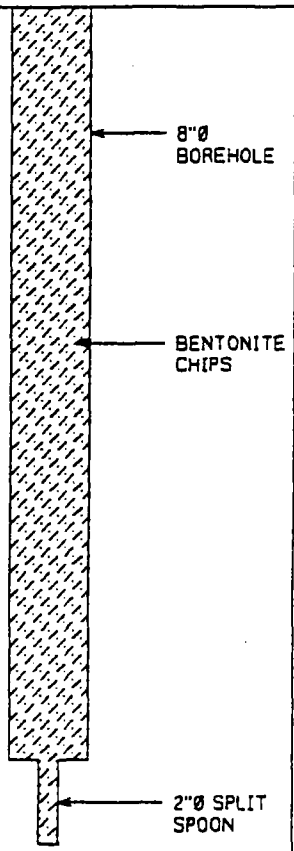
(DL-31)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP-RCRA INVESTIGATION
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-34-3
DATE COMPLETED: DECEMBER 3, 1998
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. |
|---|---|---|
| | GROUND SURFACE | 912.4 |
| | CLAY (FILL), little fine grained sand, trace silt, vegetation (grass, roots), and fine subrounded gravel, low plasticity, banded orange brown, moist, oxidized | |
| 2.5 | | |
| | | 908.8 |
| 5.0 | CL-CLAY (NATIVE), some fine grained sand, trace silt and fine subrounded gravel, stiff, slight plasticity, banded, light brown, very moist | |
| | - very stiff | 906.8 |
| 7.5 | CL-CLAY (TILL), little silt, trace fine subrounded gravel, very stiff, low plasticity, homogeneous, dark gray, moist | |
| 10.0 | | |
| 12.5 | - some silt | |
| 15.0 | - little silt | |
| | - some silt | |
| 17.5 | - little silt and fine grained sand | |
| | - hard | |
| 20.0 | END OF HOLE @ 20.0ft BGS | 892.4 |
| 22.5 | | |
| 25.0 | | |
| 27.5 | | |
| 30.0 | | |
| 32.5 | | |

MONITOR INSTALLATION




| SAMPLE NUMBER | STATE | 'N' VALUE | PID (ppm) |
|---|---|---|---|
| 1SS | | 5 | 0.0 |
| 2SS | | 11 | 0.0 |
| 3SS | | 29 | 0.0 |
| 4SS | | 24 | 0.0 |
| 5SS | | 19 | 0.0 |
| 6SS | | 20 | 0.0 |
| 7SS | | 22 | 0.0 |
| 8SS | | 20 | 0.0 |
| 9SS | | 20 | 0.0 |
| 10SS | | 44 | 0.0 |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# STRATIGRAPHIC AND INSTRUMENTATION LOG
# (OVERBURDEN)

(DL-39)
*Page 1 of 1*

PROJECT NAME: PONTIAC EAST ASSEMBLY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH-34-4
DATE COMPLETED: DECEMBER 6, 1998
DRILLING METHOD: 4 1/4" HSA
CRA SUPERVISOR: D. SOUTTER

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. AMSL | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | GROUND SURFACE | 912.8 | | | | | |
| | OL-CLAY, silty, little sand, trace gravel, low plasticity, gray/brown, moist, loam | 911.3 | | 1SS | | 12 | 0.6 |
| 2.5 | CI-CLAY, silty, little sand, trace gravel, very stiff, low plasticity, gray/brown, moist | | | 2SS | | 22 | 1.5 |
| 5.0 | CI-CLAY, silty, little sand, trace gravel, moderate plasticity, medium gray, moist to wet | 907.8 | BENTONITE CHIPS | 3SS | | 13 | 1.4 |
| 7.5 | | | | 4SS | | 11 | 1.3 |
| | | | | 5SS | | 10 | 0.9 |
| 10.0 | - sand seam, dry (10.8-10.9) | | 8" Ø BOREHOLE | 6SS | | 10 | 1.5 |
| 12.5 | | | | 7SS | | 9 | 0.8 |
| 15.0 | | | | 8SS | | 19 | 0.4 |
| 17.5 | | | | 9SS | | 12 | 0.4 |
| 20.0 | END OF HOLE @ 20.0ft BGS | 892.8 | | 10SS | | 36 | 0.3 |
| 22.5 | | | | | | | |
| 25.0 | | | | | | | |
| 27.5 | | | | | | | |
| 30.0 | | | | | | | |
| 32.5 | | | | | | | |

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼
CHEMICAL ANALYSIS ⬭

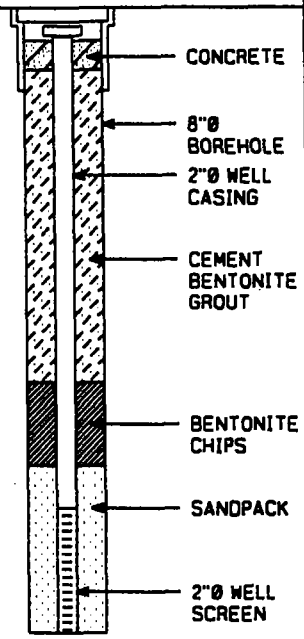
# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-53)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP FACILITY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS CORPORATION
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW-3-1 (AOI #74)
DATE COMPLETED: AUGUST 9, 2000
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | REFERENCE POINT (Top of Riser)<br>GROUND SURFACE | *0.00*<br>*0.00* | | | | | |
| | CONCRETE, gravel mixed, gray-white, competent | *-.7* | | | | | |
| -2.5 | SW/SP-SANDS (FILL), with gravels, trace silts, fragments concrete and asphalt, and clays, compact, fine with medium grained, well graded, dark brown to orange-brown, moist, fine, subangular and subrounded | | | 1GP | | | 0.0 |
| -5.0 | -no concrete and/or asphalt, organge-brown, slightly oxidized<br>-with clays | | | | | | |
| -7.5 | -olive-brown to gray-brown, very moist | *-7.0* | | 2GP | | | 0.0 |
| -10.0 | CL-SILTY CLAYS (NATIVE), trace fine, rounded gravels and fine grained sands, stiff, low plasticity brown, moist, competent, slight oxidized silt/sand fractures <1/16"<br>-slightly mottled, gray striations | | | | | | |
| -12.5 | SP-SANDS (NATIVE), trace silts, compact, fine to coarse grained gradation, poorly graded, brown to olive-gray, wet<br>-trace fine, rounded gravels | *-11.6* | | 3GP | | | 0.0 |
| -15.0 | CL-SILTY CLAYS (NATIVE), trace fine, rounded gravels and fine grained sands, stiff, low plasticity gray-brown, moist, competent | *-14.6*<br>*-15.0* | | | | | |
| -17.5 | END OF HOLE @ 15.0ft BGS | | | | | | |
| -20.0 | | | | | | | |
| -22.5 | | | | | | | |
| -25.0 | | | | | | | |
| -27.5 | | | | | | | |
| -30.0 | | | | | | | |
| -32.5 | | | | | | | |




SCREEN DETAILS
Screened interval:
12.0 to 15.0ft BGS
Length: 3.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
11.0 to 15.0ft BGS
Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

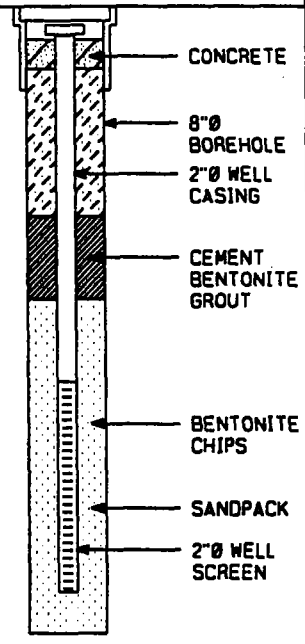
# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-54)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP FACILITY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS CORPORATION
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW-31-1 (AOI #54)
DATE COMPLETED: AUGUST 9, 2000
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | REFERENCE POINT (Top of Riser)<br>GROUND SURFACE | 0.00<br>0.00 | | | | | |
| | SM-SILTY SANDS (FILL), with vegetation, trace fine rounded gravels and clays, loose, very fine and fine grained, poorly graded, dark black-brown, very moist | -.8 | | | | | |
| -2.5 | SP-SANDS (FILL) with silts, trace slag and fine, rounded gravels, loose to compact, fine grained, poorly graded, black, very moist | -4.0 | | 1GP | | | 0.0 |
| -5.0 | SW-SANDS (FILL), with fine and coarse rounded gravels, loose, coarse grained, well graded, orange-brown, very moist, oxidized<br>-silt seam <1" thick, heavily oxidized | | | | | | |
| -7.5 | GW-GRAVELS, with silts and trace fine grained sands compact, coarse, subrounded, well graded, orange to olive-gray, wet | -7.5<br>-9.0 | | 2GP | | | 0.0 |
| -10.0 | GP-GRAVELS (PEASTONE), with coarse and medium grained sands, dense to compact, rounded, poorly graded, black-gray, wet | -10.0 | | | | | |
| -12.5 | GW-GRAVELS, with coarse grained sands, trace silts dense, fine and coarse, subrounded, well graded, black, wet, strong vegetative odor | | | 3GP | | | 0.0 |
| -15.0 | CL-SILTY CLAYS (NATIVE), trace fine, rounded gravels and fine grained sands, stiff, low plasticity, gray-brown, moist, competent | -14.0<br>-15.0 | | | | | |
| | END OF HOLE @ 15.0ft BGS | | | | | | |
| -17.5 | | | | | | | |
| -20.0 | | | | | | | |
| -22.5 | | | | | | | |
| -25.0 | | | | | | | |
| -27.5 | | | | | | | |
| -30.0 | | | | | | | |
| -32.5 | | | | | | | |




SCREEN DETAILS
Screened interval:
9.0 to 14.0ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
7.0 to 15.0ft BGS
Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

APPENDIX B

LABORATORY ANALYTICAL DATA REPORTS
(ONE COPY OF FULL ANALYTICAL DATA SET HAS BEEN PROVIDED TO U.S. EPA - ANALYTICAL DATA IS AVAILABLE FROM CRA UPON REQUEST)

CT&E Environmental Services Inc.



GM Pontiac Truck & Bus

| | | | | | |
|---|---|---|---|---|---|
| Sample: | 91131-6586 | Matrix: | Soil | / Composite | |
| Client Sample: | Drums 17-32 Comp. | Location: | | | |
| COLLECTED: | 03/19/1999 09:45 | Project: | 32 Soil Borings | | |
| RECEIVED: | 03/22/1999 : | Sampled By: | JY | | |

| Test Description | Result | | Unit | Spike Recovery | Regulatory Limit | Reporting Detection Limit | Method | Date/ Analyst | |
|---|---|---|---|---|---|---|---|---|---|
| **TCLP VOLATILES SW-846 Method 1311** | | | | | | | | | |
| TCLP Extraction Volatiles | - | | - | | | - | TCLP Extraction | 03/22/99 | WD |
| Vinyl Chloride | ND | | mg/L | 86 | 0.2 | 0.01 | SW-846 Mtd. 8260B | 03/26/99 | PJG |
| 1,1-Dichloroethylene | ND | | mg/L | 93 | 0.7 | 0.01 | " | 03/26/99 | PJG |
| Methyl Ethyl Ketone | ND | | mg/L | 80 | 200 | 0.1 | " | 03/26/99 | PJG |
| Chloroform | ND | | mg/L | 101 | 6 | 0.01 | " | 03/26/99 | PJG |
| Carbon Tetrachloride | ND | | mg/L | 96 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| 1,2-Dichloroethane | ND | | mg/L | 91 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| Benzene | ND | | mg/L | 82 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| Trichloroethene | ND | | mg/L | 75 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| Tetrachloroethene | ND | | mg/L | 85 | 0.7 | 0.01 | " | 03/26/99 | PJG |
| Chlorobenzene | ND | | mg/L | 96 | 100 | 0.01 | " | 03/26/99 | PJG |
| 1,4-Dichlorobenzene | ND | | mg/L | 96 | 7.5 | 0.01 | " | 03/26/99 | PJG |
| **TCLP SEMI-VOLATILES SW1311** | | | | | | | | | |
| TCLP Semi-Volatiles | - | | - | | | - | TCLP Extraction | 03/22/99 | WD |
| p-Cresol & m-Cresol | ND | J,M | mg/L | 1 | 200 | 0.02 | SW-846 Mtd. 8270C | 03/25/99 | JDS |
| o-Cresol | ND | J,M | mg/L | 0 | 200 | 0.02 | " | 03/25/99 | JDS |
| Total Cresol | ND | J,M | mg/L | 1 | 200 | 0.06 | " | 03/25/99 | JDS |
| Hexachlorobenzene | ND | | mg/L | 47 | 0.13 | 0.02 | " | 03/25/99 | JDS |
| Hexachloroethane | ND | | mg/L | 27 | 3 | 0.02 | " | 03/25/99 | JDS |
| Nitrobenzene | ND | | mg/L | 30 | 2 | 0.02 | " | 03/25/99 | JDS |
| Pyridine | ND | | mg/L | 15 | 5 | 0.04 | " | 03/25/99 | JDS |
| 2,4,6-Trichlorophenol | ND | J,M | mg/L | 3 | 2 | 0.02 | " | 03/25/99 | JDS |
| 2,4,5-Trichlorophenol | ND | J,M | mg/L | 3 | 400 | 0.02 | " | 03/25/99 | JDS |
| 2,4-Dinitrotoluene | ND | | mg/L | 24 | 0.13 | 0.02 | " | 03/25/99 | JDS |
| Hexachlorobutadiene | ND | | mg/L | 24 | 0.5 | 0.02 | " | 03/25/99 | JDS |
| Pentachlorophenol | ND | J,M | mg/L | 12 | 100 | 0.02 | " | 03/25/99 | JDS |

J,M - The result should be considered estimated due to matrix interference.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ORGANIC PREPS** | | | | | | | | | |
| TCLP Semi Volatiles Prep. | - | | - | | | - | SW-846 Mtd. 3510C | 03/23/99 | LJ |

ND = Non Detectable

All Solid/Soil samples are reported on dry weight basis unless otherwise noted.

Project Manager

Jason A. Asher

*Reported : 03/30/1999*

Certification Numbers: WI #999959180; MI #0021; AK UST #048; ND R-081; MD #266; IN C-MI-01

CT&E Environmental Services Inc.



GM Pontiac Truck & Bus

| | | | |
|---|---|---|---|
| Sample: | 91131-6586 | Matrix: | Soil / Composite |
| Client Sample: | Drums 17-32 Comp. | Location: | |
| COLLECTED: | 03/19/1999 09:45 | Project: | 32 Soil Borings |
| RECEIVED: | 03/22/1999 : | Sampled By: | JY |

| Test Description | Result | Unit | Spike Recovery | Regulatory Limit | Reporting Detection Limit | Method | Date/ Analyst |
|---|---|---|---|---|---|---|---|
| **HAZARDOUS WASTE CHARACTERIZATION** | | | | | | | |
| Corrosivity | NC | s.u. | | - | - | SW-846 Mtd. 7.2.2 | 03/24/99 JL |
| | | | NC = Non Corrosive | | | | |
| Ignitability | NI | - | | - | - | SW-846 Mtd. 7.1 | 03/24/99 WD |
| | | | Note: NI - Non Ignitable / I - Ignitable Capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical changes, and when ignited, burns so vigorously and persistently that it creates a hazard. | | | | |
| Reactive Cyanide | ND | mg/kg | | 250 | 25 | SW-846 7.3.3.2 | 03/29/99 LS |
| Reactive Sulfide | ND | mg/kg | | 500 | 50 | SW-846 7.3.4.2 | 03/29/99 LS |
| **PHYSICAL PROPERTY ANALYSIS** | | | | | | | |
| pH (laboratory) | 8.3 | s.u. | | - | 0.1 | SW-846 Mtd. 9045C | 03/24/99 JL |
| **INORGANIC PREPS** | | | | | | | |
| ICP Digestion (Silver) | - | - | | - | - | SW-846 Mtd. 7760A | 03/24/99 WD |
| ICP Digestion TCLP Metals | - | - | | | - | SW-846 Mtd. 3010A | 03/24/99 WD |
| **TCLP METAL ANALYSIS SW-846 Method 1311** | | | | | | | |
| TCLP ACT 64 Metals | - | - | | | - | TCLP Extraction | 03/22/99 WD |
| Arsenic (ICAP) | ND | mg/L | 110 | 5 | 0.02 | SW-846 Mtd. 6010B | 03/24/99 JC |
| Barium (ICAP) | 0.92 | mg/L | 94 | 100 | 0.005 | " | 03/24/99 JC |
| Cadmium (ICAP) | ND | mg/L | 91 | 1 | 0.02 | " | 03/24/99 JC |
| Chromium, Total (ICAP) | ND | mg/L | 91 | 5 | 0.05 | " | 03/24/99 JC |
| Copper (ICAP) | 0.07 | mg/L | 106 | 100 | 0.02 | " | 03/24/99 JC |
| Lead (ICAP) | ND | mg/L | 98 | 5 | 0.005 | " | 03/24/99 JC |
| Mercury (Cold Vapor) | 0.0044 | mg/L | 91 | 0.2 | 0.0002 | SW-846 Mtd. 7470A | 03/29/99 SMM |
| Selenium (ICAP) | ND | mg/L | 111 | 1 | 0.02 | SW-846 Mtd. 6010B | 03/24/99 JC |
| Silver (ICAP) | ND | mg/L | 105 | 5 | 0.004 | " | 03/24/99 JC |
| Zinc (ICAP) | 0.66 | mg/L | 92 | 500 | 0.02 | " | 03/24/99 JC |

ND = Non Detectable

All Solid/Soil samples are reported on dry weight basis unless otherwise noted.

*Reported : 03/30/1999*

CT&E Environmental Services Inc.



GM Pontiac Truck & Bus

| | | | |
|---|---|---|---|
| Sample: | 91131-6585 | Matrix: | Soil / Composite |
| Client Sample: | Drums 1-16 Comp. | Location: | |
| COLLECTED: | 03/19/1999 09:30 | Project: | 32 Soil Borings |
| RECEIVED: | 03/22/1999 : | Sampled By: | JY |

| Test Description | Result | | Unit | Spike Recovery | Regulatory Limit | Reporting Detection Limit | Method | Date/ Analyst | |
|---|---|---|---|---|---|---|---|---|---|
| **TCLP VOLATILES SW-846 Method 1311** | | | | | | | | | |
| TCLP Extraction Volatiles | - | | - | | | - | TCLP Extraction | 03/22/99 | WD |
| Vinyl Chloride | ND | | mg/L | 86 | 0.2 | 0.01 | SW-846 Mtd. 8260B | 03/26/99 | PJG |
| 1,1-Dichloroethylene | ND | | mg/L | 93 | 0.7 | 0.01 | " | 03/26/99 | PJG |
| Methyl Ethyl Ketone | ND | | mg/L | 80 | 200 | 0.01 | " | 03/26/99 | PJG |
| Chloroform | ND | | mg/L | 101 | 6 | 0.01 | " | 03/26/99 | PJG |
| Carbon Tetrachloride | ND | | mg/L | 96 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| 1,2-Dichloroethane | ND | | mg/L | 91 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| Benzene | ND | | mg/L | 82 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| Trichloroethene | ND | | mg/L | 75 | 0.5 | 0.01 | " | 03/26/99 | PJG |
| Tetrachloroethene | ND | | mg/L | 85 | 0.7 | 0.01 | " | 03/26/99 | PJG |
| Chlorobenzene | ND | | mg/L | 96 | 100 | 0.01 | " | 03/26/99 | PJG |
| 1,4-Dichlorobenzene | ND | | mg/L | 96 | 7.5 | 0.01 | " | 03/26/99 | PJG |
| **TCLP SEMI-VOLATILES SW1311** | | | | | | | | | |
| TCLP Semi-Volatiles | - | | - | | | - | TCLP Extraction | 03/22/99 | WD |
| p-Cresol & m-Cresol | ND | J,M | mg/L | 1 | 200 | 0.04 | SW-846 Mtd. 8270C | 03/25/99 | JDS |
| o-Cresol | ND | J,M | mg/L | 0 | 200 | 0.02 | " | 03/25/99 | JDS |
| Total Cresol | ND | J,M | mg/L | 1 | 200 | 0.06 | " | 03/25/99 | JDS |
| Hexachlorobenzene | ND | | mg/L | 47 | 0.13 | 0.02 | " | 03/25/99 | JDS |
| Hexachloroethane | ND | | mg/L | 27 | 3 | 0.02 | " | 03/25/99 | JDS |
| Nitrobenzene | ND | | mg/L | 30 | 2 | 0.02 | " | 03/25/99 | JDS |
| Pyridine | ND | | mg/L | 15 | 5 | 0.04 | " | 03/25/99 | JDS |
| 2,4,6-Trichlorophenol | ND | J,M | mg/L | 3 | 2 | 0.02 | " | 03/25/99 | JDS |
| 2,4,5-Trichlorophenol | ND | J,M | mg/L | 3 | 400 | 0.02 | " | 03/25/99 | JDS |
| 2,4-Dinitrotoluene | ND | | mg/L | 24 | 0.13 | 0.02 | " | 03/25/99 | JDS |
| Hexachlorobutadiene | ND | | mg/L | 24 | 0.5 | 0.02 | " | 03/25/99 | JDS |
| Pentachlorophenol | ND | J,M | mg/L | 12 | 100 | 0.02 | " | 03/25/99 | JDS |

J,M - The result should be considered estimated due to matrix interference.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ORGANIC PREPS** | | | | | | | | | |
| TCLP Semi Volatiles Prep. | - | | - | | | - | SW-846 Mtd. 3510C | 03/23/99 | LJ |

ND = Non Detectable

All Solid/Soil samples are reported on dry weight basis unless otherwise noted.

Project Manager

Jason A. Asher

*Reported : 03/30/1999*

CT&E Environmental Services Inc.



GM Pontiac Truck & Bus

| | | | | | |
|---|---|---|---|---|---|
| Sample: | 91131-6585 | Matrix: | Soil | / Composite | |
| Client Sample: | Drums 1-16 Comp. | Location: | | | |
| COLLECTED: | 03/19/1999 09:30 | Project: | 32 Soil Borings | | |
| RECEIVED: | 03/22/1999 : | Sampled By: | JY | | |

| Test Description | Result | Unit | Spike Recovery | Regulatory Limit | Reporting Detection Limit | Method | Date/ Analyst |
|---|---|---|---|---|---|---|---|
| **HAZARDOUS WASTE CHARACTERIZATION** | | | | | | | |
| Corrosivity | NC | s.u. | | - | - | SW-846 Mtd. 7.2.2 | 03/24/99 JL |
| | | | NC = Non Corrosive | | | | |
| Ignitability | NI | - | | - | - | SW-846 Mtd. 7.1 | 03/24/99 WD |
| | | | Note: NI - Non Ignitable / I - Ignitable Capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture, or spontaneous chemical changes, and when ignited, burns so vigorously and persistently that it creates a hazard. | | | | |
| Reactive Cyanide | ND | mg/kg | | 250 | 25 | SW-846 7.3.3.2 | 03/29/99 LS |
| Reactive Sulfide | ND | mg/kg | | 500 | 50 | SW-846 7.3.4.2 | 03/29/99 LS |
| **PHYSICAL PROPERTY ANALYSIS** | | | | | | | |
| pH (laboratory) | 7.3 | s.u. | | - | 0.1 | SW-846 Mtd. 9045C | 03/24/99 JL |
| **INORGANIC PREPS** | | | | | | | |
| ICP Digestion (Silver) | - | - | | - | - | SW-846 Mtd. 7760A | 03/24/99 WD |
| ICP Digestion TCLP Metals | - | - | | | - | SW-846 Mtd. 3010A | 03/24/99 WD |
| **TCLP METAL ANALYSIS SW-846 Method 1311** | | | | | | | |
| TCLP ACT 64 Metals | - | - | | | - | TCLP Extraction | 03/22/99 WD |
| Arsenic (ICAP) | ND | mg/L | 110 | 5 | 0.02 | SW-846 Mtd. 6010B | 03/24/99 JC |
| Barium (ICAP) | 0.92 | mg/L | 94 | 100 | 0.005 | " | 03/24/99 JC |
| Cadmium (ICAP) | 0.007 | mg/L | 91 | 1 | 0.001 | " | 03/24/99 JC |
| Chromium, Total (ICAP) | ND | mg/L | 91 | 5 | 0.05 | " | 03/24/99 JC |
| Copper (ICAP) | ND | mg/L | 106 | 100 | 0.02 | " | 03/24/99 JC |
| Lead (ICAP) | ND | mg/L | 98 | 5 | 0.03 | " | 03/24/99 JC |
| Mercury (Cold Vapor) | ND | mg/L | 91 | 0.2 | 0.0002 | SW-846 Mtd. 7470A | 03/29/99 SMM |
| Selenium (ICAP) | ND | mg/L | 111 | 1 | 0.03 | SW-846 Mtd. 6010B | 03/24/99 JC |
| Silver (ICAP) | ND | mg/L | 105 | 5 | 0.003 | " | 03/24/99 JC |
| Zinc (ICAP) | 0.31 | mg/L | 92 | 500 | 0.02 | " | 03/24/99 JC |

ND = Non Detectable

All Solid/Soil samples are reported on dry weight basis unless otherwise noted.

*Reported : 03/30/1999*

Chain of Custody

# CT&E Environmental Services Inc.

Anatech Division, 1200 Conrad Industrial Dr., Ludington, MI 49431-2681

Lab ID# 91131

Page

Phone: 616-843-1877 FAX: 616-845-9942

Results To: GM Pontiac Truck/Bus

Attention: Sue Waldrop

Telephone #

FAX ? Yes No FAX #

Invoice To: Same

Telephone #

Project Name: 32 SOIL BORINGS ~~35 drums (soil)~~

Project Number:

State in which samples were collected: Mich.

REQUIRED COMPLETION DATE: Standard

Sampled by: J. York

Work Authorization Signature:

This signature authorizes CT&E to perform the work requested on this form and acknowledges the terms and conditions of payment which are listed on the reverse side of this form.

Test Methods: TCLP No Pest/Herbs; RCI

Comment/Notes

Quote #

Lab to composite 2 jars into 1 sample

1-16 Comp Jar 1 of 2, 2 of 2

17-32 Comp. Jar 1 of 2, 2 of 2

Hr.

| Sample ID | Client Sample ID | Sampling Location | Date | Time am / pm | Comp Grab C/G | Sample Matrix | Drinking Water Y/N | Field Filtered Y/N | TCLP | RCI | VOC | Glass | O&G | 250m PI | 500m PI | 1L PI | Other | pH Check |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Drums | 1-16 Comp. | 6585 | 3-1999 | 9:30 | C | S | — | — | X | X | | 2 | | | | | | |
| Drum | 17-32 Comp. | 6586 | " | 9:45 | C | S | — | — | X | X | | 2 | | | | | | |

| Relinquished by | Date / Time (am / pm) | Relinquished by | Date / Time (am / pm) | Relinquished by | Date / Time (am / pm) |
|---|---|---|---|---|---|
| Sue A. Waldrop | 3-19-99 9:50 am | John York | 3-19-99 9:50 am | [illegible] | |
| Received by | Date / Time (am / pm) | Received by | Date / Time (am / pm) | Received by | Date / Time (am / pm) |
| | | | | [illegible] | 3-22-99 |

Cooler Temp #1 10°F Cooler Temp #2 Cooler Temp #3 Cooler Temp #4

[illegible] 3-22-99

03/30/1999 16:53 16168459942 CT&E PAGE 06

# APPENDIX D

## LABORATORY ASSESSMENT AND VALIDATION REPORTS

D.1 Phase I: Soil Investigation

D.2 Phase II: Perched Groundwater Investigation

CONESTOGA-ROVERS & ASSOCIATES
11100 Metro Airport Center Drive
Suite #160, Romulus, Michigan 48174

TELEPHONE: (734) 942-0909
FACSIMILE: (734) 942-1858

# MEMORANDUM

TO: Scott Green

REF. NO.: 7097

FROM: Paul Wiseman/rm/12/Det.

DATE: February 26, 1999

RE: Data Quality Assessment and Validation for Soil Samples Collected from the GM Truck Group Site in Pontiac, Michigan

The following details a quality assessment and validation of the analytical data resulting from the November 30, 1998, collection of 16 soil and two (2) water samples from the General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were selectively analyzed for polychlorinated biphenyls (PCB) and target analyte list (TAL) inorganics. Sample analysis was completed at Columbia Analytical Services, Kelso, Washington facility (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. The samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for PCB analyses requires that five (5) calibration standards be analyzed with a percent relative standard deviation (RSD) of the calibration factors for each compound of 20 percent of less. If the percent RSD exceeds 20 percent, a linear regression curve may be used if the correlation efficient is greater than or equal to 0.990. The initial calibration percent RSD criteria were met indicating the instruments were capable of acceptable performance prior to analysis.

The calibration criteria for inorganic analyses require that a specific number of standards be analyzed. The initial calibration is verified with an initial calibration verification (ICV) standard. The initial calibration and ICV acceptance criteria were met indicating the instruments were capable of acceptable performance prior to analysis.

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for PCB analysis required that compound response meet a maximum percent difference from the true value. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free from detectable concentrations of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored at the beginning and end of each analytical sequence. The data were within the established acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. The LCS analytes met the established control limit criteria.

Surrogate Compound Percent Recoveries

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate percent recovery acceptance criteria was met for all samples.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratories digestion and measurement methods. The inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - PCB Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recovery and RPD acceptance criteria were met for the PCB analyses.

Sample Quantitation

Sample analysis for TAL inorganics and PCB resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered as estimated values.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of two (2) field equipment blanks samples, and two (2) field duplicate sample sets.

To assess the efficiency of field decontamination procedures, two (2) equipment blank samples (W-7097-113098-TJ-009 and W-7097-113098-TJ-017) were collected and analyzed for PCB and TAL inorganics and TAL metals respectively. A number of the TAL Metals were reported detected in the two (2) equipment blank samples. Although these concentrations cannot be directly correlated to soil concentrations, all values were 1,000 times less than the reported data for subsequent samples indicating no appreciable impact. The remaining analytes were reported as not detected in the equipment blanks.

Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sample sets. Table 4 summarizes the results of the detected analytes in the field duplicate sample sets. The data indicate that an adequate level of precision was achieved for the sampling event.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

## TABLE 1

## SAMPLE IDENTIFICATION NUMBERS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

SS-7097-113098-TJ-001
SS-7097-113098-TJ-002
SS-7097-113098-TJ-003
SS-7097-113098-TJ-004
SS-7097-113098-TJ-005
SS-7097-113098-TJ-006
SS-7097-113098-TJ-007
SS-7097-113098-TJ-008
W-7097-113098-TJ-009
SS-7097-113098-TJ-010
SS-7097-113098-TJ-012
SS-7097-113098-TJ-013
SS-7097-113098-TJ-014
SS-7097-113098-TJ-015
SS-7097-113098-TJ-016
W-7097-113098-TJ-017
SS-7097-113098-TJ-018

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| Polychlorinated biphenyls | SW-846 8082[1] |
| TAL Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A/7470A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| PCB | - 14 days (soil), 7 days (water) from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |

# TABLE 4

## SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SETS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Investigative Sample* | *Duplicate Sample* | *RPD* [1] |
|---|---|---|---|
| | SS-7097-113098-TJ-004 | SS-7097-113098-TJ-005 | |
| TAL Metals | | | |
| Aluminum | 6,930 | 5,600 | 21 |
| Antimony | 0.06 | 0.05 | 18 |
| Arsenic | 4.5 | 5.1 | 13 |
| Barium | 33 | 28 | 16 |
| Beryllium | 0.25 | 0.25 | 0 |
| Cadmium | 0.20 | 0.19 | 5.1 |
| Calcium | 73,700 | 86,800 | 16 |
| Chromium | 12 | 9 | 29 |
| Cobalt | 4.76 | 5.04 | 5.7 |
| Copper | 9.6 | 11.1 | 14 |
| Iron | 12,700 | 10,600 | 18 |
| Lead | 5.26 | 5.87 | 11 |
| Magnesium | 22,100 | 23,900 | 7.8 |
| Manganese | 307 | 261 | 16 |
| Nickel | 13.1 | 14.7 | 12 |
| Potassium | 1,300 | 960 | 30 |
| Selenium | 0.4 J[2] | 0.4 J | 0 |
| Silver | 0.03 | 0.03 | 0 |
| Sodium | 196 | 208 | 5.9 |
| Thallium | 0.16 | 0.18 | 12 |
| Vanadium | 19 | 16 | 17 |
| Zinc | 37 | 30 | 21 |

# TABLE 4

## SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SETS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Investigative Sample* | *Duplicate Sample* | *RPD* [1] |
|---|---|---|---|
| | SS-7097-113098-TJ-013 | SS-7097-113098-TJ-014 | |
| TAL Metals | | | |
| Aluminum | 5,100 | 6,140 | 19 |
| Antimony | 0.10 | 0.12 | 18 |
| Arsenic | 5.3 | 4.9 | 7.8 |
| Barium | 30 | 39 | 26 |
| Beryllium | 0.36 | 0.45 | 22 |
| Cadmium | 0.53 | 0.31 | 52 |
| Calcium | 104,000 | 116,000 | 11 |
| Chromium | 16 | 19 | 17 |
| Cobalt | 4.33 | 3.93 | 10 |
| Copper | 12.3 | 11.2 | 9.4 |
| Iron | 10,500 | 9,540 | 10 |
| Lead | 8.30 | 9.57 | 14 |
| Magnesium | 22,500 | 20,300 | 10 |
| Manganese | 439 | 382 | 14 |
| Nickel | 15.1 | 13.1 | 14 |
| Potassium | 710 | 830 | 16 |
| Selenium | 0.6 | 0.6 | 0 |
| Sodium | 568 | 597 | 5.0 |
| Thallium | 0.20 | 0.13 | 42 |
| Vanadium | 17 | 18 | 5.7 |
| Zinc | 37 | 32 | 14 |

[1]RPD - Relative Percent Difference

[2]J - The associated numerical value is an estimated quantity.

CONESTOGA-ROVERS & ASSOCIATES
11100 Metro Airport Center Drive
Suite #160, Romulus, Michigan 48174

TELEPHONE: (734) 942-0909
FACSIMILE: (734) 942-1858

# MEMORANDUM

TO: Scott Green

REF. NO.: 7097

FROM: Mary Cameron/lr/13/Det.

DATE: April 6, 1999

RE: Data Quality Assessment and Validation for Soil Samples Collected from the GM Truck Group Site in Pontiac, Michigan

The following details a quality assessment and validation of the analytical data resulting from the December 1, 1998 collection of four (4) soil and one (1) water sample from the General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were analyzed for target compound list (TCL) volatile organic compounds (VOC); TCL semi-volatile organic compounds (SVOC); polychlorinated biphenyls (PCB); and target analyte list (TAL) inorganics. Sample analysis was completed at Columbia Analytical Services, in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. The samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for TCL VOC and TCL SVOC analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

## Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for TCL VOC, SVOC and PCB analyses required that all compounds meet a method-specific minimum mean response factor (RF) and maximum percent relative standard deviation (%RSD). The initial calibration data for TCL VOC, SVOC and PCB analyses were within the acceptance criteria indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

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[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Initial Calibration (Cont'd)

The calibration criteria for inorganic analyses requires a specific number of standards be analyzed with a correlation coefficient of ≥0.995. The initial calibration verification (ICV) results must fall within the percent recovery control limits of 80–120 percent for mercury and 90-110 percent for the remaining TAL metals and cyanide. The initial calibration acceptance criteria were met indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for TCL VOC, SVOC and PCB analyses required that compounds meet a method-specific minimum RF and maximum percent difference (%D) between the initial calibration mean RF and the continuing calibration RF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria as used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The samples presented in Table 4 should be qualified due to laboratory contamination. The remaining method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. The LCS percent recoveries were within the laboratory control limits, indicating that an acceptable level of overall performance was achieved.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratories digestion and measurement methods. The inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recoveries and RPDs were met for all analyses.

Internal Standard Summaries

Overall instrument stability and performance for the TCL VOC and TCL SVOC analyses was monitored using internal standard peak area and retention time data. The TCL VOC and TCL SVOC internal standard and retention time data were within the acceptance criteria.

Sample Quantitation

Sample analysis for TAL inorganics resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered estimated values.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of one (1) field blank (rinsate) sample, and one (1) trip blank sample.

To assess the efficiency of field decontamination procedures, one (1) rinsate sample (W-7097-120198-TJ-023) was collected and analyzed for all parameters. Several compounds were detected in the rinsate blank but the associated sample results were either ten (10) times higher or reported as non-detect. No qualification was required. No additional targeted analytes were reported as detected in the rinsate sample.

To monitor potential cross-contamination of VOC during aqueous sample transportation and storage, a trip blank was submitted to the laboratory for VOC analysis with each shipping cooler. No target analytes were reported as detected in the trip blank sample.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

# TABLE 1

## SAMPLE IDENTIFICATION NUMBERS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

S-7097-120198-TJ-019
S-7097-120198-TJ-020
S-7097-120198-TJ-021
S-7097-120198-TJ-022
W-7097-120198-TJ-023

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC | SW-846 5035/8260B[1] |
| TCL SVOC | SW-846 8270 |
| Polychlorinated biphenyls (PCB) | SW-846 8082 |
| TAL Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A/7470A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC | - 48 hours (soil) from sample collection to extraction<br>- 14 days (soil) from sample extraction to analysis<br>- 14 days (water) from sample collection to completion of analysis |
| TCL SVOC, PCB | - 14 days (soil), 7 days (water) from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO METHOD BLANK CONTAMINATION GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameter* | *Associated Samples* | *Qualified[1] Sample Result (µg/kg)* |
|---|---|---|---|
| TAL inorganics | Antimony | S-7097-120198-TJ-019 | U (0.1) |
| | | S-7097-120198-TJ-020 | U (0.1) |
| | | S-7097-120198-TJ-021 | U (0.1) |
| | | S-7097-120198-TJ-022 | U (0.1) |
| | Selenium | S-7097-120198-TJ-021 | U (0.7) |

[1] The parameter should be qualified for the listed samples as:

U( ) - The analyte was analyzed for, but was not detected above the reported sample quantitation limit in parenthesis.

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# MEMORANDUM

TO: Scott Green

REF. NO.: 7097

FROM: Mary Cameron/lr/14/Det.

DATE: May 24, 1999

RE: **Data Quality Assessment and Validation for Soil Samples Collected from the RCRA Facility Investigation (RFI) at the GM Truck Group Site in Pontiac, Michigan**

The following details a quality assessment and validation of the analytical data resulting from the December 2, 1998 collection of twelve (12) soil samples from the RCRA Facility Investigation (RFI) at General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were selectively analyzed for target compound list (TCL) or Appendix IX volatile organic compounds (VOC); TCL or Appendix IX semi-volatile organic compounds (SVOC); polychlorinated biphenyls (PCB) and target analyte list (TAL) or Appendix IX inorganics. Sample analysis was completed at Columbia Analytical Services, in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. The reported PCB results for samples SS-7097-120298-TJ-024 and S-7097-120298-TJ-032, re-extracted on December 22, 1998, should be disregarded. These samples were previously extracted within holding time and are qualified due to violation of surrogate percent recoveries. The re-extracted results confirmed the initial reported results. The remaining samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for TCL VOC and TCL SVOC analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for TCL VOC, SVOC and PCB analyses required that all compounds meet a method-specific minimum mean response factor (RF) and maximum percent relative standard deviation (%RSD). The initial calibration data for TCL VOC, SVOC and PCB analyses were within the acceptance criteria indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

The calibration criteria for inorganic analyses requires a specific number of standards be analyzed with a correlation coefficient of ≥0.995. The initial calibration verification (ICV) results must fall within the percent recovery control limits of 80–120 percent for mercury and 90-110 percent for the remaining TAL metals and cyanide. The initial calibration acceptance criteria were met indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for TCL VOC, SVOC and PCB analyses required that compounds meet a method-specific minimum RF and maximum percent difference (%D) between the initial calibration mean RF and the continuing calibration RF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria as used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The samples presented in Table 4 should be qualified due to laboratory contamination. The remaining method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. The LCS percent recoveries were within the laboratory control limits, indicating that an acceptable level of overall performance was achieved.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The sample analyses that violated surrogate acceptance criteria are identified and qualified in Table 5. The remaining surrogate recovery acceptance criteria was met for all samples.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recoveries and RPDs were met for all analyses.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratories digestion and measurement methods. The inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Internal Standard Summaries

Overall instrument stability and performance for the TCL VOC and TCL SVOC analyses was monitored using internal standard peak area and retention time data. The TCL VOC and TCL SVOC internal standard and retention time data were within the acceptance criteria.

Tentatively Identified Compounds

Laboratory analysis for TCL and Appendix IX VOC and SVOC included the identification of non-target compounds by conducting a forward library search against the EPA/NIST Mass Spectral Library. The identified non-target compounds were flagged by the laboratory with a "J". These compounds should be qualified as (NJ) tentatively identified compounds (TIC) with approximate concentrations.

Sample Quantitation

Sample analyses resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered estimated values.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of one (1) field duplicate sample set. Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sample set. Table 6 summarizes the results of the detected analytes in the field duplicate sample set. The data indicate that an adequate level of precision was achieved for the sampling event.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

## TABLE 1

## SAMPLE IDENTIFICATION NUMBERS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

SS-7097-120298-TJ-024
SS-7097-120298-TJ-025
SS-7097-120298-TJ-026
SS-7097-120298-TJ-027
SS-7097-120298-TJ-028
SS-7097-120298-TJ-029
S-7097-120298-TJ-030
SS-7097-120298-TJ-031
S-7097-120298-TJ-032
SS-7097-120298-TJ-033
S-7097-120298-TJ-034

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC, Appendix IX VOC | SW-846 5035/8260B[1] |
| TCL SVOC, Appendix IX SVOC | SW-846 8270C |
| Polychlorinated biphenyls (PCB) | SW-846 8082 |
| TAL Inorganics, Appendix IX Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Sulfide | SW-846 9030B |
| Tin | SWW-846 6020 |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC, Appendix IX VOC | - 48 hours from sample collection to extraction<br>- 14 days from sample extraction to analysis |
| TCL SVOC, Appendix IX SVOC, PCB | - 14 days (soil) from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL and Appendix IX Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |
| Sulfide | - 7 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO METHOD BLANK CONTAMINATION GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameter* | *Associated Samples* | *Qualified*[1] *Sample Result (mg/kg)* |
|---|---|---|---|
| TAL Inorganics | Selenium | SS-7097-120298-TJ-024 | U (1.0) |
| | | SS-7097-120298-TJ-025 | U (1.0) |
| | | SS-7097-120298-TJ-026 | U (0.7) |
| | | SS-7097-120298-TJ-027 | U (1.0) |
| | | SS-7097-120298-TJ-028 | U (1.0) |
| | | SS-7097-120298-TJ-029 | U (0.8) |
| | | S-7097-120298-TJ-030 | U (0.5) |
| | | SS-7097-120298-TJ-031 | U (0.7) |
| | | S-7097-120298-TJ-032 | U (0.5) |
| | | SS-7097-120298-TJ-033 | U (0.6) |
| | | S-7097-120298-TJ-034 | U (0.6) |

[1] The parameter should be qualified for the listed samples as:

U( ) - The analyte was analyzed for, but was not detected above the reported sample quantitation limit in parenthesis.

## TABLE 5

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO VIOLATION OF SURROGATE PERCENT RECOVERY CRITERIA GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameter* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|---|
| PCB | Aroclor 1016 | SS-7097-120298-TJ-024 | UJ |
| | Aroclor 1221 | S-7097-120298-TJ-032 | UJ |
| | Aroclor 1232 | | |
| | Aroclor 1242 | | |
| | Aroclor 1248 | | |
| | Aroclor 1254 | | |
| | Aroclor 1260 | | |

[1] The analysis parameter results should be qualified for the associated samples as:

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is estimated and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample (for non-detected parameters).

# TABLE 6

## SUMMARY OF DETECTED ANALYTIES IN FIELD DUPLICATE SAMPLE SETS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter (mg/kg)* | *Investigative Sample* | *Duplicate Sample* | *RPD*[1] |
|---|---|---|---|
| | SS-7097-120298-TJ-024 | SS-7097-120298-TJ-025 | |
| TCL SVOC | | | |
| Phenanthrene | 0.2 J[2] | ND (0.3)[3] | NC[4] |
| Anthracene | 0.05 J | ND (0.3) | NC |
| Fluoranthene | 0.3 J | 0.09 J | 110 |
| Pyrene | 0.3 | 0.09 J | 110 |
| Benzo(a)anthracene | 0.1 J | ND (0.3) | NC |
| Chrysene | 0.2 J | ND (0.3) | NC |
| Benzo(b)fluoranthene | 0.1 J | ND (0.3) | NC |
| Benzo(k)fluoranthene | 0.1 J | ND (0.3) | NC |
| Benzo(a)pyrene | 0.1 J | ND (0.3) | NC |
| Indeno(1,2,3-cd)pyrene | 0.08 J | ND (0.3) | NC |
| Benzo(g,h,i)perylene | 0.08 J | ND (0.3) | NC |
| TAL Inorganics | | | |
| Aluminum | 3,240 | 1,670 | 64 |
| Antimony | 0.1 | 0.2 | 67 |
| Arsenic | 4.4 | 2.1 | 71 |
| Barium | 85 | 50 | 52 |
| Beryllium | 0.26 | 0.21 | 21 |
| Cadmium | 0.58 | 0.31 | 61 |

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# MEMORANDUM

TO: Scott Green

REF. NO.: 7097

FROM: Mary Cameron/lr/15/Det.

DATE: May 24, 1999

RE: **Data Quality Assessment and Validation for Soil and Water Samples Collected from the RCRA Facility Investigation (RFI) at the GM Truck Group Site in Pontiac, Michigan**

The following details a quality assessment and validation of the analytical data resulting from the December 3, 1998 collection of three (3) soil and one (1) water sample from the RCRA Facility Investigation (RFI) at the General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were selectively analyzed for target compound list (TCL) or Appendix IX volatile organic compounds (VOC); TCL or Appendix IX semi-volatile organic compounds (SVOC); polychlorinated biphenyls (PCB); target analyte list (TAL) or Appendix IX inorganics and sulfide. Sample analysis was completed at Columbia Analytical Services, in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. The samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for TCL VOC and TCL SVOC analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for TCL VOC, SVOC and PCB analyses required that all compounds meet a method-specific minimum mean response factor (RF) and maximum percent relative standard deviation (%RSD). The initial calibration data for TCL VOC, SVOC and PCB analyses were within

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Initial Calibration (Cont'd)

the acceptance criteria indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

The calibration criteria for inorganic analyses requires a specific number of standards be analyzed with a correlation coefficient of ≥0.995. The initial calibration verification (ICV) results must fall within the percent recovery control limits of 80–120 percent for mercury and 90-110 percent for the remaining TAL metals and cyanide. The initial calibration acceptance criteria were met indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for TCL VOC, SVOC and PCB analyses required that compounds meet a method-specific minimum RF and maximum percent difference (%D) between the initial calibration mean RF and the continuing calibration RF. Continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria as used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. Several compounds were reported detected in the metals method blank. The associated sample results were reported as ten times higher than the method blanks therefore no qualification was required. The remaining method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. The cyanide and TCL VOC LCS results exceeded the laboratory control limits. The associated samples were reported as non detect, therefore no qualification was required. The remaining LCS percent recoveries were within the laboratory control limits, indicating that an acceptable level of overall performance was achieved.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recoveries and RPDs were met for all analyses.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratories digestion and measurement methods. The sulfide quantitation limit reported for sample W-7097-120398-TJ-037 should be qualified as an estimated (UJ) quantitation limit due to outlying matrix spike percent recovery. The remaining inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Internal Standard Summaries

Overall instrument stability and performance for the TCL VOC and TCL SVOC analyses was monitored using internal standard peak area and retention time data. The TCL VOC and TCL SVOC internal standard and retention time data were within the acceptance criteria.

Tentatively Identified Compounds

Laboratory analysis for TCL and Appendix IX VOC and SVOC included the identification of non-target compounds by conducting a forward library search against the EPA/NIST Mass Spectral Library. The identified non-target compounds were flagged by the laboratory with a "J". These compounds should be qualified as (NJ) tentatively identified compounds (TIC) with approximate concentrations.

Sample Quantitation

Sample analyses resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered estimated values.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted on one (1) field blank (rinsate) sample. To assess the efficiency of field decontamination procedures, one (1) rinsate sample (W-7097-120398-TJ-037) was collected and analyzed for Appendix IX parameters and PCBs. Several compounds were reported as detected in the field rinsate. The associated samples results for these compounds were reported as non-detect, therefore no qualification was required. No additional targeted analytes were reported as detected in the rinsate sample.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

## TABLE 1

## SAMPLE IDENTIFICATION NUMBERS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

SS-7097-120398-TJ-035
S-7097-120398-TJ-036
W-7097-120398-TJ-037
S-7097-120398-TJ-038

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC, Appendix IX VOC | SW-846 5035/8260B[1] |
| TCL SVOC, Appendix IX SVOC | SW-846 8270C |
| Polychlorinated biphenyls (PCB) | SW-846 8082 |
| TAL Inorganics, Appendix IX Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Sulfide | SW-846 9030B |
| Tin | SWW-846 6020 |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC, Appendix IX VOC | - 48 hours (soil) from sample collection to extraction<br>- 14 days (soil) from sample extraction to analysis |
| TCL SVOC, Appendix IX SVOC, PCB | - 14 days (soil) from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL and Appendix IX Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |
| Sulfide | - 7 days from sample collection to completion of analysis |

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# MEMORANDUM

TO: Paul Wiseman

REF. NO.: 7097

FROM: Paul McMahon/lr/1

DATE: June 7, 1999

RE: **Data Quality Assessment and Validation for Soil Samples Collected from the GM Truck Group Site in Pontiac, Michigan**

The following details a quality assessment and validation of the analytical data resulting from the December 4, 1998 collection of five (5) soil samples from the General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were selectively analyzed for target compound list (TCL) volatile organic compounds (VOC); Appendix IX VOC; TCL semi-volatile organic compounds (SVOC), Appendix IX SVOC; polychlorinated biphenyls (PCB); target analyte list (TAL) inorganics; and Appendix IX inorganics. Sample analysis was completed at Columbia Analytical Services, in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. Samples that violated the sulfide holding time period are detailed in Table 4. The remaining samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for VOC and SVOC analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

## Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum mean response factor (RF) and maximum percent relative standard deviation (%RSD). The initial calibration data for VOC, SVOC and PCB analyses were within the

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Initial Calibration (Cont'd)

acceptance criteria indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

The calibration criteria for inorganic analyses require that a specific number of standards be analyzed with a resulting correlation coefficient of ≥0.995. Inductively coupled plasma (ICP) instrumentation requires calibration with a blank and at least one standard. The initial calibration verification (ICV) results must fall within the percent recovery control limits of 80–120 percent for mercury and 90-110 percent for the remaining metals, sulfide, and cyanide. The initial calibration acceptance criteria were met indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum RF and maximum percent difference (%D) between the initial calibration mean RF and the continuing calibration RF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The samples presented in Table 5 should be qualified due to method blank contamination. The remaining method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. A single TCL VOC LCS percent recovery exceedance appeared to be ananomally caused by rounding and LCS spike preparation. No qualification of data is required. The remaining LCS percent recoveries were within the laboratory control limits, indicating an acceptable level of performance.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratory's digestion and measurement methods. The inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recoveries and RPDs were acceptable for all analyses.

