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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

US EPA RECORDS CENTER REGION 5
1000285

IN THE MATTER OF:	)	
	)	
PETITION OF KEYSTONE STEEL	)	AS
AND WIRE COMPANY FOR	)	(RCRA Delisting
ADJUSTED STANDARD FROM	)	Adjusted Standard)
35 Ill. Adm. Code §721.132	)	

KEYSTONE'S MOTION FOR STAY OF THE BOARD'S PROCEEDINGS

Petitioner, Keystone Steel & Wire Company ("Keystone"), by its attorneys, respectfully requests a stay for a period of ninety days in the proceeding In the Matter of: Petition of Keystone Steel and Wire Company for Adjusted Standard from 35 Illinois Administrative Code §721.132, which was filed concurrently with this motion.

In support of this motion, Keystone states as follows:

1. Keystone is filing the above-referenced RCRA delisting adjusted standard petition with the Board today, pursuant to a Consent Order filed on July 2, 1993 in the case People of the State of Illinois vs. Keystone Consolidated Industries, Inc. (Peoria County, Chancery Division, No. 93 CH 000103). The Order required Keystone to file a delisting petition for certain K062-listed sediments and contaminated soils by August 1, 1993.

2. Since August 1 fell on Sunday, Keystone is filing its petition with the Illinois Pollution Control Board (IPCB) on Monday, August 2, 1993.

3. Keystone is filing its petition without complete quality assurance/quality control (QA/QC) documentation which is required by U.S. EPA criteria and delisting guidance. Keystone seeks to amend its petition in approximately three weeks to incorporate the results of this information. At that time, Keystone will be able to certify that all of the information presented is complete.

4. On July 16, 1993, Keystone's independent testing laboratory, IEA, informed Keystone that it could not meet the established test result delivery schedule, and would be unable to complete its internal QA/QC review for the final batch of laboratory test results before August 4, 1993. (That review was actually completed on July 30th, five days ahead of IEA's July 16th estimate.)

5. Under a revised timetable, Keystone's consulting engineer on this project, ERM-North Central, and its independent validator, Environmental Standards, Inc. (ESI), will assess this laboratory data and complete independent validation of the test results by August 16, 1993. As soon as possible thereafter, Keystone can submit the validation package to Illinois EPA and file an amended petition with the Board.

6. On July 23, 1993, Keystone notified the Illinois EPA and the Illinois Attorney General's office of this unforeseen delay and requested an extension of the filing deadline required under the Consent Order. A copy of this extension request is attached as Exhibit A.

7. Illinois EPA and the Attorney General's office informed Keystone that it did not intend to grant such an extension, but rather preferred that Keystone file the petition on-time without the validation results, subject to amendment when the validation results became available.

8. Keystone's counsel, Karen Prena, discussed this issue with the Board's counsel, Michael McCambridge, who (without making any binding commitment on the Board's behalf) advised that under the circumstances, it was likely that the Board would order Keystone to submit the validation information to Illinois EPA and accordingly amend the petition within a specified timeframe.

9. As of the date of this filing, Keystone has received approximately 60% of the validated data from ESI. Keystone's engineering consultant, ERM, has received 100% of the "background" data, 72% of the "volatiles" data, and 33% of the "total metals" and "semi-volatiles" data. ESI has submitted the majority of the validation reports on schedule and should be able to meet the August 16, 1993 deadline. The validation reports to date have identified no significant sources of error in the laboratory's data.

10. Keystone recognizes that in previous petitions the Board has requested that the petitioner and Illinois EPA "assemble and review the informational justification before a petition is filed." In The Matter Of: Keystone Steel & Wire Co., (February 6, 1991) AS 91-1 (emphasis added).

11. Review of this petition by the Illinois EPA prior to filing was an impossibility given the short time frame imposed under the consent decree. In addition, Illinois EPA awaits the complete validated test results in order to fully evaluate this petition.

12. The Consent Order entered by the Peoria County Circuit Court with the approval of Keystone, the Attorney General and Illinois EPA provides that "the Agency shall either join Keystone as co-petitioner in the Delisting Petition or file a recommendation with the IPCB stating that the delisting procedures in Appendix I are in conformance with U.S. EPA criteria and guidance documents." Order at p. 16.

13. For the foregoing reasons, Keystone requests a stay of these delisting proceedings for an additional ninety days. This will provide Keystone sufficient time to deliver validated test results to Illinois EPA and allow Illinois EPA adequate time to review these materials, together with the amended petition. Thereafter, the Illinois EPA will either join Keystone as co-petitioner or file a recommendation with the Illinois Pollution Control Board. A stay of proceedings will

conserve the Board's time and resources during this interim.

WHEREFORE, Keystone moves the Board to stay proceedings in this matter for a period of ninety days.

Respectfully submitted,

KEYSTONE STEEL & WIRE COMPANY

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Dated: August 2, 1993

EXHIBIT A

KIRKLAND & ELLIS
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July 23, 1993

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Re: Notice of Delay In Achieving A Schedule Milestone Pursuant to ¶ 42 of the July 2, 1993 Consent Order In People of the State of Illinois v. Keystone Consolidated Industries, Inc. (Peoria County, Chancery Division, No. 93 CH 000103)

Gentlemen:

Pursuant to ¶ 42 of the above-referenced Consent Order, Keystone hereby requests that the Attorney General and the Illinois EPA agree to the modification of the August 1, 1993 Closure Plan Milestone to allow Keystone to submit its delisting petition to the Illinois Pollution Control Board on November 1, 1993. In support of this request, Keystone states the following:

1. Keystone completed the treatment of the Retention Reservoir prior to the May 1, 1993 Closure Plan Milestone. Keystone finished on May 21, 1993 the sampling of the Reservoir for the purpose of proving the consistency and effectiveness of the treatment in order to support the delisting of the treated wastes by the Illinois Pollution Control Board. As they were being taken, the samples were immediately sent for testing to IEA in Research Triangle Park, North Carolina, an approved analytical laboratory. IEA informed Keystone on July 16th that it would be unable to complete the testing of the Retention Reservoir samples as originally scheduled, but reassured Keystone's consulting engineering firm, ERM - North Central, that their final analysis of all samples and compilation of all QA/QC documentation would be complete on August 4, 1993. The primary reason for this delay was the laboratory's initial failure to follow the SW-846 methodology for the Multiple Extraction Procedure, thereby necessitating a reanalysis of numerous samples. Following receipt of the laboratory data, ERM and its independent validator, Environmental Standards, Inc., will need additional time to assess and compile the validated results and to deliver those results to the Illinois EPA. Prior to August 1st, Keystone will submit to Illinois EPA, either in paper report or computer disk format, the unvalidated test results supporting all applicable delisting standards.

2. The Illinois Pollution Control Board has expressed the clear preference that "the entity seeking the adjusted standard and the Agency assemble and review the informational justification <u>before</u> a petition is filed before the Board." <u>In re: Petition of Keystone Steel & Wire Co. For Hazardous Waste Delisting</u> (No. A S 91-1, February 6, 1992) at 9 (emphasis added). Based on telephone conversations with Mark Gurnik and Mark Crites, the Agency will need from 45 to 60 days to review Keystone's delisting petition, along with the supporting validated data, before it will be in a position to comment on the petition. Assuming the laboratory delivers the final data package on August 4, 1993, Keystone will submit the petition to Illinois EPA on or before September 1, 1993. The proposed November 1, 1993 modified delisting petition milestone would allow the Agency the suggested 60-day review period before the petition would be filed with the Board.

3. Keystone has in no way caused or contributed to the delay in delivery of the laboratory's test results. Prior to contracting with IEA, Keystone inquired about the laboratory's ability to complete the analytical work within the short time allowed by the Consent Order's Schedule Milestones. IEA acknowledged "the short time frame of this project" in its proposal, and assured Keystone that "IEA has the capacity in all areas of the laboratory to meet the given holding and turn around time." As previously noted, the treatment and sampling of the Retention Reservoir was completed ahead of schedule. The laboratory's failure to meet its promised delivery schedule is due solely to its own delays in completing the testing of the 529 samples and in performing its internal QA/QC review of the extensive laboratory reports. Keystone's consulting engineer, ERM - North Central, minimized the delay caused by the laboratory's initial failure to adhere strictly to the SW-846 protocols by identifying the problem during its review of the first data package in early July. IEA acknowledged their error and agreed to re-perform the tests in question, but did not advise Keystone of the seriousness of the delay caused by this problem until July 16th.

4. This unforeseen laboratory delay has resulted in one month of schedule slippage. Keystone is requesting an additional two-month delay of the modified Schedule Milestone in order to meet the Board's stated preference that the Agency review the petition in advance of its filing. Allowing the Agency to review the petition in advance of its filing will in no way delay the ultimate Board decision on the petition. To the contrary, for the reasons set forth by the Board in the Keystone opinion, prior Agency review should expedite the disposition of the petition, while minimizing the administrative burdens on the Board.

For the foregoing reasons, Keystone requests that the August 1, 1993 Milestone for the filing of the IPCB delisting petition be extended to November 1, 1993. In the alternative, if the Agency or the Attorney General does not prefer that the Agency review the petition prior to its filing with the Pollution Control Board, Keystone requests an extension to September 1, 1993. Keystone does not anticipate any further revisions to the Revised Phase 2 Closure Plan Milestones at this time.

If you have any technical questions concerning this request, please call Jim Polich at ERM - North Central (708-940-7200). Your prompt response to this request will be greatly appreciated.

Sincerely,

Andrew R. Running

ARR:pad

cc: Ralph P. End, Esq.
Mr. Leslie W. Phillips
Mr. James W. Polich, P.E.

bcc: Mr. Robert Miller
Mr. Dale Bennington
Karen Prena, Esq.

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USEPA

Keystone Steel & Wire

April 16, 1993

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PERMIT SECTION

Mr. Lawrence W. Eastep
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RE: DATA SUBMITTAL REVISED DELISTING FIELD SAMPLING PLAN
REVISED PHASE 2 PLAN FOR THE CLOSURE OF THE DITCHES, RETENTION RESERVOIR, AND DREDGE PILES
LPC #1430050001-Peoria County-ILD000714881
RCRA-Closure, Log No. C-521-M-3

Dear Mr. Eastep:

Enclosed are three copies of the Revised Delisting Field Sampling Plan dated April 14, 1993 for the Retention Reservoir Remediation project at Keystone Steel & Wire in Bartonville, Illinois. These copies are provided for informational purposes and your review prior to our initiating delisting sampling on April 26, 1993. This revised sampling plan is an expansion of the sampling plan presented as Appendix N in the June 15, 1992 Closure Plan and includes additional details that were not available during the preparation of Appendix N.

This plan covers both delisting sampling at 90 points in the Retention Reservoir and background sampling at 25 locations. Delisting sampling has been revised to comply with the requirements in the September, 1992 USEPA publication "Petition to Delist Hazardous Waste: A Guideline Document", and includes the application of the Multiple Extraction Procedure (MEP) for metals since treatment consisted of chemical stabilization of inorganics.

Background sample locations were selected based on minimum historical disturbance of soils in areas approximating undisturbed conditions. Ten of the background sample points, shown in Plate 2-1 of the Closure Plan, were approved by IEPA personnel during a visual inspection. The remaining 15 points were located in areas comparable to the original ten locations chosen.

Keystone Steel & Wire Co. 7000 S.W. Adams St. Peoria, IL 61641 (309) 697-7020 FAX 309-697-7422

The primary purpose of background sampling is to establish the naturally occurring levels of metals in soils that contribute substantial quantities of silt to the surface impoundments on Keystone property as a result of storm water runoff. This information will be useful, especially for lesser known metals, in properly evaluating the analytical results from delisting sampling. Since we are interested in surface and near-surface materials, background samples will be taken from zero to one foot deep.

We intend to start background sampling on April 26, 1993 and delisting sampling in the Retention Reservoir approximately three days later. If there are no comments by the IEPA prior to April 26, we will assume that the intended approach is adequate and sampling will proceed. Please contact me or Mr. Elton Breland of ERM-North Central, Inc. (314/928-0300) if you have any questions.

Sincerely,

Dale Bennington

DALE BENNINGTON, P.E.
Manager, Energy & Environmental Engineering

/dm
Enclosure

cc: R. End
B. Miller
L. Phillips

REVISED
DELISTING FIELD SAMPLING PLAN
KEYSTONE STEEL & WIRE COMPANY
BARTONVILLE, ILLINOIS

REVISED DELISTING FIELD SAMPLING PLAN
KEYSTONE STEEL & WIRE COMPANY
BARTONVILLE, ILLINOIS

APRIL 14, 1993

PREPARED BY:

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TABLE OF CONTENTS

		Page
List of Tables		
List of Figures		
1.0	INTRODUCTION	1
2.0	SITE BACKGROUND	1
2.1	Site Description	1
2.2	Remediation and Closure Activities	2
3.0	SAMPLING OBJECTIVE	2
4.0	SAMPLING LOCATIONS	3
4.1	Retention Reservoir Samples	3
4.2	Background Samples	5
5.0	ANALYTICAL PARAMETERS AND PROCEDURES	5
6.0	SAMPLE IDENTIFICATION AND NUMBERING SYSTEM	8
7.0	SAMPLE COLLECTION PROCEDURES	10
7.1	Equipment	10
7.2	Decontamination	10
7.3	Sample Collection	11
8.0	SAMPLE HANDLING	14
8.1	Containers and Preservation	14
8.2	Sample Shipment	14
8.3	Chain-of-Custody	15

TABLE OF CONTENTS
(Continued)

		Page
9.0	FIELD NOTEBOOK	15

APPENDICES

A Sample Location Worksheets

B Contract Documents for Analytical Services, RCRA Delisting Study, Tables 3, 4, and 5

C PID Maintenance and Calibration

D Attachment 7 Soil Volatile Sampling Procedures

E Field Sampling Form and Chain-of-Custody Form

LIST OF TABLES

Number	Description
1	Number and Frequency of Investigative and QA Samples to be Prepared for Laboratory Analysis
2	Retention Reservoir Remediation Delisting Threshold Concentrations

LIST OF FIGURES

Number	Description
1	Retention Reservoir Sampling Sections
2	Sampling Sections and Grid System
3	Example 20′ x 20′ Cell with Sample Location Plotted
4	Sampling Section 1 Random Sample Locations
5	Sampling Section 2 Random Sample Locations
6	Sampling Section 3 Random Sample Locations
7	Sampling Section 4 Random Sample Locations
8	Sampling Section 5 Random Sample Locations
9	Sampling Section 6 Random Sample Locations
10	Sampling Section 7 Random Sample Locations
11	Sampling Section 8 Random Sample Locations
12	Sampling Section 9 Random Sample Locations
13	Sampling Section 10 Random Sample Locations
14	Sampling Section 11 Random Sample Locations
15	Sampling Section 12 Random Sample Locations
16	Sampling Section 13 Random Sample Locations
17	Sampling Section 14 Random Sample Locations
18	Sampling Section 15 Random Sample Locations
19	Sampling Section 16 Random Sample Locations
20	Sampling Section 17 Random Sample Locations
21	Sampling Section 18 Random Sample Locations
22	Master Plot of Sampling Locations
23	Background Sampling Locations

REVISED DELISTING FIELD SAMPLING PLAN
KEYSTONE STEEL & WIRE COMPANY
BARTONVILLE, ILLINOIS

1.0 INTRODUCTION

An integral part of the RCRA closure activities at the Keystone facility is the delisting of lime-stabilized sediments from the Retention Reservoir. Appendix I of the revised Phase II Closure Plan dated June 15, 1992 (Closure Plan) presents a general plan for performing the sediment delisting at Keystone. This Revised Delisting Field Sampling Plan (FSP) provides additional details on sampling activities to be conducted at Keystone as part of the delisting program which were not available during preparation of Appendix I in 1992.

The selection of the sampling locations and the analytical parameters are in accordance with information provided in the "draft" second edition of the United States Environmental Protection Agency (USEPA) publication "Petitions to Delist Hazardous Wastes: A Guidance Document", dated September 1992 (the "Delisting Guidance Manual"). Other references used to prepare this sampling plan include the USEPA publication "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods", SW-846.

2.0 SITE BACKGROUND

2.1 Site Description

Information on the Keystone site location and description and details of the Retention Reservoir (Reservoir) can be found in the Closure Plan.

2.2 Remediation and Closure Activities

The sediments, baffle and side wall soils, and bottom soils in the Reservoir have been stabilized in place with a lime and cement additive mixture. The treated sediments will be analyzed and petitioned for delisting to the Illinois Pollution Control Board (IPCB). Upon successful delisting, the treated sediments will be excavated to within one foot of the untreated underlying soils and disposed of off site. This will ensure that inadequately treated or untreated contaminated bottom or side soils will not be removed with the treated material. Bottom and side wall soils and underlying soils will be sampled through the remaining treated sediments as part of clean closure. After clean closure has been documented, the remaining treated material will be removed and disposed of off site.

Solidification/stabilization of the Reservoir sediments represents the initial efforts in an estimated seven year project. Four additional surface impoundments, a Surface Drainage Ditch, and two Dredge Piles, containing an approximate total of 60,000 cubic yards of sediments and soils, will be treated in subsequent steps.

3.0 SAMPLING OBJECTIVE

The treated Reservoir sediments will be sampled and analyzed to demonstrate in the delisting petition that the lime-stabilized sediments will not:

- Meet the listing criteria (hazard code) for K062 wastes, which are corrosivity (pH less than 2.0 or greater than 12.5) and toxicity (failure of the Toxicity Characteristic Leaching Procedure (TCLP) for lead and chromium);

- Exhibit any other general hazardous waste characteristic (i.e., ignitability, reactivity, or excessive levels of TC constituents other than lead and chromium);

- Contain any RCRA hazardous waste constituents in quantities sufficient to render the treated sediments a hazardous waste; or

- Produce a leachate (using the TCLP set forth under 40 CFR 261.24) that will exceed individual constituent health-based limits as established by the USEPA.

4.0 SAMPLING LOCATIONS

4.1 Retention Reservoir

Selection of locations for sampling treated sediments in the Reservoir was determined using a two-dimensional random sampling technique that accounts for horizontal spatial variability of the sediments. A complete vertical sample of the waste will be collected from randomly selected points on a horizontal grid. The procedure used to select the sampling points follows the guidance provided in Chapter 7, Pages 7 - 10, of the Delisting Guidance Manual for sampling landfills and surface impoundments. The Reservoir sampling locations are selected as follows:

1. The Reservoir, which has an area of approximately 175,500 ft^2, is divided into 18 sections of not more than 10,000 ft^2 (see Figure 1).

2. The 20-foot and 5-foot grid systems developed for performance sampling during in-situ treatment are superimposed over the entire Reservoir so that there are at least 100 possible sampling locations for each section (see Figure 2). The 20-foot grid system contains 735 cells, each having a distinct alpha-numeric designator. Each 20-foot cell contains sixteen 5-foot sampling blocks numbered sequentially from 1 to 16 (see Figure 3). Each sampling block represents a potential sampling location, and is designated by identifying the cell and the individual sampling block. As an example, Sample C12(7) is plotted on Figures 2 and 3. The delisting sample will be collected from the approximate center of the sampling block.

3. Five sampling locations are randomly selected within each 10,000 ft^2 section. This is done by first numbering all of the possible sampling blocks in each section. The total number of possible blocks are entered into a spreadsheet which generates random numbers using a built-in function. The output includes three columns of 5 random numbers, one for each sampling point. The first column contains the primary random numbers, while the second and third columns provides back-up numbers in the event that a number is repeated in the first column. The sample location worksheets containing a figure and spreadsheet table for each of the 18 sections, are included as Appendix A.

4. The sampling locations selected for each 10,000 ft^2 section are plotted on Figures 4 through 21. The alpha-numeric designator for each sample, using the previously described grid system, is shown on each of these figures. A master plot of all sampling locations is shown on Figure 22.

As stated in Appendix I of the Closure Plan and in accordance with the Delisting Guidance Manual, vertical sample cores of the entire depth of the treated sediments will be collected at each sample location. However, to ensure that samples are sufficiently representative of the entire depth of the sediments, no sampling location will be less than 9 feet from the treated sediment line around the perimeter of the Reservoir and no less than 3 feet from the treated sediment line at the finger levees. Since the bottom slopes are 3/1 around the perimeter of the Reservoir and 1/1 for the finger levees, samples taken closer to the treated sediment line are not representative of the bulk of the material being delisted due to the shallow depths.

A representative sample of each section will be composited by combining an equal volume of treated sediments from each of the five vertical cores. This composite sample will be analyzed for all parameters, excluding volatile organic constituents. For the volatile organic analysis, a separate sample from a parallel boring at each of the five randomly selected sampling locations will be collected and analyzed. Specific

procedures for the collection of both of these samples are covered in Section 7.0 of this Sampling Plan. The sampling locations will be established by surveying the randomly selected points to a horizontal accuracy of ±0.1 feet. The location from which the sample is collected will be clearly marked in such a way as to maintain repeatability. Sample locations will be staked, flagged, or otherwise uniquely identified. All sampling locations will be identified according to the sampling sections and grid system used for this project.

4.2 Background Samples

In addition to obtaining delisting samples from the Retention Reservoir, approximately 25 background samples will be collected at various locations around the Keystone site. The locations of these samples are shown on Figure 23. Sample locations BG-1 through BG-10 are identical to the background sample locations shown in Plate 2-1 of the Closure Plan which were approved by the IEPA during an on-site inspection. Sample locations BG-1A through BG-15A are additional points which were selected as comparable to the original ten locations. All background samples will be discrete grab samples and will be analyzed by Total and Toxicity Characteristic Leaching Procedure (TCLP) extraction procedures for 14 metals. The metals analysis includes eight RCRA metals plus six metals associated with delisting requirements.

5.0 ANALYTICAL PARAMETERS AND PROCEDURES

The number of investigative and quality assurance (QA) samples to be collected, analytical parameters, and frequency of collection are summarized in Table 1. The selection of analytical parameters for the delisting sampling is based on information provided in the Delisting Guidance Manual and previous negotiations conducted between Keystone and the IEPA. The analytical parameters, number of analyses, and analytical methods for delisting sampling are shown in Table 3 of the Contract Documents for Analytical Services: RCRA Delisting Study (the "Contract Documents")

included in Appendix B. Specific analytes and their respective detection limits are shown in Table 4 of the Contract Documents in Appendix B.

Both grab and composite samples will be analyzed. Grab samples will be analyzed for volatile organic compounds (VOCs) and composite samples will be analyzed for semivolatile organic compounds (SVOCs) and inorganic analytes. Analytical protocols will be performed in accordance with Section 6.1 of the Delisting Guidance Manual which requires that sample analysis include Total and TCLP results plus the Multiple Extraction Procedure (MEP) results for metals when materials are subjected to chemical stabilization for inorganics. Figure 24 presents a decision tree for identifying the need to analyze samples by TCLP or MEP. Initially, all samples will be analyzed for Total Constituent Concentrations. The need for subsequent TCLP and MEP analysis will be determined by the use of Figure 24 along with Delisting Threshold values. Delisting threshold criteria are summarized in Table 2.

Delisting Threshold values are presented for those analytes that have been previously detected in samples collected from the Reservoir. If an analyte is detected for which no Delisting Threshold value has been included in Table 2, a value will be provided by the Project Manager. The analytical protocols are as follows:

Inorganics

1. Perform Total analyses on all Reservoir samples for:

Arsenic	Total Chromium	Silver
Antimony	Lead	Thallium
Barium	Mercury	Vanadium
Beryllium	Nickel	Zinc
Cadmium	Selenium	Total Cyanide
		Total Sulfide

2. Perform TCLP analyses on all Reservoir samples for all parameters in analytical protocol 1 (except sulfide) where the Total result is greater than the corresponding Delisting Threshold value. TCLP cyanide is to be leached with deionized water.

3. Perform MEP for all metals for which TCLP analysis was performed for samples from the Retention Reservoir. Do not perform MEP on background metals samples.

4. Perform analysis for total and TCLP hexavalent chromium on Reservoir samples where total chromium is detected at a concentration greater than 1% by weight (10,000 ppm).

5. Perform reactive cyanide and reactive sulfide analyses only if total cyanide and total sulfide concentrations exceed 500 ppm and 250 ppm, respectively.

6. Analyze all background samples for Total and TCLP metals for the 14 metals in analytical protocol 1 above.

<u>Organics</u>

1. Perform Total analyses on VOCs and SVOCs.

2. Perform TCLP analyses for volatile and semivolatile organics if any analyte exceeds the respective Delisting Threshold value. TCLP results will only be reported for analytes detected above the estimated quantitation limits for Totals analyses.

Field personnel will be in daily contact with the laboratory. If the criteria established for performing TCLP analysis is exceeded (inorganics and organics), the field personnel will report to the ERM Project Manager and instruct the laboratory to perform the required analysis.

6.0 SAMPLE IDENTIFICATION AND NUMBERING SYSTEM

Sample bottles will be appropriately labeled using a waterproof marker to indicate:

- Project name;
- Sample number;
- Date;
- Time of collection;
- Requested analysis;
- Preservative; and
- Sampler name.

To facilitate organized sampling efforts, all samples collected for laboratory analysis will be assigned a unique-site specific sample number to identify the type and location of the sample. The three-part sample numbering system that will be used is described below:

- Part 1 - Sample Matrix and Type Code - Each sample will be identified by an alpha code corresponding to the sample matrix followed by an alpha code indicating sample type (composite or grab). The alpha codes will be as follows: S-sediment/soil; B-background; C-composite sample; G-grab sample; and W-water sample.

- Part 2 - Location Code - Each sample will be identified by an alpha-numeric code corresponding to the specific sample collection location. The locations will be described by section, cell, and block. The particular depth interval from which the sample is collected will not be designated in the

sample numbering scheme, but will be indicated on the bottle labels, sampling sheets, and chain-of-custody forms.

- Part 3 - Quality Control (QC) Modifier - All field QC samples will be designated with an alpha code as follows: FB-field blank; MS-matrix spike/matrix spike duplicate; and TB-trip blank. Only field QC samples will carry this alpha designation. Investigative samples will not be assigned this alpha code.

Two examples of the site-specific sample number for this effort are as follows:

SC-8-C12(7) - Soil/Sediment Composite Sample-Section 8-Cell C12-(Block 7); and

W-8-C12(7)FB - Water Sample-Section 8-Cell C12-(Block 7)-Field Blank.

Field duplicate samples will be collected as "blind" duplicate samples. The duplicate sample number will not carry a QC modifier so that the sample will appear as an investigative sample to the laboratory personnel. Field personnel will create a false investigative sample number for the "blind" field duplicate samples. This number will not conflict with any "real" investigative sample numbers. Sample numbers associated with the field duplicates will be recorded in the field notebook for later reference.

Water samples collected as part of this field effort will be samples of distilled or deionized water prepared for equipment rinseate (field blank) and temperature samples. The temperature samples will be placed with each shipment of sample bottles to the laboratory. The location number associated with the water samples will be substituted for the date of shipping and a letter identifying the cooler in which the sample was shipped. For example, the temperature sample shipped with the example provided above would be: W-723A (Water Sample-July 23, Cooler A).

7.0 SAMPLE COLLECTION PROCEDURES

7.1 Equipment

The soil samples will be collected using the JMC Environmentalist sub-soil probe (JMC probe). The JMC probe is a hand-operated stainless steel sampling probe capable of obtaining a three-foot sample. The JMC probe is driven manually by operating a 12.5 pound slide hammer and is fitted with a stainless steel or plastic sleeve in which the soil sample is retained. The sampling probe and sleeve are retrieved by operating a foot-controlled jack built into the sampling device. If the sediments at any sampling location are soft enough, the stainless steel sampling probe will be fitted directly to a stainless steel rod and advanced and retrieved by hand.

Soil/sediment samples collected from the Retention Reservoir for VOC analyses will be collected using a 2-foot long stainless steel sleeve. Soil samples collected for non-volatile analyses will be collected using a 3-foot long plastic sleeve. One soil core over the entire depth of treated sediment from each sampling location in the Retention Reservoir will be scanned with an 11.7 eV photoionization device (PID). Instructions for calibration and maintenance of the PID selected are included in Appendix C. PID's will be calibrated daily. Response and span factors from each calibration will be recorded in the field notebook. The date, time, model number and serial number of the PID will also be recorded.

7.2 Decontamination

Prior to the collection of soil/sediment samples, all sampling equipment will be decontaminated. The decontamination procedure is as follows:

- Potable water and Alconox detergent wash;
- Potable water rinse; and

- Distilled or deionized water rinse.

Decontaminated equipment shall be protected from coming into contact with the ground or dusty surfaces.

The lead sampling tube containing the sampling sleeve and the remainder of the JMC probe will be decontaminated between sampling locations (Blocks). Plastic sleeves used for collecting composite samples will be decontaminated after each boring and reused for subsequent borings.

Stainless steel sampling sleeves will be decontaminated according to IEPA "Attachment 7, Soil Volatile Sampling Procedures", and IEPA "Instructions for the Preparation of Closure Plans for Interim Status RCRA Hazardous Waste Facilities" December 11, 1990. Attachment 7 is included as Appendix D. Hexane will be used for the solvent rinse described in the Attachment 7 Procedures. A specific area will be designated for all equipment decontamination activities. Decontamination of stainless steel sleeves will occur contemporaneously with sampling activities.

7.3 Sample Collection

A vertical sample core of the entire depth of lime-stabilized sediments will be collected by using the JMC probe. A core will be collected at each of the five randomly selected sample points within each 10,000 ft^2 section of the Retention Reservoir and will be extended to the undisturbed soils underlying the Retention Reservoir. Depth of sample collection is anticipated to range from 1.0 to 9.0. A representative composite sample of each 10,000 ft^2 section will be generated by combining an equal amount of treated sediments from each of the five vertical cores. This composite sample will be analyzed for all parameters listed in Table 4 of Appendix B, excluding VOCs. For the volatile organic analysis, a separate sample from a parallel boring at each of the five randomly selected sample points will be collected and analyzed. Volatile organic sample collection will be in accordance with Attachment 7 (Appendix D). Specific procedures for the collection of both composite and discrete VOC samples are described in the following

paragraphs. Sample collection and description will be recorded on the field sampling forms presented in Appendix E.

