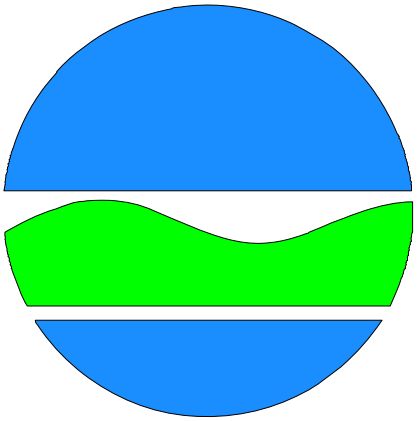
Immediate Investigation Work Assignment (IIWA) SUMMARY REPORT

Tioga Castings Site

Village of Owego, New York

Tioga County

Site No. 7-54-012



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Prepared by
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

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Section 1 Site Description

The Tioga Castings site is located on Foundry Street, off McMaster Street, in the Village of Owego, Tioga County (Figure 1). This site operated as a foundry from the 1940s until 1988. On July 11, 1989 the facility had a fire which destroyed most of the foundry structure. Shortly after the fire this facility was listed as a class 2 site, as a result of the material that was found abandoned at the facility.

The site is approximately seven acres in size. The former foundry building occupied the front (eastern) portion of the site while the former landfill occupies approximately one acre in the back (western) portion of the site. The site is located in a residential/ commercial area, adjacent to the Owego-Apalachin Middle School.

The facility operated a cupola type foundry for the production of gray iron castings. Operations at the facility included smelting of pig iron, scrap iron (including engine blocks), coke, limestone and the use of phenol-formaldehyde treated sand to cast the iron. The process produced solid wastes which included sand molds, bentonite, fly ash, cast iron grindings, and fine baghouse ash/cupola dust. These wastes were reportedly disposed of at an off-site landfill until March 1979. The facility then operated an on site landfill for the disposal of its foundry wastes. The facility ceased operations in 1988. The following materials were left on site; sand casts, various drums, a number of one-ton plastic lined bags of cupola dust as well as the material contained in the on-site landfill. EP Toxicity analysis of the cupola dust has shown it to be a hazardous waste as a result of the presence of lead and cadmium. On July 11, 1989, the facility had a fire which destroyed most of the foundry structure and left the remaining building structurally unsafe; since then the remaining portions of the foundry building have been razed.

The March 1995 Record of Decision (ROD) for this site details the selection of the remedy, which included the following:

- Consolidation of contaminated soils to the on-site landfill;
- Placement of a low permeability cover over the on-site landfill; and
- Maintaining the cover and the fence around the landfill.

The implementation of this remedy was completed during the 1997 construction season.

Section 1.1 1997 Sub-slab Soil Sampling

During the implementation of the remedy, while excavating soil adjacent to the slab foundation of the former foundry building, it appeared that fill material was present below the foundation.

As a result, at the end of the construction activities, additional subsurface soil samples were collected from beneath the slab by the construction contractor (Tyree Organization). Sample locations were based upon a grid established at approximately 100 foot intervals; at each sample location a soil sample was collected from 2"-6" and 12"-18" inches below the slab (see Figure 2).

The results of this sampling program indicated the presence of elevated concentrations of lead below the slab at sample locations SS-10 and SS-11 (as high as 4130 ppm; see Table 1).

Section 2 Issuance/Objectives of the IIWA

An Immediate Investigation Work Assignment (IIWA) was issued to IT Engineering of New York, P.C. on August 12, 1998. The objective of this IIWA project was to determine the lateral and vertical extent of the soils below the concrete slab that contain concentrations above the cleanup goals presented in the March 1995 ROD (e.g., for lead: 250 ppm (surface)/ 500 ppm (subsurface- below one foot)).

Note: Since the sub-slab soil is present beneath a solid concrete slab, the subsurface soil cleanup goal of 500 ppm for lead will be used when determining the extent of the soil to be considered for additional action.

Section 3 Scope of Work

The focus of this IIWA project was to obtain soil samples to investigate the lateral and vertical extent of the contaminated subsurface soils below the concrete slab.