Internal Standard Summaries

Overall instrument stability and performance for the VOC and SVOC analyses was monitored using internal standard peak area and retention time data. The sample results that should be qualified due to outlying internal standard retention time criteria are summarized in Table 6. The remaining VOC and SVOC internal standard recoveries and retention time data were within the acceptance criteria.

Tentatively Identified Compounds

Laboratory analysis for TCL and Appendix IX VOC and SVOC included the identification of non-target compounds by conducting a forward library search against the EPA/NIST Mass Spectral Library. The identified non-target compounds were flagged by the laboratory with a "J". These compounds should be qualified as (NJ) tentatively identified compounds (TIC) with approximate concentrations.

Sample Quantitation

Sample analyses resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered estimated values.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of one (1) field duplicate sample set.

Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sample set. Table 7 summarizes the results of the detected analytes in the field duplicate set. The data indicate that an adequate level of precision was achieved for the sampling event.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

**TABLE 1**

**SAMPLE IDENTIFICATION NUMBERS**
**GM TRUCK GROUP SITE**
**PONTIAC, MICHIGAN**

S-7097-120498-TJ-039
SD-7097-120498-TJ-040
SD-7097-120498-TJ-041
S-7097-120498-TJ-042
S-7097-120498-TJ-043

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC, Appendix IX VOC | SW-846 5035/8260B[1] |
| TCL SVOC, Appendix IX SVOC | SW-846 8270C |
| Polychlorinated biphenyls (PCB) | SW-846 8082 |
| TAL Inorganics, Appendix IX Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A/7470 A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Sulfide | SW-846 9030B |
| Tin | SWW-846 6020 |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC, Appendix IX VOC | - 48 hours from sample collection to extraction<br>- 14 days from sample extraction to analysis |
| TCL SVOC, Appendix IX SVOC, PCB | - 14 days from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL and Appendix IX Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |
| Sulfide | - 7 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO HOLDING TIME PERIOD VIOLATIONS GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|
| Sulfide | SD-7097-120498-TJ-041 | UJ |

[1]The sample parameter results should be qualified as:

UJ -The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is estimated and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample (for non-detected parameters).

## TABLE 5

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO METHOD BLANK CONTAMINATION GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameter* | *Associated Samples* | *Qualified[1] Sample Result (mg/Kg)* |
|---|---|---|---|
| Metals | Antimony | S-7097-120498-TJ-039 | U(0.08) |
| | | SD-7097-120498-TJ-040 | U(0.04) |
| | | SD-7097-120498-TJ-041 | U(0.04) |
| | | S-7097-120498-TJ-042 | U(0.03) |
| | | S-7097-120498-TJ-043 | U(0.05) |

[1] The analyte should be qualified for the listed samples as:

U( ) - The analyte was analyzed for, but was not detected above the reported sample quantitation limit in parenthesis.

## TABLE 6

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO OUTLYING INTERNAL STANDARD RECOVERIES GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *IS* | *Sample* | *Compounds* | *Qualifier*[1] |
|---|---|---|---|---|
| SVOC | Naph-d8 | SD-7097-120498-TJ-040 | Naphthalene | J |
| | | | 2-Methylnaphthalene | J |

[1] The samples should be qualified for the listed parameters as:

J - The analyte was positively identified; the associated numerical value is the estimated concentration of the analyte in the sample (for detected parameters).

## TABLE 7

## SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SET
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Investigative Sample* | *Duplicate Sample* | *RPD*[1] |
|---|---|---|---|
| | S-7097-120498-TJ-043 | S-7097-120498-TJ-042 | |
| TAL Metals | | | |
| Aluminum | 6,540 | 6,680 | 2.1 |
| Antimony | 0.05[2] J | 0.03 J | 50 |
| Arsenic | 5.7 | 4.3 | 28 |
| Barium | 32 | 35 | 9.0 |
| Beryllium | 0.28 | 0.23 | 20 |
| Cadmium | 0.21 | 0.23 | 9.1 |
| Calcium | 37,600 | 49,800 | 28 |
| Chromium | 10 | 11 | 10 |
| Cobalt | 4.69 | 4.76 | 1.5 |
| copper | 10.7 | 10.4 | 2.8 |
| Iron | 11,500 | 13,000 | 12 |
| Lead | 11.0 | 6.38 | 53 |
| Magnesium | 11,800 | 13,600 | 14 |
| Manganese | 323 | 353 | 8.9 |
| Nickel | 12.9 | 13.1 | 1.5 |
| Potassium | 660 | 680 | 3.0 |
| Selenium | 0.7 | 0.9 | 25 |
| Silver | 0.06 | 0.05 | 18 |
| Sodium | 187 | 262 | 33 |
| Thallium | 0.19 | 0.18 | 5.4 |
| Vanadium | 17 | 17 | 0 |
| Zinc | 44 | 39 | 12 |

*Notes:*

[1]RPD - Relative Percent Difference

[2]J - The associated numerical value is an estimated quantity.

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Niagara Falls, NY 14304

TELEPHONE: (716) 297-6150
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# MEMORANDUM

TO: Paul Wiseman

REF. NO.: 7097

FROM: Paul McMahon/lr/2

DATE: June 7, 1999

RE: **Data Quality Assessment and Validation for Soil Samples Collected from the GM Truck Group Site in Pontiac, Michigan**

The following details a quality assessment and validation of the analytical data resulting from the December 7 and 8, 1998 collection of three (3) soil samples from the General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were analyzed for target compound list (TCL) volatile organic compounds (VOC); TCL semi-volatile organic compounds (SVOC); polychlorinated biphenyls (PCB); and target analyte list (TAL) inorganics. Sample analysis was completed at Columbia Analytical Services, in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. The samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for TCL VOC and TCL SVOC analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

## Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for TCL VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum mean response factor (RF) and maximum percent relative standard deviation (%RSD). The initial calibration data for TCL VOC, SVOC and PCB analyses were within the

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Initial Calibration (Cont'd)

acceptance criteria indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

The calibration criteria for inorganic analyses require that a specific number of standards be analyzed with a resulting correlation coefficient of ≥0.995. Inductively coupled plasma (ICP) instrumentation requires calibration with a blank and at least one standard. The initial calibration verification (ICV) results must fall within the percent recovery control limits of 80–120 percent for mercury and 90-110 percent for the remaining TAL metals and cyanide. The initial calibration acceptance criteria were met indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for TCL VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum RF and maximum percent difference (%D) between the initial calibration mean RF and the continuing calibration RF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. Several metals were detected in the laboratory blank analyses. The samples presented in Table 4 should be qualified due to method blank contamination. All remaining method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. One TCL VOC and one TCL SVOC percent recovery exceeded the laboratory LCS percent criteria. The TCL VOC exceedance appeared to be an anomolly caused by rounding and LCS spike preparation. The TCL SVOC associated sample results were non-detect. No qualification of TCL VOC or TCL SVOC was required. The remaining LCS percent recoveries were within the laboratory control limits, indicating an acceptable level of performance.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratory's digestion and measurement methods. The sample results that should be qualified due to violation of matrix spike percent recovery criteria is summarized in Table 5. The remainder of the data were within the acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recoveries and RPDs were acceptable for all analyses.

Internal Standard Summaries

Overall instrument stability and performance for the TCL VOC and TCL SVOC analyses was monitored using internal standard peak area and retention time data. The TCL VOC and TCL SVOC internal standard recoveries and retention time data were within the acceptance criteria.

Tentatively Identified Compounds

Laboratory analysis for TCL and Appendix IX VOC and SVOC included the identification of non-target compounds by conducting a forward library search against the EPA/NIST Mass Spectral Library. The identified non-target compounds were flagged by the laboratory with a "J". These compounds should be qualified as (NJ) tentatively identified compounds (TIC) with approximate concentrations.

Sample Quantitation

Sample analyses resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered estimated values.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

## TABLE 1

## SAMPLE IDENTIFICATION NUMBERS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

SS-7097-120798-TJ-044

S-7097-120798-TJ-045

S-7097-120897-DS-046

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC | SW-846 5035/8260B[1] |
| TCL SVOC | SW-846 8270C |
| Polychlorinated Biphenyls (PCB) | SW-846 8082 |
| TAL Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A/7470A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC, Appendix IX VOC | - 48 hours from sample collection to extraction<br>- 14 days from sample extraction to analysis |
| TCL SVOC, Appendix IX SVOC, PCB | - 14 days from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL and Appendix IX Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |
| Sulfide | - 7 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO METHOD BLANK CONTAMINATION GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameter* | *Associated Samples* | *Qualified[1] Sample Result (mg/Kg)* |
|---|---|---|---|
| TAL Metals | Antimony | SS-7097-120798-TJ-044 | U(0.03) |
| | | S-7097-120798-TJ-045 | U(0.03) |
| | | S-7097-120898-DS-046 | U(0.03) |

[1] The analyte should be qualified for the listed samples as:

U( ) - The analyte was analyzed for, but was not detected above the reported sample quantitation limit in parenthesis.

## TABLE 5

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO OUTLYING MATRIX SPIKE RECOVERY DATA-INORGANICS GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameters* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|---|
| TAL Metals | Silver | SS-7097-120798-TJ-044 | J |
| | | S-7097-120798-TJ-045 | J |
| | | S-7097-120898-DS-046 | J |

[1] The parameter results should be qualified for the listed samples as:

J - The associated value is an estimated quantity (for detected parameters).

CONESTOGA-ROVERS & ASSOCIATES
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Niagara Falls, NY 14304

TELEPHONE: (716) 297-6150
FAX: (716) 297-2265

# MEMORANDUM

TO: Paul Wiseman

REF. NO.: 7097

FROM: Paul McMahon/lr/3

DATE: June 7, 1999

RE: **Data Quality Assessment and Validation for Soil Samples Collected from the GM Truck Group Site in Pontiac, Michigan**

The following details a quality assessment and validation of the analytical data resulting from the December 9, 10 and December 11, 1998 collection of ten (10) soil samples and one (1) rinsate blank from the General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were selectively analyzed for target compound list (TCL) volatile organic compounds (VOC); TCL semi-volatile organic compounds (SVOC); polychlorinated biphenyls (PCB); and target analyte list (TAL) inorganics. Sample analysis was completed at Columbia Analytical Services, in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. Samples that violated the cyanide holding time period are detailed in Table 4. The remaining samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for TCL VOC and TCL SVOC analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

## Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for TCL VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum mean response factor (RF) and maximum percent relative standard deviation (%RSD). The initial calibration data for TCL VOC, SVOC and PCB analyses were within the

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Initial Calibration (Cont'd)

acceptance criteria indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

The calibration criteria for inorganic analyses require that a specific number of standards be analyzed with a resulting correlation coefficient of ≥0.995. Inductively coupled plasma (ICP) instrumentation requires calibration with a blank and at least one standard. The initial calibration verification (ICV) results must fall within the percent recovery control limits of 80–120 percent for mercury and 90-110 percent for the remaining TAL metals and cyanide. The initial calibration acceptance criteria were met indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for TCL VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum RF and maximum percent difference (%D) between the initial calibration mean RF and the continuing calibration RF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. Several metals were detected in the laboratory blank analyses. The associated samples results were either reported as non-detect or five (5) times the method blank results, therefore no qualification was required. All remaining method blank samples were reported to be free from detectable levels of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. Several TCL SVOC and TCL VOC LCS percent recoveries exceeded the laboratory LCS percent criteria. This exceedance appeared to be an anomolly caused by rounding and LCS spike preparation, therefore no qualification was required. The remaining LCS percent recoveries were within the laboratory control limits, indicating an acceptable level of overall performance was achieved.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratory's digestion and measurement methods. The samples that should be qualified due to violation of matrix spike recovery criteria are outlined in Table 5. The remainder of the data were within the acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recoveries and RPDs were acceptable for all analyses.

Internal Standard Summaries

Overall instrument stability and performance for the TCL VOC and TCL SVOC analyses was monitored using internal standard peak area and retention time data. The sample results that should be qualified due to outlying internal standard retention time criteria are summarized in Table 6. The remaining TCL VOC and TCL SVOC internal standard recoveries and retention time data were within the acceptance criteria.

Tentatively Identified Compounds

Laboratory analysis for TCL and Appendix IX VOC and SVOC included the identification of non-target compounds by conducting a forward library search against the EPA/NIST Mass Spectral Library. The identified non-target compounds were flagged by the laboratory with a "J". These compounds should be qualified as (NJ) tentatively identified compounds (TIC) with approximate concentrations.

Sample Quantitation

Sample analyses resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered estimated values.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted on one (1) field duplicate set, one (1) field blank (rinsate) sample, and one (1) trip blank sample.

Field Quality Assurance/Quality Control (Cont'd)

To assess the efficiency of field decontamination procedures, one (1) rinsate sample (W-7097-121098-DS-049) was collected and analyzed for all organic parameters. Several TCL VOC and TCL SVOC were detected in the rinsate blanks but associated sample results were reported as non-detect. No qualification was required. No additional target analytes were reported as detected in the rinsate samples.

To monitor potential cross-contamination of VOC during aqueous sample transportation and storage, a trip blank was submitted to the laboratory for VOC analysis with each shipping cooler. No target analytes were reported as detected in the trip blank sample.

Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate set. Table 7 summarize the results of the detected analytes in the field duplicate set. The data indicate that an adequate level of precision achieved for the sampling event.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

# TABLE 1

## SUMMARY IDENTIFICATION NUMBERS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

S-7097-120998-DS-047

S-7097-120998-DS-048

W-7097-121098-DS-049

S-7097-121098-DS-050

S-7097-121098-DS-051

S-7097-121098-DS-052

S-7097-121198-DS-053

S-7097-121198-DS-054

S-7097-121198-DS-055

S-7097-121198-DS-056

S-7097-121198-DS-057

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC | SW-846 5035/8260B[1] |
| TCL SVOC | SW-846 8270 |
| Polychlorinated Biphenyls (PCB) | SW-846 8082 |
| TAL Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A/7470A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC | - 48 hours (soil) from sample collection to extraction<br>- 14 days (soil) from sample extraction to analysis<br>- 14 days (water) from sample collection to completion of analysis |
| TCL SVOC, PCB | - 14 days (soil), 7 days (water) from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO HOLDING TIME PERIOD VIOLATIONS GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|
| Cyanide | S-7097-120998-DS-047 | UJ/J |
| | S-7097-120998-DS-048 | |
| | S-7097-121098-DS-050 | |
| | S-7097-121098-DS-051 | |
| | S-7097-121098-DS-052 | |
| | S-7097-121198-DS-053 | |
| | S-7097-121198-DS-054 | |
| | S-7097-121198-DS-055 | |
| | S-7097-121198-DS-056 | |
| | S-7097-121198-DS-057 | |

[1]The sample parameter results should be qualified as:

J -The analyte was positively identified; the associated numerical value is the estimated concentration of the analyte in the sample (for detected parameters).

UJ -The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is estimated and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample (for non-detected parameters).

## TABLE 5

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO OUTLYING MATRIX SPIKE RECOVERY DATA-INORGANICS GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameters* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|---|
| TAL Metals | Silver | S-7097-120998-DS-047 | J |
| | | S-7097-120998-DS-048 | |
| | | S-7097-121098-DS-050 | |
| | | S-7097-121098-DS-051 | |
| | | S-7097-121098-DS-052 | |
| | | S-7097-121198-DS-053 | |
| | | S-7097-121198-DS-054 | |
| | | S-7097-121198-DS-055 | |
| | | S-7097-121198-DS-056 | |
| | | S-7097-121198-DS-057 | |

[1] The parameter results should be qualified for the listed samples as:

J - The associated value is an estimated quantity (for detected parameters).

## TABLE 6

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO OUTLYING INTERNAL STANDARD RECOVERIES GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *IS* | *Sample* | *Compounds* | *Qualifier*[1] |
|---|---|---|---|---|
| Semi-Volatiles | Acen-d10 | S-7097-121098-DS-052 | Phenanthrene | J |

[1] The samples should be qualified for the listed parameters as:

J - The analyte was positively identified; the associated numerical value is the estimated concentration of the analyte in the sample (for detected parameters).

## TABLE 7

## SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SET
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Investigative Sample* | *Duplicate Sample* | *RPD*[1] |
|---|---|---|---|
| | S-7097-121098-DS-50 | S-7097-121098-DS-50 | |
| TAL Metals | | | |
| Aluminum | 5,650 | 4,950 | 13 |
| Antimony | 0.06 | 0.04 J[2] | 40 |
| Arsenic | 4.3 | 4.5 | 4.5 |
| Barium | 31 | 30 | 3.3 |
| Beryllium | 0.29 | 0.29 | 0 |
| Cadmium | 0.23 | 0.19 | 19 |
| Calcium | 72,900 | 71,800 | 1.5 |
| Chromium | 11 | 10 | 10 |
| Cobalt | 5.24 | 5.19 | 0.96 |
| Copper | 12.0 | 11.9 | 0.84 |
| Iron | 11,600 | 10,800 | 7.1 |
| Lead | 6.54 | 6.92 | 5.7 |
| Magnesium | 22,400 | 21,500 | 4.1 |
| Manganese | 285 | 274 | 3.9 |
| Nickel | 14.7 | 15.1 | 2.7 |
| Potassium | 110 | 900 | 160 |
| Selenium | 0.4 J | 0.5 J | 22 |
| Silver | 0.07 | 0.05 | 33 |
| Sodium | 174 | 176 | 1.1 |
| Thallium | 0.23 | 0.22 | 4.4 |
| Vanadium | 17 | 14 | 19 |
| Zinc | 35 | 49 | 33 |

[1]RPD - Relative Percent Difference
[2]J - The associated numerical value is an estimated quantity.

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# MEMORANDUM

TO: Paul Wiseman

REF. NO.: 7097

FROM: Paul McMahon/lr/4

DATE: June 7, 1999

RE: **Data Quality Assessment and Validation for Soil Samples Collected from the GM Truck Group Site in Pontiac, Michigan**

The following details a quality assessment and validation of the analytical data resulting from the December 16, 17 and 18, 1998 collection of nine (9) soil samples and one (1) rinsate blank from the General Motors (GM) Truck Group Site in Pontiac, Michigan. The samples identified in Table 1 were selectively analyzed for target compound list (TCL) volatile organic compounds (VOC); Appendix IX VOC; TCL semi volatile organic compounds (SVOC); Appendix IX SVOC; polychlorinated biphenyls (PCB); target analyte list (TAL) inorganics; and Appendix IX inorganics. Sample analysis was completed at Columbia Analytical Services, in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. Samples that violated the sulfide holding time period are detailed in Table 4. The remaining samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for VOC and SVOC analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

## Initial Calibration

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum mean response factor (RF) and maximum percent relative standard

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

Initial Calibration (Cont'd)

deviation (%RSD). The initial calibration data for VOC, SVOC and PCB analyses were within the acceptance criteria indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

The calibration criteria for inorganic analyses require that a specific number of standards be analyzed with a resulting correlation coefficient of ≥0.995. Inductively coupled plasma (ICP) instrumentation requires calibration with a blank and at least one standard. The initial calibration verification (ICV) results must fall within the percent recovery control limits of 80–120 percent for mercury and 90-110 percent for the remaining metals, sulfide, and cyanide. The initial calibration acceptance criteria were met indicating the instruments were capable of generating acceptable quantitative data prior to analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for VOC, SVOC and PCB analyses require that compounds meet a method-specific minimum RF and maximum percent difference (%D) between the initial calibration mean RF and the continuing calibration RF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were evaluated against the same criteria used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. Calcium and copper were reported as detected in the metals method blanks. The associated samples results were reported as five (5) times the method blank results, therefore no qualification was required. The remaining method blank samples were reported to be free from detectable concentrations of target analytes, indicating no laboratory-attributable contamination occurred.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses served as a monitor of the overall performance of all steps in the organic and inorganic analyses. All LCS percent recoveries were within the laboratory control limits, indicating that an acceptable level of overall performance was achieved.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratory's digestion and measurement methods. Sulfide MS percent recovery exceeded the acceptance criteria but the associated sample result was reported as non-detect, therefore no qualification was required. The remaining inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the RPD of the recoveries were determined. The MS/MSD percent recoveries and RPDs were acceptable for all analyses.

Internal Standard Summaries

Overall instrument stability and performance for the VOC and SVOC analyses was monitored using internal standard peak area and retention time data. The VOC and SVOC internal standard recoveries and retention time data were within the acceptance criteria.

Tentatively Identified Compounds

Laboratory analysis for TCL and Appendix IX VOC and SVOC included the identification of non-target compounds by conducting a forward library search against the EPA/NIST Mass Spectral Library. The identified non-target compounds were flagged by the laboratory with a "J". These compounds should be qualified as (NJ) tentatively identified compounds (TIC) with approximate concentrations.

Sample Quantitation

Sample analyses resulted in several analytes or compounds reported below the laboratory's method reporting limit (MRL) but above their method detection limit (MDL). These results were identified by the laboratory with a "J" flag and should be considered estimated values.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of two (2) field duplicate sets and one (1) field blank (rinsate) sample.

Field Quality Assurance/Quality Control (Cont'd)

To assess the efficiency of field decontamination procedures, one (1) rinsate sample (W-7097-121798-DS-062) was collected and analyzed for VOC and metals parameters. Several TCL VOCs and metals were detected in the rinsate blank, but the associated sample results were either reported as non-detect or were five (5) times the rinsate blanks. No qualification was required. No additional analytes were reported as detected in the rinsate sample.

Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sets. Tables 5 summarize the results of the detected analytes in the field duplicate sets. All data indicate that an adequate level of precision was achieved for the sampling event.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

# TABLE 1

## SAMPLE IDENTIFICATION NUMBERS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

S-7097-121698-DS-058

S-7097-121698-DS-059

S-7097-121698-DS-060

S-7097-121798-DS-061

W-7097-121798-DS-062

S-7097-121798-DS-063

S-7097-121798-DS-064

S-7097-121898-DS-065

S-7097-121898-DS-066

S-7097-121898-DS-067

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC, Appendix IX VOC | SW-846 5035/8260B[1] |
| TCL SVOC, Appendix IX SVOC | SW-846 8270C |
| Polychlorinated biphenyls (PCB) | SW-846 8082 |
| TAL Inorganics, Appendix IX Inorganics | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6020 |
| Copper | SW-846 6020 |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7471A/7470 A |
| Nickel | SW-846 6020 |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Sulfide | SW-846 9030B |
| Tin | SWW-846 6020 |
| Thallium | SW-846 6020 |
| Total Cyanide | SW-846 9010B |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and promulgated updates, November 1986.

## TABLE 3

## HOLDING TIME PERIODS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC, Appendix IX VOC | - 48 hours (soil) from sample collection to extraction<br>- 14 days (soil) from sample extraction to analysis<br>- 14 days (water) from sample collection to completion of analysis |
| TCL SVOC, Appendix IX SVOC, PCB | - 14 days (soil), 7 days (water) from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL and Appendix IX Inorganics - | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Total Cyanide | - 14 days from sample collection to completion of analysis |
| Sulfide | - 7 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO HOLDING TIME PERIOD VIOLATIONS GM TRUCK GROUP SITE PONTIAC, MICHIGAN

| *Analysis* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|
| Sulfide | S-7097-121698-DS-058 | UJ |
| | S-7097-121798-DS-061 | |
| | S-7097-121898-DS-066 | |
| | S-7097-121898-DS-067 | |

[1]The sample parameter results should be qualified as:

UJ -The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is estimated and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample (for non-detected parameters).

# TABLE 5

## SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SETS
## GM TRUCK GROUP SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Investigative Sample* | *Duplicate Sample* | *RPD*[1] |
|---|---|---|---|
| | S-7097-121898-DS-059 | S-7097-121898-DS-060 | |
| TCL Semi-Volatiles | | | |
| 2-Methylnaphthalene | 0.12 J[2] | 0.1J | 0 |
| TAL Metals | | | |
| Aluminum | 5,920 | 6,280 | 5.9 |
| Antimony | 0.1 | 0.2 | 67 |
| Arsenic | 6.6 | 8.0 | 19 |
| Barium | 36 | 38 | 5.4 |
| Beryllium | 0.28 | 0.31 | 10 |
| Cadmium | 0.27 | 0.28 | 3.6 |
| Calcium | 71,600 | 71,700 | 0.14 |
| Chromium | 13 | 12 | 8.0 |
| Cobalt | 6.21 | 7.24 | 15 |
| Copper | 14.2 | 16.1 | 13 |
| Iron | 15,200 | 15,200 | 0 |
| Lead | 6.97 | 9.10 | 27 |
| Magnesium | 24,200 | 21,700 | 11 |
| Manganese | 292 | 314 | 7.3 |
| Nickel | 18.9 | 23.0 | 20 |
| Potassium | 1,200 | 1,200 | 0 |
| Selenium | 0.5 | 0.4 J | 22 |
| Silver | 0.06 | 0.08 | 29 |
| Sodium | 120 | 122 | 1.7 |
| Thallium | 0.38 | 0.54 | 35 |
| Vanadium | 18 | 18 | 0 |
| Zinc | 42 | 45 | 6.9 |

**TABLE 5**

**SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SETS**
**GM TRUCK GROUP SITE**
**PONTIAC, MICHIGAN**

| *Analysis* | *Investigative Sample* | *Duplicate Sample* | *RPD*[1] |
|---|---|---|---|
| | S-7097-121898-DS-059 | S-7097-121898-DS-060 | |
| | S-7097-121898-DS-066 | S-7097-121898-DS-067 | |
| Appendix IX - SVOCs | | | |
| 2-Methylnaphthalene | 0.2 J | 0.2 J | 0 |
| Naphthalene | 0.07 J | 0.07 J | 0 |
| Phenanthrene | 0.1 J | 0.09 J | 11 |
| Appendix IX - Metals | | | |
| Antimony | 0.08 J | 0.09 J | 12 |
| Arsenic | 8.5 | 8.3 | 2.4 |
| Barium | 41 | 40 | 2.5 |
| Beryllium | 0.3 | 0.31 | 3.3 |
| Cadmium | 0.66 | 0.31 | 72 |
| Chromium | 12 | 11 | 8.7 |
| Cobalt | 7.2 | 7.66 | 6.2 |
| Copper | 17.2 | 16.3 | 5.3 |
| Lead | 8.04 | 12.4 | 43 |
| Nickel | 22.2 | 23.3 | 4.8 |
| Selenium | 0.3J | 0.4J | 29 |
| Silver | 0.08 | 0.07 | 13 |
| Thallium | 0.5 | 0.5 | 0 |
| Vanadium | 18 | 17 | 5.7 |
| Zinc | 65 | 65 | 0 |

[1]RPD - Relative Percent Difference
[2]J - The associated numerical value is an estimated quantity.

## D.2 Phase II: Perched Groundwater Investigation

CONESTOGA-ROVERS & ASSOCIATES

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# MEMORANDUM

TO: Scott Green

REF. NO.: 7097

FROM: Mary Cameron/lr/24/Det. MBC

DATE: November 10, 2000

RE: Data Quality Assessment and Validation – Expanded Deliverables
General Motors Truck Production Center (GM TPC)
Pontiac, Michigan

The following details a quality assessment and validation of the analytical data resulting from the August 17, 2000, collection of three (3) groundwater samples from the General Motors Truck Production Center in Pontiac, Michigan. The sample summary detailing sample identification, sample location, quality control samples and analytical parameters is presented in Table 1. Sample analysis was completed at Columbia Analytical Services in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. Samples that violated the TCL SVOC holding time period are detailed in Table 4. The remaining samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

Initial Calibration – Organic Analyses

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for organic analyses required that all compounds meet a method-specific minimum mean relative response factor (RRF) for GC/MS analyses and a maximum

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[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

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Initial Calibration – Organic Analyses (Cont'd)

percent relative standard deviation (RSD) for all organic analyses. The initial calibration data for organic analyses were within the acceptance criteria indicating the instruments were capable of acceptable performance prior to analysis.

Initial Calibration – Inorganic Analyses

The initial calibration criteria for inorganic analysis requires an initial calibration verification standard be analyzed within a method-specific percent recovery of the accepted or true value. The initial calibration data for the inorganic analyses were within the acceptance criteria indicating the instruments were capable of acceptable performance prior or analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for organic analyses required that compounds meet a method-specific minimum RRF (GC/MS analyses only) and maximum percent difference (D) between the initial calibration mean RRF and the continuing calibration RRF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were the same criteria as used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free from detectable concentrations of target analytes, indicating no laboratory-attributable contamination occurred.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses serve as a monitor of the overall performance in all steps of the sample analysis. The sample results that should be qualified due to violation of LCS percent recovery criteria are identified and qualified in Table 5. Several of the samples were previously qualified as estimated (UJ) quantitation limits (extracted on 9/26/2000) due to violation of TCL SVOC holding time criteria. The extent and magnitude of the LCS percent recovery criteria violation overides the previous qualification. Therefore, the TCL SVOC results for the samples extracted on 9/26/2000 should be qualified as rejected (R) and only the TCL SVOC results extracted on 8/24/2000 should be reported. The remaining LCS percent recoveries were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) of the concentrations were determined. The TCL SVOC MS/MSD percent recoveries and associated RPD acceptance criteria were violated, but the associated sample was previously qualified. No further qualification was required. The MS/MSD percent recoveries and associate RPDs acceptance criteria were met for the remaining analyses.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratories digestion and measurement methods. The inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate RPD data were within the acceptance criteria.

Serial Dilution – Inorganic Analyses

The percent difference (D) between serial dilutions of a sample for various matrices were monitored to determine physical or chemical interference. The calcium result reported for sample GW-7097-081700-TJ-003 should be qualified as an estimated (J) value due to violation of serial dilution criteria. The remaining percent D acceptance criteria were met.

Internal Standard Summaries

Overall instrument stability and performance for the VOC and SVOC analyses was monitored using internal standard peak area and retention time (RT) data. Internal standard peak areas of the samples were required to fall within method-specific percent recovery of their respective internal standard areas in the continuing calibration standard. The RT for each internal standard in the samples were required to be within method-specific time intervals of their respective internal standard RT in the continuing calibration standard. The TCL VOC and TCL SVOC internal standard and retention time data were within the acceptance criteria.

Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra (if applicable) were evaluated according to identification criteria established by the methods. The organics reported adhered to the specified identification criteria.

Compound Quantitation

The reported quantitation results and detection limits were checked to ensure results reported were accurate. No discrepancies were found between the raw data and the sample results reported by the laboratory.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of one (1) field duplicate sample set and one (1) trip blank sample.

Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sample set. Table 6 summarizes the results of the detected analytes in the field duplicate sample set. The data indicate that an adequate level of precision was achieved for the sampling event.

To monitor potential cross-contamination of VOC during aqueous sample transportation and storage, a trip blank was submitted to the laboratory for VOC analysis with each shipping cooler. No target analytes were reported as detected in the trip blank sample.

System Performance

System performance between various quality control checks was evaluated to monitor for changes that may have caused the degradation of data quality. No technical problems or chromatographic anomalies were observed which require qualification of the data.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

TABLE 1

SAMPLE SUMMARY
GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
PONTIAC, MICHIGAN

| *Sample Identification* | *Sample Location / Description* | *Matrix* | *QC* | *Parameters* |
|---|---|---|---|---|
| GW-7097-081700-TJ-001 | MW-3-1 | Water | | VOC, SVOC, Inorganics, Pesticides, PCB |
| GW-7097-081700-TJ-002 | MW-3-1 | Water | Duplicate of 001 | VOC, SVOC, Inorganics, Pesticides, PCB |
| GW-7097-081700-TJ-003 | MW-31-2 | Water | | VOC, SVOC, Inorganics, Pesticides, PCB |

*Notes:*

VOC - Target Compound List (TCL) Volatile Organic Compounds (VOC).

SVOC - TCL Semi-Volatile Organic Compounds (SVOC).

Inorganics - Target Analyte List (TAL) Inorganics, Dissolved and Total

PCB - Polychlorinated biphynels.

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC | SW-846 8260B [1] |
| TCL SVOC | SW-846 8270C |
| PCB | SW-846 8082 |
| TAL Inorganics, Total and Dissolved | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6010B |
| Copper | SW-846 6010B |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7470A |
| Nickel | SW-846 6010B |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Thallium | SW-846 6020 |
| Total Cyanide | EPA-WW 335.2[2] |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and Promulgated updates, November 1986

[2] EPA-WW - "Methods for Chemical Analysis of Water and Waste," EPA-600/4-79-020, revised March 1983.

## TABLE 3

## HOLDING TIME PERIODS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC | - 14 days from sample collection to completion of analysis |
| TCL SVOC, TCL Pesticides, PCB | - 7 days from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL Inorganics- | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Cyanide | - 14 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA
## DUE TO HOLDING TIME PERIOD VIOLATIONS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|
| TCL SVOC | GW-7097-081700-TJ-001 (9/26/2000)[2] | UJ |
| | GW-7097-081700-TJ-002 (9/26/2000) | UJ |
| | GW-7097-081700-TJ-003 (9/26/2000) | UJ |

[1]The sample parameter results should be qualified as:

UJ -The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is estimated and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample (for non-detected parameters).

[2] Date of extraction

## TABLE 5

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO LABORATORY CONTROL SAMPLE PERCENT RECOVERY VIOLATION GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameters* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|---|
| TCL SVOC | Phenol, | GW-7097-081700-TJ-001 (8/24/2000) [2] | R |
| | 2-Chlorophenol, | GW-7097-081700-TJ-002 (8/24/2000) | R |
| | Benzoic Acid, | GW-7097-081700-TJ-003 (8/24/2000) | R |
| | Hexachlorocyclopentadiene | | R |
| TCL SVOC | TCL SVOC | GW-7097-081700-TJ-001 (9/26/2000) | R |
| | | GW-7097-081700-TJ-002 (9/26/2000) | R |
| | | GW-7097-081700-TJ-003 (9/26/2000) | R |

[1]The analysis parameters results should be qualified for the listed samples as:

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

[2] Date of extraction.

## TABLE 6

## SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SETS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Investigative Sample* | *Duplicate Sample* | *RPD* [1] |
|---|---|---|---|
| | GW-7097-081700-TJ-001 | GW-7097-081700-TJ-002 | |
| TAL Inorganics - Total (µg/L) | | | |
| Aluminum | 116 | ND (50.0)[2] | NC[3] |
| Antimony | 0.25 | ND (0.25) | NC |
| Arsenic | 24.2 | 25.8 | 6.4 |
| Barium | 429 | 434 | 1.2 |
| Calcium | 323,000 | 327,000 | 1.2 |
| Iron | 11,100 | 11,300 | 1.8 |
| Lead | 0.75 | 0.56 | 29 |
| Magnesium | 95,400 | 95,000 | 0.42 |
| Manganese | 1,360 | 1,330 | 2.2 |
| Nickel | 224 | 228 | 1.8 |
| Potassium | 9,200 | 9,290 | 0.97 |
| Selenium | 23.3 | 27.4 | 16 |
| Silver | 0.36 | ND (0.25) | NC |
| Sodium | 790,000 | 810,000 | 2.5 |
| TAL Inorganics - Dissolved (µg/L) | | | |
| Antimony | 0.39 | 1.2 | 100 |
| Arsenic | 25.9 | 25.8 | 0.39 |
| Barium | 455 | 444 | 2.4 |
| Calcium | 335,000 | 310,000 | 7.8 |
| Iron | 11,800 | 11,000 | 7.0 |
| Lead | 0.32 | 0.37 | 14 |
| Magnesium | 98,100 | 90,300 | 8.3 |
| Manganese | 1,400 | 1,370 | 2.2 |
| Nickel | 244 | 196 | 22 |
| Potassium | 9,430 | 10,100 | 6.9 |
| Selenium | 29.4 | 29.7 | 1.0 |
| Sodium | 835,000 | 775,000 | 7.5 |
| Zinc | ND (10.0) | 10.4 | NC |

Notes:

[1] RPD - Relative Percent Difference

[2] ND( ) - Not detected at the quantitation limit stated in parentheses.

[3] NC - Not calculable.

# APPENDIX E

# MDEQ GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

(June 6, 2000)

# ATTACHMENT A

## GROUNDWATER: RESIDENTIAL AND INDUSTRIAL-COMMERCIAL

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



**Developed under the authority of the**
**NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED**

Groundwater criteria were calculated using currently available chemical-specific data and U.S. Environmental Protection Agency risk assessment guidance. Criteria may change for the next annual revision of the criteria tables. All criteria are expressed in units of parts per billion (ppb;ug/L). Scientific notation is represented by E+ or E- a value; for example, 2 x $10^6$ is reported as 2.0E+6. For comparison to the criteria, groundwater samples should be representative of the water moving through the aquifer in the contaminant plume. Samples should be collected using a low flow protocol that minimizes turbidity caused by disturbances from sampling and, in most cases, total analyses of the samples should be conducted (see Op Memos #18 for details). Please refer to Op Memo #6 for recommended analytical methods and target detection limits.

| Guidesheet Number → | | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Chemical Abstract Service Number | Residential & Commercial I Drinking Water Criteria | Industrial & Commercial II, III & IV Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential & Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria | Industrial & Commercial II, III & IV Groundwater Volatilization to Indoor Air Inhalation Criteria | Groundwater Contact Criteria | Water Solubility | Flammability and Explosivity Screening Level | Acute Inhalation Screening Level |
| **PHYSICAL PARAMETERS** | | | | | | | | | | |
| Dissolved oxygen (DO) | | NA | NA | {AE} | NA | NA | NA | NA | NA | NA |
| Phosphorus | | NA | NA | {AE} | NA | NA | NA | NA | NA | NA |
| Total dissolved solids (TDS) | | 5.0E+5 {E} | 5.0E+5 {E} | {AE} | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | | |
| **HAZARDOUS SUBSTANCES** | | | | | | | | | | |
| Acenaphthene | 83329 | 1,300 | 3,800 | 19 | 4,200 {S} | 4,200 {S} | 4,200 {S} | 4,240 | ID | ID |
| Acenaphthylene | 208968 | 52 | 150 | ID | 3,900 {S} | 3,900 {S} | 3,900 {S} | 3,930 | ID | ID |
| Acetaldehyde {I} | 75070 | 950 | 2,700 | NA | 1.1E+6 | 2.3E+6 | 4.2E+7 | 1.0E+9 | 4.4E+6 | 2.6E+7 |
| Acetic acid | 64197 | 18,000 {M} | 18,000 {M} | 18,000 {M} | NLV | NLV | 1.8E+8 | 6.0E+9 | 4.8E+9 | 1.0E+9 {D} |
| Acetone {I} | 67641 | 730 | 2,100 | 1,700 | 1.0E+9 {D,S} | 1.0E+9 {D,S} | 3.1E+7 | 1.0E+9 | 7.5E+6 | 1.0E+9 {D} |
| Acetonitrile | 75058 | 140 | 400 | NA | 2.4E+7 | 4.5E+7 | 5.6E+6 | 2.00E+8 | 1.0E+7 | 2.0E+8 |
| Acetophenone | 98862 | 1,500 | 4,400 | NA | 6.1E+6 {S} | 6.1E+6 {S} | 6.1E+6 {S} | 6.1E+6 | ID | ID |
| Acrolein {I} | 107028 | 120 | 330 | NA | 2,100 | 4,200 | 3.4E+6 | 2.10E+8 | 3.3E+6 | 3.4E+5 |
| Acrylamide | 79061 | 0.3 | 1.2 | NA | NLV | NLV | 13,000 | 2.20E+9 | NA | ID |
| Acrylic acid | 79107 | 3,900 | 11,000 | NA | 1.2E+7 | 2.8E+7 | 7.6E+7 | 1.00E+9 | 1.0E+9 {D} | ID |
| Acrylonitrile {I} | 107131 | 2.6 | 11 | 4.9 {X} | 34,000 | 1.9E+5 | 14,000 | 7.50E+7 | 3.2E+6 | ID |
| Alachlor | 15972608 | 2.0 {A} | 2.0 {A} | 11 {X} | NLV | NLV | 1,700 | 1.83E+5 | ID | ID |
| Aldicarb | 116063 | 3.0 {A} | 3.0 {A} | NA | NLV | NLV | 1.2E+5 | 6.00E+6 | ID | ID |
| Aldicarb sulfoxide | 1646873 | 4.0 {A} | 4.0 {A} | NA | NLV | NLV | 2.7E+6 | 2.80E+7 | ID | ID |
| Aldicarb sulfone | 1646884 | 2.0 {A} | 2.0 {A} | NA | NLV | NLV | 2.1E+6 | 7.80E+6 | ID | ID |
| Aldrin | 309002 | 0.098 | 0.4 | NA | 180 {S} | 180 {S} | 0.34 {AA} | 180 | ID | ID |
| Aluminum {B} | 7429905 | [illegible]0 {V} | 50 {V} | NA | NLV | NLV | 6.4E+7 | NA | ID | ID |
| Ammonia | 7664417 | 10,000 {N} | 10,000 {N} | {AC} | 3.2E+6 | 7.2E+6 | ID | 5.30E+8 | ID | 3.5E+6 |

# ATTACHMENT A
## GROUNDWATER: RESIDENTIAL AND INDUSTRIAL-COMMERCIAL
### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| Guidesheet Number → | | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Chemical Abstract Service Number | Residential & Commercial I Drinking Water Criteria | Industrial & Commercial II, III & IV Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential & Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria | Industrial & Commercial II, III & IV Groundwater Volatilization to Indoor Air Inhalation Criteria | Groundwater Contact Criteria | Water Solubility | Flammability and Explosivity Screening Level | Acute Inhalation Screening Level |
| Aniline | 62533 | 53 | 220 | 20 {M} | NLV | NLV | 1.4E+5 | 3.60E+7 | NA | ID |
| Anthracene | 120127 | 43 {S} | 43 {S} | ID | 43 {S} | 43 {S} | 43 {S} | 43.4 | ID | ID |
| Antimony | 7440360 | [illegible] {A} | 6.0 {A} | ID | NLV | NLV | 68,000 | NA | ID | ID |
| Arsenic {B} | 7440382 | [illegible] {A} | 50 {A} | 150 {X} | NLV | NLV | 4,300 | NA | ID | ID |
| Asbestos {AB} | 1332214 | 7.0E+6 f/mL {A} | 7.0E+6 f/mL {A} | NA | NLV | NLV | ID | NA | NA | ID |
| Atrazine | 1912249 | 3.0 {A} | 3.0 {A} | 7.3 {X} | NLV | NLV | 5,400 | 70,000 | ID | ID |
| Azobenzene | 103333 | 23 | 94 | NA | 6,400 {S} | 6,400 {S} | 1,600 | 6,400 | ID | ID |
| Barium | 7440393 | [illegible] {A} | 2,000 {A} | {G,X} | NLV | NLV | 1.4E+7 | NA | ID | ID |
| Benzene {I} | 71432 | [illegible] {A} | 5.0 {A} | 200 {X} | 5,600 | 36,000 | 11,000 | 1.75E+6 | 34,000 | 67,000 |
| Benzidine | 92875 | 0.3 {M} | 0.3 {M} | ID | NLV | NLV | 7.1 | 5.20E+5 | ID | ID |
| Benzo(a)anthracene {Q} | 56553 | 2.1 | 8.5 | NA | NLV | NLV | 9.4 {S,AA} | 9.4 | ID | ID |
| Benzo(b)fluoranthene {Q} | 205992 | 2.0 {M} | 2.0 {M} | ID | NLV | NLV | 2.0 {M,AA} | 1.5 | ID | ID |
| Benzo(k)fluoranthene {Q} | 207089 | 5.0 {M} | 5.0 {M} | NA | NLV | NLV | 5.0 {M,AA} | 0.8 | ID | ID |
| Benzo(g,h,i)perylene | 191242 | 5.0 {M} | 5.0 {M} | NA | NLV | NLV | 5.0 {M,AA} | 0.26 | ID | ID |
| Benzo(a)pyrene {Q} | 50328 | 5.0 {A,M} | 5.0 {A,M} | ID | NLV | NLV | 5.0 {M,AA} | 1.62 | ID | ID |
| Benzoic acid | 65850 | 32,000 | 92,000 | NA | NLV | NLV | 3.5E+6 {S} | 3.50E+6 | ID | ID |
| Benzyl alcohol | 100516 | 10,000 | 29,000 | NA | NLV | NLV | 4.4E+7 {S} | 4.40E+7 | ID | ID |
| Benzyl chloride | 100447 | 7.7 | 32 | NA | 12,000 | 77,000 | 3,600 | 4.90E+5 | NA | ID |
| Beryllium | 7440417 | 4.0 {A} | 4.0 {A} | {G} | NLV | NLV | 2.9E+5 | NA | ID | ID |
| bis(2-Chloroethoxy)ethane | 112265 | ID | ID | NA | NLV | NLV | ID | 1.89E+7 | ID | ID |
| bis(2-Chloroethyl)ether {I} | 111444 | 2.0 | 8.3 | NA | 38,000 | 2.1E+5 | 5,700 | 1.72E+7 | 1.7E+7 {S} | 1.7E+7 {S} |
| bis(2-Ethylhexyl)phthalate | 117817 | 6.0 {A} | 6.0 {A} | 32 | NLV | NLV | 320 {AA} | 340 | NA | 340 {S} |
| Boron {B} | 7440428 | 500 {F} | 500 {F} | 1,900 | NLV | NLV | 6.2E+7 | NA | ID | ID |
| Bromobenzene {I} | 108861 | 18 | 50 | NA | 1.8E+5 | 3.9E+5 | 12,000 | 4.13E+5 | ID | ID |
| Bromodichloromethane | 75274 | 100 {A,W} | 100 {A,W} | ID | 4,800 | 38,000 | 14,000 | 6.74E+6 | ID | ID |
| Bromoform | 75252 | 100 {A,W} | 100 {A,W} | ID | 4.8E+5 | 3.1E+6 {S} | 1.4E+5 | 3.10E+6 | ID | ID |
| Bromomethane | 74839 | 10 | 29 | 35 | 4,000 | 9,000 | 70,000 | 1.45E+7 | ID | ID |

# ATTACHMENT A
## GROUNDWATER: RESIDENTIAL AND INDUSTRIAL-COMMERCIAL
### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| Guidesheet Number → | | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|---|
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| n-Butanol {I} | 71363 | 950 | 2,700 | NA | NLV | NLV | 8.8E+6 | 7.40E+7 | 2.4E+7 | 7.4E+7 {S} |
| 2-Butanone (MEK) {I} | 78933 | 13,000 | 38,000 | 2,200 | 2.4E+8 {S} | 2.4E+8 {S} | 2.4E+8 {S} | 2.40E+8 | ID | 2.4E+8 {S} |
| n-Butyl acetate | 123864 | 550 | 1,600 | NA | 6.7E+6 {S} | 6.7E+6 {S} | 1.8E+6 | 6.70E+6 | 1.2E+6 | 6.7E+6 {S} |
| t-Butyl alcohol | 75650 | 3,900 | 11,000 | NA | 1.0E+9 {D,S} | 1.0E+9 {D,S} | 7.9E+7 | 1.0E+9 | 3.0E+7 | ID |
| Butyl benzyl phthalate | 85687 | 1,200 | 2,700 {S} | 14 {X} | NLV | NLV | 2,700 {S} | 2,690 | ID | ID |
| n-Butylbenzene | 104518 | 80 | 230 | NA | ID | ID | 5,900 | NA | ID | ID |
| sec-Butylbenzene | 135988 | 80 | 230 | NA | ID | ID | 4,400 | NA | ID | ID |
| tert-Butylbenzene {I} | 98066 | 80 | 230 | NA | ID | ID | 8,900 | NA | ID | ID |
| Cadmium {B} | 7440439 | 5.0 {A} | 5.0 {A} | {G,X} | NLV | NLV | 1.9E+5 | NA | ID | ID |
| Camphene {I} | 79925 | ID | ID | NA | ID | ID | ID | 33,400 | ID | ID |
| Caprolactam | 105602 | 5,800 | 17,000 | NA | NLV | NLV | 3.9E+8 | 5.25E+9 | NA | 1.0E+9 {D} |
| Carbaryl | 63252 | 700 | 2,000 | NA | ID | ID | 1.3E+5 {S} | 1.26E+5 | ID | ID |
| Carbazole | 86748 | 85 | 350 | 10 {M} | NLV | NLV | 7,400 | 7,480 | ID | ID |
| Carbofuran | 1563662 | 40 {A} | 40 {A} | NA | NLV | NLV | 3.4E+5 | 7.00E+5 | ID | ID |
| Carbon disulfide {I,R} | 75150 | 800 | 2,300 | ID | 2.5E+5 | 5.5E+5 | 1.2E+6 {S} | 1.19E+6 | 6,500 | ID |
| Carbon tetrachloride | 56235 | 5.0 {A} | 5.0 {A} | 45 {X} | 370 | 2,400 | 4,600 | 7.93E+5 | ID | 96,000 |
| Chlordane {J} | 57749 | 2.0 {A} | 2.0 {A} | IP | 56 {S} | 56 {S} | 15 {AA} | 56 | ID | ID |
| Chloride | 16887006 | 2.5E+5 {E} | 2.5E+5 {E} | 1.25E+5 {X} | NLV | NLV | ID | NA | ID | ID |
| Chlorobenzene {I} | 108907 | 100 {A} | 100 {A} | 47 | 2.1E+5 | 4.7E+5 {S} | 86,000 | 4.72E+5 | 79,000 | ID |
| 1-Chloro-1,1-difluoroethane | 75683 | 15,000 | 44,000 | NA | 3.9E+6 {S} | 3.9E+6 {S} | 3.9E+6 {S} | 3.9E+06 | ID | ID |
| Chloroethane | 75003 | 430 | 1,700 | ID | 5.7E+6 {S} | 5.7E+6 {S} | 4.4E+5 | 5.74E+6 | 56,000 | ID |
| 2-Chloroethyl vinyl ether | 110758 | ID | ID | NA | ID | ID | ID | 1.50E+7 | ID | ID |
| Chloroform | 67663 | 100 {A,W} | 100 {A,W} | 170 {X} | 28,000 | 1.8E+5 | 1.5E+5 | 7.92E+6 | ID | ID |
| Chloromethane {I} | 74873 | 260 | 1,100 | ID | 8,600 | 52,000 | 4.9E+5 | 6.34E+6 | 18,000 | 2.1E+5 |
| 4-Chloro-3-methylphenol | 59507 | 150 | 420 | NA | NLV | NLV | 79,000 | 3.90E+6 | ID | ID |
| beta-Chloronaphthalene | 91587 | 1,800 | 5,200 | NA | ID | ID | 6,700 {S} | 6,740 | ID | ID |
| 2-Chlorophenol | 95578 | 45 | 130 | 22 | ID | ID | 94,000 | 2.20E+7 | ID | ID |
| o-Chlorotoluene {I} | 95498 | 150 | 420 | NA | 3.7E+5 {S} | 3.7E+5 {S} | 44,000 | 3.73E+5 | ID | ID |
| Chlorpyrifos | 2921882 | 22 | 63 | NA | 2.9 | 6.6 | 1,100 {S} | 1,120 | ID | ID |