Composite samples to be analyzed for all constituents except VOCs and will be collected by the following procedures.

1. Advance the JMC probe fitted with a plastic sleeve from the surface to the bottom of the previously treated sediments. If the depth of the boring is greater than 3 feet, consecutive plastic sleeves will be advanced. The sampler will retain the entire volume of sample from each core.

2. Label the first core collected and perform sample description and PID scanning.

3. Continue collecting complete cores from the treated sediment surface to the bottom of the Reservoir until sufficient sample is collected for laboratory analysis of non-volatile analytes.

4. Mix sample aliquots to form a vertical composite for each sampling location.

5. Mix an equal quantity of the composite sample from each of the five sampling locations to form the composite sample for the entire section.

Samples to be analyzed for VOCs will be obtained in the following manner.

1. The continuous vertical core obtained from each sample location and used in the generation of the composite samples for inorganics and SVOCs analyses will be field screened for volatile organic vapors at 12-inch intervals using a PID. PID measurements and sample descriptions will be recorded on sampling forms.

2. A second, parallel boring will then be advanced at each sampling location and a sample from the interval with the highest PID reading recorded. If no positive PID readings are measured, the interval will be selected based on a visual survey of the first soil core.

3. Treated sediment samples from the 12-inch increment to be sampled will be collected from the second parallel boring using a 2-foot long steel sleeve following the IEPA procedures described in Attachment 7 (Appendix D).

4. Use waterproof marker to indicate on the tube the exact sample interval to be analyzed by the laboratory. Label the steel sleeve according to the labeling protocols presented in Section 6.0.

A total of twenty-five background soil samples will be taken from the locations shown in Figure 23. These background soil samples will be collected from ground surface to 1 foot below grade level (BGL) and analyzed for both Total and TCLP metals (14 metals) as specified for delisting.

Procedures specified in the USEPA Delisting Guidance Manual for sample handling and documentation will be followed. Laboratory analysis will be conducted in accordance with procedures contained in the latest edition of SW-846 and EPA 200.8 as summarized in Table 5 of Appendix B.

The sampling coordinator will also prepare one temperature water sample for shipment with each cooler of samples to the laboratory. The receiving laboratory will record the temperature of the water sample upon receipt. This will identify whether the samples were maintained at a temperature of less than 6° C between the time of collection and receipt by laboratory.

8.0 SAMPLE HANDLING

8.1 Containers and Preservation

The appropriate containers, preservation, holding times, and sample volumes for the non-volatile and volatile sampling fractions are presented in Table 5 included in Appendix B. The non-volatile sample fractions collected from each of the five sampling locations within each section will be composited. Care will be taken so that equal quantities are taken from each sediment sample in generating the composite samples.

8.2 Sample Shipment

Shipment of soil/sediment samples will be accomplished in containers and packing materials designed to prevent breakage, spills, and contamination of samples. Soil samples collected for the analysis of VOCs will be shipped in their respective sealed stainless steel sampling sleeves. All other samples will be transferred to and shipped in their appropriate bottles (Table 5, Appendix B). Stainless steel sleeves containing VOC samples will be shipped in a cooler designated for this purpose. VOC samples will not be shipped in the same cooler as the nonvolatile sample fractions.

Sample bottle lid tops will be sealed following filling. All soil/sediment samples collected as part of this investigation require refrigeration as part of preservation. Sample bottles will be sealed in waterproof plastic bags (Ziploc) and packed with freezer packs. The chain-of-custody record will accompany the samples in the shipping container during shipment. The shipment of sampling sleeves and sampling bottles will apply with applicable Department of Transportation regulations as appropriate. All samples will be shipped for overnight delivery to IEA, Inc. located in Research Triangle Park, North Carolina for chemical analysis.

The cooler will be bound with strapping tape. The cooler drain ports will be sealed with tape. Custody seals will be placed over lid openings (right front and left back) and

covered with clear tape. An airbill with shipper's and consignee's addresses will be affixed to the top of the cooler. The samples will be shipped to the laboratory via overnight courier. The sampling crew will telephone the laboratory, notify them that they will be receiving the samples, inform them of the number of coolers they will be receiving, and identify anything unique about the shipment (i.e., partial sample volumes or Saturday deliveries).

8.3 Chain-of-Custody Control

The sampling program described herein will include chain-of-custody control of sample integrity to ensure against manipulation and/or unknowing introduction of contamination to the collected samples. Chain-of-custody procedures document custody of samples and provide a written tracking mechanism that lists the person responsible for samples before shipping, during shipment, and when the sample is received by the laboratory.

The chain-of-custody form (Appendix E) will be completed and signed by the sample coordinator prior to sample shipment. The chain-of-custody form will also document the requested analyses to be performed by the laboratory and indicate any special sample handling or analytical requirements (i.e., sample interval to be analyzed from the VOC sampling tubes). The sampler will retain a copy of the chain-of-custody form for project files and enclose the original within the shipping container in a sealed, watertight plastic bag (Ziploc). The original chain-of-custody form will accompany the samples throughout shipment.

9.0 FIELD NOTEBOOK

A field log book shall be maintained by sampling personnel, which in addition to the field sampling sheets and chain-of-custody forms, will provide a written record of field data, observations, field equipment calibrations, and sample collection. The entries will be made with waterproof ink. If the weather is too hot or cold, use pencil, but

document the weather conditions as the reason for not using ink. Mistakes will not be erased or scratched out, but will be lined out with a single line through the error. The corrected material inserted above, below, or behind the error and the error initialed by the person making the correction. The signature of the person making the entries must appear on each page of the log book. The purpose of the log book is not to reproduce the information presented on the sample collection or chain-of-custody forms, but to document site activities so that field activities can be reconstructed without having to rely on a person's memory.

Field notebooks will be bound, field survey books. The field notebook will be assigned to field personnel and will be stored in the on-site trailer when not in use. On the inside cover of the field notebook, indicate the following:

- Person to whom the book is assigned;
- Log book number;
- Project name;
- Project address and telephone number;
- Emergency telephone numbers;
- An indication to return the book to ERM-North Central (i.e., include a telephone number) if the book is lost and then found;
- Project start date; and
- Project end date (after completion of the project).

Begin each day's entry on a new page and leave a small margin at the right to permit references. Include the following information:

- Start time;
- Weather;
- Field conditions (i.e., precipitation);
- On site personnel;
- Level of personnel protective equipment;
- Instrument calibration (S);
- Planned tasks for the day;
- Field events (chronological record);
- Summary of day's activities; and
- Signature of individual recording the information.

The field book will contain a photographic log if pictures are taken at the site. This log will include the following:

- Time;
- Date;
- Location;

- Direction;
- Weather conditions;
- A description of the subject in the photograph and the orientation of the photograph (i.e., looking north); and
- The sequential number of the photograph and the film roll number.

The individual recording the last entry of the day must sign the notebook beneath the last entry. If field notes cannot be recorded at the time of the actual field activity, record the observations as soon as possible.

TABLE 1
NUMBER AND FREQUENCY OF INVESTIGATIVE
AND QA SAMPLES TO BE PREPARED FOR LABORATORY ANALYSIS

Sample Location	Matrix	Investigative Samples			Quality Assurance Samples								Project Total	Laboratory Parameters
					Field (Equipment) Blank		Field Duplicate		Matrix Spike/Duplicate [4]		Trip Blank [1]			
		No.	Freq.	Total	Freq.	Total	Freq.	Total	Freq.	Total	Freq.	Total		
Retention Reservoir	Soil/ Sediment	90	1/1	90	--	--	1/10	9	1/20	5	--	--	99	Volatile Organic Compounds
		18	1/1	18	--	--	1/10	2	1/20	1	--	--	20	Oil and Grease
		18	1/1	18	--	--	1/10	2	1/20	1	--	--	20	Nonvolatile Organic Compounds; Total, TCLP, and MEP Metals; Total, TCLP and Reactive Cyanide; Total and Reactive Sulfide; Ignitability; Corrosivity; Reactivity; and TOC.
	Water	--	--	--	1/10	9	--	--	--	--	Daily	[1]	9	Volatile Organic Compounds
		--	--	--	1/2 [5]	9	--	--	--	--	--	--	9	Oil and Grease
		--	--	--	1/2 [5]	9	--	--	--	--	--	--	9	Nonvolatile Organic Compounds; Total, TCLP, and MEP Metals; Total, TCLP and Reactive Cyanide; Total and Reactive Sulfide; Ignitability; Corrosivity; Reactivity; and TOC.
		30	1/cooler	30	--	--	--	--	--	--	--	--	30	Temperature [2]
Background	Soil/ Sediment	25	1/1	25	--	--	1/10	3	1/20	2	--	--	28	Total and TCLP Metals [3]
	Water	--	--	--	1/10	3	--	--	--	--	--	--	3	Total and TCLP Metals [3]

Notes:
(1) VOA trip blank samples will be shipped/analyzed with each cooler of investigative and QA samples.
(2) The number of temperature samples to be analyzed is estimated and based on the anticipated number of coolers to be shipped to the laboratory.
(3) Metals limited to: Arsenic, Antimony, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, and Zinc.
(4) Extra volume is added to the investigative and duplicate samples. This is not a separate sample. Therefore, the MS/MSD total is not included in the project total.
(5) Field (equipment) blanks will be generated from sampling equipment used in obtaining samples from 90 borings at a frequency of 1/10 individual samples or 1/2 composite samples.

TABLE 2

RETENTION RESERVOIR REMEDIATION
DELISTING THRESHOLD CONCENTRATIONS
(Using EPACML Model)

KEYSTONE STEEL & WIRE COMPANY
BARTONVILLE, ILLINOIS

Analytes	TCLP (mg/l) (1)
METALS	
Antimony	0.0984
Arsenic	0.820
Barium	32.8
Beryllium	0.0656
Cadmium	0.082
Chromium	1.64
Cyanide	3.28
Lead	0.246
Mercury	0.0328
Nickel	1.64
Selenium	0.820
Silver	3.28
Thallium	0.0328
Vanadium	3.28
Zinc	115
VOLATILES	
Benzene	0.082
Carbon Tetrachloride	0.082
Chlorobenzene	1.64

TABLE 2
(Continued)

Analytes	TCLP (mg/l) (1)
VOLATILES (cont.)	
Chloroform	0.0984
1,2-Dichloroethane	0.082
1,1-Dichloroethene	0.115
2-Butanone (Methyl ethyl ketone)	32.8
Tetrachloroethene	0.082
Trichloroethene	0.082
Vinyl Chloride	0.0328
trans-1,2-Dichloroethylene	1.64
Methylene Chloride	0.082
Toluene	16.4
Carbon Disulfide	65.6
1,1,1-Trichloroethane	3.28
SEMIVOLATILES	
m-Cresol (2-Methyl phenol)	32.8
o-Cresol (3-Methyl phenol)	32.8
p-Cresol (4-Methyl phenol)	32.8
1,4-Dichlorobenzene	1.23
2,4-Dinitrotoluene (2)	0.010
Hexachlorobenzene	0.0164
Hexachlorobutadiene (2)	0.010
Hexachloroethane	0.0492
Nitrobenzene	0.328

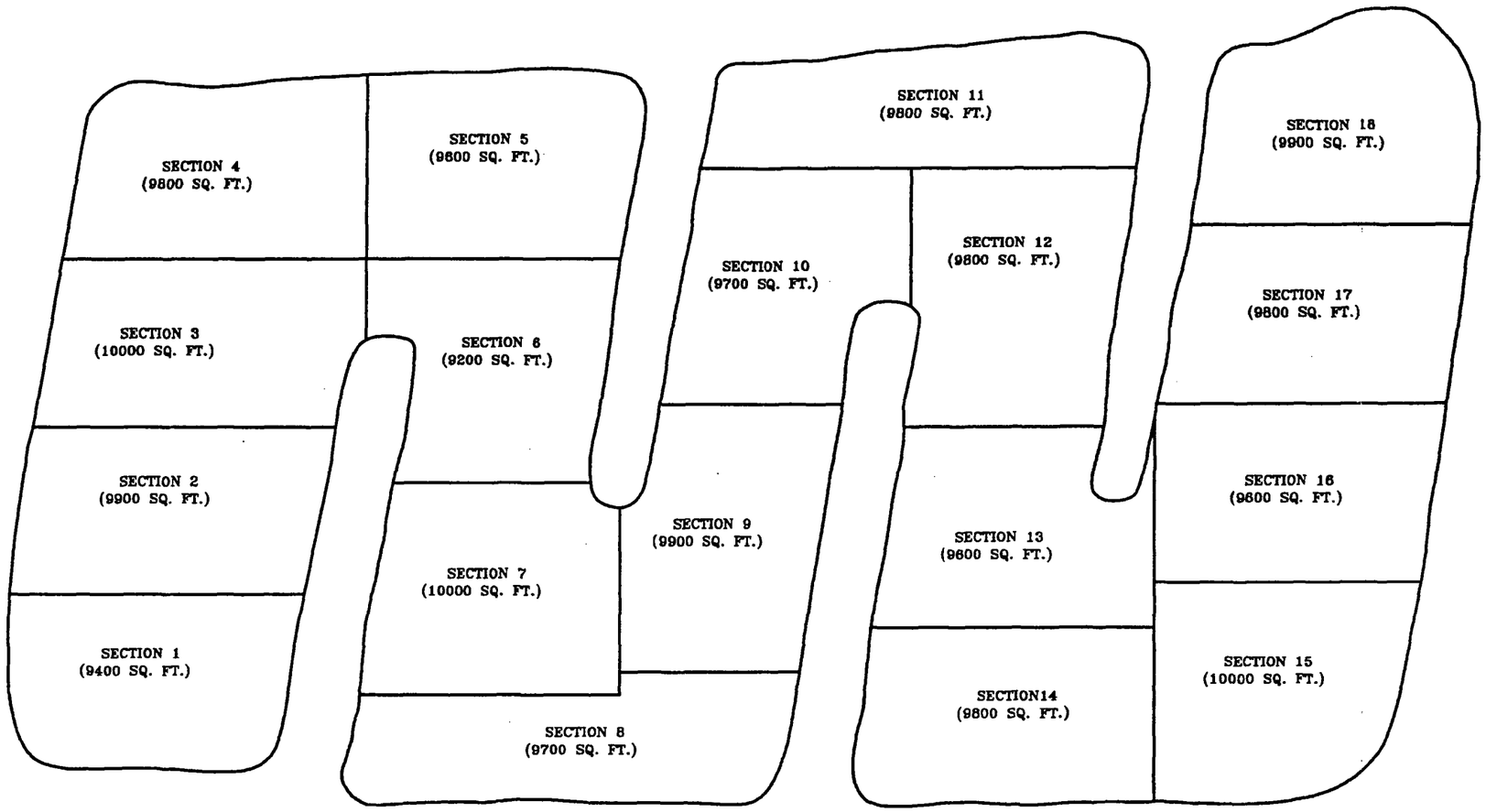
TABLE 2
(Continued)

Analytes	TCLP (mg/l) (1)
SEMIVOLATILES (cont.)	
Pentachlorophenol (2)	0.050
Pyridine	0.656
2,4,5-Trichlorophenol	65.6
2,4,6-Trichlorophenol	0.0492
Phenol	328
Napthalene	16.4
Di-n-octyl phthalate	11.5
Benzo(a)Anthracene (2)	0.010
Benzo(a)Pyrene (2)	0.010
Benzo(b)Fluoranthene (2)	0.010
Chrysene (2)	0.010
Dibenzo(a,h)Anthracene (2)	0.010
Fluoranthene	16.4
Di-n-butyl phthalate	65.6
Indeno(1,2,3,cd)pyrene (2)	0.010

NOTES:

(1) Based on a dilution attenuation factor of 16.4.

(2) The calculated delisting threshold concentration has been replaced by the Estimated Quanitation Limit (EQL), since the calculated delisting threshold is substantially lower than the EQL.



TOTAL AREA OF RETENTION RESERVOIR IS 175,500 SQUARE FEET

APPROX. SCALE (ft.)
0 60

FIGURE 1

RETENTION RESERVOIR
SAMPLING SECTIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 92136EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: | CLIENT NAME: KEYSTONE STEEL & WIRE

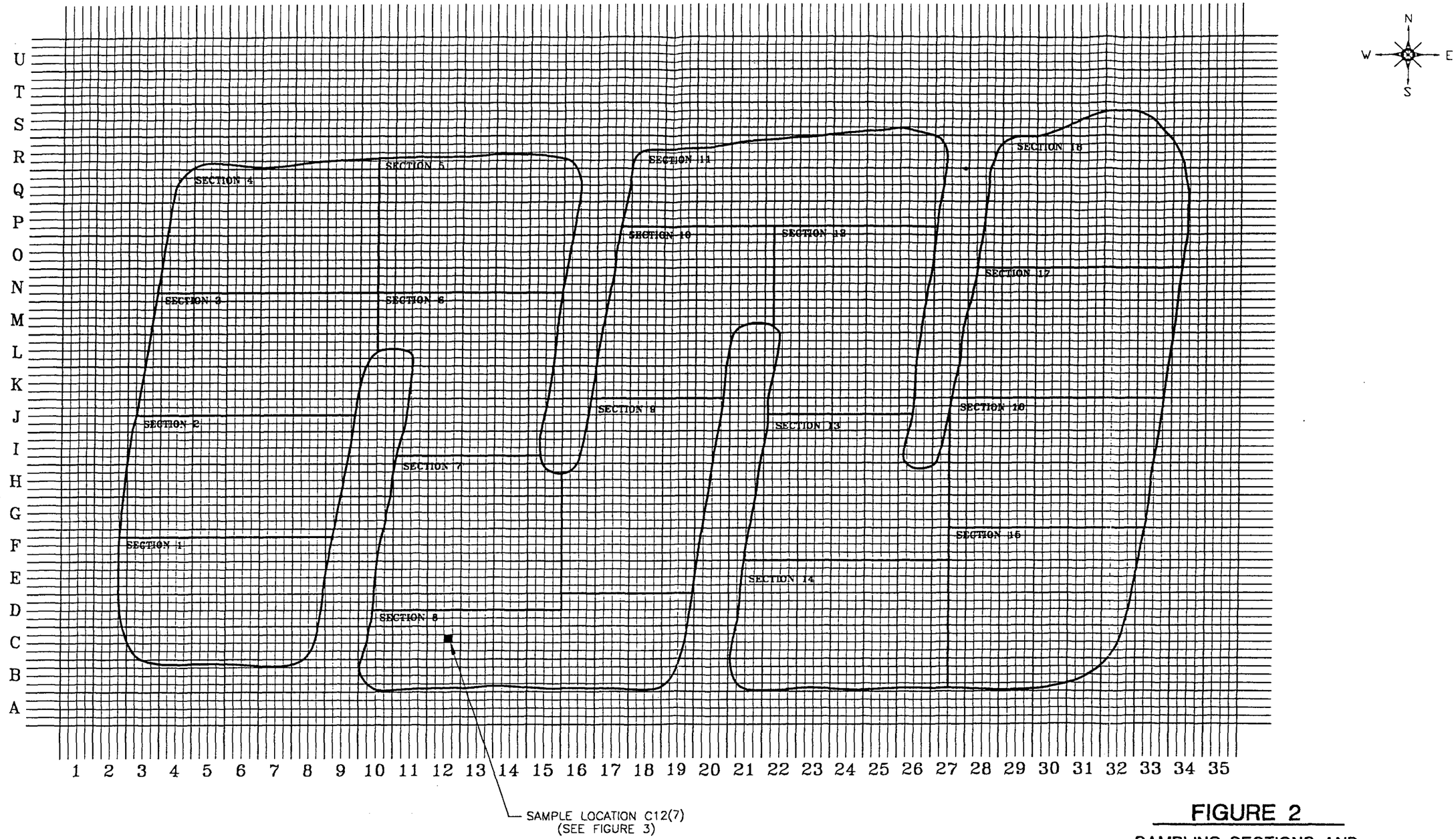


FIGURE 2

SAMPLING SECTIONS AND
GRID SYSTEM
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

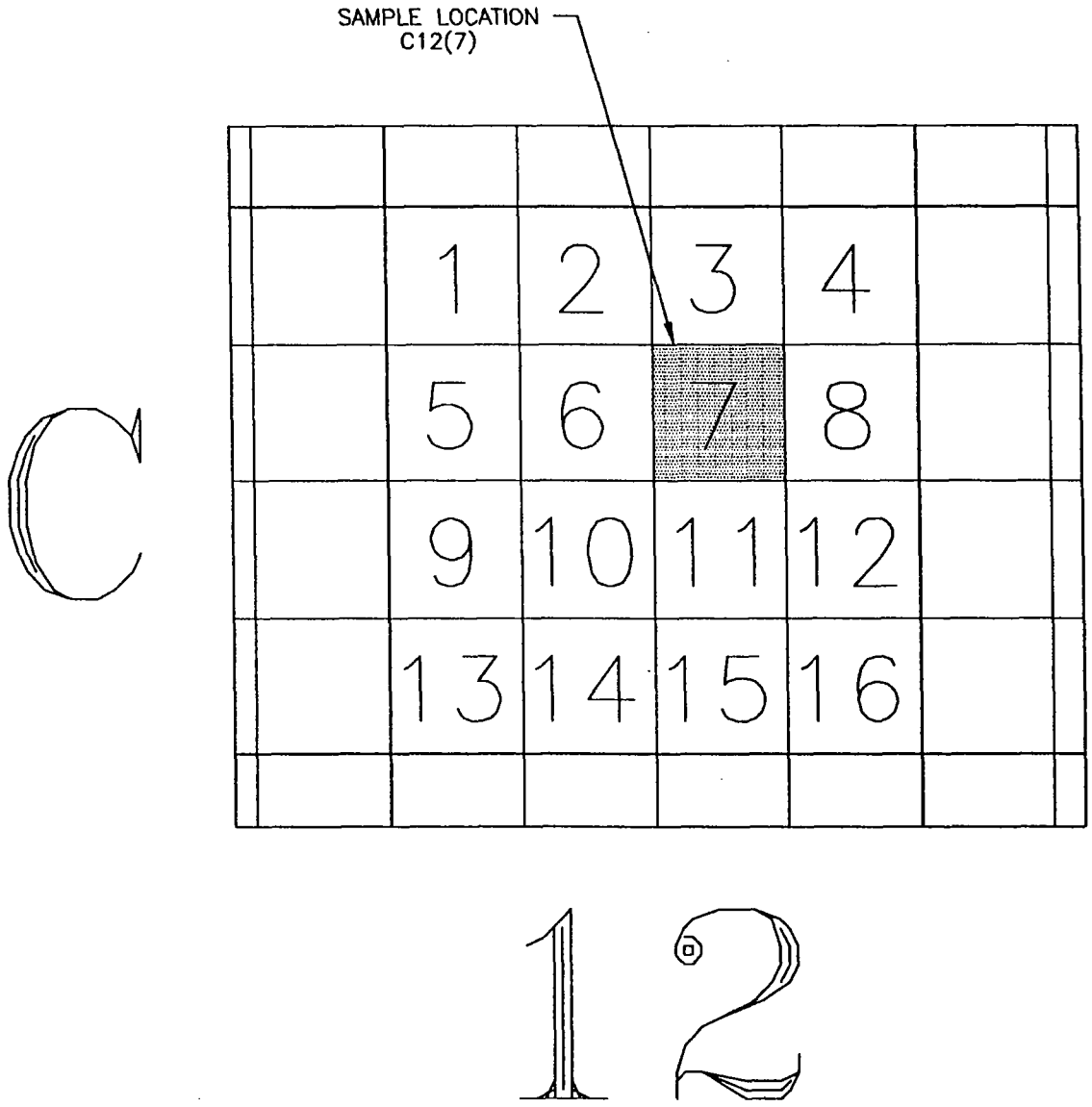
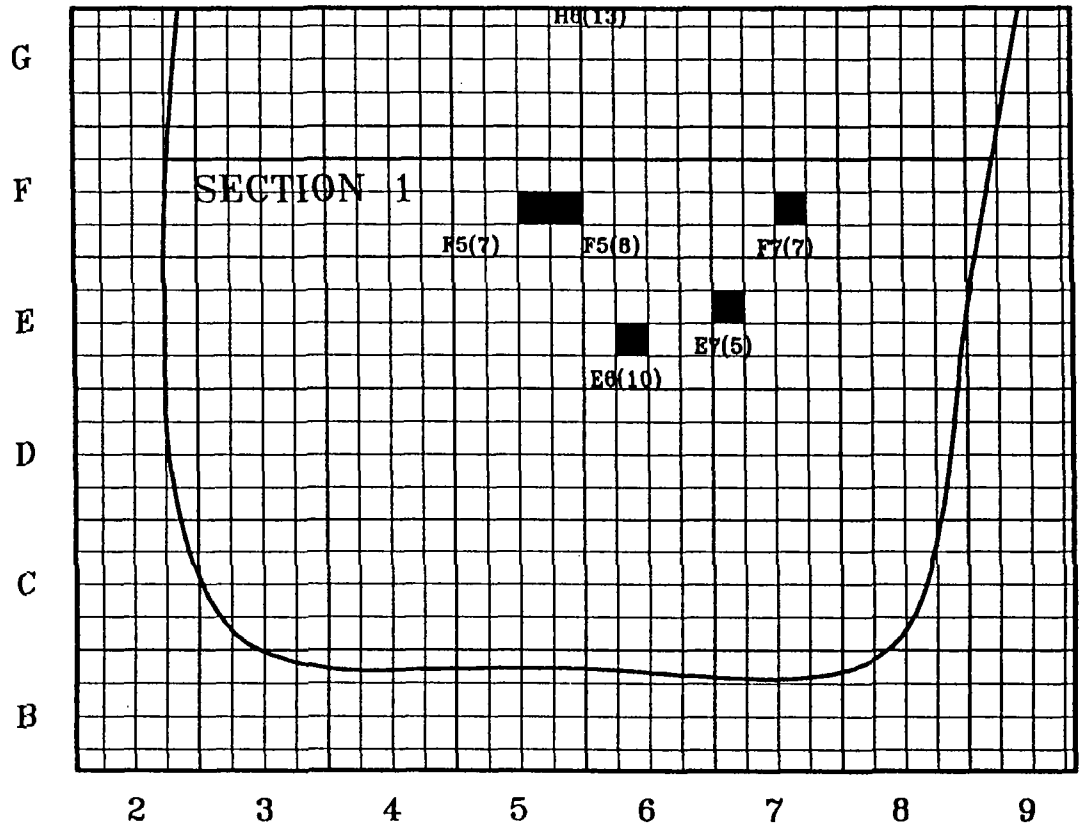


FIGURE 3

EXAMPLE 20' X 20' CELL
WITH SAMPLE LOCATION PLOTTED
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | MCW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SAMP1 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 1 AREA APPROXIMATELY 9400 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

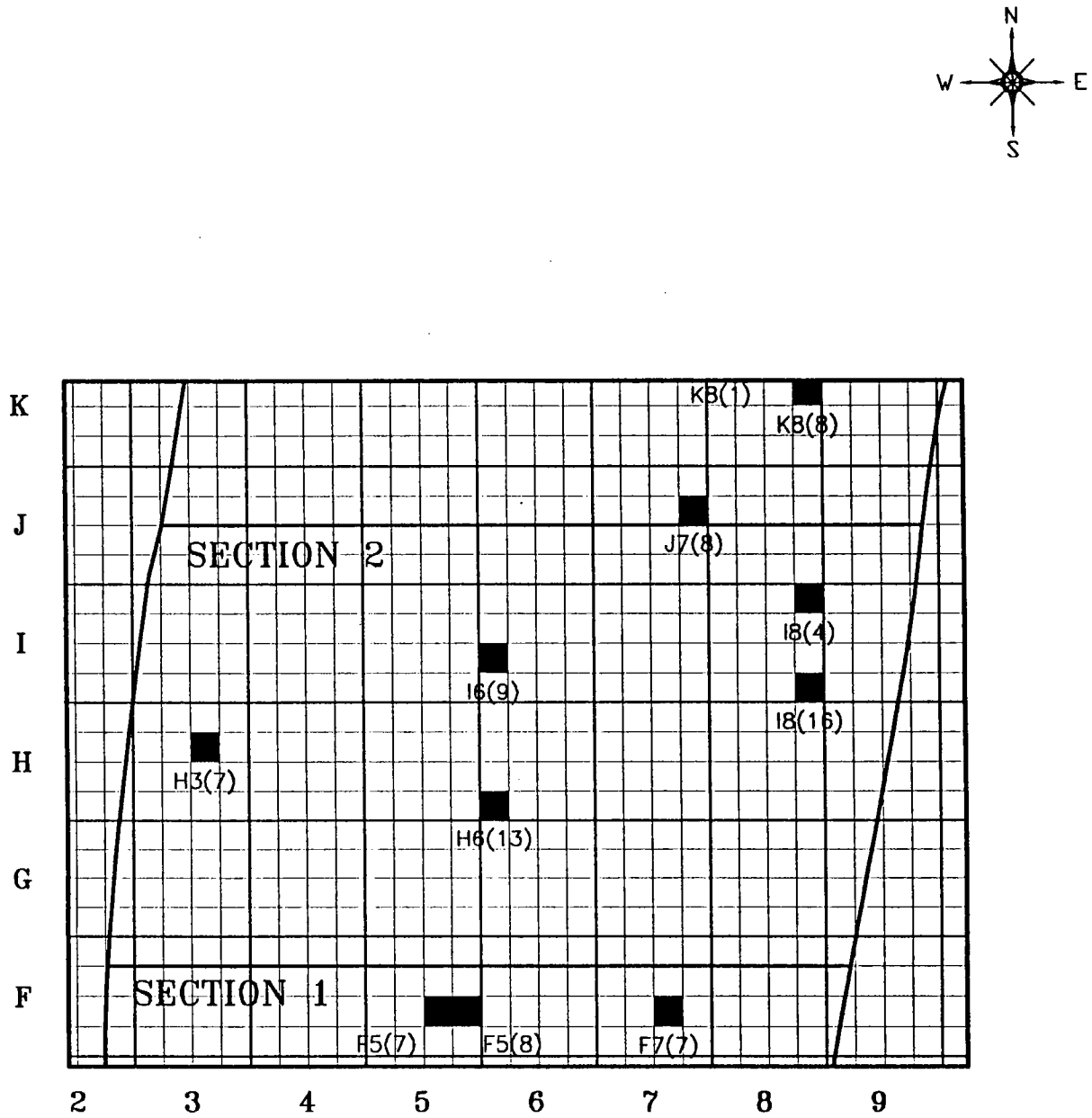
APPROX. SCALE (ft.)
0 30

FIGURE 4

SAMPLING SECTION 1
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SAMP1
DATE: 2/22/93
CHECKED: EDB
MGW
REPORT:
PROJECT: 91070E3



