Technical Report

# Remediation Assessment

**Fansteel, Inc.**
**Muskogee, Oklahoma**

**Volume 1 of 4**

Kirkpatrick & Lockhart
Pittsburgh, Pennsylvania

Project No. 111
December 1993

Earth Sciences
Consultants, Inc.

Fansteel Metals
number ten tantalum place muskogee, oklahoma 74401

December 28, 1993

Mr. Harvey Spiro
Project Manager
Regulatory Issues Section
Low Level Waste Division
U.S. Nuclear Regulatory Commission
Washington, DC 30555

RE: Transmittal
Final Report
Remedial Assessment
Fansteel, Muskogee, OK

Dear Mr. Spiro:

In accordance with Fansteel Inc. (Fansteel) Nuclear Regulatory Commission (NRC) License No. SMB-911, Licens Condition 26, amended December 21, 1992, Fansteel is pleased to provide you with the enclosed final report for the remedial assessment of our Muskogee, Oklahoma, facility. This report documents the results of the remedial assessment activities performed by Earth Sciences Consultants, Inc. (Earth Sciences), a wholly owned subsidiary of American Waste Services, Inc., at our facility during 1993. The work performed as part of the remedial assessment was conducted in accordance with Earth Sciences' Remedial Assessment Work Plan (revised July 1992) which the NRC approved by incorporation into Fansteel's NRC license amendment dated December 21, 1992.

Please review that portion of the remedial assessment regarding the deep aquifer wells expeditiously. Fansteel would like to appropriately abandon these wells as the data acquired point to no contamination of the deep aquifer. The closure would abate potential impacts caused by communication of these wells with the surface.

Fansteel is moving forward with the preparation of a site-specific decommission plan for the Muskogee, Oklahoma, facility to address the concerns identified in Earth Sciences' Remedial Assessment Report. Fansteel will be providing the NRC with a final decommissioning plan by the

deadline identified in our amended NRC license, June 30, 1994. Should you have any questions regarding the Remedial Assessment Report, please feel free to contact me or our consultant, Earth Sciences, at any time.

Sincerely,

JOHN J. HUNTER
Corp. Mgr., Process Eng. &
Facilities Construction

JJH/bsm

enc.

cc: A. Davis, US EPA
D. Dimick, OKDEQ
L. Kirk, OKDEQ
K. R. Garrity
M. J. Mocniak
J. Harrick, ESC

Fansteel
Metals
number ten tantalum place muskogee, oklahoma 74401

December 28, 1993

Mr. David Dimick
Water Quality
Oklahoma Dept. of
Environmental Quality
1000 Northeast 10th Street
Oklahoma City, OK 73117-1212

Dear Mr. Dimick:

Attached is the Remedial Assessment Study for our Muskogee, Oklahoma, property as prepared by our consultants, Earth Sciences Consultants, Inc. (Earth Sciences) of Pittsburgh, Pennsylvania. It includes a cover letter to the Nuclear Regulatory Commission's Project Manager, Mr. Harvey Spiro.

Please review that portion of the report regarding the deep aquifer wells. The data indicates that the bedrock aquifer has not been impacted by site operations. As such, Fansteel, Inc., (Fansteel) would like to appropriately close these four wells to prohibit any communication between the bedrock aquifer and the surface. Fansteel requires your concurrence before proceeding with the abandonment of these wells.

Should you have any comments or questions, please feel free to contact me or our consultants, Earth Sciences, at any time.

Sincerely,

JOHN J. HUNTER
Corp. Mgr., Process Eng. &
Facilities Construction

JJH/bsm

enc.

cc: K. R. Garrity

Table 5
Summary of Waste Chemistry Data
Pond 2 Residues
Fansteel, Inc.
Muskogee, Oklahoma



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P2-1A (0-4) 2/19/93 | P2-1B (4-8) 2/19/93 | P2-1C (8-12.5) 2/19/93 | P2-2A (0-3) 2/19/93 | P2-2B (3-6) 2/19/93 |
| Total Analyses: | | | | | | |
| Cyanide | mg/kg | 11 | 4.4 | <1.9 | <2.0 | <2.0 |
| Silver | mg/kg | 21.7 | 39.2 | 23.9 | 49.6 | 10.0 |
| Arsenic | mg/kg | <36.0 | <39.0 | <37.0 | 41.7 | <36.0 |
| Barium | mg/kg | 585 | 452 | 524 | 1380 | 284 |
| Beryllium | mg/kg | 25.5 | 23.9 | 22.0 | 33.1 | 10.3 |
| Cadmium | mg/kg | <3.60 | <3.90 | <3.70 | <3.60 | <3.60 |
| Chromium | mg/kg | 377 | 438 | 153 | 740 | 169 |
| Mercury | mg/kg | 2.74 | 0.685 | 0.312 | 0.774 | 1.15 |
| Molybdenum | mg/kg | 30 | 31 | 40 | 40 | <18 |
| Nickel | mg/kg | 59.3 | 103 | 50.9 | 38.6 | <18.0 |
| Lead | mg/kg | 167 | <39.0 | 68.5 | 110 | 70.5 |
| Antimony | mg/kg | 346 | 118 | 384 | 284 | 61.9 |
| Selenium | mg/kg | <0.360 | <0.400 | <0.370 | <0.400 | <0.390 |
| Tin | mg/kg | 3100 | 1600 | 6000 | 4000 | 830 |
| Columbium | mg/kg | 5000 | 1200 | 3100 | 3000 | 4800 |
| Tantalum | mg/kg | 2200 | 1700 | 2300 | 2000 | 980 |
| Gross Alpha | pCi/g | 2300±100 | 4800±100 | 3200±100 | 6200±100 | 3200±100 |
| Gross Beta | pCi/g | 920±20 | 2400±100 | 2000±100 | 2700±100 | 1500±100 |
| Isotopes: | | | | | | |
| Uranium-233 & 234 | pCi/g | 180±10 | 510±20 | 410±10 | 440±10 | 170±10 |
| Uranium 235 | pCi/g | 5.8±1.7 | 19±3 | 22±3 | 19±3 | 5.3±1.7 |
| Uranium-238 | pCi/g | 180±10 | 530±20 | 430±10 | 440±10 | 170±10 |
| Thorium-230 | pCi/g | 640±40 | 780±40 | 850±40 | 650±30 | 420±30 |
| Lead-210 @ 46 KeV | pCi/g | 60±9 | 68±14 | 86±12 | 30±21 | 55±11 |
| Thorium-234 @ 63.3 KeV | pCi/g | 91±8 | 260±40 | 160±30 | 130±40 | 140±30 |
| Protactinium-234m @ 1001 KeV | pCi/g | 170±70 | 590±120 | 640±120 | 560±30 | 250±90 |
| Radium 226 | pCi/g | 250±10 | 540±20 | 500±10 | 590±20 | 310±10 |
| Lead-214 @ 295.2 KeV | pCi/g | 170±10 | 370±10 | 330±10 | 400±10 | 240±10 |
| Lead-214 @ 352.0 KeV | pCi/g | 170±10 | 370±10 | 340±10 | 420±10 | 250±10 |
| Bismuth-214 @ 609.4 KeV | pCi/g | 170±10 | 360±10 | 330±10 | 420±10 | 240±10 |
| Bismuth-214 @ 1120.4 KeV | pCi/g | 160±10 | 360±10 | 330±10 | 420±10 | 240±10 |
| Bismuth-214 @ 1764.7 KeV | pCi/g | 160±10 | 350±10 | 300±10 | 380±10 | 220±10 |
| Actinium-228 @ 338 KeV | pCi/g | 140±10 | 300±10 | 230±10 | 460±10 | 230±10 |
| Actinium-228 @ 911 KeV | pCi/g | 160±10 | 340±10 | 260±10 | 500±10 | 250±10 |
| Actinium-228 @ 968 KeV | pCi/g | 160±10 | 340±10 | 260±10 | 500±20 | 260±10 |
| Lead-212 @ 238 KeV | pCi/g | 140±10 | 320±10 | 240±10 | 440±30 | 240±10 |
| Bismuth-212 @ 727 KeV | pCi/g | 170±10 | 370±20 | 300±20 | 540±20 | 270±20 |
| Thallium-208 @ 583 KeV | pCi/g | 150±10 | 320±10 | 240±10 | 480±10 | 230±10 |
| Uranium-235 @ 143 KeV | pCi/g | 5.8±1.9 | 15±3 | 13±2 | 15±3 | 8.1±2.2 |
| ASTM Analysis: | | | | | | |
| Alkalinity | mg/l $CaCO_3$ | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Ammonia | mg/l NH3-N | 5.8 | 8.9 | 8.1 | 2.7 | 1.3 |
| Chloride | mg/l | <0.50 | 3.8 | 5.7 | <0.50 | <0.50 |
| Fluoride | mg/l | 410 | 140 | 110 | 580 | 450 |
| Nitrate | mg/l $NO_3$-N | 0.12 | 0.29 | 0.32 | 0.35 | 0.46 |
| Sulfate | mg/l | 6.6 | 510 | 26 | 50 | 2.6 |
| pH | pH Units | 2.89 | 3.34 | 3.38 | 2.42 | 2.70 |
| Specific Conductance @ 25°C | µmhos/cm | 1930 | 1380 | 845 | 4190 | 2020 |
| Aluminum | mg/l | 71 | <10 | 34 | 170 | 91 |
| Calcium | mg/l | 53 | 35 | 13 | 200 | 91 |
| Iron | mg/l | 220 | 180 | 110 | 390 | 140 |
| Potassium | mg/l | 67 | 38 | 15 | 120 | 59 |
| Magnesium | mg/l | 20 | 25 | 16 | 40 | 25 |
| Manganese | mg/l | 52 | 70 | 33 | 96 | 33 |
| Sodium | mg/l | 19 | 18 | <10 | 40 | 23 |