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| Chromium (III) {B,H} | 16065831 | 100 {A} | 100 {A} | {G,X} | NLV | NLV | 2.9E+8 | NA | ID | ID |
| Chromium (VI) | 18540299 | 100 {A} | 100 {A} | 11 | NLV | NLV | 4.6E+5 | NA | ID | ID |
| Chrysene {Q} | 218019 | 5.0 {M} | 5.0 {M} | ID | ID | ID | 5.0 {M,AA} | 1.6 | ID | ID |
| Cobalt | 7440484 | 40 | 100 | 100 | NLV | NLV | 2.4E+6 | NA | ID | ID |
| Copper | 7440508 | 1,000 {E} | 1,000 {E} | {G} | NLV | NLV | 7.4E+6 | NA | ID | ID |
| Cyanazine | 21725462 | 10 {M} | 10 {M} | 56 {X} | NLV | NLV | 2,800 | 1.70E+5 | ID | ID |
| Cyanide {R} | 57125 | 200 {A} | 200 {A} | 20 {M} | NLV | NLV | 57,000 | NA | ID | ID |
| Cyclohexanone | 108941 | 33,000 | 94,000 | NA | 1,400 | 3,300 | 2.3E+7 {S} | 2.30E+7 | NA | ID |
| Dacthal | 1861321 | 73 | 210 | NA | NLV | NLV | 500 {S} | 500 | ID | ID |
| Dalapon | 75990 | 200 {A} | 200 {A} | NA | NLV | NLV | 1.2E+7 | 5.02E+8 | ID | ID |
| 4-4'-DDD | 72548 | 9.1 | 37 | NA | NLV | NLV | 44 {AA} | 90 | ID | ID |
| 4-4'-DDE | 72559 | 4.3 | 15 | NA | ID | ID | 27 {AA} | 120 | ID | ID |
| 4-4'-DDT | 50293 | 3.6 | 10 | 0.02 {M} | NLV | NLV | 13 {AA} | 25 | NA | ID |
| Decabromodiphenyl ether | 1163195 | 30 {S} | 30 {S} | NA | 30 {S} | 30 {S} | 30 {S} | 30 | ID | ID |
| Di-n-butyl phthalate | 84742 | 880 | 2,500 | 9.7 | NLV | NLV | 11,000 {S} | 11,200 | NA | ID |
| Di(2-ethylhexyl) adipate | 103231 | 400 {A} | 400 {A} | NA | NLV | NLV | 470 {S} | 471 | ID | ID |
| Di-n-octyl phthalate | 117840 | 130 | 380 | ID | NLV | NLV | 400 | 3,000 | ID | ID |
| Diacetone alcohol {I} | 123422 | ID | ID | NA | NLV | NLV | ID | 1.0E+9 | 1.0E+9 {D} | ID |
| Diazinon | 333415 | 1.3 | 3.8 | NA | NLV | NLV | 1,300 | 68,800 | NA | ID |
| Dibenzo(a,h)anthracene {Q} | 53703 | 5.0 {M} | 5.0 {M} | ID | NLV | NLV | 5.0 {M,AA} | 2.49 | ID | ID |
| Dibenzofuran | 132649 | ID | ID | 4.0 | ID | ID | ID | 10,000 | ID | ID |
| Dibromochloromethane | 124481 | 100 {A,W} | 100 {A,W} | ID | 15,000 | 1.1E+5 | 18,000 | 2.60E+6 | ID | ID |
| Dibromochloropropane | 96128 | 0.2 {A} | 0.2 {A} | NA | 1,200 {S} | 1,200 {S} | 390 | 1,230 | ID | ID |
| Dibromomethane | 74953 | 80 | 230 | NA | ID | ID | 5.3E+5 | 1.10E+7 | ID | ID |
| 1,2-Dichlorobenzene | 95501 | 600 {A} | 600 {A} | 16 | 1.6E+5 {S} | 1.6E+5 {S} | 1.6E+5 {S} | 1.56E+5 | NA | 1.6E+5 {S} |
| 1,3-Dichlorobenzene | 541731 | 6.6 | 19 | 38 | ID | ID | 2,000 | 1.11E+5 | ID | ID |
| 1,4-Dichlorobenzene | 106467 | 75 {A} | 75 {A} | 13 | 16,000 | 74,000 {S} | 6,400 | 73,800 | NA | ID |
| 3,3'-Dichlorobenzidine | 91941 | 1.1 | 4.3 | 0.3 {M,X} | NLV | NLV | 180 | 3,110 | ID | ID |
| Dichlorodifluoromethane | 75718 | 1,700 | 4,800 | ID | 2.2E+5 | 3.0E+5 {S} | 3.0E+5 {S} | 3.00E+5 | ID | ID |

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| 1,1-Dichloroethane | 75343 | 880 | 2,500 | ID | 1.0E+6 | 2.3E+6 | 2.4E+6 | 5.06E+6 | 1.9E+5 | ID |
| 1,2-Dichloroethane {I} | 107062 | 5.0 {A} | 5.0 {A} | 360 {X} | 9,600 | 59,000 | 19,000 | 8.52E+6 | 1.3E+6 | ID |
| 1,1-Dichloroethylene {I} | 75354 | 7.0 {A} | 7.0 {A} | 65 {X} | 200 | 1,300 | 11,000 | 2.25E+6 | 48,000 | 1.4E+5 |
| cis-1,2-Dichloroethylene | 156592 | [illegible] {A} | 70 {A} | ID | 96,000 | 2.2E+5 | 2.0E+5 | 3.50E+6 | 2.7E+5 | ID |
| trans-1,2-Dichloroethylene | 156605 | 100 {A} | 100 {A} | ID | 85,000 | 2.0E+5 | 2.2E+5 | 6.30E+6 | 1.2E+5 | ID |
| 2,6-Dichloro-4-nitroaniline | 99309 | 2,200 | 6,300 | NA | NLV | NLV | 7,000 {S} | 7,000 | ID | ID |
| 2,4-Dichlorophenol | 120832 | 73 | 210 | 19 | NLV | NLV | 48,000 | 4.50E+6 | ID | ID |
| 2,4-Dichlorophenoxyacetic acid | 94757 | 70 {A} | 70 {A} | 220 | NLV | NLV | 1.2E+5 | 6.80E+5 | ID | ID |
| 1,2-Dichloropropane {I} | 78875 | 5.0 {A} | 5.0 {A} | 290 {X} | 16,000 | 36,000 | 16,000 | 2.80E+6 | 2.7E+5 | 2.8E+6 {S} |
| 1,3-Dichloropropene | 542756 | 21 | 63 | NA | 2.0 | 13 | 13,000 | 2.80E+6 | 66,000 | ID |
| Dichlorovos | 62737 | 1.6 | 6.7 | NA | NLV | NLV | 5,900 | 1.60E+7 | NA | ID |
| Dicyclohexyl phthalate | 84617 | ID | ID | NA | ID | ID | ID | 4,000 | ID | ID |
| Dieldrin | 60571 | 0.11 | 0.43 | 0.02 {M} | 200 {S} | 200 {S} | 2.4 {AA} | 195 | ID | ID |
| Diethyl ether | 60297 | 10 {E,M} | 10 {E,M} | ID | 6.1E+7 {S} | 6.1E+7 {S} | 3.5E+7 | 6.10E+7 | 3.2E+5 | 6.1E+7 {S} |
| Diethyl phthalate | 84662 | 5,500 | 16,000 | NA | NLV | NLV | 1.1E+6 {S} | 1.08E+6 | NA | ID |
| Diethylene glycol monobutyl ether | 112345 | 88 | 250 | NA | NLV | NLV | 4.0E+6 | 1.0E+9 | ID | ID |
| Diisopropyl ether | 108203 | 30 | 86 | NA | ID | ID | 8,000 {S} | 8,041 | ID | ID |
| Diisopropylamine {I} | 108189 | 5.6 | 16 | NA | ID | ID | 21,000 | 3.69E+7 | 2.3E+6 | ID |
| Dimethyl phthalate | 131113 | 73,000 | 2.1E+5 | NA | NLV | NLV | 4.2E+6 {S} | 4.19E+6 | NA | ID |
| N,N-Dimethylacetamide | 127195 | 180 | 520 | 4,100 {X} | NLV | NLV | 2.3E+7 | 1.0E+9 | NA | ID |
| N,N-Dimethylaniline | 121697 | 16 | 46 | NA | 2.4E+5 | 1.3E+6 {S} | 20,000 | 1.27E+6 | NA | 1.3E+6 {S} |
| Dimethylformamide {I} | 68122 | 700 | 2,000 | NA | NLV | NLV | 1.1E+8 | 1.0E+9 | ID | ID |
| 2,4-Dimethylphenol | 105679 | 370 | 1,000 | 380 | NLV | NLV | 5.2E+5 | 7.87E+6 | ID | ID |
| 2,6-Dimethylphenol | 576261 | 4.4 | 13 | NA | NLV | NLV | 6,300 | 6.14E+6 | ID | ID |
| 3,4-Dimethylphenol | 95658 | 10 | 29 | NA | NLV | NLV | 18,000 | 4.93E+6 | ID | ID |
| Dimethylsulfoxide | 67685 | 2.2E+5 | 6.3E+5 | 1.9E+5 | NLV | NLV | 1.7E+8 {S} | 1.66E+8 | ID | ID |
| 2,4-Dinitrotoluene | 121142 | 7.7 | 32 | NA | NLV | NLV | 8,600 | 2.70E+5 | ID | ID |
| Dinoseb | 88857 | 7.0 {A} | 7.0 {A} | NA | ID | ID | 7,000 | 52,000 | ID | ID |
| 1,4-Dioxane {I} | 123911 | 85 | 350 | 2,800 {X} | NLV | NLV | 1.7E+6 | 9.00E+8 | 7.2E+7 | ID |
| Diquat | 85007 | 20 {A} | 20 {A} | NA | NLV | NLV | 7.0E+5 {S} | 7.00E+5 | ID | ID |
| Diuron | 330541 | 31 | 90 | NA | NLV | NLV | 37,000 {S} | 37,300 | ID | ID |
| Endosulfan {J} | 115297 | 1.7 | 4.8 | NA | ID | ID | 510 {S} | 510 | ID | ID |

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| Endothall | 145733 | 100 {A} | 100 {A} | NA | NLV | NLV | 2.5E+7 {AA} | 1.00E+8 | ID | ID |
| Endrin | 72208 | 2.0 {A} | 2.0 {A} | IP | NLV | NLV | 160 {AA} | 250 | ID | ID |
| Epichlorohydrin {I} | 106898 | 5.0 {M} | 6.0 | NA | 3.2E+5 | 6.3E+5 | 11,000 | 6.60E+7 | 2.3E+7 | ID |
| Ethanol {I} | 64175 | 1.9E+6 | 3.8E+6 | IP | NLV | NLV | 1.0E+9 {D} | 1.0E+9 | 4.8E+7 | ID |
| Ethyl acetate {I} | 141786 | 6,600 | 19,000 | NA | 6.4E+7 {S} | 6.4E+7 {S} | 6.4E+7 {S} | 6.40E+7 | 2.1E+6 | ID |
| Ethylbenzene {I} | 100414 | 74 {E} | 74 {E} | 18 | 1.7E+5 {S} | 1.7E+5 {S} | 1.7E+5 {S} | 1.69E+5 | 22,000 | 1.7E+5 {S} |
| Ethylene dibromide | 106934 | 1.0 {A,M} | 1.0 {A,M} | 1.0 {M} | 2,400 | 15,000 | 25 | 4.20E+6 | ID | ID |
| Ethylene glycol | 107211 | 15,000 | 42,000 | 1.9E+5 {X} | NLV | NLV | 1.0E+9 {D,S} | 1.0E+9 | NA | 1.0E+9 {D} |
| Ethylene glycol monobutyl ether | 111762 | 3,700 | 10,000 | NA | 2.9E+6 | 6.5E+6 | 5.3E+7 | 2.24E+8 | NA | ID |
| Fluoranthene | 206440 | 210 {S} | 210 {S} | 1.6 | 210 {S} | 210 {S} | 210 {S} | 206 | ID | ID |
| Fluorene | 86737 | 880 | 2,000 {S} | 12 | 2,000 {S} | 2,000 {S} | 2,000 {S} | 1,980 | ID | ID |
| Fluorine (soluble fluoride) {B} | 7782414 | 2,000 {E} | 2,000 {E} | NA | NLV | NLV | 1.2E+7 | NA | ID | ID |
| Formaldehyde | 50000 | 1,300 | 3,800 | 120 | 63,000 | 3.6E+5 | 3.0E+7 | 5.50E+8 | ID | 61,000 |
| Formic acid {I,U} | 64186 | 18,000 {M} | 29,000 | ID | 7.7E+6 | 1.5E+7 | 6.0E+8 | 1.0E+9 | 6.6E+8 | 3.5E+8 |
| 1-Formylpiperidine | 2591868 | 80 | 230 | NA | ID | ID | ID | NA | ID | ID |
| Gentian violet | 548629 | 15 | 63 | NA | NLV | NLV | 1.0E+6 {S} | 1.00E+6 | ID | ID |
| Glyphosate | 1071836 | 700 {A} | 700 {A} | NA | NLV | NLV | 1.2E+7 {S,AA} | 1.16E+7 | ID | ID |
| Heptachlor | 76448 | 0.4 {A} | 0.4 {A} | NA | 180 {S} | 180 {S} | 2.9 {AA} | 180 | ID | ID |
| Heptachlor epoxide | 1024573 | 0.2 {A} | 0.2 {A} | NA | NLV | NLV | 9.0 {AA} | 200 | ID | ID |
| n-Heptane | 142825 | 2,700 {S} | 2,700 {S} | NA | 2,700 {S} | 2,700 {S} | 2,700 {S} | 2,690 | 100 | 2,700 {S} |
| Hexabromobenzene | 87821 | 10 {M} | 10 {M} | ID | ID | ID | 10 {M} | 0.17 | ID | ID |
| Hexachlorobenzene (C-66) | 118741 | 1.0 {A} | 1.0 {A} | ID | 440 | 3,000 | 4.6 | 6,200 | ID | ID |
| Hexachlorobutadiene (C-46) | 87683 | 15 | 42 | 0.053 | 1,600 | 3,200 {S} | 400 | 3,230 | ID | ID |
| alpha-Hexachlorocyclohexane | 319846 | 0.43 | 1.7 | NA | 2,000 {S} | 2,000 {S} | 60 | 2,000 | ID | ID |
| beta-Hexachlorocyclohexane | 319857 | 0.88 | 3.6 | NA | NLV | NLV | 120 | 240 | ID | ID |
| Hexachlorocyclopentadiene (C-56) | 77474 | 50 {A} | 50 {A} | ID | ID | ID | 1,800 {S} | 1,800 | ID | ID |
| Hexachloroethane | 67721 | 7.3 | 21 | 6.7 {X} | 27,000 | 50,000 {S} | 1,900 | 50,000 | ID | ID |
| n-Hexane | 110543 | 3,000 | 8,600 | NA | 12,000 {S} | 12,000 {S} | 12,000 {S} | 12,000 | 12,000 {S} | ID |
| 2-Hexanone | 591786 | 1,000 | 2,900 | NA | 4.2E+6 | 8.8E+6 | 5.2E+6 | 1.60E+7 | ID | ID |
| Indeno(1,2,3-cd)pyrene {Q} | 193395 | 5.0 {M} | 5.0 {M} | ID | NLV | NLV | 5.0 {M,AA} | 0.022 | ID | ID |
| Iron {B} | 7439896 | [illegible] {E} | 300 {E} | NA | NLV | NLV | 5.8E+7 | NA | ID | ID |
| Isobutyl alcohol {I} | 78831 | 2,300 | 6,700 | NA | 7.6E+7 {S} | 7.6E+7 {S} | 2.5E+7 | 7.60E+7 | ID | ID |

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| Isophorone | 78591 | 770 | 3,100 | 570 {X} | NLV | NLV | 9.9E+5 | 1.20E+7 | NA | 1.2E+7 {S} |
| Isopropyl alcohol {I} | 67630 | 470 | 1,300 | NA | NLV | NLV | 1.3E+7 | 1.0E+9 | 3.0E+7 | 1.0E+9 {D} |
| Isopropyl benzene | 98828 | 800 | 2,300 | ID | 56,000 {S} | 56,000 {S} | 56,000 {S} | 56,000 | 15,000 | ID |
| Lead | 7439921 | [illegible]0 {L} | 4.0 {L} | {G,X} | NLV | NLV | ID | NA | ID | ID |
| Lindane | 58899 | 0.2 {A} | 0.2 {A} | 0.027 | ID | ID | 190 | 6,800 | ID | ID |
| Lithium {B} | 7439932 | 170 | 350 | 25 | NLV | NLV | 5.4E+6 | NA | ID | ID |
| Magnesium {B} | 7439954 | [illegible]E+5 | 1.1E+6 | NA | NLV | NLV | 1.0E+9 {D} | NA | ID | ID |
| Manganese {B} | 7439965 | [illegible] {E} | 50 {E} | {G,X} | NLV | NLV | 9.1E+6 | NA | ID | ID |
| Mercury (Inorganic) | 7439976 | 2.0 {A} | 2.0 {A} | 1.3E-3 {Z} | NLV | NLV | 56 {S} | 56 | ID | ID |
| Methane | 74828 | ID | ID | ID | {K} | {K} | ID | NA | {K} | ID |
| Methanol | 67561 | 3,700 | 10,000 | 480 | 2.5E+6 | 6.0E+6 | 2.9E+7 {S} | 2.90E+7 | 2.3E+6 | 2.9E+7 {S} |
| Methoxychlor | 72435 | 40 {A} | 40 {A} | NA | ID | ID | 45 {S} | 45 | ID | ID |
| 2-Methoxyethanol {I} | 109864 | 7.3 | 21 | NA | NLV | NLV | 8.3E+5 | 1.0E+9 | ID | ID |
| 2-Methyl-4-chlorophenoxyacetic acid | 94746 | 7.3 | 21 | NA | NLV | NLV | 9,200 | 9.24E+5 | ID | ID |
| 2-Methyl-4,6-dinitrophenol | 534521 | 20 {M} | 20 {M} | NA | NLV | NLV | 9,500 | 2.00E+5 | ID | ID |
| Methyl parathion | 298000 | 1.8 | 5.2 | NA | NLV | NLV | 3,000 | 50,000 | ID | ID |
| 4-Methyl-2-pentanone (MIBK) {I} | 108101 | 1,800 | 5,200 | ID | 2.0E+7 {S} | 2.0E+7 {S} | 1.3E+7 | 2.00E+7 | ID | 2.0E+7 {S} |
| Methyl-tert-butyl ether (MTBE) | 1634044 | 40 {E} | 40 {E} | 730 {X} | 4.7E+7 {S} | 4.7E+7 {S} | 6.9E+5 | 4.68E+7 | ID | ID |
| N-Methyl-morpholine {I} | 109024 | 20 | 56 | NA | NLV | NLV | 1.5E+6 | 1.0E+9 | ID | ID |
| Methylcyclopentane {I} | 96377 | ID | ID | NA | ID | ID | ID | 73,890 | ID | ID |
| 4,4'-Methylene-bis-2-chloroaniline (MBOCA) | 101144 | 1.1 | 4.5 | NA | NLV | NLV | 110 {AA} | 14,000 | ID | ID |
| Methylene chloride | 75092 | 5.0 {A} | 5.0 {A} | 940 {X} | 2.2E+5 | 1.4E+6 | 2.2E+5 | 1.70E+7 | ID | ID |
| 2-Methylnaphthalene | 91576 | 260 | 750 | ID | ID | ID | 25,000 {S} | 24,600 | ID | ID |
| Methylphenols (J) | 1319773 | 370 | 1,000 | 71 | NLV | NLV | 8.1E+5 | 2.80E+7 | NA | ID |

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| Metolachlor | 51218452 | 240 | 990 | NA | NLV | NLV | 91,000 | 5.30E+5 | ID | ID |
| Mirex | 2385855 | 0.02 {M} | 0.02 {M} | NA | NA | NA | 0.02 {M} | 6.8E-6 | NA | ID |
| Molybdenum {B} | 7439987 | 37 | 100 | 800 {X} | NLV | NLV | 9.7E+5 | NA | ID | ID |
| Naphthalene | 91203 | 520 | 1,500 | 13 | 31,000 {S} | 31,000 {S} | 31,000 {S} | 31,000 | 31,000 {S} | 31,000 {S} |
| Nickel {B} | 7440020 | 100 {A} | 100 {A} | {G} | NLV | NLV | 7.4E+7 | NA | ID | ID |
| Nitrate {B,N} | 14797558 | 10,000 {A,N} | 10,000 {A,N} | NA | NLV | NLV | 3.1E+8 | NA | ID | ID |
| Nitrite {B,N} | 14797650 | 1,000 {A,N} | 1,000 {A,N} | NA | NLV | NLV | 1.9E+7 | NA | ID | ID |
| Nitrobenzene {I} | 98953 | 3.4 | 9.6 | 180 {X} | 2.1E+6 {S} | 2.1E+6 {S} | 11,000 | 2.09E+6 | NA | ID |
| 2-Nitrophenol | 88755 | 20 | 58 | ID | NLV | NLV | 79,000 | 2.50E+6 | ID | ID |
| n-Nitroso-di-n-propylamine | 621647 | 5.0 {M} | 5.0 {M} | NA | NLV | NLV | 360 | 9.89E+6 | ID | ID |
| N-Nitrosodiphenylamine | 86306 | 270 | 1,100 | NA | NLV | NLV | 35,000 {S} | 35,100 | ID | ID |
| Oxamyl | 23135220 | 200 {A} | 200 {A} | NA | NLV | NLV | 6.2E+7 | 2.80E+8 | ID | ID |
| Oxo-hexyl acetate | 88230357 | 73 | 210 | NA | ID | ID | ID | NA | ID | ID |
| Pendimethalin | 40487421 | 280 {S} | 280 {S} | NA | NLV | NLV | 280 {S} | 275 | ID | ID |
| Pentachlorobenzene | 608935 | 6.1 | 17 | NA | ID | ID | 240 | 650 | ID | ID |
| Pentachloronitrobenzene | 82688 | 32 {S} | 32 {S} | NA | 32 {S} | 32 {S} | 32 {S} | 32 | ID | ID |
| Pentachlorophenol | 87865 | 1.0 {A} | 1.0 {A} | {G,X} | NLV | NLV | 200 | 1.85E+6 | ID | ID |
| Pentane | 109660 | ID | ID | NA | 38,000 {S} | 38,000 {S} | ID | 38,200 | 170 | 38,000 {S} |
| 2-Pentene {I} | 109682 | ID | ID | NA | ID | ID | ID | 2.03E+5 | ID | ID |
| Phenanthrene | 85018 | 52 | 150 | 5.0 {M} | 1,000 {S} | 1,000 {S} | 1,000 {S} | 1,000 | ID | ID |
| Phenol | 108952 | 4,400 | 13,000 | 210 | NLV | NLV | 2.9E+7 | 8.28E+7 | NA | ID |
| Phosphorus (total) | 7723140 | 63,000 | 2.4E+5 | NA | NLV | NLV | ID | NA | ID | ID |
| Phthalic acid | 88993 | 14,000 | 40,000 | NA | NLV | NLV | 1.4E+7 {S} | 1.42E+7 | ID | ID |
| Phthalic anhydride | 85449 | 15,000 | 44,000 | NA | NLV | NLV | 6.2E+6 {S} | 6.2E+6 | NA | ID |
| Picloram | 1918021 | 500 {A} | 500 {A} | NA | NLV | NLV | 4.3E+5 {S} | 4.30E+5 | ID | ID |
| Piperidine | 110894 | 3.2 | 9.2 | NA | NLV | NLV | 34,000 | 1.0E+9 | ID | ID |
| Polybrominated biphenyls {J} | 67774327 | 0.032 | 0.09 | IP | NLV | NLV | ID | 1.66E+7 | ID | ID |
| Polychlorinated biphenyls (PCBs) {J,T} | 1336363 | 0.5 {A} | 0.5 {A} | 0.2 {M} | 45 {S} | 45 {S} | 3.3 {AA} | 44.7 | ID | ID |
| Prometon | 1610180 | 160 | 460 | NA | NLV | NLV | 1.8E+5 | 7.50E+5 | ID | ID |
| Propachlor | 1918167 | 95 | 270 | NA | NLV | NLV | 4.4E+5 | 6.55E+5 | ID | ID |
| Propazine | 139402 | 200 | 560 | NA | NLV | NLV | 8,600 {S} | 8,600 | ID | ID |
| Propionic acid | 79094 | 12,000 | 35,000 | ID | NLV | NLV | 2.8E+8 | 1.0E+9 | 9.7E+8 | ID |

# ATTACHMENT A

## GROUNDWATER: RESIDENTIAL AND INDUSTRIAL-COMMERCIAL

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| Guidesheet Number → | | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Chemical Abstract Service Number | Residential & Commercial I Drinking Water Criteria | Industrial & Commercial II, III & IV Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential & Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria | Industrial & Commercial II, III & IV Groundwater Volatilization to Indoor Air Inhalation Criteria | Groundwater Contact Criteria | Water Solubility | Flammability and Explosivity Screening Level | Acute Inhalation Screening Level |
| Propyl alcohol {I} | 71238 | 1,400 | 4,000 | NA | NLV | NLV | 2.8E+7 | 1.0E+9 | 3.6E+7 | 1.0E+9 {D} |
| n-Propylbenzene {I} | 103651 | 80 | 230 | ID | ID | ID | 15,000 | NA | ID | ID |
| Propylene glycol | 57556 | 1.5E+5 | 4.2E+5 | NA | NLV | NLV | 1.0E+9 {D,S} | 1.0E+9 | ID | ID |
| Pyrene | 129000 | 140 {S} | 140 {S} | ID | 140 {S} | 140 {S} | 140 {S} | 135 | ID | ID |
| Pyridine {I} | 110861 | 7.3 | 21 | NA | 5,500 | 12,000 | 94,000 | 3.00E+5 | 41,000 | ID |
| Selenium {B} | 7782492 | 50 {A} | 50 {A} | [illegible]0 | NLV | NLV | 9.7E+5 | NA | ID | ID |
| Silver {B} | 7440224 | 34 | 98 | 0.2 {M} | NLV | NLV | 1.5E+6 | NA | ID | ID |
| Silvex (2,4,5-TP) | 93721 | 50 {A} | 50 {A} | NA | NLV | NLV | 43,000 | 1.40E+5 | ID | ID |
| Simazine | 122349 | 4.0 {A} | 4.0 {A} | NA | NLV | NLV | 4,500 {S} | 4,470 | ID | ID |
| Sodium | 7440235 | 1.2E+5 | 3.5E+5 | NA | NLV | NLV | 1.0E+9 {D} | NA | ID | ID |
| Strontium {B} | 7440246 | 4,600 | 13,000 | 760 | NLV | NLV | 1.2E+8 | NA | ID | ID |
| Styrene | 100425 | 100 {A} | 100 {A} | 80 | 1.7E+5 | 3.1E+5 {S} | 9,700 | 3.10E+5 | 68,000 | 3.1E+5 {S} |
| Sulfate | 14808798 | 2.5E+5 {E} | 2.5E+5 {E} | NA | NLV | NLV | ID | NA | ID | ID |
| Tebuthiuron | 34014181 | 510 | 1,500 | NA | NLV | NLV | 2.5E+6 {S} | 2.50E+6 | ID | ID |
| 2,3,7,8-Tetrabromodibenzo-p-dioxin {O} | 50585416 | {O} | {O} | {O} | NLV | NLV | {O} | 0.00996 | ID | ID |
| 1,2,4,5-Tetrachlorobenzene | 95943 | 1,300 {S} | 1,300 {S} | 2.9 {X} | ID | ID | 1,300 {S} | 1,300 | ID | ID |
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin {O} | 1746016 | 3.0E-5 {A} | 3.0E-5 {A} | 1.0E-5 {M} | NLV | NLV | 1.0E-5 {M,O,AA} | 0.019 | ID | ID |
| 1,1,1,2-Tetrachloroethane | 630206 | 77 | 320 | NA | 15,000 | 96,000 | 30,000 | 1.10E+6 | ID | ID |
| 1,1,2,2-Tetrachloroethane | 79345 | 8.5 | 35 | 78 {X} | 12,000 | 77,000 | 4,700 | 2.97E+6 | ID | ID |
| Tetrachloroethylene | 127184 | 5.0 {A} | 5.0 {A} | 45 {X} | 25,000 | 1.7E+5 | 12,000 | 2.0E+5 | ID | 2.0E+5 {S} |
| Tetrahydrofuran | 109999 | 95 | 270 | 11,000 {X} | 6.9E+6 | 1.6E+7 | 1.6E+6 | 1.0E+9 | 30,000 | 3.6E+6 |
| Thallium {B} | 7440280 | 2.0 {A} | 2.0 {A} | 3.7 {X} | NLV | NLV | 13,000 | NA | ID | ID |
| Toluene {I} | 108883 | 790 {E} | 790 {E} | 140 | 5.3E+5 {S} | 5.3E+5 {S} | 5.3E+5 {S} | 5.26E+5 | 31,000 | ID |
| p-Toluidine | 106490 | 15 | 62 | NA | NLV | NLV | 24,000 | 7.60E+6 | NA | ID |
| Toxaphene | 8001352 | 3.0 {A} | 3.0 {A} | 1.0 {M} | NLV | NLV | 44 | 740 | ID | 740 {S} |
| Triallate | 2303175 | 95 | 270 | NA | ID | ID | 4,000 {S} | 4,000 | ID | ID |

# ATTACHMENT A

## GROUNDWATER: RESIDENTIAL AND INDUSTRIAL-COMMERCIAL

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| Guidesheet Number → | | #1 | #2 | #3 | #4 | #5 | #6 | #7 | #8 | #9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Chemical Abstract Service Number | Residential & Commercial I Drinking Water Criteria | Industrial & Commercial II, III & IV Drinking Water Criteria | Groundwater Surface Water Interface Criteria | Residential & Commercial I Groundwater Volatilization to Indoor Air Inhalation Criteria | Industrial & Commercial II, III & IV Groundwater Volatilization to Indoor Air Inhalation Criteria | Groundwater Contact Criteria | Water Solubility | Flammability and Explosivity Screening Level | Acute Inhalation Screening Level |
| Tributylamine | 102829 | 10 | 29 | ID | 14,000 | 75,000 {S} | 2,300 | 75,400 | ID | ID |
| 1,2,4-Trichlorobenzene | 120821 | 70 {A} | 70 {A} | 30 | 3.0E+5 {S} | 3.0E+5 {S} | 19,000 | 3.00E+5 | NA | 3.0E+5 {S} |
| 1,1,1-Trichloroethane | 71556 | 200 {A} | 200 {A} | 200 | 6.6E+5 | 1.3E+6 {S} | 1.3E+6 {S} | 1.33E+6 | ID | 1.3E+6 {S} |
| 1,1,2-Trichloroethane | 79005 | 5.0 {A} | 5.0 {A} | 330 {X} | 17,000 | 1.1E+5 | 21,000 | 4.42E+6 | 1.8E+6 | ID |
| Trichloroethylene | 79016 | 5.0 {A} | 5.0 {A} | 200 {X} | 15,000 | 97,000 | 37,000 | 1.10E+6 | ID | 1.1E+6 {S} |
| Trichlorofluoromethane | 75694 | 2,600 | 7,300 | NA | 1.1E+6 {S} | 1.1E+6 {S} | 1.1E+6 {S} | 1.10E+6 | ID | 1.1E+6 {S} |
| 2,4,5-Trichlorophenol | 95954 | 730 | 2,100 | NA | NLV | NLV | 1.7E+5 | 1.20E+6 | ID | ID |
| 2,4,6-Trichlorophenol | 88062 | 120 | 470 | 4.4 | NLV | NLV | 10,000 | 8.00E+5 | ID | ID |
| 1,2,3-Trichloropropane | 96184 | 42 | 120 | NA | ID | ID | 84,000 | 1.90E+6 | NA | ID |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 76131 | 1.7E+5 {S} | 1.7E+5 {S} | NA | 1.7E+5 {S} | 1.7E+5 {S} | 1.7E+5 {S} | 1.70E+5 | ID | 1.7E+5 {S} |
| Triethanolamine | 102716 | 3,700 | 10,000 | NA | NLV | NLV | 1.0E+9 {D,S} | 1.0E+9 | ID | ID |
| Triethylene glycol | 112276 | 10,000 {M} | 12,000 | NA | NLV | NLV | 1.0E+6 {S} | 1.00E+6 | ID | ID |
| 3-Trifluoromethyl-4-nitrophenol | 88302 | 4,500 | 13,000 | NA | NLV | NLV | 5.0E+6 {S} | 5.00E+6 | ID | ID |
| Trifluralin | 1582098 | 37 | 110 | NA | ID | ID | 2,400 | 8,100 | ID | ID |
| 2,2,4-Trimethyl pentane | 540841 | ID | ID | NA | ID | ID | ID | 2,330 | 81 | ID |
| 2,4,4-Trimethyl-2-pentene {I} | 107404 | ID | ID | NA | ID | ID | ID | 11,900 | ID | ID |
| 1,2,4-Trimethylbenzene {I} | 95636 | 63 {E} | 63 {E} | ID | 56,000 {S} | 56,000 {S} | 56,000 {S} | 55,890 | 37,000 | ID |
| 1,3,5-Trimethylbenzene {I} | 108678 | 72 {E} | 72 {E} | ID | 61,000 {S} | 61,000 {S} | 61,000 {S} | 61,150 | ID | ID |
| Triphenyl phosphate | 115866 | 1,200 | 1,400 {S} | NA | NLV | NLV | 1,400 {S} | 1,430 | ID | ID |
| tris(2,3-Dibromopropyl)phosphate | 126727 | 0.71 | 2.9 | NA | 4,700 {S} | 4,700 {S} | 2,100 | 4,700 | ID | ID |
| Urea | 57136 | ID {N} | ID {N} | NA | NLV | NLV | ID | NA | ID | ID |
| Vanadium | 7440622 | 4.5 | 62 | 12 | NLV | NLV | 9.7E+5 | NA | ID | ID |
| Vinyl acetate {I} | 108054 | 640 | 1,800 | NA | 4.1E+6 | 8.9E+6 | 8.0E+6 | 2.00E+7 | 8.8E+5 | 4.8E+6 |
| Vinyl chloride | 75014 | [illegible]0 {A} | 2.0 {A} | 15 | 110 | 690 | 570 | 2.76E+6 | 17,000 | ID |
| White phosphorus {R} | 12185103 | 0.11 | 0.31 | NA | NLV | NLV | 2,900 | NA | ID | ID |
| Xylenes {I} | 1330207 | 280 {E} | 280 {E} | 35 | 1.9E+5 {S} | 1.9E+5 {S} | 1.9E+5 {S} | 1.86E+5 | 35,000 | 1.9E+5 {S} |
| Zinc {B} | 7440666 | [illegible]00 | 5,000 {E} | {G} | NLV | NLV | 1.1E+8 | NA | ID | ID |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

**Developed under the authority of the**
**NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED**

Soil criteria were calculated using currently available chemical-specific data and U.S. Environmental Protection Agency risk assessment guidance. Criteria may change for the next annual revision of the criteria tables. All criteria are expressed in units of parts per billion (ppb;ug/Kg). Scientific notation is represented by E+ or E- a value; for example, 2 x $10^6$ is reported as 2.0E+6. Analytical results must be expressed as dry-weight concentrations for comparison to criteria. Please refer to Operational Memorandum #6 for recommended analytical methods and target detection limits.

| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Acenaphthene | 83329 | NA | 3.0E+5 | [illegible] | 9.7E+5 | 1.9E+8 | 8.1E+7 | 8.1E+7 | 8.1E+7 | 1.4E+10 | 4.1E+7 | NA |
| Acenaphthylene | 208968 | NA | 5,900 | ID | 4.4E+5 | 1.6E+6 | 2.2E+6 | 2.2E+6 | 2.2E+6 | 2.3E+9 | 1.6E+6 | NA |
| Acetaldehyde (I) | 75070 | NA | 19,000 | NA | 1.1E+8 (C) | 2.2E+5 | 1.7E+5 | 1.7E+5 | 2.8E+5 | 6.0E+8 | 2.9E+7 | 1.1E+8 |
| Acetic acid | 64197 | NA | 9.0E+5 (M) | 9.0E+5 (M) | 6.5E+8 (C) | NLV | NLV | NLV | NLV | 1.7E+10 | 1.3E+8 | 6.5E+8 |
| Acetone (I) | 67641 | NA | [illegible] | 34,000 | 1.1E+8 (C) | 1.1E+8 (C) | 1.3E+8 | 1.3E+8 | 1.9E+8 | 3.9E+11 | 2.3E+7 | 1.1E+8 |
| Acetonitrile | 75058 | NA | 2,800 | NA | 2.2E+7 (C) | 4.8E+6 | 1.6E+6 | 1.6E+6 | 2.1E+6 | 4.0E+9 | 4.3E+6 | 2.2E+7 |
| Acetophenone | 98862 | NA | 30,000 | NA | 1.1E+6 (C) | 1.1E+6 (C) | 4.4E+7 | ID | ID | 3.3E+10 | 1.1E+6 (C) | 1.1E+6 |
| Acrolein (I) | 107028 | NA | 2,400 | NA | 2.3E+7 (C) | 410 | 310 | 310 | 610 | 1.3E+6 | 3.6E+6 | 2.3E+7 |
| Acrylamide | 79061 | NA | 6.0 | NA | 2.6E+5 | NLV | NLV | NLV | NLV | 2.4E+6 | 1,900 | NA |
| Acrylic acid | 79107 | NA | 78,000 | NA | 1.1E+8 (C) | 2.4E+6 | 1.9E+5 | 2.3E+5 | 2.3E+5 | 6.7E+7 | 3.5E+7 (AD) | 1.1E+8 |
| Acrylonitrile (I) | 107131 | NA | 52 | 98 (X) | 2.8E+5 | 6,600 | 5,000 | 5,100 | 10,000 | 4.6E+7 | 16,000 | 8.3E+6 |
| Alachlor | 15972608 | NA | 52 | 290 (X) | 44,000 | NLV | NLV | NLV | NLV | ID | 93,000 | NA |
| Aldicarb | 116063 | NA | 60 | NA | 2.4E+6 | NLV | NLV | NLV | NLV | ID | 2.3E+5 | NA |
| Aldicarb sulfoxide | 1646873 | NA | 80 | NA | 5.4E+7 | NLV | NLV | NLV | NLV | ID | 2.9E+5 | NA |
| Aldicarb sulfone | 1646884 | NA | 50 (M) | NA | 4.2E+7 | NLV | NLV | NLV | NLV | ID | 2.5E+5 | NA |
| Aldrin | 309002 | NA | NLL | NLL | NLL | 1.3E+6 | 58,000 | 58,000 | 58,000 | 6.4E+5 | 1,000 | NA |
| Aluminum (B) | 7429905 | 6.9E+6 | 1,000 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 5.0E+7 (AD) | NA |
| Ammonia | 7664417 | NA | ID (N) | (AC) | ID | ID | ID | ID | ID | 6.7E+9 | ID | 1.0E+7 |
| Aniline | 62533 | NA | 1,700 (M) | 1,700 (M) | 2.8E+6 | NLV | NLV | NLV | NLV | 6.7E+7 | 3.3E+5 | 4.5E+6 |
| Anthracene | 120127 | NA | 41,000 | ID | [illegible] | 1.0E+9 (D) | 1.4E+9 | 1.4E+9 | 1.4E+9 | 6.7E+10 | 2.3E+8 | NA |
| Antimony | 7440360 | NA | [illegible] (M) | ID | 4.9E+7 | NLV | NLV | NLV | NLV | 1.3E+7 | [illegible] | NA |
| Arsenic (B) | 7440382 | 5,800 | 23,000 | 70,000 (X) | 2.0E+6 | NLV | NLV | NLV | NLV | 7.2E+5 | [illegible] | NA |
| Asbestos (AB) | 1332214 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.0E+7 (M) | ID | NA |
| Atrazine | 1912249 | NA | 60 | 150 (X) | 1.1E+5 | NLV | NLV | NLV | NLV | ID | 71,000 (AD) | NA |
| Azobenzene | 103333 | NA | 4,200 | NA | 3.0E+5 | 6.1E+6 | 6.3E+5 | ID | ID | 1.0E+8 | 1.4E+5 | NA |
| Barium | 7440393 | 75,000 | [illegible] | (G,X) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 3.3E+8 | 3.7E+7 | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Benzene (I) | 71432 | NA | 100 | 4,000 (X) | 2.2E+5 | 1,600 | 13,000 | 34,000 | 79,000 | 3.8E+8 | 1.8E+5 | 4.0E+5 |
| Benzidine | 92875 | NA | 1,000 (M) | ID | 1,000 (M) | NLV | NLV | NLV | NLV | 46,000 | 1,000 (M) | NA |
| Benzo(a)anthracene (Q) | 56553 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | [illegible] | NA |
| Benzo(b)fluoranthene (Q) | 205992 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | [illegible] | NA |
| Benzo(k)fluoranthene (Q) | 207089 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | [illegible] | NA |
| Benzo(g,h,i)perylene | 191242 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 8.0E+8 | 2.5E+6 | NA |
| Benzo(a)pyrene (Q) | 50328 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.5E+6 | 2,000 | NA |
| Benzoic acid | 65850 | NA | 6.4E+5 | NA | 7.0E+7 | NLV | NLV | NLV | NLV | ID | 9.9E+8 | NA |
| Benzyl alcohol | 100516 | NA | 2.0E+5 | NA | 5.8E+6 (C) | NLV | NLV | NLV | NLV | 3.3E+11 | 5.8E+6 (C) | 5.8E+6 |
| Benzyl chloride | 100447 | NA | 200 (M) | NA | 72,000 | 6,300 | 14,000 | 14,000 | 17,000 | 6.2E+7 | 48,000 | 2.3E+5 |
| Beryllium | 7440417 | NA | [illegible] | (G) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.3E+6 | 4.1E+5 | NA |
| bis(2-Chloroethoxy)ethane | 112265 | NA | ID | NA | ID | NLV | NLV | NLV | NLV | ID | ID | 2.7E+6 |
| bis(2-Chloroethyl)ether (I) | 111444 | NA | 330 (M) | NA | 1.1E+5 | 8,300 | 3,800 | 3,800 | 3,800 | 9.4E+6 | 13,000 | 2.2E+6 |
| bis(2-Ethylhexyl)phthalate | 117817 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 7.0E+8 | [illegible] | 1.0E+7 |
| Boron (B) | 7440428 | NA | 10,000 | 38,000 | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 4.8E+7 (AD) | NA |
| Bromobenzene (I) | 108861 | NA | 550 | NA | 3.6E+5 | 3.1E+5 | 4.5E+5 | 4.5E+5 | 4.5E+5 | 5.3E+8 | 5.4E+5 | 7.6E+5 |
| Bromodichloromethane | 75274 | NA | 2,000 (W) | ID | 2.8E+5 | 1,200 | 9,100 | 9,700 | 19,000 | 8.4E+7 | 1.1E+5 | 1.5E+6 |
| Bromoform | 75252 | NA | 2,000 (W) | ID | 8.7E+5 (C) | 1.5E+5 | 9.0E+5 | 9.0E+5 | 9.0E+5 | 2.8E+9 | 8.2E+5 | 8.7E+5 |
| Bromomethane | 74839 | NA | 200 | 700 | 1.4E+6 | 860 | 11,000 | 57,000 | 1.4E+5 | 3.3E+8 | 3.2E+5 | 2.2E+6 |
| n-Butanol (I) | 71363 | NA | 19,000 | NA | 8.7E+6 (C) | NLV | NLV | NLV | NLV | 2.3E+10 | 8.7E+6 (C) | 8.7E+6 |
| 2-Butanone (MEK) (I) | 78933 | NA | 2.6E+5 | 44,000 | 2.7E+7 (C) | 2.7E+7 (C) | 2.9E+7 | 2.9E+7 | 3.5E+7 | 6.7E+10 | 2.7E+7 (C,AD) | 2.7E+7 |
| n-Butyl acetate | 123864 | NA | 11,000 | NA | 1.1E+6 (C) | 1.1E+6 (C) | 1.1E+8 | 2.6E+8 | 3.2E+8 | 4.7E+11 | 1.1E+6 (C) | 1.1E+6 |
| t-Butyl alcohol | 75650 | NA | 78,000 | NA | 1.1E+8 (C) | 1.1E+8 (C) | 9.7E+7 | 2.0E+8 | 2.0E+8 | 1.3E+11 | 1.1E+8 (C) | 1.1E+8 |
| Butyl benzyl phthalate | 85687 | NA | 3.1E+5 (C) | 26,000 (X) | 3.1E+5 (C) | NLV | NLV | NLV | NLV | 4.7E+10 | 3.1E+5 (C) | 3.1E+5 |
| n-Butylbenzene | 104518 | NA | 1,600 | NA | 1.2E+5 | ID | ID | ID | ID | ID | 2.5E+6 | 1.0E+7 |
| sec-Butylbenzene | 135988 | NA | 1,600 | NA | 88,000 | ID | ID | ID | ID | ID | 2.5E+6 | 1.0E+7 |
| tert-Butylbenzene (I) | 98066 | NA | 1,600 | NA | 1.8E+5 | ID | ID | ID | ID | ID | 2.5E+6 | 1.0E+7 |
| Cadmium (B) | 7440439 | 1,200 | [illegible] | (G,X) | 2.3E+8 | NLV | NLV | NLV | NLV | 1.7E+6 | 5.5E+5 | NA |
| Camphene (I) | 79925 | NA | ID | NA | ID | ID | ID | ID | ID | ID | ID | NA |
| Caprolactam | 105602 | NA | 1.2E+5 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 6.7E+8 | 5.3E+7 (AD) | NA |
| Carbaryl | 63252 | NA | 14,000 | NA | 2.6E+6 | ID | ID | ID | ID | ID | 2.2E+7 | NA |
| Carbazole | 86748 | NA | 9,400 | [illegible] | 8.2E+5 | NLV | NLV | NLV | NLV | ID | 5.3E+5 | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air {Y} | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Carbofuran | 1563662 | NA | 800 | NA | 6.8E+6 | NLV | NLV | NLV | NLV | ID | 1.1E+6 | NA |
| Carbon disulfide {I,R} | 75150 | NA | 16,000 | ID | 2.8E+5 {C} | 76,000 | 1.3E+6 | 7.9E+6 | 1.9E+7 | 4.7E+10 | 2.8E+5 {C,AD} | 2.8E+5 |
| Carbon tetrachloride | 56235 | NA | 100 | 900 {X} | 92,000 | 190 | 3,500 | 12,000 | 28,000 | 1.3E+8 | 96,000 | 3.9E+5 |
| Chlordane {J} | 57749 | NA | NLL | NLL | NLL | 1.1E+7 | 1.2E+6 | 1.2E+6 | 1.2E+6 | 3.1E+7 | 31,000 | NA |
| Chloride | 16887006 | NA | 5.0E+6 | 2.5E+6 {X} | ID | NLV | NLV | NLV | NLV | ID | 5.0E+5 {F} | NA |
| Chlorobenzene {I} | 108907 | NA | 2,000 | 940 | 2.6E+5 {C} | 1.2E+5 | 7.7E+5 | 9.9E+5 | 2.1E+6 | 4.7E+9 | 2.6E+5 {C} | 2.6E+5 |
| 1-Chloro-1,1-difluoroethane | 75683 | NA | 3.0E+5 | NA | 9.6E+5 {C} | 9.6E+5 {C} | 7.9E+7 | ID | ID | 3.3E+12 | 9.6E+5 {C} | 9.6E+5 |
| Chloroethane | 75003 | NA | 8,600 | ID | 9.5E+5 {C} | 9.5E+5 {C} | 3.0E+7 | 1.2E+8 | 2.8E+8 | 6.7E+11 | 9.5E+5 {C} | 9.5E+5 |
| 2-Chloroethyl vinyl ether | 110758 | NA | ID | NA | ID | ID | ID | ID | ID | ID | ID | 1.9E+6 |
| Chloroform | 67663 | NA | 2,000 {W} | 3,400 {X} | 1.5E+6 {C} | 7,200 | 45,000 | 1.2E+5 | 2.7E+5 | 1.3E+9 | 1.2E+6 | 1.5E+6 |
| Chloromethane {I} | 74873 | NA | 5,200 | ID | 1.1E+6 {C} | 2,300 | 40,000 | 4.1E+5 | 1.0E+6 | 4.9E+9 | 1.1E+6 {C} | 1.1E+6 |
| 4-Chloro-3-methylphenol | 59507 | NA | 5,800 | NA | 3.0E+6 | NLV | NLV | NLV | NLV | ID | 4.5E+6 | NA |
| beta-Chloronaphthalene | 91587 | NA | 6.2E+5 | NA | 2.3E+6 | ID | ID | ID | ID | ID | 5.6E+7 | NA |
| 2-Chlorophenol | 95578 | NA | 900 | 440 | 1.9E+6 | ID | ID | ID | ID | ID | 1.4E+6 | 1.9E+7 |
| o-Chlorotoluene {I} | 95498 | NA | 3,300 | NA | 5.0E+5 {C} | 5.0E+5 {C} | ID | ID | ID | 1.7E+11 | 5.0E+5 {C} | 5.0E+5 |
| Chlorpyrifos | 2921882 | NA | 17,000 | NA | 8.4E+5 | 130 | 4,600 | ID | ID | 1.3E+8 | 1.1E+7 | NA |
| Chromium (III) {B,H} | 16065831 | 18,000 (total) | 1.0E+9 {D} | {G,X} | 1.0E+9 {D} | NLV | NLV | NLV | NLV | [illegible].3E+8 | 7.9E+8 | NA |
| Chromium (VI) | 18540299 | 18,000 (total) | 30,000 | 3,300 | 1.4E+8 | NLV | NLV | NLV | NLV | 2.6E+5 | 2.5E+6 | NA |
| Chrysene {Q} | 218019 | NA | NLL | NLL | NLL | ID | ID | ID | ID | ID | [illegible]E+6 | NA |
| Cobalt | 7440484 | 6,800 | 800 | 2,000 | 4.8E+7 | NLV | NLV | NLV | NLV | 1.3E+7 | 2.6E+6 | NA |
| Copper | 7440508 | 32,000 | 5.8E+6 | {G} | 1.0E+9 {D} | NLV | NLV | NLV | NLV | 1.3E+8 | 2.0E+7 | NA |
| Cyanazine | 21725462 | NA | 500 {M} | 1,100 {X} | 56,000 | NLV | NLV | NLV | NLV | ID | 14,000 | NA |
| Cyanide {R} | 57125 | 390 (Total) | 4,000 {P} | [illegible] {P} | 2.5E+5 {P} | NLV | NLV | NLV | NLV | 2.5E+5 {P} | 12,000 {P} | NA |
| Cyclohexanone | 108941 | NA | 5.2E+6 | NA | 2.2E+8 {C} | 17,000 | 1.0E+6 | ID | ID | 6.7E+10 | 2.2E+8 {C} | 2.2E+8 |
| Dacthal | 1861321 | NA | 50,000 | NA | 3.4E+5 | NLV | NLV | NLV | NLV | ID | 2.3E+6 | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Dalapon | 75990 | NA | 4,000 | NA | 5.9E+7 (C) | NLV | NLV | NLV | NLV | ID | 1.9E+7 | 5.9E+7 |
| 4-4'-DDD | 72548 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 4.4E+7 | 95,000 | NA |
| 4-4'-DDE | 72559 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 3.2E+7 | 45,000 | NA |
| 4-4'-DDT | 50293 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 3.2E+7 | 57,000 | NA |
| Decabromodiphenyl ether | 1163195 | NA | 1.4E+5 | NA | 1.4E+5 | 1.0E+9 (D) | 8.6E+7 | ID | ID | 2.3E+9 | 3.8E+6 | NA |
| Di-n-butyl phthalate | 84742 | NA | 7.6E+5 (C) | 11,000 | 7.6E+5 (C) | NLV | NLV | NLV | NLV | 3.3E+9 | 7.6E+5 (C) | 7.6E+5 |
| Di(2-ethylhexyl) adipate | 103231 | NA | 9.6E+5 (C) | NA | 9.6E+5 (C) | NLV | NLV | NLV | NLV | 9.2E+9 | 9.6E+5 (C,AD) | 9.6E+5 |
| Di-n-octyl phthalate | 117840 | NA | 1.0E+8 | ID | 1.4E+8 (C) | NLV | NLV | NLV | NLV | ID | 6.9E+6 | 1.4E+8 |
| Diacetone alcohol (I) | 123422 | NA | ID | NA | ID | NLV | NLV | NLV | NLV | 1.6E+11 | ID | 1.1E+8 |
| Diazinon | 333415 | NA | 95 | NA | 95,000 | NLV | NLV | NLV | NLV | ID | 12,000 (AD) | 3.1E+5 |
| Dibenzo(a,h)anthracene (Q) | 53703 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | [illegible]00 | NA |
| Dibenzofuran | 132649 | NA | ID | [illegible]00 | ID | ID | ID | ID | ID | ID | ID | NA |
| Dibromochloromethane | 124481 | NA | 2,000 (W) | ID | 3.6E+5 | 3,900 | 24,000 | 24,000 | 33,000 | 1.3E+8 | 1.1E+5 | 6.1E+5 |
| Dibromochloropropane | 96128 | NA | 4.0 | NA | 1,200 (C) | 1,200 (C) | 13,000 | ID | ID | 1.3E+7 | 1,200 (C) | 1,200 |
| Dibromomethane | 74953 | NA | 1,600 | NA | 2.0E+6 (C) | ID | ID | ID | ID | ID | 2.0E+6 (C) | 2.0E+6 |
| 1,2-Dichlorobenzene | 95501 | NA | 14,000 | 360 | 2.1E+5 (C) | 2.1E+5 (C) | 3.9E+7 | 3.9E+7 | 5.2E+7 | 1.0E+11 | 2.1E+5 (C) | 2.1E+5 |
| 1,3-Dichlorobenzene | 541731 | NA | 170 | 1,100 | 51,000 | ID | ID | ID | ID | ID | 1.7E+5 (C) | 1.7E+5 |
| 1,4-Dichlorobenzene | 106467 | NA | 1,700 | 290 | 1.4E+5 | 19,000 | 77,000 | 77,000 | 1.1E+5 | 4.5E+8 | 4.0E+5 | NA |
| 3,3'-Dichlorobenzidine | 91941 | NA | 2,000 (M) | 2,000 (M,X) | 4,600 | NLV | NLV | NLV | NLV | 6.5E+6 | 6,600 | NA |
| Dichlorodifluoromethane | 75718 | NA | 95,000 | ID | 1.0E+6 (C) | 9.0E+5 | 5.3E+7 | 5.5E+8 | 1.4E+9 | 3.3E+12 | 1.0E+6 (C) | 1.0E+6 |
| 1,1-Dichloroethane | 75343 | NA | 18,000 | ID | 8.9E+5 (C) | 2.3E+5 | 2.1E+6 | 5.9E+6 | 1.4E+7 | 3.3E+10 | 8.9E+5 (C) | 8.9E+5 |
| 1,2-Dichloroethane (I) | 107062 | NA | 100 | 7,200 (X) | 3.8E+5 | 2,100 | 6,200 | 11,000 | 26,000 | 1.2E+8 | 91,000 | 1.2E+6 |
| 1,1-Dichloroethylene (I) | 75354 | NA | 140 | 1,300 (X) | 2.2E+5 | 62 | 1,100 | 5,300 | 13,000 | 6.2E+7 | 2.0E+5 | 5.7E+5 |
| cis-1,2-Dichloroethylene | 156592 | NA | 1,400 | ID | 6.4E+5 (C) | 23,000 | 1.8E+5 | 4.2E+5 | 9.9E+5 | 2.3E+9 | 6.4E+5 (C) | 6.4E+5 |
| trans-1,2-Dichloroethylene | 156605 | NA | 2,000 | ID | 1.4E+6 (C) | 23,000 | 2.8E+5 | 8.3E+5 | 2.0E+6 | 4.7E+9 | 1.4E+6 (C) | 1.4E+6 |
| 2,6-Dichloro-4-nitroaniline | 99309 | NA | 44,000 | NA | 1.4E+5 | NLV | NLV | NLV | NLV | ID | 6.8E+7 | NA |
| 2,4-Dichlorophenol | 120832 | NA | 1,500 | 380 | 9.6E+5 | NLV | NLV | NLV | NLV | 5.1E+9 | 6.6E+5 (AD) | 1.8E+6 |
| 2,4-Dichlorophenoxyacetic acid | 94757 | NA | 1,400 | 4,400 | 2.4E+6 | NLV | NLV | NLV | NLV | 6.7E+9 | 2.5E+6 | NA |
| 1,2-Dichloropropane (I) | 78875 | NA | 100 | 5,800 (X) | 3.2E+5 | 4,000 | 25,000 | 50,000 | 1.1E+5 | 2.7E+8 | 1.4E+5 | 5.5E+5 |
| 1,3-Dichloropropene | 542756 | NA | 420 | NA | 2.6E+5 | 10 (M) | 10 (M) | 35 | 83 | 4.0E+5 | 1.3E+5 | 6.2E+5 |
| Dichlorovos | 62737 | NA | 50 (M) | NA | 1.2E+5 | NLV | NLV | NLV | NLV | 3.3E+7 | 10,000 | 2.2E+6 |
| Dicyclohexyl phthalate | 84617 | NA | ID | NA | ID | ID | ID | ID | ID | ID | ID | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Dieldrin | 60571 | NA | NLL | NLL | NLL | 1.4E+5 | 19,000 | 19,000 | 19,000 | 6.8E+5 | 1,100 | NA |
| Diethyl ether | 60297 | NA | 200 | ID | 7.4E+6 (C) | 7.4E+6 (C) | 8.5E+7 | 1.5E+8 | 3.4E+8 | 8.0E+11 | 7.4E+6 (C) | 7.4E+6 |
| Diethyl phthalate | 84662 | NA | 1.1E+5 | NA | 7.4E+5 (C) | NLV | NLV | NLV | NLV | 3.3E+9 | 7.4E+5 (C) | 7.4E+5 |
| Diethylene glycol monobutyl ether | 112345 | NA | 1,800 | NA | 8.0E+7 | NLV | NLV | NLV | NLV | 1.3E+9 | 2.7E+6 | 1.1E+8 |
| Diisopropyl ether | 108203 | NA | 600 | NA | 1,300 (C) | ID | ID | ID | ID | ID | 1,300 (C) | 1,300 |
| Diisopropylamine (I) | 108189 | NA | 110 | NA | 4.2E+5 | ID | ID | ID | ID | ID | 1.7E+5 | 6.7E+6 |
| Dimethyl phthalate | 131113 | NA | 7.9E+5 (C) | NA | 7.9E+5 (C) | NLV | NLV | NLV | NLV | 3.3E+9 | 7.9E+5 (C) | 7.9E+5 |
| N,N-Dimethylacetamide | 127195 | NA | 3,600 | 82,000 (X) | 1.1E+8 (C) | NLV | NLV | NLV | NLV | ID | 5.6E+6 | 1.1E+8 |
| N,N-Dimethylaniline | 121697 | NA | 320 | NA | 4.0E+5 | 1.7E+5 | 1.5E+5 | ID | ID | 2.6E+8 | 5.0E+5 | 8.0E+5 |
| Dimethylformamide (I) | 68122 | NA | 14,000 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 2.0E+9 | 2.2E+7 | 1.1E+8 |
| 2,4-Dimethylphenol | 105679 | NA | 7,400 | 7,600 | 1.0E+7 | NLV | NLV | NLV | NLV | 4.7E+9 | 1.1E+7 | NA |
| 2,6-Dimethylphenol | 576261 | NA | 330 (M) | NA | 1.3E+5 | NLV | NLV | NLV | NLV | ID | 1.4E+5 | NA |
| 3,4-Dimethylphenol | 95658 | NA | 330 (M) | NA | 3.6E+5 | NLV | NLV | NLV | NLV | ID | 3.2E+5 | NA |
| Dimethylsulfoxide | 67685 | NA | 4.4E+6 | 3.8E+6 | 1.8E+7 (C) | NLV | NLV | NLV | NLV | ID | 1.8E+7 (C) | 1.8E+7 |
| 2,4-Dinitrotoluene | 121142 | NA | 430 | NA | 1.7E+5 | NLV | NLV | NLV | NLV | 1.6E+7 | 48,000 | NA |
| Dinoseb | 88857 | NA | 300 | NA | 1.4E+5 (C) | ID | ID | ID | ID | ID | 66,000 (AD) | 1.4E+5 |
| 1,4-Dioxane (I) | 123911 | NA | 1,700 | 56,000 | 3.4E+7 | NLV | NLV | NLV | NLV | 5.7E+8 | 5.3E+5 | 9.7E+7 |
| Diquat | 85007 | NA | 400 | NA | 1.4E+7 | NLV | NLV | NLV | NLV | ID | 5.0E+5 | NA |
| Diuron | 330541 | NA | 620 | NA | 7.4E+5 | NLV | NLV | NLV | NLV | 4.7E+8 | 9.7E+5 | NA |
| Endosulfan (J) | 115297 | NA | NLL | NLL | NLL | ID | ID | ID | ID | ID | 1.4E+6 | NA |
| Endothall | 145733 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 2.3E+9 | 3.8E+6 | NA |
| Endrin | 72208 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 65,000 | NA |
| Epichlorohydrin (I) | 106898 | NA | 100 | NA | 2.2E+5 | 64,000 | 31,000 | 31,000 | 35,000 | 6.7E+7 | 8,900 | 7.3E+6 |
| Ethanol (I) | 64175 | NA | 3.8E+7 | IP | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 1.3E+12 | 1.1E+8 (C,AD) | 1.1E+8 |
| Ethyl acetate (I) | 141786 | NA | 1.3E+5 | NA | 7.5E+6 (C) | 7.5E+6 (C) | 4.9E+7 | 4.9E+7 | 9.8E+7 | 2.1E+11 | 7.5E+6 (C) | 7.5E+6 |
| Ethylbenzene (I) | 100414 | NA | 1,500 | [illegible]60 | 1.4E+5 (C) | 1.4E+5 (C) | 9.5E+6 | 1.4E+7 | 3.0E+7 | 6.7E+10 | 1.4E+5 (C) | 1.4E+5 |
| Ethylene dibromide | 106934 | NA | 10 (M) | 20 | 500 | 670 | 1,700 | 1,700 | 3,300 | 1.4E+7 | 92 | 8.9E+5 |
| Ethylene glycol | 107211 | NA | 3.0E+5 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 6.7E+10 | 1.1E+8 (C) | 1.1E+8 |
| Ethylene glycol monobutyl ether | 111762 | NA | 74,000 | NA | 4.1E+7 (C) | 7.4E+5 | 1.8E+7 | 1.5E+8 | 3.6E+8 | 8.7E+11 | 4.1E+7 (C) | 4.1E+7 |
| Fluoranthene | 206440 | NA | 7.3E+5 | 5,[illegible] | 7.3E+5 | 1.0E+9 (D) | 7.4E+8 | 7.4E+8 | 7.4E+8 | 9.3E+9 | 4.6E+7 | NA |
| Fluorene | 86737 | NA | 3.9E+5 | [illegible]00 | 8.9E+5 | 5.8E+8 | 1.3E+8 | 1.3E+8 | 1.3E+8 | 9.3E+9 | 2.7E+7 | NA |
| Fluorine (soluble fluoride) (B) | 7782414 | NA | 40,000 | NA | 2.4E+8 | NLV | NLV | NLV | NLV | ID | 9.0E+6 (AD) | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
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| Formaldehyde | 50000 | NA | 26,000 | 2,400 | 6.0E+7 (C) | 12,000 | 13,000 | 23,000 | 52,000 | 2.4E+8 | 4.1E+7 | 6.0E+7 |
| Formic acid (I,U) | 64186 | NA | 9.0E+5 (M) | ID | 1.1E+8 (C) | 1.5E+6 | 9.0E+5 (M) | 9.0E+5 (M) | 9.0E+5 (M) | 1.3E+8 | 1.1E+8 (C) | 1.1E+8 |
| 1-Formylpiperidine | 2591868 | NA | 1,600 | NA | ID | ID | ID | ID | ID | ID | 2.5E+6 | 1.0E+7 |
| Gentian violet | 548629 | NA | 300 | NA | 2.0E+7 | NLV | NLV | NLV | NLV | ID | 96,000 | NA |
| Glyphosate | 1071836 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 1.1E+7 (AD) | NA |
| Heptachlor | 76448 | NA | NLL | NLL | NLL | 3.5E+5 | 62,000 | 62,000 | 62,000 | 2.4E+6 | 5,600 | NA |
| Heptachlor epoxide | 1024573 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.2E+6 | 3,100 | NA |
| n-Heptane | 142825 | NA | 2.4E+5 (C) | NA | 2.4E+5 (C) | 2.4E+5 (C) | 2.1E+7 | ID | ID | 2.3E+11 | 2.4E+5 (C) | 2.4E+5 |
| Hexabromobenzene | 87821 | NA | 3.2E+5 | ID | 3.2E+5 | ID | ID | ID | ID | ID | 1.1E+6 | NA |
| Hexachlorobenzene (C-66) | 118741 | NA | 1,800 | ID | 8,200 | 41,000 | 17,000 | 17,000 | 17,000 | 6.8E+6 | 8,900 | NA |
| Hexachlorobutadiene (C-46) | 87683 | NA | 26,000 | 330 (M) | 3.5E+5 (C) | 1.3E+5 | 1.3E+5 | 1.3E+5 | 1.3E+5 | 1.4E+8 | 1.0E+5 | 3.5E+5 |
| alpha-Hexachlorocyclohexane | 319846 | NA | 18 | NA | 2,500 | 30,000 | 12,000 | 22,000 | 25,000 | 1.7E+6 | 2,600 | NA |
| beta-Hexachlorocyclohexane | 319857 | NA | 37 | NA | 5,100 | NLV | NLV | NLV | NLV | 5.9E+6 | 5,400 | NA |
| Hexachlorocyclopentadiene (C-56) | 77474 | NA | 3.2E+5 | ID | 7.2E+5 (C) | ID | ID | ID | ID | ID | 7.2E+5 (C) | 7.2E+5 |
| Hexachloroethane | 67721 | NA | 430 | 1,800 (X) | 1.1E+5 | 40,000 | 5.5E+5 | 9.3E+5 | 9.3E+5 | 2.3E+8 | 2.3E+5 | NA |
| n-Hexane | 110543 | NA | 44,000 (C) | NA | 44,000 (C) | 44,000 (C) | 3.0E+6 | ID | ID | 1.3E+10 | 44,000 (C) | 44,000 |
| 2-Hexanone | 591786 | NA | 20,000 | NA | 2.5E+6 (C) | 9.9E+5 | 1.1E+6 | ID | ID | 2.7E+9 | 2.5E+6 (C) | 2.5E+6 |
| Indeno(1,2,3-cd)pyrene (Q) | 193395 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | [illegible] | NA |
| Iron (B) | 7439896 | [illegible] | 6,000 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | [illegible] | NA |
| Isobutyl alcohol (I) | 78831 | NA | 46,000 | NA | 8.9E+6 (C) | 8.9E+6 (C) | 7.9E+7 | 7.9E+7 | 7.9E+7 | 1.0E+11 | 8.9E+6 (C) | 8.9E+6 |
| Isophorone | 78591 | NA | 15,000 | 11,000 (X) | 2.4E+6 (C) | NLV | NLV | NLV | NLV | 1.2E+10 | 2.4E+6 (C) | 2.4E+6 |
| Isopropyl alcohol (I) | 67630 | NA | 9,400 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 1.5E+10 | 1.4E+7 | 1.1E+8 |
| Isopropyl benzene | 98828 | NA | 91,000 | ID | 3.9E+5 (C) | 3.9E+5 (C) | 1.7E+6 | ID | ID | 5.8E+9 | 3.9E+5 (C) | 3.9E+5 |
| Lead | 7439921 | 21,000 | 7.0E+5 | (G,M,X) | ID | NLV | NLV | NLV | NLV | 1.0E+8 | [illegible] | NA |
| Lindane | 58899 | NA | 20 (M) | 20 (M) | 7,100 | ID | ID | ID | ID | ID | 8,300 | NA |
| Lithium (B) | 7439932 | 9,800 | 3,400 | 500 | 1.1E+8 | NLV | NLV | NLV | NLV | ID | 4.2E+6 (AD) | NA |
| Magnesium (B) | 7439954 | NA | [illegible] | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 6.7E+9 | [illegible] | NA |
| Manganese (B) | 7439965 | [illegible] | 1,000 | (G,X) | 1.8E+8 | NLV | NLV | NLV | NLV | 3.3E+6 | [illegible] | NA |
| Mercury (Inorganic) | 7439976 | [illegible] | 1,700 | [illegible] (M) | 47,000 | NLV | NLV | NLV | NLV | ID | [illegible] | NA |
| Methane | 74828 | NA | ID | ID | ID | (K) | ID | ID | ID | ID | ID | ID |
| Methanol | 67561 | NA | 74,000 | 9,600 | 3.1E+6 (C) | 5.0E+5 | 3.1E+7 | 4.4E+7 | 9.6E+7 | 2.2E+11 | 3.1E+6 (C) | 3.1E+6 |
| Methoxychlor | 72435 | NA | 16,000 | NA | 18,000 | ID | ID | ID | ID | ID | 1.9E+6 | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I
### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| 2-Methoxyethanol (I) | 109864 | NA | 150 | NA | 1.7E+7 | NLV | NLV | NLV | NLV | 1.3E+9 | 2.3E+5 | 1.1E+8 |
| 2-Methyl-4-chlorophenoxyacetic acid | 94746 | NA | 390 | NA | 4.9E+5 | NLV | NLV | NLV | NLV | ID | 2.3E+5 | NA |
| 2-Methyl-4,6-dinitrophenol | 534521 | NA | 1,700 (M) | NA | 1.9E+5 | NLV | NLV | NLV | NLV | ID | 79,000 | NA |
| Methyl parathion | 298000 | NA | 46 | NA | 76,000 | NLV | NLV | NLV | NLV | ID | 56,000 | NA |
| 4-Methyl-2-pentanone (MIBK) (I) | 108101 | NA | 36,000 | ID | 2.7E+6 (C) | 2.7E+6 (C) | 4.5E+7 | 4.5E+7 | 6.7E+7 | 1.4E+11 | 2.7E+6 (C) | 2.7E+6 |
| Methyl-tert-butyl ether (MTBE) | 1634044 | NA | 800 | 15,000 (X) | 5.9E+6 (C) | 5.9E+6 (C) | 2.5E+7 | 3.9E+7 | 8.7E+7 | 2.0E+11 | 1.8E+6 | 5.9E+6 |
| N-Methyl-morpholine (I) | 109024 | NA | 400 | NA | 3.0E+7 | NLV | NLV | NLV | NLV | ID | 6.1E+5 | 1.1E+8 |
| Methylcyclopentane (I) | 96377 | NA | ID | NA | ID | ID | ID | ID | ID | ID | ID | 3.5E+5 |
| 4,4'-Methylene-bis-2-chloroaniline (MBOCA) | 101144 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 8.4E+7 | 6,800 | NA |
| Methylene chloride | 75092 | NA | 100 | 19,000 (X) | 2.3E+6 (C) | 45,000 | 2.1E+5 | 5.9E+5 | 1.4E+6 | 6.6E+9 | 1.3E+6 | 2.3E+6 |
| 2-Methylnaphthalene | 91576 | NA | [illegible]7,000 | ID | 5.5E+6 | ID | ID | ID | ID | ID | 8.1E+6 | NA |
| Methylphenols (J) | 1319773 | NA | 7,400 | 1,400 | 1.6E+7 | NLV | NLV | NLV | NLV | 6.7E+9 | 1.1E+7 | NA |
| Metolachlor | 51218452 | NA | 4,800 | NA | 4.4E+5 (C) | NLV | NLV | NLV | NLV | ID | 4.4E+5 (C,AD) | 4.4E+5 |
| Mirex | 2385855 | NA | NLL | NLL | NLL | ID | ID | ID | ID | ID | 9,600 | NA |
| Molybdenum (B) | 7439987 | NA | 740 | 16,000 (X) | 1.9E+7 | NLV | NLV | NLV | NLV | ID | 2.6E+6 | NA |
| Naphthalene | 91203 | NA | 35,000 | [illegible]0 | 2.1E+6 | 2.5E+5 | 3.0E+5 | 3.0E+5 | 3.0E+5 | 2.0E+8 | 1.6E+7 | NA |
| Nickel (B) | 7440020 | 20,000 | [illegible]0E+5 | (G) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.3E+7 | 4.0E+7 | NA |
| Nitrate (B,N) | 14797558 | NA | 2.0E+5 (N) | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | ID | NA |
| Nitrite (B,N) | 14797650 | NA | 20,000 (N) | NA | 3.8E+8 | NLV | NLV | NLV | NLV | ID | ID | NA |
| Nitrobenzene (I) | 98953 | NA | 330 (M) | 3,600 (X) | 2.2E+5 | 4.9E+5 (C) | 3.9E+6 | 3.9E+6 | 3.9E+6 | 3.3E+9 | 1.0E+5 | 4.9E+5 |
| 2-Nitrophenol | 88755 | NA | 400 | ID | 1.6E+6 | NLV | NLV | NLV | NLV | ID | 6.3E+5 | NA |
| n-Nitroso-di-n-propylamine | 621647 | NA | 330 (M) | NA | 7,200 | NLV | NLV | NLV | NLV | 1.6E+6 | 1,200 | 1.5E+6 |
| N-Nitrosodiphenylamine | 86306 | NA | 5,400 | NA | 7.0E+5 | NLV | NLV | NLV | NLV | ID | 1.7E+6 | NA |
| Oxamyl | 23135220 | NA | 4,000 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 8.6E+6 | NA |
| Oxo-hexyl acetate | 88230357 | NA | 1,500 | NA | ID | ID | ID | ID | ID | 5.4E+9 | 2.3E+6 | 1.0E+7 |
| Pendimethalin | 40487421 | NA | 1.1E+6 | NA | 1.1E+6 | NLV | NLV | NLV | NLV | ID | 4.6E+7 | NA |
| Pentachlorobenzene | 608935 | NA | 29,000 | NA | 1.9E+5 (C) | ID | ID | ID | ID | ID | 1.9E+5 (C) | 1.9E+5 |
| Pentachloronitrobenzene | 82688 | NA | 37,000 | NA | 37,000 | 1.2E+5 | 2.3E+5 | 2.3E+5 | 2.3E+5 | 3.3E+8 | 1.7E+6 | NA |
| Pentachlorophenol | 87865 | NA | 22 | (G,X) | 4,300 | NLV | NLV | NLV | NLV | 1.0E+8 | 90,000 | NA |
| Pentane | 109660 | NA | ID | NA | ID | 2.4E+5 (C) | 3.7E+7 | ID | ID | 1.2E+12 | ID | 2.4E+5 |
| 2-Pentene (I) | 109682 | NA | ID | NA | ID | ID | ID | ID | ID | ID | ID | 2.2E+5 |
| Phenanthrene | 85018 | NA | 56,000 | [illegible]2,300 | 1.1E+6 | 1.8E+6 | 9,300 | 31,000 | 31,000 | 6.7E+6 | 1.6E+6 | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Phenol | 108952 | NA | 88,000 | 4,200 | 1.2E+7 (C) | NLV | NLV | NLV | NLV | 4.0E+10 | 1.2E+7 (C,AD) | 1.2E+7 |
| Phosphorus (total) | 7723140 | NA | 1.3E+6 | NA | ID | NLV | NLV | NLV | NLV | ID | 1.0E+9 (D) | NA |
| Phthalic acid | 88993 | NA | 2.8E+5 | NA | 1.7E+6 (C) | NLV | NLV | NLV | NLV | ID | 1.7E+6 (C) | 1.7E+6 |
| Phthalic anhydride | 85449 | NA | 3.0E+5 | NA | 1.1E+6 (C) | NLV | NLV | NLV | NLV | ID | 1.1E+6 (C) | 1.1E+6 |
| Picloram | 1918021 | NA | 10,000 | NA | 8.6E+6 | NLV | NLV | NLV | NLV | ID | 1.6E+7 | NA |
| Piperidine | 110894 | NA | 64 | NA | 6.8E+5 | NLV | NLV | NLV | NLV | 9.3E+9 | 99,000 | 1.2E+8 |
| Polybrominated biphenyls (J) | 67774327 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 1,200 | NA |
| Polychlorinated biphenyls (PCBs) (J,T) | 1336363 | NA | NLL | NLL | NLL | 3.0E+6 | 2.4E+5 | 7.9E+6 | 7.9E+6 | 5.2E+6 | (T) | NA |
| Prometon | 1610180 | NA | 4,900 | NA | 5.5E+6 | NLV | NLV | NLV | NLV | ID | 5.0E+6 | NA |
| Propachlor | 1918167 | NA | 1,900 | NA | 8.8E+6 | NLV | NLV | NLV | NLV | ID | 2.9E+6 | NA |
| Propazine | 139402 | NA | 4,000 | NA | 1.7E+5 | NLV | NLV | NLV | NLV | ID | 6.1E+6 | NA |
| Propionic acid | 79094 | NA | 2.4E+5 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 2.0E+10 | 1.1E+8 (C) | 1.1E+8 |
| Propyl alcohol (I) | 71238 | NA | 28,000 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 4.9E+10 | 1.3E+7 (AD) | 1.1E+8 |
| n-Propylbenzene (I) | 103651 | NA | 1,600 | NA | 3.0E+5 | ID | ID | ID | ID | 1.3E+9 | 2.5E+6 | 1.0E+7 |
| Propylene glycol | 57556 | NA | 3.0E+6 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 4.0E+11 | 1.1E+8 (C) | 1.1E+8 |
| Pyrene | 129000 | NA | 4.8E+5 | ID | 4.8E+5 | 1.0E+9 (D) | 6.5E+8 | 6.5E+8 | 6.5E+8 | 6.7E+9 | 2.9E+7 | NA |
| Pyridine (I) | 110861 | NA | 330 (M) | NA | 37,000 (C) | 1,100 | 8,200 | 40,000 | 97,000 | 2.3E+8 | 37,000 (C) | 37,000 |
| Selenium (B) | 7782492 | 410 | 4,000 | 400 | 7.8E+7 | NLV | NLV | NLV | NLV | 1.3E+8 | 2.6E+6 | NA |
| Silver (B) | 7440224 | 1,000 | 4,500 | 500 (M) | 2.0E+8 | NLV | NLV | NLV | NLV | 6.7E+6 | 2.5E+6 | NA |
| Silvex (2,4,5-TP) | 93721 | NA | 3,600 | NA | 3.1E+6 | NLV | NLV | NLV | NLV | ID | 1.7E+6 | NA |
| Simazine | 122349 | NA | 80 | NA | 90,000 | NLV | NLV | NLV | NLV | ID | 1.2E+6 | NA |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| Sodium | 7440235 | NA | 5E+6 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 0E+9 (D) | NA |
| Strontium (B) | 7440246 | NA | 92,000 | 15,000 | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 3.3E+8 | NA |
| Styrene | 100425 | NA | 2,700 | 2,200 | 2.7E+5 | 2.5E+5 | 9.7E+5 | 9.7E+5 | 1.4E+6 | 5.5E+9 | 4.0E+5 | 5.2E+5 |
| Sulfate | 14808798 | NA | 5.0E+6 | NA | ID | NLV | NLV | NLV | NLV | ID | ID | NA |
| Tebuthiuron | 34014181 | NA | 10,000 | NA | 5.0E+7 | NLV | NLV | NLV | NLV | ID | 4.6E+6 (AD) | NA |
| 2,3,7,8-Tetrabromodibenzo-p-dioxin (O) | 50585416 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | (O) | (O) | NA |
| 1,2,4,5-Tetrachlorobenzene | 95943 | NA | 1.5E+6 | 3,400 (X) | 1.5E+6 | ID | ID | ID | ID | ID | 7.7E+7 | NA |
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin (O) | 1746016 | NA | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 71 (O) | 0.09 (O) | NA |
| 1,1,1,2-Tetrachloroethane | 630206 | NA | 1,500 | NA | 4.4E+5 (C) | 6,200 | 36,000 | 54,000 | 1.0E+5 | 4.2E+8 | 4.4E+5 (C) | 4.4E+5 |
| 1,1,2,2-Tetrachloroethane | 79345 | NA | 170 | 1,600 (X) | 94,000 | 4,300 | 10,000 | 10,000 | 14,000 | 5.4E+7 | 53,000 | 8.7E+5 |
| Tetrachloroethylene | 127184 | NA | 100 | 900 (X) | 88,000 (C) | 11,000 | 1.8E+5 | 4.8E+5 | 1.1E+6 | 5.4E+9 | 88,000 (C) | 88,000 |
| Tetrahydrofuran | 109999 | NA | 1,900 | 2.2E+5 (X) | 3.2E+7 | 1.3E+6 | 1.3E+7 | ID | ID | 3.9E+11 | 2.9E+6 | 1.2E+8 |
| Thallium (B) | 7440280 | NA | 2,300 | 4,200 (X) | 1.5E+7 | NLV | NLV | NLV | NLV | ID | 35,000 | NA |
| Toluene (I) | 108883 | NA | 16,000 | 2,800 | 2.5E+5 (C) | 2.5E+5 (C) | 2.8E+6 | 5.1E+6 | 1.2E+7 | 2.7E+10 | 2.5E+5 (C) | 2.5E+5 |
| p-Toluidine | 106490 | NA | 660 (M) | NA | 4.8E+5 | NLV | NLV | NLV | NLV | 1.0E+8 | 94,000 | 1.2E+6 |
| Toxaphene | 8001352 | NA | 24,000 | 860 | 3.6E+5 | NLV | NLV | NLV | NLV | 9.7E+6 | 20,000 | NA |
| Triallate | 2303175 | NA | 95,000 | NA | 2.5E+5 (C) | ID | ID | ID | ID | ID | 2.5E+5 (C) | 2.5E+5 |
| Tributylamine | 102829 | NA | 7,800 | ID | 1.8E+6 | 5.8E+5 | 6.0E+5 | ID | ID | 4.7E+8 | 7.9E+5 | 3.7E+6 |
| 1,2,4-Trichlorobenzene | 120821 | NA | 4,200 | 1,800 | 1.1E+6 | 1.1E+6 (C) | 2.8E+7 | 2.8E+7 | 2.8E+7 | 2.5E+10 | 9.9E+5 (AD) | 1.1E+6 |
| 1,1,1-Trichloroethane | 71556 | NA | 4,000 | 4,000 | 4.6E+5 (C) | 2.5E+5 | 3.8E+6 | 1.2E+7 | 2.8E+7 | 6.7E+10 | 4.6E+5 (C) | 4.6E+5 |
| 1,1,2-Trichloroethane | 79005 | NA | 100 | 6,600 (X) | 4.2E+5 | 4,600 | 17,000 | 21,000 | 44,000 | 1.9E+8 | 1.8E+5 | 9.2E+5 |
| Trichloroethylene | 79016 | NA | 100 | 4,000 (X) | 5.0E+5 (C) | 7,100 | 78,000 | 1.7E+5 | 3.9E+5 | 1.8E+9 | 5.0E+5 (C) | 5.0E+5 |
| Trichlorofluoromethane | 75694 | NA | 52,000 | NA | 5.6E+5 (C) | 5.6E+5 (C) | 9.2E+7 | 6.3E+8 | 1.5E+9 | 3.8E+12 | 5.6E+5 (C) | 5.6E+5 |
| 2,4,5-Trichlorophenol | 95954 | NA | 39,000 | NA | 9.1E+6 | NLV | NLV | NLV | NLV | 2.3E+10 | 2.3E+7 | NA |
| 2,4,6-Trichlorophenol | 88062 | NA | 2,400 | 330 (M) | 2.0E+5 | NLV | NLV | NLV | NLV | 1.0E+9 | 7.1E+5 | NA |
| 1,2,3-Trichloropropane | 96184 | NA | 840 | NA | 8.3E+5 (C) | ID | ID | ID | ID | ID | 8.3E+5 (C) | 8.3E+5 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 76131 | NA | 5.5E+5 (C) | NA | 5.5E+5 (C) | 5.5E+5 (C) | 1.8E+8 | 8.8E+8 | 2.1E+9 | 5.1E+12 | 5.5E+5 (C) | 5.5E+5 |
| Triethanolamine | 102716 | NA | 74,000 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 3.3E+9 | 1.1E+8 | 1.1E+8 |
| Triethylene glycol | 112276 | NA | 2.0E+5 | NA | 1.1E+5 (C) | NLV | NLV | NLV | NLV | ID | 1.1E+5 (C,AD) | 1.1E+5 |
| 3-Trifluoromethyl-4-nitrophenol | 88302 | NA | 1.1E+5 | NA | 1.2E+8 | NLV | NLV | NLV | NLV | ID | 4.1E+7 (AD) | NA |
| Trifluralin | 1582098 | NA | 1.9E+5 | NA | 1.2E+7 | ID | ID | ID | ID | ID | 2.0E+6 | NA |
| 2,2,4-Trimethyl pentane | 540841 | NA | ID | NA | ID | ID | ID | ID | ID | ID | ID | 19,000 |

# ATTACHMENT A
## SOIL: RESIDENTIAL AND COMMERCIAL I



### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

| | | | Groundwater Protection | | | Indoor Air | Ambient Air {Y} | | | | Direct Contact | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #11 | #12 | #13 | #14 | #15 | #16 | #17 | #18 | #19 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Direct Contact Criteria | Soil Saturation Concentration Screening Levels |
| 2,4,4-Trimethyl-2-pentene {I} | 107404 | NA | ID | NA | ID | ID | ID | ID | ID | ID | ID | 56,000 |
| 1,2,4-Trimethylbenzene {I} | 95636 | NA | 2,100 | ID | 1.1E+5 {C} | 1.1E+5 {C} | 2.1E+7 | 5.0E+8 | 5.0E+8 | 8.2E+10 | 1.1E+5 {C} | 1.1E+5 |
| 1,3,5-Trimethylbenzene {I} | 108678 | NA | 1,800 | ID | 94,000 {C} | 94,000 {C} | 1.6E+7 | 3.8E+8 | 3.8E+8 | 8.2E+10 | 94,000 {C} | 94,000 |
| Triphenyl phosphate | 115866 | NA | 1.1E+5 {C} | NA | 1.1E+5 {C} | ID | ID | ID | ID | ID | 1.1E+5 {C} | 1.1E+5 |
| tris(2,3-Dibromopropyl)phosphate | 126727 | NA | 66 | NA | 27,000 {C} | 27,000 {C} | 18,000 | 18,000 | 18,000 | 5.9E+6 | 4,400 | 27,000 |
| Urea | 57136 | NA | ID {N} | NA | ID | NLV | NLV | NLV | NLV | ID | ID | NA |
| Vanadium | 7440622 | NA | 72,000 | 1.9E+5 | 1.0E+9 {D} | NLV | NLV | NLV | NLV | ID | 7.5E+5 | NA |
| Vinyl acetate {I} | 108054 | NA | 13,000 | NA | 2.4E+6 {C} | 7.9E+5 | 1.7E+6 | 2.6E+6 | 5.8E+6 | 1.3E+10 | 2.4E+6 {C,AD} | 2.4E+6 |
| Vinyl chloride | 75014 | NA | 40 | 300 | 11,000 | 28 | 440 | 3,100 | 7,600 | 3.7E+7 | 4,000 | 4.9E+5 |
| White phosphorus {R} | 12185103 | NA | 2.2 | NA | 58,000 | NLV | NLV | NLV | NLV | ID | 2,300 {AD} | NA |
| Xylenes {I} | 1330207 | NA | 5,600 | 700 | 1.5E+5 {C} | 1.5E+5 {C} | 4.6E+7 | 6.1E+7 | 1.3E+8 | 2.9E+11 | 1.5E+5 {C} | 1.5E+5 |
| Zinc {B} | 7440666 | 47,000 | 2.4E+6 | {G} | 1.0E+9 {D} | NLV | NLV | NLV | NLV | ID | 1.7E+8 | NA |

# ATTACHMENT A
## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV
### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



**Developed under the authority of the**
**NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT, 1994 PA 451, AS AMENDED**

Soil criteria were calculated using currently available chemical-specific data and U.S. Environmental Protection Agency risk assessment guidance. Criteria may change for the next annual revision of the criteria tables. All criteria are expressed in units of parts per billion (ppb;ug/Kg). Scientific notation is represented by E+ or E- a value; for example, 2 x $10^6$ is reported as 2.0E+6. Analytical results must be expressed as dry-weight concentrations for comparison to criteria. Please refer to Operational Memorandum #6 for recommended analytical methods and target detection limits.

| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| Acenaphthene | 83329 | NA | 3.0E+5 | 8.8E+5 | 4,400 | 9.7E+5 | 3.5E+8 | 9.7E+7 | 9.7E+7 | 9.7E+7 | 6.2E+9 | 2.0E+8 | 3.6E+8 | 2.6E+8 | NA |
| Acenaphthylene | 208968 | NA | 5,900 | 17,000 | ID | 4.4E+5 | 3.0E+6 | 2.7E+6 | 2.7E+6 | 2.7E+6 | 1.0E+9 | 8.0E+6 | 1.4E+7 | 1.0E+7 | NA |
| Acetaldehyde (I) | 75070 | NA | 19,000 | 54,000 | NA | 1.1E+8 (C) | 4.0E+5 | 2.1E+5 | 2.1E+5 | 2.9E+5 | 2.6E+8 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| Acetic acid | 64197 | NA | 9.0E+5 (M) | 9.0E+5 (M) | 9.0E+5 (M) | 6.5E+8 (C) | NLV | NLV | NLV | NLV | 7.4E+9 | 6.4E+8 | 6.5E+8 (C) | 6.5E+8 (C) | 6.5E+8 |
| Acetone (I) | 67641 | NA | 15,000 | 42,000 | 34,000 | 1.1E+8 (C) | 1.1E+8 (C) | 1.6E+8 | 1.6E+8 | 2.0E+8 | 1.7E+11 | 1.1E+8 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| Acetonitrile | 75058 | NA | 2,800 | 8,000 | NA | 2.2E+7 (C) | 8.8E+6 | 1.9E+6 | 1.9E+6 | 2.2E+6 | 1.8E+9 | 2.1E+7 | 2.2E+7 (C) | 2.2E+7 (C) | 2.2E+7 |
| Acetophenone | 98862 | NA | 30,000 | 88,000 | NA | 1.1E+6 (C) | 1.1E+6 (C) | 5.2E+7 | ID | ID | 1.4E+10 | 1.1E+6 (C) | 1.1E+6 (C) | 1.1E+6 (C) | 1.1E+6 |
| Acrolein (I) | 107028 | NA | 2,400 | 6,600 | NA | 2.3E+7 (C) | 760 | 370 | 370 | 630 | 5.9E+5 | 1.8E+7 | 2.3E+7 (C) | 2.3E+7 | 2.3E+7 |
| Acrylamide | 79061 | NA | 6.0 | 24 | NA | 2.6E+5 | NLV | NLV | NLV | NLV | 3.0E+6 | 13,000 | 24,000 | 17,000 | NA |
| Acrylic acid | 79107 | NA | 78,000 | 2.2E+5 | NA | 1.1E+8 (C) | 5.5E+6 | 2.2E+5 | 2.7E+5 | 2.7E+5 | 2.9E+7 | 1.1E+8 (C,AD) | 1.1E+8 (C,AD) | 1.1E+8 (C,AD) | 1.1E+8 |
| Acrylonitrile (I) | 107131 | NA | 52 | 220 | 98 (X) | 2.8E+5 | 35,000 | 17,000 | 17,000 | 31,000 | 5.8E+7 | 1.1E+5 | 2.0E+5 | 1.5E+5 | 8.3E+6 |
| Alachlor | 15972608 | NA | 52 | 52 | 290 (X) | 44,000 | NLV | NLV | NLV | NLV | ID | 5.3E+5 | 1.3E+6 | 7.8E+5 | NA |
| Aldicarb | 116063 | NA | 60 | 60 | NA | 2.4E+6 | NLV | NLV | NLV | NLV | ID | 1.1E+6 | 2.0E+6 | 1.5E+6 | NA |
| Aldicarb sulfoxide | 1646873 | NA | 80 | 80 | NA | 5.4E+7 | NLV | NLV | NLV | NLV | ID | 1.5E+6 | 2.6E+6 | 1.9E+6 | NA |
| Aldicarb sulfone | 1646884 | NA | 50 (M) | 50 (M) | NA | 4.2E+7 | NLV | NLV | NLV | NLV | ID | 1.2E+6 | 2.2E+6 | 1.6E+6 | NA |
| Aldrin | 309002 | NA | NLL | NLL | NLL | NLL | 7.1E+6 | 2.0E+5 | 2.0E+5 | 2.0E+5 | 8.0E+5 | 5,900 | 15,000 | 8,600 | NA |
| Aluminum (B) | 7429905 | 6.9E+6 | 1,000 | 1,000 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 6.6E+8 (AD) | 8.1E+8 (AD) | 7.3E+8 (AD) | NA |
| Ammonia | 7664417 | NA | ID (N) | ID (N) | (AC) | ID | ID | ID | ID | ID | 2.9E+9 | ID | ID | ID | 1.0E+7 |
| Aniline | 62533 | NA | 1,700 (M) | 4,400 | 1,700 (M) | 2.8E+6 | NLV | NLV | NLV | NLV | 2.9E+7 | 2.3E+6 | 4.2E+6 | 3.0E+6 | 4.5E+6 |
| Anthracene | 120127 | NA | 41,000 | 41,000 | ID | 41,000 | 1.0E+9 (D) | 1.6E+9 | 1.6E+9 | 1.6E+9 | 2.9E+10 | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Antimony | 7440360 | NA | 500 (M) | 4,300 | ID | 4.9E+7 | NLV | NLV | NLV | NLV | 5.9E+6 | 1.2E+6 | 1.4E+6 | 1.3E+6 | NA |
| Arsenic (B) | 7440382 | 5,800 | 23,000 | 23,000 | 70,000 (X) | 2.0E+6 | NLV | NLV | NLV | NLV | 9.1E+5 | 61,000 | 90,000 | 74,000 | NA |
| Asbestos (AB) | 1332214 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.0E+7 (M) | ID | ID | ID | NA |
| Atrazine | 1912249 | NA | 60 | 60 | 150 (X) | 1.1E+5 | NLV | NLV | NLV | NLV | ID | 5.0E+5 (AD) | 9.0E+5 (AD) | 6.6E+5 (AD) | NA |
| Azobenzene | 103333 | NA | 4,200 | 17,000 | NA | 3.0E+5 | 3.2E+7 | 2.1E+6 | ID | ID | 1.3E+8 | 1.0E+6 | 1.8E+6 | 1.3E+6 | NA |