The initial work to conducted was the clearing of surface debris from the area where sample locations were to be located. It was necessary to mobilize a bulldozer to the site to move the debris piles so that there was enough clearance to collect samples at all of the proposed locations. The first bulldozer mobilized (on September 1, 1998) to the site was too small to successfully move the debris piles present at the site. On September 2, 1998 a larger bulldozer (D-5) was mobilized to the site and was able to successfully re-locate the debris piles away from the sample location areas. The approximate sample locations were established on a 25 foot grid. The sample locations were surveyed using RI monitoring wells as reference points. The surveyed coordinates for the IIWA sample locations are presented in Table 1 of Attachment 1; Figure 1 presents the coordinates for MW-2 and MW-5. Certain sample locations were adjusted slightly in the field to avoid obstructions. The sample locations, established and surveyed for horizontal control prior to the initiation of the sampling, are shown on Figure 3. Any deviations from the surveyed sample locations are noted in Attachment 1, Table 1. The sampling began at the ring of samples just inside the outer ring, as shown on Figure 3. Once the samples were collected they were turned over to the NYSDEC representative for shipping/analysis by one of the Department's contract laboratories (Columbia Analytical Services). The initial samples that were collected were submitted for 24-hour turnaround so that decisions could be made in the field on the need to collect additional samples. When results became available, some of the

sample locations were modified/deleted based on the fact that the extent of the contamination had already been defined. As a result, sample locations 4, 5, 6, 7, 16, and 43 were eliminated. Samples were collected on Thursday September 10, 1998 - Tuesday September 15, 1998. The samples collected on 9/14/98 and 9/15/98 (a majority of the samples) were not analyzed using a 24-hour turnaround since it became apparent that the results would not be available before the crew demobilized from the site.

The IIWA project involved cutting through the concrete and sampling soils below the slab. Originally the IIWA called for sampling at a total of 52 locations, established based on the sampling grid discussed above. As discussed in the previous paragraph, some of those sample locations were eliminated based on results from the 24-hour analysis. Samples were to be collected at five depths below the slab, as follows:

- 2"-6" horizon “A”
- 12"-18" horizon “B”
- 24"-30" horizon “C”
- 36"- 42" horizon “D”
- 48"-54" horizon “E”
- samples labeled horizon “F” were duplicate samples of the “B” horizon, taken every 4th sample location (i.e., @ locations 4, 8, 12, etc.)

A total of 225 subsurface soil samples were collected during the IIWA; of these 225 samples, 11 of them were duplicates. The samples were submitted to the laboratory with some of them to be analyzed upon receipt, while the rest of them were to be archived pending the results from the initial sample analysis. The samples were submitted for total lead, cadmium, and chromium analysis. Once the initial results were available (prior to the analysis of any of the archived samples), three of the samples were re-analyzed for TCLP lead, cadmium and chromium. A summary of the samples originally planned, the samples that were actually collected, whether the sample was analyzed or archived, and the results of the samples that were analyzed can be found in Table 2.

All subsurface tools and equipment used during the collection of the soil samples were decontaminated prior to their use/re-use using an Alconox and a brush to clean the sampling equipment followed by a clean water rinse. Once the sampling effort was completed the holes were backfilled with drill cuttings from the hole and a cement/bentonite grout was used to fill the hole back to the surface of the cement slab.

The September 23, 1998 letter Report from IT Corporation (Attachment 1) summarizes the field activities conducted as a part of the IIWA, presents a table of the surveyed sample location coordinates, and includes the soil logs from the split spoons samples collected.

Section 4 Summary of Results

No explanation has been found to account for the fact that contamination is present beneath the slab foundation of the building whose historical operations generated the source of the contamination (e.g., cupola dust). However, as first discovered in 1997, elevated contaminant concentrations are present beneath the slab. A summary of the results of the results from the 1998 IIWA is presented below. The results indicate no real "pattern" to the presence of soils with concentrations greater than the March 1995 ROD cleanup goals, as discussed further in the following paragraphs.