SECTION 2 AREA APPROXIMATELY 9900 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

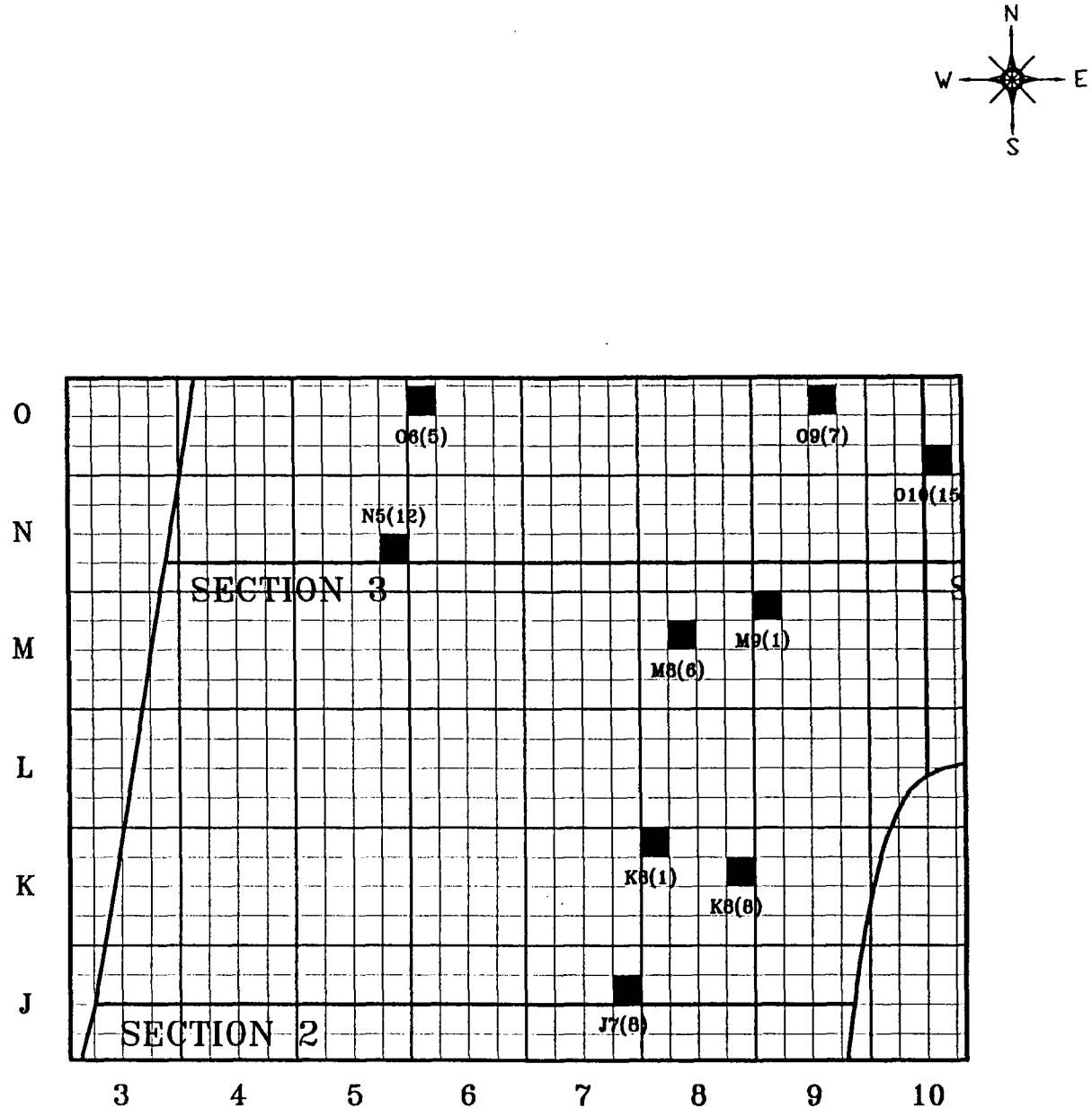
APPROX. SCALE (ft.)
0 30

FIGURE 5

SAMPLING SECTION 2
RANDOM SAMPLE LOCATION
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC2
DATE: 2/22/93
CHECKED: EDB
MGW
REPORT:
PROJECT: 910703B



SECTION 3 AREA APPROXIMATELY 10000 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

APPROX. SCALE (ft.)

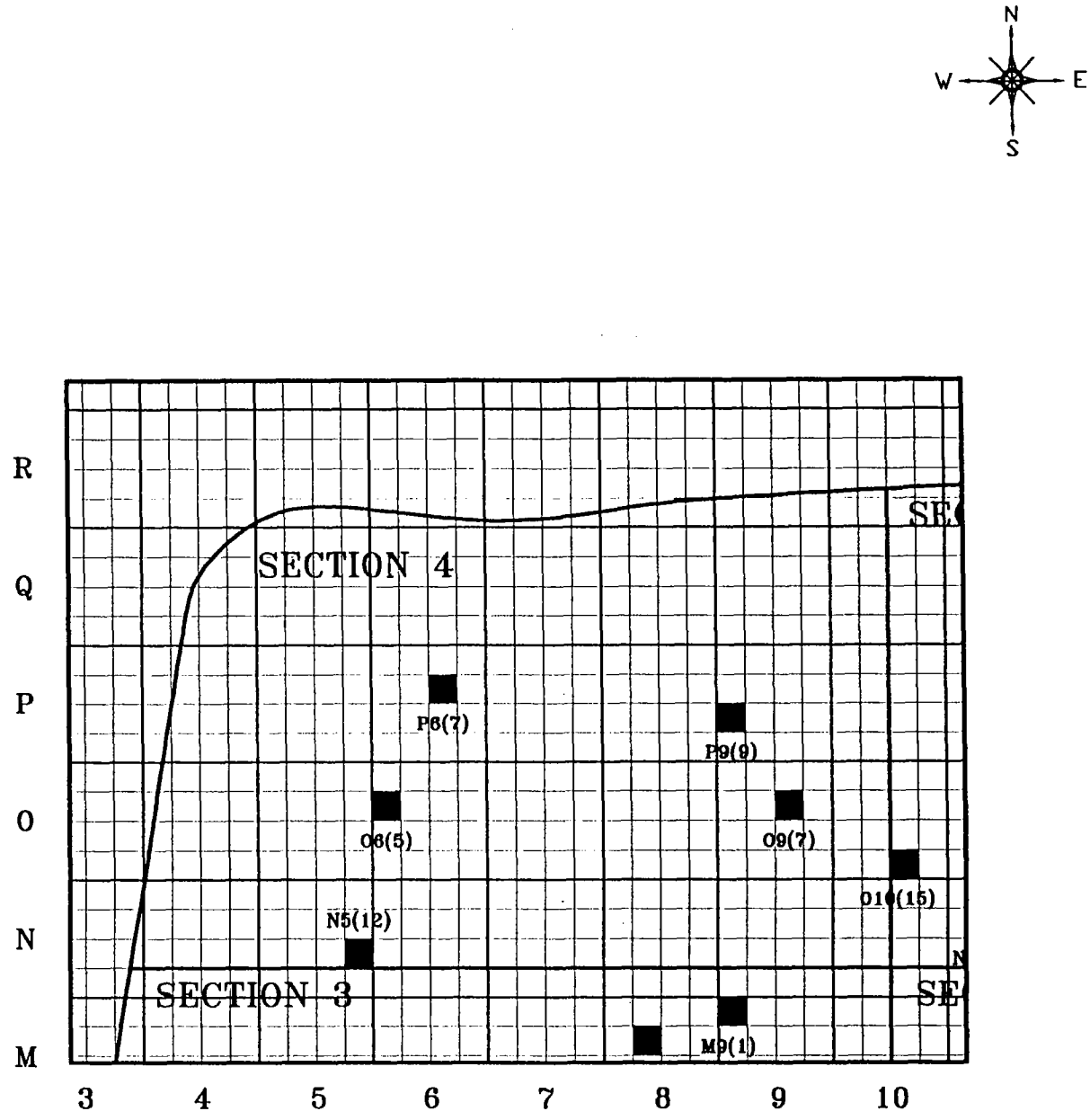
0 30

FIGURE 6

SAMPLING SECTION 3
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC3 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 4 AREA APPROXIMATELY 9800 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

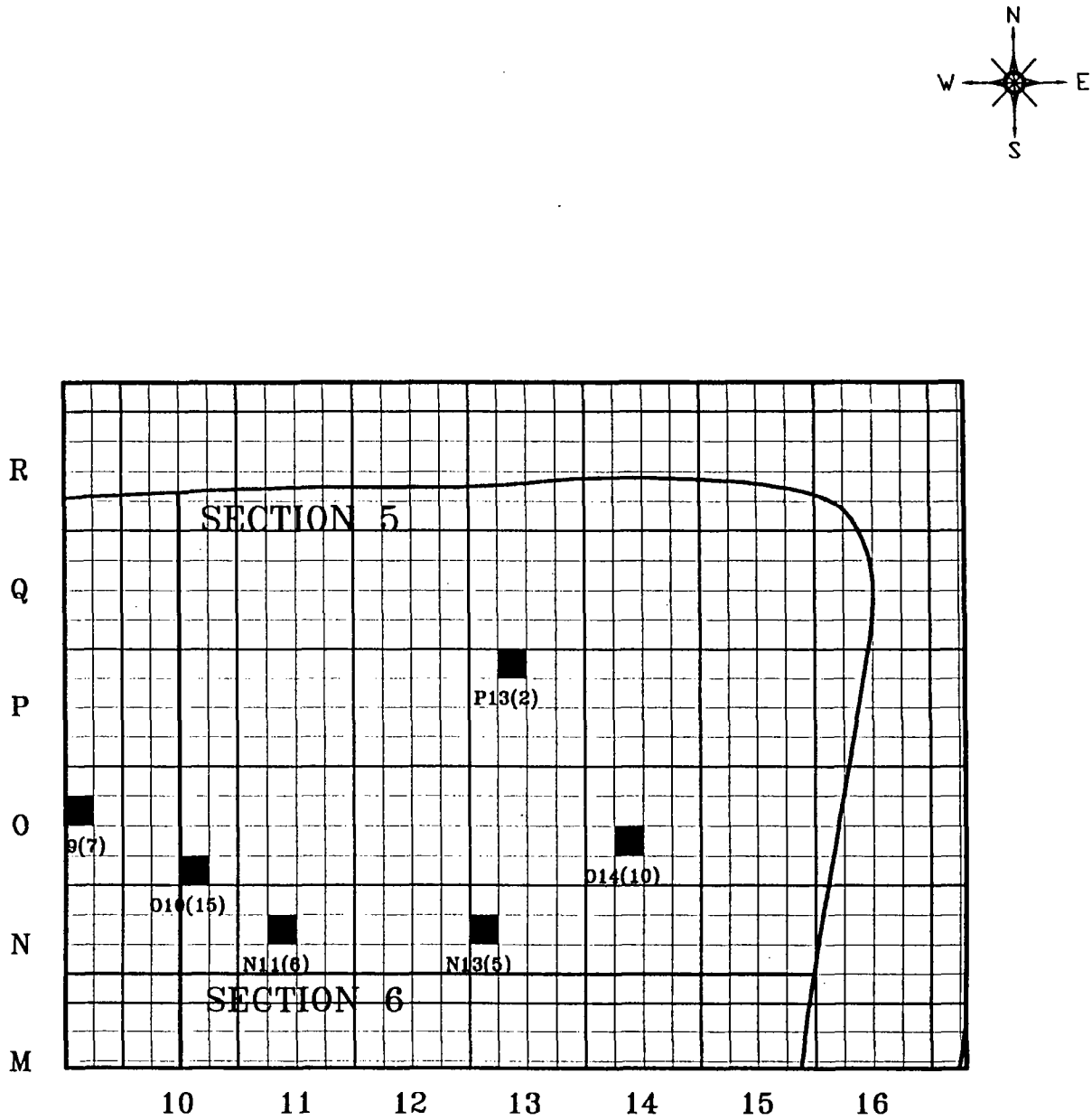
APPROX. SCALE (ft.)
0 30

FIGURE 7

SAMPLING SECTION 4
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC4 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 5 AREA APPROXIMATELY 9600 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

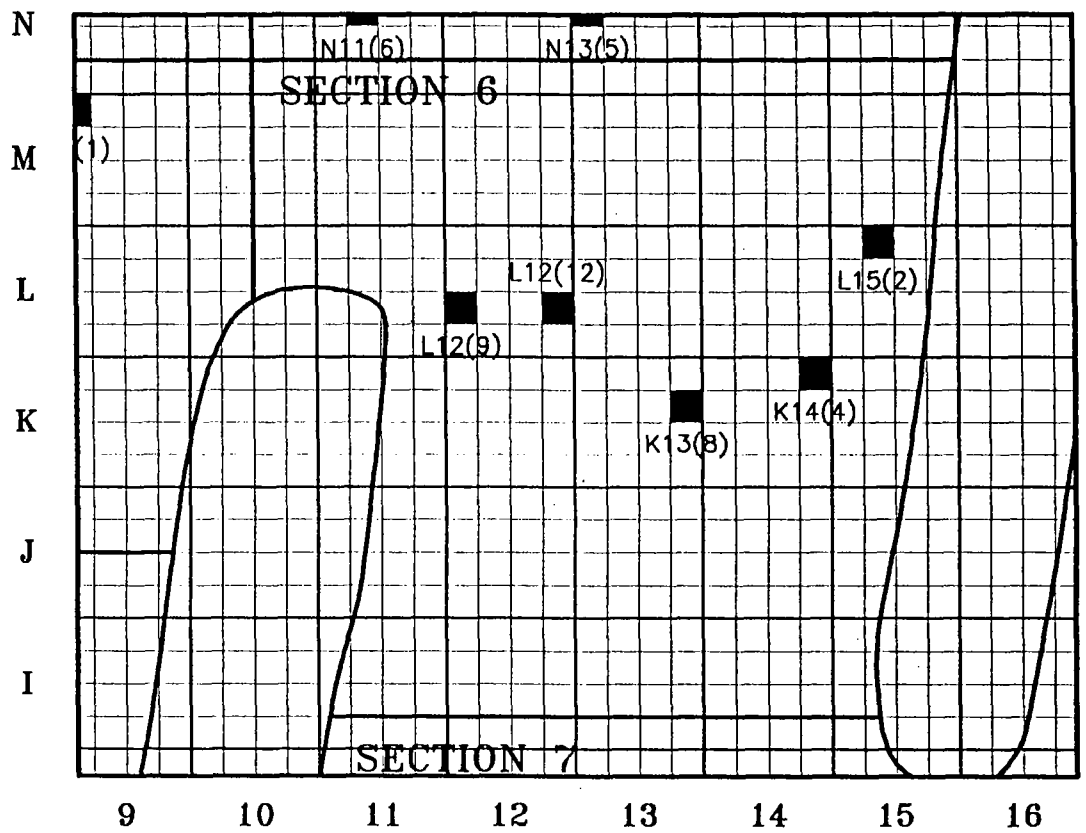
APPROX. SCALE (ft.)
0 30

FIGURE 8

SAMPLING SECTION 5
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC5 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 6 AREA APPROXIMATELY 9200 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

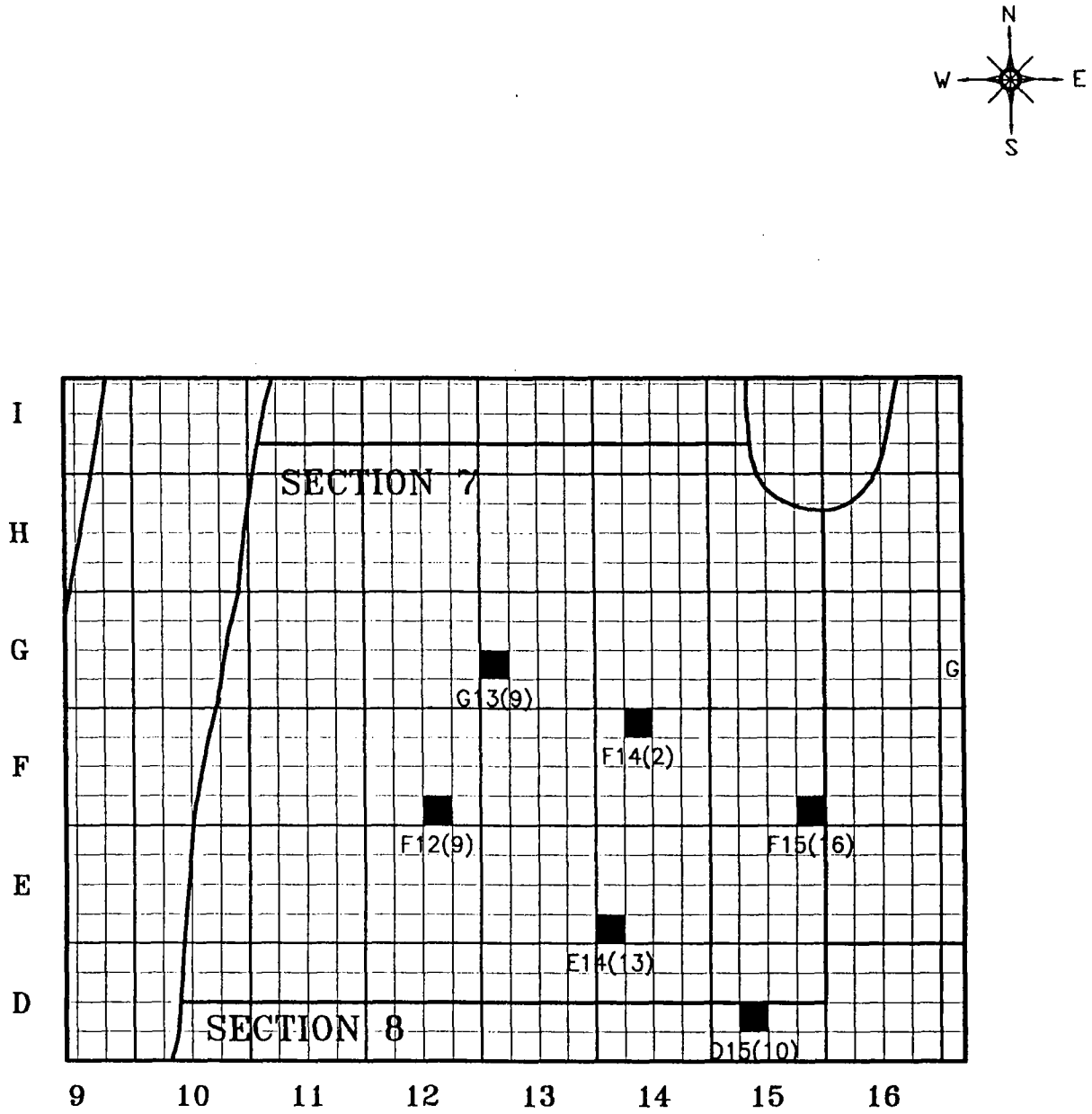
APPROX. SCALE (ft.)
0 30

FIGURE 9

SAMPLING SECTION 6
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC6 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 7 AREA APPROXIMATELY 10000 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

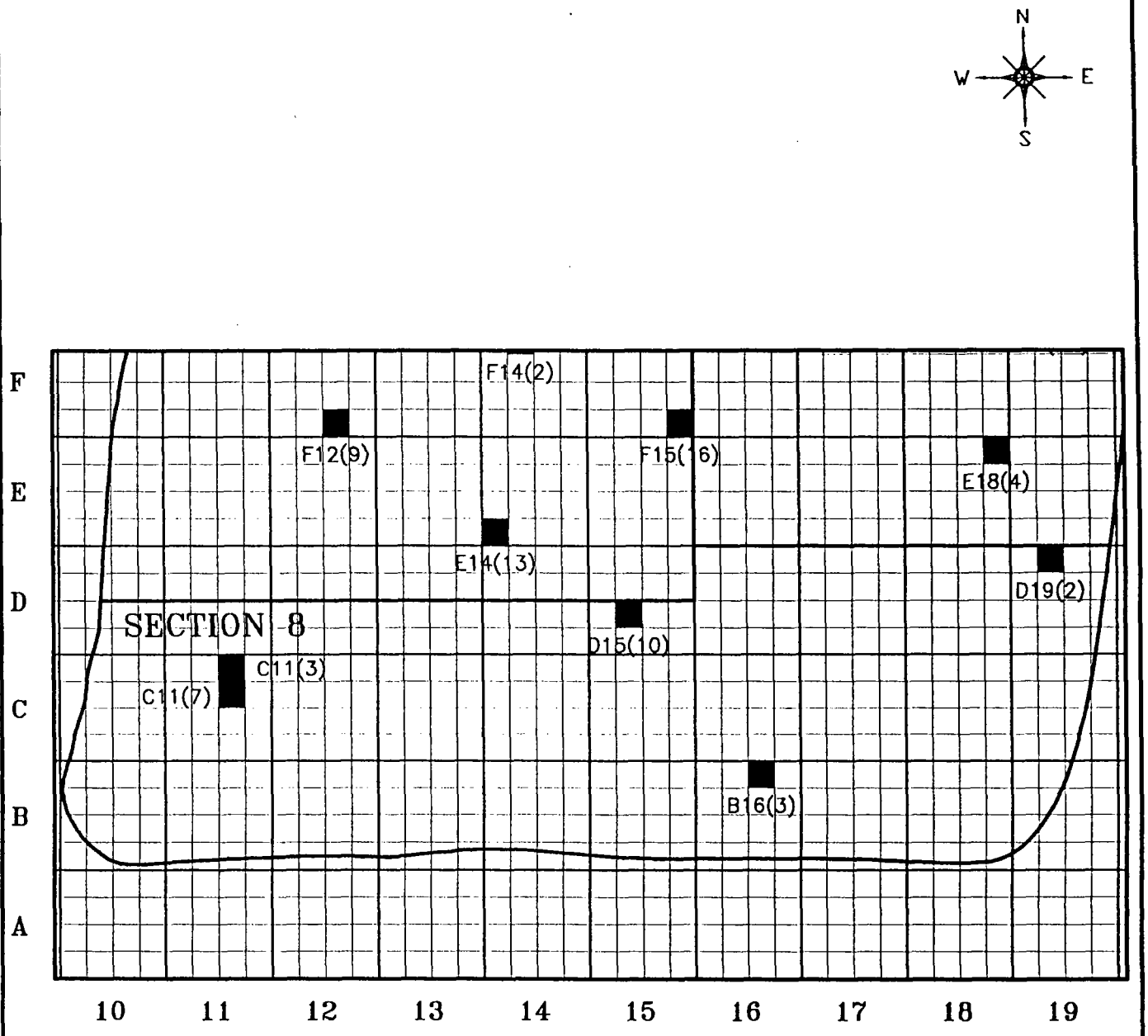
APPROX. SCALE (ft.)
0 30

FIGURE 10

SAMPLING SECTION 7
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC7 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 8 AREA APPROXIMATELY 9700 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

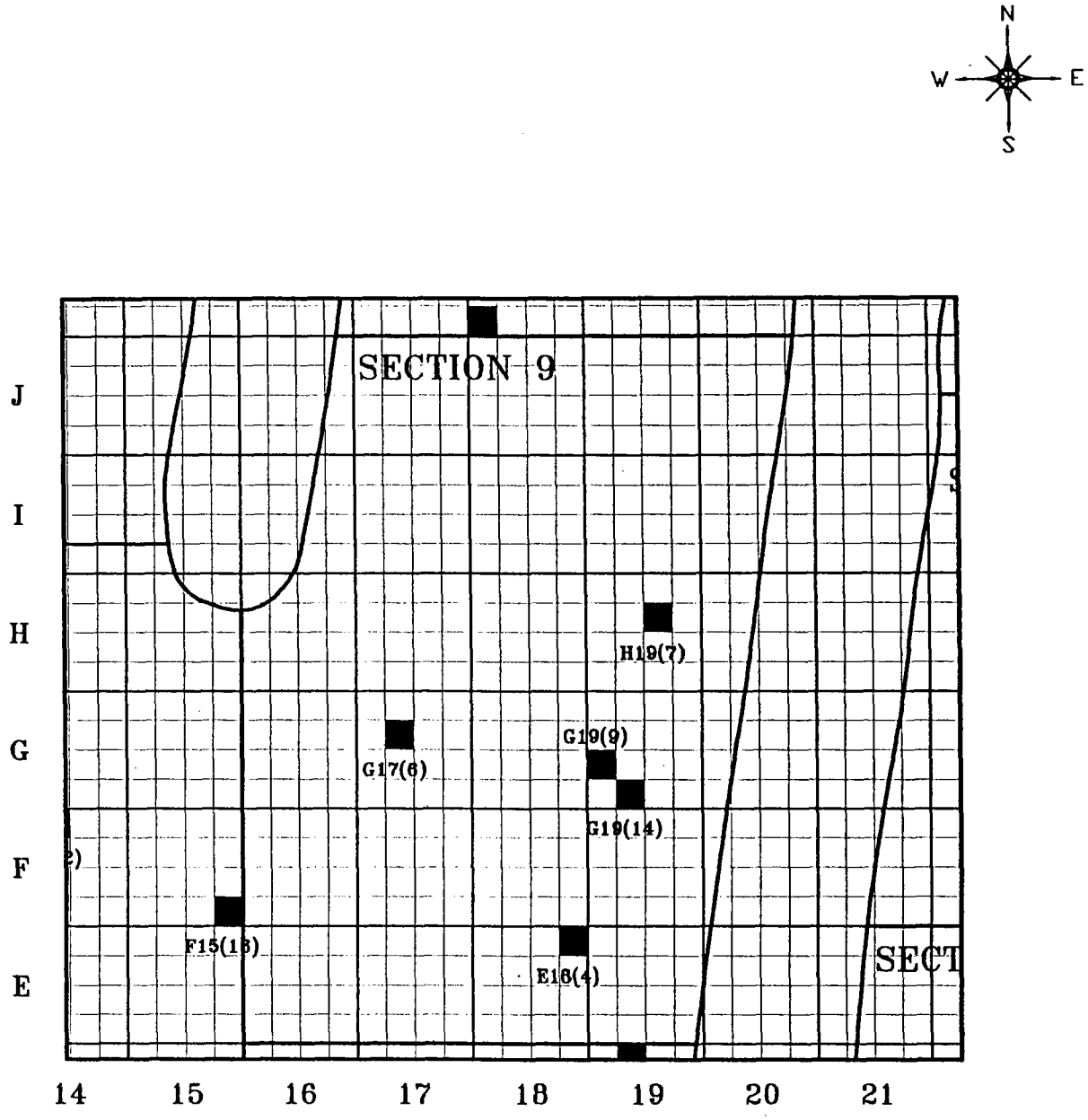
APPROX. SCALE (ft.)
0 30

FIGURE 11

SAMPLING SECTION 8
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC8
DATE: 2/22/93
CHECKED: EDB
MGW
REPORT:
PROJECT: 91070EB



SECTION 9 AREA APPROXIMATELY 9900 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

APPROX. SCALE (ft.)