**Table 5**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P2-1A (0-4) 2/19/93 | P2-1B (4-8) 2/19/93 | P2-1C (8-12.5) 2/19/93 | P2-2A (0-3) 2/19/93 | P2-2B (3-6) 2/19/93 |
| TCLP Metals: | | | | | | |
| Silver | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Arsenic | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Barium | mg/l | <10 | <10 | <10 | <10 | <10 |
| Cadmium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Chromium | mg/l | 7.2 | 3.0 | 0.47 | 15 | 4.4 |
| Mercury | mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nickel | mg/l | <1.0 | 1.8 | <1.0 | <1.0 | <1.0 |
| Lead | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Selenium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| TCLP Extraction Fluid Data: | | | | | | |
| Extraction Fluid | | No. 1 | No. 1 | No. 1 | No. 1 | No. 1 |
| pH with Deionized Water | pH units | 2.76 | 3.32 | 3.26 | 2.26 | 2.56 |
| pH of TCLP Extract | pH units | 4.44 | 4.65 | 4.74 | 4.17 | 4.39 |
| Amount of Sample Extracted | g | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Volatile Organic Analyses: | | | | | | |
| Acetone | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Benzene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Bromodichloromethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Bromoform | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Bromomethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 2-Butanone | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Carbon Disulfide | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Carbon Tetrachloride | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Chlorobenzene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Dibromochloromethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Chloroethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Chloromethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Chloroform | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,1-Dichloroethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,2-Dichloroethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,1-Dichloroethene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,2-Dichloroethene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,2-Dichloropropane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Cis-1,3-Dichloropropene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Trans-1,3-Dichloropropene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Ethylbenzene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 2-Hexanone | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Methylene Chloride | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 4-Methyl-2-pentanone | µg/kg | 130000 | 160000 | 140000 | 43000 | 70000 |
| Styrene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,1,2,2-Tetrachloroethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Tetrachloroethene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Toluene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,1,1-Trichloroethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| 1,1,2-Trichloroethane | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Trichloroethene | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Vinyl Chloride | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |
| Xylenes, Total | µg/kg | <2300 | <2600 | <2400 | <2600 | <2500 |

**Table 5**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | |
|---|---|---|---|---|---|
| | | P2-2C (6-9) 2/19/93 | P2-3A (0-4) 2/19/93 | P2-3B (4-8) 2/19/93 | P2-3C (8-12) 2/19/93 |
| Total Analyses: | | | | | |
| Cyanide | mg/kg | <1.9 | <1.8 | <2.1 | <1.9 |
| Silver | mg/kg | 38.5 | 40.9 | 52.7 | 30.3 |
| Arsenic | mg/kg | <35.6 | 39.4 | 74.3 | <37.0 |
| Barium | mg/kg | 972 | 1340 | 2180 | 649 |
| Beryllium | mg/kg | 26.0 | 29.7 | 32.2 | 30.8 |
| Cadmium | mg/kg | <3.56 | <3.08 | <3.94 | <3.70 |
| Chromium | mg/kg | 303 | 652 | 442 | 338 |
| Mercury | mg/kg | 1.20 | 0.260 | 0.459 | 2.45 |
| Molybdenum | mg/kg | 34 | 21 | 35 | 36 |
| Nickel | mg/kg | 22.7 | 27.3 | 22.6 | 68.9 |
| Lead | mg/kg | 96.7 | 92.0 | 85.9 | 166 |
| Antimony | mg/kg | 220 | 144 | 221 | 576 |
| Selenium | mg/kg | <0.380 | <0.350 | <0.430 | <0.380 |
| Tin | mg/kg | 3400 | 6000 | 4800 | 4700 |
| Columbium | mg/kg | 3200 | 1700 | 2500 | 11000 |
| Tantalum | mg/kg | 2200 | 970 | 1300 | 7100 |
| Gross Alpha | pCi/g | 5200±100 | 4900±100 | 6700±100 | 3800±100 |
| Gross Beta | pCi/g | 2200±100 | 2200±100 | 3100±100 | 1800±100 |
| Isotopes: | | | | | |
| Uranium-233 & 234 | pCi/g | 290±10 | 320±20 | 550±25 | 230±10 |
| Uranium 235 | pCi/g | 13±2 | 11±3 | 29±6 | 13±3 |
| Uranium-238 | pCi/g | 280±10 | 350±20 | 580±30 | 250±10 |
| Thorium-230 | pCi/g | 670±30 | 710±30 | 690±40 | 860±40 |
| Lead-210 @ 46 KeV | pCi/g | 40±13 | 57±10 | 56±19 | 77±12 |
| Thorium-234 @ 63.3 KeV | pCi/g | 210±60 | 220±40 | 280±30 | 130±10 |
| Protactinium-234m @ 1001 KeV | pCi/g | 310±120 | 520±120 | 660±150 | 390±120 |
| Radium 226 | pCi/g | 530±20 | 510±20 | 720±20 | 400±10 |
| Lead-214 @ 295.2 KeV | pCi/g | 400±10 | 390±10 | 450±10 | 310±10 |
| Lead-214 @ 352.0 KeV | pCi/g | 410±10 | 400±10 | 470±10 | 310±10 |
| Bismuth-214 @ 609.4 KeV | pCi/g | 400±10 | 380±10 | 460±10 | 300±10 |
| Bismuth-214 @ 1120.4 KeV | pCi/g | 400±10 | 380±10 | 460±10 | 300±10 |
| Bismuth-214 @ 1764.7 KeV | pCi/g | 370±10 | 360±10 | 420±10 | 280±10 |
| Actinium-228 @ 338 KeV | pCi/g | 410±10 | 380±20 | 510±10 | 260±10 |
| Actinium-228 @ 911 KeV | pCi/g | 450±10 | 420±10 | 560±10 | 300±10 |
| Actinium-228 @ 968 KeV | pCi/g | 450±10 | 430±10 | 570±10 | 300±10 |
| Lead-212 @ 238 KeV | pCi/g | 400±20 | 400±10 | 440±10 | 280±10 |
| Bismuth-212 @ 727 KeV | pCi/g | 490±20 | 460±20 | 590±20 | 310±20 |
| Thallium-208 @ 583 KeV | pCi/g | 430±10 | 390±10 | 540±10 | 270±10 |
| Uranium-235 @ 143 KeV | pCi/g | 8.5±2.9 | 12±3 | 18±5 | 11±2 |
| ASTM Analysis: | | | | | |
| Alkalinity | mg/l $CaCO_3$ | <2.00 | <2.00 | <2.00 | <2.00 |
| Ammonia | mg/l NH3-N | 1.6 | 2.8 | 1.9 | 3.0 |
| Chloride | mg/l | <0.50 | <0.50 | <0.50 | <0.50 |
| Fluoride | mg/l | 630 | 610 | 610 | 650 |
| Nitrate | mg/l $NO_3$-N | <0.10 | <0.10 | <0.10 | <0.10 |
| Sulfate | mg/l | 6.9 | 23 | 22 | 20 |
| pH | pH Units | 2.70 | 2.33 | 2.65 | 2.51 |
| Specific Conductance @ 25°C | µmhos/cm | 2740 | 5660 | 2900 | 3520 |
| Aluminum | mg/l | 120 | 270 | 160 | 110 |
| Calcium | mg/l | 110 | 300 | 110 | 53 |
| Iron | mg/l | 280 | 190 | 640 | 210 |
| Potassium | mg/l | 170 | 130 | 150 | 110 |
| Magnesium | mg/l | 33 | 38 | 18 | 50 |
| Manganese | mg/l | 66 | 47 | 150 | 27 |
| Sodium | mg/l | 32 | 58 | 31 | 48 |