# ATTACHMENT A

## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| Barium | 7440393 | 75,000 | 1.3E+6 | 1.3E+6 | (G,X) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.5E+8 | 2.5E+8 | 2.9E+8 | 2.7E+8 | NA |
| Benzene (I) | 71432 | NA | 100 | 100 | 4,000 (X) | 2.2E+5 | 8,400 | 45,000 | 99,000 | 2.3E+5 | 4.7E+8 | 4.0E+5 (C) | 4.0E+5 (C) | 4.0E+5 (C) | 4.0E+5 |
| Benzidine | 92875 | NA | 1,000 (M) | 1,000 (M) | ID | 1,000 (M) | NLV | NLV | NLV | NLV | 59,000 | 1,000 (M) | 1,000 (M) | 1,000 (M) | NA |
| Benzo(a)anthracene (Q) | 56553 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 1.0E+5 | 3.0E+5 | 1.6E+5 | NA |
| Benzo(b)fluoranthene (Q) | 205992 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 1.0E+5 | 3.0E+5 | 1.6E+5 | NA |
| Benzo(k)fluoranthene (Q) | 207089 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 1.0E+6 | 3.0E+6 | 1.6E+6 | NA |
| Benzo(g,h,i)perylene | 191242 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 3.5E+8 | 9.1E+6 | 2.7E+7 | 1.4E+7 | NA |
| Benzo(a)pyrene (Q) | 50328 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.9E+6 | 10,000 | 30,000 | 16,000 | NA |
| Benzoic acid | 65850 | NA | 6.4E+5 | 1.8E+6 | NA | 7.0E+7 | NLV | NLV | NLV | NLV | ID | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Benzyl alcohol | 100516 | NA | 2.0E+5 | 5.8E+5 | NA | 5.8E+6 (C) | NLV | NLV | NLV | NLV | 1.5E+11 | 5.8E+6 (C) | 5.8E+6 (C) | 5.8E+6 (C) | 5.8E+6 |
| Benzyl chloride | 100447 | NA | 200 (M) | 640 | NA | 72,000 | 33,000 | 48,000 | 48,000 | 52,000 | 7.8E+7 | 2.3E+5 (C) | 2.3E+5 (C) | 2.3E+5 (C) | 2.3E+5 |
| Beryllium | 7440417 | NA | 51,000 | 51,000 | (G) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 5.9E+5 | 3.1E+6 | 3.1E+6 | 3.1E+6 | NA |
| bis(2-Chloroethoxy)ethane | 112265 | NA | ID | ID | NA | ID | NLV | NLV | NLV | NLV | ID | ID | ID | ID | 2.7E+6 |
| bis(2-Chloroethyl)ether (I) | 111444 | NA | 330 (M) | 330 (M) | NA | 1.1E+5 | 44,000 | 13,000 | 13,000 | 13,000 | 1.2E+7 | 89,000 | 1.6E+5 | 1.2E+5 | 2.2E+6 |
| bis(2-Ethylhexyl)phthalate | 117817 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 8.9E+8 | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 |
| Boron (B) | 7440428 | NA | 10,000 | 10,000 | 38,000 | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 6.4E+8 (AD) | 7.8E+8 (AD) | 7.1E+8 (AD) | NA |
| Bromobenzene (I) | 108861 | NA | 550 | 1,500 | NA | 3.6E+5 | 5.8E+5 | 5.4E+5 | 5.4E+5 | 5.4E+5 | 2.4E+8 | 7.6E+5 (C) | 7.6E+5 (C) | 7.6E+5 (C) | 7.6E+5 |
| Bromodichloromethane | 75274 | NA | 2,000 (W) | 2,000 (W) | ID | 2.8E+5 | 6,400 | 31,000 | 31,000 | 57,000 | 1.1E+8 | 7.5E+5 | 1.3E+6 | 9.7E+5 | 1.5E+6 |
| Bromoform | 75252 | NA | 2,000 (W) | 2,000 (W) | ID | 8.7E+5 (C) | 7.7E+5 | 3.1E+6 | 3.1E+6 | 3.1E+6 | 3.6E+9 | 8.7E+5 (C) | 8.7E+5 (C) | 8.7E+5 (C) | 8.7E+5 |
| Bromomethane | 74839 | NA | 200 | 580 | 700 | 1.4E+6 | 1,600 | 13,000 | 57,000 | 1.4E+5 | 1.5E+8 | 1.6E+6 | 2.2E+6 (C) | 2.0E+6 | 2.2E+6 |
| n-Butanol (I) | 71363 | NA | 19,000 | 54,000 | NA | 8.7E+6 (C) | NLV | NLV | NLV | NLV | 1.0E+10 | 8.7E+6 (C) | 8.7E+6 (C) | 8.7E+6 (C) | 8.7E+6 |
| 2-Butanone (MEK) (I) | 78933 | NA | 2.6E+5 | 7.6E+5 | 44,000 | 2.7E+7 (C) | 2.7E+7 (C) | 3.5E+7 | 3.5E+7 | 3.6E+7 | 2.9E+10 | 2.7E+7 (C,AD) | 2.7E+7 (C,AD) | 2.7E+7 (C,AD) | 2.7E+7 |
| n-Butyl acetate | 123864 | NA | 11,000 | 32,000 | NA | 1.1E+6 (C) | 1.1E+6 (C) | 1.4E+8 | 3.1E+8 | 3.5E+8 | 2.1E+11 | 1.1E+6 (C) | 1.1E+6 (C) | 1.1E+6 (C) | 1.1E+6 |
| t-Butyl alcohol | 75650 | NA | 78,000 | 2.2E+5 | NA | 1.1E+8 (C) | 1.1E+8 (C) | 1.2E+8 | ID | ID | 5.6E+10 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| Butyl benzyl phthalate | 85687 | NA | 3.1E+5 (C) | 3.1E+5 (C) | 26,000 (X) | 3.1E+5 (C) | NLV | NLV | NLV | NLV | 2.1E+10 | 3.1E+5 (C) | 3.1E+5 (C) | 3.1E+5 (C) | 3.1E+5 |
| n-Butylbenzene | 104518 | NA | 1,600 | 4,600 | NA | 1.2E+5 | ID | ID | ID | ID | ID | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 |
| sec-Butylbenzene | 135988 | NA | 1,600 | 4,600 | NA | 88,000 | ID | ID | ID | ID | ID | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 |
| tert-Butylbenzene (I) | 98066 | NA | 1,600 | 4,600 | NA | 1.8E+5 | ID | ID | ID | ID | ID | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 |
| Cadmium (B) | 7440439 | 1,200 | 6,000 | 6,000 | (G,X) | 2.3E+8 | NLV | NLV | NLV | NLV | 2.2E+6 | 4.1E+6 | 4.2E+6 | 4.1E+6 | NA |
| Camphene (I) | 79925 | NA | ID | ID | NA | ID | ID | ID | ID | ID | ID | ID | ID | ID | NA |
| Caprolactam | 105602 | NA | 1.2E+5 | 3.4E+5 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 2.9E+8 | 4.5E+8 (AD) | 9.4E+8 (AD) | 6.2E+8 (AD) | NA |

# ATTACHMENT A

## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| Carbaryl | 63252 | NA | 14,000 | 40,000 | NA | 2.6E+6 | ID | ID | ID | ID | ID | 1.1E+8 | 1.9E+8 | 1.4E+8 | NA |
| Carbazole | 86748 | NA | 9,400 | 39,000 | 1,100 | 8.2E+5 | NLV | NLV | NLV | NLV | ID | 3.7E+6 | 6.7E+6 | 4.9E+6 | NA |
| Carbofuran | 1563662 | NA | 800 | 800 | NA | 6.8E+6 | NLV | NLV | NLV | NLV | ID | 5.6E+6 | 1.0E+7 | 7.3E+6 | NA |
| Carbon disulfide (I,R) | 75150 | NA | 16,000 | 46,000 | ID | 2.8E+5 (C) | 1.4E+5 | 1.6E+6 | 8.0E+6 | 1.9E+7 | 2.1E+10 | 2.8E+5 (C,AD) | 2.8E+5 (C,AD) | 2.8E+5 (C,AD) | 2.8E+5 |
| Carbon tetrachloride | 56235 | NA | 100 | 100 | 900 (X) | 92,000 | 990 | 12,000 | 34,000 | 79,000 | 1.7E+8 | 3.9E+5 (C) | 3.9E+5 (C) | 3.9E+5 (C) | 3.9E+5 |
| Chlordane (J) | 57749 | NA | NLL | NLL | NLL | NLL | 5.9E+7 | 4.2E+6 | 4.2E+6 | 4.2E+6 | 2.1E+7 | 2.4E+5 | 3.8E+5 | 3.0E+5 | NA |
| Chloride | 16887006 | NA | 5.0E+6 | 5.0E+6 | 2.5E+6 (X) | ID | NLV | NLV | NLV | NLV | ID | 5.0E+5 (F) | 5.0E+5 (F) | 5.0E+5 (F) | NA |
| Chlorobenzene (I) | 108907 | NA | 2,000 | 2,000 | 940 | 2.6E+5 (C) | 2.2E+5 | 9.2E+5 | 1.1E+6 | 2.1E+6 | 2.1E+9 | 2.6E+5 (C) | 2.6E+5 (C) | 2.6E+5 (C) | 2.6E+5 |
| 1-Chloro-1,1-difluoroethane | 75683 | NA | 3.0E+5 | 8.8E+5 | NA | 9.6E+5 (C) | 9.6E+5 (C) | 9.4E+7 | ID | ID | 1.5E+12 | 9.6E+5 (C) | 9.6E+5 (C) | 9.6E+5 (C) | 9.6E+5 |
| Chloroethane | 75003 | NA | 8,600 | 34,000 | ID | 9.5E+5 (C) | 9.5E+5 (C) | 3.6E+7 | 1.2E+8 | 2.8E+8 | 2.9E+11 | 9.5E+5 (C) | 9.5E+5 (C) | 9.5E+5 (C) | 9.5E+5 |
| 2-Chloroethyl vinyl ether | 110758 | NA | ID | ID | NA | ID | ID | ID | ID | ID | ID | ID | ID | ID | 1.9E+6 |
| Chloroform | 67663 | NA | 2,000 (W) | 2,000 (W) | 3,400 (X) | 1.5E+6 (C) | 38,000 | 1.5E+5 | 3.4E+5 | 7.9E+5 | 1.6E+9 | 1.5E+6 (C) | 1.5E+6 (C) | 1.5E+6 (C) | 1.5E+6 |
| Chloromethane (I) | 74873 | NA | 5,200 | 22,000 | ID | 1.1E+6 (C) | 12,000 | 1.4E+5 | 1.2E+6 | 2.9E+6 | 6.1E+9 | 1.1E+6 (C) | 1.1E+6 (C) | 1.1E+6 (C) | 1.1E+6 |
| 4-Chloro-3-methylphenol | 59507 | NA | 5,800 | 16,000 | NA | 3.0E+6 | NLV | NLV | NLV | NLV | ID | 2.2E+7 | 4.0E+7 | 2.9E+7 | NA |
| beta-Chloronaphthalene | 91587 | NA | 6.2E+5 | 1.8E+6 | NA | 2.3E+6 | ID | ID | ID | ID | ID | 2.8E+8 | 5.0E+8 | 3.6E+8 | NA |
| 2-Chlorophenol | 95578 | NA | 900 | 2,600 | 440 | 1.9E+6 | ID | ID | ID | ID | ID | 6.9E+6 | 1.2E+7 | 9.0E+6 | 1.9E+7 |
| o-Chlorotoluene (I) | 95498 | NA | 3,300 | 9,300 | NA | 5.0E+5 (C) | 5.0E+5 (C) | ID | ID | ID | 7.6E+10 | 5.0E+5 (C) | 5.0E+5 (C) | 5.0E+5 (C) | 5.0E+5 |
| Chlorpyrifos | 2921882 | NA | 17,000 | 48,000 | NA | 8.4E+5 | 240 | 5,500 | ID | ID | 5.9E+7 | 4.6E+7 | 1.2E+8 | 6.7E+7 | NA |
| Chromium (III)(B,H) | 16065831 | 18,000 (total) | 1.0E+9 (D) | 1.0E+9 (D) | (G,X) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.5E+8 | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Chromium (VI) | 18540299 | 18,000 (total) | 30,000 | 30,000 | 3,300 | 1.4E+8 | NLV | NLV | NLV | NLV | 2.4E+5 | 1.7E+7 | 2.0E+7 | 1.8E+7 | NA |
| Chrysene (Q) | 218019 | NA | NLL | NLL | NLL | NLL | ID | ID | ID | ID | ID | 1.0E+7 | 3.0E+7 | 1.6E+7 | NA |
| Cobalt | 7440484 | 6,800 | 800 | 2,000 | 2,000 | 4.8E+7 | NLV | NLV | NLV | NLV | 5.9E+6 | 1.8E+7 | 2.1E+7 | 1.9E+7 | NA |
| Copper | 7440508 | 32,000 | 5.8E+6 | 5.8E+6 | (G) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 5.9E+7 | 1.4E+8 | 1.6E+8 | 1.5E+8 | NA |
| Cyanazine | 21725462 | NA | 500 (M) | 500 (M) | 1,100 (X) | 56,000 | NLV | NLV | NLV | NLV | ID | 1.0E+5 | 1.8E+5 | 1.3E+5 | NA |
| Cyanide (R) | 57125 | 390 (Total) | 4,000 (P) | 4,000 (P) | 400 (P) | 2.5E+5 (P) | NLV | NLV | NLV | NLV | 2.5E+5 (P) | 2.5E+5 (P) | 2.5E+5 (P) | 2.5E+5 (P) | NA |
| Cyclohexanone | 108941 | NA | 5.2E+6 | 1.5E+7 | NA | 2.2E+8 (C) | 32,000 | 1.3E+6 | ID | ID | 2.9E+10 | 2.2E+8 (C) | 2.2E+8 (C) | 2.2E+8 (C) | 2.2E+8 |
| Dacthal | 1861321 | NA | 50,000 | 1.4E+5 | NA | 3.4E+5 | NLV | NLV | NLV | NLV | ID | 1.1E+7 | 2.0E+7 | 1.5E+7 | NA |
| Dalapon | 75990 | NA | 4,000 | 4,000 | NA | 5.9E+7 (C) | NLV | NLV | NLV | NLV | ID | 5.9E+7 (C) | 5.9E+7 (C) | 5.9E+7 (C) | 5.9E+7 |
| 4-4'-DDD | 72548 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 5.6E+7 | 5.4E+5 | 1.4E+6 | 7.9E+5 | NA |
| 4-4'-DDE | 72559 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 4.0E+7 | 2.6E+5 | 6.4E+5 | 3.7E+5 | NA |
| 4-4'-DDT | 50293 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 4.0E+7 | 4.6E+5 | 6.8E+5 | 5.5E+5 | NA |

# ATTACHMENT A

## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air {Y} | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| Decabromodiphenyl ether | 1163195 | NA | 1.4E+5 | 1.4E+5 | NA | 1.4E+5 | 1.0E+9 {D} | 1.0E+8 | ID | ID | 1.0E+9 | 1.5E+7 | 3.8E+7 | 2.2E+7 | NA |
| Di-n-butyl phthalate | 84742 | NA | 7.6E+5 {C} | 7.6E+5 {C} | 11,000 | 7.6E+5 {C} | NLV | NLV | NLV | NLV | 1.5E+9 | 7.6E+5 {C} | 7.6E+5 {C} | 7.6E+5 {C} | 7.6E+5 |
| Di(2-ethylhexyl) adipate | 103231 | NA | 9.6E+5 {C} | 9.6E+5 {C} | NA | 9.6E+5 {C} | NLV | NLV | NLV | NLV | 1.2E+10 | 9.6E+5 {C,AD} | 9.6E+5 {C,AD} | 9.6E+5 {C,AD} | 9.6E+5 |
| Di-n-octyl phthalate | 117840 | NA | 1.0E+8 | 1.4E+8 {C} | ID | 1.4E+8 {C} | NLV | NLV | NLV | NLV | ID | 2.8E+7 | 6.9E+7 | 4.0E+7 | 1.4E+8 |
| Diacetone alcohol {I} | 123422 | NA | ID | ID | NA | ID | NLV | NLV | NLV | NLV | 7.1E+10 | ID | ID | ID | 1.1E+8 |
| Diazinon | 333415 | NA | 95 | 280 | NA | 95,000 | NLV | NLV | NLV | NLV | ID | 1.0E+5 {AD} | 2.1E+5 {AD} | 1.4E+5 {AD} | 3.1E+5 |
| Dibenzo(a,h)anthracene {Q} | 53703 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 10,000 | 30,000 | 16,000 | NA |
| Dibenzofuran | 132649 | NA | ID | ID | 1,700 | ID | ID | ID | ID | ID | ID | ID | ID | ID | NA |
| Dibromochloromethane | 124481 | NA | 2,000 {W} | 2,000 {W} | ID | 3.6E+5 | 21,000 | 80,000 | 80,000 | 98,000 | 1.6E+8 | 6.1E+5 {C} | 6.1E+5 {C} | 6.1E+5 {C} | 6.1E+5 |
| Dibromochloropropane | 96128 | NA | 4.0 | 4.0 {M} | NA | 1,200 {C} | 1,200 {C} | 1.5E+4 | ID | ID | 5.9E+6 | 1,200 {C} | 1,200 {C} | 1,200 {C} | 1,200 |
| Dibromomethane | 74953 | NA | 1,600 | 4,600 | NA | 2.0E+6 {C} | ID | ID | ID | ID | ID | 2.0E+6 {C} | 2.0E+6 {C} | 2.0E+6 {C} | 2.0E+6 |
| 1,2-Dichlorobenzene | 95501 | NA | 14,000 | 14,000 | 360 | 2.1E+5 {C} | 2.1E+5 {C} | 4.6E+7 | 4.6E+7 | 5.5E+7 | 4.4E+10 | 2.1E+5 {C} | 2.1E+5 {C} | 2.1E+5 {C} | 2.1E+5 |
| 1,3-Dichlorobenzene | 541731 | NA | 170 | 480 | 1,100 | 51,000 | ID | ID | ID | ID | ID | 1.7E+5 {C} | 1.7E+5 {C} | 1.7E+5 {C} | 1.7E+5 |
| 1,4-Dichlorobenzene | 106467 | NA | 1,700 | 1,700 | 290 | 1.4E+5 | 1.0E+5 | 2.6E+5 | 2.6E+5 | 3.4E+5 | 5.7E+8 | 2.9E+6 | 5.1E+6 | 3.7E+6 | NA |
| 3,3'-Dichlorobenzidine | 91941 | NA | 2,000 {M} | 2,000 {M} | 2,000 {M,X} | 4,600 | NLV | NLV | NLV | NLV | 8.2E+6 | 47,000 | 83,000 | 61,000 | NA |
| Dichlorodifluoromethane | 75718 | NA | 95,000 | 2.7E+5 | ID | 1.0E+6 {C} | 1.0E+6 {C} | 6.3E+7 | 5.5E+8 | 1.4E+9 | 1.5E+12 | 1.0E+6 {C} | 1.0E+6 {C} | 1.0E+6 {C} | 1.0E+6 |
| 1,1-Dichloroethane | 75343 | NA | 18,000 | 50,000 | ID | 8.9E+5 {C} | 4.3E+5 | 2.5E+6 | 6.0E+6 | 1.4E+7 | 1.5E+10 | 8.9E+5 {C} | 8.9E+5 {C} | 8.9E+5 {C} | 8.9E+5 |
| 1,2-Dichloroethane {I} | 107062 | NA | 100 | 100 | 7,200 {X} | 3.8E+5 | 11,000 | 21,000 | 33,000 | 74,000 | 1.5E+8 | 6.4E+5 | 1.1E+6 | 8.4E+5 | 1.2E+6 |
| 1,1-Dichloroethylene {I} | 75354 | NA | 140 | 140 | 1,300 {X} | 2.2E+5 | 330 | 3,700 | 15,000 | 37,000 | 7.8E+7 | 5.7E+5 {C} | 5.7E+5 {C} | 5.7E+5 {C} | 5.7E+5 |
| cis-1,2-Dichloroethylene | 156592 | NA | 1,400 | 1,400 | ID | 6.4E+5 {C} | 42,000 | 2.1E+5 | 4.3E+5 | 1.0E+6 | 1.0E+9 | 6.4E+5 {C} | 6.4E+5 {C} | 6.4E+5 {C} | 6.4E+5 |
| trans-1,2-Dichloroethylene | 156605 | NA | 2,000 | 2,000 | ID | 1.4E+6 {C} | 43,000 | 3.3E+5 | 8.4E+5 | 2.0E+6 | 2.1E+9 | 1.4E+6 {C} | 1.4E+6 {C} | 1.4E+6 {C} | 1.4E+6 |
| 2,6-Dichloro-4-nitroaniline | 99309 | NA | 44,000 | 1.3E+5 | NA | 1.4E+5 | NLV | NLV | NLV | NLV | ID | 3.4E+8 | 6.0E+8 | 4.4E+8 | NA |
| 2,4-Dichlorophenol | 120832 | NA | 1,500 | 4,200 | 380 | 9.6E+5 | NLV | NLV | NLV | NLV | 2.3E+9 | 1.8E+6 {C,AD} | 1.8E+6 {C,AD} | 1.8E+6 {C,AD} | 1.8E+6 |
| 2,4-Dichlorophenoxyacetic acid | 94757 | NA | 1,400 | 1,400 | 4,400 | 2.4E+6 | NLV | NLV | NLV | NLV | 2.9E+9 | 1.5E+7 | 2.0E+7 | 1.7E+7 | NA |
| 1,2-Dichloropropane {I} | 78875 | NA | 100 | 100 | 5,800 {X} | 3.2E+5 | 7,400 | 30,000 | 51,000 | 1.2E+5 | 1.2E+8 | 5.5E+5 {C} | 5.5E+5 {C} | 5.5E+5 {C} | 5.5E+5 |
| 1,3-Dichloropropene | 542756 | NA | 420 | 1,300 | NA | 2.6E+5 | 10 {M} | 31 | 100 | 240 | 5.0E+5 | 6.2E+5 {C} | 6.2E+5 {C} | 6.2E+5 {C} | 6.2E+5 |
| Dichlorovos | 62737 | NA | 50 {M} | 130 | NA | 1.2E+5 | NLV | NLV | NLV | NLV | 1.5E+7 | 72,000 | 1.3E+5 | 93,000 | 2.2E+6 |
| Dicyclohexyl phthalate | 84617 | NA | ID | ID | NA | ID | ID | ID | ID | ID | ID | ID | ID | ID | NA |
| Dieldrin | 60571 | NA | NLL | NLL | NLL | NLL | 7.2E+5 | 64,000 | 64,000 | 64,000 | 8.5E+5 | 6,400 | 16,000 | 9,300 | NA |
| Diethyl ether | 60297 | NA | 200 | 200 | ID | 7.4E+6 {C} | 7.4E+6 {C} | 1.0E+8 | 1.6E+8 | 3.5E+8 | 3.5E+11 | 7.4E+6 {C} | 7.4E+6 {C} | 7.4E+6 {C} | 7.4E+6 |
| Diethyl phthalate | 84662 | NA | 1.1E+5 | 3.2E+5 | NA | 7.4E+5 {C} | NLV | NLV | NLV | NLV | 1.5E+9 | 7.4E+5 {C} | 7.4E+5 {C} | 7.4E+5 {C} | 7.4E+5 |

# ATTACHMENT A
## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV
### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| Diethylene glycol monobutyl ether | 112345 | NA | 1,800 | 5,000 | NA | 8.0E+7 | NLV | NLV | NLV | NLV | 5.9E+8 | 1.3E+7 | 2.4E+7 | 1.7E+7 | 1.1E+8 |
| Diisopropyl ether | 108203 | NA | 600 | 1,300 (C) | NA | 1,300 (C) | ID | ID | ID | ID | ID | 1,300 (C) | 1,300 (C) | 1,300 (C) | 1,300 |
| Diisopropylamine (I) | 108189 | NA | 110 | 320 | NA | 4.2E+5 | ID | ID | ID | ID | ID | 8.6E+5 | 1.5E+6 | 1.1E+6 | 6.7E+6 |
| Dimethyl phthalate | 131113 | NA | 7.9E+5 (C) | 7.9E+5 (C) | NA | 7.9E+5 (C) | NLV | NLV | NLV | NLV | 1.5E+9 | 7.9E+5 (C) | 7.9E+5 (C) | 7.9E+5 (C) | 7.9E+5 |
| N,N-Dimethylacetamide | 127195 | NA | 3,600 | 10,000 | 82,000 (X) | 1.1E+8 (C) | NLV | NLV | NLV | NLV | ID | 2.8E+7 | 5.0E+7 | 3.6E+7 | 1.1E+8 |
| N,N-Dimethylaniline | 121697 | NA | 320 | 920 | NA | 4.0E+5 | 8.0E+5 (C) | 5.2E+5 | ID | ID | 3.3E+8 | 8.0E+5 (C) | 8.0E+5 (C) | 8.0E+5 (C) | 8.0E+5 |
| Dimethylformamide (I) | 68122 | NA | 14,000 | 40,000 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 8.8E+8 | 1.1E+8 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| 2,4-Dimethylphenol | 105679 | NA | 7,400 | 20,000 | 7,600 | 1.0E+7 | NLV | NLV | NLV | NLV | 2.1E+9 | 5.6E+7 | 1.0E+8 | 7.3E+7 | NA |
| 2,6-Dimethylphenol | 576261 | NA | 330 (M) | 330 (M) | NA | 1.3E+5 | NLV | NLV | NLV | NLV | ID | 6.7E+5 | 1.2E+6 | 8.7E+5 | NA |
| 3,4-Dimethylphenol | 95658 | NA | 330 (M) | 580 | NA | 3.6E+5 | NLV | NLV | NLV | NLV | ID | 1.6E+6 | 2.8E+6 | 2.0E+6 | NA |
| Dimethylsulfoxide | 67685 | NA | 4.4E+6 | 1.3E+7 | 3.8E+6 | 1.8E+7 (C) | NLV | NLV | NLV | NLV | ID | 1.8E+7 (C) | 1.8E+7 (C) | 1.8E+7 (C) | 1.8E+7 |
| 2,4-Dinitrotoluene | 121142 | NA | 430 | 640 | NA | 1.7E+5 | NLV | NLV | NLV | NLV | 2.0E+7 | 3.4E+5 | 6.1E+5 | 4.4E+5 | NA |
| Dinoseb | 88857 | NA | 300 | 300 | NA | 1.4E+5 (C) | ID | ID | ID | ID | ID | 1.4E+5 (C,AD) | 1.4E+5 (C,AD) | 1.4E+5 (C,AD) | 1.4E+5 |
| 1,4-Dioxane (I) | 123911 | NA | 1,700 | 7,000 | 56,000 | 3.4E+7 | NLV | NLV | NLV | NLV | 7.1E+8 | 3.7E+6 | 6.7E+6 | 4.9E+6 | 9.7E+7 |
| Diquat | 85007 | NA | 400 | 400 | NA | 1.4E+7 | NLV | NLV | NLV | NLV | ID | 2.5E+6 | 4.4E+6 | 3.2E+6 | NA |
| Diuron | 330541 | NA | 620 | 1,800 | NA | 7.4E+5 | NLV | NLV | NLV | NLV | 2.1E+8 | 4.8E+6 | 8.6E+6 | 6.3E+6 | NA |
| Endosulfan (J) | 115297 | NA | NLL | NLL | NLL | NLL | ID | ID | ID | ID | ID | 6.7E+6 | 1.2E+7 | 8.7E+6 | NA |
| Endothall | 145733 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.0E+9 | 1.9E+7 | 3.4E+7 | 2.5E+7 | NA |
| Endrin | 72208 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 2.6E+5 | 6.5E+5 | 3.8E+5 | NA |
| Epichlorohydrin (I) | 106898 | NA | 100 | 120 | NA | 2.2E+5 | 1.2E+5 | 37,000 | 37,000 | 37,000 | 2.9E+7 | 63,000 | 1.1E+5 | 82,000 | 7.3E+6 |
| Ethanol (I) | 64175 | NA | 3.8E+7 | 7.6E+7 | IP | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 5.6E+11 | 1.1E+8 (C,AD) | 1.1E+8 (C,AD) | 1.1E+8 (C,AD) | 1.1E+8 |
| Ethyl acetate (I) | 141786 | NA | 1.3E+5 | 3.8E+5 | NA | 7.5E+6 (C) | 7.5E+6 (C) | 5.9E+7 | 5.9E+7 | 1.0E+8 | 9.4E+10 | 7.5E+6 (C) | 7.5E+6 (C) | 7.5E+6 (C) | 7.5E+6 |
| Ethylbenzene (I) | 100414 | NA | 1,500 | 1,500 | 360 | 1.4E+5 (C) | 1.4E+5 (C) | 1.1E+7 | 1.4E+7 | 3.0E+7 | 2.9E+10 | 1.4E+5 (C) | 1.4E+5 (C) | 1.4E+5 (C) | 1.4E+5 |
| Ethylene dibromide | 106934 | NA | 10 (M) | 10 (M) | 20 | 500 | 3,600 | 5,800 | 5,800 | 9,800 | 1.8E+7 | 660 | 1,200 | 850 | 8.9E+5 |
| Ethylene glycol | 107211 | NA | 3.0E+5 | 8.4E+5 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 2.9E+10 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| Ethylene glycol monobutyl ether | 111762 | NA | 74,000 | 2.0E+5 | NA | 4.1E+7 (C) | 1.4E+6 | 2.1E+7 | 1.5E+8 | 3.6E+8 | 3.8E+11 | 4.1E+7 (C) | 4.1E+7 (C) | 4.1E+7 (C) | 4.1E+7 |
| Fluoranthene | 206440 | NA | 7.3E+5 | 7.3E+5 | 5,500 | 7.3E+5 | 1.0E+9 (D) | 8.9E+8 | 8.8E+8 | 8.8E+8 | 4.1E+9 | 1.8E+8 | 4.6E+8 | 2.7E+8 | NA |
| Fluorene | 86737 | NA | 3.9E+5 | 8.9E+5 | 5,300 | 8.9E+5 | 1.0E+9 (D) | 1.5E+8 | 1.5E+8 | 1.5E+8 | 4.1E+9 | 1.3E+8 | 2.4E+8 | 1.7E+8 | NA |
| Fluorine (soluble fluoride) (B) | 7782414 | NA | 40,000 | 40,000 | NA | 2.4E+8 | NLV | NLV | NLV | NLV | ID | 1.2E+8 (AD) | 1.5E+8 (AD) | 1.3E+8 (AD) | NA |
| Formaldehyde | 50000 | NA | 26,000 | 76,000 | 2,400 | 6.0E+7 (C) | 65,000 | 43,000 | 69,000 | 1.5E+5 | 3.0E+8 | 6.0E+7 (C) | 6.0E+7 (C) | 6.0E+7 (C) | 6.0E+7 |
| Formic acid (I,U) | 64186 | NA | 9.0E+5 (M) | 9.0E+5 (M) | ID | 1.1E+8 (C) | 2.8E+6 | 9.0E+5 (M) | 9.0E+5 (M) | 9.0E+5 (M) | 5.9E+7 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |

# ATTACHMENT A

## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| 1-Formylpiperidine | 2591868 | NA | 1,600 | 4,600 | NA | ID | ID | ID | ID | ID | ID | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 |
| Gentian violet | 548629 | NA | 300 | 1,300 | NA | 2.0E+7 | NLV | NLV | NLV | NLV | ID | 6.8E+5 | 1.2E+6 | 8.8E+5 | NA |
| Glyphosate | 1071836 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 7.4E+7 (AD) | 2.2E+8 (AD) | 1.1E+8 (AD) | NA |
| Heptachlor | 76448 | NA | NLL | NLL | NLL | NLL | 1.9E+6 | 2.1E+5 | 2.1E+5 | 2.1E+5 | 3.0E+6 | 32,000 | 80,000 | 47,000 | NA |
| Heptachlor epoxide | 1024573 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.5E+6 | 13,000 | 33,000 | 19,000 | NA |
| n-Heptane | 142825 | NA | 2.4E+5 (C) | 2.4E+5 (C) | NA | 2.4E+5 (C) | 2.4E+5 (C) | 2.5E+7 | ID | ID | 1.0E+11 | 2.4E+5 (C) | 2.4E+5 (C) | 2.4E+5 (C) | 2.4E+5 |
| Hexabromobenzene | 87821 | NA | 3.2E+5 | 3.2E+5 | ID | 3.2E+5 | ID | ID | ID | ID | ID | 4.3E+6 | 1.1E+7 | 6.3E+6 | NA |
| Hexachlorobenzene (C-66) | 118741 | NA | 1,800 | 1,800 | ID | 8,200 | 2.2E+5 | 56,000 | 56,000 | 56,000 | 8.5E+6 | 51,000 | 1.3E+5 | 75,000 | NA |
| Hexachlorobutadiene (C-46) | 87683 | NA | 26,000 | 72,000 | 330 (M) | 3.5E+5 (C) | 3.5E+5 (C) | 4.6E+5 | 4.6E+5 | 4.6E+5 | 1.8E+8 | 3.5E+5 (C) | 3.5E+5 (C) | 3.5E+5 (C) | 3.5E+5 |
| alpha-Hexachlorocyclohexane | 319846 | NA | 18 | 71 | NA | 2,500 | 1.6E+5 | 41,000 | 86,000 | 86,000 | 2.1E+6 | 19,000 | 33,000 | 24,000 | NA |
| beta-Hexachlorocyclohexane | 319857 | NA | 37 | 150 | NA | 5,100 | NLV | NLV | NLV | NLV | 7.4E+6 | 38,000 | 69,000 | 50,000 | NA |
| Hexachlorocyclopentadiene (C-56) | 77474 | NA | 3.2E+5 | 3.2E+5 | ID | 7.2E+5 (C) | ID | ID | ID | ID | ID | 7.2E+5 (C) | 7.2E+5 (C) | 7.2E+5 (C) | 7.2E+5 |
| Hexachloroethane | 67721 | NA | 430 | 1,200 | 1,800 (X) | 1.1E+5 | 79,000 | 6.6E+5 | 1.4E+6 | 1.4E+6 | 1.0E+8 | 1.1E+6 | 2.0E+6 | 1.5E+6 | NA |
| n-Hexane | 110543 | NA | 44,000 (C) | 44,000 (C) | NA | 44,000 (C) | 44,000 (C) | 3.5E+6 | ID | ID | 5.9E+9 | 44,000 (C) | 44,000 (C) | 44,000 (C) | 44,000 |
| 2-Hexanone | 591786 | NA | 20,000 | 58,000 | NA | 2.5E+6 (C) | 1.8E+6 | 1.3E+6 | ID | ID | 1.2E+9 | 2.5E+6 (C) | 2.5E+6 (C) | 2.5E+6 (C) | 2.5E+6 |
| Indeno(1,2,3-cd)pyrene (Q) | 193395 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 1.0E+5 | 3.0E+5 | 1.6E+5 | NA |
| Iron (B) | 7439896 | 1.2E+7 | 6,000 | 6,000 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Isobutyl alcohol (I) | 78831 | NA | 46,000 | 1.3E+5 | NA | 8.9E+6 (C) | 8.9E+6 (C) | 9.5E+7 | 9.5E+7 | 9.5E+7 | 4.4E+10 | 8.9E+6 (C) | 8.9E+6 (C) | 8.9E+6 (C) | 8.9E+6 |
| Isophorone | 78591 | NA | 15,000 | 62,000 | 11,000 (X) | 2.4E+6 (C) | NLV | NLV | NLV | NLV | 8.2E+9 | 2.4E+6 (C) | 2.4E+6 (C) | 2.4E+6 (C) | 2.4E+6 |
| Isopropyl alcohol (I) | 67630 | NA | 9,400 | 26,000 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 6.5E+9 | 7.2E+7 | 1.1E+8 (C) | 9.3E+7 | 1.1E+8 |
| Isopropyl benzene | 98828 | NA | 91,000 | 2.6E+5 | ID | 3.9E+5 (C) | 3.9E+5 (C) | 2.0E+6 | ID | ID | 2.6E+9 | 3.9E+5 (C) | 3.9E+5 (C) | 3.9E+5 (C) | 3.9E+5 |
| Lead | 7439921 | 21,000 | 7.0E+5 | 7.0E+5 | (G,M,X) | ID | NLV | NLV | NLV | NLV | 4.4E+7 | 9.0E+5 (draft) | 4.0E+5 | 4.0E+5 | NA |
| Lindane | 58899 | NA | 20 (M) | 20 (M) | 20 (M) | 7,100 | ID | ID | ID | ID | ID | 73,000 | 96,000 | 84,000 | NA |
| Lithium (B) | 7439932 | 9,800 | 3,400 | 7,000 | 500 | 1.1E+8 | NLV | NLV | NLV | NLV | ID | 5.6E+7 (AD) | 6.9E+7 (AD) | 6.2E+7 (AD) | NA |
| Magnesium (B) | 7439954 | NA | 8.0E+6 | 2.2E+7 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 2.9E+9 | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Manganese (B) | 7439965 | 4.4E+5 | 1,000 | 1,000 | (G,X) | 1.8E+8 | NLV | NLV | NLV | NLV | 1.5E+6 | 1.7E+8 | 1.9E+8 | 1.8E+8 | NA |
| Mercury (Inorganic) | 7439976 | 130 | 1,700 | 1,700 | 100 (M) | 47,000 | NLV | NLV | NLV | NLV | ID | 1.1E+6 | 1.2E+6 | 1.2E+6 | NA |
| Methane | 74828 | NA | ID | ID | ID | ID | (K) | ID | ID | ID | ID | ID | ID | ID | ID |
| Methanol | 67561 | NA | 74,000 | 2.0E+5 | 9,600 | 3.1E+6 (C) | 1.2E+6 | 3.7E+7 | 4.6E+7 | 9.7E+7 | 9.6E+10 | 3.1E+6 (C) | 3.1E+6 (C) | 3.1E+6 (C) | 3.1E+6 |
| Methoxychlor | 72435 | NA | 16,000 | 16,000 | NA | 18,000 | ID | ID | ID | ID | ID | 7.7E+6 | 1.9E+7 | 1.1E+7 | NA |
| 2-Methoxyethanol (I) | 109864 | NA | 150 | 420 | NA | 1.7E+7 | NLV | NLV | NLV | NLV | 5.9E+8 | 1.1E+6 | 2.0E+6 | 1.5E+6 | 1.1E+8 |

# ATTACHMENT A

## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| 2-Methyl-4-chlorophenoxyacetic acid | 94746 | NA | 390 | 1,100 | NA | 4.9E+5 | NLV | NLV | NLV | NLV | ID | 1.1E+6 | 2.0E+6 | 1.5E+6 | NA |
| 2-Methyl-4,6-dinitrophenol | 534521 | NA | 1,700 (M) | 1,700 (M) | NA | 1.9E+5 | NLV | NLV | NLV | NLV | ID | 3.9E+5 | 7.0E+5 | 5.1E+5 | NA |
| Methyl parathion | 298000 | NA | 46 | 130 | NA | 76,000 | NLV | NLV | NLV | NLV | ID | 2.8E+5 | 5.0E+5 | 3.6E+5 | NA |
| 4-Methyl-2-pentanone (MIBK) (I) | 108101 | NA | 36,000 | 1.0E+5 | ID | 2.7E+6 (C) | 2.7E+6 (C) | 5.3E+7 | 5.3E+7 | 7.0E+7 | 6.0E+10 | 2.7E+6 (C) | 2.7E+6 (C) | 2.7E+6 (C) | 2.7E+6 |
| Methyl-tert-butyl ether (MTBE) | 1634044 | NA | 800 | 800 | 15,000 (X) | 5.9E+6 (C) | 5.9E+6 (C) | 3.0E+7 | 4.1E+7 | 8.9E+7 | 8.8E+10 | 5.9E+6 (C) | 5.9E+6 (C) | 5.9E+6 (C) | 5.9E+6 |
| N-Methyl-morpholine (I) | 109024 | NA | 400 | 1,100 | NA | 3.0E+7 | NLV | NLV | NLV | NLV | ID | 3.0E+6 | 5.4E+6 | 3.9E+6 | 1.1E+8 |
| Methylcyclopentane (I) | 96377 | NA | ID | ID | NA | ID | ID | ID | ID | ID | ID | ID | ID | ID | 3.5E+5 |
| 4,4'-Methylene-bis-2-chloroaniline (MBOCA) | 101144 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 1.1E+8 | 48,000 | 87,000 | 63,000 | NA |
| Methylene chloride | 75092 | NA | 100 | 100 | 19,000 (X) | 2.3E+6 (C) | 2.4E+5 | 7.0E+5 | 1.7E+6 | 4.0E+6 | 8.3E+9 | 2.3E+6 (C) | 2.3E+6 (C) | 2.3E+6 (C) | 2.3E+6 |
| 2-Methylnaphthalene | 91576 | NA | 57,000 | 1.7E+5 | ID | 5.5E+6 | ID | ID | ID | ID | ID | 4.0E+7 | 7.2E+7 | 5.2E+7 | NA |
| Methylphenols (J) | 1319773 | NA | 7,400 | 20,000 | 1,400 | 1.6E+7 | NLV | NLV | NLV | NLV | 2.9E+9 | 5.6E+7 | 1.0E+8 | 7.3E+7 | NA |
| Metolachlor | 51218452 | NA | 4,800 | 20,000 | NA | 4.4E+5 (C) | NLV | NLV | NLV | NLV | ID | 4.4E+5 (C,AD) | 4.4E+5 (C,AD) | 4.4E+5 (C,AD) | 4.4E+5 |
| Mirex | 2385855 | NA | NLL | NLL | NLL | NLL | ID | ID | ID | ID | ID | 5.5E+4 | 1.4E+5 | 80,000 | NA |
| Molybdenum (B) | 7439987 | NA | 740 | 2,000 | 16,000 (X) | 1.9E+7 | NLV | NLV | NLV | NLV | ID | 1.8E+7 | 2.1E+7 | 1.9E+7 | NA |
| Naphthalene | 91203 | NA | 35,000 | 1.0E+5 | 870 | 2.1E+6 | 4.7E+5 | 3.5E+5 | 3.5E+5 | 3.5E+5 | 8.8E+7 | 8.0E+7 | 1.4E+8 | 1.0E+8 | NA |
| Nickel (B) | 7440020 | 20,000 | 1.0E+5 | 1.0E+5 | (G) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | 1.6E+7 | 2.7E+8 | 3.1E+8 | 2.9E+8 | NA |
| Nitrate (B,N) | 14797558 | NA | 2.0E+5 (N) | 2.0E+5 (N) | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | ID | ID | ID | NA |
| Nitrite (B,N) | 14797650 | NA | 20,000 (N) | 20,000 (N) | NA | 3.8E+8 | NLV | NLV | NLV | NLV | ID | ID | ID | ID | NA |
| Nitrobenzene (I) | 98953 | NA | 330 (M) | 330 (M) | 3,600 (X) | 2.2E+5 | 4.9E+5 (C) | 4.6E+6 | 4.6E+6 | 4.6E+6 | 1.5E+9 | 4.9E+5 (C) | 4.9E+5 (C) | 4.9E+5 (C) | 4.9E+5 |
| 2-Nitrophenol | 88755 | NA | 400 | 1,200 | ID | 1.6E+6 | NLV | NLV | NLV | NLV | ID | 3.1E+6 | 5.6E+6 | 4.1E+6 | NA |
| n-Nitroso-di-n-propylamine | 621647 | NA | 330 (M) | 330 (M) | NA | 7,200 | NLV | NLV | NLV | NLV | 2.0E+6 | 8,300 | 15,000 | 11,000 | 1.5E+6 |
| N-Nitrosodiphenylamine | 86306 | NA | 5,400 | 22,000 | NA | 7.0E+5 | NLV | NLV | NLV | NLV | ID | 1.2E+7 | 2.2E+7 | 1.6E+7 | NA |
| Oxamyl | 23135220 | NA | 4,000 | 4,000 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 4.3E+7 | 7.6E+7 | 5.5E+7 | NA |
| Oxo-hexyl acetate | 88230357 | NA | 1,500 | 4,200 | NA | ID | ID | ID | ID | ID | 2.4E+9 | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 |
| Pendimethalin | 40487421 | NA | 1.1E+6 | 1.1E+6 | NA | 1.1E+6 | NLV | NLV | NLV | NLV | ID | 1.8E+8 | 4.6E+8 | 2.7E+8 | NA |
| Pentachlorobenzene | 608935 | NA | 29,000 | 81,000 | NA | 1.9E+5 (C) | ID | ID | ID | ID | ID | 1.9E+5 (C) | 1.9E+5 (C) | 1.9E+5 (C) | 1.9E+5 |
| Pentachloronitrobenzene | 82688 | NA | 37,000 | 37,000 | NA | 37,000 | 2.2E+5 | 2.8E+5 | 2.8E+5 | 2.8E+5 | 1.5E+8 | 8.4E+6 | 1.5E+7 | 1.1E+7 | NA |
| Pentachlorophenol | 87865 | NA | 22 | 22 | (G,X) | 4,300 | NLV | NLV | NLV | NLV | 1.3E+8 | 3.9E+5 | 1.7E+6 | 6.5E+5 | NA |
| Pentane | 109660 | NA | ID | ID | NA | ID | 2.4E+5 (C) | 4.4E+7 | ID | ID | 5.2E+11 | ID | ID | ID | 2.4E+5 |
| 2-Pentene (I) | 109682 | NA | ID | ID | NA | ID | ID | ID | ID | ID | ID | ID | ID | ID | 2.2E+5 |
| Phenanthrene | 85018 | NA | 56,000 | 1.6E+5 | 2,300 | 1.1E+6 | 3.3E+6 | 11,000 | 37,000 | 37,000 | 2.9E+6 | 8.0E+6 | 1.4E+7 | 1.0E+7 | NA |

# ATTACHMENT A
## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV
### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| Phenol | 108952 | NA | 88,000 | 2.6E+5 | 4,200 | 1.2E+7 (C) | NLV | NLV | NLV | NLV | 1.8E+10 | 1.2E+7 (C,AD) | 1.2E+7 (C,AD) | 1.2E+7 (C,AD) | 1.2E+7 |
| Phosphorus (total) | 7723140 | NA | 1.3E+6 | 4.8E+6 | NA | ID | NLV | NLV | NLV | NLV | ID | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Phthalic acid | 88993 | NA | 2.8E+5 | 8.0E+5 | NA | 1.7E+6 (C) | NLV | NLV | NLV | NLV | ID | 1.7E+6 (C) | 1.7E+6 (C) | 1.7E+6 (C) | 1.7E+6 |
| Phthalic anhydride | 85449 | NA | 3.0E+5 | 8.8E+5 | NA | 1.1E+6 (C) | NLV | NLV | NLV | NLV | ID | 1.1E+6 (C) | 1.1E+6 (C) | 1.7E+6 (C) | 1.1E+6 |
| Picloram | 1918021 | NA | 10,000 | 10,000 | NA | 8.6E+6 | NLV | NLV | NLV | NLV | ID | 7.8E+7 | 1.4E+8 | 1.0E+8 | NA |
| Piperidine | 110894 | NA | 64 | 180 | NA | 6.8E+5 | NLV | NLV | NLV | NLV | 4.1E+9 | 4.9E+5 | 8.8E+5 | 6.4E+5 | 1.2E+8 |
| Polybrominated biphenyls (J) | 67774327 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | ID | 6,600 | 17,000 | 9,600 | NA |
| Polychlorinated biphenyls (PCBs) (J,T) | 1336363 | NA | NLL | NLL | NLL | NLL | 1.6E+7 | 8.1E+5 | 2.8E+7 | 2.8E+7 | 6.5E+6 | (T) | (T) | (T) | NA |
| Prometon | 1610180 | NA | 4,900 | 14,000 | NA | 5.5E+6 | NLV | NLV | NLV | NLV | ID | 2.5E+7 | 4.4E+7 | 3.2E+7 | NA |
| Propachlor | 1918167 | NA | 1,900 | 5,400 | NA | 8.8E+6 | NLV | NLV | NLV | NLV | ID | 1.5E+7 | 2.6E+7 | 1.9E+7 | NA |
| Propazine | 139402 | NA | 4,000 | 11,000 | NA | 1.7E+5 | NLV | NLV | NLV | NLV | ID | 3.0E+7 | 5.4E+7 | 3.9E+7 | NA |
| Propionic acid | 79094 | NA | 2.4E+5 | 7.0E+5 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 8.8E+9 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| Propyl alcohol (I) | 71238 | NA | 28,000 | 80,000 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 2.1E+10 | 1.1E+8 (AD) | 1.1E+8 (C,AD) | 1.1E+8 (C,AD) | 1.1E+8 |
| n-Propylbenzene (I) | 103651 | NA | 1,600 | 4,600 | NA | 3.0E+5 | ID | ID | ID | ID | 5.9E+8 | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 (C) | 1.0E+7 |
| Propylene glycol | 57556 | NA | 3.0E+6 | 8.4E+6 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 1.8E+11 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| Pyrene | 129000 | NA | 4.8E+5 | 4.8E+5 | ID | 4.8E+5 | 1.0E+9 (D) | 7.8E+8 | 7.7E+8 | 7.7E+8 | 2.9E+9 | 1.1E+8 | 2.9E+8 | 1.7E+8 | NA |
| Pyridine (I) | 110861 | NA | 330 (M) | 420 | NA | 37,000 (C) | 2,000 | 9,800 | 40,000 | 97,000 | 1.0E+8 | 37,000 (C) | 37,000 (C) | 37,000 (C) | 37,000 |
| Selenium (B) | 7782492 | 410 | 4,000 | 4,000 | 400 | 7.8E+7 | NLV | NLV | NLV | NLV | 5.9E+7 | 1.8E+7 | 2.1E+7 | 1.9E+7 | NA |
| Silver (B) | 7440224 | 1,000 | 4,500 | 13,000 | 500 (M) | 2.0E+8 | NLV | NLV | NLV | NLV | 2.9E+6 | 1.7E+7 | 1.9E+7 | 1.8E+7 | NA |
| Silvex (2,4,5-TP) | 93721 | NA | 3,600 | 3,600 | NA | 3.1E+6 | NLV | NLV | NLV | NLV | ID | 8.4E+6 | 1.5E+7 | 1.1E+7 | NA |
| Simazine | 122349 | NA | 80 | 80 | NA | 90,000 | NLV | NLV | NLV | NLV | ID | 5.8E+6 | 1.0E+7 | 7.6E+6 | NA |
| Sodium | 7440235 | NA | 2.5E+6 | 7.0E+6 | NA | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Strontium (B) | 7440246 | NA | 92,000 | 2.6E+5 | 15,000 | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |
| Styrene | 100425 | NA | 2,700 | 2,700 | 2,200 | 2.7E+5 | 5.2E+5 (C) | 3.3E+6 | 3.3E+6 | 4.2E+6 | 6.9E+9 | 5.2E+5 (C) | 5.2E+5 (C) | 5.2E+5 (C) | 5.2E+5 |
| Sulfate | 14808798 | NA | 5.0E+6 | 5.0E+6 | NA | ID | NLV | NLV | NLV | NLV | ID | ID | ID | ID | NA |
| Tebuthiuron | 34014181 | NA | 10,000 | 30,000 | NA | 5.0E+7 | NLV | NLV | NLV | NLV | ID | 4.0E+7 (AD) | 8.2E+7 (AD) | 5.5E+7 (AD) | NA |
| 2,3,7,8-Tetrabromodibenzo-p-dioxin (O) | 50585416 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | (O) | (O) | (O) | (O) | NA |
| 1,2,4,5-Tetrachlorobenzene | 95943 | NA | 1.5E+6 | 1.5E+6 | 3,400 (X) | 1.5E+6 | ID | ID | ID | ID | ID | 3.8E+8 (D) | 6.8E+8 | 5.0E+8 | NA |
| 2,3,7,8-Tetrachlorodibenzo-p-dioxin (O) | 1746016 | NA | NLL | NLL | NLL | NLL | NLV | NLV | NLV | NLV | 89 (O) | 0.99 (O) | 1.4 (O) | 2.9 (O) | NA |
| 1,1,1,2-Tetrachloroethane | 630206 | NA | 1,500 | 6,400 | NA | 4.4E+5 (C) | 33,000 | 1.2E+5 | 2.1E+5 | 3.3E+5 | 5.3E+8 | 4.4E+5 (C) | 4.4E+5 (C) | 4.4E+5 (C) | 4.4E+5 |
| 1,1,2,2-Tetrachloroethane | 79345 | NA | 170 | 700 | 1,600 (X) | 94,000 | 23,000 | 34,000 | 34,000 | 34,000 | 6.8E+7 | 3.7E+5 | 6.7E+5 | 4.9E+5 | 8.7E+5 |