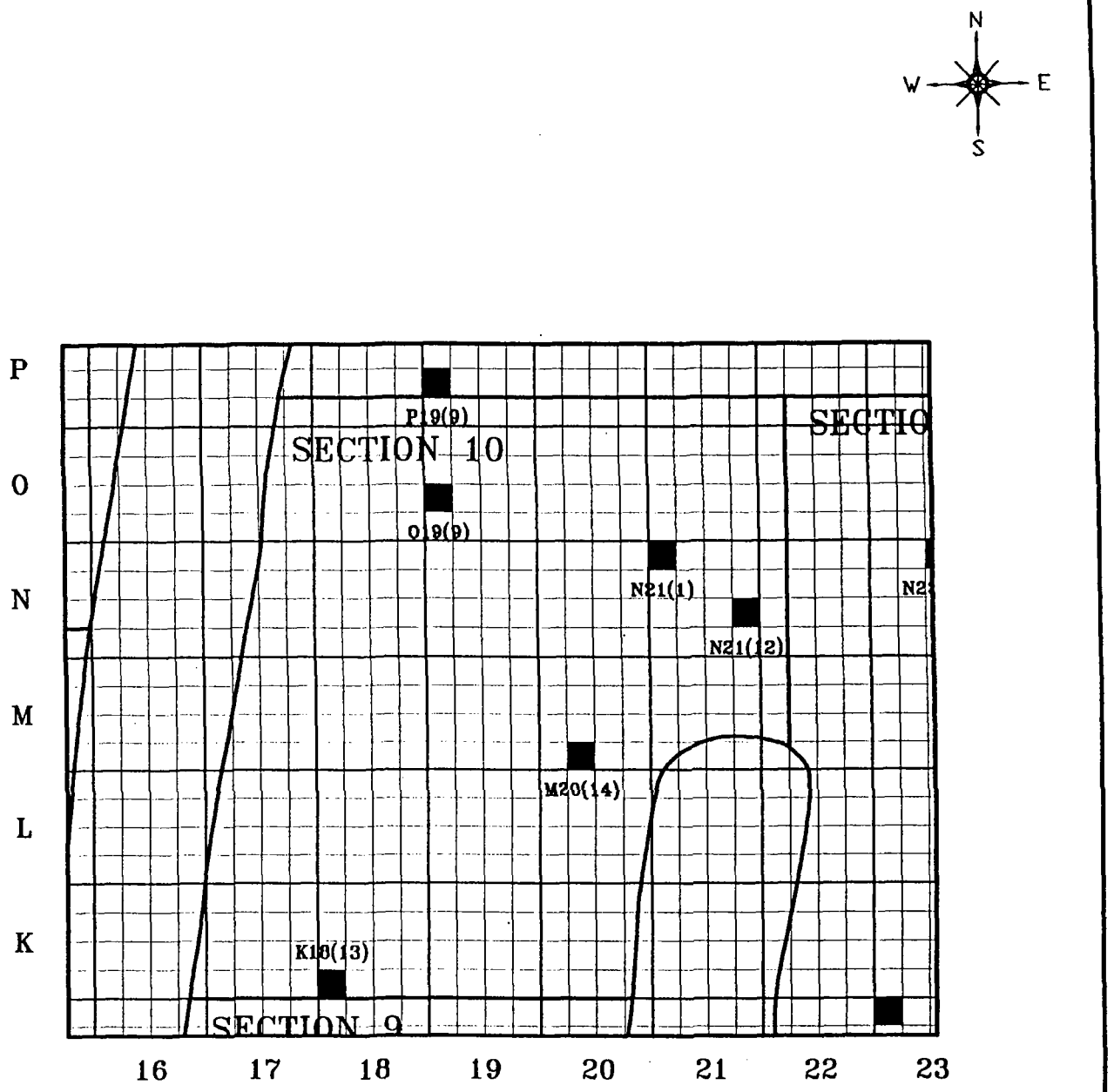
0 30

FIGURE 12

SAMPLING SECTION 9
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC9
DATE: 2/22/93
CHECKED: EDB
MGW
REPORT:
PROJECT: 910703B



SECTION 10 AREA APPROXIMATELY 9700 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

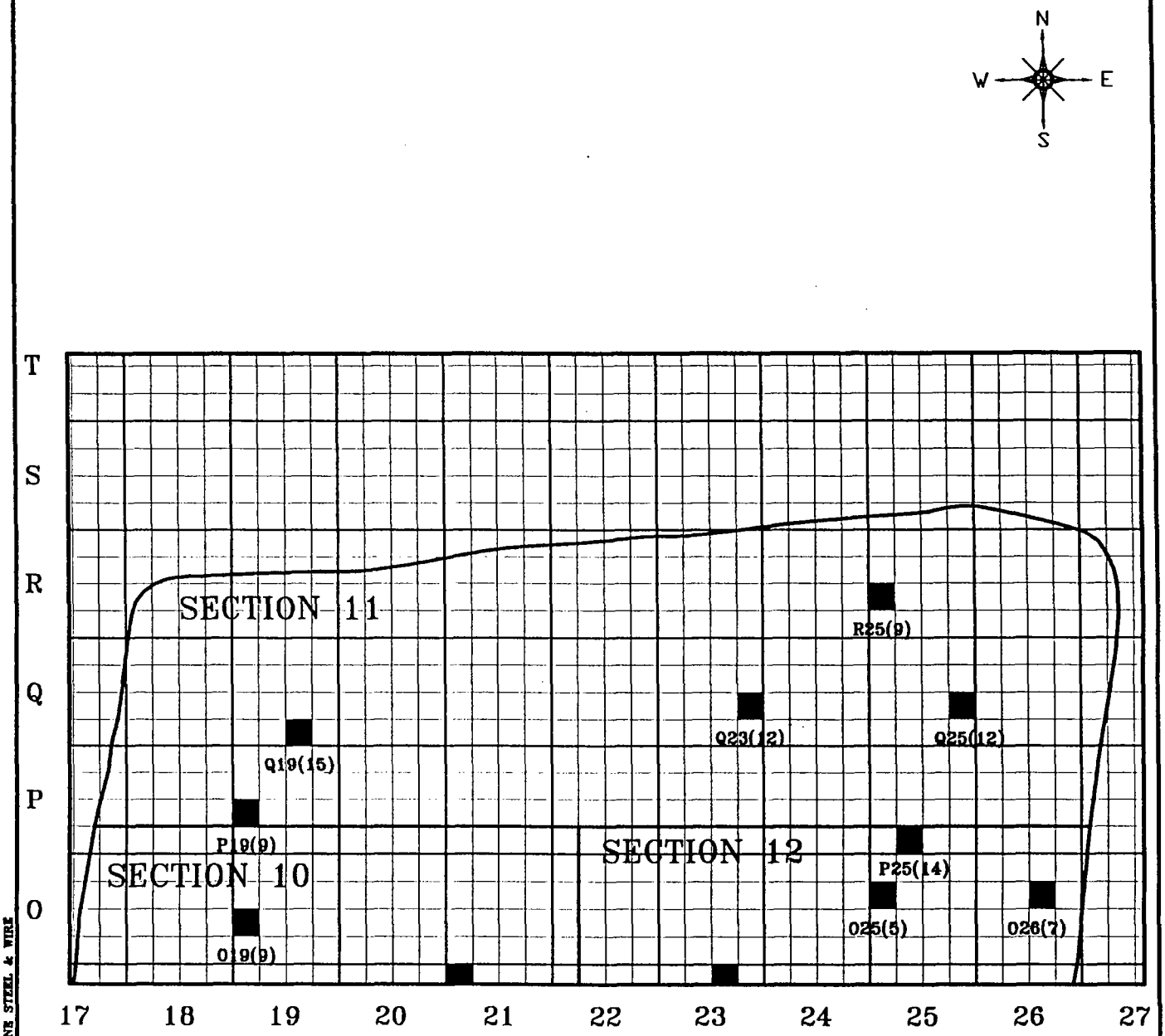
APPROX. SCALE (ft.)
0 30

FIGURE 13

SAMPLING SECTION 10
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC10
DATE: 2/22/93
CHECKED: EDB
MGW
REPORT:
PROJECT: 910702B



SECTION 11 AREA APPROXIMATELY 9800 SQ FT

SYMBOL LEGEND:

■ SAMPLE LOCATION

APPROX. SCALE (ft.)

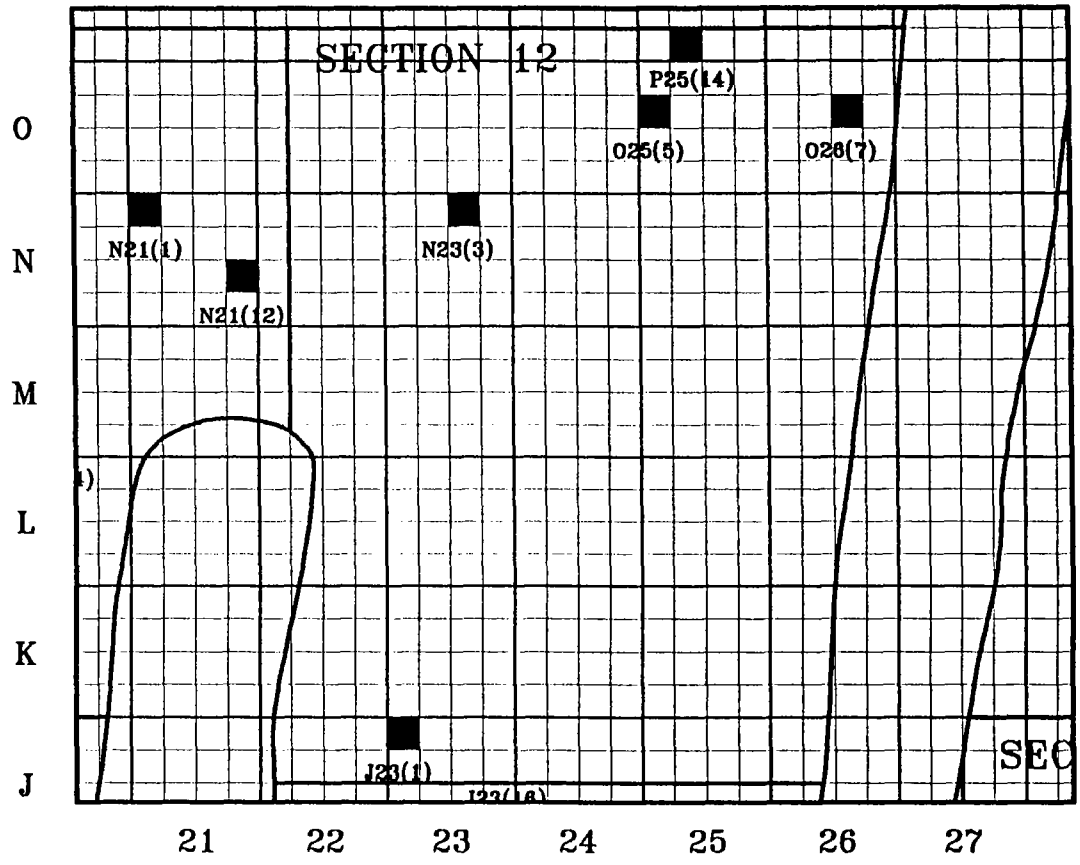
0 30

FIGURE 14

SAMPLING SECTION 11
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC11 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 12 AREA APPROXIMATELY 9800 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

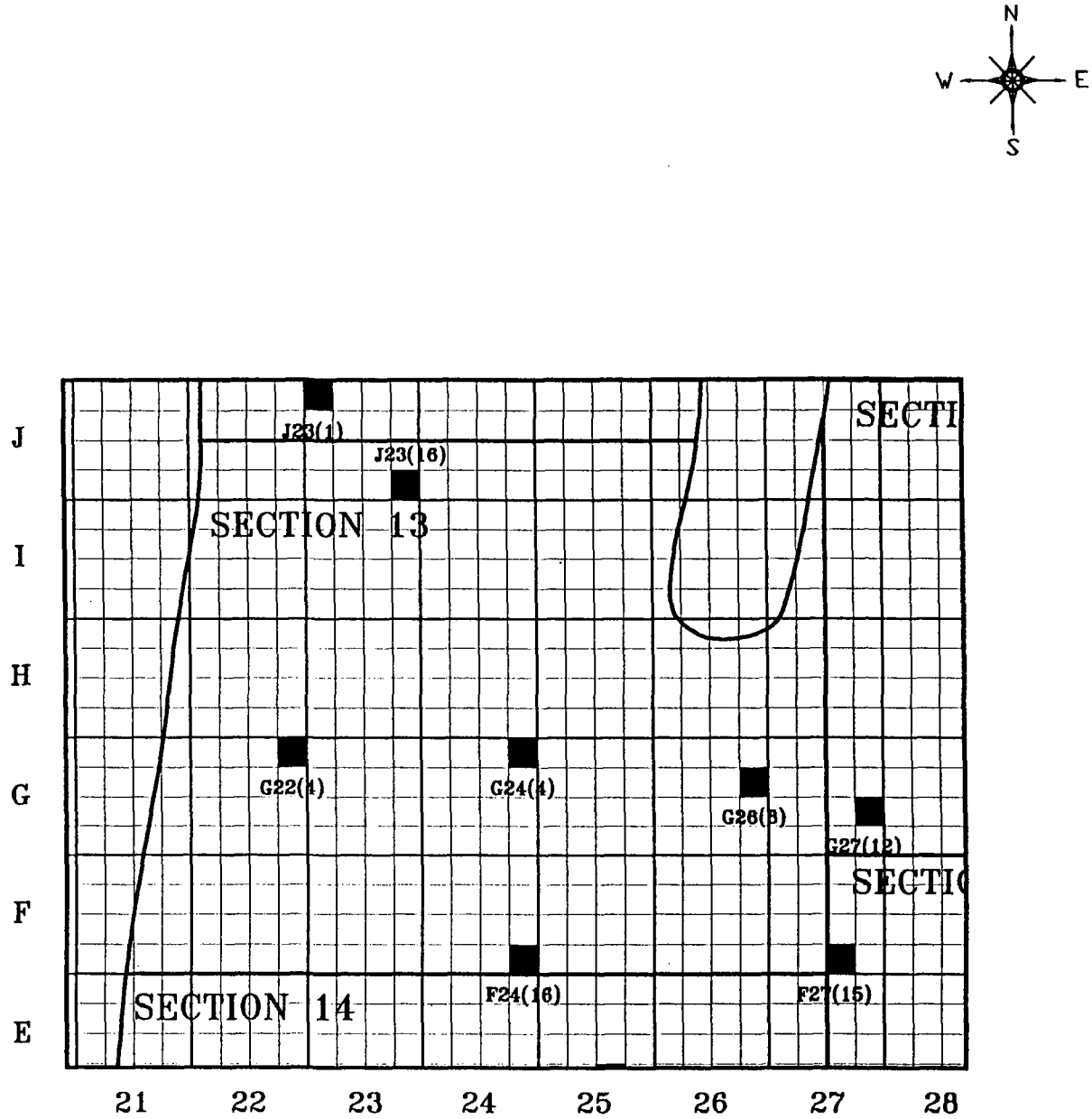
APPROX. SCALE (ft.)
0 30

FIGURE 15

SAMPLING SECTION 12
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC12
DATE: 2/22/93
CHECKED: EDB
MCW
REPORT:
PROJECT: 910703B



SECTION 13 AREA APPROXIMATELY 9600 SQ FT

SYMBOL LEGEND:	
■	SAMPLE LOCATION

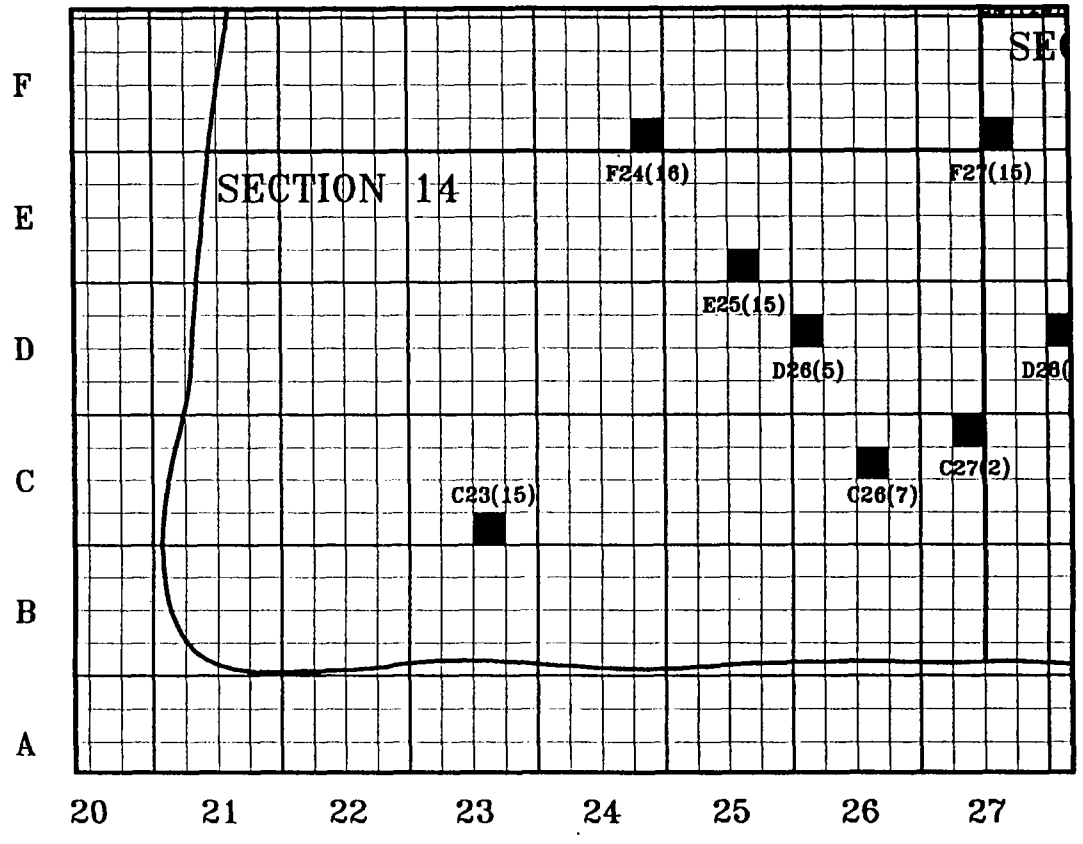
APPROX. SCALE (ft.)
0 30

FIGURE 16

SAMPLING SECTION 13
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC4 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 14 AREA APPROXIMATELY 9800 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

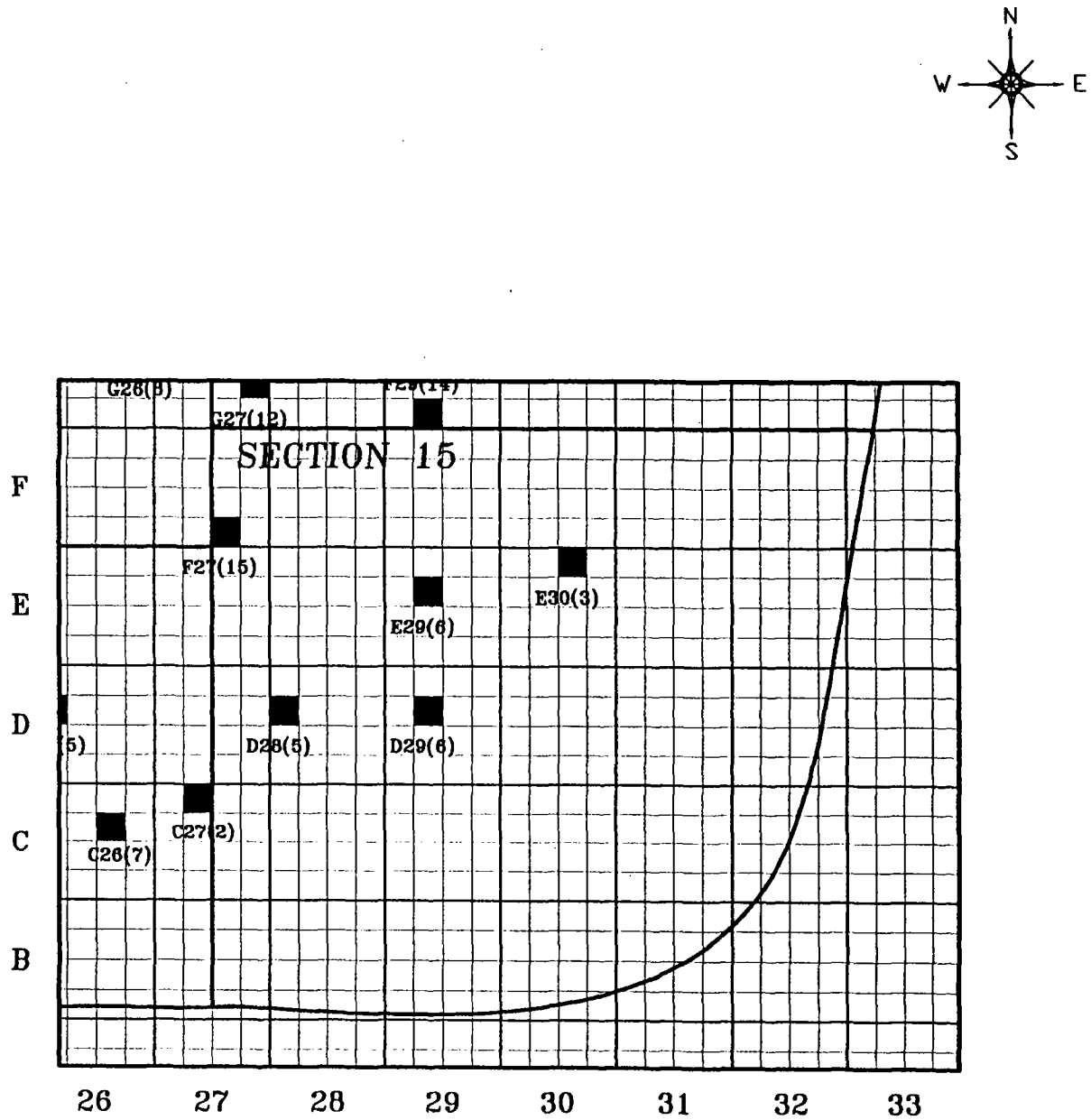
APPROX. SCALE (ft.)
0 30

FIGURE 17

SAMPLING SECTION 14
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC14
DATE: 2/22/93
CHECKED: DDB
DRAWN: MCW
REPORT:
PROJECT: 0107028



SECTION 15 AREA APPROXIMATELY 10000 SQ FT

SYMBOL LEGEND:

■ SAMPLE LOCATION

APPROX. SCALE (ft.)

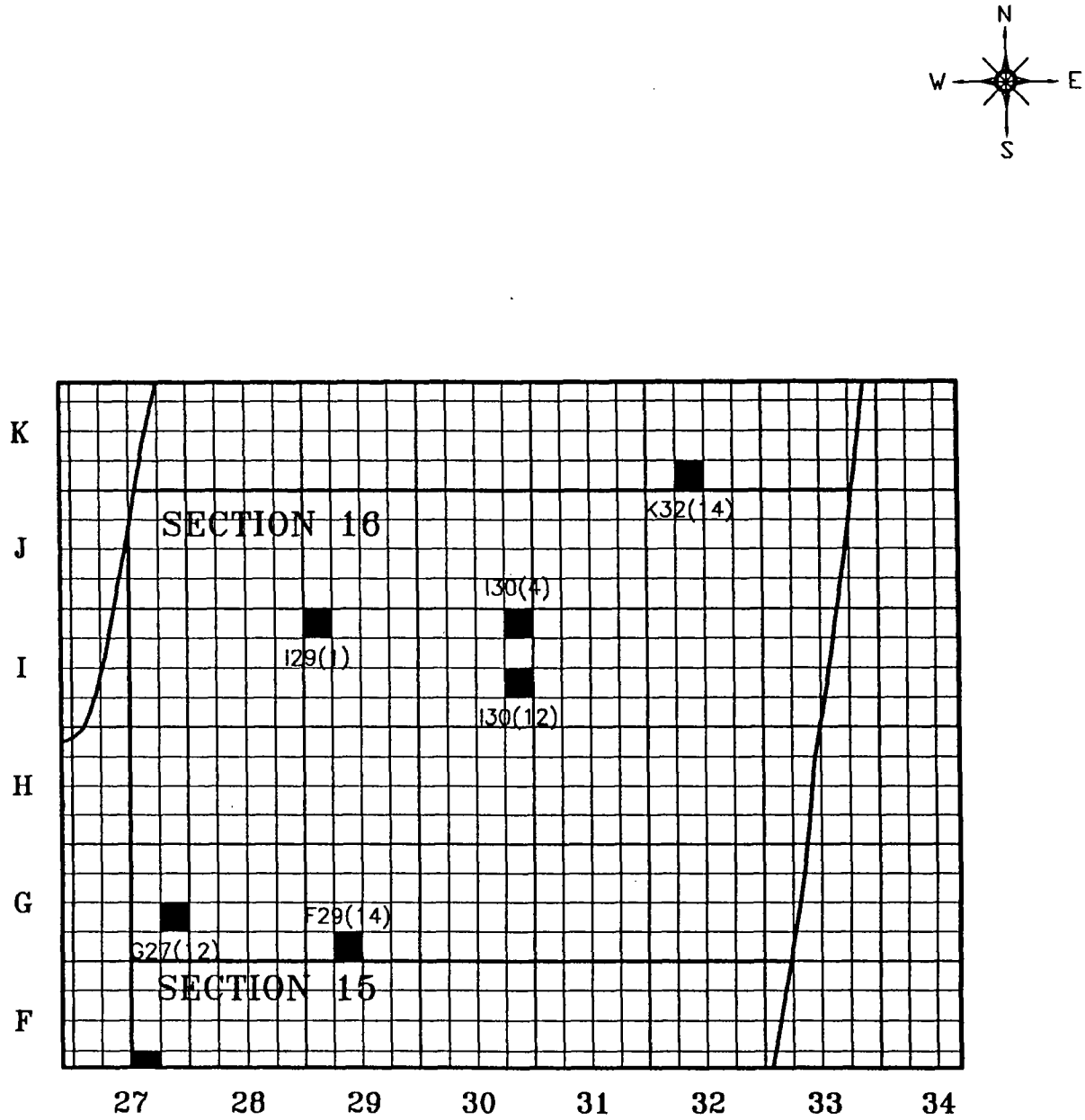
0 30

FIGURE 18

SAMPLING SECTION 15
RANDOM SAMPLE LOCATION
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC15 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 16 AREA APPROXIMATELY 9600 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

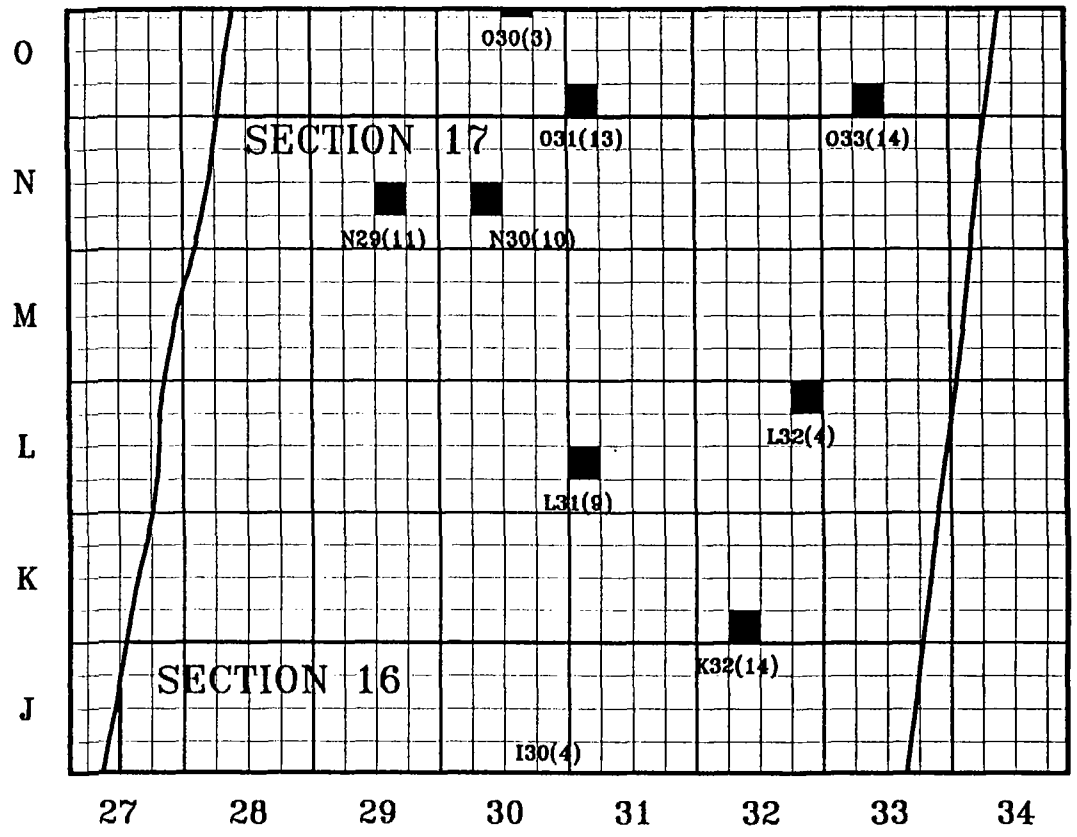
APPROX. SCALE (ft.)
0 30

FIGURE 19

SAMPLING SECTION 16
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 91070EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC16 | CLIENT NAME: KEYSTONE STEEL & WIRE



SECTION 17 AREA APPROXIMATELY 9800 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

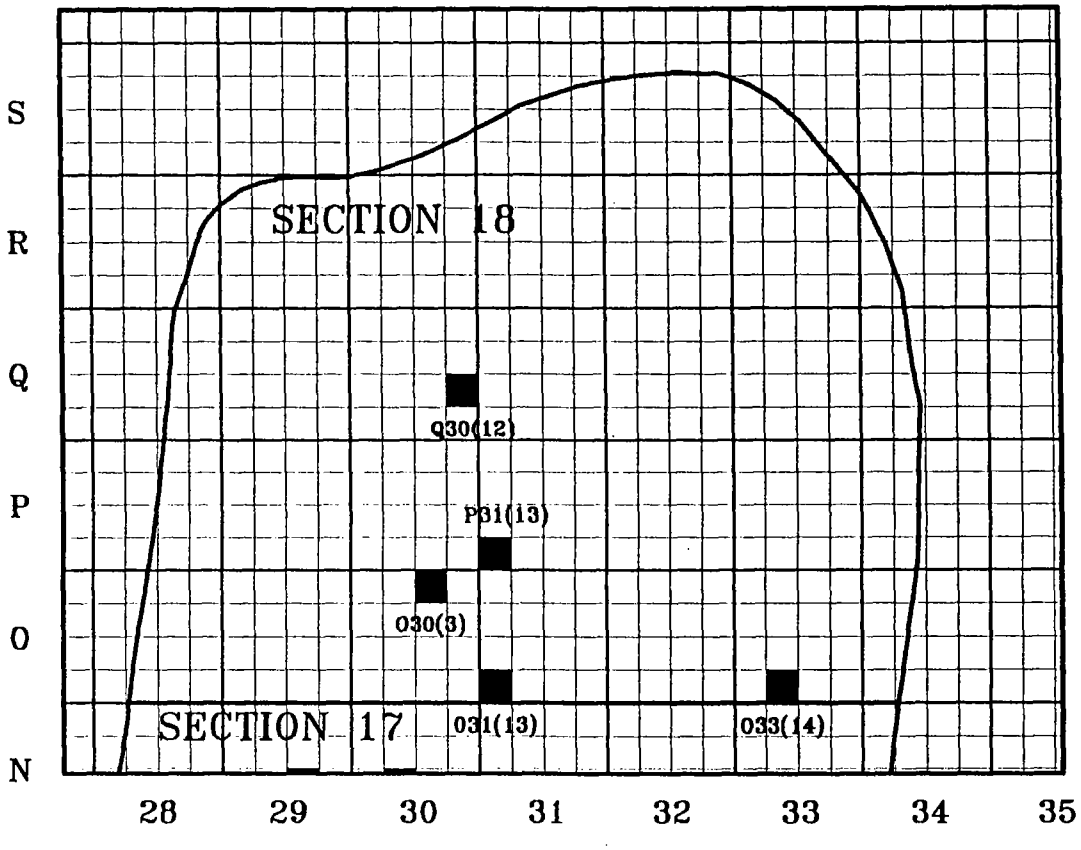
APPROX. SCALE (ft.)
0 30

FIGURE 20

SAMPLING SECTION 17
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC17
DATE: 2/22/93
CHECKED: EDB
DRAWN: MGW
REPORT:
PROJECT: 9107028



