

May 23, 2000

Mr. John Hock  
Environmental Project Manager  
NWI Land Management  
3041 Woodcreek Drive, Suite 210  
Downers Grove, IL 60515

SUBJECT: NRC INSPECTION REPORT 040-06264/2000002(DNMS)  
NWI LAND MANAGEMENT INSPECTION

Dear Mr. Hock:

This refers to the special inspection conducted at your former 10 CFR 20.304 Low Level Burial Site located near Breckenridge, Michigan, on April 19-20, 2000, and to the discussion on May 18, 2000, regarding the results of radiological analyses of soil samples collected during the inspection. The purposes of the inspection were to monitor dredging operations on Bush Creek, which runs adjacent to the site, to conduct radiological surveys to assess site conditions and to verify that construction personnel and equipment did not become contaminated, and to verify that the site was not disturbed. A copy of our report of this inspection is enclosed for your information.

NRC observations ascertained that the site was secure and the dredging was well controlled. Surveys showed that construction personnel and equipment used in the dredging operation were free of radiological contamination. Additionally, radiological analyses of the soil samples collected from the Bush Creek excavation did not identify elevated levels of contamination requiring remediation.

The analytical results for three other samples, collected from two site areas with elevated ground-surface radiation levels, identified elevated levels of both thorium and uranium, similar to some previous analytical results from this site. The thorium concentration in one sample exceeded the level expected, based on historic inventory information on filter cake material buried at the site. Further, the presence and level of uranium are unexplained. These results suggest the presence of waste other than filter cake. As also discussed with you on May 18, NWI is preparing to submit a characterization plan for the Breckenridge site. We understand this plan will consider the need to fully address all residual radioactive contamination at the site and not focus exclusively on the filter cake.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure(s) will be placed in the NRC Public Electronic Room (PERR) link at the NRC homepage, namely, <http://www.nrc.gov/NRC/ADAMS/index.html>.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

***/RA/***

Bruce L. Jorgensen, Chief  
Decommissioning Branch

Docket No. 040-06264 (Terminated)  
License No. SUB-833 (Terminated)

Enclosure: Inspection Report 040-06264/2000002(DNMS))

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 040-06265 (Terminated)  
License No: SUB-00833 (Terminated)

Report No: 040-06264/2000002(DNMS))

Licensee: Michigan Chemical Company (now NWI Land Management - a subsidiary of Velsicol Chemical)

Location: Breckenridge Disposal Site  
Intersection of Madison Road  
and Bush Creek Breckenridge, Michigan

Dates: April 19-20, 2000 - May 18, 2000

Inspectors: George M. McCann, Senior Radiation Specialist

Accompanying: Kenneth W. Coble, Physicist  
Michigan Department of Environmental Quality  
  
Russell B. Rotta  
Michigan Department of Environmental Quality

Approved By: Bruce L. Jorgensen, Chief  
Decommissioning Branch  
Division of Nuclear Materials Safety

## **EXECUTIVE SUMMARY**

### **Michigan Chemical Company Breckenridge, Michigan NRC Inspection Report 040-06264/2000002(DNMS)**

This was a special inspection conducted to insure that a creek dredging operation did not disturb radiological materials buried in the Breckenridge Disposal Site (a former 10 CFR 20.304 burial by the former Michigan Chemical Company), and did not contaminate construction workers and equipment who performed the dredging operations. The inspection was also performed for the purpose of collecting soil samples from the soils dredged from the Creek, in order to ascertain if radiological materials may have migrated from the Site into the Creek.

Bush Creek bounds one side of the Breckenridge Disposal Site. The Bush Creek maintenance operation was a flood control initiative, and was being performed under the guidance of the Bush Creek Inter-County Drain Commission.

Based on NRC radiological surveys and observations, it was determined that the conditions of the site had not changed, and that the buried radiological waste materials were not an immediate threat to the public or the environment. Additionally, surveys performed on dredging equipment following the dredging operation did not identify any contamination above natural background levels found in the Breckenridge area.