**Table 5**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P2-1A (0-4) 2/19/93 | P2-1B (4-8) 2/19/93 | P2-1C (8-12.5) 2/19/93 | P2-2A (0-3) 2/19/93 | P2-2B (3-6) 2/19/93 |
| Semivolatile Organic Analyses: | | | | | | |
| Acenaphthene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Acenaphthylene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Anthracene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Bis(2-chloroethyl)ether | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Bis(2-chloroethoxy)methane | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Bis(2-chloroisopropyl)ether | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Bis(2-ethylhexyl)phthalate | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Benzo(a)pyrene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Benzo(a)anthracene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Benzo(b)fluoranthene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Benzo(g,h,i)perylene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Benzo(k)fluoranthene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 4-Bromophenyl Phenyl Ether | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Butylbenzyl Phthalate | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Carbazole | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Chrysene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 4-Chloroaniline | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2-Chloronaphthalene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2-Chlorophenol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 4-Chlorophenyl Phenyl Ether | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| o-Cresol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| p-Cresol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Dibenzo(a,h)anthracene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Dibenzofuran | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2,4-Dichlorophenol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 1,2-Dichlorobenzene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 1,3-Dichlorobenzene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 1,4-Dichlorobenzene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 3,3-Dichlorobenzidine | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Diethyl Phthalate | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Dimethyl Phthalate | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2,4-Dimethylphenol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Di-N-butyl Phthalate | µg/kg | <1300 | <1300 | 1400 | <1300 | 1400 |
| 4,6-Dinitro-o-cresol | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| 2,4-Dinitrotoluene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2,6-Dinitrotoluene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Di-N-octyl Phthalate | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2,4-Dinitrophenol | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| Fluoranthene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Fluorene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Hexachlorocyclopentadiene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Hexachlorobenzene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Hexachlorobutadiene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Hexachloroethane | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Indeno(1,2,3-c,d)pyrene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Isophorone | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2-Methylnaphthalene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| N-Nitrosodiphenylamine | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| N-Nitroso-di-n-propylamine | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Naphthalene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2-Nitroaniline | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| 3-Nitroaniline | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| 4-Nitroaniline | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| Nitrobenzene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2-Nitrophenol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 4-Nitrophenol | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| p-chloro-m-cresol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Pentachlorophenol | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| Phenanthrene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Phenol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| Pyrene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 2,4,5-Trichlorophenol | µg/kg | <6600 | <6600 | <6600 | <6600 | <6400 |
| 2,4,6-Trichlorophenol | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |
| 1,2,4-Trichlorobenzene | µg/kg | <1300 | <1300 | <1300 | <1300 | <1300 |

Table 5
(Continued)



| Parameter | Units | Sample Identification and Date | | | |
|---|---|---|---|---|---|
| | | P2-2C (6-9) 2/19/93 | P2-3A (0-4) 2/19/93 | P2-3B (4-8) 2/19/93 | P2-3C (8-12) 2/19/93 |
| TCLP Metals: | | | | | |
| Silver | mg/l | <0.10 | <0.10 | <0.10 | <0.10 |
| Arsenic | mg/l | <0.10 | <0.10 | <0.10 | <0.10 |
| Barium | mg/l | <10 | <10 | <10 | <10 |
| Cadmium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 |
| Chromium | mg/l | 4.9 | 20 | 5.0 | 3.8 |
| Mercury | mg/l | <0.010 | <0.010 | <0.010 | <0.010 |
| Nickel | mg/l | <1.0 | <1.0 | <1.0 | <1.0 |
| Lead | mg/l | <0.10 | 0.17 | <0.10 | <0.10 |
| Selenium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 |
| TCLP Extraction Fluid Data: | | | | | |
| Extraction Fluid | | No. 1 | No. 1 | No. 1 | No. 1 |
| pH with Deionized Water | pH units | 2.57 | 2.33 | 2.65 | 2.43 |
| pH of TCLP Extract | pH units | 4.40 | 3.74 | 4.23 | 4.33 |
| Amount of Sample Extracted | g | 40.0 | 40.0 | 40.0 | 40.0 |
| Volatile Organic Analyses: | | | | | |
| Acetone | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Benzene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Bromodichloromethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Bromoform | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Bromomethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 2-Butanone | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Carbon Disulfide | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Carbon Tetrachloride | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Chlorobenzene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Dibromochloromethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Chloroethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Chloromethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Chloroform | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,1-Dichloroethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,2-Dichloroethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,1-Dichloroethene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,2-Dichloroethene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,2-Dichloropropane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Cis-1,3-Dichloropropene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Trans-1,3-Dichloropropene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Ethylbenzene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 2-Hexanone | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Methylene Chloride | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 4-Methyl-2-pentanone | µg/kg | 68000 | 61000 | 490000 | 730000 |
| Styrene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,1,2,2-Tetrachloroethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Tetrachloroethene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Toluene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,1,1-Trichloroethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| 1,1,2-Trichloroethane | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Trichloroethene | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Vinyl Chloride | µg/kg | <25000 | <23000 | <28000 | <25000 |
| Xylenes, Total | µg/kg | <25000 | <23000 | <28000 | <25000 |