Table 2 includes the analytical results for the samples that were analyzed as a part of the IIWA. The results indicate many of the sample results at concentrations above the cleanup goals established in the March 1995 ROD. Many of the sample locations indicate higher concentrations in the 12"-18" range, as compared to the 2"-6" range. The concentrations of lead in the sub-slab soil ranges from a low of 5.1 ppm, at location 45-A, to a high of 33,500 ppm at location 09-D (the 33,500 ppm is by far the highest concentration; the next highest concentration was 3260 ppm at location 26-D).

The analytical results are highly variable, with some areas indicating significant differences in concentrations between adjacent samples (e.g., 09-C and 09-D indicated lead concentrations of 2030 ppm and 33,500, respectively while 08-A, 08-B, and 08-C indicated concentrations ranging from 171 ppm - 407 ppm), as well as between duplicate samples (e.g., 32-B indicated a lead concentration of 292 ppm while its duplicate, 32-F, indicated a concentration of 1300 ppm).

The analytical results indicated that 14 of the samples exceeded the 3/95 ROD cleanup goal for chromium (50 ppm). The concentrations of these exceedances ranged from 50.8 ppm at location 48-A, to 179 ppm at location 49-A (four of the samples exceeded a concentration of 100 ppm).

The analytical results indicated that all the samples were below the cleanup goal for cadmium (10 ppm), as established in the 3/95 ROD.

The results of the first round of analytical data were reviewed (prior to requesting analysis of any of the archived samples) and three of the samples that were already analyzed were requested to be re-analyzed using the TCLP method (09-C, 33-A, and 35-A). The following is a comparison between the total lead results and the TCLP lead results:

sample location	total lead concentration (ppm)	TCLP lead concentration (mg/l)
09-C	2030	5.38
33-A	1710	0.17
35-A	2820	0.25

There was no direct correlation between the results of the total lead analysis compared to the results of the TCLP lead analysis. Even though sample 35-A had the highest lead concentration

of the three samples analyzed via the TCLP method, only sample 09-C indicated a TCLP concentration above the regulatory level for lead (5 mg/l).

Section 4.1 Data Usability

The raw data, generated by the sample analyses, was reviewed by a chemist in DER's Quality Assurance Unit. DER's chemist concluded that the data is valid and usable, as documented in the memorandum's included in Attachment 2.

Section 5 Conclusions

Figure 4 shows the approximate limits of areas that exceed the cleanup goals, established in the March 1995 ROD, for lead or chromium (none of the samples exceeded the cleanup goal for cadmium). The approximate volume of soil identified in Figure 4 is 40,625 ft^3, or approximately 1500 yd^3.

Some of the areas, identified on Figure 4, indicated sample results that only slightly exceed the original cleanup goals and/or show exceedances in only one sample interval. Figure 5 shows the approximate limits of areas that exceed the cleanup goals, with a few exceptions, as summarized below (it should also be noted that 3 of the 1997 samples present outside of the area of the IIWA, shown in Figure 2 with the results summarized in Table 1, indicated the presence of chromium at concentrations above the 50 ppm ROD cleanup goal, ranging from 56.9 ppm - 100 ppm):

sample	concentration >50 ppm goal for chromium	concentration >500 ppm goal for lead
08-B	101 ppm	
11-A	62.5 ppm	
17-B		527 ppm
18-C		503 ppm
46-A	75.7 ppm	
47-A		501 ppm
49-A	179 ppm	
50-A	127 ppm	

The approximate volume of soil identified in Figure 5 is 28,750 ft^3, or approximately 1065 yd^3.

NOTE: The areal extent of the soils included in the volume estimates is based upon a 25 foot grid with each sample point at the center of each 25'x25' block. The estimates include all soils to the depth of the deepest sample that exceeded the cleanup goal(s), even if a shallower sample at the same location did not exceed the cleanup goal(s).

TABLES & FIGURES

ATTACHMENT 1

IT CORPORATION
September 23, 1998 IIWA Letter Report

ATTACHMENT 2

Summary of Analytical Data Review