SECTION 18 AREA APPROXIMATELY 9900 SQ FT

SYMBOL LEGEND:
■ SAMPLE LOCATION

APPROX. SCALE (ft.)
0 30

FIGURE 21

SAMPLING SECTION 18
RANDOM SAMPLE LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 9107028 | REPORT: | BY: MGW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: SEC18 | CLIENT NAME: KEYSTONE STEEL & WIRE

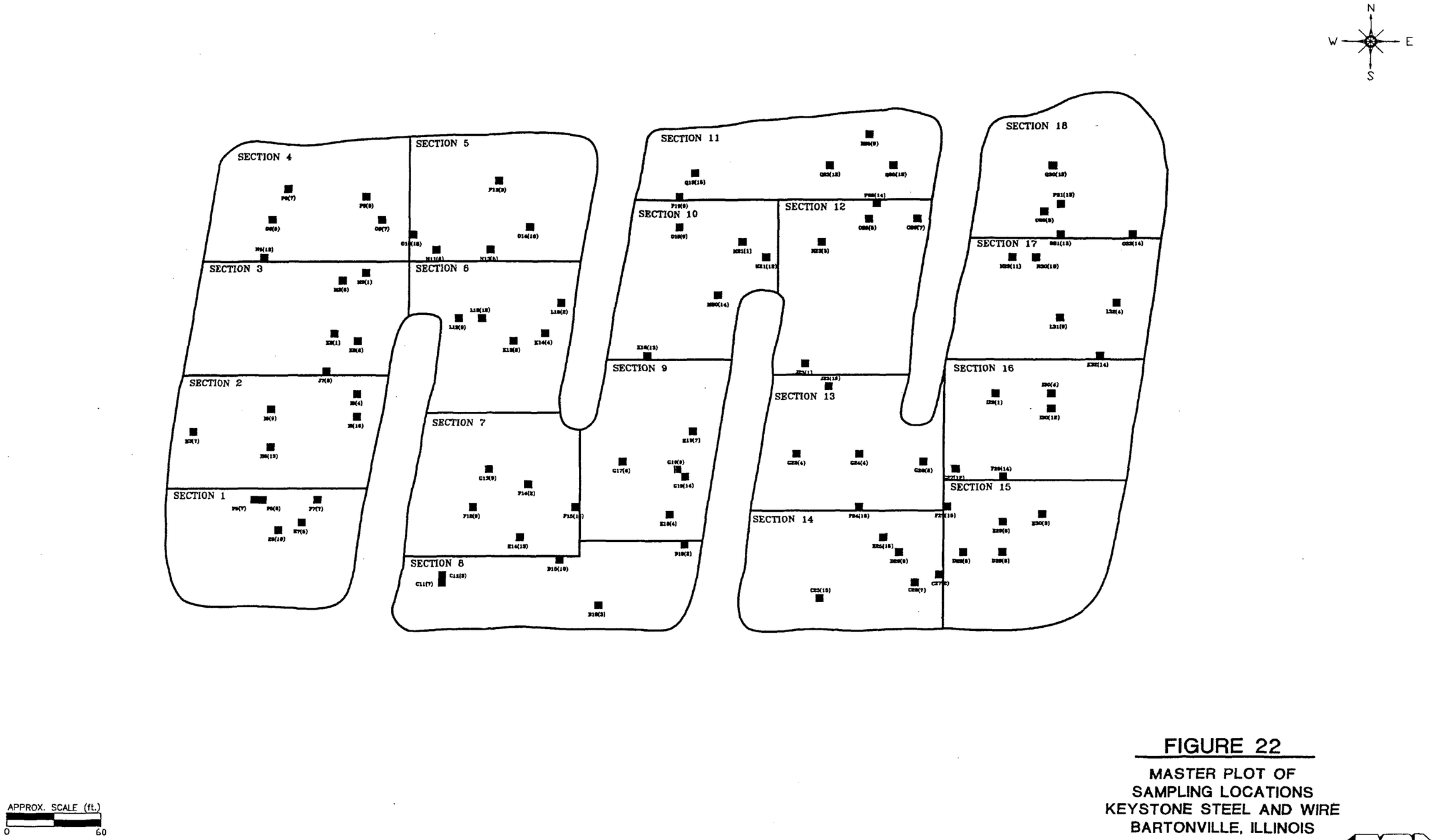
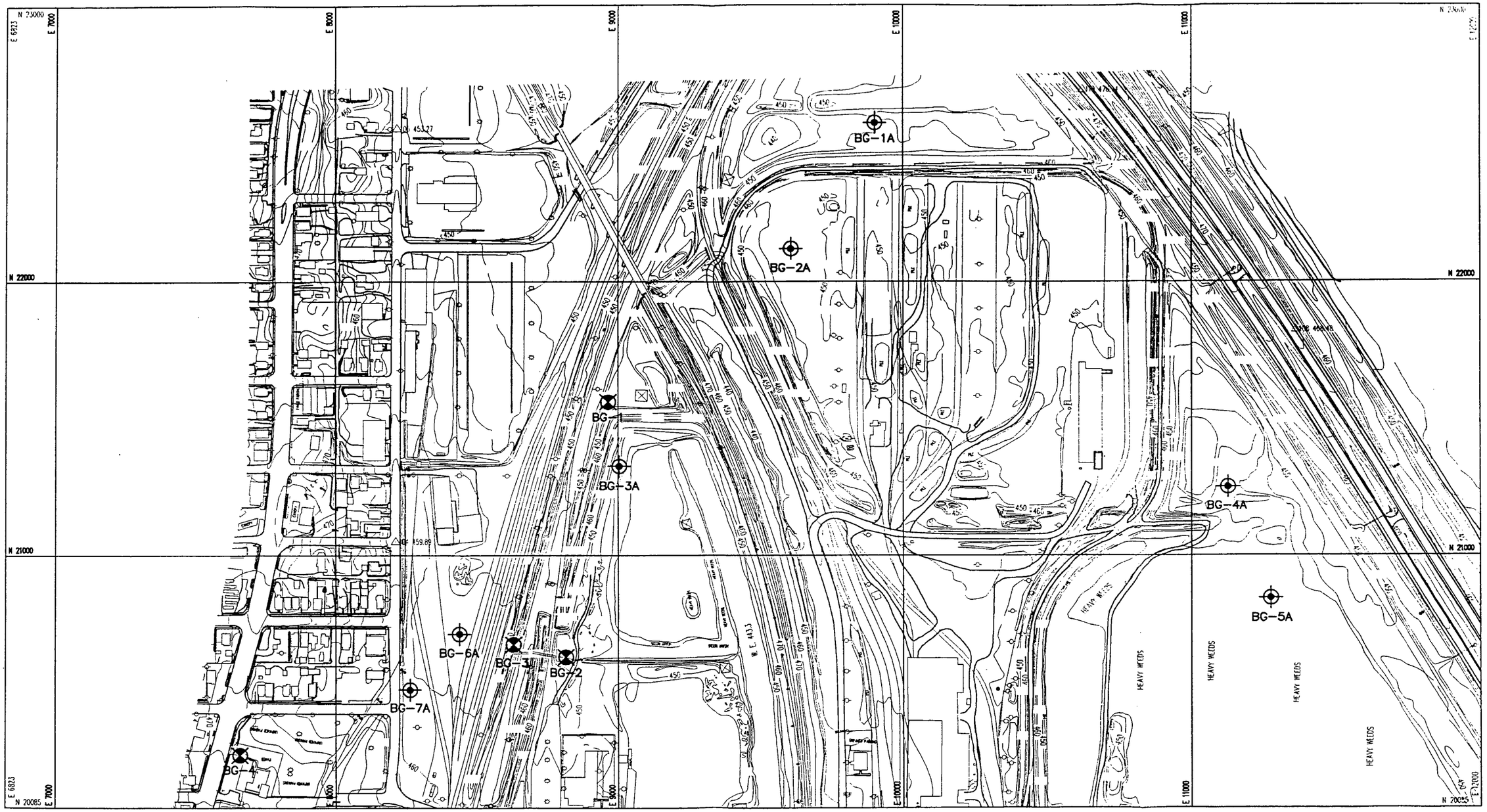


FIGURE 22

MASTER PLOT OF
SAMPLING LOCATIONS
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

ERM

PROJECT: 92138EB | REPORT: | DRAWN: MGW | CHECKED: EDB | DATE: 2/23/93 | FILE NAME: FIG22 | CLIENT NAME: KEYSTONE STEEL AND WIRE



SYMBOL LEGEND:

- BACKGROUND SAMPLE LOCATIONS IDENTIFIED IN THE FIELD WITH IEPA PERSONNEL
- ADDITIONAL BACKGROUND SOIL SAMPLE LOCATIONS

N
W E
S

APPROX. SCALE (ft.)
0 350

FIGURE 23

PAGE 1 OF 3
BACKGROUND SAMPLING LOCATIONS
KEYSTONE STEEL AND WIRE COMPANY
BARTONVILLE, ILLINOIS

ERM

PROJECT:	REPORT:	DRAWN:	CHECKED:	DATE:	FILE NAME:	CLIENT NAME:
92136BB		MGW	EDB	4/12/93		KEYSTONE STEEL AND WIRE COMPANY

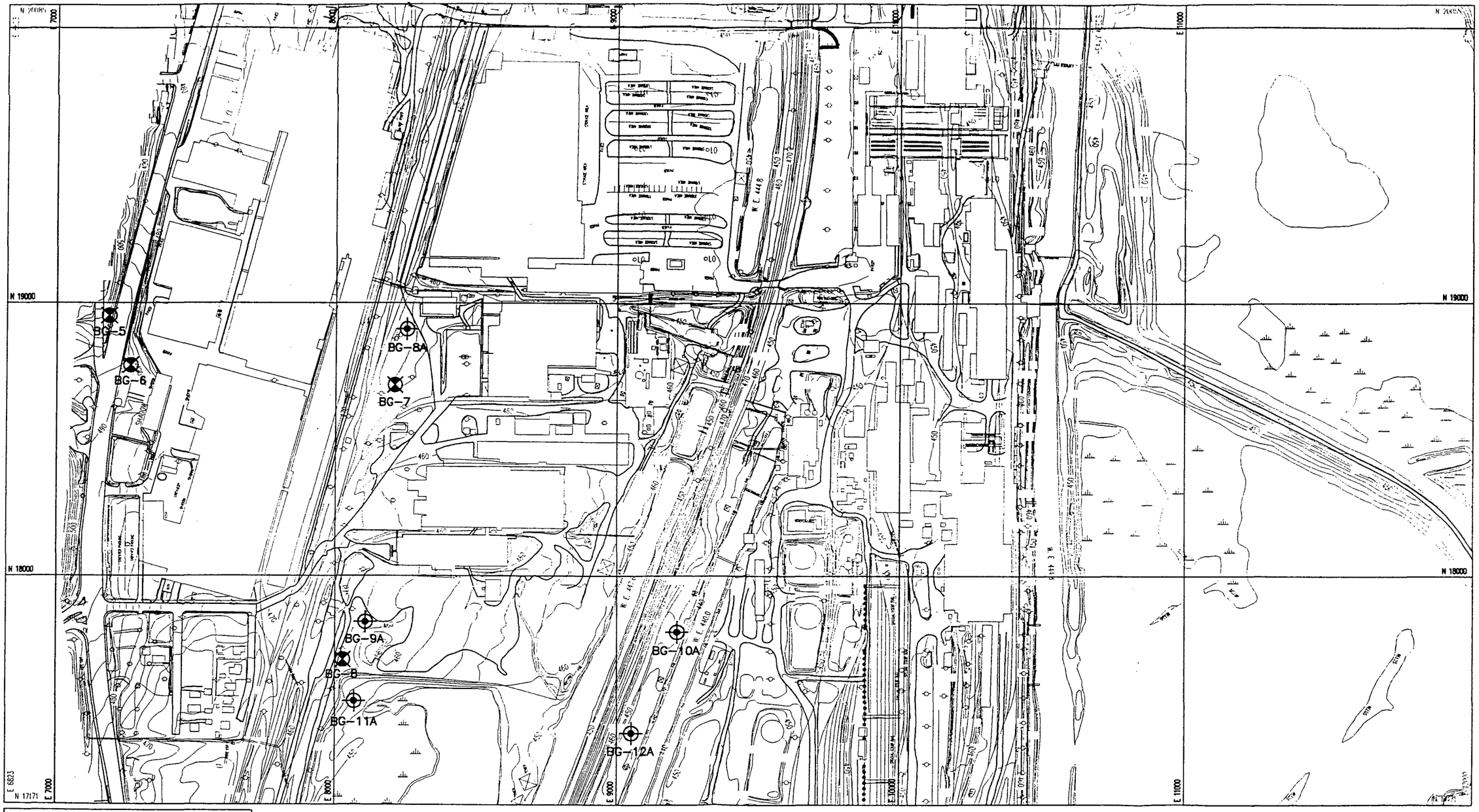
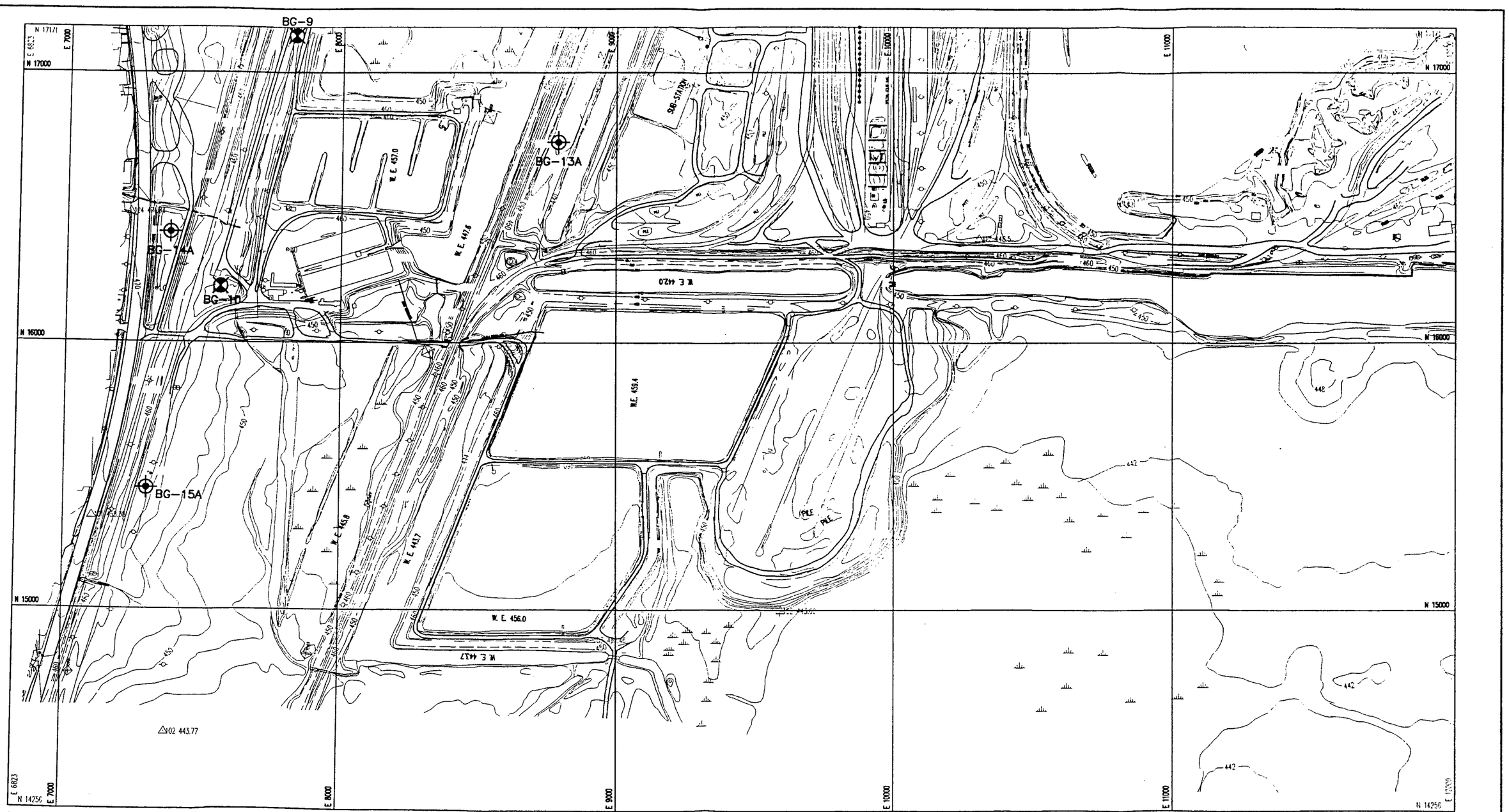


FIGURE 23

PAGE 2 OF 3
BACKGROUND SAMPLING LOCATIONS
KEYSTONE STEEL AND WIRE COMPANY
BARTONVILLE, ILLINOIS

ERM

PROJECT:	REPORT:	DRAWN:	CHECKED:	DATE:	FILE NAME:	CLIENT NAME:
921366B		MGW	EDB	4/12/93		KEYSTONE STEEL AND WIRE COMPANY



SYMBOL LEGEND:

- BACKGROUND SAMPLE LOCATIONS IDENTIFIED IN THE FIELD WITH IEPA PERSONNEL
- ADDITIONAL BACKGROUND SOIL SAMPLE LOCATIONS

N
W E
S

APPROX. SCALE (ft.)
0 350

FIGURE 23

PAGE 3 OF 3
BACKGROUND SAMPLING LOCATIONS
KEYSTONE STEEL AND WIRE COMPANY
BARTONVILLE, ILLINOIS

ERM

PROJECT:	REPORT:	DRAWN:	CHECKED:	DATE:	FILE NAME:	CLIENT NAME:
921365B		MGW	EDB	4/12/93		KEYSTONE STEEL AND WIRE COMPANY

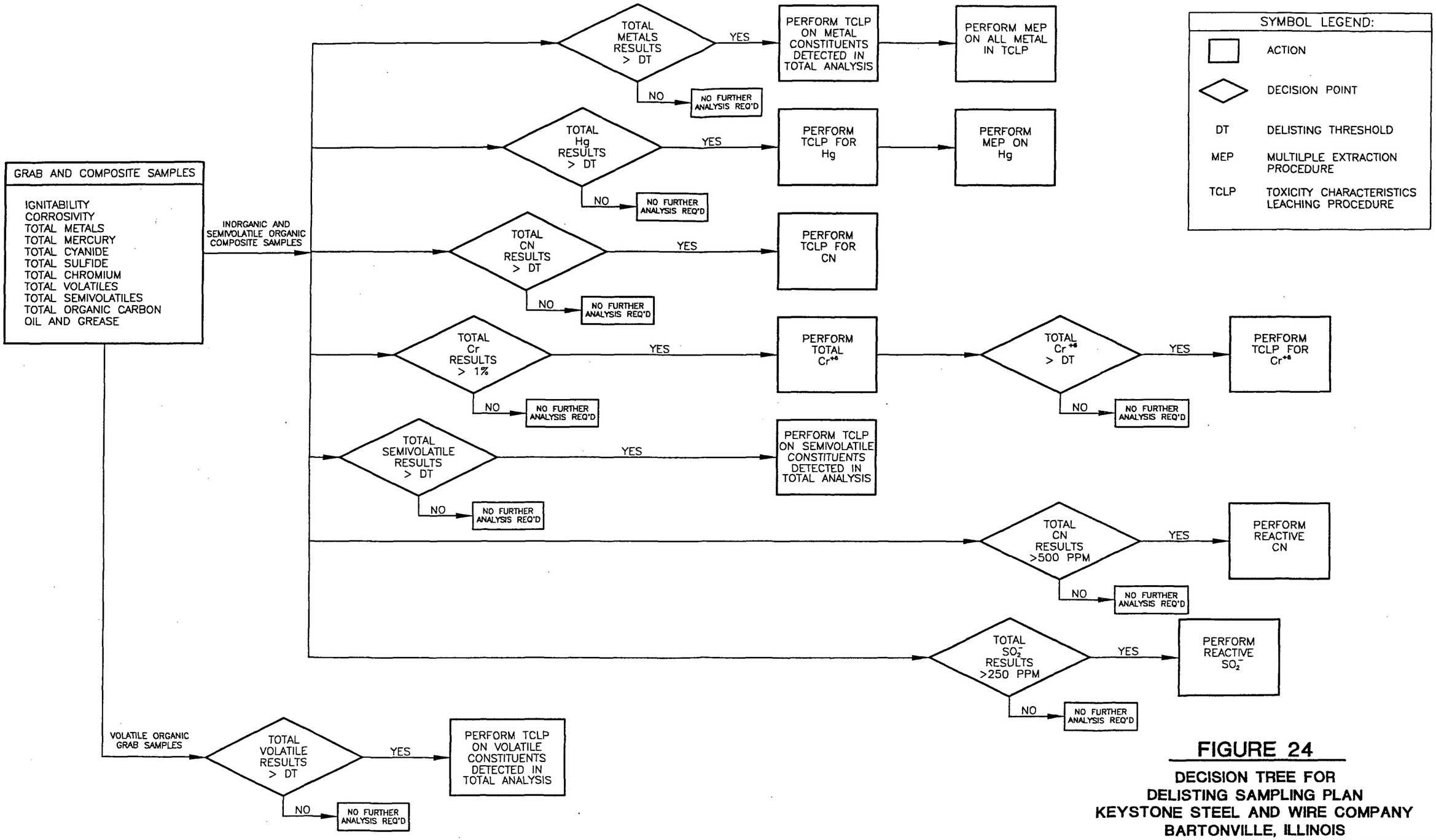


FIGURE 24

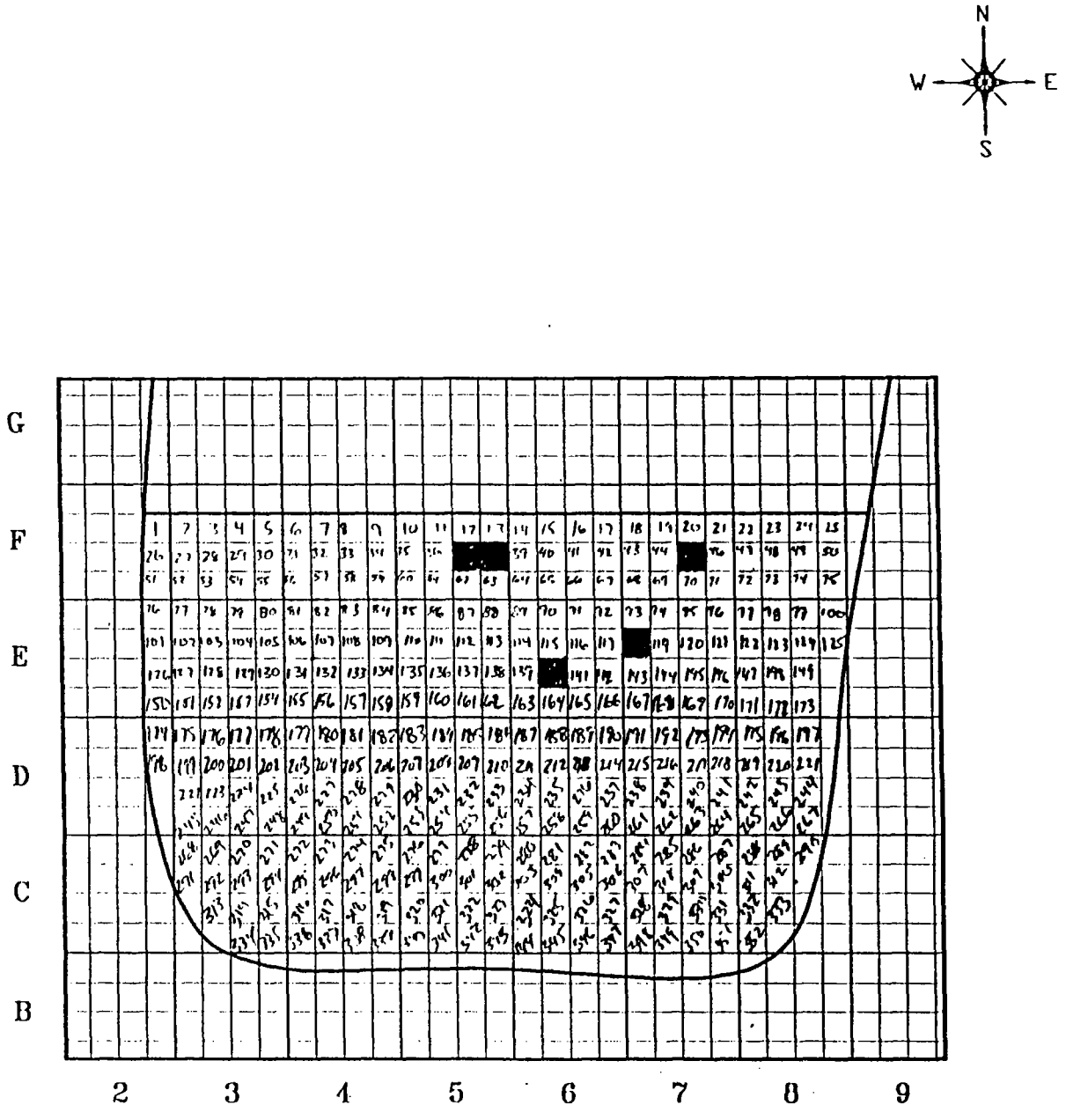
DECISION TREE FOR DELISTING SAMPLING PLAN KEYSTONE STEEL AND WIRE COMPANY BARTONVILLE, ILLINOIS

ERM

PROJECT: 92138BB | REPORT: DEL | DRAWN: MGW | CHECKED: KDB | DATE: 4/8/93 | FILE NAME: | CLIENT NAME: KEYSTONE STEEL & WIRE COMPANY

APPENDIX A

SAMPLE LOCATION WORKSHEETS



SECTION 1 AREA APPROXIMATELY 9400 SQ FT

APPENDIX

SAMPLING SECTION 1
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME KEYSTONE STEEL & WIRE
FILE NAME SEC1
DATE 2/22/93
CHECKED EDB
PROJECT 9107028

RANDOM NUMBER GENERATION
SECTION 1

This program will generate 15 random numbers for you.