**Table 5**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | |
|---|---|---|---|---|---|
| | | P2-2C (6-9) 2/19/93 | P2-3A (0-4) 2/19/93 | P2-3B (4-8) 2/19/93 | P2-3C (8-12) 2/19/93 |
| Semivolatile Organic Analyses: | | | | | |
| Acenaphthene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Acenaphthylene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Anthracene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Bis(2-chloroethyl)ether | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Bis(2-chloroethoxy)methane | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Bis(2-chloroisopropyl)ether | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Bis(2-ethylhexyl)phthalate | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Benzo(a)pyrene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Benzo(a)anthracene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Benzo(b)fluoranthene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Benzo(g,h,i)perylene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Benzo(k)fluoranthene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 4-Bromophenyl Phenyl Ether | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Butylbenzyl Phthalate | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Carbazole | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Chrysene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 4-Chloroaniline | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2-Chloronaphthalene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2-Chlorophenol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 4-Chlorophenyl Phenyl Ether | µg/kg | <1300 | <1200 | <3400 | <1400 |
| o-Cresol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| p-Cresol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Dibenzo(a,h)anthracene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Dibenzofuran | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2,4-Dichlorophenol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 1,2-Dichlorobenzene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 1,3-Dichlorobenzene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 1,4-Dichlorobenzene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 3,3-Dichlorobenzidine | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Diethyl Phthalate | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Dimethyl Phthalate | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2,4-Dimethylphenol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Di-N-butyl Phthalate | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 4,6-Dinitro-o-cresol | µg/kg | <6300 | <5900 | <17000 | <6600 |
| 2,4-Dinitrotoluene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2,6-Dinitrotoluene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Di-N-octyl Phthalate | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2,4-Dinitrophenol | µg/kg | <6300 | <5900 | <17000 | <6600 |
| Fluoranthene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Fluorene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Hexachlorocyclopentadiene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Hexachlorobenzene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Hexachlorobutadiene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Hexachloroethane | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Indeno(1,2,3-c,d)pyrene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Isophorone | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2-Methylnaphthalene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| N-Nitrosodiphenylamine | µg/kg | <1300 | <1200 | <3400 | <1400 |
| N-Nitroso-di-n-propylamine | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Naphthalene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2-Nitroaniline | µg/kg | <6300 | <5900 | <17000 | <6600 |
| 3-Nitroaniline | µg/kg | <6300 | <5900 | <17000 | <6600 |
| 4-Nitroaniline | µg/kg | <6300 | <5900 | <17000 | <6600 |
| Nitrobenzene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2-Nitrophenol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 4-Nitrophenol | µg/kg | <6300 | <5900 | <17000 | <6600 |
| p-chloro-m-cresol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Pentachlorophenol | µg/kg | <6300 | <5900 | <17000 | <6600 |
| Phenanthrene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Phenol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| Pyrene | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 2,4,5-Trichlorophenol | µg/kg | <6300 | <5900 | <17000 | <6600 |
| 2,4,6-Trichlorophenol | µg/kg | <1300 | <1200 | <3400 | <1400 |
| 1,2,4-Trichlorobenzene | µg/kg | <1300 | <1200 | <3400 | <1400 |

Table 3
Summary of Waste Chemistry Data
Pond 3 Residues
Fansteel, Inc.
Muskogee, Oklahoma



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-1A (0-5) 2/19/93 | P3-1B (5-10) 2/19/93 | P3-1C (10-16) 2/19/93 | P3-2A (0-5) 2/19/93 | P3-2B (5-10) 2/19/93 |
| Total Analyses: | | | | | | |
| Cyanide | mg/kg | 15 | 5.9 | 15 | 5.3 | 1.9 |
| Silver | mg/kg | 24.7 | 26.5 | 37.0 | 12.4 | 29.7 |
| Arsenic | mg/kg | 93.6 | 85.7 | 33.0 | 30.7 | 109 |
| Barium | mg/kg | 939 | 987 | 1310 | 452 | 1200 |
| Beryllium | mg/kg | 19.4 | 32.0 | 30.8 | 3.50 | 17.4 |
| Cadmium | mg/kg | <3.70 | <4.70 | <5.00 | <2.90 | <3.50 |
| Chromium | mg/kg | 476 | 1110 | 889 | 154 | 807 |
| Mercury | mg/kg | 1.45 | 0.248 | 0.665 | 1.70 | 3.51 |
| Molybdenum | mg/kg | 40 | 49 | 40 | <15 | 48 |
| Nickel | mg/kg | 25.9 | 42.0 | 36.0 | <15.0 | 37.2 |
| Lead | mg/kg | 83.8 | 79.7 | 98.4 | 58.2 | 115 |
| Antimony | mg/kg | 103 | 143 | 105 | <29.0 | 127 |
| Selenium | mg/kg | <0.400 | <0.500 | <0.560 | <0.340 | <0.380 |
| Tin | mg/kg | 770 | 2800 | 2600 | 210 | 830 |
| Columbium | mg/kg | 1100 | 2100 | 1400 | 2300 | 1300 |
| Tantalum | mg/kg | 1000 | 1300 | 950 | 2200 | 1200 |
| Gross Alpha | pCi/g | 5800±100 | 5200±100 | 7600±100 | 3400±100 | 5500±100 |
| Gross Beta | pCi/g | 2700±100 | 2900±100 | 3800±100 | 1800±100 | 2500±100 |
| Isotopes: | | | | | | |
| Uranium-233 & 234 | pCi/g | 570±20 | 860±30 | 950±30 | 290±20 | 650±50 |
| Uranium 235 | pCi/g | 20±4 | 46±8 | 43±7 | 14±5 | 33±12 |
| Uranium-238 | pCi/g | 580±20 | 910±30 | 1000±100 | 290±20 | 710±60 |
| Thorium-230 | pCi/g | 770±30 | 780±30 | 800±40 | 790±30 | 1100±100 |
| Lead-210 @ 46 KeV | pCi/g | 63±13 | 39±17 | 61±14 | 71±10 | 64±10 |
| Thorium-234 @ 63.3 KeV | pCi/g | 230±10 | 210±30 | 340±30 | 180±10 | 240±40 |
| Protactinium-234m @ 1001 KeV | pCi/g | 680±130 | 790±130 | 980±170 | 430±130 | 660±140 |
| Radium 226 | pCi/g | 730±20 | 670±20 | 860±20 | 490±20 | 610±20 |
| Lead-214 @ 295.2 KeV | pCi/g | 450±10 | 460±10 | 500±10 | 360±10 | 430±10 |
| Lead-214 @ 352.0 KeV | pCi/g | 480±10 | 470±10 | 510±10 | 380±10 | 440±10 |
| Bismuth-214 @ 609.4 KeV | pCi/g | 460±10 | 450±10 | 500±10 | 360±10 | 430±10 |
| Bismuth-214 @ 1120.4 KeV | pCi/g | 460±10 | 440±10 | 480±10 | 360±10 | 430±10 |
| Bismuth-214 @ 1764.7 KeV | pCi/g | 440±10 | 430±10 | 460±20 | 340±10 | 400±10 |
| Actinium-228 @ 338 KeV | pCi/g | 430±10 | 410±10 | 550±10 | 340±10 | 390±10 |
| Actinium-228 @ 911 KeV | pCi/g | 470±10 | 450±10 | 600±10 | 360±10 | 420±10 |
| Actinium-228 @ 968 KeV | pCi/g | 470±10 | 460±10 | 610±20 | 370±10 | 420±10 |
| Lead-212 @ 238 KeV | pCi/g | 410±20 | 410±10 | 540±30 | 320±20 | 400±10 |
| Bismuth-212 @ 727 KeV | pCi/g | 490±30 | 490±20 | 650±20 | 390±20 | 480±20 |
| Thallium-208 @ 583 KeV | pCi/g | 450±10 | 400±10 | 580±10 | 350±10 | 400±10 |
| Uranium-235 @ 143 KeV | pCi/g | 21±3 | 17±3 | 28±3 | 11±3 | 14±3 |
| ASTM Analysis: | | | | | | |
| Alkalinity | mg/l $CaCO_3$ | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Ammonia | mg/l $NH_3$-N | 3.8 | 4.0 | 5.1 | 6.1 | 7.5 |
| Chloride | mg/l | <0.50 | <0.50 | 2.2 | 2.3 | 5.9 |
| Fluoride | mg/l | 330 | 640 | 610 | 280 | 290 |
| Nitrate | mg/l $NO_3$-N | 2.6 | 0.55 | <0.10 | 1.0 | 0.45 |
| Sulfate | mg/l | 2.9 | 5.2 | 9.8 | 2.6 | 540 |
| pH | pH Units | 2.99 | 2.34 | 2.47 | 3.06 | 2.65 |
| Specific Conductance @ 25°C | µmhos/cm | 1330 | 4620 | 3860 | 1520 | 2250 |
| Aluminum | mg/l | 49 | 59 | 95 | 51 | 99 |
| Calcium | mg/l | 38 | 200 | 170 | 20 | 43 |
| Iron | mg/l | 74 | 280 | 300 | 56 | 94 |
| Potassium | mg/l | 82 | 63 | 59 | 170 | 91 |
| Magnesium | mg/l | 21 | 43 | 27 | 15 | 33 |
| Manganese | mg/l | 24 | 86 | 83 | 16 | 27 |
| Sodium | mg/l | 19 | 37 | 28 | 22 | 25 |