The inspector collected 13 soil samples. Three of the samples were collected inside the Disposal Site, with the remainder being collected from the soils dredged from the Creek. The samples of soils dredged from the Creek did not reveal elevated levels of radiological material requiring remediation. The analyses of the soil samples collected from inside the Site revealed levels of contamination consistent with levels previously identified during past inspections, and with some analyses performed by NWI Land Management's (NWI) radiological consultant. The level of thorium contamination, and the presence and level of uranium contamination, point to a need for further radiological characterization of the site by NWI, to fully address all residual contamination present.

NWI staff indicated that a Plan for further radiological characterization of the Site will be submitted to the NRC for review in June of 2000, and that the characterization will be performed later this summer/fall.

## Report Details

### **1.0 Background**

Michigan Chemical Company (MCC) operated a rare earth processing plant at St. Louis, Michigan. The feed-stock materials used by MCC contained licensable quantities of source material. MCC used the Breckenridge Disposal Site to dispose of filter cake. NWI Land Management (NWI) is continuing to obtain radiological characterization data. This characterization data will be used to determine compliance with the NRC's criteria for unrestricted release of formerly licensed sites.

### **2.0 Dredging Operations**

#### a. Inspection Scope

The NRC inspector monitored the dredging operations performed in Bush Creek, which runs alongside of the Breckenridge Disposal Site.

#### b. Observations and Findings

The contractor's operation of the dredging excavator appeared to be done in such a manner that surface soils on the Disposal Site were not disturbed. The operation deviated from the NWI Plan only from the standpoint that the excavator was able to dredge two-thirds of the Creek without having to be inside the Site. This reduced the potential for spread of contamination. The top one-third of the Site had been previously determined by past radiological measurements not to have elevated radiological levels.

#### c. Conclusions

Sufficient instruction was provided to the contractor personnel, and oversight of the operation was adequate.

### **3.0 Radiation Surveys and Site Security**

#### a. Inspection Scope

The inspector inspected site access controls, performed radiological surveys, and collected soil and sediment samples from material dredged from the Creek and from the ground inside the fenced Site.

#### b. Observations and Findings

The natural background levels for the Breckenridge area ranged up to approximately 8000 counts per minute (CPM)) using a NaI count rate meter, and 5 microroentgen per hour ( $\mu\text{R/h}$ ) using an exposure rate meter. Surveys of the Creek did not identify any areas of elevated radiation. Ten samples were collected from the soils which had been dredged from the East and West banks of Bush Creek. Two general areas inside the

Disposal Site were identified with elevated radiation levels. The inspector collected three soil samples from the areas with elevated readings. The soil sample analytical results and the radiological measurements performed at the time of the inspection are indicated in Attachment 1.

None of the ten soil samples from the Creek dredging contained elevated radioactive material contamination above acceptable levels. The samples from inside the Site did contain elevated levels of both thorium and uranium, in quantities indicating a need for further site characterization work by NWI.

The inspectors surveyed the excavator following completion of the dredging operations. No residual radioactive contamination levels were identified greater than background levels on the excavator.

The Disposal Site was surrounded by a chain link security fence. The fence, except for one area where the ground had been washed away from the bottom of the fence, appeared to be in good condition, and no evidence of overt intrusion into the Site was observed. The NWI Project Manager indicated that they would consider putting rock in the washed out area.

c. Conclusions

The equipment used in dredging the Creek alongside the Breckenridge Disposal Site did not become contaminated. In general, the Site continues to be secure. One washed-out area will be evaluated for being filled with rock by NWI.

Analysis of soil samples showed no notable migration of contamination to Bush Creek. Samples collected from inside the Disposal Site revealed elevated levels of both thorium and uranium, which require further detailed characterization to enable a clear determination whether the site has residual contamination greater than NRC unrestricted release limits.

#### **4.0 Exit Meeting**

The preliminary results of the inspection were discussed at the site on April 20, 2000, and the results of soil analyses were discussed with the NWI Project Manager during a May 18, 2000, telephone conversation. The planned site characterization was also discussed during the May 18 call.

