DATE	PEER REVIEWER(S)	CODE
09/25/96	Tyna S. Peterson Signature	D-8620
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ADM-13.00

SEP 27 1996

Mr. Richard Smith
Ohio Environmental Protection Agency
Northeast District Office
2110 Aurora Road
Twinsburg OH 44087

Subject: Transmittal of Technical Memorandum No. 11

Dear Mr. Smith:

Please find enclosed Technical Memorandum No. 11 for the Krejci Dump Site Remedial Investigation/Feasibility Study. This technical memorandum defines a sampling plan to determine if dioxin/furan contamination exists at the site.

If you have any questions relative to this technical memorandum, please contact me at (303) 236-8299, extension 440.

Sincerely,

Robert E. McCaig

Robert E. McCaig
Resource Manager
Krejci Dump Investigations

Enclosure

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DRAFT

Technical Memorandum No. 11
Krejci Dump Site Supplemental Soil Sampling Plan
Dioxin/Furan Investigations

Introduction
This memorandum outlines the Krejci Dump Site supplemental surface soil sampling plan which provides for the acquisition of soil chemical data needed to determine dioxin/furan contamination in surface soils exists at the site.

Discussion
Dioxin/furan contamination was confirmed in the some of the wastes staged for removal by the U.S. EPA during the initial removal actions at the site. These wastes were identified as potentially contaminated based on visual observations during the removal work. It is probable that the removal action activities have eliminated the primary sources of dioxin/furan contamination at the site. However, through discussions with contract risk assessment staff, a concern remains that, based on the site history and the results of the RI/FS investigations recently conducted, residual dioxin/furan contamination may remain at the site. If significant contamination remains, this contamination may dramatically effect the findings of the baseline risk assessment due to the toxicity of some congeners of dioxin/furan . The risk assessor's findings relative to this issue are identified in an memorandum dated August 8, 1996 (attached).

In addition to acknowledging the dioxin/furan contaminants identified in the staged waste already removed from the site, the August 8, 1996 observed the following:

1) It is known that a number of chemicals existed on the site which are considered precursors to dioxin formation during a combustion process. These precursor chemicals include chlorinated solvents and polychlorinated biphenyls.

2) The incineration of municipal and industrial waste has been known to produce dioxins.

3) The Krejci deposition indicated that "fly ash" was brought to the site, and this type of material has been associated with dioxin.

4) Dioxin compounds are ubiquitous, and exist in background concentrations throughout the United States

The deposition of John Krejci III taken by the U.S. EPA on March 23, 1987 documents that a number of uncontrolled fires occurred at the West Site. These are areas where the precursor chemicals have been identified by the RI/FS investigations, and therefore, the possibility exists that dioxin/furans could have been generated by the fires in these areas. The deposition also documents that a controlled fire was continuously maintained in the municipal waste deposited in Silicon Valley (Zone R1). Dioxins could therefore have

been generated through the process identified in item (3) above.

At the same time, it is recognized that some caution is appropriate when investigating the site for these contaminants due to their ubiquitous distribution. Low toxicity congeners of dioxin/furan were found at relatively low concentrations in the large bulk waste piles evaluated during the removal actions. It is possible that the identified concentrations may represent background levels, but no data was collected at the time to test that hypothesis. An effective determination of background levels during these investigations is therefore important to discern site contamination from background. The following defines the plan to address the issues identified above.

Identification of Data Needs
The primary hypotheses to test during these investigations are:

1) Dioxins were released at the site by the combustion of PCB contaminated soils and wastes.

2) Dioxins were released at the site by the combustion of precursor chlorinated solvents.

3) Dioxins were released at the site by the combustion of municipal waste in Silicon Valley (zone R1).

4) Dioxins were deposited at the site as a constituent of fly ash and has since leached from the fly ash into the site soils.

The above hypotheses assume that the primary sources of dioxin/furan contamination deposited at the site (such as oils) were removed with the disposal of the wastes during the U.S. EPA initiated removal action. It is considered impractical, if not impossible at this point to locate isolated releases which may have occurred.

If the investigations confirm any of the above hypotheses, then additional investigations may or may not be required to further define the nature and extent of contamination to the extent required to complete the baseline risk assessment.