# ATTACHMENT A

## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| Tetrachloroethylene | 127184 | NA | 100 | 100 | 900 (X) | 88,000 (C) | 88,000 | 6.0E+5 | 1.4E+6 | 3.3E+6 | 6.8E+9 | 88,000 (C) | 88,000 (C) | 88,000 (C) | 88,000 |
| Tetrahydrofuran | 109999 | NA | 1,900 | 5,400 | 2.2E+5 (X) | 3.2E+7 | 2.4E+6 | 1.5E+7 | ID | ID | 1.7E+11 | 1.5E+7 | 2.6E+7 | 1.9E+7 | 1.2E+8 |
| Thallium (B) | 7440280 | NA | 2,300 | 2,300 | 4,200 (X) | 1.5E+7 | NLV | NLV | NLV | NLV | ID | 2.4E+5 | 2.8E+5 | 2.6E+5 | NA |
| Toluene (I) | 108883 | NA | 16,000 | 16,000 | 2,800 | 2.5E+5 (C) | 2.5E+5 (C) | 3.3E+6 | 3.6E+7 | 3.6E+7 | 1.2E+10 | 2.6E+5 (C) | 2.5E+5 (C) | 2.5E+5 (C) | 2.5E+5 |
| p-Toluidine | 106490 | NA | 660 (M) | 1,200 | NA | 4.8E+5 | NLV | NLV | NLV | NLV | 1.3E+8 | 6.7E+5 | 1.2E+6 (C) | 8.7E+5 | 1.2E+6 |
| Toxaphene | 8001352 | NA | 24,000 | 24,000 | 860 | 3.6E+5 | NLV | NLV | NLV | NLV | 1.2E+7 | 1.2E+5 | 2.9E+5 | 1.7E+5 | NA |
| Triallate | 2303175 | NA | 95,000 | 2.5E+5 (C) | NA | 2.5E+5 (C) | ID | ID | ID | ID | ID | 2.5E+5 (C) | 2.5E+5 (C) | 2.5E+5 (C) | 2.5E+5 |
| Tributylamine | 102829 | NA | 7,800 | 23,000 | ID | 1.8E+6 | 1.1E+6 | 7.2E+5 | ID | ID | 2.1E+8 | 3.7E+6 (C) | 3.7E+6 (C) | 3.7E+6 (C) | 3.7E+6 |
| 1,2,4-Trichlorobenzene | 120821 | NA | 4,200 | 4,200 | 1,800 | 1.1E+6 | 1.1E+6 (C) | 3.4E+7 | 3.4E+7 | 3.4E+7 | 1.1E+10 | 1.1E+6 (C,AD) | 1.1E+6 (C,AD) | 1.1E+6 (C,AD) | 1.1E+6 |
| 1,1,1-Trichloroethane | 71556 | NA | 4,000 | 4,000 | 4,000 | 4.6E+5 (C) | 4.6E+5 | 4.5E+6 | 1.5E+7 | 3.1E+7 | 2.9E+10 | 4.6E+5 (C) | 4.6E+5 (C) | 4.6E+5 (C) | 4.6E+5 |
| 1,1,2-Trichloroethane | 79005 | NA | 100 | 100 | 6,600 (X) | 4.2E+5 | 24,000 | 57,000 | 57,000 | 1.2E+5 | 2.5E+8 | 9.2E+5 (C) | 9.2E+5 (C) | 9.2E+5 (C) | 9.2E+5 |
| Trichloroethylene | 79016 | NA | 100 | 100 | 4,000 (X) | 5.0E+5 (C) | 37,000 | 2.6E+5 | 4.4E+5 | 1.1E+6 | 2.3E+9 | 5.0E+5 (C) | 5.0E+5 (C) | 5.0E+5 (C) | 5.0E+5 |
| Trichlorofluoromethane | 75694 | NA | 52,000 | 1.5E+5 | NA | 5.6E+5 (C) | 5.6E+5 (C) | 1.1E+8 | 1.4E+11 | 1.4E+11 | 1.7E+12 | 5.6E+5 (C) | 5.6E+5 (C) | 5.6E+5 (C) | 5.6E+5 |
| 2,4,5-Trichlorophenol | 95954 | NA | 39,000 | 1.1E+5 | NA | 9.1E+6 | NLV | NLV | NLV | NLV | 1.0E+10 | 1.1E+8 | 2.0E+8 | 1.5E+8 | NA |
| 2,4,6-Trichlorophenol | 88062 | NA | 2,400 | 9,400 | 330 (M) | 2.0E+5 | NLV | NLV | NLV | NLV | 1.3E+9 | 5.0E+6 | 9.0E+6 | 6.6E+6 | NA |
| 1,2,3-Trichloropropane | 96184 | NA | 840 | 2,400 | NA | 8.3E+5 (C) | ID | ID | ID | ID | ID | 8.3E+5 (C) | 8.3E+5 (C) | 8.3E+5 (C) | 8.3E+5 |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 76131 | NA | 5.5E+5 (C) | 5.5E+5 (C) | NA | 5.5E+5 (C) | 5.5E+5 (C) | 2.1E+8 | 8.9E+8 | 2.1E+9 | 2.3E+12 | 5.5E+5 (C) | 5.5E+5 (C) | 5.5E+5 (C) | 5.5E+5 |
| Triethanolamine | 102716 | NA | 74,000 | 2.0E+5 | NA | 1.1E+8 (C) | NLV | NLV | NLV | NLV | 1.5E+9 | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 (C) | 1.1E+8 |
| Triethylene glycol | 112276 | NA | 1.1E+5 (C) | 1.1E+5 (C) | NA | 1.1E+5 (C) | NLV | NLV | NLV | NLV | ID | 1.1E+5 (C,AD) | 1.1E+5 (C,AD) | 1.1E+5 (C,AD) | 1.1E+5 |
| 3-Trifluoromethyl-4-nitrophenol | 88302 | NA | 1.1E+5 | 3.1E+5 | NA | 1.2E+8 | NLV | NLV | NLV | NLV | ID | 3.5E+8 (AD) | 7.3E+8 (AD) | 4.8E+8 (AD) | NA |
| Trifluralin | 1582098 | NA | 1.9E+5 | 5.7E+5 | NA | 1.2E+7 | ID | ID | ID | ID | ID | 7.8E+6 | 2.0E+7 | 1.1E+7 | NA |
| 2,2,4-Trimethyl pentane | 540841 | NA | ID | ID | NA | ID | ID | ID | ID | ID | ID | ID | ID | ID | 19,000 |
| 2,4,4-Trimethyl-2-pentene (I) | 107404 | NA | ID | ID | NA | ID | ID | ID | ID | ID | ID | ID | ID | ID | 56,000 |
| 1,2,4-Trimethylbenzene (I) | 95636 | NA | 2,100 | 2,100 | ID | 1.1E+5 (C) | 1.1E+5 (C) | 2.5E+7 | 6.0E+8 | 6.0E+8 | 3.6E+10 | 1.1E+5 (C) | 1.1E+5 (C) | 1.1E+5 (C) | 1.1E+5 |
| 1,3,5-Trimethylbenzene (I) | 108678 | NA | 1,800 | 1,800 | ID | 94,000 (C) | 94,000 (C) | 1.9E+7 | 4.6E+8 | 4.6E+8 | 3.6E+10 | 94,000 (C) | 94,000 (C) | 94,000 (C) | 94,000 |
| Triphenyl phosphate | 115866 | NA | 1.1E+5 (C) | 1.1E+5 (C) | NA | 1.1E+5 (C) | NLV | ID | ID | ID | ID | 1.1E+5 (C) | 1.1E+5 (C) | 1.1E+5 (C) | 1.1E+5 |
| tris(2,3-Dibromopropyl)phosphate | 126727 | NA | 66 | 270 | NA | 27,000 (C) | 27,000 (C) | 60,000 | 60,000 | 60,000 | 7.4E+6 | 27,000 (C) | 27,000 (C) | 27,000 (C) | 27,000 |
| Urea | 57136 | NA | ID (N) | ID (N) | NA | ID | NLV | NLV | NLV | NLV | ID | ID | ID | ID | NA |
| Vanadium | 7440622 | NA | 72,000 | 9.9E+5 | 1.9E+5 | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.0E+7 | 1.2E+7 | 1.1E+7 | NA |
| Vinyl acetate (I) | 108054 | NA | 13,000 | 36,000 | NA | 2.4E+6 (C) | 1.5E+6 | 2.0E+6 | 2.7E+6 | 5.9E+6 | 5.9E+9 | 2.4E+6 (C,AD) | 2.4E+6 (C,AD) | 2.4E+6 (C,AD) | 2.4E+6 |
| Vinyl chloride | 75014 | NA | 40 | 40 | 300 | 11,000 | 150 | 1,500 | 9,000 | 22,000 | 4.7E+7 | 29,000 | 51,000 | 37,000 | 4.9E+5 |

# ATTACHMENT A

## SOIL: INDUSTRIAL AND COMMERCIAL II, III, AND IV

### PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS



| | | | Groundwater Protection | | | | Indoor Air | Ambient Air (Y) | | | | Direct Contact | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Guidesheet Number → | | #10 | #21 | | #12 | #13 | #22 | #23 | #24 | #25 | #26 | #27 | #28 | #29 | #20 |
| Hazardous Substance | Chemical Abstract Service Number | Statewide Default Background Levels | Residential Drinking Water Protection Criteria | Industrial and Commercial Drinking Water Protection Criteria | Groundwater Surface Water Interface Protection Criteria | Groundwater Contact Protection Criteria | Soil Volatilization to Indoor Air Inhalation Criteria | Infinite Source Volatile Soil Inhalation Criteria (VSIC) | Finite VSIC for 5 Meter Source Thickness | Finite VSIC for 2 Meter Source Thickness | Particulate Soil Inhalation Criteria | Industrial and Commercial II | Commercial III | Commercial IV | Soil Saturation Concentration Screening Levels |
| White phosphorus (R) | 12185103 | NA | 2.2 | 6.0 | NA | 58,000 | NLV | NLV | NLV | NLV | ID | 30,000 (AD) | 37,000 (AD) | 33,000 (AD) | NA |
| Xylenes (I) | 1330207 | NA | 5,600 | 5,600 | 700 | 1.5E+5 (C) | 1.5E+5 (C) | 5.4E+7 | 6.5E+7 | 1.3E+8 | 1.3E+11 | 1.5E+5 (C) | 1.5E+5 (C) | 1.5E+5 (C) | 1.5E+5 |
| Zinc (B) | 7440666 | 47,000 | 2.4E+6 | 5.0E+6 | (G) | 1.0E+9 (D) | NLV | NLV | NLV | NLV | ID | 1.0E+9 (D) | 1.0E+9 (D) | 1.0E+9 (D) | NA |

TABLE : F1

EXPOSURE SCENARIO : CONSTRUCTION WORKER
FUTURE FACILITY CONDITION
INCLUDES INGESTION AND DERMAL CONTACT WITH CHEMICALS IN SOIL
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

EQUATION : INTAKE (mg/kg-day) = $\frac{CS \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT} + \frac{CS \times IR \times ABS \times CF \times EF \times ED}{BW \times AT}$

where :
CS = Chemical Concentration in Soil (mg/kg)
IR = Ingestion Rate (mg soil/day)
SA = Skin Surface Area Available for Contact (cm2/event)
CF = Conversion Factor (10E-06 kg/mg)
EF = Exposure Frequency (days/years)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (period over which exposure is averaged – days)
AF = Soil to Skin Adherence Factor (mg/cm2)
ABS = Absorption Factor (unitless)

| VARIABLE ASSUMPTIONS | MEAN | RME | REFERENCES |
|---|---|---|---|
| CS (mg/kg) | Mean | 95% UCL | RAGS (1, 2) |
| IR (ADULT) (mg soil/day) | 480 | 480 | RAGS (1, 2) |
| SA (ADULT) (cm2) | 3300 | 3300 | RAGS (3) |
| CF (kg/mg) | 0.000001 | 0.000001 | RAGS (1, 2) |
| EF (days/year) | 10 (2 weeks) | 20 (1 month) | PROFESSIONAL JUDGEMENT |
| ED- CARCINOGEN (adult) (years) | 1 | 1 | PROFESSIONAL JUDGEMENT |
| ED - NON-CARCINOGEN (years) | 1 | 1 | PROFESSIONAL JUDGEMENT |
| BW (ADULT) (kg) | 70 | 70 | RAGS (1, 2) |
| AT - CARCINOGEN (yrs x days/yr) | 25550 | 25550 | RAGS (1, 2) |
| AT - NON-CARC. (yrs x days/yr) | 365 | 365 | RAGS (1, 2) |
| AF (mg/cm2) | 0.02 | 0.20 | RAGS (3) |
| ABS ORAL | chemical specific | | |
| DERMAL | chemical specific | | |

NOTE:
(1) EPA "RISK ASSESSMENT GUIDANCE FOR SUPERFUND MANUAL, DECEMBER 1989, EPA/540/1-89/002.
(2) SUPPLEMENTAL GUIDANCE: "STANDARD DEFAULT EXPOSURE FACTORS", OSWER DIRECTIVE: 9285.6-03, MARCH 25, 1991
(3) EPA RAGS, VOLUME 1: HUMAN HEALTH EVALUATION MANUAL, SUPPLEMENTAL GUIDANCE, DERMAL RISK ASSESSMENT, MARCH 14, 1999.

TABLE : F2

MEDIA CONCENTRATIONS AND CHEMICAL CONSTANTS
EXPOSURE SCENARIO : CONSTRUCTION WORKER
FUTURE FACILITY CONDITION
INCLUDES INGESTION AND DERMAL CONTACT WITH CHEMICALS IN SOIL
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

SITE : GENERAL MOTORS CORPORATION
SECTOR : SWMU #31
LOCATION : ON-SITE
MEDIA : SOIL
POPULATION : ADULTS
EXPOSURE SCENARIO : CONSTRUCTION WORKER

| | MEDIA CONCENTRATION | | | | | | ORAL BIOAVAIL. FACTOR | | DERMAL BIOAVAIL. FACTOR | |
|---|---|---|---|---|---|---|---|---|---|---|
| PARAMETER | MEAN mg/kg | RME mg/kg | ORAL CSF 1/(mg/kg/d) | DERMAL CSF 1/(mg/kg/d) | ORAL RfD mg/kg/d | DERMAL RfD mg/kg/d | MEAN %/100 | RME %/100 | MEAN %/100 | RME %/100 |
| ***METALS*** | | | | | | | | | | |
| ARSENIC | 5.25E+01 | 1.02E+02 | 1.50E+00 | 1.58E+00 | 3.00E-04 | 2.85E-04 | 0.50 | 0.50 | 0.03 | 0.03 |

NOTE :
NA = NOT AVAILABLE

TABLE : F3

ESTIMATED CANCER RISKS
EXPOSURE SCENARIO : CONSTRUCTION WORKER
FUTURE FACILITY CONDITION
INCLUDES INGESTION AND DERMAL CONTACT WITH CHEMICALS IN SOIL
GENERAL MOTORS CORPORATION
PONTIAC, MICHIGAN

SITE : GENERAL MOTORS CORPORATION
SECTOR : SWMU #31
LOCATION : ON-SITE
MEDIA : SOIL
POPULATION : ADULTS
EXPOSURE SCENARIO : CONSTRUCTION WORKER

| PARAMETER | INGESTION | | | | DERMAL | | | |
|---|---|---|---|---|---|---|---|---|
| | LIFETIME AVERAGE DAILY INTAKE (mg/kg/day) | | LIFETIME UPPER BOUND EXCESS CANCER RISK | | LIFETIME AVERAGE DAILY INTAKE (mg/kg/day) | | LIFETIME UPPER BOUND EXCESS CANCER RISK | |
| | MEAN | RME | MEAN | RME | MEAN | RME | MEAN | RME |
| ***METALS*** | | | | | | | | |
| ARSENIC | 7.05E-08 | 2.74E-07 | 1.06E-07 | 4.11E-07 | 5.81E-10 | 2.26E-08 | 9.18E-10 | 3.57E-08 |
| | | **Ingestion :** | 1.06E-07 | 4.11E-07 | | | | |
| | | **Dermal :** | 9.18E-10 | 3.57E-08 | | | | |
| | | **TOTAL LIFETIME ADDED CANCER RISK :** | 1.07E-07 | 4.46E-07 | | | | |

TABLE : F4

**HAZARD INDEX**
**EXPOSURE SCENARIO : CONSTRUCTION WORKER**
**FUTURE FACILITY CONDITION**
**INCLUDES INGESTION AND DERMAL CONTACT WITH CHEMICALS IN SOIL**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

SITE : GENERAL MOTORS CORPORATION
SECTOR : SWMU #31
LOCATION : ON-SITE
MEDIA : SOIL
POPULATION : ADULTS
EXPOSURE SCENARIO : CONSTRUCTION WORKER

| | INGESTION | | | | DERMAL | | | |
|---|---|---|---|---|---|---|---|---|
| | ANNUAL AVERAGE DAILY INTAKE (mg/kg/d) | | HAZARD QUOTIENT CDI/RfD | | ANNUAL AVERAGE DAILY INTAKE (mg/kg/d) | | HAZARD QUOTIENT CDI/RfD | |
| PARAMETER | MEAN | RME | MEAN | RME | MEAN | RME | MEAN | RME |
| ***METALS*** | | | | | | | | |
| ARSENIC | 4.93E-06 | 1.92E-05 | 1.64E-02 | 6.39E-02 | 1.23E-11 | 4.79E-10 | 4.33E-08 | 1.68E-06 |
| | | **Ingestion :** | 1.64E-02 | 6.39E-02 | | | | |
| | | **Dermal :** | 4.33E-08 | 1.68E-06 | | | | |
| | | **HAZARD INDEX:** | 1.64E-02 | 6.39E-02 | | | | |

**TABLE 5.11**

**SWMU #33**
**FORMER SOUTH RETENTION POND**
**SUMMARY OF DETECTED APPENDIX IX RESULTS IN SOIL SAMPLES**
**RCRA FACILITY INVESTIGATION REPORT**
**GENERAL MOTORS CORPORATION**
**PONTIAC, MICHIGAN**

| *Location:* | | *BH-33-1* | *BH-33-1* |
|---|---|---|---|
| *Sample Interval:* | | *18-20 ft.* | *18-20 ft.* |
| *Sample ID:* | | *S-7097-121898-DS-066* | *S-7097-121898-DS-067* |
| *Sample Date:* | | *12/18/98* | *12/18/98* |
| | | | *Duplicate* |
| *Parameter* | *GIDCV (1)* | | |
| Appendix IX - Semi-Volatile Organics (mg/kg) | | | |
| 2-METHYLNAPHTHALENE | 40,000 | 0.2 J | 0.2 J |
| NAPHTHALENE | 80,000 | 0.07 J | 0.07 J |
| PHENANTHRENE | 8,000 | 0.1 J | 0.09 J |
| Appendix IX - Metals (mg/kg) | | | |
| ANTIMONY, TOTAL | 1,200 | 0.08 J | 0.09 J |
| ARSENIC, TOTAL | 61 | 8.5 | 8.3 |
| BARIUM, TOTAL | 250,000 | 41 | 40 |
| BERYLLIUM, TOTAL | 3,100 | 0.3 | 0.31 |
| CADMIUM, TOTAL | 4,100 | 0.66 | 0.31 |
| CHROMIUM, TOTAL | 17,000 (2) | 12 | 11 |
| COBALT, TOTAL | 18,000 | 7.2 | 7.66 |
| COPPER, TOTAL | 140,000 | 17.2 | 16.3 |
| LEAD, TOTAL | 900 | 8.04 | 12.4 |
| NICKEL, TOTAL | 270,000 | 22.2 | 23.3 |
| SELENIUM, TOTAL | 18,000 | 0.3 J | 0.4 J |
| SILVER, TOTAL | 17,000 | 0.08 | 0.07 |
| THALLIUM, TOTAL | 240 | 0.5 | 0.5 |
| VANADIUM, TOTAL | 10,000 | 18 | 17 |
| ZINC, TOTAL | 1,000,000 | 65 | 65 |

Notes:
ND ( ) - Parameter not-detected at the limit stated in parenthesis.
J - Parameter is estimated value.
NR - No regulartory criteria established.
ID - Inadequate data to develop criterion.
ft. - Feet below ground surface.
-- Parameter not sampled.
(1) - Generic Industrial Soil Direct Contact Value, MDEQ ERD Operational Memorandum No. 18, June 6, 2000.
(2) - Value is for Chromium VI.
(3) - Criteria for total PCB's.
▭ Boxed values represent parameters which exceeded Generic Industrial Soil Direct Contact Value Criteria.

# ADDENDUM NO. 1 TO RCRA FACILITY INVESTIGATION (RFI) REPORT

MID 005 356 902

GM TRUCK GROUP
PONTIAC, MICHIGAN

NOVEMBER 21, 2000
REF. NO. 7097 (17)

**Prepared By:**

CONESTOGA-ROVERS & ASSOCIATES
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# GM

**Worldwide Facilities Group**
**Remediation Team**

November 30, 2000 Reference No. 7097

Ms. Mirtha Capiro
Corrective Action Manager
United States Environmental Protection Agency
Region 5
77 W. Jackson Boulevard (HRE-8J0)
Chicago, IL 60604-3590

Dear Ms. Capiro:

Re: Draft RCRA Facility Investigation (RFI) Report
General Motors Truck Group Facility
Centerpoint Business Campus, Pontiac, Michigan
U.S. EPA ID No. MID 005 356 902

---

Consistent with your earlier discussion with Ms. Jean Caufield of the General Motors Corporation (GM), enclosed please find the Draft RFI Report for the referenced Facility.

The Draft RFI Report has been prepared consistent with the August 17, 2000 GM Response to U.S. EPA July 12, 2000 comments (approved by U.S. EPA on September 29, 2000) and October 24, 2000 discussion between GM and U.S. EPA. The Draft RFI Report includes a compendium of the RFI Report dated July 19, 1999 and the Addendum No. 1 to RFI Report dated November 21, 2000.

As discussed, we have included a strike-out/underline version of the revised text to support your review.

Please feel free to contact me at (313) 556-0821 if you have any questions or require any further information.

Sincerely,

GENERAL MOTORS CORPORATION

Glenn Turchan

for: G. Keith West

SRG/rm/20/Det.

Encl.

c.c. Gerald Phillips - U.S. EPA
Anthony Thrubis, Esq. (GM)
Jean Caufield (GM)
Steve Song (ENVIRON)
Glenn Turchan (CRA)
Scott Green (CRA)

485 West Milwaukee Avenue, MC 482-310-004 • Detroit, MI 48202-3220 • FAX (313) 556-0803

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## 1.0 INTRODUCTION

This document serves as Addendum No. 1 to the Resource Conservation and Recovery Act (RCRA) Facility Investigation Report (RFI) Report (Addendum No. 1 to RFI Report) for the General Motors Truck Group Pontiac, Michigan Facility (Facility). The Facility location is presented on Figure 1.1. The original RFI Work Plan was dated September 4, 1998 and approved by the United States Environmental Protection Agency (U.S. EPA) on November 8, 1998. The original phase of RFI field investigative activities was documented in the RCRA Facility Investigation (RFI) Report dated July 19, 1999.

This Addendum No 1 to RFI Report has been prepared to document work activities conducted in accordance with the RFI Work Plan Addendum dated July 27, 2000 which was approved by the U.S. EPA on August 2, 2000. The RFI Work Plan Addendum was prepared in response to the U.S. EPA Request for Additional Work dated July 12, 2000.

## 2.0 SCOPE OF WORK

Two shallow monitoring wells were installed in the perched water table zone and sampled at Area of Interest (AOI) #54 and AOI #74. The locations of AOI #53 and AOI #74 are presented on Figure 2.1. The field activities were conducted between August 9 and 17, 2000. One monitoring well (MW-3-1) was installed at AOI #74 in the vicinity of BH-3-1, where a native sand seam had been encountered from 11 to 14 feet below ground surface (bgs) during the original RFI field investigation (Figure 2.2). The second monitoring well (MW-31-1) was installed at AOI #54 in the vicinity of BH-31-2, where a native sand seam had been encountered during original RFI field investigation from 9 to 12 feet bgs (Figure 2.3). All monitoring well installation protocols were consistent with the Field Sampling Plan (Appendix G of the approved RFI Work Plan). Stratigraphic and Instrumentation logs for the two perched water table monitoring wells are presented in Appendix A.

Groundwater samples were collected and analyzed in accordance with the approved Quality Assurance Project Plan (QAPP) (Appendix C of the RFI Work Plan) and the RFI Work Plan Addendum dated July 27, 2000. Development and purging of the monitoring wells was completed with a variable speed peristaltic pump (to minimize agitation) and samples were collected with disposable polyethylene bailers. Field parameters of pH, temperature, and conductivity were measured, and the samples were collected in order of the parameters' volatilization sensitivity (i.e. most volatile first). Groundwater samples were analyzed for Target Compound List (TCL) Volatile Organic Compounds (VOCs), TCL Semi-Volatile Organic Compounds (SVOCs), TCL Polychlorinated Biphenyls (PCBs), and Target Analyte List (TAL) Inorganics.

## 3.0 SUMMARY OF RESULTS

The investigative work identified detectable levels of TCL VOCs and TAL total and dissolved inorganics. A summary of the detected analyte results is presented in Table 3.1. Exceedances of the Michigan Public Act 451, Part 201 Industrial/Commercial Drinking Water Criteria and Federal Maximum Contaminant Levels (MCLs) are underlined in Table 3.1. All TCL VOCs and TAL total and dissolved inorganics were below the Michigan Public Act 451, Part 201 Industrial Groundwater Contact Criteria (GCC) for all groundwater samples. All of the perched groundwater samples were non-detect for TCL SVOC and TCL PCB analytes.

The analytical data quality validation memo is presented in Appendix B. Analytical data report summaries are presented in Appendix C.

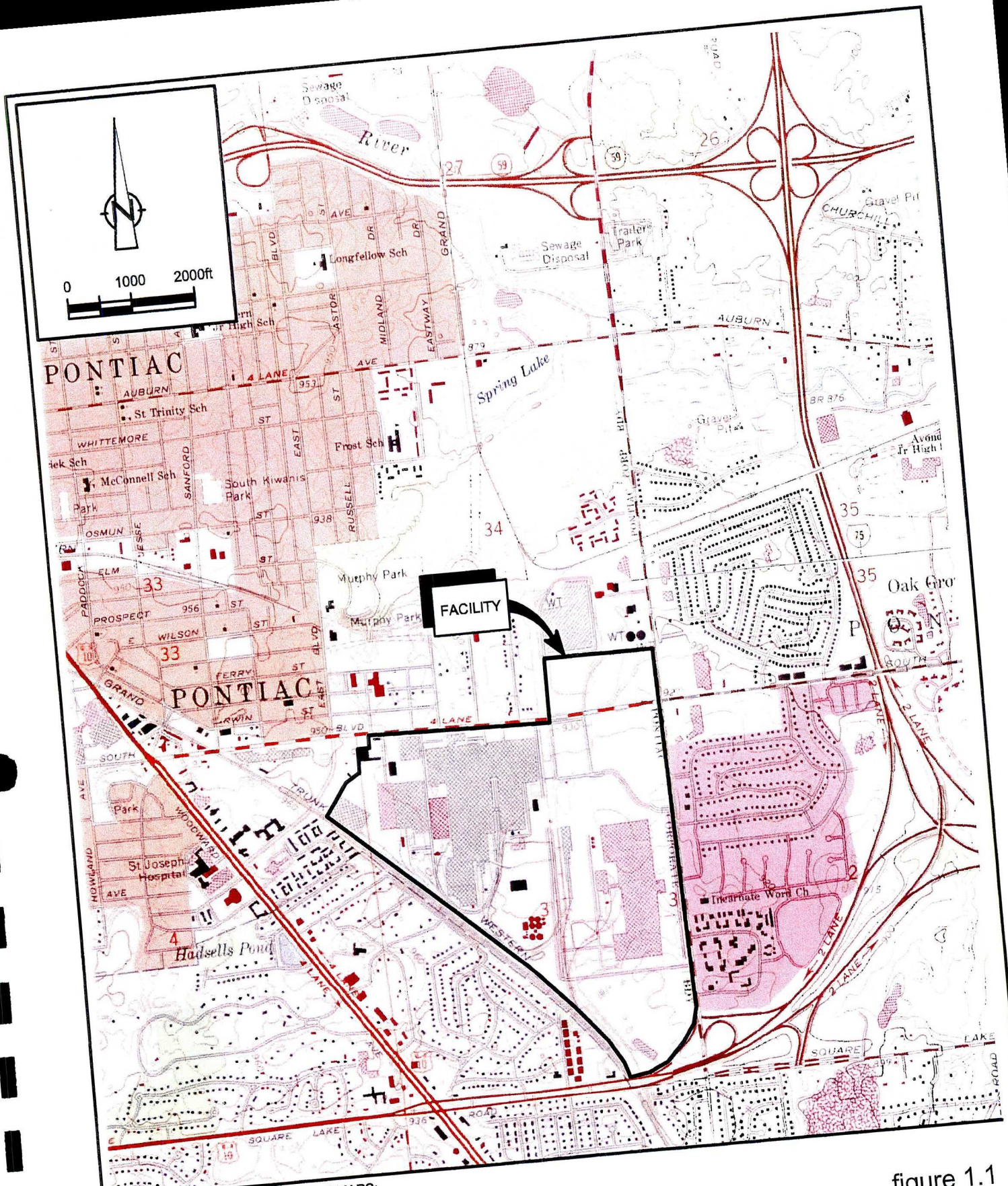
## 4.0 CONCLUSIONS AND RECOMMENDATIONS

No potable groundwater aquifers have been identified to exist in the surficial water table zone immediately beneath the Facility. Potable water use for the Facility and surrounding area is supplied by the City of Pontiac municipal water supply system. As a result, drinking water consumption is not a completed exposure pathway associated with the perched water table zone at the Facility. In addition, all results were below the Act 451, Part 201 Industrial Groundwater Contact Criteria (GCC). The GCC are considered to be the most applicable screening levels for the perched water table zone identified at AOI #74 (SWMU #3) and AOI #54 (SWMU #31). This indicates that the perched groundwater analytical detections are below the level of human health concern for a potential perched water table zone direct contact exposure (e.g., utility trench construction activities).

TABLE 3.1

SUMMARY OF DETECTED ANALYTES
AUGUST 2000
GM TRUCK GROUP
PONTIAC, MICHIGAN

| *Sample Location*<br>*Sample ID # GW-7097-081700*<br>*Date Sampled*<br>*QA/QC* | *Federal Maximum Contaminant Level* | *Industrial & Commercial Drinking Water Criteria*[1] | *Groundwater Contact Criteria*[2] | *MW3-1 -TJ-001 8/17/2000 Groundwater* | *MW3-1 -TJ-002 8/17/2000 Groundwater/Duplicate* | *MW31-1 -TJ-003 8/17/2000 Groundwater* |
|---|---|---|---|---|---|---|
| **Volatile Organic Compounds (µg/L)** | | | | | | |
| Benzene | 5 | 5 | 11,000 | ND(0.50)[4] | ND(0.50) | 3.0 |
| cis-1,2-Dichloroethene | 70 | 70 | 200,000 | ND(0.50) | ND(0.50) | 1.0 |
| Vinyl Chloride | 2 | 2 | 570 | ND(0.50) | ND(0.50) | *14* |
| **Semi-Volatile Organic Compounds (µg/L)** | | NA[5] | NA | ND | ND | ND |
| **Polychlorinated Biphenyls (PCBs) (µg/L)** | 0.5 | 0.5 | 3.3 | ND(0.08) | ND(0.08) | ND(0.08) |
| **Total Metals (µg/L)** | | | | | | |
| Aluminum | 50-200 (SMCL)[6] | 50 | 64,000,000 | *116* | ND(50) | *1,220* |
| Antimony | 6 | 6 | 68,000 | 0.25 | ND(0.25) | ND(0.25) |
| Arsenic | 50 | 50 | 4,300 | 24.2 | 25.8 | 33.3 |
| Barium | 2000 | 2,000 | 14,000,000 | 429 | 434 | 252 |
| Calcium | NV | ID[3] | ID | 323,000 | 327,000 | 186000 J |
| Copper | 1,000 (AL)[7] | 1,000 | 7,400,000 | ND(10) | ND(10) | 12.3 |
| Iron | 300 (SMCL) | 300 | 58,000,000 | 11,100 | 11,300 | 14,700 |
| Lead | 15 (AL) | 4 | ID | 0.75 | 0.56 | 5.06 |
| Magnesium | NV | 1,100,000 | 1,000,000,000 | 95,400 | 95,000 | 52,600 |
| Manganese | 50 (SMCL) | 50 | 9,100,000 | *1,360* | *1,330* | *1,340* |
| Nickel | NV | 100 | 74,000,000 | 224 | 228 | ND(20) |
| Potassium | NV | ID | ID | 9,200 | 9,290 | 7,770 |
| Selenium | 50 | 50 | 970,000 | 23.3 | 27.4 | ND(10) |
| Silver | 100 (SMCL) | 98 | 1,500,000 | 0.36 | ND(0.25) | ND(0.25) |
| Sodium | NV | 350,000 | 1,000,000,000 | 790,000 | 810,000 | 570,000 |
| Zinc | 5000 (SMCL) | 5,000 | 110,000,000 | ND(10) | ND(10) | 33.5 |



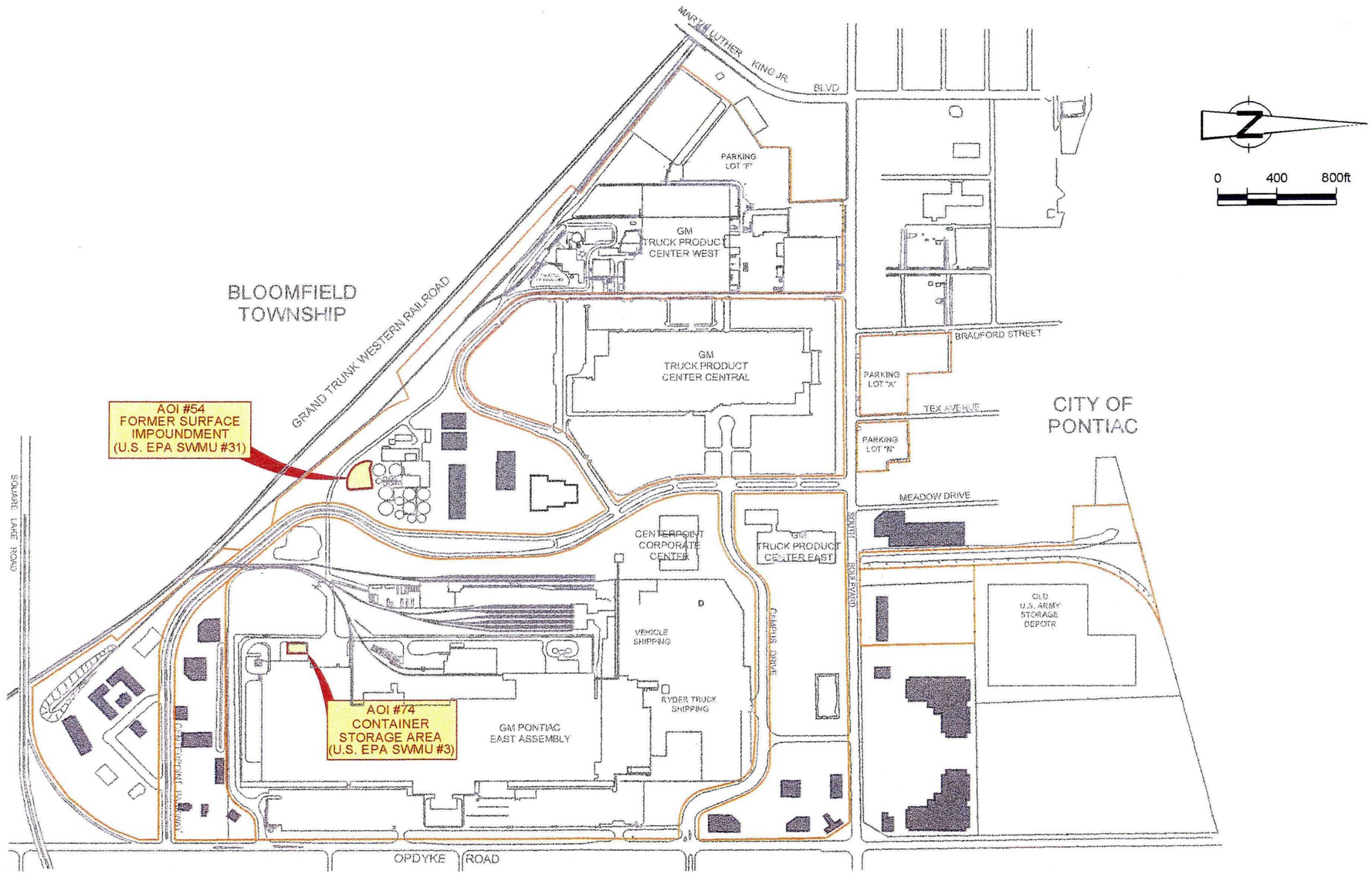

SOURCE: USGS QUADRANGLE MAPS;
BIRMINGHAM, ROCHESTER, PONTIAC NORTH,
AND PONTIAC SOUTH, MICHIGAN

figure 1.1

FACILITY LOCATION
ADDENDUM NO. 1 TO RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

**CRA**

07097-00(017)GN-DE002 NOV 09/2000




LEGEND

1995 GM TRUCK GROUP PROPERTY BOUNDARY

CONCEPTUAL CENTERPOINT BUSINESS CAMPUS DEVELOPMENT SITES

AOI #54 FORMER SURFACE IMPOUNDMENT — AREA OF INTEREST (AOI) LOCATION

figure 2.1

AREA OF INTEREST (AOI) LOCATIONS
ADDENDUM NO. 1 TO RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(017)GN-DE004 NOV 21/2000

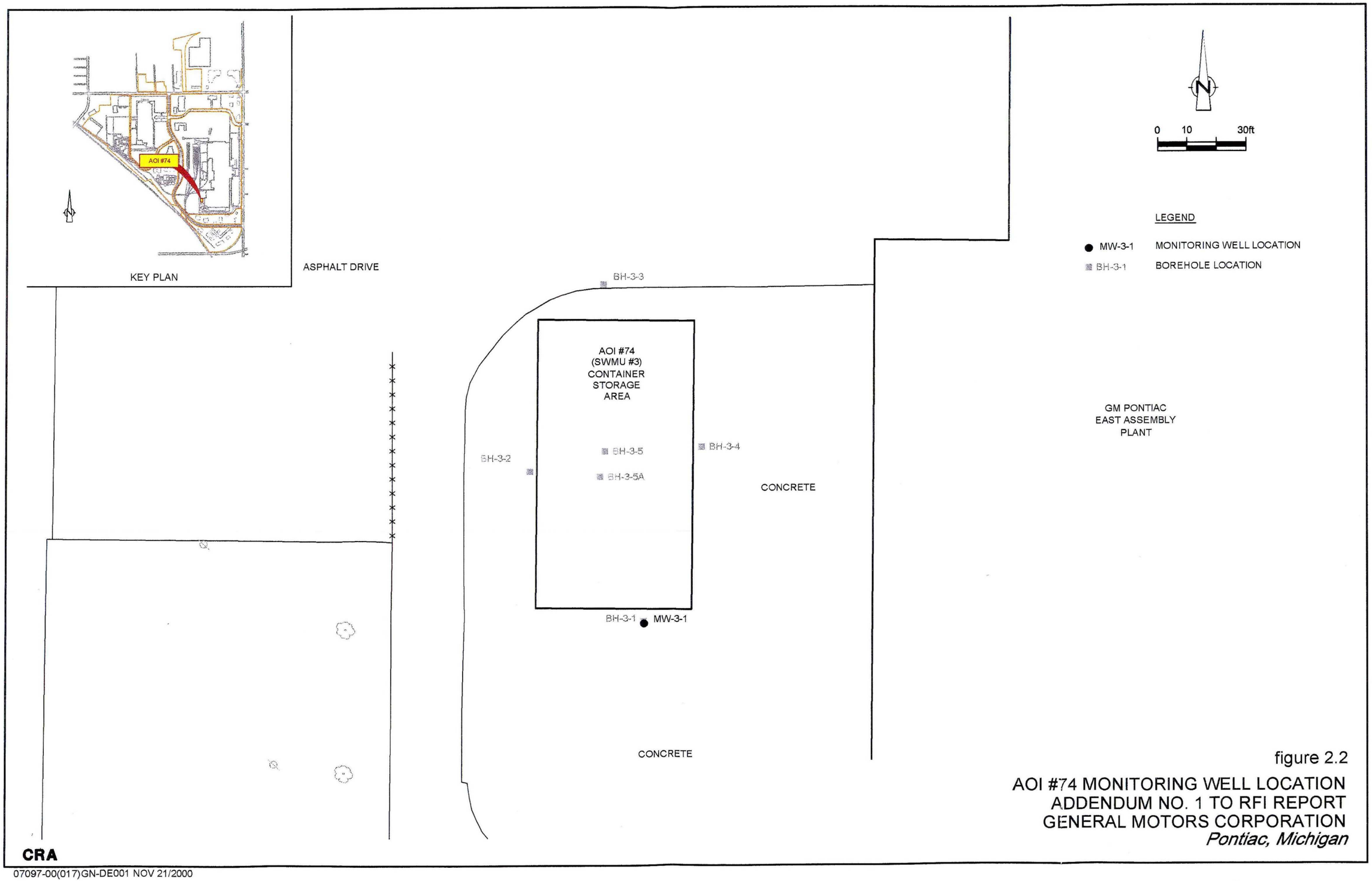



figure 2.2

AOI #74 MONITORING WELL LOCATION
ADDENDUM NO. 1 TO RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(017)GN-DE001 NOV 21/2000

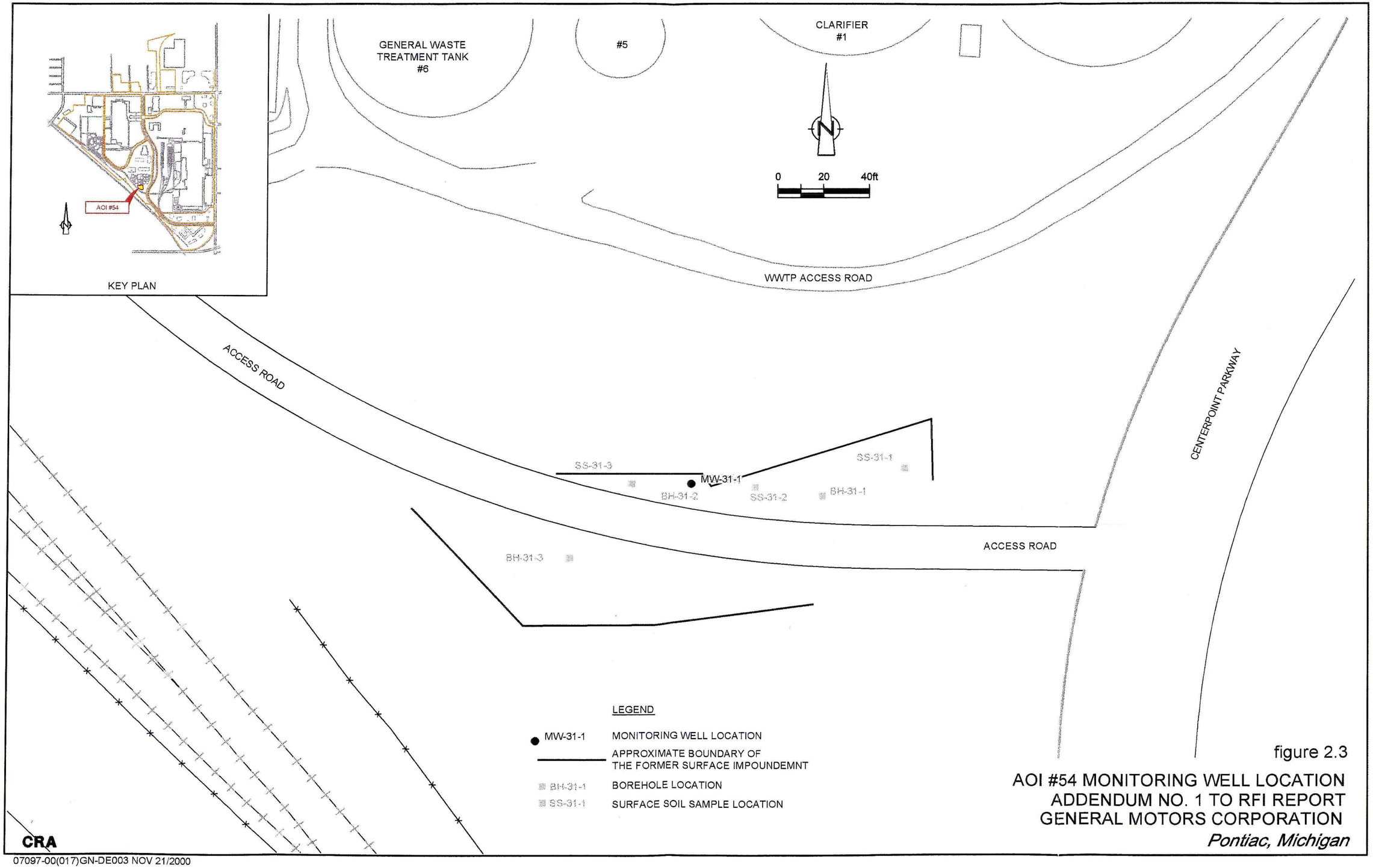



figure 2.3

AOI #54 MONITORING WELL LOCATION
ADDENDUM NO. 1 TO RFI REPORT
GENERAL MOTORS CORPORATION
*Pontiac, Michigan*

07097-00(017)GN-DE003 NOV 21/2000

TABLE 3.1

SUMMARY OF DETECTED ANALYTES
AUGUST 2000
GM TRUCK GROUP
PONTIAC, MICHIGAN

| *Sample Location*<br>*Sample ID # GW-7097-081700*<br>*Date Sampled*<br>*QA/QC* | *Federal Maximum Contaminant Level* | *Industrial & Commercial Drinking Water Criteria* [1] | *Groundwater Contact Criteria* [2] | *MW3-1 -TJ-001 8/17/2000 Groundwater* | *MW3-1 -TJ-002 8/17/2000 Groundwater/Duplicate* | *MW31-1 -TJ-003 8/17/2000 Groundwater* |
|---|---|---|---|---|---|---|
| **Dissolved Metals (µg/L)** | | | | | | |
| Antimony | 6 | 6 | 68,000 | 0.39 | 1.2 | 0.93 |
| Arsenic | 50 | 50 | 4,300 | 25.9 | 25.8 | 37.6 |
| Barium | 2000 | 2,000 | 14,000,000 | 455 | 444 | 251 |
| Calcium | NV | ID | ID | 335,000 | 310,000 | 176,000 |
| Copper | 1,000 (AL) | 1,000 | 7,400,000 | ND(10) | ND(10) | 15.4 |
| Iron | 300 (SMCL) | 300 | 58,000,000 | 11,800 | 11,000 | 10,600 |
| Lead | 15 (AL) | 4 | ID | 0.32 | 0.37 | ND(0.10) |
| Magnesium | NV | 1,100,000 | 1,000,000,000 | 98,100 | 90,300 | 49,900 |
| Manganese | 50 (SMCL) | 50 | 9,100,000 | *1,400* | *1,370* | *1,280* |
| Nickel | NV | 100 | 74,000,000 | 244 | 196 | ND(20) |
| Potassium | NV | ID | ID | 9,430 | 10,100 | 7,830 |
| Selenium | 50 | 50 | 970,000 | 29.4 | 29.7 | 13.7 |
| Sodium | NV | 350,000 | 1,000,000,000 | 835,000 | 775,000 | 562,000 |
| Zinc | 5000 (SMCL) | 5,000 | 110,000,000 | ND(10) | 10.4 | ND(10) |

*Notes:*

NV - No Value
[1] Industrial & Commercial Drinking Water Criteria - MDEQ Operational Memorandum #18, June 7, 2000
[2] Groundwater Contact Criteria - MDEQ Operational Memorandum #18, June 7, 2000
[3] ID - Insufficient Data
[4] ND - Not detected at or above the detection limit in parentheses
[5] NA - Not Applicable
[6] SMCL - Secondary Maximum Contaminant Level
[7] AL - Action Level
Underlined value exceeds Act 451, Part 201 Industrial/Commercial Drinking Water Criteria
Italicized value exceeds Federal Maximum Contaminant Level
Boxed value exceeds Act 451, Part 201 Industrial Groundwater Contact Criteria

# APPENDIX A

# STRATIGRAPHIC AND INSTRUMENTATION LOGS

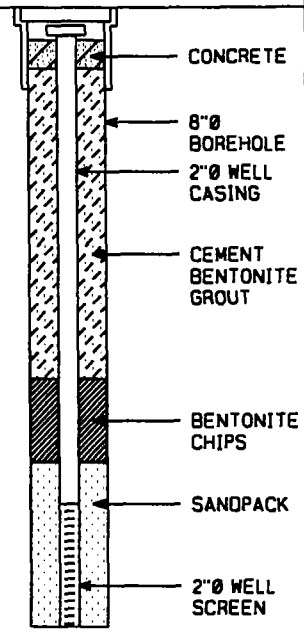
# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-53)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP FACILITY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS CORPORATION
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW-3-1 (AOI #74)
DATE COMPLETED: AUGUST 9, 2000
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | REFERENCE POINT (Top of Riser)<br>GROUND SURFACE | *0.00*<br>*0.00* | | | | | |
| | CONCRETE, gravel mixed, gray-white, competent | *-.7* | | | | | |
| -2.5 | SW/SP-SANDS (FILL), with gravels, trace silts, fragments concrete and asphalt, and clays, compact, fine with medium grained, well graded, dark brown to orange-brown, moist, fine, subangular and subrounded | | | 1GP | | | 0.0 |
| -5.0 | -no concrete and/or asphalt, organge-brown, slightly oxidized<br>-with clays | | | | | | |
| -7.5 | -olive-brown to gray-brown, very moist | *-7.0* | | 2GP | | | 0.0 |
| -10.0 | CL-SILTY CLAYS (NATIVE), trace fine, rounded gravels and fine grained sands, stiff, low plasticity brown, moist, competent, slight oxidized silt/sand fractures <1/16"<br>-slightly mottled, gray striations | | | | | | |
| -12.5 | SP-SANDS (NATIVE), trace silts, compact, fine to coarse grained gradation, poorly graded, brown to olive-gray, wet<br>-trace fine, rounded gravels | *-11.6* | | 3GP | | | 0.0 |
| -15.0 | CL-SILTY CLAYS (NATIVE), trace fine, rounded gravels and fine grained sands, stiff, low plasticity gray-brown, moist, competent | *-14.6*<br>*-15.0* | | | | | |
| -17.5 | END OF HOLE @ 15.0ft BGS | | | | | | |
| -20.0 | | | | | | | |
| -22.5 | | | | | | | |
| -25.0 | | | | | | | |
| -27.5 | | | | | | | |
| -30.0 | | | | | | | |
| -32.5 | | | | | | | |




SCREEN DETAILS
Screened interval:
12.0 to 15.0ft BGS
Length: 3.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
11.0 to 15.0ft BGS
Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

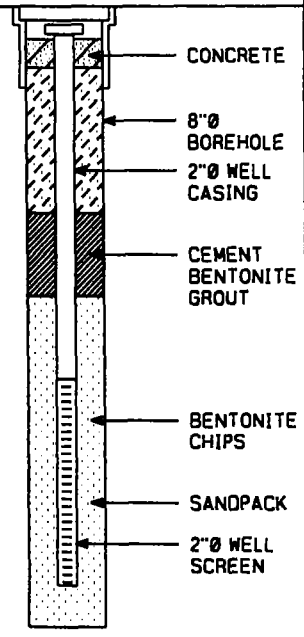
# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(DL-54)
*Page 1 of 1*

PROJECT NAME: GM TRUCK GROUP FACILITY
PROJECT NUMBER: 7097
CLIENT: GENERAL MOTORS CORPORATION
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW-31-1 (AOI #54)
DATE COMPLETED: AUGUST 9, 2000
DRILLING METHOD: 4¼" HSA
CRA SUPERVISOR: T. JOHNSON

| DEPTH ft. BGS | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV. ft. | MONITOR INSTALLATION | SAMPLE NUMBER | SAMPLE STATE | SAMPLE 'N' VALUE | SAMPLE PID (ppm) |
|---|---|---|---|---|---|---|---|
| | REFERENCE POINT (Top of Riser)<br>GROUND SURFACE | 0.00<br>0.00 | | | | | |
| | SM-SILTY SANDS (FILL), with vegetation, trace fine rounded gravels and clays, loose, very fine and fine grained, poorly graded, dark black-brown, very moist | -.8 | | | | | |
| -2.5 | SP-SANDS (FILL) with silts, trace slag and fine, rounded gravels, loose to compact, fine grained, poorly graded, black, very moist | -4.0 | | 1GP | | | 0.0 |
| -5.0 | SW-SANDS (FILL), with fine and coarse rounded gravels, loose, coarse grained, well graded, orange-brown, very moist, oxidized<br>-silt seam <1" thick, heavily oxidized | | | | | | |
| -7.5 | GW-GRAVELS, with silts and trace fine grained sands compact, coarse, subrounded, well graded, orange to olive-gray, wet | -7.5<br>-9.0 | | 2GP | | | 0.0 |
| -10.0 | GP-GRAVELS (PEASTONE), with coarse and medium grained sands, dense to compact, rounded, poorly graded, black-gray, wet | -10.0 | | | | | |
| -12.5 | GW-GRAVELS, with coarse grained sands, trace silts dense, fine and coarse, subrounded, well graded, black, wet, strong vegetative odor | | | 3GP | | | 0.0 |
| -15.0 | CL-SILTY CLAYS (NATIVE), trace fine, rounded gravels and fine grained sands, stiff, low plasticity, gray-brown, moist, competent | -14.0<br>-15.0 | | | | | |
| | END OF HOLE @ 15.0ft BGS | | | | | | |
| -17.5 | | | | | | | |
| -20.0 | | | | | | | |
| -22.5 | | | | | | | |
| -25.0 | | | | | | | |
| -27.5 | | | | | | | |
| -30.0 | | | | | | | |
| -32.5 | | | | | | | |




SCREEN DETAILS
Screened interval:
9.0 to 14.0ft BGS
Length: 5.0ft
Diameter: 2"
Slot Size: #10
Material: PVC
Sand Pack:
7.0 to 15.0ft BGS
Material: Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽ STATIC WATER LEVEL ▼

# APPENDIX B

# ANALYTICAL DATA QUALITY VALIDATION MEMO

CONESTOGA-ROVERS & ASSOCIATES

11100 Metro Airport Center Drive, Suite #160
Romulus, Michigan 48174
Telephone: (734) 942-0909 Fax: (734) 942-1858
www.CRAworld.com

# MEMORANDUM

TO: Scott Green

REF. NO.: 7097

FROM: Mary Cameron/lr/24/Det. MBC

DATE: November 10, 2000

RE: Data Quality Assessment and Validation – Expanded Deliverables
General Motors Truck Production Center (GM TPC)
Pontiac, Michigan

The following details a quality assessment and validation of the analytical data resulting from the August 17, 2000, collection of three (3) groundwater samples from the General Motors Truck Production Center in Pontiac, Michigan. The sample summary detailing sample identification, sample location, quality control samples and analytical parameters is presented in Table 1. Sample analysis was completed at Columbia Analytical Services in Kelso, Washington (CAS) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods and the quality assurance project plan (QAPP).[1]

## Holding Time Period and Sample Analysis

The holding time periods are presented in Table 3. Samples that violated the TCL SVOC holding time period are detailed in Table 4. The remaining samples, as indicated by the sample collection, extraction and analysis dates on the chain-of-custody forms and analytical reports provided by CAS, were prepared and analyzed within the required holding time periods.