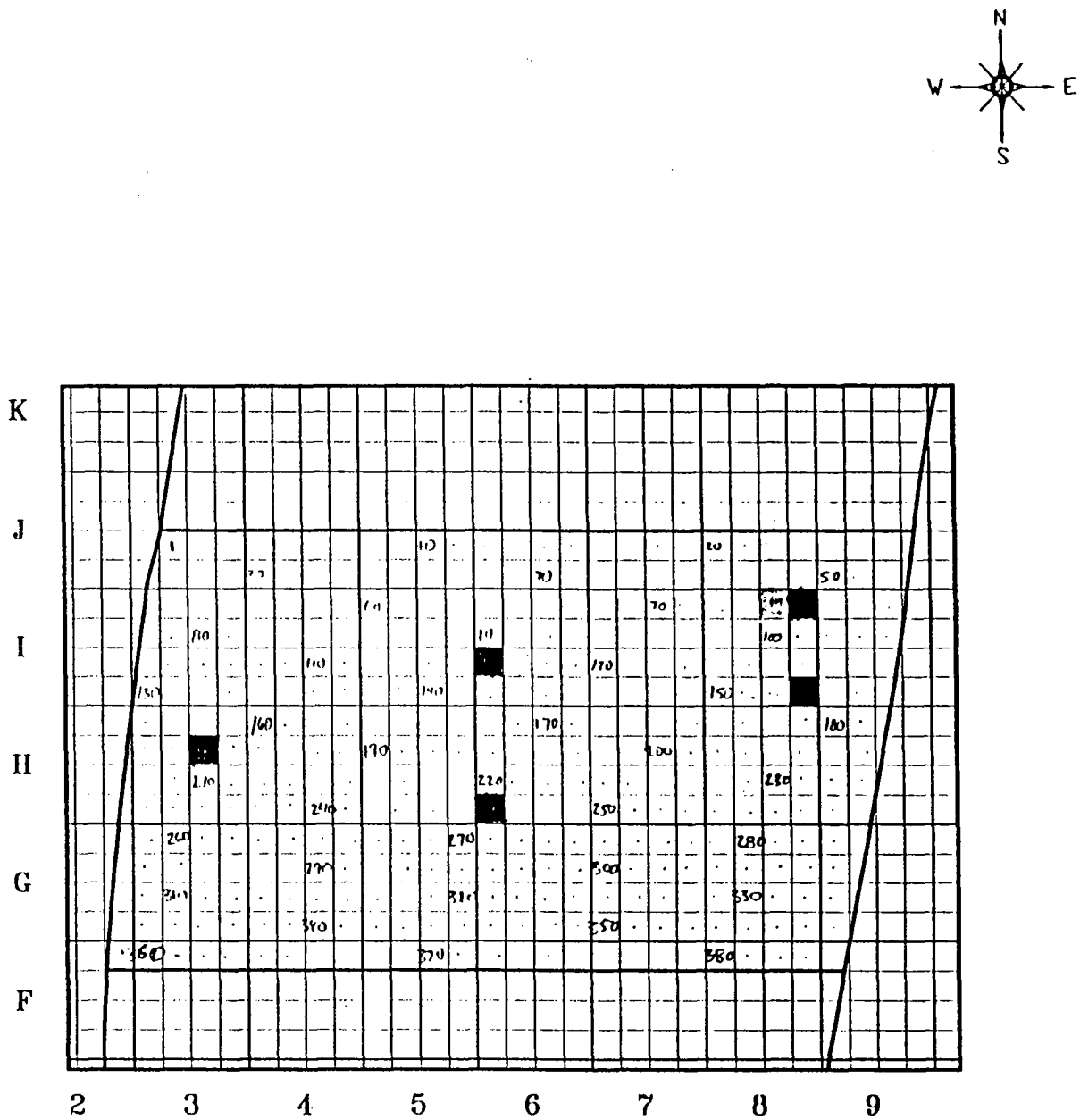
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 352

Your 15 Random Numbers are:

45	329	177
140	184	195
118	49	74
37	147	298
38	207	127



SECTION 2 AREA APPROXIMATELY 9900 SQ FT

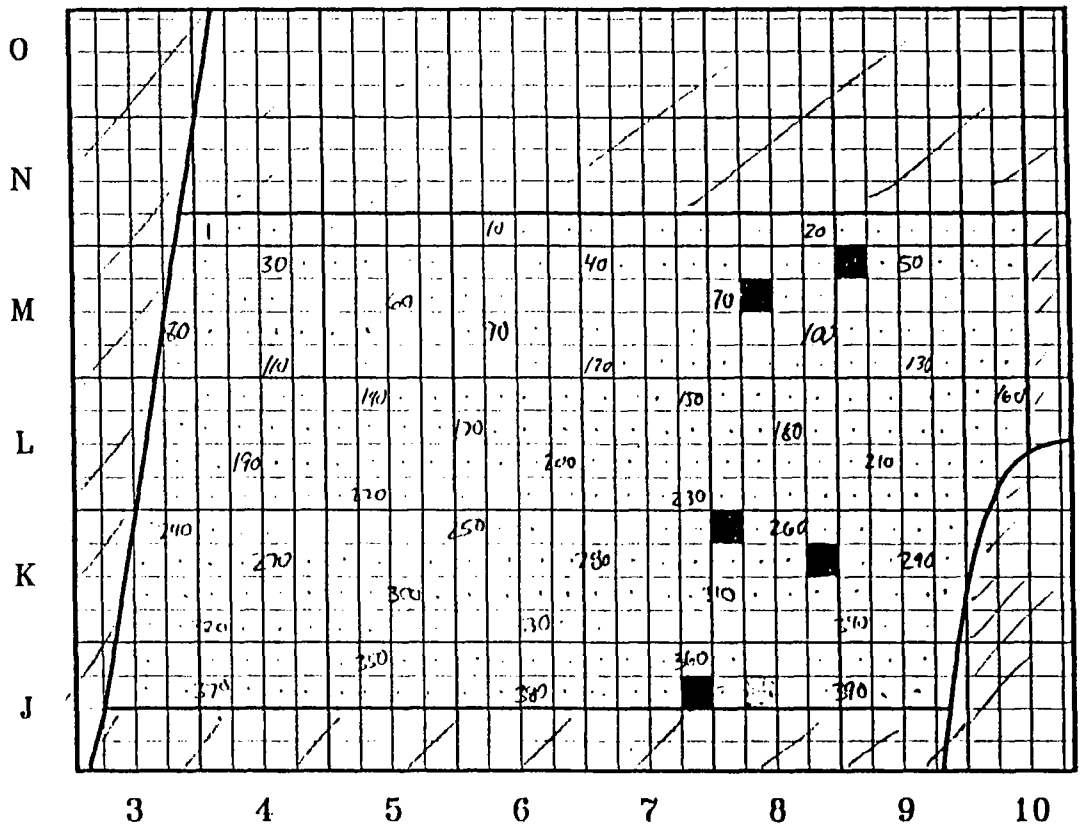
APPENDIX

SAMPLING SECTION 2
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

PROJECT	91070EB
REPORT	
DR	MGW
CHECKED	EDB
DATE	2/22/93
FILE NAME	SEC2
CLIENT NAME	KEYSTONE STEEL & WIRE



SECTION 3 AREA APPROXIMATELY 10000 SQ FT

APPENDIX

SAMPLING SECTION 3
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC3
DATE: 2/22/93
CHECKED: EDB
SAMPLED: MGW
REPORT:
PROJECT: 91070EB

RANDOM NUMBER GENERATION
SECTION 3

This program will generate 15 random numbers for you.

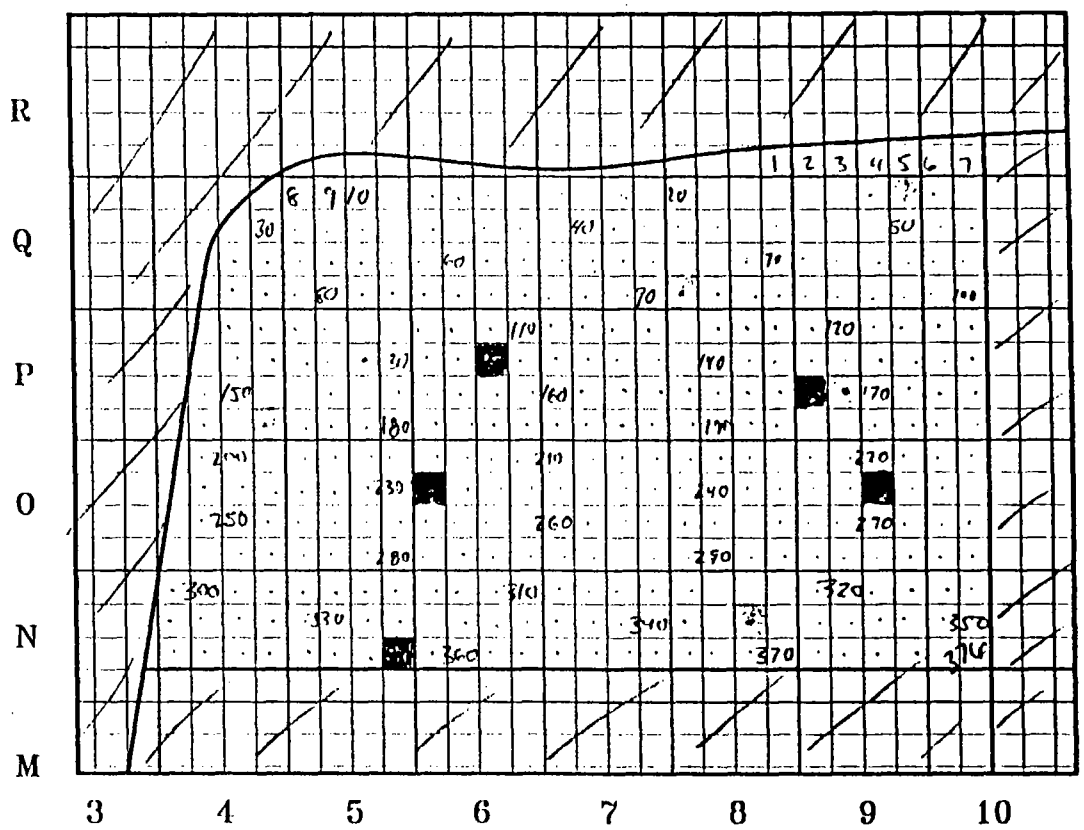
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 392

Your 15 Random Numbers are:

287	92	191
258	382	285
71	334	144
48	223	264
385	11	118



SECTION 4 AREA APPROXIMATELY 9800 SQ FT

APPENDIX

SAMPLING SECTION 4
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC4
DATE: 2/22/93
CHECKED: EDB
BY: MGW
REPORT:
PROJECT: 9107028

RANDOM NUMBER GENERATION
SECTION 4

This program will generate 15 random numbers for you.

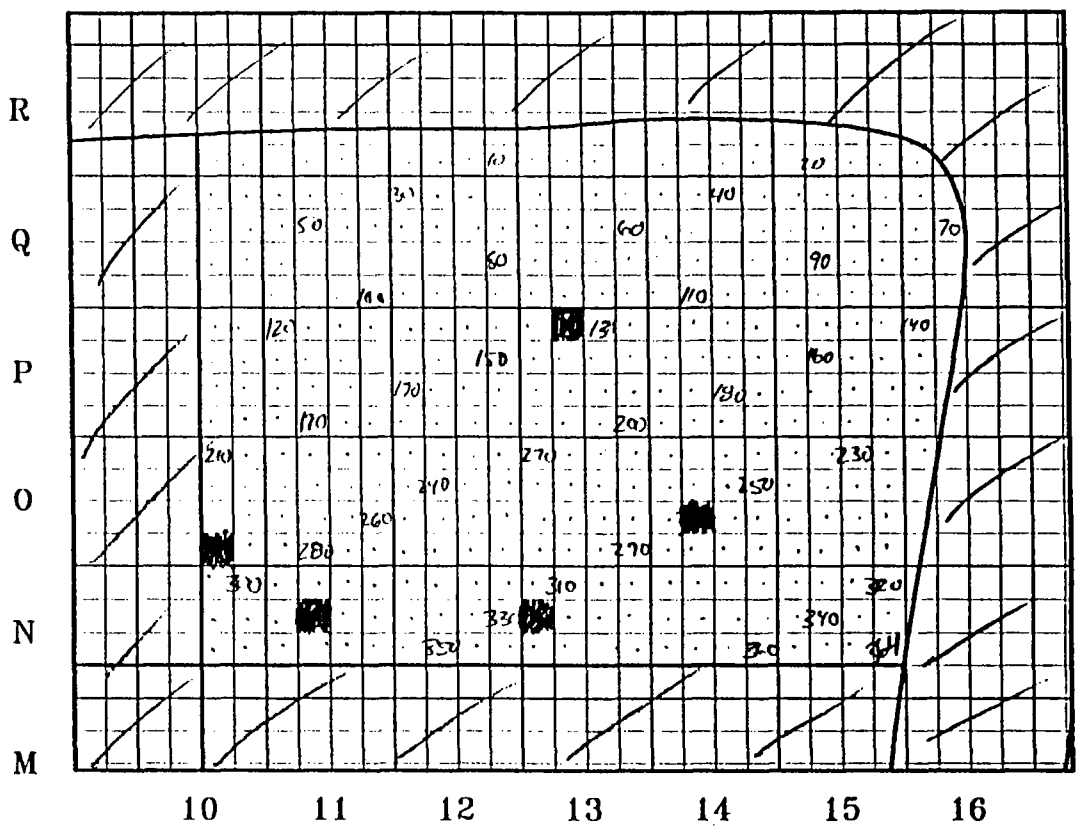
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 376

Your 15 Random Numbers are:

168	363	43
133	213	191
358	371	164
245	352	15
231	238	115



SECTION 5 AREA APPROXIMATELY 9600 SQ FT

APPENDIX

SAMPLING SECTION 5
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC5
DATE: 2/22/93
CHECKED: EDB
REPORT:
PROJECT: 910702B

RANDOM NUMBER GENERATION
SECTION 5

This program will generate 15 random numbers for you.

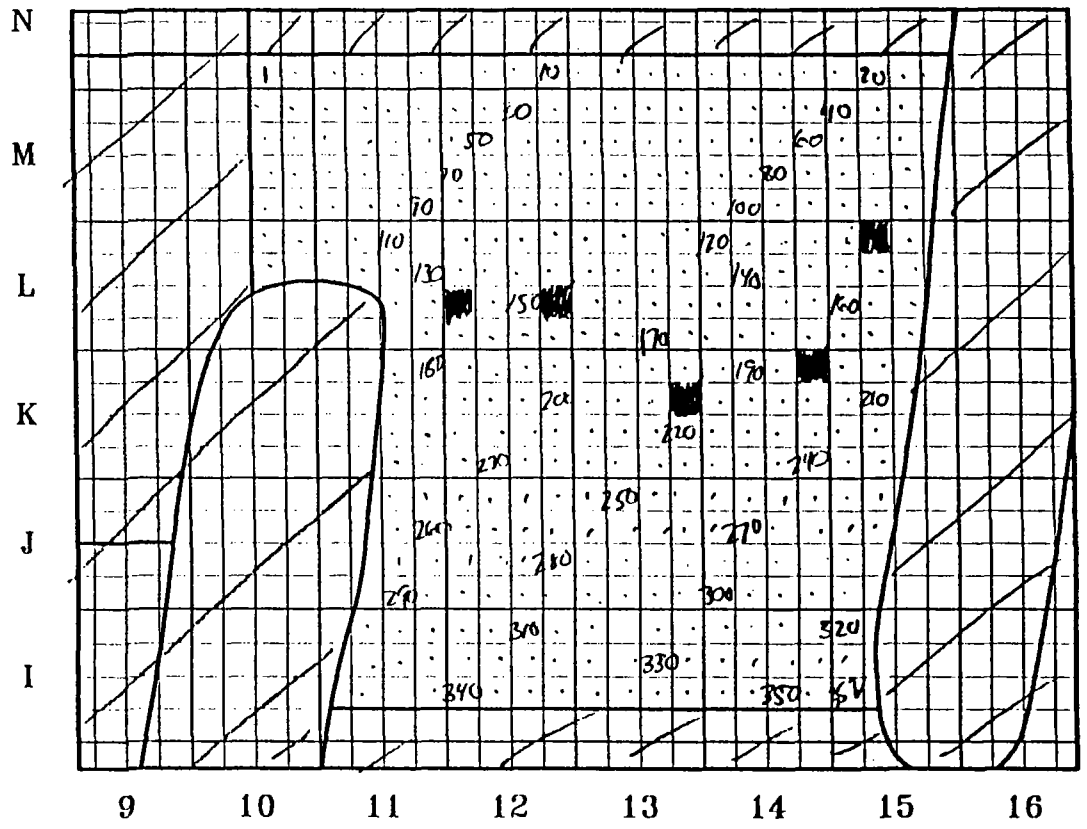
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 364

Your 15 Random Numbers are:

270	96	168
324	208	290
277	199	141
129	202	153
331	147	247



SECTION 6 AREA APPROXIMATELY 9200 SQ FT

APPENDIX

SAMPLING SECTION 6
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC6
DATE: 2/22/93
CHECKED: EDB
PROJECT: 9107028

RANDOM NUMBER GENERATION
SECTION 6

This program will generate 15 random numbers for you.

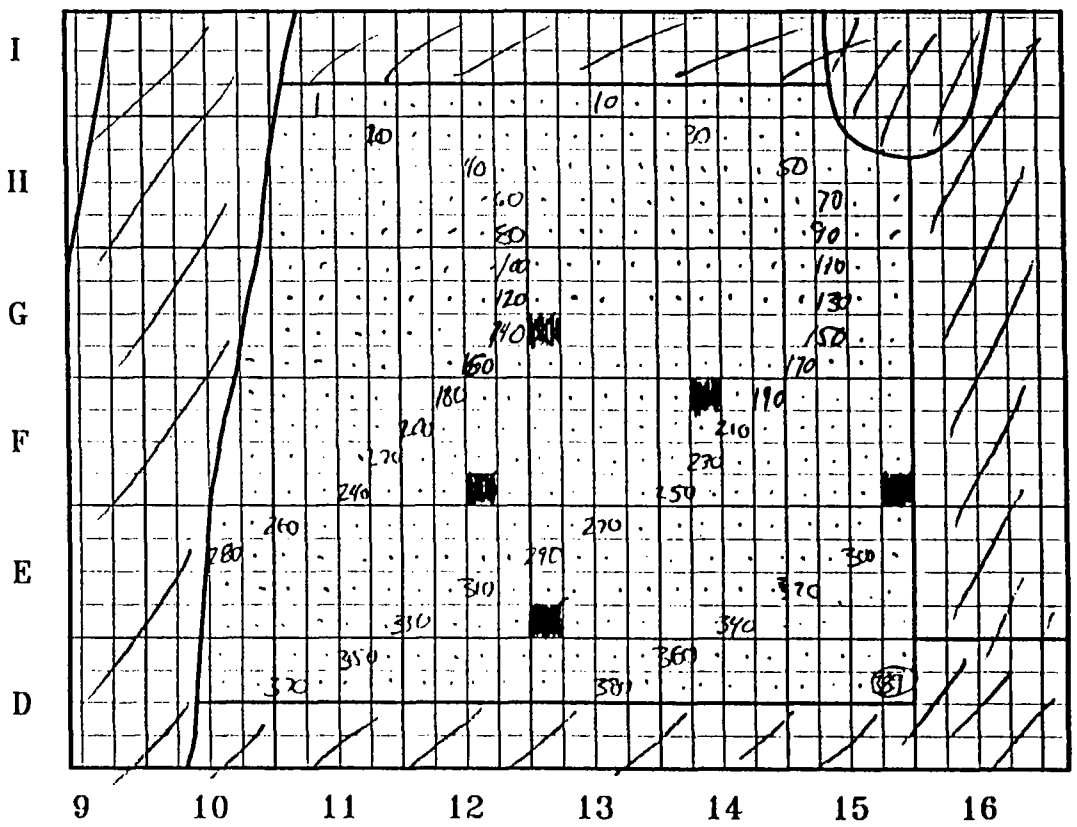
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 352

Your 15 Random Numbers are:

192	168	210
204	125	278
151	45	78
148	201	336
125	292	117



SECTION 7 AREA APPROXIMATELY 10000 SQ FT

APPENDIX

SAMPLING SECTION 7
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME KEYSTONE STEEL & WIRE
FILE NAME SEC7
DATE 2/22/93
DRAWN ZDB
PROJECT 91070EB

RANDOM NUMBER GENERATION
SECTION 7

This program will generate 15 random numbers for you.

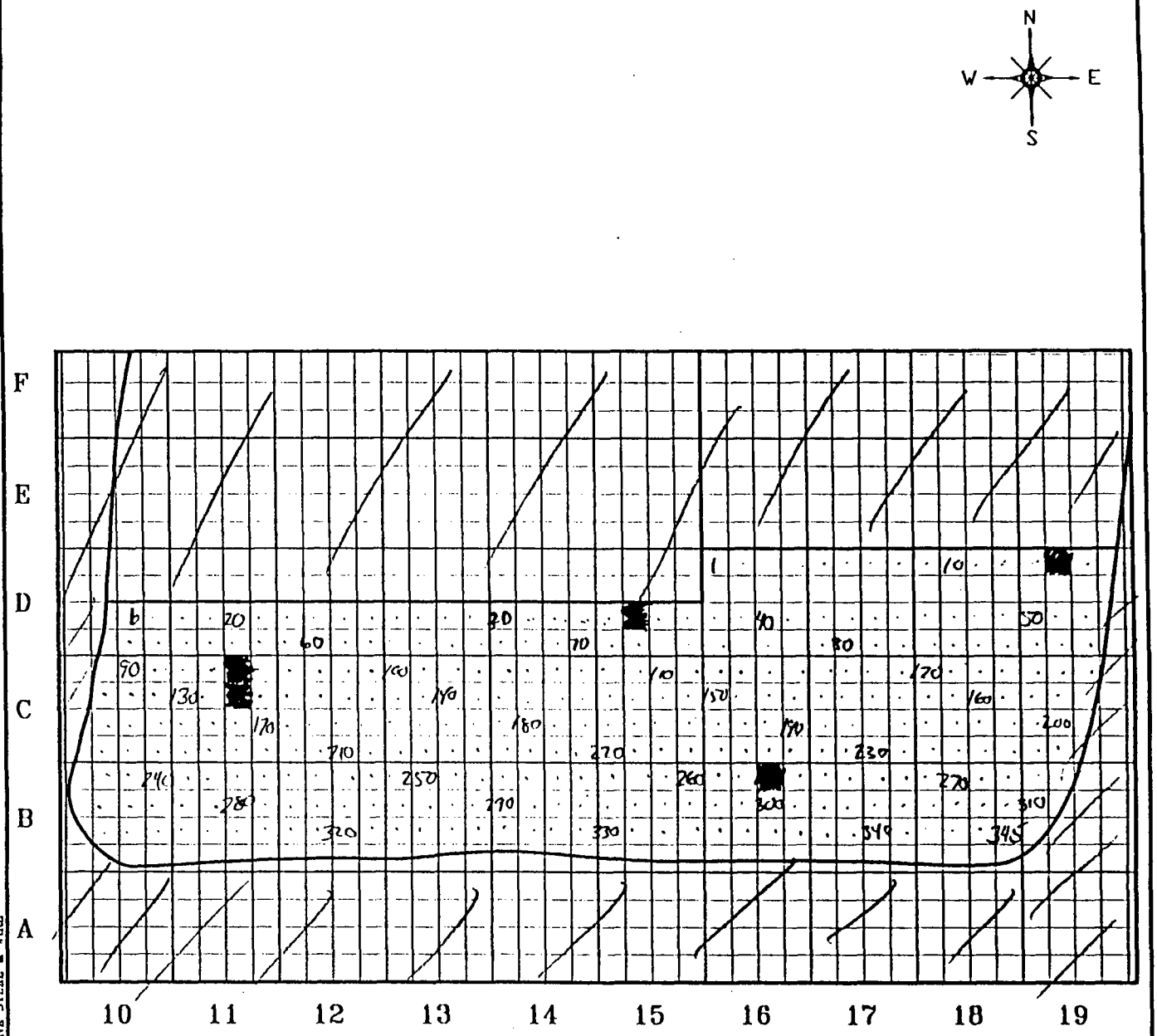
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 389

Your 15 Random Numbers are:

257	330	376
244	124	249
334	85	135
188	355	330
141	98	317



SECTION 8 AREA APPROXIMATELY 9700 SQ FT

APPENDIX

SAMPLING SECTION 8
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC8
DATE: 2/22/93
CHECKED: EDB
REPORT:
PROJECT: 91070EB

RANDOM NUMBER GENERATION
SECTION 8

This program will generate 15 random numbers for you.

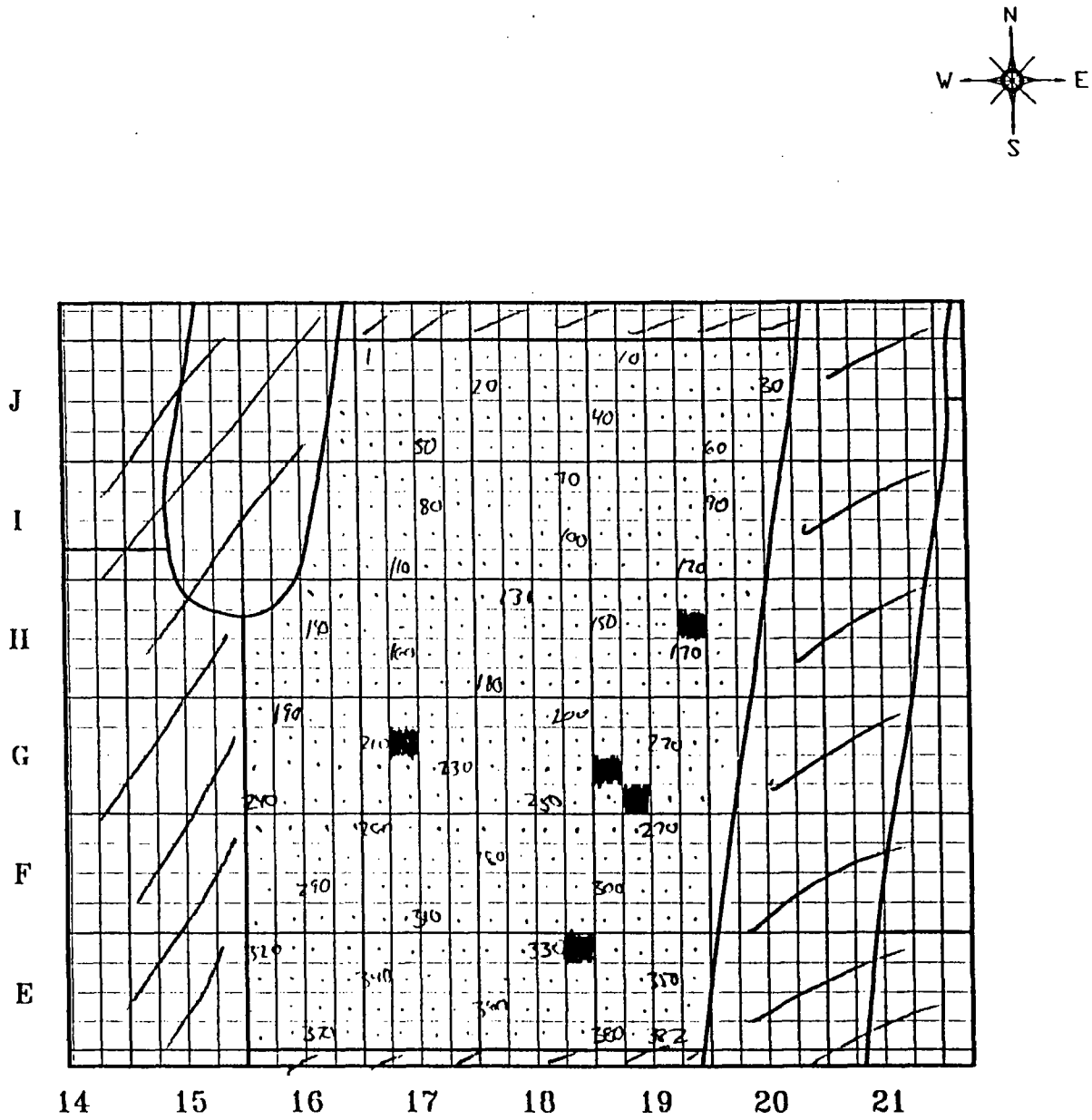
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 345

Your 15 Random Numbers are:

94	35	108
14	320	324
132	28	107
263	48	322
35	29	240



SECTION 9 AREA APPROXIMATELY 9900 SQ FT

APPENDIX

SAMPLING SECTION 9
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC9
DATE: 2/22/93
CHECKED: EDB
REPORT: MGW
PROJECT: 91070EB

RANDOM NUMBER GENERATION
SECTION 9

This program will generate 15 random numbers for you.

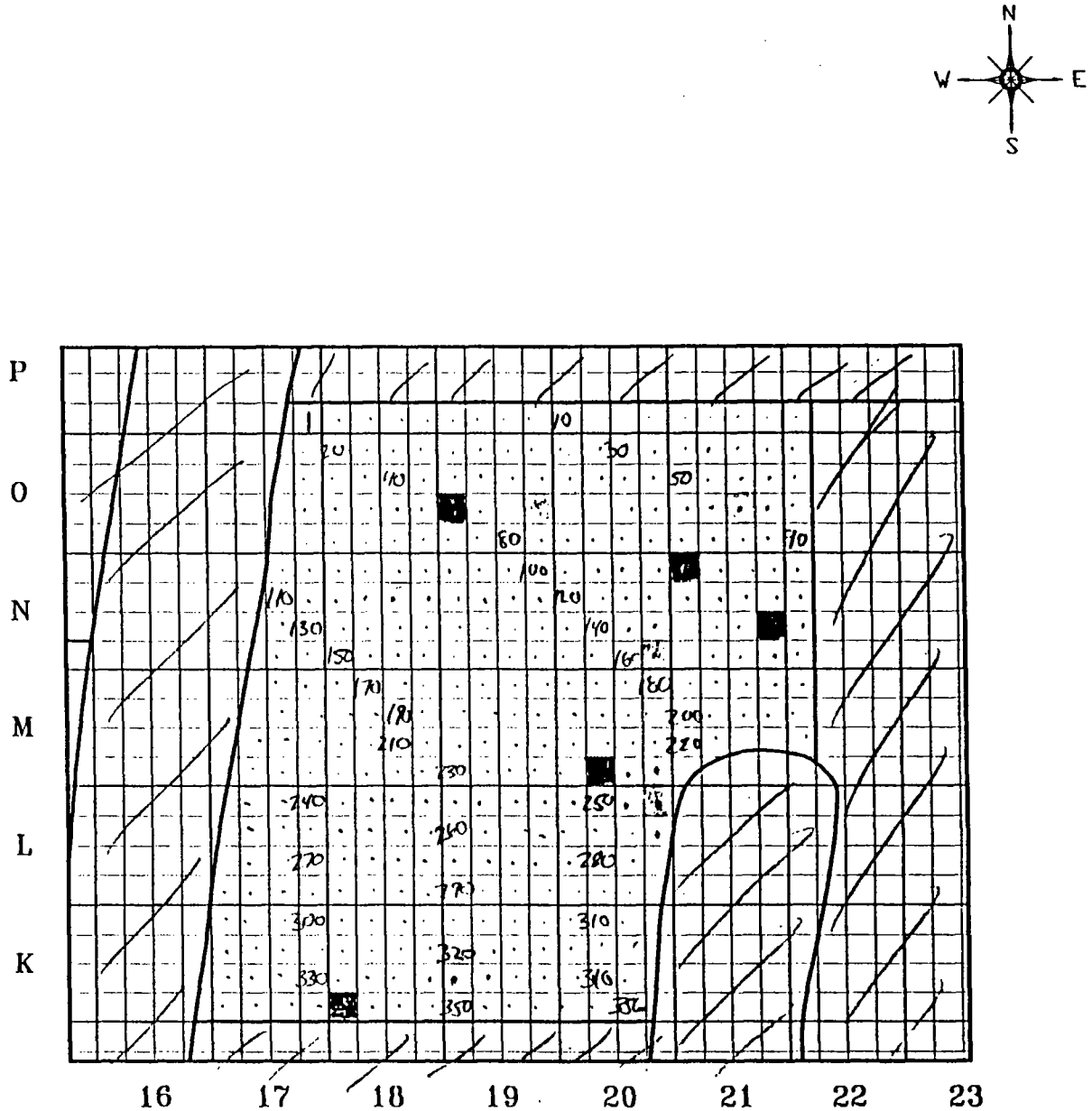
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 382

Your 15 Random Numbers are:

253	48	176
235	72	121
331	264	120
211	310	233
153	141	24



SECTION 10 AREA APPROXIMATELY 9700 SQ FT

APPENDIX

SAMPLING SECTION 10
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

PROJECT: 9107028 | REPORT: | MCW | CHECKED: EDB | DATE: 2/22/93 | FILE NAME: S2C10 | CLIENT NAME: KEYSTONE STEEL & WIRE

RANDOM NUMBER GENERATION
SECTION 10

This program will generate 15 random numbers for you.