<u>Hypothesis 1 - Dioxins released by the combustion of PCB</u>
An evaluation was conducted to determine the most likely location to find dioxin/furan contamination formed by the combustion of PCB. Outside of Silicon Valley, no specific "burn areas," or areas where combustion of waste was known to occur, can be identified. However, the Krejci deposition does note a large uncontrolled fire which raged over the entire West Site. During the U.S. EPA's removal action, five "burn areas" were identified and sampled on the East site. Although, the U.S. EPA failed to document the location of these burn areas, the samples collected were analyzed for dioxin, and no contamination was identified. The Krejci deposition also notes that an uncontrolled fire occurred in the lagoon in what is now called Zone R3.

The RI/FS PCB screening and TAL/TCL surface soil point sampling investigations have found extensive PCB contamination on the West site, particularly in Zone R2, and to a lesser extent in Zone O1. Little PCB contamination was found in Zone R1, and very little PCB contamination was found in Zone R3. Therefore the best area to test this hypothesis is by evaluating Zone R2.

The hypothesis will be tested by collecting samples from both Zones R2 and B1 as determined by a pre-defined grid. A test for significance as defined by the Ohio EPA's "How Clean is Clean Policy" will then be performed on the data. If significant contamination is not identified, then it will be presumed that the hypothesis is disproven, no additional investigations will be conducted, and the risk assessment will not consider dioxin/furans as a contaminant of concern. If significant contamination is identified, a number of decisions may need to be formulated. If the finding of significance is statistically clear, the contaminant(s) identified will be moved forward for consideration as a contaminant of concern in the risk assessment process. Consideration of the results, in consultation with the risk assessors, will be made to identify if the results adequately characterize the nature and extent of dioxin/furan contamination for the purpose of the baseline risk assessment. If the finding of significance is statistically borderline, additional investigation may be warranted to test the hypothesis further with a higher number of samples.

An important aspect of these investigations will be to obtain as low a detection limit on the chemical analyses as possible. When calculating the exposure concentration, the risk assessment will evaluate risk utilizing a value of 1/2 the detection limit for the non-detects of the dioxin/furan contaminants. However, due to the high level of toxicity identified for some of these contaminants, if a low detection limit is not achieved, a quantification of unacceptable risk might be found, even if few detections were made. For this reason the SW 846 method 8290 was selected to analyze the samples. This method has a target detection limit in the parts per trillion range for soil samples. It is expected that dioxin/furans will be detected in both background and site soils.

<u>Hypothesis 2 - Dioxins were released at the site by the combustion of precursor chlorinated solvents</u>
The RI/FS subsurface soil investigations identified chlorinated solvents on an infrequent basis in Zone R2 and at the top of Silicon Valley (Zone R1). The finding of these solvents in Zone R2 is consistent with John Krejci III's description of site operations in his deposition taken by the U.S. EPA. The finding of volatile organics in the upper part of Silicon Valley is not surprising given the proximity of that area to the entrances to the sites and the probable waste handling areas.

Based on the Krejci deposition, the lagoon in what is now called Zone R3, may have also received solvents. However, the lagoon waste was staged for removal during the U.S. EPA's portion of the removal work, characterized and then removed (bulk waste pile BWPE-3) by

Ebasco. The characterization performed by Ebasco found some low toxicity congeners of dioxin/furan in the waste.

To test this hypothesis relative to residual contamination in Zone R2, the investigation proposed to test hypothesis 1 will also be applicable. To test this hypothesis relative to residual contamination in Zone R1, the investigation proposed for hypothesis 3 (defined below) will be applicable.

Revise or keep the following based on Harza review of BWPE3 data

It is recommended that no additional sampling be conducted in Zone 3 at this time. The values found by the Ebasco characterization can be compared to the background levels found in area B1 and tested for significance. If significant contamination is determined, then it is recommended that either the Ebasco established values be used in the risk assessment to reflect the contamination still remaining in Zone R3, or further sampling be considered.

Hypothesis 3 - Dioxin were released at the site by the combustion of municipal waste

Based on John Krejci III's deposition, virtually all municipal waste brought to the site was deposited in Silicon Valley. As stated above, Krejci acknowledged that a fire was continuously maintained in the bottom of the valley throughout much of the early operation of the site (up until 1968). An evaluation of Silicon Valley is therefore the most likely choice to test this hypothesis.

The samples collected in Zone B1 for hypothesis 1 should be adequate to define background levels for this evaluation. Samples should be taken from a similarly sized grid in Zone R2 and then evaluated for significance against the background levels. If significant contamination is not identified, then it will be presumed that this hypothesis is disproven, no additional investigations will be conducted, and dioxin/furans will not be considered a contaminant of concern in the risk assessment. If significant contamination is identified, additional investigation may be warranted to test the hypothesis further with a higher number of samples. No other areas received substantial quantities of municipal waste, and so the investigation of additional areas based on the confirmation of this hypothesis is not recommended.