**Table 3**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-1A (0-5) 2/19/93 | P3-1B (5-10) 2/19/93 | P3-1C (10-16) 2/19/93 | P3-2A (0-5) 2/19/93 | P3-2B (5-10) 2/19/93 |
| TCLP Metals: | | | | | | |
| Silver | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Arsenic | mg/l | <0.10 | 0.21 | 0.18 | 0.1 | 0.10 |
| Barium | mg/l | <10 | <10 | <10 | <10 | <10 |
| Cadmium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Chromium | mg/l | 5.7 | 20 | 15 | 3.6 | 7.5 |
| Mercury | mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nickel | mg/l | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Lead | mg/l | <0.10 | 0.34 | 0.26 | 0.10 | 0.24 |
| Selenium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| TCLP Extraction Fluid Data: | | | | | | |
| Extraction Fluid | | No. 1 | No. 1 | No. 1 | No. 1 | No. 1 |
| pH with Deionized Water | pH units | 2.74 | 2.20 | 2.27 | 2.97 | 2.45 |
| pH of TCLP Extract | pH units | 4.59 | 4.26 | 4.29 | 4.60 | 4.52 |
| Amount of Sample Extracted | g | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Volatile Organic Analyses: | | | | | | |
| Acetone | µg/kg | <26000 | <33000 | <3700 | <2200 | 81000 |
| Benzene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Bromodichloromethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Bromoform | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Bromomethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 2-Butanone | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Carbon Disulfide | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Carbon Tetrachloride | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Chlorobenzene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Dibromochloromethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Chloroethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Chloromethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Chloroform | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,1-Dichloroethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,2-Dichloroethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,1-Dichloroethene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,2-Dichloroethene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,2-Dichloropropane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Cis-1,3-Dichloropropene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Trans-1,3-Dichloropropene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Ethylbenzene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 2-Hexanone | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Methylene Chloride | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 4-Methyl-2-pentanone | µg/kg | 150000 | 780000 | 130000 | 34000 | 330000 |
| Styrene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,1,2,2-Tetrachloroethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Tetrachloroethene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Toluene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,1,1-Trichloroethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| 1,1,2-Trichloroethane | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Trichloroethene | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Vinyl Chloride | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |
| Xylenes, Total | µg/kg | <26000 | <33000 | <3700 | <2200 | <25000 |

**Table 3**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-1A (0-5) 2/19/93 | P3-1B (5-10) 2/19/93 | P3-1C (10-16) 2/19/93 | P3-2A (0-5) 2/19/93 | P3-2B (5-10) 2/19/93 |
| Semivolatile Organic Analyses: | | | | | | |
| Acenaphthene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Acenaphthylene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Anthracene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Bis(2-chloroethyl)ether | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Bis(2-chloroethoxy)methane | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Bis(2-chloroisopropyl)ether | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Bis(2-ethylhexyl)phthalate | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Benzo(a)pyrene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Benzo(a)anthracene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Benzo(b)fluoranthene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Benzo(g,h,i)perylene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Benzo(k)fluoranthene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 4-Bromophenyl Phenyl Ether | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Butylbenzyl Phthalate | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Carbazole | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Chrysene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 4-Chloroaniline | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2-Chloronaphthalene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2-Chlorophenol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 4-Chlorophenyl Phenyl Ether | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| o-Cresol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| p-Cresol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Dibenzo(a,h)anthracene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Dibenzofuran | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2,4-Dichlorophenol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 1,2-Dichlorobenzene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 1,3-Dichlorobenzene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 1,4-Dichlorobenzene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 3,3-Dichlorobenzidine | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Diethyl Phthalate | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Dimethyl Phthalate | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2,4-Dimethylphenol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Di-N-butyl Phthalate | µg/kg | 1600 | <1300 | 2700 | <3200 | <3400 |
| 4,6-Dinitro-o-cresol | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| 2,4-Dinitrotoluene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2,6-Dinitrotoluene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Di-N-octyl Phthalate | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2,4-Dinitrophenol | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| Fluoranthene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Fluorene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Hexachlorocyclopentadiene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Hexachlorobenzene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Hexachlorobutadiene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Hexachloroethane | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Indeno(1,2,3-c,d)pyrene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Isophorone | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2-Methylnaphthalene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| N-Nitrosodiphenylamine | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| N-Nitroso-di-n-propylamine | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Naphthalene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2-Nitroaniline | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| 3-Nitroaniline | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| 4-Nitroaniline | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| Nitrobenzene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2-Nitrophenol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 4-Nitrophenol | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| p-chloro-m-cresol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Pentachlorophenol | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| Phenanthrene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Phenol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| Pyrene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 2,4,5-Trichlorophenol | µg/kg | <6600 | <6600 | <9900 | <16000 | <16000 |
| 2,4,6-Trichlorophenol | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |
| 1,2,4-Trichlorobenzene | µg/kg | <1300 | <1300 | <2000 | <3200 | <3400 |