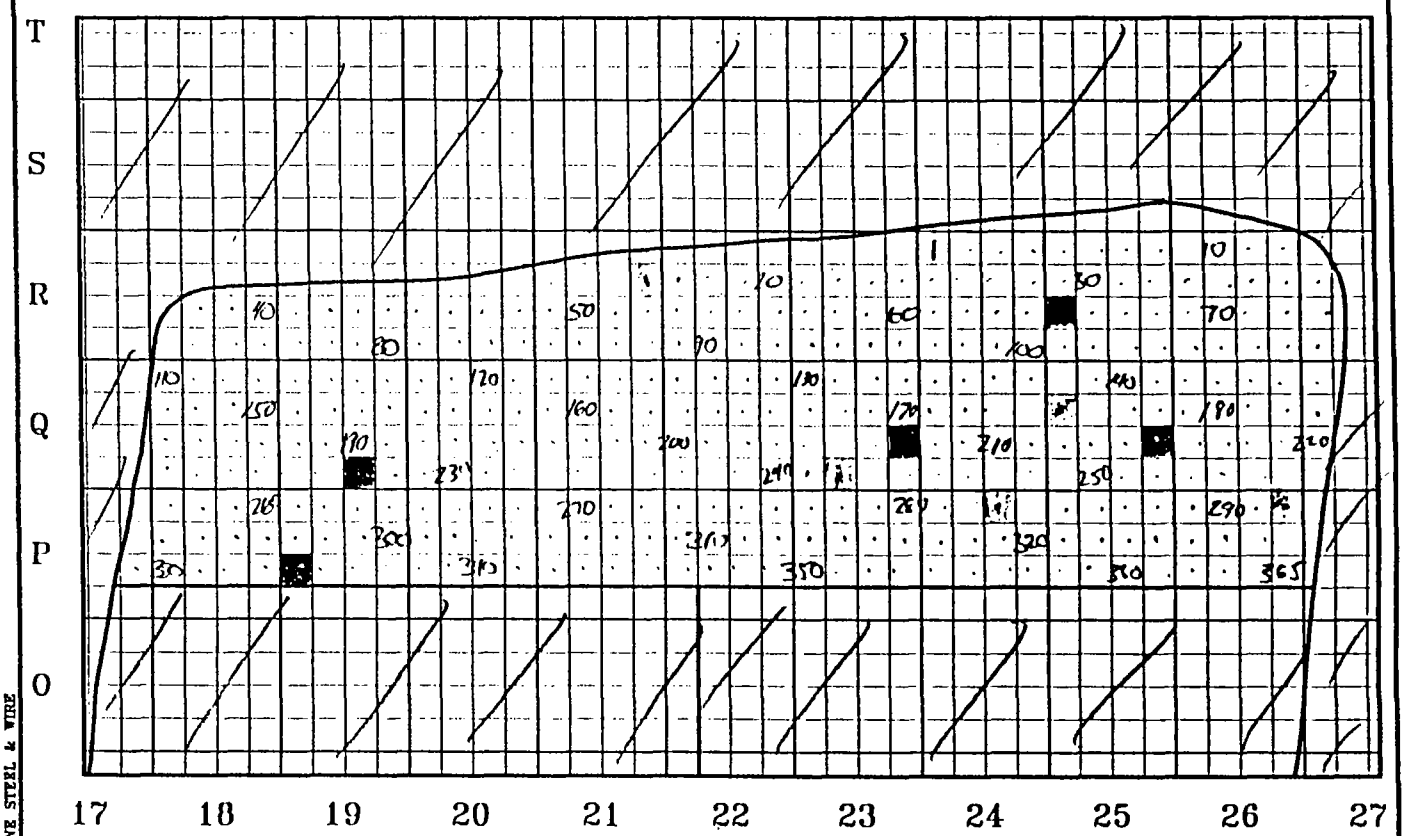
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 356

Your 15 Random Numbers are:

235	114	59
105	19	67
60	287	280
146	178	19
346	324	275



SECTION 11 AREA APPROXIMATELY 9800 SQ FT

APPENDIX

SAMPLING SECTION 11
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC11
DATE: 2/22/93
CHECKED: EDB
BY: MGW
REPORT:
PROJECT: 0107028

RANDOM NUMBER GENERATION
SECTION 11

This program will generate 15 random numbers for you.

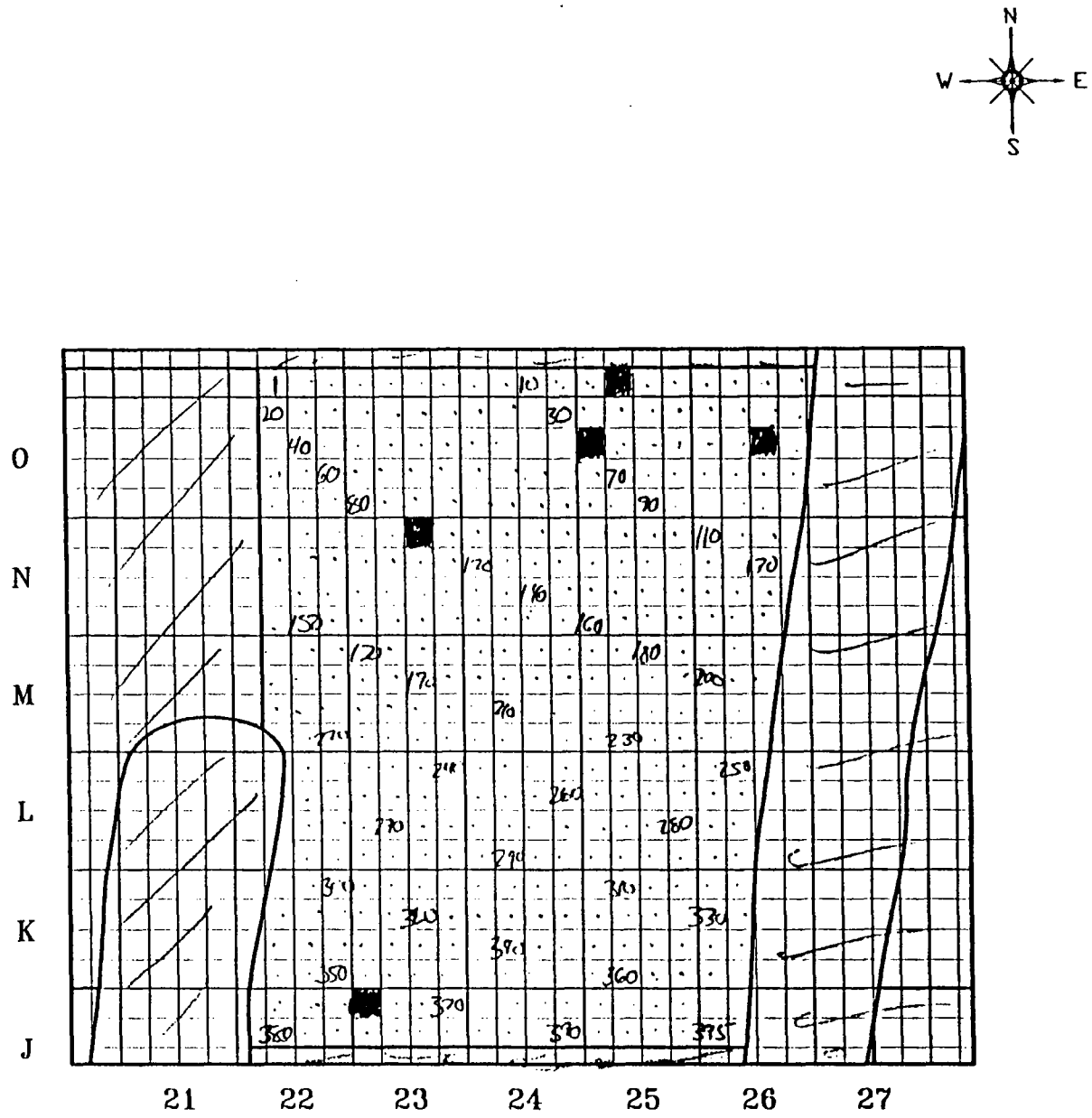
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 365

Your 15 Random Numbers are:

334	117	184
207	218	89
227	359	198
215	229	15
65	203	295



SECTION 12 AREA APPROXIMATELY 9800 SQ FT

APPENDIX

SAMPLING SECTION 12
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME	KEYSTONE STEEL & WIRE
FILE NAME	SEC12
DATE	2/22/93
CHECKED	EDB
DRAWN	MGW
REPORT	
PROJECT	91070EB

RANDOM NUMBER GENERATION
SECTION 12

This program will generate 15 random numbers for you.

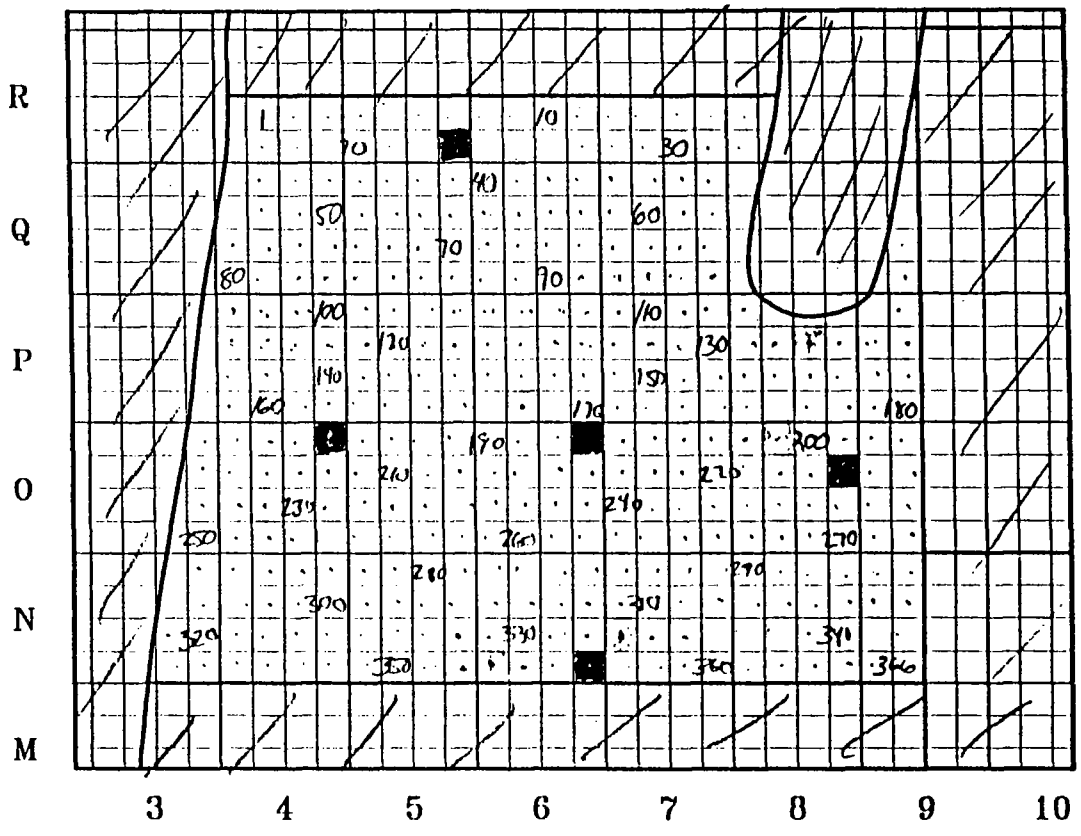
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 395

Your 15 Random Numbers are:

56	318	347
13	354	160
367	178	53
50	143	289
100	105	254



SECTION 13 AREA APPROXIMATELY 9600 SQ FT

APPENDIX

SAMPLING SECTION 13
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC13
DATE: 2/22/93
CHECKED: EDB
MGW
REPORT:
PROJECT: 910702B

RANDOM NUMBER GENERATION
SECTION 13

This program will generate 15 random numbers for you.

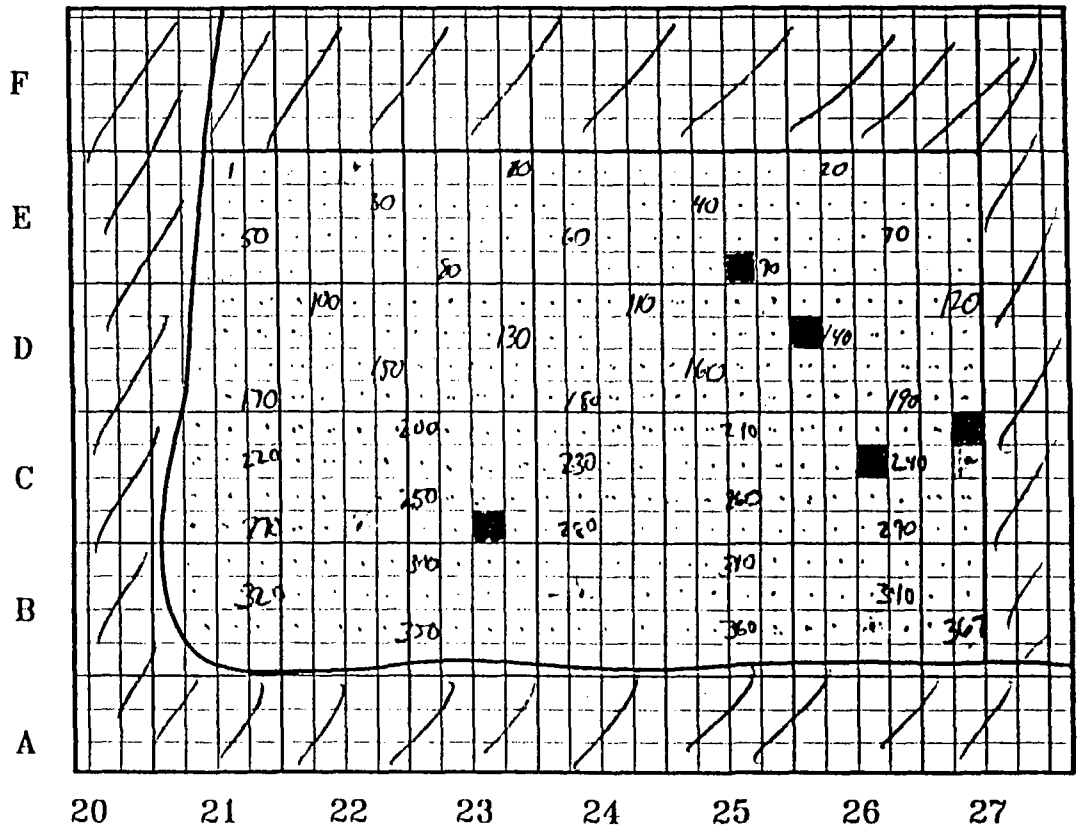
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 366

Your 15 Random Numbers are:

224	283	60
23	150	308
185	202	250
356	187	200
193	109	130



SECTION 14 AREA APPROXIMATELY 9800 SQ FT

APPENDIX

SAMPLING SECTION 14
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC14
DATE: 2/22/93
CHECKED: EDB
DRAWN: WCW
REPORT:
PROJECT: 910702B

RANDOM NUMBER GENERATION
SECTION 14

This program will generate 15 random numbers for you.

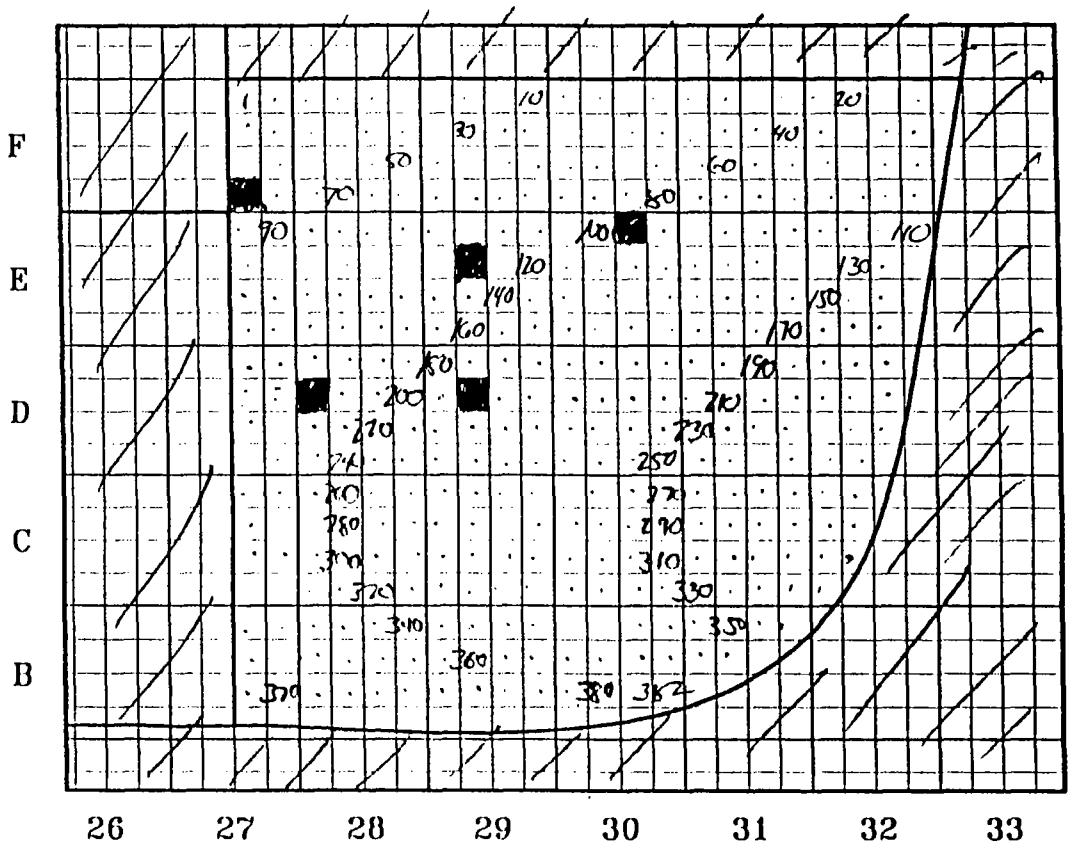
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 367

Your 15 Random Numbers are:

217	22	158
277	180	11
239	249	336
89	146	147
139	86	246



SECTION 15 AREA APPROXIMATELY 10000 SQ FT

APPENDIX

SAMPLING SECTION 15
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC15
DATE: 2/22/93
CHECKED: EDB
DRAWN: MCW
REPORT:
PROJECT: 0107028

RANDOM NUMBER GENERATION
SECTION 15

This program will generate 15 random numbers for you.

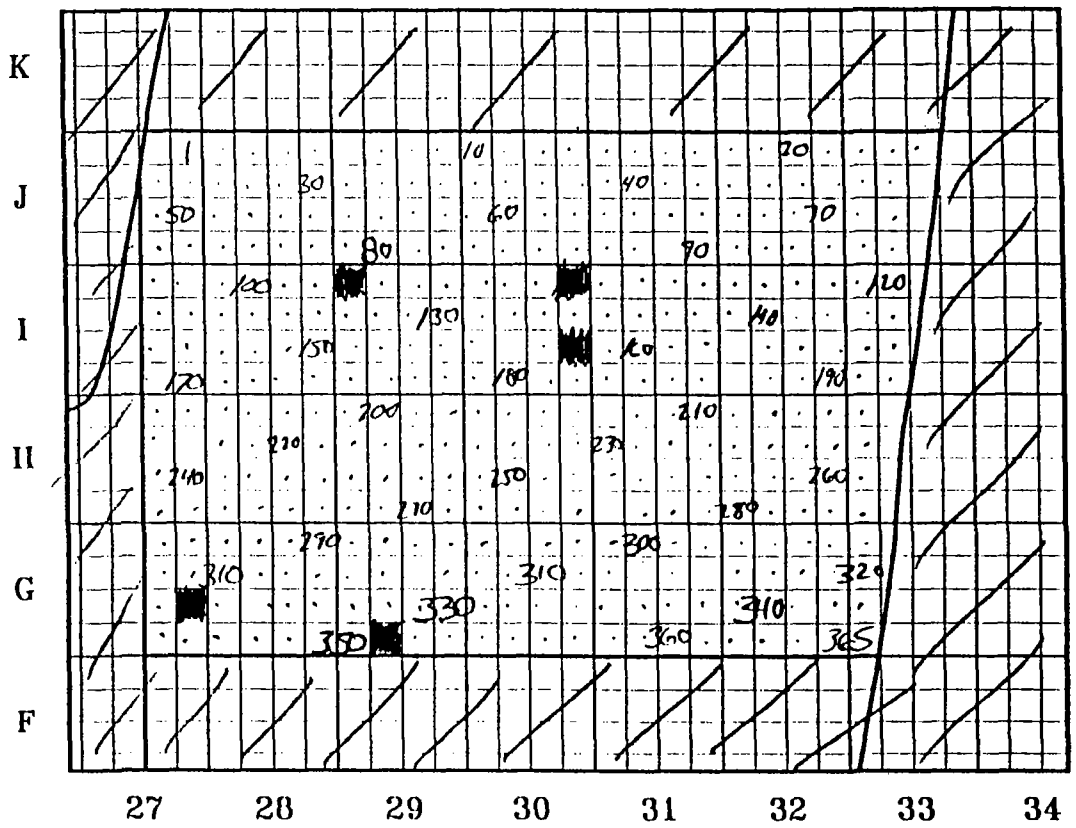
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 382

Your 15 Random Numbers are:

101	53	302
197	280	48
67	283	274
118	274	244
~~197~~ →	202	378



SECTION 16 AREA APPROXIMATELY 9600 SQ FT

APPENDIX

SAMPLING SECTION 16
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC16
DATE: 2/22/93
CHECKED: EDB
PROJECT: 91070EB

RANDOM NUMBER GENERATION
SECTION 16

This program will generate 15 random numbers for you.

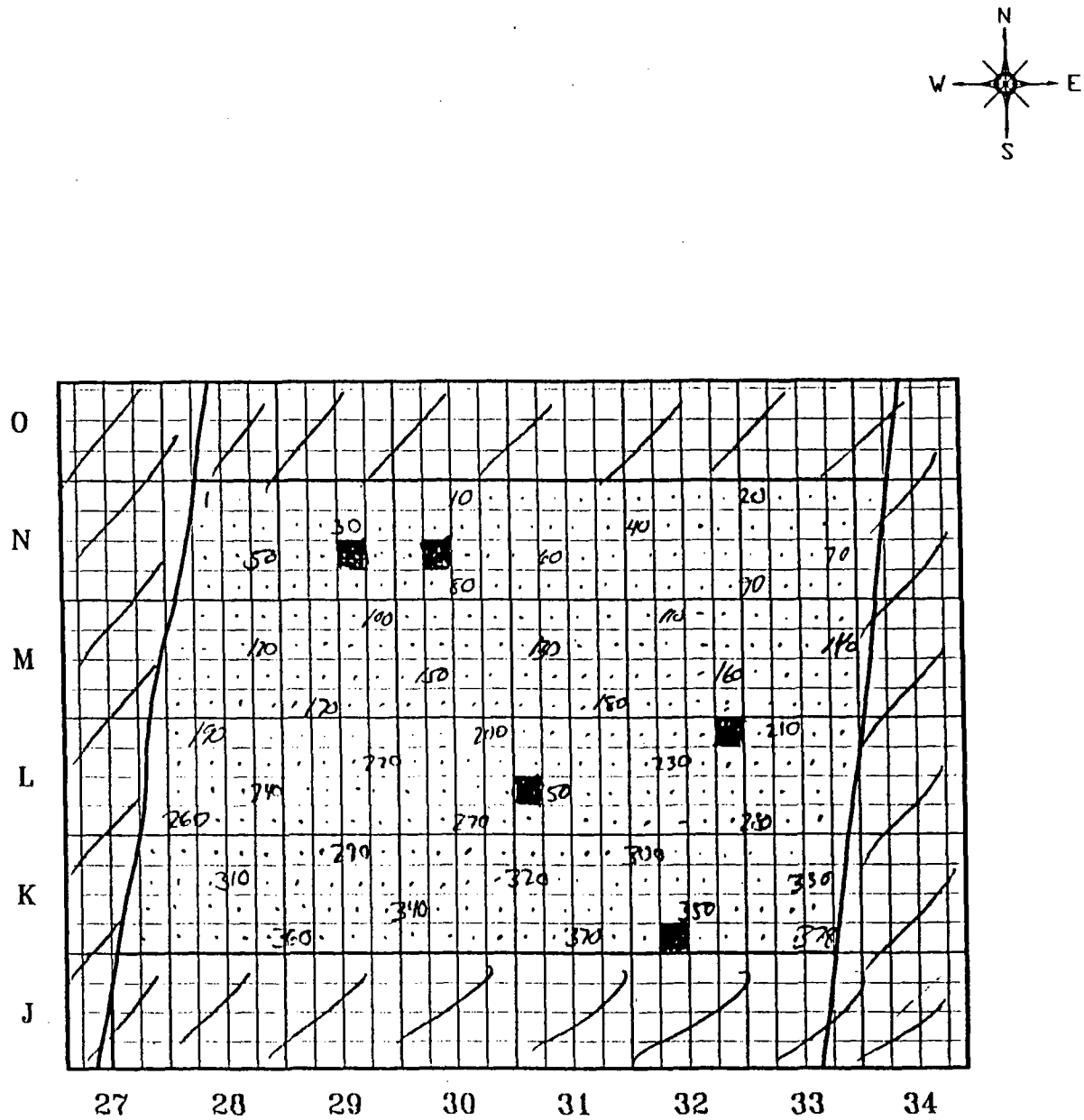
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 365

Your 15 Random Numbers are:

351	285	13
103	91	217
110	266	193
158	236	318
322	217	87



SECTION 17 AREA APPROXIMATELY 9800 SQ FT

APPENDIX

SAMPLING SECTION 17
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC17
DATE: 2/22/93
CHECKED: EDB
DRAWN: MCW
REPORT:
PROJECT: 91070EB

RANDOM NUMBER GENERATION
SECTION 17

This program will generate 15 random numbers for you.

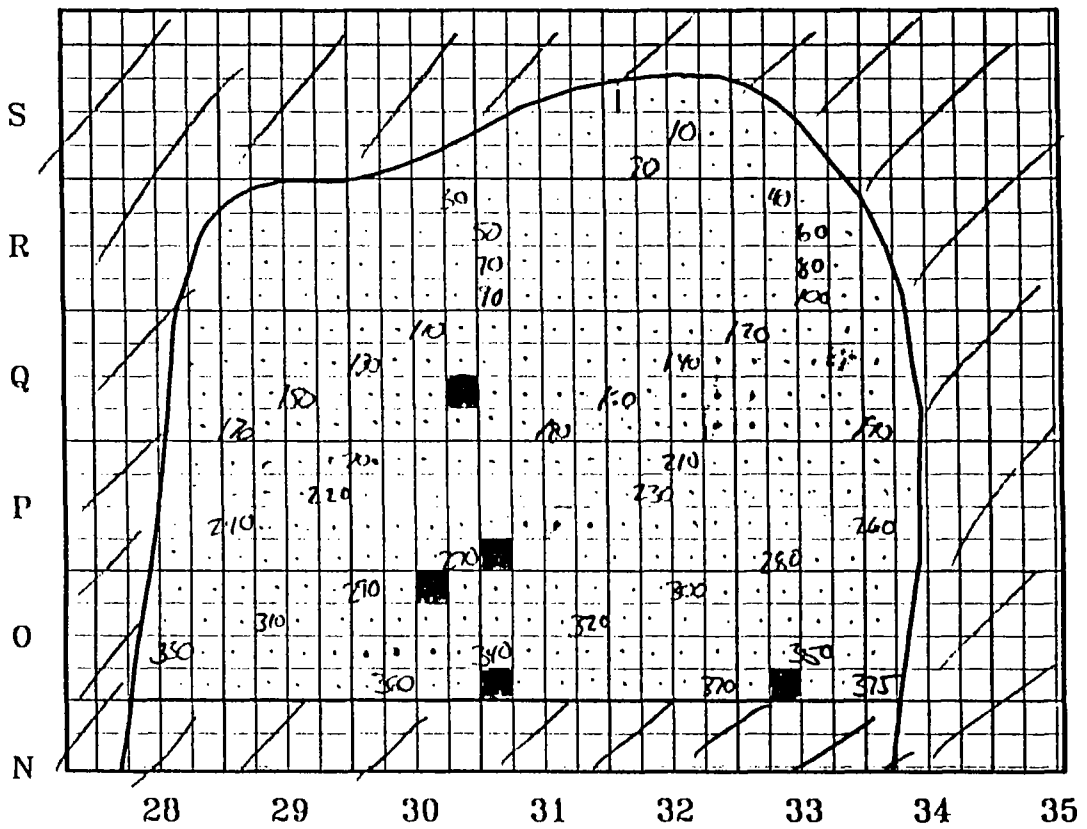
You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 378

Your 15 Random Numbers are:

373	157	160
249	79	119
56	314	170
218	97	316
53	243	314



SECTION 18 AREA APPROXIMATELY 9900 SQ FT

APPENDIX

SAMPLING SECTION 18
KEYSTONE STEEL AND WIRE
BARTONVILLE, ILLINOIS

APPROX. SCALE (ft.)
0 30

ERM

CLIENT NAME: KEYSTONE STEEL & WIRE
FILE NAME: SEC18
DATE: 2/22/93
CHECKED: EDB
DRAWN: MGM
REPORT:
PROJECT: 9107028

RANDOM NUMBER GENERATION
SECTION 18

This program will generate 15 random numbers for you.