## Gas Chromatography/Mass Spectrometer Mass Calibration (Instrument Performance Check)

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each gas chromatography/mass spectrometer (GC/MS) instrument used for volatile organic compounds (VOC) and semi-volatile organic compounds (SVOC) analyses was checked at the beginning of each 12-hour period using bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The results of all instrument performance checks were within the acceptance criteria, indicating acceptable instrument performance.

## Initial Calibration – Organic Analyses

Initial calibration data were used to demonstrate that each instrument was capable of generating acceptable quantitative data. Initial calibration criteria for organic analyses required that all compounds meet a method-specific minimum mean relative response factor (RRF) for GC/MS analyses and a maximum

[1] Application of quality assurance criteria was consistent with "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA-540/R-94/012, February 1994 and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Review", EPA-540/R-94/013, February 1994.

REGISTERED COMPANY
ISO 9001
ENGINEERING DESIGN

Initial Calibration – Organic Analyses (Cont'd)

percent relative standard deviation (RSD) for all organic analyses. The initial calibration data for organic analyses were within the acceptance criteria indicating the instruments were capable of acceptable performance prior to analysis.

Initial Calibration – Inorganic Analyses

The initial calibration criteria for inorganic analysis requires an initial calibration verification standard be analyzed within a method-specific percent recovery of the accepted or true value. The initial calibration data for the inorganic analyses were within the acceptance criteria indicating the instruments were capable of acceptable performance prior or analysis.

Continuing Calibration

To ensure that each instrument was capable of producing acceptable quantitative data over the analysis period, routine checks upon the instrument calibrations were performed. Continuing calibration acceptance criteria for organic analyses required that compounds meet a method-specific minimum RRF (GC/MS analyses only) and maximum percent difference (D) between the initial calibration mean RRF and the continuing calibration RRF. The continuing calibration verification data were within the acceptance criteria.

Continuing calibration criteria for inorganic analyses were the same criteria as used for assessing the initial calibration data. The continuing calibration verification data were within the acceptance criteria.

Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free from detectable concentrations of target analytes, indicating no laboratory-attributable contamination occurred.

Surrogate Compound Percent Recoveries (Surrogate Recoveries)

Individual sample performance for the organic analyses was monitored by assessing the results of surrogate compound percent recoveries. The surrogate recovery acceptance criteria was met for all samples.

Inductively Coupled Plasma Interference Check Sample Analysis

To verify that proper inter-element and background correction factors had been established by the laboratory for metals analyses, the inductively coupled plasma interference check sample data was monitored. The data were within the acceptance criteria.

Laboratory Control Sample Analysis

The laboratory control sample (LCS) analyses serve as a monitor of the overall performance in all steps of the sample analysis. The sample results that should be qualified due to violation of LCS percent recovery criteria are identified and qualified in Table 5. Several of the samples were previously qualified as estimated (UJ) quantitation limits (extracted on 9/26/2000) due to violation of TCL SVOC holding time criteria. The extent and magnitude of the LCS percent recovery criteria violation overides the previous qualification. Therefore, the TCL SVOC results for the samples extracted on 9/26/2000 should be qualified as rejected (R) and only the TCL SVOC results extracted on 8/24/2000 should be reported. The remaining LCS percent recoveries were within the acceptance criteria.

Matrix Spike/Matrix Spike Duplicate Percent Recoveries - Organic Analyses

To assess the long term accuracy and precision of the analytical methods on various matrices, matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and the relative percent difference (RPD) of the concentrations were determined. The TCL SVOC MS/MSD percent recoveries and associated RPD acceptance criteria were violated, but the associated sample was previously qualified. No further qualification was required. The MS/MSD percent recoveries and associate RPDs acceptance criteria were met for the remaining analyses.

Matrix Spike Analysis - Inorganic Analyses

Matrix spike samples were monitored to determine the effects of sample matrix on the laboratories digestion and measurement methods. The inorganic matrix spike recoveries were within acceptance criteria.

Duplicate Sample Analyses - Inorganic Analyses

The laboratory precision of matrix-specific metals methods was monitored by the analyses of duplicate samples. The duplicate RPD data were within the acceptance criteria.

Serial Dilution – Inorganic Analyses

The percent difference (D) between serial dilutions of a sample for various matrices were monitored to determine physical or chemical interference. The calcium result reported for sample GW-7097-081700-TJ-003 should be qualified as an estimated (J) value due to violation of serial dilution criteria. The remaining percent D acceptance criteria were met.

Internal Standard Summaries

Overall instrument stability and performance for the VOC and SVOC analyses was monitored using internal standard peak area and retention time (RT) data. Internal standard peak areas of the samples were required to fall within method-specific percent recovery of their respective internal standard areas in the continuing calibration standard. The RT for each internal standard in the samples were required to be within method-specific time intervals of their respective internal standard RT in the continuing calibration standard. The TCL VOC and TCL SVOC internal standard and retention time data were within the acceptance criteria.

Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra (if applicable) were evaluated according to identification criteria established by the methods. The organics reported adhered to the specified identification criteria.

Compound Quantitation

The reported quantitation results and detection limits were checked to ensure results reported were accurate. No discrepancies were found between the raw data and the sample results reported by the laboratory.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of one (1) field duplicate sample set and one (1) trip blank sample.

Overall precision for the sampling event and laboratory procedures was monitored using the results of the field duplicate sample set. Table 6 summarizes the results of the detected analytes in the field duplicate sample set. The data indicate that an adequate level of precision was achieved for the sampling event.

To monitor potential cross-contamination of VOC during aqueous sample transportation and storage, a trip blank was submitted to the laboratory for VOC analysis with each shipping cooler. No target analytes were reported as detected in the trip blank sample.

System Performance

System performance between various quality control checks was evaluated to monitor for changes that may have caused the degradation of data quality. No technical problems or chromatographic anomalies were observed which require qualification of the data.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

TABLE 1

SAMPLE SUMMARY
GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
PONTIAC, MICHIGAN

| *Sample Identification* | *Sample Location / Description* | *Matrix* | *QC* | *Parameters* |
|---|---|---|---|---|
| GW-7097-081700-TJ-001 | MW-3-1 | Water | | VOC, SVOC, Inorganics, Pesticides, PCB |
| GW-7097-081700-TJ-002 | MW-3-1 | Water | Duplicate of 001 | VOC, SVOC, Inorganics, Pesticides, PCB |
| GW-7097-081700-TJ-003 | MW-31-2 | Water | | VOC, SVOC, Inorganics, Pesticides, PCB |

*Notes:*

VOC - Target Compound List (TCL) Volatile Organic Compounds (VOC).
SVOC - TCL Semi-Volatile Organic Compounds (SVOC).
Inorganics - Target Analyte List (TAL) Inorganics, Dissolved and Total
PCB - Polychlorinated biphynels.

## TABLE 2

## SUMMARY OF ANALYTICAL METHODS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Method* |
|---|---|
| TCL VOC | SW-846 8260B [1] |
| TCL SVOC | SW-846 8270C |
| PCB | SW-846 8082 |
| TAL Inorganics, Total and Dissolved | |
| Aluminum | SW-846 6010B |
| Antimony | SW-846 6020 |
| Arsenic | SW-846 6020 |
| Barium | SW-846 6010B |
| Beryllium | SW-846 6020 |
| Cadmium | SW-846 6020 |
| Calcium | SW-846 6010B |
| Chromium | SW-846 6010B |
| Cobalt | SW-846 6010B |
| Copper | SW-846 6010B |
| Iron | SW-846 6010B |
| Lead | SW-846 6020 |
| Magnesium | SW-846 6010B |
| Manganese | SW-846 6010B |
| Mercury | SW-846 7470A |
| Nickel | SW-846 6010B |
| Potassium | SW-846 6010B |
| Selenium | SW-846 6020 |
| Silver | SW-846 6020 |
| Sodium | SW-846 6010B |
| Thallium | SW-846 6020 |
| Total Cyanide | EPA-WW 335.2[2] |
| Vanadium | SW-846 6010B |
| Zinc | SW-846 6010B |

[1] SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and Promulgated updates, November 1986

[2] EPA-WW - "Methods for Chemical Analysis of Water and Waste," EPA-600/4-79-020, revised March 1983.

## TABLE 3

## HOLDING TIME PERIODS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Holding Time Period* |
|---|---|
| TCL VOC | - 14 days from sample collection to completion of analysis |
| TCL SVOC, TCL Pesticides, PCB | - 7 days from sample collection to extraction<br>- 40 days from extraction to completion of analysis |
| TAL Inorganics- | |
| Metals (except Mercury) | - 180 days from sample collection to completion of analysis |
| Mercury | - 28 days from sample collection to completion of analysis |
| Cyanide | - 14 days from sample collection to completion of analysis |

## TABLE 4

## SUMMARY OF QUALIFIED SAMPLE DATA
## DUE TO HOLDING TIME PERIOD VIOLATIONS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Analysis* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|
| TCL SVOC | GW-7097-081700-TJ-001 (9/26/2000)[2] | UJ |
| | GW-7097-081700-TJ-002 (9/26/2000) | UJ |
| | GW-7097-081700-TJ-003 (9/26/2000) | UJ |

[1]The sample parameter results should be qualified as:

UJ -The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is estimated and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample (for non-detected parameters).

[2] Date of extraction

## TABLE 5

## SUMMARY OF QUALIFIED SAMPLE DATA DUE TO LABORATORY CONTROL SAMPLE PERCENT RECOVERY VIOLATION GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE PONTIAC, MICHIGAN

| *Analysis* | *Parameters* | *Associated Samples* | *Qualifier*[1] |
|---|---|---|---|
| TCL SVOC | Phenol, | GW-7097-081700-TJ-001 (8/24/2000) [2] | R |
| | 2-Chlorophenol, | GW-7097-081700-TJ-002 (8/24/2000) | R |
| | Benzoic Acid, | GW-7097-081700-TJ-003 (8/24/2000) | R |
| | Hexachlorocyclopentadiene | | R |
| TCL SVOC | TCL SVOC | GW-7097-081700-TJ-001 (9/26/2000) | R |
| | | GW-7097-081700-TJ-002 (9/26/2000) | R |
| | | GW-7097-081700-TJ-003 (9/26/2000) | R |

[1]The analysis parameters results should be qualified for the listed samples as:

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

[2] Date of extraction.

## TABLE 6

## SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SETS
## GENERAL MOTORS TRUCK PRODUCTION CENTERS SITE
## PONTIAC, MICHIGAN

| *Parameter* | *Investigative Sample* | *Duplicate Sample* | *RPD* [1] |
|---|---|---|---|
| | GW-7097-081700-TJ-001 | GW-7097-081700-TJ-002 | |
| TAL Inorganics - Total (µg/L) | | | |
| Aluminum | 116 | ND (50.0)[2] | NC[3] |
| Antimony | 0.25 | ND (0.25) | NC |
| Arsenic | 24.2 | 25.8 | 6.4 |
| Barium | 429 | 434 | 1.2 |
| Calcium | 323,000 | 327,000 | 1.2 |
| Iron | 11,100 | 11,300 | 1.8 |
| Lead | 0.75 | 0.56 | 29 |
| Magnesium | 95,400 | 95,000 | 0.42 |
| Manganese | 1,360 | 1,330 | 2.2 |
| Nickel | 224 | 228 | 1.8 |
| Potassium | 9,200 | 9,290 | 0.97 |
| Selenium | 23.3 | 27.4 | 16 |
| Silver | 0.36 | ND (0.25) | NC |
| Sodium | 790,000 | 810,000 | 2.5 |
| TAL Inorganics - Dissolved (µg/L) | | | |
| Antimony | 0.39 | 1.2 | 100 |
| Arsenic | 25.9 | 25.8 | 0.39 |
| Barium | 455 | 444 | 2.4 |
| Calcium | 335,000 | 310,000 | 7.8 |
| Iron | 11,800 | 11,000 | 7.0 |
| Lead | 0.32 | 0.37 | 14 |
| Magnesium | 98,100 | 90,300 | 8.3 |
| Manganese | 1,400 | 1,370 | 2.2 |
| Nickel | 244 | 196 | 22 |
| Potassium | 9,430 | 10,100 | 6.9 |
| Selenium | 29.4 | 29.7 | 1.0 |
| Sodium | 835,000 | 775,000 | 7.5 |
| Zinc | ND (10.0) | 10.4 | NC |

Notes:

[1] RPD - Relative Percent Difference

[2] ND( ) - Not detected at the quantitation limit stated in parentheses.

[3] NC - Not calculable.

# APPENDIX C

## LABORATORY ANALYTICAL DATA REPORTS
## (TABULATED DATA SUMMARIES)

REC'D CRA
OCT 24 2000
SDG: 14

Columbia Analytical Services INC.
An Employee-Owned Company

October 23, 2000

Service Request No: K2006327

Paul Wiseman
Conestoga-Rovers & Associates, Inc
11100 Metro Airport Center Drive, Suite 160
Romulus, MI 48174

**Re: GM Truck Group Facility-RCRA Invest./7097**

Dear Paul:

Enclosed are the results of the sample(s) submitted to our laboratory on August 18, 2000. Preliminary results were transmitted via facsimile on September 25 and 26, 2000. For your reference, these analyses have been assigned our service request number K2006327.

All analyses were performed according to our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions. My extension is 3345.

Respectfully submitted,

**Columbia Analytical Services, Inc.**

Mingta Lin
Project Chemist

ML/cb

**ORIGINAL ANALYTICAL REPORT**
**Project#:** 7097 **Lab#:** K2006327
**Name:** GM Truck Group
**Description**
**Event:** RCRA Investigation
**Samples:** 3 water (8/17/00)
**Analysis:** VOC, SVOC, PCB, Mtl, TCN
**TAT:** 28 days not met
**Lab:** CAS
Page 1 of 130
**Checked Against Preliminary Data:**
**Date:** 10/25/00 **Init.:**
**Date of Validation Memo:**
**Invoice Approval Date:**
**Comments:**

317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 360/ 577-7222 • Fax 360/636-1068

## Acronyms

| | |
|---|---|
| ASTM | American Society for Testing and Materials |
| A2LA | American Association for Laboratory Accreditation |
| CARB | California Air Resources Board |
| CAS Number | Chemical Abstract Service registry Number |
| CFC | Chlorofluorocarbon |
| CFU | Colony-Forming Unit |
| DEC | Department of Environmental Conservation |
| DEQ | Department of Environmental Quality |
| DHS | Department of Health Services |
| DOE | Department of Ecology |
| DOH | Department of Health |
| EPA | U. S. Environmental Protection Agency |
| ELAP | Environmental Laboratory Accreditation Program |
| GC | Gas Chromatography |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| LUFT | Leaking Underground Fuel Tank |
| M | Modified |
| MCL | Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. |
| MDL | Method Detection Limit |
| MPN | Most Probable Number |
| MRL | Method Reporting Limit |
| NA | Not Applicable |
| NC | Not Calculated |
| NCASI | National Council of the Paper Industry for Air and Stream Improvement |
| ND | Not Detected |
| NIOSH | National Institute for Occupational Safety and Health |
| PQL | Practical Quantitation Limit |
| RCRA | Resource Conservation and Recovery Act |
| SIM | Selected Ion Monitoring |
| TPH | Total Petroleum Hydrocarbons |
| tr | Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL. |

## Inorganic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |

## Metals Data Qualifiers

| | |
|---|---|
| # | The control limit criteria is not applicable. See case narrative. |
| B | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| E | The reported value is estimated because of the presence of matrix interference. |
| M | The duplicate injection precision was not met. |
| N | The Matrix Spike sample recovery is not within control limits. See case narrative. |
| S | The reported value was determined by the Method of Standard Additions (MSA). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| W | The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |
| * | The duplicate analysis not within control limits. See case narrative. |
| + | The correlation coefficient for the MSA is less than 0.995. |

## Organic Data Qualifiers

| | |
|---|---|
| * | The result is an outlier. See case narrative. |
| # | The control limit criteria is not applicable. See case narrative. |
| A | A tentatively identified compound, a suspected aldol-condensation product. |
| B | The analyte was found in the associated method blank at a level that is significant relative to the sample result. |
| C | The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data. |
| D | The reported result is from a dilution. |
| E | The result is an estimate amount because the value exceeded the instrument calibration range. |
| J | The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. |
| N | The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed. |
| P | The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results (25% for CLP Pesticides). |
| U | The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. |
| i | The MRL/MDL has been elevated due to a matrix interference. |
| X | See case narrative. |

## Additional Petroleum Hydrocarbon Specific Qualifiers

| | |
|---|---|
| F | The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard. |
| L | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard. |
| H | The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard. |
| O | The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard. |
| Y | The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard. |
| Z | The chromatographic fingerprint does not resemble a petroleum product. |

COLUMBIA ANALYTICAL SERVICES, INC.

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Associates | **Service Request No.:** | K2006327 |
| **Project:** | GM Truck Facility - RCRA Investigation | **Date Received:** | 8/18/00 |
| **Sample Matrix:** | Water | | |

## CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for sample(s) designated for Tier III data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), Initial/Continuing Calibration Verification Standards (ICV/CCV), and Initial/Continuing Calibration Blanks (ICB/CCB).

All EPA recommended holding times have been met for analyses in this sample delivery group.

The following difficulties were experienced during analysis of this batch:

Metals

The MS recovery of iron is not applicable because the iron concentration in the unspiked sample was significantly higher than the added spike, preventing accurate evaluation of the spike recovery. All other QC results (e.g., LCS recovery) indicated that the analysis was in control, and no further corrective action was taken.

SVOCs

Due to failure of some compounds in Lab Control Sample KWG2003485-5, all samples were reextracted past hold time and reported in addition to the initial extractions per CAS QC policy. All compounds in samples extracted past hold time are flagged.

The upper control criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) MS08 from 9/27: Bis(2-chloroisopropyl)ether. The field samples analyzed in this sequence did not contain the analyte(s) in question. Sincethe elevated recovery equates to a high bias, the data quality has not been affected. No further corrective action was taken.

The upper control criterion was exceeded for the following analytes in Continuing Calibration Verification (CCV) MS08 from 10/02: Benzoic acid, 2-Nitroaniline. The field samples analyzed in this sequence did not contain the analyte(s) in question. Since the elevated recovery equates to a high bias, the data quality has not been affected. No further corrective action was taken.

Approved by mth Date 10/13/00

SVOCs (Continued)

The control criteria were exceeded for the following surrogate(s) in KWG2003485-5(LCS): 2-Fluorophenol. Since the exceedance of the criterion may indicate a potential bias in the analysis, the associated samples were re-extracted and re-analyzed. The re-analyses confirm the original results. Both analyses have been reported.

The control criteria were exceeded for the following surrogate(s) in K2006327-002RX,-003RX ,KWG2004257-1(LCS): Phenol-d6. The exceedance of the criterion may indicate a potential bias in the analysis. These samples were re-extracted. The re-extracts associated with the failed LCS surrogate were not re-extracted again since the re-analyses confirm the original results. Both analyses have been reported.

The upper control criterion was exceeded for the following surrogate(s) in samples K2006327-001RX, -002RX: Nitrobenzene-d5. No target analytes were detected in the sample. The error associated with an elevated recovery equates to a high bias. The quality of the sample data has not been significantly affected. No further corrective action was feasible.

The matrix spike recoveries of Phenol, 2-Chlorophenol for samples K2006368-001MS/DMS were outside control criteria. The samples were re-extracted and re-analyzed. The results of the original and secondary analyses are reported.

The matrix spike recovery of 4-Chloro-3-methylphenol for samples K2006368-001MS was outside control criteria. The samples were re-extracted and re-analyzed. The results of the original and secondary analyses are reported.

The control criterion was exceeded for the following analyte(s) in Laboratory Control Sample (LCS) KWG2003485-5: Phenol, 2-Chlorophenol, Benzoic acid, Hexachlorocyclopentadiene. Since theexceedance of the criterion may indicate a potential bias in the analytical batch, all associated field samples containing analyte(s) in question were re-extracted out of hold time and re-analyzed. The re-analyses confirm an error with original results. The initial and secondary analyses have both been reported.

The control criterion was exceeded for the following analyte(s) in Laboratory Control Sample (LCS) KWG2004257-1: N-Nitrosodimethylamine, Aniline, Phenol, 2-Chlorophenol, 1,4-Dichlorobenzene, Benzoic acid, 1,2,4-Trichlorobenzene, 4-Chloroaniline, 4-Chloro-3-methylphenol, Hexachlorocyclopentadiene, Acenaphthene, 4-Nitrophenol, 2,4-Dinitrotoluene. This batch was extracted as re-extracts due to the lower recovery of original LCS and surrogat. The lower recovery of LCS can be attributed to loss of some of the extract as documented on the bench sheet. Both batches of extracts were reported.

The control criterion was exceeded for the following analyte(s) in Laboratory Control Sample (LCS) KWG2004257-2: Aniline, Phenol, Benzoic Acid, and 4-Nitrophenol. This batch was extracted as re-extracts due to the lower recovery of the original LCS and surrogate. Both batches of extracts were reported.

The Relative Percent Difference (RPD) for the following analyte(s) in the replicate Laboratory Control Sample (LCS) analyses (KWG2004257-1 and KWG2004257-2) was outside control criteria: N-Nitrosodimethylamine, Hexachlorocyclopentadiene, 2-NitroanilineButylbenzyl phthalate, 3,3'-Dichlorobenzidine. The high RPD can be attributed to loss of some of the extract as documented on the bench sheet. Both batches of extracts were reported. No further corrective action was taken.

The Relative Percent Difference (RPD) for the following analyte in the replicate Matrix Spike Samples (MS/DMS) analyses (KWG2003485-1 and KWG2003485-2) was outside control criteria: Phenol, 2-Chlorophenol, 4-Chloro-3-methylphenol. The data has been flagged to indicate the elevated RPD and samples re-extracted. Both sets of extracts have been reported.

Approved by mtl Date 10/13/00

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097
**Sample Matrix:** Water

**Service Request:** K2006327
**Date Collected:** 8/17/00
**Date Received:** 8/18/00

Cyanide, Total

Prep Method: NONE
Analysis Method: 335.2
Test Notes:

Units: mg/L (ppm)
Basis: NA

| Sample Name | Lab Code | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|
| GW-7097-081700-TJ-001 | K2006327-001 | 0.01 | 1 | 8/29/00 | 8/30/00 | ND | |
| GW-7097-081700-TJ-002 | K2006327-002 | 0.01 | 1 | 8/29/00 | 8/30/00 | ND | |
| GW-7097-081700-TJ-003 | K2006327-003 | 0.01 | 1 | 8/29/00 | 8/30/00 | ND | |
| Method Blank | K2006327-MB | 0.01 | 1 | 8/29/00 | 8/30/00 | ND | |

Approved By: _____ Date: 8/31/00

*Columbia Analytical Services, Inc.*

# METALS
## - Cover Page -
## INORGANIC ANALYSIS DATA PACKAGE

Contract: Conestoga Rovers & Assoc. SDG No.: K2006327

Lab Code: KLAB Case No.: 7097 SAS No.:

SOW No.: SW-846

| Sample No. | Lab Sample ID. |
|---|---|
| 7097-081700-TJ001 | K2006327-001 |
| 7097-081700-TJ001 | K2006327-001 DISS |
| 7097-081700-TJ002 | K2006327-002 |
| 7097-081700-TJ002 | K2006327-002 DISS |
| 7097-081700-TJ003 | K2006327-003 |
| 7097-081700-TJ003 | K2006327-003 DISS |
| 7097-081700-TJ003D | K2006327-003D |
| 7097-081700-TJ003S | K2006327-003S |

Were ICP interelement corrections applied? Yes/No YES

Were ICP background corrections applied? Yes/No YES

If yes-were raw data generated before application of background corrections? Yes/No NO

Comments: P = 6010B
MS = 6020
CV = 7470A (Hg)

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: JEFF CORONADO

Date: 9/19/00 Title: METALS LAB MANAGER

*Columbia Analytical Services, Inc.*

# METALS

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## INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

7097-081700-TJ001

Contract: Conestoga Rovers & Assoc.

Lab Code: KLAB Case No.: 7097 SAS No.: SDG NO.: K2006327

Matrix (soil/water): WATER Lab Sample ID: K2006327-001

Level (low/med): LOW Date Received: 08/18/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 116 | | | P |
| 7440-36-0 | Antimony | 0.25 | | | MS |
| 7440-38-2 | Arsenic | 24.2 | | | MS |
| 7440-39-3 | Barium | 429 | | | P |
| 7440-41-7 | Beryllium | 0.10 | U | | MS |
| 7440-43-9 | Cadmium | 0.25 | U | | MS |
| 7440-70-2 | Calcium | 323000 | | | P |
| 7440-47-3 | Chromium | 10.0 | U | | P |
| 7440-48-4 | Cobalt | 10.0 | U | | P |
| 7440-50-8 | Copper | 10.0 | U | | P |
| 7439-89-6 | Iron | 11100 | | | P |
| 7439-92-1 | Lead | 0.75 | | | MS |
| 7439-95-4 | Magnesium | 95400 | | | P |
| 7439-96-5 | Manganese | 1360 | | | P |
| 7439-97-6 | Mercury | 0.20 | U | | CV |
| 7440-02-0 | Nickel | 224 | | | P |
| 7440-09-7 | Potassium | 9200 | | | P |
| 7782-49-2 | Selenium | 23.3 | | | MS |
| 7440-22-4 | Silver | 0.36 | | | MS |
| 7440-23-5 | Sodium | 790000 | | | P |
| 7440-28-0 | Thallium | 0.10 | U | | MS |
| 7440-62-2 | Vanadium | 10.0 | U | | P |
| 7440-66-6 | Zinc | 10.0 | U | | P |

Color Before: Clarity Before: Texture:

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Comments: TOTAL METALS

# METALS

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## INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

7097-081700-TJ001

Contract: Conestoga Rovers & Assoc.

Lab Code: KLAB Case No.: 7097 SAS No.: SDG NO.: K2006327

Matrix (soil/water): WATER Lab Sample ID: K2006327-001 DISS

Level (low/med): LOW Date Received: 08/18/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 50.0 | U | | P |
| 7440-36-0 | Antimony | 0.39 | | | MS |
| 7440-38-2 | Arsenic | 25.9 | | | MS |
| 7440-39-3 | Barium | 455 | | | P |
| 7440-41-7 | Beryllium | 0.10 | U | | MS |
| 7440-43-9 | Cadmium | 0.25 | U | | MS |
| 7440-70-2 | Calcium | 335000 | | | P |
| 7440-47-3 | Chromium | 10.0 | U | | P |
| 7440-48-4 | Cobalt | 10.0 | U | | P |
| 7440-50-8 | Copper | 10.0 | U | | P |
| 7439-89-6 | Iron | 11800 | | | P |
| 7439-92-1 | Lead | 0.32 | | | MS |
| 7439-95-4 | Magnesium | 98100 | | | P |
| 7439-96-5 | Manganese | 1400 | | | P |
| 7439-97-6 | Mercury | 0.20 | U | | CV |
| 7440-02-0 | Nickel | 244 | | | P |
| 7440-09-7 | Potassium | 9430 | | | P |
| 7782-49-2 | Selenium | 29.4 | | | MS |
| 7440-22-4 | Silver | 0.25 | U | | MS |
| 7440-23-5 | Sodium | 835000 | | | P |
| 7440-28-0 | Thallium | 0.10 | U | | MS |
| 7440-62-2 | Vanadium | 10.0 | U | | P |
| 7440-66-6 | Zinc | 10.0 | U | | P |

Color Before: Clarity Before: Texture:

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Comments: DISSOLVED METALS

*Columbia Analytical Services, Inc.*

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## INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

7097-081700-TJ002

Contract: Conestoga Rovers & Assoc.

Lab Code: KLAB Case No.: 7097 SAS No.: SDG NO.: K2006327

Matrix (soil/water): WATER Lab Sample ID: K2006327-002

Level (low/med): LOW Date Received: 08/18/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 50.0 | U | | P |
| 7440-36-0 | Antimony | 0.25 | U | | MS |
| 7440-38-2 | Arsenic | 25.8 | | | MS |
| 7440-39-3 | Barium | 434 | | | P |
| 7440-41-7 | Beryllium | 0.10 | U | | MS |
| 7440-43-9 | Cadmium | 0.25 | U | | MS |
| 7440-70-2 | Calcium | 327000 | | | P |
| 7440-47-3 | Chromium | 10.0 | U | | P |
| 7440-48-4 | Cobalt | 10.0 | U | | P |
| 7440-50-8 | Copper | 10.0 | U | | P |
| 7439-89-6 | Iron | 11300 | | | P |
| 7439-92-1 | Lead | 0.56 | | | MS |
| 7439-95-4 | Magnesium | 95000 | | | P |
| 7439-96-5 | Manganese | 1330 | | | P |
| 7439-97-6 | Mercury | 0.20 | U | | CV |
| 7440-02-0 | Nickel | 228 | | | P |
| 7440-09-7 | Potassium | 9290 | | | P |
| 7782-49-2 | Selenium | 27.4 | | | MS |
| 7440-22-4 | Silver | 0.25 | U | | MS |
| 7440-23-5 | Sodium | 810000 | | | P |
| 7440-28-0 | Thallium | 0.10 | U | | MS |
| 7440-62-2 | Vanadium | 10.0 | U | | P |
| 7440-66-6 | Zinc | 10.0 | U | | P |

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Comments: TOTAL METALS

*Columbia Analytical Services, Inc.*

# METALS

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## INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

7097-081700-TJ002

Contract: Conestoga Rovers & Assoc.

Lab Code: KLAB Case No.: 7097 SAS No.: SDG NO.: K2006327

Matrix (soil/water): WATER Lab Sample ID: K2006327-002 DISS

Level (low/med): LOW Date Received: 08/18/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 50.0 | U | | P |
| 7440-36-0 | Antimony | 1.20 | | | MS |
| 7440-38-2 | Arsenic | 25.8 | | | MS |
| 7440-39-3 | Barium | 444 | | | P |
| 7440-41-7 | Beryllium | 0.10 | U | | MS |
| 7440-43-9 | Cadmium | 0.25 | U | | MS |
| 7440-70-2 | Calcium | 310000 | | | P |
| 7440-47-3 | Chromium | 10.0 | U | | P |
| 7440-48-4 | Cobalt | 10.0 | U | | P |
| 7440-50-8 | Copper | 10.0 | U | | P |
| 7439-89-6 | Iron | 11000 | | | P |
| 7439-92-1 | Lead | 0.37 | | | MS |
| 7439-95-4 | Magnesium | 90300 | | | P |
| 7439-96-5 | Manganese | 1370 | | | P |
| 7439-97-6 | Mercury | 0.20 | U | | CV |
| 7440-02-0 | Nickel | 196 | | | P |
| 7440-09-7 | Potassium | 10100 | | | P |
| 7782-49-2 | Selenium | 29.7 | | | MS |
| 7440-22-4 | Silver | 0.25 | U | | MS |
| 7440-23-5 | Sodium | 775000 | | | P |
| 7440-28-0 | Thallium | 0.10 | U | | MS |
| 7440-62-2 | Vanadium | 10.0 | U | | P |
| 7440-66-6 | Zinc | 10.4 | | | P |

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments: DISSOLVED METALS

*Columbia Analytical Services, Inc.*

# METALS

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## INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

7097-081700-TJ003

Contract: Conestoga Rovers & Assoc.

Lab Code: KLAB Case No.: 7097 SAS No.: SDG NO.: K2006327

Matrix (soil/water): WATER Lab Sample ID: K2006327-003

Level (low/med): LOW Date Received: 08/18/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 1220 | | | P |
| 7440-36-0 | Antimony | 0.25 | U | | MS |
| 7440-38-2 | Arsenic | 33.3 | | | MS |
| 7440-39-3 | Barium | 252 | | | P |
| 7440-41-7 | Beryllium | 0.10 | U | | MS |
| 7440-43-9 | Cadmium | 0.25 | | | MS |
| 7440-70-2 | Calcium | 186000 | | | P |
| 7440-47-3 | Chromium | 10.0 | U | | P |
| 7440-48-4 | Cobalt | 10.0 | U | | P |
| 7440-50-8 | Copper | 12.3 | | | P |
| 7439-89-6 | Iron | 14700 | | | P |
| 7439-92-1 | Lead | 5.06 | | | MS |
| 7439-95-4 | Magnesium | 52600 | | | P |
| 7439-96-5 | Manganese | 1340 | | | P |
| 7439-97-6 | Mercury | 0.20 | U | | CV |
| 7440-02-0 | Nickel | 20.0 | U | | P |
| 7440-09-7 | Potassium | 7770 | | | P |
| 7782-49-2 | Selenium | 10.0 | U | | MS |
| 7440-22-4 | Silver | 0.25 | U | | MS |
| 7440-23-5 | Sodium | 570000 | | | P |
| 7440-28-0 | Thallium | 0.10 | U | | MS |
| 7440-62-2 | Vanadium | 10.0 | U | | P |
| 7440-66-6 | Zinc | 33.5 | | | P |

Color Before: Clarity Before: Texture:

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Comments: TOTAL METALS

*Columbia Analytical Services, Inc.*

# METALS

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## INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

7097-081700-TJ003

Contract: Conestoga Rovers & Assoc.

Lab Code: KLAB Case No.: 7097 SAS No.: SDG NO.: K2006327

Matrix (soil/water): WATER Lab Sample ID: K2006327-003 DISS

Level (low/med): LOW Date Received: 08/18/00

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): µG/L

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 50.0 | U | | P |
| 7440-36-0 | Antimony | 0.93 | | | MS |
| 7440-38-2 | Arsenic | 37.6 | | | MS |
| 7440-39-3 | Barium | 251 | | | P |
| 7440-41-7 | Beryllium | 0.10 | U | | MS |
| 7440-43-9 | Cadmium | 0.25 | U | | MS |
| 7440-70-2 | Calcium | 176000 | | | P |
| 7440-47-3 | Chromium | 10.0 | U | | P |
| 7440-48-4 | Cobalt | 10.0 | U | | P |
| 7440-50-8 | Copper | 15.4 | | | P |
| 7439-89-6 | Iron | 10600 | | | P |
| 7439-92-1 | Lead | 0.10 | U | | MS |
| 7439-95-4 | Magnesium | 49900 | | | P |
| 7439-96-5 | Manganese | 1280 | | | P |
| 7439-97-6 | Mercury | 0.20 | U | | CV |
| 7440-02-0 | Nickel | 20.0 | U | | P |
| 7440-09-7 | Potassium | 7830 | | | P |
| 7782-49-2 | Selenium | 13.7 | | | MS |
| 7440-22-4 | Silver | 0.25 | U | | MS |
| 7440-23-5 | Sodium | 562000 | | | P |
| 7440-28-0 | Thallium | 0.10 | U | | MS |
| 7440-62-2 | Vanadium | 10.0 | U | | P |
| 7440-66-6 | Zinc | 10.0 | U | | P |

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Comments: DISSOLVED METALS

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 8/17/00 |
| **Sample Matrix:** | Water | **Date Received:** | 8/18/00 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name: | GW-7097-081700-TJ-001 | Units: | ug/L (ppb) |
| Lab Code: | K2006327-001 | Basis: | NA |
| Test Notes: | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1221 | EPA 3520C | 8082 | 0.4 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1232 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1242 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1248 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1254 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1260 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |

Approved By: mtl Date: 10/20/00

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 8/17/00 |
| **Sample Matrix:** | Water | **Date Received:** | 8/18/00 |

## Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name: | GW-7097-081700-TJ-002 | Units: | ug/L (ppb) |
| Lab Code: | K2006327-002 | Basis: | NA |
| Test Notes: | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1221 | EPA 3520C | 8082 | 0.4 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1232 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1242 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1248 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1254 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1260 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |

Approved By: mtl Date: 10/20/00

## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 8/17/00 |
| **Sample Matrix:** | Water | **Date Received:** | 8/18/00 |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name: | GW-7097-081700-TJ-003 | Units: | ug/L (ppb) |
| Lab Code: | K2006327-003 | Basis: | NA |
| Test Notes: | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1221 | EPA 3520C | 8082 | 0.4 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1232 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1242 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1248 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1254 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1260 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |

Approved By: mtl Date: 10/20/00

## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

Polychlorinated Biphenyls (PCBs)

| | | | |
|---|---|---|---|
| Sample Name: | Method Blank | Units: | ug/L (ppb) |
| Lab Code: | KWG2003391-4 | Basis: | NA |
| Test Notes: | | | |

| Analyte | Prep Method | Analysis Method | MRL | Dilution Factor | Date Extracted | Date Analyzed | Result | Result Notes |
|---|---|---|---|---|---|---|---|---|
| Aroclor 1016 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1221 | EPA 3520C | 8082 | 0.4 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1232 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1242 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1248 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1254 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |
| Aroclor 1260 | EPA 3520C | 8082 | 0.2 | 1 | 8/21/00 | 8/28/00 | ND | |

Approved By: mtl Date: 10/20/00

1S22/020597p

06327SVG.AY1 - MB 10/20/00

# COLUMBIA ANALYTICAL SERVICES, INC.

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097

**Service Request:** K2006327

## Cover Page - Organic Analysis Data Package
## Volatile Organic Compounds

| Sample Name | Lab Code | Date Collected | Date Received |
|---|---|---|---|
| GW-7097-081700-TJ-001 | K2006327-001 | 08/17/2000 | 08/18/2000 |
| GW-7097-081700-TJ-002 | K2006327-002 | 08/17/2000 | 08/18/2000 |
| GW-7097-081700-TJ-003 | K2006327-003 | 08/17/2000 | 08/18/2000 |
| Trip Blank | K2006327-004 | 08/17/2000 | 08/18/2000 |

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Nathan Hyde  Name: Nathan Hyde

Date: 10/12/00  Title: Scientist

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097
**Sample Matrix:** Water

**Service Request:** K2006327
**Date Collected:** 08/17/2000
**Date Received:** 08/18/2000

## Volatile Organic Compounds

**Sample Name:** GW-7097-081700-TJ-001
**Lab Code:** K2006327-001

**Extraction Method:** EPA 5030B
**Analysis Method:** 8260B

**Units:** ug/L
**Basis:** NA

**Level:** Low

| Analyte Name | Result | Q | MRL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|
| Chloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Vinyl Chloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromomethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Acetone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Disulfide | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Methylene Chloride | ND | U | 1.0 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Butanone (MEK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,1-Trichloroethane (TCA) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Tetrachloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloroethane (EDC) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Benzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Trichloroethene (TCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloropropane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromodichloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Hexanone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Toluene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2-Trichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 4-Methyl-2-pentanone (MIBK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Tetrachloroethene (PCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Dibromochloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chlorobenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Ethylbenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| m,p-Xylenes | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| o-Xylene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Styrene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromoform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2,2-Tetrachloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097
**Sample Matrix:** Water

**Service Request:** K2006327
**Date Collected:** 08/17/2000
**Date Received:** 08/18/2000

## Volatile Organic Compounds

**Sample Name:** GW-7097-081700-TJ-001
**Lab Code:** K2006327-001

**Units:** ug/L
**Basis:** NA

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| Dibromofluoromethane | 102 | 87-115 | Acceptable |
| Toluene-d8 | 115 | 83-116 | Acceptable |
| 4-Bromofluorobenzene | 109 | 75-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097
**Sample Matrix:** Water

**Service Request:** K2006327
**Date Collected:** 08/17/2000
**Date Received:** 08/18/2000

## Volatile Organic Compounds

**Sample Name:** GW-7097-081700-TJ-002
**Lab Code:** K2006327-002

**Extraction Method:** EPA 5030B
**Analysis Method:** 8260B

**Units:** ug/L
**Basis:** NA

**Level:** Low

| Analyte Name | Result | Q | MRL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|
| Chloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Vinyl Chloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromomethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Acetone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Disulfide | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Methylene Chloride | ND | U | 1.0 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Butanone (MEK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,1-Trichloroethane (TCA) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Tetrachloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloroethane (EDC) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Benzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Trichloroethene (TCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloropropane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromodichloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Hexanone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Toluene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2-Trichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 4-Methyl-2-pentanone (MIBK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Tetrachloroethene (PCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Dibromochloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chlorobenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Ethylbenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| m,p-Xylenes | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| o-Xylene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Styrene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromoform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2,2-Tetrachloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |

## Volatile Organic Compounds

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-002 | **Units:** | ug/L |
| **Lab Code:** | K2006327-002 | **Basis:** | NA |

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| Dibromofluoromethane | 96 | 87-115 | Acceptable |
| Toluene-d8 | 114 | 83-116 | Acceptable |
| 4-Bromofluorobenzene | 105 | 75-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097
**Sample Matrix:** Water

**Service Request:** K2006327
**Date Collected:** 08/17/2000
**Date Received:** 08/18/2000

## Volatile Organic Compounds

**Sample Name:** GW-7097-081700-TJ-003
**Lab Code:** K2006327-003
**Extraction Method:** EPA 5030B
**Analysis Method:** 8260B

**Units:** ug/L
**Basis:** NA
**Level:** Low

| Analyte Name | Result | Q | MRL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|
| Chloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| **Vinyl Chloride** | **14** | | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromomethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Acetone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Disulfide | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Methylene Chloride | ND | U | 1.0 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Butanone (MEK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| **cis-1,2-Dichloroethene** | **1.0** | | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| loroform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,1-Trichloroethane (TCA) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Tetrachloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloroethane (EDC) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| **Benzene** | **3.0** | | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Trichloroethene (TCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloropropane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromodichloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Hexanone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Toluene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2-Trichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 4-Methyl-2-pentanone (MIBK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Tetrachloroethene (PCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Dibromochloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chlorobenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Ethylbenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| m,p-Xylenes | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| o-Xylene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Styrene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromoform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2,2-Tetrachloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |

## Volatile Organic Compounds

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-003 | **Units:** | ug/L |
| **Lab Code:** | K2006327-003 | **Basis:** | NA |

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| Dibromofluoromethane | 99 | 87-115 | Acceptable |
| Toluene-d8 | 110 | 83-116 | Acceptable |
| 4-Bromofluorobenzene | 109 | 75-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097
**Sample Matrix:** Water

**Service Request:** K2006327
**Date Collected:** 08/17/2000
**Date Received:** 08/18/2000

## Volatile Organic Compounds

**Sample Name:** Trip Blank
**Lab Code:** K2006327-004

**Extraction Method:** EPA 5030B
**Analysis Method:** 8260B

**Units:** ug/L
**Basis:** NA

**Level:** Low

| Analyte Name | Result | Q | MRL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|
| Chloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Vinyl Chloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromomethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Acetone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Disulfide | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Methylene Chloride | ND | U | 1.0 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Butanone (MEK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,1-Trichloroethane (TCA) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Tetrachloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloroethane (EDC) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Benzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Trichloroethene (TCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloropropane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromodichloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Hexanone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Toluene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2-Trichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 4-Methyl-2-pentanone (MIBK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Tetrachloroethene (PCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Dibromochloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chlorobenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Ethylbenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| m,p-Xylenes | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| o-Xylene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Styrene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromoform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2,2-Tetrachloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |

## Volatile Organic Compounds

| | | | |
|---|---|---|---|
| **Sample Name:** | Trip Blank | **Units:** | ug/L |
| **Lab Code:** | K2006327-004 | **Basis:** | NA |

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| Dibromofluoromethane | 98 | 87-115 | Acceptable |
| Toluene-d8 | 112 | 83-116 | Acceptable |
| 4-Bromofluorobenzene | 108 | 75-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097
**Sample Matrix:** Water

**Service Request:** K2006327
**Date Collected:** NA
**Date Received:** NA

## Volatile Organic Compounds

**Sample Name:** Method Blank
**Lab Code:** KWG2003588-5

**Extraction Method:** EPA 5030B
**Analysis Method:** 8260B

**Units:** ug/L
**Basis:** NA

**Level:** Low

| Analyte Name | Result | Q | MRL | Dilution Factor | Date Extracted | Date Analyzed | Extraction Lot | Note |
|---|---|---|---|---|---|---|---|---|
| Chloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Vinyl Chloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromomethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Acetone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Disulfide | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Methylene Chloride | ND | U | 1.0 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1-Dichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Butanone (MEK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,2-Dichloroethene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chloroform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,1-Trichloroethane (TCA) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Carbon Tetrachloride | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloroethane (EDC) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Benzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Trichloroethene (TCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,2-Dichloropropane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromodichloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 2-Hexanone | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| cis-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Toluene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| trans-1,3-Dichloropropene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2-Trichloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 4-Methyl-2-pentanone (MIBK) | ND | U | 20 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Tetrachloroethene (PCE) | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Dibromochloromethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Chlorobenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Ethylbenzene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| m,p-Xylenes | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| o-Xylene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Styrene | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| Bromoform | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |
| 1,1,2,2-Tetrachloroethane | ND | U | 0.50 | 1 | 08/30/00 | 08/30/00 | KWG2003588 | |

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |

## Volatile Organic Compounds

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG2003588-5 | **Basis:** | NA |

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| Dibromofluoromethane | 95 | 87-115 | Acceptable |
| Toluene-d8 | 113 | 83-116 | Acceptable |
| 4-Bromofluorobenzene | 110 | 75-120 | Acceptable |

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COLUMBIA ANALYTICAL SERVICES, INC.