**Table 6**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-2C (10-15) 2/19/93 | P3-3A (0-5) 2/19/93 | P3-3B (5-10) 2/19/93 | P3-3C (10-13) 2/19/93 | P3-4A (0-3) 2/19/93 |
| Total Analyses: | | | | | | |
| Cyanide | mg/kg | <2.4 | 3.1 | 42 | <2.5 | 5.4 |
| Silver | mg/kg | 30.4 | 34.4 | 19.4 | 19.3 | 22.2 |
| Arsenic | mg/kg | 107 | <45.0 | <40.0 | 47.9 | <42.0 |
| Barium | mg/kg | 884 | 757 | 565 | 690 | 763 |
| Beryllium | mg/kg | 39.8 | 19.1 | 22.2 | 24.0 | 24.5 |
| Cadmium | mg/kg | <4.50 | 5.90 | <4.00 | <4.60 | <4.20 |
| Chromium | mg/kg | 1970 | 580 | 813 | 867 | 704 |
| Mercury | mg/kg | 0.286 | 0.598 | <0.110 | 0.135 | 0.142 |
| Molybdenum | mg/kg | 45 | 31 | 36 | 35 | 45 |
| Nickel | mg/kg | 56.4 | <22.0 | 31.3 | 50.7 | 26.3 |
| Lead | mg/kg | 98.6 | <45.0 | 45.4 | 48.3 | 57.1 |
| Antimony | mg/kg | 197 | 61.4 | 74.2 | 93.2 | 171 |
| Selenium | mg/kg | <0.480 | <0.470 | <0.450 | <0.500 | <0.470 |
| Tin | mg/kg | 1400 | 830 | 1600 | 2400 | 2900 |
| Columbium | mg/kg | 2600 | 720 | 1300 | 1900 | 1900 |
| Tantalum | mg/kg | 1100 | 610 | 590 | 1300 | 1000 |
| Gross Alpha | pCi/g | 6300±100 | 5400±100 | 3300±100 | 5500±100 | 5900±100 |
| Gross Beta | pCi/g | 3100±100 | 2900±100 | 1700±100 | 2700±100 | 2700±100 |
| Isotopes: | | | | | | |
| Uranium-233 & 234 | pCi/g | 800±30 | 510±20 | 420±20 | 340±20 | 420±40 |
| Uranium 235 | pCi/g | 45±7 | 30±5 | 42±6 | 14±3 | 22±10 |
| Uranium-238 | pCi/g | 870±30 | 560±20 | 460±20 | 340±20 | 430±40 |
| Thorium-230 | pCi/g | 1200±100 | 950±40 | 690±30 | 920±40 | 700±30 |
| Lead-210 @ 46 KeV | pCi/g | 50±14 | 23±17 | 44±12 | 71±14 | 88±18 |
| Thorium-234 @ 63.3 KeV | pCi/g | 310±20 | 290±20 | 250±30 | 220±40 | 280±20 |
| Protactinium-234m @ 1001 KeV | pCi/g | 1000±200 | 830±130 | 670±110 | 480±90 | 650±100 |
| Radium 226 | pCi/g | 840±20 | 720±20 | 550±20 | 590±20 | 660±20 |
| Lead-214 @ 295.2 KeV | pCi/g | 490±10 | 530±10 | 300±10 | 450±10 | 420±10 |
| Lead-214 @ 352.0 KeV | pCi/g | 510±10 | 540±10 | 320±10 | 460±10 | 440±10 |
| Bismuth-214 @ 609.4 KeV | pCi/g | 490±10 | 520±10 | 300±10 | 450±10 | 420±10 |
| Bismuth-214 @ 1120.4 KeV | pCi/g | 490±10 | 510±10 | 290±10 | 450±10 | 430±10 |
| Bismuth-214 @ 1764.7 KeV | pCi/g | 460±10 | 490±10 | 280±10 | 410±10 | 410±10 |
| Actinium-228 @ 338 KeV | pCi/g | 400±20 | 470±20 | 260±10 | 420±20 | 360±10 |
| Actinium-228 @ 911 KeV | pCi/g | 450±10 | 520±10 | 290±10 | 470±10 | 400±10 |
| Actinium-228 @ 968 KeV | pCi/g | 460±10 | 540±10 | 300±10 | 480±10 | 400±10 |
| Lead-212 @ 238 KeV | pCi/g | 400±20 | 490±10 | 250±20 | 440±10 | 350±20 |
| Bismuth-212 @ 727 KeV | pCi/g | 460±20 | 570±30 | 320±10 | 530±30 | 420±20 |
| Thallium-208 @ 583 KeV | pCi/g | 440±10 | 480±10 | 270±10 | 440±10 | 380±10 |
| Uranium-235 @ 143 KeV | pCi/g | 25±3 | 20±3 | 15±3 | 13±3 | 17±3 |
| ASTM Analysis: | | | | | | |
| Alkalinity | mg/l $CaCO_3$ | <2.00 | <2.00 | <2.00 | <2.00 | <2.00 |
| Ammonia | mg/l NH3-N | 3.9 | 6.7 | 6.9 | 7.4 | 4.7 |
| Chloride | mg/l | <0.50 | 4.1 | <0.50 | <0.50 | 3.5 |
| Fluoride | mg/l | 660 | 540 | 670 | 640 | 650 |
| Nitrate | mg/l $NO_3$-N | <0.10 | 0.87 | <0.10 | 0.34 | <0.10 |
| Sulfate | mg/l | 540 | 2.7 | 3.0 | 5.2 | 2.7 |
| pH | pH Units | 2.10 | 2.67 | 2.63 | 2.66 | 2.42 |
| Specific Conductance @ 25°C | µmhos/cm | 5900 | 2400 | 6220 | 3910 | 4000 |
| Aluminum | mg/l | 73 | 53 | 25 | 53 | 40 |
| Calcium | mg/l | 96 | 71 | 270 | 250 | 230 |
| Iron | mg/l | 260 | 150 | 280 | 380 | 200 |
| Potassium | mg/l | 86 | 43 | 38 | 47 | 45 |
| Magnesium | mg/l | 29 | 30 | 48 | 47 | 55 |
| Manganese | mg/l | 27 | 46 | 71 | 85 | 50 |
| Sodium | mg/l | 36 | 17 | 32 | 29 | 28 |

**Table 6**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-2C (10-15) 2/19/93 | P3-3A (0-5) 2/19/93 | P3-3B (5-10) 2/19/93 | P3-3C (10-13) 2/19/93 | P3-4A (0-3) 2/19/93 |
| TCLP Metals: | | | | | | |
| Silver | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Arsenic | mg/l | 0.56 | <0.10 | <0.10 | <0.10 | 0.15 |
| Barium | mg/l | <10 | <10 | <10 | <10 | <10 |
| Cadmium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Chromium | mg/l | 36 | 10 | 13 | 13 | 13 |
| Mercury | mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nickel | mg/l | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Lead | mg/l | 0.36 | 0.20 | <0.10 | <0.10 | 0.17 |
| Selenium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| TCLP Extraction Fluid Data: | | | | | | |
| Extraction Fluid | | No. 1 | No. 1 | No. 1 | No. 1 | No. 1 |
| pH with Deionized Water | pH units | 1.96 | 2.46 | 2.35 | 2.51 | 2.32 |
| pH of TCLP Extract | pH units | 4.33 | 4.53 | 4.28 | 4.25 | 4.26 |
| Amount of Sample Extracted | g | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Volatile Organic Analyses: | | | | | | |
| Acetone | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Benzene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Bromodichloromethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Bromoform | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Bromomethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 2-Butanone | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Carbon Disulfide | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Carbon Tetrachloride | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Chlorobenzene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Dibromochloromethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Chloroethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Chloromethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Chloroform | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,1-Dichloroethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,2-Dichloroethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,1-Dichloroethene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,2-Dichloroethene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,2-Dichloropropane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Cis-1,3-Dichloropropene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Trans-1,3-Dichloropropene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Ethylbenzene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 2-Hexanone | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Methylene Chloride | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 4-Methyl-2-pentanone | µg/kg | 1300000 | 330000 | 850000 | 830000 | 660000 |
| Styrene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,1,2,2-Tetrachloroethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Tetrachloroethene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Toluene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,1,1-Trichloroethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| 1,1,2-Trichloroethane | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Trichloroethene | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Vinyl Chloride | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |
| Xylenes, Total | µg/kg | <31000 | <31000 | <30000 | <33000 | <30000 |