## PARTIAL LIST OF PERSONS CONTACTED

1. Brian Denman, Project Manager  
Drain Commissioner's Office  
Gratiot County Courthouse  
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2. Kenneth W. Coble, Physicist  
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3. Stan Plesko  
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4. Jack W. Long  
(NWI Land Management - Site Custodian)  
Long and Wetzel Co.  
P.O. Box 364  
Mt. Pleasant, MI 48804-0364
5. Kevin D. Irrer  
(Consultant for the Bush Creek Inter-County Drain Commission)  
Spicer Group, Inc  
100 South Ottawa Street  
St. Johns, MI 48879
6. John Hock, Environmental Project Manager  
NWI Land Management
7. Andrew T. Raymond  
Michigan Department of Agriculture  
611 West Ottawa  
P.O. Box 30017  
Lansing, MI 48909
8. Rex R. Crumbaugh  
433 East Madison Road  
Breckenridge, MI 48615  
(517)681-4568

## INSPECTION PROCEDURES USED

IP 83890: Closeout Inspection and Survey

Attachment One

Breckenridge Disposal Site  
Breckenridge, MI

NOTE: samples 7, 9, and 13 were counted for 16 hours; the remainder were counted for 1 hour, yielding a minimum detectable total uranium concentration of approximately 4 to 7 pCi/g. All results are reported with two sigma uncertainty.

| Sample Number | Sample Identification Location   | Comments  | Sample Analysis Results (pCi/g)               |
|---------------|--|---|---|
| 1             | Inside Disposal Site Area One, Hole One  | Background 7.9 kCPM / Contact reading in area of sample 12.1 kCPM | Th: 92 +/- 4 pCi/g<br>U: 98 +/- 32 pCi/g      |
| 2             | Inside Disposal Site Area Two, Hole 2, 2' 8" below ground surface in bore hole created by past characterization work | Background 7.9 kCPM / contact reading in area of sample 16.5 kCPM | Th: 308 +/- 6 pCi/g<br>U: 208 +/- 50 pCi/g    |
| 3             | Sample collected from sidewalls of Hole 2, Area 2  | Background 7.6 kCPM / contact reading n area of sample 10.6 kCPM  | Th: 125 +/- 4 pCi/g<br>U: 279 +/- 46 pCi/g    |
| 4             | Sediment from West Bank of Bush Creek 88 feet from Bridge  | Background 7.8 kCPM/ contact reading in area of sample 8.1 kCPM   | Th: 1.5 +/- 0.4 pCi/g<br>U: not detected      |
| 5             | Sediment from West Bank of Bush Creek 118 feet from Bridge   | average background 7.8/ direct reading in area of samples 8 KCPM  | Th: 1.4 +/- 0.4 pCi/g<br>U: not detected      |
| 6             | Sediment from West Bank of Bush Creek 318 feet from Bridge   | average background 7.8/ direct reading in area of samples 8 KCPM  | Th: 2.0 +/- 0.4 pCi/g<br>U: not detected      |
| 7             | Sediment from West Bank of Bush Creek  | average background 7.8/ direct reading in area of samples 8 KCPM  | Th: 1.0 +/- 0.2 pCi/g<br>U: 1.7 +/- 1.2 pCi/g |
| 8             | Sediment from West Bank of Bush Creek  | average background 7.8/ direct reading in area of samples 8 KCPM  | Th: 1.3 +/- 0.2 pCi/g<br>U: not detected      |
| 9             | Sediment from West Bank of Bush Creek  | average background 7.8/ direct reading in area of samples 8 KCPM  | Th: 1.3 +/- 0.2 pCi/g<br>U: 3.6 +/- 2.6 pCi/g |

Attachment One

Breckenridge Disposal Site  
 Breckenridge, MI

|    |                                       |  |   |
|----|---------------------------------------|--|---|
| 10 | Sediment from West Bank of Bush Creek | average background 7.8/ direct reading in area of samples 8 KCPM | Th: 1.2 +/- 0.4 pCi/g<br>U: not detected      |
| 11 | Samples from East Bank of Bush Creek  | average background 7.8/ direct reading in area of samples 8 KCPM | Th: 1.7 +/- 0.2 pCi/g<br>U: not detected      |
| 12 | Samples from East Bank of Bush Creek  | average background 7.8/ direct reading in area of samples 8 KCPM | Th: 1.7 +/- 0.2 pCi/g<br>U: not detected      |
| 13 | Samples from East Bank of Bush Creek  | average background 7.8/ direct reading in area of samples 8 KCPM | Th: 1.7 +/- 0.2 pCi/g<br>U: 2.9 +/- 0.8 pCi/g |