Hypothesis 4 - Dioxins were deposited at the site as a constituent of fly ash

The deposition of John Krejci III indicates "fly ash" was brought to the site, but is non-specific as to where this material was placed. The removal activities did not specifically identify any waste as "fly ash." The most likely location for depositing this type of waste is Silicon Valley. Reclamation's Site Manager for the removal action at the West Site is not aware of any wastes remaining at the site which could be identified as "fly ash." However, he does note that some "slag waste" still remains on the slopes of Silicon Valley. Since, the most logical location for the deposit of "fly ash" is Silicon Valley, this hypothesis should be

adequately tested by the investigations proposed to test hypothesis 4.

The Sampling Plan
Table 1 presents the supplemental surface soil sampling locations and requirements to be added to Table VII.F.3-1 of the Krejci Work Plan, Field Sampling Plan. Locations are shown graphically on Figures 1 and 2.

The locations identified shall be sampled in accordance with SOP VII.F.3-1. Sample identification shall be consistent with Section VII.F.3.1 of the Field Sampling Plan. The alphanumeric designation for these samples in the identification string is "SS2."

Samples shall be collected in 8 oz wide mouth amber glass bottles. The size of the sample shall assure that an adequate amount of sample is available to the laboratory to perform matrix spike and matrix spike duplicate analyses. Sampling logistics are shown on Table 2.

Duplicates shall be collected on a frequency of one for every ten samples collected.

A separate sampling spoon shall be used for each sampling location. These spoons shall be pre-cleaned and a rinse blank collected to verify non-contamination. No additional rinse blanks will be collected.

The samples are projected to be collected in a two day event. A crew of three shall perform the sampling. The first task will be to locate the sampling grid stakes, and if necessary relocate sampling sites if the stakes are no longer present. Once this task has been performed, at both the background and site areas, the investigative sampling will commence. A separate log book shall be utilized for the sampling.

The samples shall be sent by overnight mail to the Reclamation laboratory for log-in, and they shall then will be transmitted to the selected contract laboratory for analyses by SW 846 Method 8290. A copy of the selected laboratory's Quality Assurance Plan will be forwarded to Ohio EPA by a separate transmittal. Method 8290 requires the samples be extracted within 30 days and analyzed within 45 days. The expected target detection levels (soil matrix) for each congener are as follows:

TCDD/TCDF	0.1-1.0 ppt
PCDD/PCDF	0.5-5.0 ppt
HpCDD/HpCDF	0.5-5.0 ppt
HxCDD/HxCDF	0.5-5.0 ppt
OCDD-OCDF	1.0-10.0 ppt

ppt - parts per trillion

The in Section 8.3.4. of the 8290 method, it is recommended that a

fortified field blank be submitted with each sample set. A generic, pre-cleaned, soil field blank shall be fortified and submitted with the collected investigation samples.

The contract laboratory shall provide data within 21 days of delivery of the samples. The QC data deliverables to be provided shall meet the requirements of Level 2 data needs as identified in the Reclamation Laboratories Good Lab Practices, GLP-CON-1.0, Section 7.2.

The data shall be validated relative to Level 2 requirements as specified in GLP-CON-1.0, Section 7.3.9.3. by either the Client Representative of the Independent Data Validator working in the Reclamation laboratory. The results shall be reported to the Resource Manager within 5 days of receipt of the data from the contract laboratory. These requirements are further detailed in the Protocol For Specific Purpose (PSP) developed for this work (attached). The PSP further