Table 3
(Continued)



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-2C (10-15) 2/19/93 | P3-3A (0-5) 2/19/93 | P3-3B (5-10) 2/19/93 | P3-3C (10-13) 2/19/93 | P3-4A (0-3) 2/19/93 |
| Semivolatile Organic Analyses: | | | | | | |
| Acenaphthene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Acenaphthylene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Anthracene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Bis(2-chloroethyl)ether | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Bis(2-chloroethoxy)methane | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Bis(2-chloroisopropyl)ether | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Bis(2-ethylhexyl)phthalate | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Benzo(a)pyrene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Benzo(a)anthracene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Benzo(b)fluoranthene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Benzo(g,h,i)perylene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Benzo(k)fluoranthene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 4-Bromophenyl Phenyl Ether | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Butylbenzyl Phthalate | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Carbazole | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Chrysene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 4-Chloroaniline | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2-Chloronaphthalene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2-Chlorophenol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 4-Chlorophenyl Phenyl Ether | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| o-Cresol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| p-Cresol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Dibenzo(a,h)anthracene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Dibenzofuran | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2,4-Dichlorophenol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 1,2-Dichlorobenzene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 1,3-Dichlorobenzene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 1,4-Dichlorobenzene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 3,3-Dichlorobenzidine | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Diethyl Phthalate | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Dimethyl Phthalate | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2,4-Dimethylphenol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Di-N-butyl Phthalate | µg/kg | <1300 | <3400 | <660 | <660 | 700 |
| 4,6-Dinitro-o-cresol | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| 2,4-Dinitrotoluene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2,6-Dinitrotoluene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Di-N-octyl Phthalate | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2,4-Dinitrophenol | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| Fluoranthene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Fluorene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Hexachlorocyclopentadiene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Hexachlorobenzene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Hexachlorobutadiene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Hexachloroethane | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Indeno(1,2,3-c,d)pyrene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Isophorone | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2-Methylnaphthalene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| N-Nitrosodiphenylamine | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| N-Nitroso-di-n-propylamine | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Naphthalene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2-Nitroaniline | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| 3-Nitroaniline | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| 4-Nitroaniline | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| Nitrobenzene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2-Nitrophenol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 4-Nitrophenol | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| p-chloro-m-cresol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Pentachlorophenol | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| Phenanthrene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Phenol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| Pyrene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 2,4,5-Trichlorophenol | µg/kg | <6600 | <17000 | <3200 | <3200 | <3400 |
| 2,4,6-Trichlorophenol | µg/kg | <1300 | <3400 | <660 | <660 | <660 |
| 1,2,4-Trichlorobenzene | µg/kg | <1300 | <3400 | <660 | <660 | <660 |

**Table 6**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-4B (3-6) 2/19/93 | P3-4C (6-9) 2/19/93 | P3-5A (0-3) 2/19/93 | P3-5B (3-6) 2/19/93 | P3-5C (6-9) 2/19/93 |
| Total Analyses: | | | | | | |
| Cyanide | mg/kg | 110 | 36 | <2.1 | 7.6 | 160 |
| Silver | mg/kg | 18.1 | 32.6 | 26.0 | 9.60 | 14.0 |
| Arsenic | mg/kg | <50.0 | <56.0 | <38.0 | <48.0 | 57.2 |
| Barium | mg/kg | 558 | 1720 | 942 | 288 | 534 |
| Beryllium | mg/kg | 21.2 | 30.9 | 18.4 | 20.8 | 22.9 |
| Cadmium | mg/kg | <5.00 | <5.60 | <3.80 | <4.80 | <4.10 |
| Chromium | mg/kg | 430 | 1370 | 428 | 636 | 692 |
| Mercury | mg/kg | <0.140 | 0.228 | 0.687 | 0.299 | 0.188 |
| Molybdenum | mg/kg | <25 | 47 | 32 | 42 | 39 |
| Nickel | mg/kg | <25.0 | 51.3 | <19.0 | 34.2 | 40.1 |
| Lead | mg/kg | 56.8 | 137 | 73.1 | 67.5 | 65.8 |
| Antimony | mg/kg | <50.0 | 105 | 49.4 | 241 | 174 |
| Selenium | mg/kg | <0.540 | <0.600 | <0.410 | <0.480 | <0.440 |
| Tin | mg/kg | 1000 | 3900 | 660 | 3300 | 3000 |
| Columbium | mg/kg | 1700 | 1600 | 730 | 2300 | 4400 |
| Tantalum | mg/kg | 1100 | 1100 | 580 | 260 | 740 |
| Gross Alpha | pCi/g | 6400±100 | 6900±100 | 6500±100 | 840±40 | 4400±100 |
| Gross Beta | pCi/g | 3700±100 | 3800±100 | 3100±100 | 610±20 | 2100±100 |
| Isotopes: | | | | | | |
| Uranium-233 & 234 | pCi/g | 820±30 | 1000±100 | 820±30 | 170±20 | 350±20 |
| Uranium 235 | pCi/g | 32±6 | 41±6 | 39±6 | 12±5 | 20±5 |
| Uranium-238 | pCi/g | 850±30 | 1100±100 | 870±30 | 180±20 | 370±20 |
| Thorium-230 | pCi/g | 850±40 | 810±30 | 430±20 | 210±20 | 490±30 |
| Lead-210 @ 46 KeV | pCi/g | 73±15 | 52±22 | 77±11 | 32±9 | 69±9 |
| Thorium-234 @ 63.3 KeV | pCi/g | 240±30 | 340±20 | 320±20 | 110±20 | 240±30 |
| Protactinium-234m @ 1001 KeV | pCi/g | 770±150 | 780±170 | 840±140 | 300±60 | 560±120 |
| Radium 226 | pCi/g | 680±20 | 820±30 | 740±20 | 170±10 | 480±10 |
| Lead-214 @ 295.2 KeV | pCi/g | 440±10 | 470±10 | 510±10 | 90±3 | 320±10 |
| Lead-214 @ 352.0 KeV | pCi/g | 450±10 | 490±10 | 520±10 | 95±3 | 330±10 |
| Bismuth-214 @ 609.4 KeV | pCi/g | 440±10 | 480±10 | 500±10 | 90±3 | 310±10 |
| Bismuth-214 @ 1120.4 KeV | pCi/g | 440±10 | 470±10 | 500±10 | 93±4 | 310±10 |
| Bismuth-214 @ 1764.7 KeV | pCi/g | 400±10 | 420±10 | 460±10 | 84±4 | 290±10 |
| Actinium-228 @ 338 KeV | pCi/g | 470±20 | 620±20 | 440±10 | 85±4 | 310±10 |
| Actinium-228 @ 911 KeV | pCi/g | 530±10 | 680±10 | 470±10 | 94±3 | 350±10 |
| Actinium-228 @ 968 KeV | pCi/g | 540±10 | 690±10 | 490±10 | 98±4 | 350±10 |
| Lead-212 @ 238 KeV | pCi/g | 500±20 | 600±30 | 440±10 | 88±3 | 320±10 |
| Bismuth-212 @ 727 KeV | pCi/g | 580±20 | 720±30 | 520±20 | 100±10 | 380±20 |
| Thallium-208 @ 583 KeV | pCi/g | 500±10 | 640±20 | 440±10 | 88±3 | 320±10 |
| Uranium-235 @ 143 KeV | pCi/g | 21±3 | 21±4 | 21±3 | 5.7±1.4 | 14±3 |
| ASTM Analysis: | | | | | | |
| Alkalinity | mg/l $CaCO_3$ | <2.00 | <2.00 | <2.00 | 3.00 | <2.00 |
| Ammonia | mg/l $NH_3$-N | 5.0 | 2.9 | 5.4 | 4.3 | 5.6 |
| Chloride | mg/l | <0.50 | 2.6 | 1.6 | 48 | 8.7 |
| Fluoride | mg/l | 630 | 640 | 650 | 32 | 630 |
| Nitrate | mg/l $NO_3$-N | <0.10 | 0.45 | 0.83 | 0.63 | 0.67 |
| Sulfate | mg/l | 5.4 | 6.0 | 2.9 | 210 | 3.1 |
| pH | pH Units | 2.47 | 2.37 | 2.72 | 5.56 | 2.94 |
| Specific Conductance @ 25°C | µmhos/cm | 4240 | 4550 | 2850 | 714 | 2910 |
| Aluminum | mg/l | 100 | 100 | 27 | <10 | 28 |
| Calcium | mg/l | 150 | 170 | 120 | 160 | 160 |
| Iron | mg/l | 340 | 310 | 200 | <10 | 300 |
| Potassium | mg/l | 60 | 21 | 48 | 14 | 35 |
| Magnesium | mg/l | 26 | 18 | 51 | 25 | 45 |
| Manganese | mg/l | 99 | 140 | 51 | 20 | 67 |
| Sodium | mg/l | 29 | 31 | 21 | 16 | 21 |