**Client:** Conestoga Rovers & Assoc.
**Project:** GM Truck Group Facility - RCRA Invest./7097

**Service Request:** K2006327

## Cover Page - Organic Analysis Data Package
## Semi-Volatile Organic Compounds by GC/MS

| Sample Name | Lab Code | Date Collected | Date Received |
|---|---|---|---|
| GW-7097-081700-TJ-001 | K2006327-001 | 08/17/2000 | 08/18/2000 |
| GW-7097-081700-TJ-002 | K2006327-002 | 08/17/2000 | 08/18/2000 |
| GW-7097-081700-TJ-003 | K2006327-003 | 08/17/2000 | 08/18/2000 |

Certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Carol C. Haines  Name: Carol C. Haines

Date: OCT 09 2000  Title: SVM Supervisor

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-001 | **Units:** | ug/L |
| **Lab Code:** | K2006327-001 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F019.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,040.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 24 | U | 24 | |
| 62-53-3 | Aniline | 24 | U | 24 | |
| 111-44-4 | Bis(2-chloroethyl) Ether | 9.6 | U | 9.6 | |
| 108-95-2 | Phenol | 9.6 | U | 9.6 | * |
| 95-57-8 | 2-Chlorophenol | 9.6 | U | 9.6 | * |
| 541-73-1 | 1,3-Dichlorobenzene | 9.6 | U | 9.6 | |
| 106-46-7 | 1,4-Dichlorobenzene | 9.6 | U | 9.6 | |
| 95-50-1 | 1,2-Dichlorobenzene | 9.6 | U | 9.6 | |
| 100-51-6 | Benzyl alcohol | 9.6 | U | 9.6 | |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 9.6 | U | 9.6 | |
| 95-48-7 | 2-Methylphenol | 9.6 | U | 9.6 | |
| 67-72-1 | Hexachloroethane | 9.6 | U | 9.6 | |
| 621-64-7 | N-Nitrosodi-n-propylamine | 9.6 | U | 9.6 | |
| CASID30030 | 3- and 4-Methylphenol Coelution | 9.6 | U | 9.6 | |
| 98-95-3 | Nitrobenzene | 9.6 | U | 9.6 | |
| 78-59-1 | Isophorone | 9.6 | U | 9.6 | |
| 88-75-5 | 2-Nitrophenol | 9.6 | U | 9.6 | |
| 105-67-9 | 2,4-Dimethylphenol | 9.6 | U | 9.6 | |
| 111-91-1 | bis(2-Chloroethoxy)methane | 9.6 | U | 9.6 | |
| 120-83-2 | 2,4-Dichlorophenol | 9.6 | U | 9.6 | |
| 65-85-0 | Benzoic acid | 24 | U | 24 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 9.6 | U | 9.6 | |
| 91-20-3 | Naphthalene | 9.6 | U | 9.6 | |
| 106-47-8 | 4-Chloroaniline | 9.6 | U | 9.6 | |
| 87-68-3 | Hexachlorobutadiene | 9.6 | U | 9.6 | |
| 59-50-7 | 4-Chloro-3-methylphenol | 9.6 | U | 9.6 | |
| 91-57-6 | 2-Methylnaphthalene | 9.6 | U | 9.6 | |
| 77-47-4 | Hexachlorocyclopentadiene | 9.6 | U | 9.6 | * |
| 88-06-2 | 2,4,6-Trichlorophenol | 9.6 | U | 9.6 | |
| 95-95-4 | 2,4,5-Trichlorophenol | 9.6 | U | 9.6 | |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-001 | **Units:** | ug/L |
| **Lab Code:** | K2006327-001 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F019.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,040.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 9.6 | U | 9.6 | |
| 88-74-4 | 2-Nitroaniline | 24 | U | 24 | |
| 208-96-8 | Acenaphthylene | 9.6 | U | 9.6 | |
| 131-11-3 | Dimethyl Phthalate | 9.6 | U | 9.6 | |
| 606-20-2 | 2,6-Dinitrotoluene | 9.6 | U | 9.6 | |
| 83-32-9 | Acenaphthene | 9.6 | U | 9.6 | |
| 99-09-2 | 3-Nitroaniline | 24 | U | 24 | |
| 51-28-5 | 2,4-Dinitrophenol | 24 | U | 24 | |
| 132-64-9 | Dibenzofuran | 9.6 | U | 9.6 | |
| 100-02-7 | 4-Nitrophenol | 24 | U | 24 | |
| 121-14-2 | 2,4-Dinitrotoluene | 9.6 | U | 9.6 | |
| 86-73-7 | Fluorene | 9.6 | U | 9.6 | |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 9.6 | U | 9.6 | |
| 84-66-2 | Diethyl Phthalate | 9.6 | U | 9.6 | |
| 100-01-6 | 4-Nitroaniline | 24 | U | 24 | |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 24 | U | 24 | |
| 86-30-6 | N-Nitrosodiphenylamine | 9.6 | U | 9.6 | |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 9.6 | U | 9.6 | |
| 118-74-1 | Hexachlorobenzene | 9.6 | U | 9.6 | |
| 87-86-5 | Pentachlorophenol | 24 | U | 24 | |
| 85-01-8 | Phenanthrene | 9.6 | U | 9.6 | |
| 120-12-7 | Anthracene | 9.6 | U | 9.6 | |
| 84-74-2 | Di-n-butyl Phthalate | 9.6 | U | 9.6 | |
| 206-44-0 | Fluoranthene | 9.6 | U | 9.6 | |
| 129-00-0 | Pyrene | 9.6 | U | 9.6 | |
| 85-68-7 | Butyl Benzyl Phthalate | 9.6 | U | 9.6 | |
| 91-94-1 | 3,3'-Dichlorobenzidine | 24 | U | 24 | |
| 56-55-3 | Benz(a)anthracene | 9.6 | U | 9.6 | |
| 218-01-9 | Chrysene | 9.6 | U | 9.6 | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-001 | **Units:** | ug/L |
| **Lab Code:** | K2006327-001 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F019.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,040.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | Bis(2-ethylhexyl) Phthalate | 9.6 | U | 9.6 | |
| 117-84-0 | Di-n-octyl Phthalate | 9.6 | U | 9.6 | |
| 205-99-2 | Benzo(b)fluoranthene | 9.6 | U | 9.6 | |
| 207-08-9 | Benzo(k)fluoranthene | 9.6 | U | 9.6 | |
| 50-32-8 | Benzo(a)pyrene | 9.6 | U | 9.6 | |
| [illegible]-39-5 | Indeno(1,2,3-cd)pyrene | 9.6 | U | 9.6 | |
| [illegible]0-3 | Dibenz(a,h)anthracene | 9.6 | U | 9.6 | |
| 191-24-2 | Benzo(g,h,i)perylene | 9.6 | U | 9.6 | |

See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 78 | 19-107 | Acceptable |
| Phenol-d6 | 67 | 32-115 | Acceptable |
| Nitrobenzene-d5 | 140 | 42-117 | Outside Control Limits |
| 2-Fluorobiphenyl | 82 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 92 | 30-121 | Acceptable |
| Terphenyl-d14 | 86 | 39-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-001RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-001 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F019.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 980.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 26 | U | 26 | * |
| 62-53-3 | Aniline | 26 | U | 26 | * |
| 111-44-4 | Bis(2-chloroethyl) Ether | 10 | U | 10 | * |
| 108-95-2 | Phenol | 10 | U | 10 | * |
| 95-57-8 | 2-Chlorophenol | 10 | U | 10 | * |
| [illegible]-73-1 | 1,3-Dichlorobenzene | 10 | U | 10 | * |
| 106-46-7 | 1,4-Dichlorobenzene | 10 | U | 10 | * |
| 95-50-1 | 1,2-Dichlorobenzene | 10 | U | 10 | * |
| 100-51-6 | Benzyl alcohol | 10 | U | 10 | * |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 10 | U | 10 | * |
| 95-48-7 | 2-Methylphenol | 10 | U | 10 | * |
| 67-72-1 | Hexachloroethane | 10 | U | 10 | * |
| 621-64-7 | N-Nitrosodi-n-propylamine | 10 | U | 10 | * |
| CASID30030 | 3- and 4-Methylphenol Coelution | 10 | U | 10 | * |
| 98-95-3 | Nitrobenzene | 10 | U | 10 | * |
| 78-59-1 | Isophorone | 10 | U | 10 | * |
| 88-75-5 | 2-Nitrophenol | 10 | U | 10 | * |
| 105-67-9 | 2,4-Dimethylphenol | 10 | U | 10 | * |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10 | U | 10 | * |
| 120-83-2 | 2,4-Dichlorophenol | 10 | U | 10 | * |
| 65-85-0 | Benzoic acid | 26 | U | 26 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 10 | U | 10 | * |
| 91-20-3 | Naphthalene | 10 | U | 10 | * |
| 106-47-8 | 4-Chloroaniline | 10 | U | 10 | * |
| 87-68-3 | Hexachlorobutadiene | 10 | U | 10 | * |
| 59-50-7 | 4-Chloro-3-methylphenol | 10 | U | 10 | * |
| 91-57-6 | 2-Methylnaphthalene | 10 | U | 10 | * |
| 77-47-4 | Hexachlorocyclopentadiene | 10 | U | 10 | * |
| [illegible]06-2 | 2,4,6-Trichlorophenol | 10 | U | 10 | * |
| [illegible]-95-4 | 2,4,5-Trichlorophenol | 10 | U | 10 | * |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-001RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-001 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F019.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 980.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 10 | U | 10 | * |
| 88-74-4 | 2-Nitroaniline | 26 | U | 26 | * |
| 208-96-8 | Acenaphthylene | 10 | U | 10 | * |
| 131-11-3 | Dimethyl Phthalate | 10 | U | 10 | * |
| 606-20-2 | 2,6-Dinitrotoluene | 10 | U | 10 | * |
| [illegible]2-9 | Acenaphthene | 10 | U | 10 | * |
| 99-09-2 | 3-Nitroaniline | 26 | U | 26 | * |
| 51-28-5 | 2,4-Dinitrophenol | 26 | U | 26 | * |
| 132-64-9 | Dibenzofuran | 10 | U | 10 | * |
| 100-02-7 | 4-Nitrophenol | 26 | U | 26 | * |
| 121-14-2 | 2,4-Dinitrotoluene | 10 | U | 10 | * |
| 86-73-7 | Fluorene | 10 | U | 10 | * |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 10 | U | 10 | * |
| 84-66-2 | Diethyl Phthalate | 10 | U | 10 | * |
| 100-01-6 | 4-Nitroaniline | 26 | U | 26 | * |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 26 | U | 26 | * |
| 86-30-6 | N-Nitrosodiphenylamine | 10 | U | 10 | * |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 10 | U | 10 | * |
| 118-74-1 | Hexachlorobenzene | 10 | U | 10 | * |
| 87-86-5 | Pentachlorophenol | 26 | U | 26 | * |
| 85-01-8 | Phenanthrene | 10 | U | 10 | * |
| 120-12-7 | Anthracene | 10 | U | 10 | * |
| 84-74-2 | Di-n-butyl Phthalate | 10 | U | 10 | * |
| 206-44-0 | Fluoranthene | 10 | U | 10 | * |
| 129-00-0 | Pyrene | 10 | U | 10 | * |
| 85-68-7 | Butyl Benzyl Phthalate | 10 | U | 10 | * |
| 91-94-1 | 3,3'-Dichlorobenzidine | 26 | U | 26 | * |
| 56-55-3 | Benz(a)anthracene | 10 | U | 10 | * |
| [illegible]-01-9 | Chrysene | 10 | U | 10 | * |

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-001RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-001 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F019.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 980.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | Bis(2-ethylhexyl) Phthalate | 10 | U | 10 | * |
| 117-84-0 | Di-n-octyl Phthalate | 10 | U | 10 | * |
| 205-99-2 | Benzo(b)fluoranthene | 10 | U | 10 | * |
| 207-08-9 | Benzo(k)fluoranthene | 10 | U | 10 | * |
| 50-32-8 | Benzo(a)pyrene | 10 | U | 10 | * |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 10 | U | 10 | * |
| 53-70-3 | Dibenz(a,h)anthracene | 10 | U | 10 | * |
| 191-24-2 | Benzo(g,h,i)perylene | 10 | U | 10 | * |

See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 44 | 19-107 | Acceptable |
| Phenol-d6 | 35 | 32-115 | Acceptable |
| Nitrobenzene-d5 | 85 | 42-117 | Acceptable |
| 2-Fluorobiphenyl | 84 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 95 | 30-121 | Acceptable |
| Terphenyl-d14 | 65 | 39-120 | Acceptable |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-002 | **Units:** | ug/L |
| **Lab Code:** | K2006327-002 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F020.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,050.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 24 | U | 24 | |
| 62-53-3 | Aniline | 24 | U | 24 | |
| 111-44-4 | Bis(2-chloroethyl) Ether | 9.5 | U | 9.5 | |
| 108-95-2 | Phenol | 9.5 | U | 9.5 | * |
| 95-57-8 | 2-Chlorophenol | 9.5 | U | 9.5 | * |
| 541-73-1 | 1,3-Dichlorobenzene | 9.5 | U | 9.5 | |
| 106-46-7 | 1,4-Dichlorobenzene | 9.5 | U | 9.5 | |
| 95-50-1 | 1,2-Dichlorobenzene | 9.5 | U | 9.5 | |
| 100-51-6 | Benzyl alcohol | 9.5 | U | 9.5 | |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 9.5 | U | 9.5 | |
| 95-48-7 | 2-Methylphenol | 9.5 | U | 9.5 | |
| 67-72-1 | Hexachloroethane | 9.5 | U | 9.5 | |
| 621-64-7 | N-Nitrosodi-n-propylamine | 9.5 | U | 9.5 | |
| CASID30030 | 3- and 4-Methylphenol Coelution | 9.5 | U | 9.5 | |
| 98-95-3 | Nitrobenzene | 9.5 | U | 9.5 | |
| 78-59-1 | Isophorone | 9.5 | U | 9.5 | |
| 88-75-5 | 2-Nitrophenol | 9.5 | U | 9.5 | |
| 105-67-9 | 2,4-Dimethylphenol | 9.5 | U | 9.5 | |
| 111-91-1 | bis(2-Chloroethoxy)methane | 9.5 | U | 9.5 | |
| 120-83-2 | 2,4-Dichlorophenol | 9.5 | U | 9.5 | |
| 65-85-0 | Benzoic acid | 24 | U | 24 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 9.5 | U | 9.5 | |
| 91-20-3 | Naphthalene | 9.5 | U | 9.5 | |
| 106-47-8 | 4-Chloroaniline | 9.5 | U | 9.5 | |
| 87-68-3 | Hexachlorobutadiene | 9.5 | U | 9.5 | |
| 59-50-7 | 4-Chloro-3-methylphenol | 9.5 | U | 9.5 | |
| 91-57-6 | 2-Methylnaphthalene | 9.5 | U | 9.5 | |
| 77-47-4 | Hexachlorocyclopentadiene | 9.5 | U | 9.5 | * |
| 88-06-2 | 2,4,6-Trichlorophenol | 9.5 | U | 9.5 | |
| 95-95-4 | 2,4,5-Trichlorophenol | 9.5 | U | 9.5 | |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-002 | **Units:** | ug/L |
| **Lab Code:** | K2006327-002 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F020.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,050.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 9.5 | U | 9.5 | |
| 88-74-4 | 2-Nitroaniline | 24 | U | 24 | |
| 208-96-8 | Acenaphthylene | 9.5 | U | 9.5 | |
| 131-11-3 | Dimethyl Phthalate | 9.5 | U | 9.5 | |
| 606-20-2 | 2,6-Dinitrotoluene | 9.5 | U | 9.5 | |
| [illegible]32-9 | Acenaphthene | 9.5 | U | 9.5 | |
| 99-09-2 | 3-Nitroaniline | 24 | U | 24 | |
| 51-28-5 | 2,4-Dinitrophenol | 24 | U | 24 | |
| 132-64-9 | Dibenzofuran | 9.5 | U | 9.5 | |
| 100-02-7 | 4-Nitrophenol | 24 | U | 24 | |
| 121-14-2 | 2,4-Dinitrotoluene | 9.5 | U | 9.5 | |
| 86-73-7 | Fluorene | 9.5 | U | 9.5 | |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 9.5 | U | 9.5 | |
| 84-66-2 | Diethyl Phthalate | 9.5 | U | 9.5 | |
| 100-01-6 | 4-Nitroaniline | 24 | U | 24 | |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 24 | U | 24 | |
| 86-30-6 | N-Nitrosodiphenylamine | 9.5 | U | 9.5 | |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 9.5 | U | 9.5 | |
| 118-74-1 | Hexachlorobenzene | 9.5 | U | 9.5 | |
| 87-86-5 | Pentachlorophenol | 24 | U | 24 | |
| 85-01-8 | Phenanthrene | 9.5 | U | 9.5 | |
| 120-12-7 | Anthracene | 9.5 | U | 9.5 | |
| 84-74-2 | Di-n-butyl Phthalate | 9.5 | U | 9.5 | |
| 206-44-0 | Fluoranthene | 9.5 | U | 9.5 | |
| 129-00-0 | Pyrene | 9.5 | U | 9.5 | |
| 85-68-7 | Butyl Benzyl Phthalate | 9.5 | U | 9.5 | |
| 91-94-1 | 3,3'-Dichlorobenzidine | 24 | U | 24 | |
| 56-55-3 | Benz(a)anthracene | 9.5 | U | 9.5 | |
| [illegible]-01-9 | Chrysene | 9.5 | U | 9.5 | |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-002 | **Units:** | ug/L |
| **Lab Code:** | K2006327-002 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F020.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,050.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | Bis(2-ethylhexyl) Phthalate | 9.5 | U | 9.5 | |
| 117-84-0 | Di-n-octyl Phthalate | 9.5 | U | 9.5 | |
| 205-99-2 | Benzo(b)fluoranthene | 9.5 | U | 9.5 | |
| 207-08-9 | Benzo(k)fluoranthene | 9.5 | U | 9.5 | |
| 50-32-8 | Benzo(a)pyrene | 9.5 | U | 9.5 | |
| [illegible]-39-5 | Indeno(1,2,3-cd)pyrene | 9.5 | U | 9.5 | |
| [illegible]70-3 | Dibenz(a,h)anthracene | 9.5 | U | 9.5 | |
| 191-24-2 | Benzo(g,h,i)perylene | 9.5 | U | 9.5 | |

* See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 54 | 19-107 | Acceptable |
| Phenol-d6 | 57 | 32-115 | Acceptable |
| Nitrobenzene-d5 | 127 | 42-117 | Outside Control Limits |
| 2-Fluorobiphenyl | 77 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 82 | 30-121 | Acceptable |
| Terphenyl-d14 | 82 | 39-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-002RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-002 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F020.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 970.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 26 | U | 26 | * |
| 62-53-3 | Aniline | 26 | U | 26 | * |
| 111-44-4 | Bis(2-chloroethyl) Ether | 10 | U | 10 | * |
| 108-95-2 | Phenol | 10 | U | 10 | * |
| 95-57-8 | 2-Chlorophenol | 10 | U | 10 | * |
| 541-73-1 | 1,3-Dichlorobenzene | 10 | U | 10 | * |
| 106-46-7 | 1,4-Dichlorobenzene | 10 | U | 10 | * |
| 95-50-1 | 1,2-Dichlorobenzene | 10 | U | 10 | * |
| 100-51-6 | Benzyl alcohol | 10 | U | 10 | * |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 10 | U | 10 | * |
| 95-48-7 | 2-Methylphenol | 10 | U | 10 | * |
| 67-72-1 | Hexachloroethane | 10 | U | 10 | * |
| 621-64-7 | N-Nitrosodi-n-propylamine | 10 | U | 10 | * |
| CASID30030 | 3- and 4-Methylphenol Coelution | 10 | U | 10 | * |
| 98-95-3 | Nitrobenzene | 10 | U | 10 | * |
| 78-59-1 | Isophorone | 10 | U | 10 | * |
| 88-75-5 | 2-Nitrophenol | 10 | U | 10 | * |
| 105-67-9 | 2,4-Dimethylphenol | 10 | U | 10 | * |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10 | U | 10 | * |
| 120-83-2 | 2,4-Dichlorophenol | 10 | U | 10 | * |
| 65-85-0 | Benzoic acid | 26 | U | 26 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 10 | U | 10 | * |
| 91-20-3 | Naphthalene | 10 | U | 10 | * |
| 106-47-8 | 4-Chloroaniline | 10 | U | 10 | * |
| 87-68-3 | Hexachlorobutadiene | 10 | U | 10 | * |
| 59-50-7 | 4-Chloro-3-methylphenol | 10 | U | 10 | * |
| 91-57-6 | 2-Methylnaphthalene | 10 | U | 10 | * |
| 77-47-4 | Hexachlorocyclopentadiene | 10 | U | 10 | * |
| 88-06-2 | 2,4,6-Trichlorophenol | 10 | U | 10 | * |
| 95-95-4 | 2,4,5-Trichlorophenol | 10 | U | 10 | * |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-002RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-002 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F020.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 970.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 10 | U | 10 | * |
| 88-74-4 | 2-Nitroaniline | 26 | U | 26 | * |
| 208-96-8 | Acenaphthylene | 10 | U | 10 | * |
| 131-11-3 | Dimethyl Phthalate | 10 | U | 10 | * |
| 606-20-2 | 2,6-Dinitrotoluene | 10 | U | 10 | * |
| [illegible]32-9 | Acenaphthene | 10 | U | 10 | * |
| [illegible]-09-2 | 3-Nitroaniline | 26 | U | 26 | * |
| 51-28-5 | 2,4-Dinitrophenol | 26 | U | 26 | * |
| 132-64-9 | Dibenzofuran | 10 | U | 10 | * |
| 100-02-7 | 4-Nitrophenol | 26 | U | 26 | * |
| 121-14-2 | 2,4-Dinitrotoluene | 10 | U | 10 | * |
| 86-73-7 | Fluorene | 10 | U | 10 | * |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 10 | U | 10 | * |
| 84-66-2 | Diethyl Phthalate | 10 | U | 10 | * |
| 100-01-6 | 4-Nitroaniline | 26 | U | 26 | * |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 26 | U | 26 | * |
| 86-30-6 | N-Nitrosodiphenylamine | 10 | U | 10 | * |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 10 | U | 10 | * |
| 118-74-1 | Hexachlorobenzene | 10 | U | 10 | * |
| 87-86-5 | Pentachlorophenol | 26 | U | 26 | * |
| 85-01-8 | Phenanthrene | 10 | U | 10 | * |
| 120-12-7 | Anthracene | 10 | U | 10 | * |
| 84-74-2 | Di-n-butyl Phthalate | 10 | U | 10 | * |
| 206-44-0 | Fluoranthene | 10 | U | 10 | * |
| 129-00-0 | Pyrene | 10 | U | 10 | * |
| 85-68-7 | Butyl Benzyl Phthalate | 10 | U | 10 | * |
| 91-94-1 | 3,3'-Dichlorobenzidine | 26 | U | 26 | * |
| 56-55-3 | Benz(a)anthracene | 10 | U | 10 | * |
| [illegible]-01-9 | Chrysene | 10 | U | 10 | * |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-002RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-002 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F020.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 970.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | **Bis(2-ethylhexyl) Phthalate** | **71** | | 10 | * |
| 117-84-0 | Di-n-octyl Phthalate | 10 | U | 10 | * |
| 205-99-2 | Benzo(b)fluoranthene | 10 | U | 10 | * |
| 207-08-9 | Benzo(k)fluoranthene | 10 | U | 10 | * |
| 50-32-8 | Benzo(a)pyrene | 10 | U | 10 | * |
| [illegible]-39-5 | Indeno(1,2,3-cd)pyrene | 10 | U | 10 | * |
| [illegible]70-3 | Dibenz(a,h)anthracene | 10 | U | 10 | * |
| 191-24-2 | Benzo(g,h,i)perylene | 10 | U | 10 | * |

* See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 49 | 19-107 | Acceptable |
| Phenol-d6 | 27 | 32-115 | Outside Control Limits |
| Nitrobenzene-d5 | 96 | 42-117 | Acceptable |
| 2-Fluorobiphenyl | 76 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 93 | 30-121 | Acceptable |
| Terphenyl-d14 | 104 | 39-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-003 | **Units:** | ug/L |
| **Lab Code:** | K2006327-003 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F021.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 950.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 26 | U | 26 | |
| 62-53-3 | Aniline | 26 | U | 26 | |
| 111-44-4 | Bis(2-chloroethyl) Ether | 11 | U | 11 | |
| 108-95-2 | Phenol | 11 | U | 11 | * |
| 95-57-8 | 2-Chlorophenol | 11 | U | 11 | * |
| 541-73-1 | 1,3-Dichlorobenzene | 11 | U | 11 | |
| [illegible]-46-7 | 1,4-Dichlorobenzene | 11 | U | 11 | |
| 95-50-1 | 1,2-Dichlorobenzene | 11 | U | 11 | |
| 100-51-6 | Benzyl alcohol | 11 | U | 11 | |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 11 | U | 11 | |
| 95-48-7 | 2-Methylphenol | 11 | U | 11 | |
| 67-72-1 | Hexachloroethane | 11 | U | 11 | |
| 621-64-7 | N-Nitrosodi-n-propylamine | 11 | U | 11 | |
| CASID30030 | 3- and 4-Methylphenol Coelution | 11 | U | 11 | |
| 98-95-3 | Nitrobenzene | 11 | U | 11 | |
| 78-59-1 | Isophorone | 11 | U | 11 | |
| 88-75-5 | 2-Nitrophenol | 11 | U | 11 | |
| 105-67-9 | 2,4-Dimethylphenol | 11 | U | 11 | |
| 111-91-1 | bis(2-Chloroethoxy)methane | 11 | U | 11 | |
| 120-83-2 | 2,4-Dichlorophenol | 11 | U | 11 | |
| 65-85-0 | Benzoic acid | 26 | U | 26 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 11 | U | 11 | |
| 91-20-3 | Naphthalene | 11 | U | 11 | |
| 106-47-8 | 4-Chloroaniline | 11 | U | 11 | |
| 87-68-3 | Hexachlorobutadiene | 11 | U | 11 | |
| 59-50-7 | 4-Chloro-3-methylphenol | 11 | U | 11 | |
| 91-57-6 | 2-Methylnaphthalene | 11 | U | 11 | |
| 77-47-4 | Hexachlorocyclopentadiene | 11 | U | 11 | * |
| 88-06-2 | 2,4,6-Trichlorophenol | 11 | U | 11 | |
| [illegible]5-4 | 2,4,5-Trichlorophenol | 11 | U | 11 | |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-003 | **Units:** | ug/L |
| **Lab Code:** | K2006327-003 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F021.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 950.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 11 | U | 11 | |
| 88-74-4 | 2-Nitroaniline | 26 | U | 26 | |
| 208-96-8 | Acenaphthylene | 11 | U | 11 | |
| 131-11-3 | Dimethyl Phthalate | 11 | U | 11 | |
| 606-20-2 | 2,6-Dinitrotoluene | 11 | U | 11 | |
| [illegible]32-9 | Acenaphthene | 11 | U | 11 | |
| [illegible]09-2 | 3-Nitroaniline | 26 | U | 26 | |
| 51-28-5 | 2,4-Dinitrophenol | 26 | U | 26 | |
| 132-64-9 | Dibenzofuran | 11 | U | 11 | |
| 100-02-7 | 4-Nitrophenol | 26 | U | 26 | |
| 121-14-2 | 2,4-Dinitrotoluene | 11 | U | 11 | |
| 86-73-7 | Fluorene | 11 | U | 11 | |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 11 | U | 11 | |
| 84-66-2 | Diethyl Phthalate | 11 | U | 11 | |
| 100-01-6 | 4-Nitroaniline | 26 | U | 26 | |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 26 | U | 26 | |
| 86-30-6 | N-Nitrosodiphenylamine | 11 | U | 11 | |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 11 | U | 11 | |
| 118-74-1 | Hexachlorobenzene | 11 | U | 11 | |
| 87-86-5 | Pentachlorophenol | 26 | U | 26 | |
| 85-01-8 | Phenanthrene | 11 | U | 11 | |
| 120-12-7 | Anthracene | 11 | U | 11 | |
| 84-74-2 | Di-n-butyl Phthalate | 11 | U | 11 | |
| 206-44-0 | Fluoranthene | 11 | U | 11 | |
| 129-00-0 | Pyrene | 11 | U | 11 | |
| 85-68-7 | Butyl Benzyl Phthalate | 11 | U | 11 | |
| 91-94-1 | 3,3'-Dichlorobenzidine | 26 | U | 26 | |
| 56-55-3 | Benz(a)anthracene | 11 | U | 11 | |
| [illegible]-01-9 | Chrysene | 11 | U | 11 | |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/15/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-003 | **Units:** | ug/L |
| **Lab Code:** | K2006327-003 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F021.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 950.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | Bis(2-ethylhexyl) Phthalate | 11 | U | 11 | |
| 117-84-0 | Di-n-octyl Phthalate | 11 | U | 11 | |
| 205-99-2 | Benzo(b)fluoranthene | 11 | U | 11 | |
| 207-08-9 | Benzo(k)fluoranthene | 11 | U | 11 | |
| 50-32-8 | Benzo(a)pyrene | 11 | U | 11 | |
| [illegible]-39-5 | Indeno(1,2,3-cd)pyrene | 11 | U | 11 | |
| [illegible]70-3 | Dibenz(a,h)anthracene | 11 | U | 11 | |
| 191-24-2 | Benzo(g,h,i)perylene | 11 | U | 11 | |

See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 28 | 19-107 | Acceptable |
| Phenol-d6 | 50 | 32-115 | Acceptable |
| Nitrobenzene-d5 | 68 | 42-117 | Acceptable |
| 2-Fluorobiphenyl | 75 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 72 | 30-121 | Acceptable |
| Terphenyl-d14 | 68 | 39-120 | Acceptable |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-003RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-003 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F021.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 970.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 26 | U | 26 | * |
| 62-53-3 | Aniline | 26 | U | 26 | * |
| 111-44-4 | Bis(2-chloroethyl) Ether | 10 | U | 10 | * |
| 108-95-2 | Phenol | 10 | U | 10 | * |
| 95-57-8 | 2-Chlorophenol | 10 | U | 10 | * |
| 541-73-1 | 1,3-Dichlorobenzene | 10 | U | 10 | * |
| 106-46-7 | 1,4-Dichlorobenzene | 10 | U | 10 | * |
| 95-50-1 | 1,2-Dichlorobenzene | 10 | U | 10 | * |
| 100-51-6 | Benzyl alcohol | 10 | U | 10 | * |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 10 | U | 10 | * |
| 95-48-7 | 2-Methylphenol | 10 | U | 10 | * |
| 67-72-1 | Hexachloroethane | 10 | U | 10 | * |
| 621-64-7 | N-Nitrosodi-n-propylamine | 10 | U | 10 | * |
| CASID30030 | 3- and 4-Methylphenol Coelution | 10 | U | 10 | * |
| 98-95-3 | Nitrobenzene | 10 | U | 10 | * |
| 78-59-1 | Isophorone | 10 | U | 10 | * |
| 88-75-5 | 2-Nitrophenol | 10 | U | 10 | * |
| 105-67-9 | 2,4-Dimethylphenol | 10 | U | 10 | * |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10 | U | 10 | * |
| 120-83-2 | 2,4-Dichlorophenol | 10 | U | 10 | * |
| 65-85-0 | Benzoic acid | 26 | U | 26 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 10 | U | 10 | * |
| 91-20-3 | Naphthalene | 10 | U | 10 | * |
| 106-47-8 | 4-Chloroaniline | 10 | U | 10 | * |
| 87-68-3 | Hexachlorobutadiene | 10 | U | 10 | * |
| 59-50-7 | 4-Chloro-3-methylphenol | 10 | U | 10 | * |
| 91-57-6 | 2-Methylnaphthalene | 10 | U | 10 | * |
| 77-47-4 | Hexachlorocyclopentadiene | 10 | U | 10 | * |
| 88-06-2 | 2,4,6-Trichlorophenol | 10 | U | 10 | * |
| 95-95-4 | 2,4,5-Trichlorophenol | 10 | U | 10 | * |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-003RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-003 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F021.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 970.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 10 | U | 10 | * |
| 88-74-4 | 2-Nitroaniline | 26 | U | 26 | * |
| 208-96-8 | Acenaphthylene | 10 | U | 10 | * |
| 131-11-3 | Dimethyl Phthalate | 10 | U | 10 | * |
| 606-20-2 | 2,6-Dinitrotoluene | 10 | U | 10 | * |
| 83-32-9 | Acenaphthene | 10 | U | 10 | * |
| 99-09-2 | 3-Nitroaniline | 26 | U | 26 | * |
| 51-28-5 | 2,4-Dinitrophenol | 26 | U | 26 | * |
| 132-64-9 | Dibenzofuran | 10 | U | 10 | * |
| 100-02-7 | 4-Nitrophenol | 26 | U | 26 | * |
| 121-14-2 | 2,4-Dinitrotoluene | 10 | U | 10 | * |
| 86-73-7 | Fluorene | 10 | U | 10 | * |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 10 | U | 10 | * |
| 84-66-2 | Diethyl Phthalate | 10 | U | 10 | * |
| 100-01-6 | 4-Nitroaniline | 26 | U | 26 | * |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 26 | U | 26 | * |
| 86-30-6 | N-Nitrosodiphenylamine | 10 | U | 10 | * |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 10 | U | 10 | * |
| 118-74-1 | Hexachlorobenzene | 10 | U | 10 | * |
| 87-86-5 | Pentachlorophenol | 26 | U | 26 | * |
| 85-01-8 | Phenanthrene | 10 | U | 10 | * |
| 120-12-7 | Anthracene | 10 | U | 10 | * |
| 84-74-2 | Di-n-butyl Phthalate | 10 | U | 10 | * |
| 206-44-0 | Fluoranthene | 10 | U | 10 | * |
| 129-00-0 | Pyrene | 10 | U | 10 | * |
| 85-68-7 | Butyl Benzyl Phthalate | 10 | U | 10 | * |
| 91-94-1 | 3,3'-Dichlorobenzidine | 26 | U | 26 | * |
| 56-55-3 | Benz(a)anthracene | 10 | U | 10 | * |
| 218-01-9 | Chrysene | 10 | U | 10 | * |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | 08/17/2000 |
| **Sample Matrix:** | Water | **Date Received:** | 08/18/2000 |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/29/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | GW-7097-081700-TJ-003RX | **Units:** | ug/L |
| **Lab Code:** | K2006327-003 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092800\0928F021.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3510C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 970.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | Bis(2-ethylhexyl) Phthalate | 10 | U | 10 | * |
| 117-84-0 | Di-n-octyl Phthalate | 10 | U | 10 | * |
| 205-99-2 | Benzo(b)fluoranthene | 10 | U | 10 | * |
| 207-08-9 | Benzo(k)fluoranthene | 10 | U | 10 | * |
| 50-32-8 | Benzo(a)pyrene | 10 | U | 10 | * |
| [illegible]-39-5 | Indeno(1,2,3-cd)pyrene | 10 | U | 10 | * |
| [illegible]70-3 | Dibenz(a,h)anthracene | 10 | U | 10 | * |
| 191-24-2 | Benzo(g,h,i)perylene | 10 | U | 10 | * |

* See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 51 | 19-107 | Acceptable |
| Phenol-d6 | 26 | 32-115 | Outside Control Limits |
| Nitrobenzene-d5 | 92 | 42-117 | Acceptable |
| 2-Fluorobiphenyl | 78 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 92 | 30-121 | Acceptable |
| Terphenyl-d14 | 86 | 39-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/14/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG2003485-6 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F017.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,000.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 25 | U | 25 | |
| 62-53-3 | Aniline | 25 | U | 25 | |
| 111-44-4 | Bis(2-chloroethyl) Ether | 10 | U | 10 | |
| 108-95-2 | Phenol | 10 | U | 10 | * |
| 95-57-8 | 2-Chlorophenol | 10 | U | 10 | * |
| 541-73-1 | 1,3-Dichlorobenzene | 10 | U | 10 | |
| 106-46-7 | 1,4-Dichlorobenzene | 10 | U | 10 | |
| 95-50-1 | 1,2-Dichlorobenzene | 10 | U | 10 | |
| 100-51-6 | Benzyl alcohol | 10 | U | 10 | |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 10 | U | 10 | |
| 95-48-7 | 2-Methylphenol | 10 | U | 10 | |
| 67-72-1 | Hexachloroethane | 10 | U | 10 | |
| 621-64-7 | N-Nitrosodi-n-propylamine | 10 | U | 10 | |
| CASID30030 | 3- and 4-Methylphenol Coelution | 10 | U | 10 | |
| 98-95-3 | Nitrobenzene | 10 | U | 10 | |
| 78-59-1 | Isophorone | 10 | U | 10 | |
| 88-75-5 | 2-Nitrophenol | 10 | U | 10 | |
| 105-67-9 | 2,4-Dimethylphenol | 10 | U | 10 | |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10 | U | 10 | |
| 120-83-2 | 2,4-Dichlorophenol | 10 | U | 10 | |
| 65-85-0 | Benzoic acid | 25 | U | 25 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 10 | U | 10 | |
| 91-20-3 | Naphthalene | 10 | U | 10 | |
| 106-47-8 | 4-Chloroaniline | 10 | U | 10 | |
| 87-68-3 | Hexachlorobutadiene | 10 | U | 10 | |
| 59-50-7 | 4-Chloro-3-methylphenol | 10 | U | 10 | |
| 91-57-6 | 2-Methylnaphthalene | 10 | U | 10 | |
| 77-47-4 | Hexachlorocyclopentadiene | 10 | U | 10 | * |
| 88-06-2 | 2,4,6-Trichlorophenol | 10 | U | 10 | |
| 95-95-4 | 2,4,5-Trichlorophenol | 10 | U | 10 | |

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## COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/14/2000 |

### Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG2003485-6 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F017.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,000.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 10 | U | 10 | |
| 88-74-4 | 2-Nitroaniline | 25 | U | 25 | |
| 208-96-8 | Acenaphthylene | 10 | U | 10 | |
| 131-11-3 | Dimethyl Phthalate | 10 | U | 10 | |
| 606-20-2 | 2,6-Dinitrotoluene | 10 | U | 10 | |
| 83-32-9 | Acenaphthene | 10 | U | 10 | |
| 99-09-2 | 3-Nitroaniline | 25 | U | 25 | |
| 51-28-5 | 2,4-Dinitrophenol | 25 | U | 25 | |
| 132-64-9 | Dibenzofuran | 10 | U | 10 | |
| 100-02-7 | 4-Nitrophenol | 25 | U | 25 | |
| 121-14-2 | 2,4-Dinitrotoluene | 10 | U | 10 | |
| 86-73-7 | Fluorene | 10 | U | 10 | |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 10 | U | 10 | |
| 84-66-2 | Diethyl Phthalate | 10 | U | 10 | |
| 100-01-6 | 4-Nitroaniline | 25 | U | 25 | |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 25 | U | 25 | |
| 86-30-6 | N-Nitrosodiphenylamine | 10 | U | 10 | |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 10 | U | 10 | |
| 118-74-1 | Hexachlorobenzene | 10 | U | 10 | |
| 87-86-5 | Pentachlorophenol | 25 | U | 25 | |
| 85-01-8 | Phenanthrene | 10 | U | 10 | |
| 120-12-7 | Anthracene | 10 | U | 10 | |
| 84-74-2 | Di-n-butyl Phthalate | 10 | U | 10 | |
| 206-44-0 | Fluoranthene | 10 | U | 10 | |
| 129-00-0 | Pyrene | 10 | U | 10 | |
| 85-68-7 | Butyl Benzyl Phthalate | 10 | U | 10 | |
| 91-94-1 | 3,3'-Dichlorobenzidine | 25 | U | 25 | |
| 56-55-3 | Benz(a)anthracene | 10 | U | 10 | |
| 218-01-9 | Chrysene | 10 | U | 10 | |

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**COLUMBIA ANALYTICAL SERVICES, INC.**

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Extracted:** | 08/24/2000 |
| | | **Date Analyzed:** | 09/14/2000 |

**Semi-Volatile Organic Compounds by GC/MS**

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG2003485-6 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\091400\0914F017.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2003485 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL408 |
| | | **Column:** | |
| **Sample Amount:** | 1,000.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | Bis(2-ethylhexyl) Phthalate | 10 | U | 10 | |
| 117-84-0 | Di-n-octyl Phthalate | 10 | U | 10 | |
| 205-99-2 | Benzo(b)fluoranthene | 10 | U | 10 | |
| 207-08-9 | Benzo(k)fluoranthene | 10 | U | 10 | |
| 50-32-8 | Benzo(a)pyrene | 10 | U | 10 | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 10 | U | 10 | |
| 53-70-3 | Dibenz(a,h)anthracene | 10 | U | 10 | |
| 191-24-2 | Benzo(g,h,i)perylene | 10 | U | 10 | |

* See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 30 | 19-107 | Acceptable |
| Phenol-d6 | 65 | 32-115 | Acceptable |
| Nitrobenzene-d5 | 88 | 42-117 | Acceptable |
| 2-Fluorobiphenyl | 78 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 82 | 30-121 | Acceptable |
| Terphenyl-d14 | 97 | 39-120 | Acceptable |

# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/27/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG2004257-3 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092700\0927F013.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 1,000.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 62-75-9 | N-Nitrosodimethylamine | 25 | U | 25 | * |
| 62-53-3 | Aniline | 25 | U | 25 | * |
| 111-44-4 | Bis(2-chloroethyl) Ether | 10 | U | 10 | |
| 108-95-2 | Phenol | 10 | U | 10 | * |
| 95-57-8 | 2-Chlorophenol | 10 | U | 10 | * |
| 541-73-1 | 1,3-Dichlorobenzene | 10 | U | 10 | |
| [illegible]-46-7 | 1,4-Dichlorobenzene | 10 | U | 10 | * |
| 95-50-1 | 1,2-Dichlorobenzene | 10 | U | 10 | |
| 100-51-6 | Benzyl alcohol | 10 | U | 10 | |
| 108-60-1 | Bis(2-chloroisopropyl) Ether | 10 | U | 10 | |
| 95-48-7 | 2-Methylphenol | 10 | U | 10 | |
| 67-72-1 | Hexachloroethane | 10 | U | 10 | |
| 621-64-7 | N-Nitrosodi-n-propylamine | 10 | U | 10 | |
| CASID30030 | 3- and 4-Methylphenol Coelution | 10 | U | 10 | |
| 98-95-3 | Nitrobenzene | 10 | U | 10 | |
| 78-59-1 | Isophorone | 10 | U | 10 | |
| 88-75-5 | 2-Nitrophenol | 10 | U | 10 | |
| 105-67-9 | 2,4-Dimethylphenol | 10 | U | 10 | |
| 111-91-1 | bis(2-Chloroethoxy)methane | 10 | U | 10 | |
| 120-83-2 | 2,4-Dichlorophenol | 10 | U | 10 | |
| 65-85-0 | Benzoic acid | 25 | U | 25 | * |
| 120-82-1 | 1,2,4-Trichlorobenzene | 10 | U | 10 | * |
| 91-20-3 | Naphthalene | 10 | U | 10 | |
| 106-47-8 | 4-Chloroaniline | 10 | U | 10 | * |
| 87-68-3 | Hexachlorobutadiene | 10 | U | 10 | |
| 59-50-7 | 4-Chloro-3-methylphenol | 10 | U | 10 | * |
| 91-57-6 | 2-Methylnaphthalene | 10 | U | 10 | |
| 77-47-4 | Hexachlorocyclopentadiene | 10 | U | 10 | * |
| 88-06-2 | 2,4,6-Trichlorophenol | 10 | U | 10 | |
| [illegible]95-4 | 2,4,5-Trichlorophenol | 10 | U | 10 | |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/27/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG2004257-3 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092700\0927F013.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 1,000.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 91-58-7 | 2-Chloronaphthalene | 10 | U | 10 | |
| 88-74-4 | 2-Nitroaniline | 25 | U | 25 | |
| 208-96-8 | Acenaphthylene | 10 | U | 10 | |
| 131-11-3 | Dimethyl Phthalate | 10 | U | 10 | |
| 606-20-2 | 2,6-Dinitrotoluene | 10 | U | 10 | |
| [illegible]82-9 | Acenaphthene | 10 | U | 10 | * |
| [illegible]09-2 | 3-Nitroaniline | 25 | U | 25 | |
| 51-28-5 | 2,4-Dinitrophenol | 25 | U | 25 | |
| 132-64-9 | Dibenzofuran | 10 | U | 10 | |
| 100-02-7 | 4-Nitrophenol | 25 | U | 25 | * |
| 121-14-2 | 2,4-Dinitrotoluene | 10 | U | 10 | * |
| 86-73-7 | Fluorene | 10 | U | 10 | |
| 7005-72-3 | 4-Chlorophenyl Phenyl Ether | 10 | U | 10 | |
| 84-66-2 | Diethyl Phthalate | 10 | U | 10 | |
| 100-01-6 | 4-Nitroaniline | 25 | U | 25 | |
| 534-52-1 | 2-Methyl-4,6-dinitrophenol | 25 | U | 25 | |
| 86-30-6 | N-Nitrosodiphenylamine | 10 | U | 10 | |
| 101-55-3 | 4-Bromophenyl Phenyl Ether | 10 | U | 10 | |
| 118-74-1 | Hexachlorobenzene | 10 | U | 10 | |
| 87-86-5 | Pentachlorophenol | 25 | U | 25 | |
| 85-01-8 | Phenanthrene | 10 | U | 10 | |
| 120-12-7 | Anthracene | 10 | U | 10 | |
| 84-74-2 | Di-n-butyl Phthalate | 10 | U | 10 | |
| 206-44-0 | Fluoranthene | 10 | U | 10 | |
| 129-00-0 | Pyrene | 10 | U | 10 | |
| 85-68-7 | Butyl Benzyl Phthalate | 10 | U | 10 | |
| 91-94-1 | 3,3'-Dichlorobenzidine | 25 | U | 25 | |
| 56-55-3 | Benz(a)anthracene | 10 | U | 10 | |
| [illegible]-01-9 | Chrysene | 10 | U | 10 | |

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# COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

| | | | |
|---|---|---|---|
| **Client:** | Conestoga Rovers & Assoc. | **Service Request:** | K2006327 |
| **Project:** | GM Truck Group Facility - RCRA Invest./7097 | **Date Collected:** | NA |
| **Sample Matrix:** | Water | **Date Received:** | NA |
| | | **Date Extracted:** | 09/26/2000 |
| | | **Date Analyzed:** | 09/27/2000 |

## Semi-Volatile Organic Compounds by GC/MS

| | | | |
|---|---|---|---|
| **Sample Name:** | Method Blank | **Units:** | ug/L |
| **Lab Code:** | KWG2004257-3 | **Basis:** | NA |
| **File ID:** | J:\MS08\DATA\092700\0927F013.D | **Level:** | Low |
| **Instrument ID:** | MS08 | | |
| **Extraction Method:** | EPA 3520C | **Extraction Lot:** | KWG2004257 |
| **Analysis Method:** | 8270C | **Calibration ID:** | CAL425 |
| | | **Column:** | |
| **Sample Amount:** | 1,000.00 ml | | |
| **% Solids:** | NA | | |
| **Dilution Factor:** | 1 | | |

| CAS No. | Analyte Name | Result | Q | MRL | Note |
|---|---|---|---|---|---|
| 117-81-7 | Bis(2-ethylhexyl) Phthalate | 10 | U | 10 | |
| 117-84-0 | Di-n-octyl Phthalate | 10 | U | 10 | |
| 205-99-2 | Benzo(b)fluoranthene | 10 | U | 10 | |
| 207-08-9 | Benzo(k)fluoranthene | 10 | U | 10 | |
| 50-32-8 | Benzo(a)pyrene | 10 | U | 10 | |
| [illegible]-39-5 | Indeno(1,2,3-cd)pyrene | 10 | U | 10 | |
| 53-70-3 | Dibenz(a,h)anthracene | 10 | U | 10 | |
| 191-24-2 | Benzo(g,h,i)perylene | 10 | U | 10 | |

* See Case Narrative

| Surrogate Name | %Rec | Control Limits | Note |
|---|---|---|---|
| 2-Fluorophenol | 44 | 19-107 | Acceptable |
| Phenol-d6 | 37 | 32-115 | Acceptable |
| Nitrobenzene-d5 | 86 | 42-117 | Acceptable |
| 2-Fluorobiphenyl | 83 | 33-120 | Acceptable |
| 2,4,6-Tribromophenol | 88 | 30-121 | Acceptable |
| Terphenyl-d14 | 111 | 39-120 | Acceptable |