Table 1 - Data Supporting Supplemental Needs for Dioxin Investigations

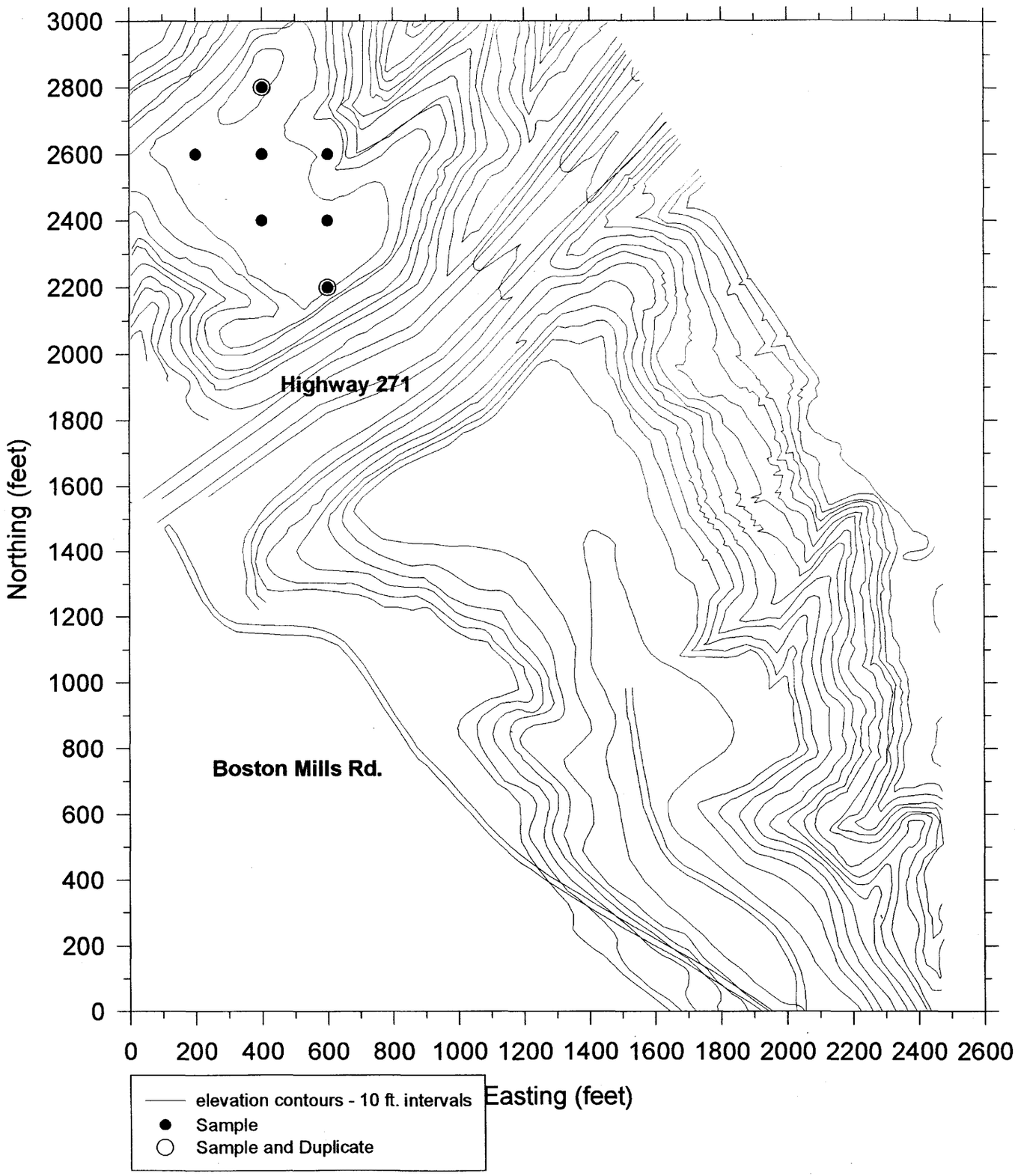
Sub-Unit	Sample Type	North	East	Dioxin/Furan Analysis	Duplicate
B1	SS2	2600	200	X	
B1	SS2	2800	400	X	
B1	SS2	2600	400	X	X
B1	SS2	2400	400	X	
B1	SS2	2600	600	X	
B1	SS2	2400	600	X	
B1	SS2	2200	600	X	
R1	SS2	4600	1800	X	
R1	SS2	4400	1800	X	
R1	SS2	4600	2000	X	
R1	SS2	4400	2000	X	X
R1	SS2	4200	2000	X	
R1	SS2	4000	2000	X	
R2	SS2	4600	2200	X	
R2	SS2	4400	2200	X	
R2	SS2	4200	2200	X	
R2	SS2	4000	2200	X	
R2	SS2	3800	2200	X	
R2	SS2	4000	2400	X	
R2	SS2	4200	2400	X	X
R2	SS2	4400	2400	X	
R2	SS2	4200	2600	X	

Table 2 - Supplemental Sampling Logistics For Dioxin Investigations

Investigative Samples	Duplicate Samples	Rinse Blanks	Fortified Soil Blank	Containerization	Preservation	Analytical Method	Holding Time
22	3	1	1	8 oz amber widemouth glass	4 degrees C	8290	30/45 *

*30 days from the date of sampling for extraction and 45 days from extraction for the completion of analysis

Figure 1
Krejci Background Site
Surface Dioxin/Furan Investigation Locations



Krejci West Site
Surface Dioxin/Furan Investigation Locations