**Table 6**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-4B (3-6) 2/19/93 | P3-4C (6-9) 2/19/93 | P3-5A (0-3) 2/19/93 | P3-5B (3-6) 2/19/93 | P3-5C (6-9) 2/19/93 |
| TCLP Metals: | | | | | | |
| Silver | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Arsenic | mg/l | <0.10 | <0.10 | <0.10 | 0.15 | <0.10 |
| Barium | mg/l | <10 | <10 | <10 | <10 | <10 |
| Cadmium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Chromium | mg/l | 15 | 18 | 9.2 | <0.10 | 10 |
| Mercury | mg/l | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Nickel | mg/l | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Lead | mg/l | 0.17 | 0.20 | <0.10 | <0.10 | <0.10 |
| Selenium | mg/l | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| TCLP Extraction Fluid Data: | | | | | | |
| Extraction Fluid | | No. 1 | No. 1 | No. 1 | No. 1 | No. 1 |
| pH with Deionized Water | pH units | 2.29 | 2.17 | 2.64 | 6.26 | 2.84 |
| pH of TCLP Extract | pH units | 4.27 | 4.27 | 4.46 | 5.10 | 4.39 |
| Amount of Sample Extracted | g | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 |
| Volatile Organic Analyses: | | | | | | |
| Acetone | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Benzene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Bromodichloromethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Bromoform | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Bromomethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 2-Butanone | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Carbon Disulfide | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Carbon Tetrachloride | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Chlorobenzene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Dibromochloromethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Chloroethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Chloromethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Chloroform | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,1-Dichloroethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,2-Dichloroethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,1-Dichloroethene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,2-Dichloroethene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,2-Dichloropropane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Cis-1,3-Dichloropropene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Trans-1,3-Dichloropropene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Ethylbenzene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 2-Hexanone | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Methylene Chloride | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 4-Methyl-2-pentanone | µg/kg | 880000 | 800000 | 200000 | 750000 | 600000 |
| Styrene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,1,2,2-Tetrachloroethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Tetrachloroethene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Toluene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,1,1-Trichloroethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| 1,1,2-Trichloroethane | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Trichloroethene | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Vinyl Chloride | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |
| Xylenes, Total | µg/kg | <35000 | <39000 | <27000 | <31000 | <28000 |

**Table 6**
**(Continued)**



| Parameter | Units | Sample Identification and Date | | | | |
|---|---|---|---|---|---|---|
| | | P3-4B (3-6) 2/19/93 | P3-4C (6-9) 2/19/93 | P3-5A (0-3) 2/19/93 | P3-5B (3-6) 2/19/93 | P3-5C (6-9) 2/19/93 |
| Semivolatile Organic Analyses: | | | | | | |
| Acenaphthene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Acenaphthylene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Anthracene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Bis(2-chloroethyl)ether | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Bis(2-chloroethoxy)methane | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Bis(2-chloroisopropyl)ether | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Bis(2-ethylhexyl)phthalate | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Benzo(a)pyrene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Benzo(a)anthracene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Benzo(b)fluoranthene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Benzo(g,h,i)perylene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Benzo(k)fluoranthene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 4-Bromophenyl Phenyl Ether | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Butylbenzyl Phthalate | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Carbazole | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Chrysene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 4-Chloroaniline | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2-Chloronaphthalene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2-Chlorophenol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 4-Chlorophenyl Phenyl Ether | µg/kg | <990 | <990 | <660 | <660 | <660 |
| o-Cresol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| p-Cresol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Dibenzo(a,h)anthracene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Dibenzofuran | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2,4-Dichlorophenol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 1,2-Dichlorobenzene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 1,3-Dichlorobenzene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 1,4-Dichlorobenzene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 3,3-Dichlorobenzidine | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Diethyl Phthalate | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Dimethyl Phthalate | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2,4-Dimethylphenol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Di-N-butyl Phthalate | µg/kg | <990 | <990 | 1600 | 760 | <660 |
| 4,6-Dinitro-o-cresol | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| 2,4-Dinitrotoluene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2,6-Dinitrotoluene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Di-N-octyl Phthalate | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2,4-Dinitrophenol | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| Fluoranthene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Fluorene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Hexachlorocyclopentadiene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Hexachlorobenzene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Hexachlorobutadiene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Hexachloroethane | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Indeno(1,2,3-c,d)pyrene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Isophorone | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2-Methylnaphthalene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| N-Nitrosodiphenylamine | µg/kg | <990 | <990 | <660 | <660 | <660 |
| N-Nitroso-di-n-propylamine | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Naphthalene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2-Nitroaniline | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| 3-Nitroaniline | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| 4-Nitroaniline | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| Nitrobenzene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2-Nitrophenol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 4-Nitrophenol | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| p-chloro-m-cresol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Pentachlorophenol | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| Phenanthrene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Phenol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| Pyrene | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 2,4,5-Trichlorophenol | µg/kg | <5100 | <4800 | <3200 | <3400 | <3200 |
| 2,4,6-Trichlorophenol | µg/kg | <990 | <990 | <660 | <660 | <660 |
| 1,2,4-Trichlorobenzene | µg/kg | <990 | <990 | <660 | <660 | <660 |