You must insert what the lowest and the highest numbers are that you want a random number generated between.

Insert Lower Limit Here: 1

Insert Upper Bound Here: 375

Your 15 Random Numbers are:

155	283	306
372	225	117
271	102	129
292	226	64
363	318	331

APPENDIX B

CONTRACT DOCUMENTS FOR ANALYTICAL SERVICES
RCRA DELISTING STUDY
MARCH 16, 1993

Table 3 - Analytical Parameters, Sample Load, and Method References

Table 4 - Characteristics, Analytes, and Required Detection/Reporting Limits

Table 5 - Holding Time Requirements

TABLE 3

ANALYTICAL PARAMETERS, SAMPLE LOAD, AND METHOD REFERENCES

Parameter/Characteristic	Number of Analysis of Field Samples	Method Reference
Ignitability	22	SW-846 1010
Corrosivity	22	SW-846 9045
Reactivity (CN- and SO_2)	22	SW-846 Chapter 7.3
TCLP Preparation	53	SW-846 1311
Metals in TCLP Extracts	53	SW-846 6020
Cyanide in TCLP Extracts (1)	53	SW-846 9010
Cr^{+6} in TCLP Extracts(1)	53	SW-846 7196
Hg in TCLP Extract	53	SW-846 7471
Volatile Organics in TCLP Extracts	108	SW-846 8240
Semivolatile Organics in TCLP Extracts	22	SW-846 8270
Volatile Organics in Soil, Sludge, Waste, Aqueous	108	SW-846 8240
Semivolatile Organics in Soil, Sludge, Waste, Aqueous	22	SW-846 8270
Metals in Soil, Sludge, Waste, Aqueous	53	SW-846 6020
Cr^{+6} in Soil, Sludge, Waste	53	SW-846 3060 (Modified)(2)/7196
Cr^{+6} in Aqueous	--	SW-846 7196
Hg in Soil, Sludge, Waste, Aqueous	53	SW-846 7470/7471
CN in Soil, Sludge, Waste, Aqueous	53	SW-846 9010
TOC in Soil, Sludge, Waste, Aqueous	22	USEPA 415.1 (Modified)
Oil and Grease in Soil, Sludge, Waste, Aqueous	22	SW-846 9071

Notes:
(1) Using deionized water for extraction medium.
(2) The SW-846 Method 3060 modifications include a 2.5 gram digestion to a 100 mL final digest volume plus additional quality control measures.

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

CHARACTERISTIC	REQUIRED LIMIT
Ignitability	yes/no at - ° F
Corrosivity	pH, yes/no
Reactivity - Cyanide	100 mg/Kg
Reactivity - Sulfide	100 mg/Kg

AQUEOUS[1] OR TCLP EXTRACTS	REQUIRED LIMIT
Volatile Organics	
benzene	10 µg/L
carbon tetrachloride	10 µg/L
chlorobenzene	10 µg/L
chloroform	10 µg/L
1,2-dichloroethane	10 µg/L
1,1-dichloroethene	10 µg/L
2-butanone	10 µg/L
tetrachloroethene	10 µg/L
trichloroethene	10 µg/L
vinyl chloride	10 µg/L
Semivolatile Organics	
2-methylphenol	10 µg/L
3-methylphenol	10 µg/L
4-methylphenol	10 µg/L
1,4-dichlorobenzene	10 µg/L
2,4-dinitrotoluene	5 µg/L
hexachlorobenzene	5 µg/L
hexachlorobutadiene	5 µg/L
hexachloroethane	10 µg/L

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

AQUEOUS[1] OR TCLP EXTRACTS	REQUIRED LIMIT
Semivolatile Organics (Cont.)	
nitrobenzene	10 µg/L
pentachlorophenol	20 µg/L
pyridine	10 µg/L
2,4,5-trichlorophenol	50 µg/L
2,4,6-trichlorophenol	10 µg/L
Metals and Cyanide	
antimony	5 µg/L
arsenic	10 µg/L
barium	5 µg/L
beryllium	1 µg/L
cadmium	10 µg/L
total chromium	10 µg/L
hexavalent chromium	10 µg/L
lead	10 µg/L
nickel	10 µg/L
selenium	10 µg/L
silver	10 µg/L
thallium	10 µg/L
vanadium	50 µg/L
zinc	50 µg/L
mercury	1 µg/L
cyanide	10 µg/L

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Volatile Organics	Aqueous	Solid[3], [4]
trans-1,2-dichloroethene	10 µg/L	10 µg/Kg
methylene chloride	10 µg/L	10 µg/Kg
toluene	10 µg/L	10 µg/Kg
1,1,1-trichloroethane	10 µg/L	10 µg/Kg
carbon disulfide	10 µg/L	10 µg/Kg
chloromethane	10 µg/L	10 µg/Kg
bromomethane	10 µg/L	10 µg/Kg
vinyl chloride	10 µg/L	10 µg/Kg
chloroethane	10 µg/L	10 µg/Kg
trichlorofluoromethane	10 µg/L	10 µg/Kg
1,1-dichloroethene	10 µg/L	10 µg/Kg
1,1-dichloroethane	10 µg/L	10 µg/Kg
chloroform	10 µg/L	10 µg/Kg
1,2-dichloroethane	10 µg/L	10 µg/Kg
carbon tetrachloride	10 µg/L	10 µg/Kg
bromodichloromethane	10 µg/L	10 µg/Kg
1,2-dichloropropane	10 µg/L	10 µg/Kg
trans-1,3-dichloropropene	10 µg/L	10 µg/Kg
cis-1,3-dichloropropene	10 µg/L	10 µg/Kg
trichloroethene	10 µg/L	10 µg/Kg
benzene	10 µg/L	10 µg/Kg
dibromochloromethane	10 µg/L	10 µg/Kg
1,1,2-trichloroethane	10 µg/L	10 µg/Kg
2-chloroethylvinyl ether	10 µg/L	10 µg/Kg
bromoform	10 µg/L	10 µg/Kg
1,1,1,2-tetrachloroethane	10 µg/L	10 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Volatile Organics	Aqueous	Solid[3], [4]
1,1,2,2-tetrachloroethane	10 µg/L	10 µg/Kg
tetrachloroethene	10 µg/L	10 µg/Kg
chlorobenzene	10 µg/L	10 µg/Kg
ethyl benzene	10 µg/L	10 µg/Kg
total xylenes	10 µg/L	10 µg/Kg
1,3-dichlorobenzene	10 µg/L	10 µg/Kg
1,2-dichlorobenzene	10 µg/L	10 µg/Kg
1,4-dichlorobenzene	10 µg/L	10 µg/Kg
acetone	50 µg/L	50 µg/Kg
2-butanone	50 µg/L	50 µg/Kg
vinyl acetate	50 µg/L	50 µg/Kg
4-methyl-2-pentanone	50 µg/L	50 µg/Kg
2-hexanone	50 µg/L	50 µg/Kg
styrene	10 µg/L	10 µg/Kg

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
phenol	10 µg/L	330 µg/Kg
2-chlorophenol	10 µg/L	330 µg/Kg
4-methylphenol	10 µg/L	330 µg/Kg
2-methylphenol	10 µg/L	330 µg/Kg
2-nitrophenol	10 µg/L	330 µg/Kg
2,4-dimethylphenol	10 µg/L	330 µg/Kg
2,4-dichlorophenol	10 µg/L	330 µg/Kg
4-chloro-3-methylphenol	10 µg/L	330 µg/Kg
2,4,6-trichlorophenol	10 µg/L	330 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
2,4,5-trichlorophenol	10 µg/L	330 µg/Kg
2,4-dinitrophenol	50 µg/L	1650 µg/Kg
4-nitrophenol	50 µg/L	1650 µg/Kg
2-methyl-4,6-dinitrophenol	50 µg/L	1650 µg/Kg
pentachlorophenol	50 µg/L	1650 µg/Kg
benzoic acid	50 µg/L	1650 µg/Kg
naphthalene	10 µg/L	330 µg/Kg
acenaphthylene	10 µg/L	330 µg/Kg
acenaphthene	10 µg/L	330 µg/Kg
fluorene	10 µg/L	330 µg/Kg
phenanthrene	10 µg/L	330 µg/Kg
2-propyl-n-ol[5]	10 µg/L	330 µg/Kg
anthracene	10 µg/L	330 µg/Kg
fluoranthene	10 µg/L	330 µg/Kg
pyrene	10 µg/L	330 µg/Kg
benzo(a)anthracene	10 µg/L	330 µg/Kg
chrysene	10 µg/L	330 µg/Kg
benzo(b)fluoranthene	10 µg/L	330 µg/Kg
benzo(k)fluoranthene	10 µg/L	330 µg/Kg
benzo(a)pyrene	10 µg/L	330 µg/Kg
indeno(1,2,3-cd)pyrene	10 µg/L	330 µg/Kg
dibenzo(a,h)anthracene	10 µg/L	330 µg/Kg
benzo(g,h,i)perylene	10 µg/L	330 µg/Kg
2-methylnaphthalene	10 µg/L	330 µg/Kg
2-chloronaphthalene	10 µg/L	330 µg/Kg
N-nitrosodimethylamine	10 µg/L	330 µg/Kg
bis(2-chloroethyl)ether	10 µg/L	330 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
1,3-dichlorobenzene	10 µg/L	330 µg/Kg
1,2-dichlorobenzene	10 µg/L	330 µg/Kg
1,4-dichlorobenzene	10 µg/L	330 µg/Kg
bis(2-chloroisopropyl)ether	10 µg/L	330 µg/Kg
N-nitrosodi-*n*-propylamine	10 µg/L	330 µg/Kg
hexachloroethane	10 µg/L	330 µg/Kg
nitrobenzene	10 µg/L	330 µg/Kg
isophorone	10 µg/L	330 µg/Kg
bis(2-chloroethoxyl)methane	10 µg/L	330 µg/Kg
1,2,4-trichlorobenzene	10 µg/L	330 µg/Kg
hexachlorobutadiene	10 µg/L	330 µg/Kg
hexachlorocyclopentadiene	10 µg/L	330 µg/Kg
dimethylphthalate	10 µg/L	330 µg/Kg
2,6-dinitrotoluene	10 µg/L	330 µg/Kg
2,4-dinitrotoluene	10 µg/L	330 µg/Kg
4-chlorophenylphenyl ether	10 µg/L	330 µg/Kg
diethylphthalate	10 µg/L	330 µg/Kg
1,2-diphenylhydrazine	10 µg/L	330 µg/Kg
N-nitrosodiphenylamine	10 µg/L	330 µg/Kg
4-bromophenylphenyl ether	10 µg/L	330 µg/Kg
hexachlorobenzene	10 µg/L	330 µg/Kg
di-*n*-butyl phthalate	10 µg/L	330 µg/Kg
benzidine	50 µg/L	1650 µg/Kg
butylbenzyl phthalate	10 µg/L	330 µg/Kg
bis(2-ethylhexyl)phthalate	10 µg/L	330 µg/Kg
3,3′-dichlorobenzidine	20 µg/L	660 µg/Kg
di-*n*-octyl phthalate	10 µg/L	330 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
benzyl alcohol	50 µg/L	1650 µg/Kg
4-chloroaniline	50 µg/L	1650 µg/Kg
2-nitroaniline	50 µg/L	1650 µg/Kg
3-nitroaniline	50 µg/L	1650 µg/Kg
4-nitroaniline	50 µg/L	1650 µg/Kg
dibenzofuran	10 µg/L	330 µg/Kg
Metals and Cyanide		
antimony	5 µg/L	0.5 mg/Kg
arsenic	10 µg/L	1.0 mg/Kg
barium	5 µg/L	0.5 mg/Kg
beryllium	1 µg/L	0.1 mg/Kg
cadmium	10 µg/L	1.0 mg/Kg
total chromium	10 µg/L	1.0 mg/Kg
hexavalent chromium[6]	10 µg/L	0.4 mg/Kg
lead	10 µg/L	1.0 mg/Kg
nickel	10 µg/L	1.0 mg/Kg
selenium	10 µg/L	1.0 mg/Kg
silver	10 µg/L	1.0 mg/Kg
thallium	10 µg/L	1.0 mg/Kg
vanadium	50 µg/L	5.0 mg/Kg
zinc	50 µg/L	5.0 mg/Kg
mercury	1 µg/L	0.1 mg/Kg
cyanide	10 µg/L	1.0 mg/Kg
Total Organic Carbon	1.0 mg/L	5.0 mg/Kg
Oil and Grease	0.1 mg/L	4.0 mg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

NOTES:

[1] The Toxicity Characteristic Leaching Procedure (TCLP) list will be applied to aqueous field blanks and trip blanks sent with solid samples that have been requested for TCLP extraction/analysis.

[2] The field blanks and trip blanks sent with solid samples that have been requested for total analysis.

[3] Although all results (i.e., positive and nondetected) will be reported on a dry-weight basis, the limits presented assume 100 percent solids. Accordingly, the sample-specific limits for solids will be somewhat higher.

[4] See Section 2.2.2 of this Request for Proposal.

[5] Subject to change.

[6] Aqueous samples will be analyzed directly by using SW-846 Method 7196. Solid samples will be analyzed by using the modified version of SW-846 Method 3060 (i.e., 2.5 gram digestion to 100 mL final digest volume plus additional quality control measures).

TABLE 5
HOLDING TIME REQUIREMENTS

(Page 1 of 2)

Type/Media	Parameter	Preservative	Method	Holding Time[1]
TCLP Extraction	Volatile Organics	-	SW-846 1311	14 days
	Semivolatile Organics	-	SW-846 1311	14 days
	Metals (Except Mercury)	-	SW-846 1311	6 months
	Mercury	-	SW-846 1311	28 days
	Hexavalent Chromium[2]	-	SW-846 1311	7 days
	Cyanide[2]	-	SW-846 1311	14 days
TCLP Extracts	Volatile Organics	acidified, cool 4° ± 2° C	SW-846 8240	14 days (from TCLP extraction)
	Semivolatile Organics	cool 4° ± 2° C	SW-846 8270	7 days from TCLP extraction to solvent, 40 days from solvent extraction to analysis
	Metals (Except Mercury)	HNO_3, pH<2	SW-846 6020	6 months for digestion/analysis
	Mercury	HNO_3, pH<2	SW-846 7471	28 days (from TCLP extraction)
	Hexavalent Chromium	cool 4° ± 2° C	SW-846 7196	24 hours (from TCLP extraction)
	Cyanide	NaOH, pH>12, cool 4° ± 2° C	SW-846 9010	14 days for distillation/analysis (from TCLP extraction)
Aqueous	Volatile Organics	HCL, pH<2, cool 4° ± 2° C	SW-846 8240	14 days
	Semivolatile Organics	cool 4° ± 2° C	SW-846 8270	7 days to extraction, 40 days from extraction to analysis
	Metals (Except Hg)	HNO_3, pH<2	SW-846 6020	6 months for digestion/analysis
	Mercury	HNO_3, pH<2	SW-846 7470	28 days for digestion/analysis
	Hexavalent Chromium	cool 4° ± 2° C	SW-846 7196	24 hours
	Cyanide	NaOH, pH>12 cool 4° ± 2° C	SW-846 9010	14 days for distillation/analysis
	TOC	H_2SO_4, pH<2 cool 4° ± 2° C	USEPA 415.1	28 days
	Oil and Grease	H_2SO_4, pH<2 cool 4° ± 2° C	SW-846 9071	28 days

TABLE 5
HOLDING TIME REQUIREMENTS

(Page 2 of 2)

Type/Media	Parameter	Preservative	Method	Holding Time[1]
Solids	Volatile Organics	cool 4° ± 2° C	SW-846 8240	14 days
	Semivolatiles	cool 4° ± 2° C	SW-846 8270	14 days to extraction, 40 days from extraction to analysis
	Metals (Except Hg)	cool 4° ± 2° C	SW-846 6020	6 months for digestion/analysis
	Mercury	cool 4° ± 2° C	SW-846 7471	28 days for digestion/analysis
	Hexavalent Chromium	cool 4° ± 2° C	SW-846 3060(Modified[3])/7196	7 days to digestion, 24 hours from digestion to analysis
	Cyanide	cool 4° ± 2° C	SW-846 9010	14 days for distillation/analysis
	TOC	cool 4° ± 2° C	USEPA 415.1 (modified)	28 days
	Oil and Grease	cool 4° ± 2° C	SW-846 9071	28 days
	Ignitability	cool 4° ± 2° C	SW-846 1010	48 hours
	Corrosivity	cool 4° ± 2° C	SW-846 9045	48 hours
	Reactive Cyanide	cool 4° ± 2° C	SW-846 Chapter 7.3	14 days
	Reactive Sulfide	cool 4° ± 2° C	SW-846 Chapter 7.3	7 days

Notes: (1) From sample collection.

(2) Hexavalent chromium and cyanide TCLP extractant will consist of deionized water. The cyanide TCLP extract must be preserved with NaOH to a pH >12 immediately following leachate generation.

(3) The SW-846 Method 3060 modifications include a 2.5 gram digestion to a 100 ml final digest volume plus additional quality control measures.

INSTRUCTION MANUAL

OVM / DATALOGGER

MODEL 580B

Thermo Environmental Instruments Inc.
8 WEST FORGE PARKWAY • FRANKLIN, MA 02038
(508) 520-0430 • TELEX: 200205 THEMO UR

580B USER MANUAL

Table of Contents

Section		Page
1	**Introduction**	1-1
	1.1 About this Manual	1-1
	1.2 Instrument Overview	1-2
	1.3 580B Features	1-3
2	**Principle of operation**	2-1
	2.1 Introduction	2-1
	2.2 Run and Log mode	2-1
	2.3 Main menu	2-3
	2.4 Parameters	2-3
	2.5 Access mode	2-6
	2.6 Clock mode	2-8
	2.7 Communication mode	2-8
	2.8 Battery/Charger	2-10
3	**Service / Hardware**	3-1
	3.1 Lamp insertion and removal	3-1
	3.2 Calibration	3-1
	3.3 Charge	3-3
4	**Calibration**	4-1
	4.1 General	4-1
	4.2 Methods of Generating Concentrations of various materials in air	4-1
5	**Applications**	5-1
	5.1 General	5-1
	5.2 Vinyl Chloride Monomer	5-1
	5.3 Monitoring Isolated Plant areas for toluene and methyl isobutyl ketone	5-1
	5.4 Pertoleum ether vapor in workspace air	5-2
	5.5 Leak sourcing	5-3
	5.6 Afterburner efficiency	5-4
	5.7 Sample collection of unknown environments	5-4
6	**Collection techniques**	6-1
	6.1 General	6-1
	6.2 Bag sample collection	6-1
	6.3 Collection using charcoal tubes view - sample collection techniques	6-2
7	**Communication**	7-1
	7.1 Printer	7-1
	7.2 Computer	7-1
	7.3 Communication Software	7-1
8	**Flow Chart**	8-1
	8.1 Quick Start-up	8-1
	8.2 Detailed Flow Chart	8-1
A	**Communication**	A-1
	A.1 Introduction	A-1
	A.2 Printer mode	A-1
	A.3 Computer mode	A-2
B	**Schematics**	
C	**Material List and Silkscreen**	
D	**580B Detailed drawing**	
E	**Common organic solvents and gases data sheet**	
F	**Variable Dilution Probe Assembly drawing**	
G	**580B Block Diagram**	
H	**Probe Extension**	

INSTRUMENT WARRANTY

WARRANTY. Subject to the exceptions stated below, Thermo Environmental Instruments Inc. agrees to correct, either by repair or, at our option, by replacement, any defects in materials or workmanship which develop within one year from the date of surface shipment, parts and labor supplied free of charge and surface transportation costs to be borne by the offeror both ways, provided that the investigation and inspection defects developed under normal and proper use.

The exceptions mentioned above are: (1) All items claimed defective must be returned to Thermo Environmental Instruments Inc., transportation charges collect, and will be shipped prepaid and charged to the customer unless the item is found to be defective and covered by the warranty in which case Thermo Environmental Instruments Inc. will pay all transportation charges; (2) Thermo Environmental Instruments Inc. agrees to extend to the customer whatever warranty is given to Thermo Environmental Instruments Inc. by suppliers of component items purchased by Thermo Environmental Instruments Inc. and incorporated into products sold to the customer; (3) Thermo Environmental Instruments Inc. shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own authorized service personnel, or service personnel from an authorized representative, unless such repair is minor, merely the installation of a new plug-in component; (4) If any model or sample was shown to the Purchaser, such model or sample was shown merely to illustrate the article and not to represent that any article delivered hereunder would conform to the model or sample; and (5) Spare parts are warranted for ninety (90) days.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, IMPLIED OR STATUTORY. SELLER DOES NOT WARRANT MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, OR MAKE ANY OTHER WARRANTY OR AGREEMENT EXPRESSED OR IMPLIED WITH RESPECT TO ANY ARTICLES COVERED HEREUNDER. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THOSE EXPRESSLY STATED IN THIS CONTRACT.

SECTION I

Introduction

The 580B is a portable Organic Vapor Meter (OVM). Which detects and quantitates most organic vapors with a highly sensitive photoionization detector (PID). The 580B has an operating range of 0-2000 parts per million (ppm) with a minimum detectable of 0.1 ppm. No support gases are required.

The 580B is controlled by a microprocessor which provides many features that were not prevoiusly available. Maximum signal hold, detector linearization, overrange lockout, IBM PC (or compatible) interface, extensive data logging capabilities and much more. With the many features provided by the 580B leak detection, head space measurements, and field survey are all easily accomplished. Completely portable, the 580B operates from internal batteries for eight hours in the field.

1.1 ABOUT THIS MANUAL

This manual is broken down into eight chapters. The first chapter (this one) provides a general overview of the 580B. Chapter two discusses, in great detail, the extensive facilities of the 580B. The focus of this chapter is on how to use the seven switches to access the various facilities. Chapter three explains, in detail, how to perform routine maintenance on the 580B. Chapter four is a technical discussion of calibration and methods for generating standards. Chapter five is a technical discussion of a few applications which illustrate some of the uses of the 580B. Chapter six is a technical discussion of methods for collecting a sample useing the 580B. Chapter seven is a discussion of the communication facilities provided by the 580B. Chapter eight contains two flow charts which illustrate the 580B software flow. This chapter is a helpful tool for the new user. Appendix A is a detailed explanation of the 580B communication protocol. This chapter is provided in order to allow a programmer to develop specialized communication software for the 580B. There are several other addendums which contain miscelaneous information about the 580B.

1.2 INSTRUMENT OVERVIEW

This section describes various points of interest on the 580B. Each number refers to a number in figure 1.1.

1. POWER PLUG - The power plug is used to run the instrument off of its internal batteries. There is a chain attached to the power plug so that it will not be lost.

2. RS-232 CONNECTOR - This connector is used for communication with a serial printer or computer. A communication cable provided with the instrument fits into the receptacle.

3. KEY PAD - There are seven switches which operate the 580B. The switch marked ON/OFF is used to turn the pump and lamp on and off. The switch marked LIGHT will turn on backlighting for the two line display. The other five switches perform various functions. For a detailed description of the function of each switch see chapter two or the flow charts in chapter eight.

4. DISPLAY - The 580B has a two line by sixteen character display.

5. SHOULDER STRAP - There is an adjustable shoulder strap for carrying the 580B.

6. SAMPLE EXIT PORT - The 580B sample is drawn into the detector by a positive displacement pump and then sent back out through the exit port.

NOTE : The photoionization detector is a non destructive detector so the sample may be collected at the exit for further analysis (see chapter six).

7. PUMP - The 580B pump draws the sample into the detector.

8. MOUNTING SCREWS - There are four screws which hold the 580B top and bottom together. The screws are specially designed so that they do not fall out when they are loosened out of the case top.

9. DETECTOR - The photoionization detector is shown with the lamp and high voltage power supply.

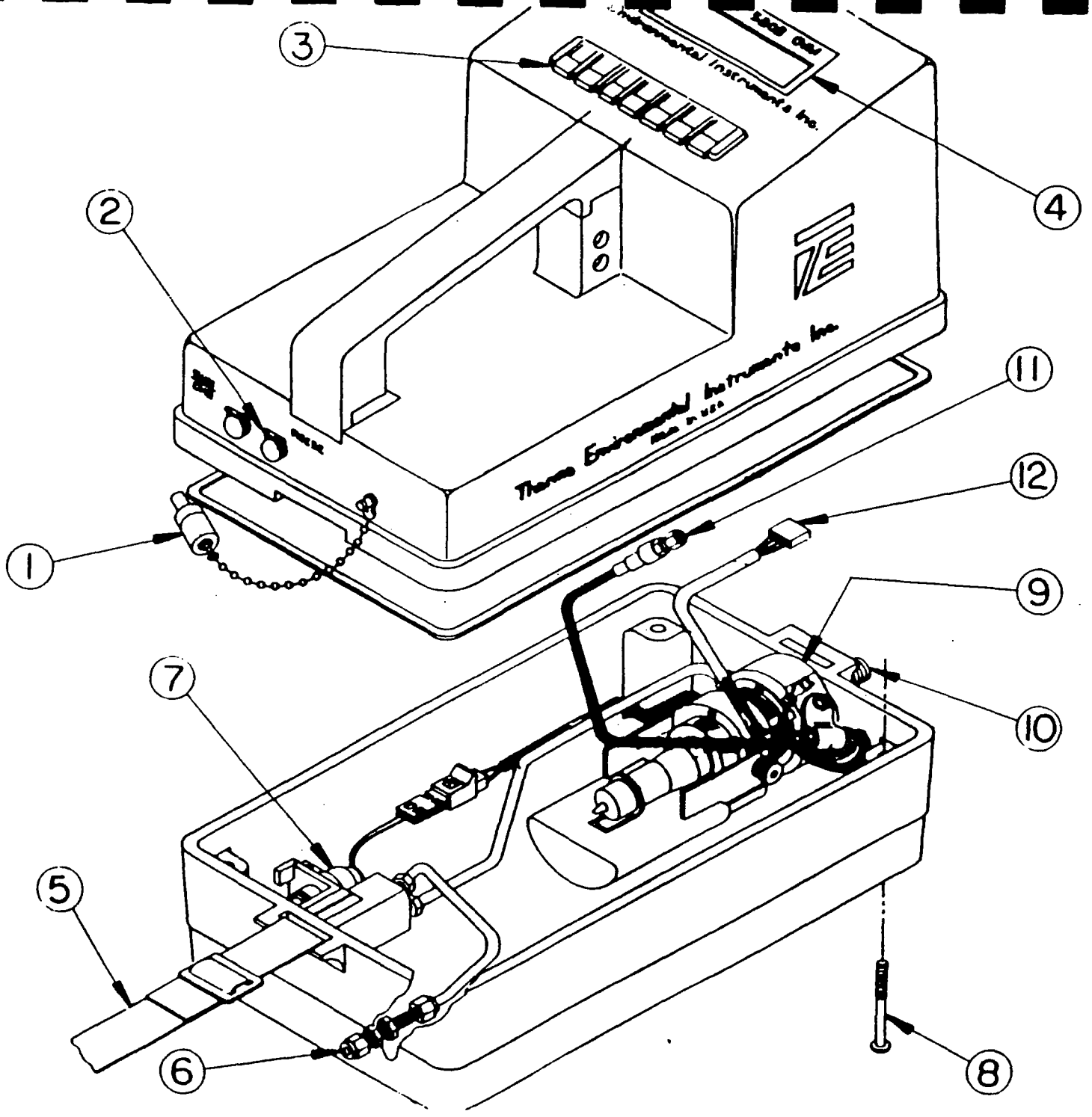


FIGURE 1.1

10. SAMPLE INLET - Sample is drawn into the detector through the sample inlet at the front of the 580B.

11. SIGNAL CABLE - The PID signal is brought up to the microprocessor, for analysis, via the coaxial signal cable.

12. BASE HARNESS - The base harness plugs into a connector on the case top.

1.3 580B FEATURES

This section provides a brief overview of the various features of the 580B. After reading this section the user should have a good idea of what the instrument can do. Chapters two and three will explain, in deatail, how each feature is selected.

TURNING ON PUMP AND LAMP - The pump and lamp are turned on by pressing the ON/OFF switch (the instrument power must allready be on).

CALIBRATION - Calibration of the 580B is extremely important. Chapter two explains how to calibrate the 580B in great detail. Chapter four discusses at length some of the basic theory and methods behind calibration. It is strongly suggested that this chapter be read in order to gain a deeper understanding of usage of the 580B. Chapter three also discusses calibration.

CONCENTRATIONS - Once the lamp and pump have been turned on the 580B begins to display the concentration of the incoming sample on the bottom line of the display. Normally the top line of the display will be a bar graph (logarithmic on a scale of zero to 2000). The operator may however select the MAX HOLD mode of operation. When in max hold, the top line of the display will show the highest concentration.

LOGGING - The 580B provides extensive facilities for logging information. The operator may save a particular reading along with a six digit location code and a date and time stamp. If the 580B is in the MAX HOLD mode when logging is initiated then the max hold value will be logged.

AUTO LOGGING - Logging may be performed automatically by using the 580B's auto logging feature. Auto logging is not allowed while in the MAX HOLD mode. When auto logging is selected a LOGGING INTERVAL is selected (anywhere from one second to 99 minutes and 59 seconds). At the end of each logging interval the present concentration will be logged (the location code is automatically incremented each time).

AVERAGE - The 580B normally updates the concentration once per second. The operator has the option of setting the averaging time anywhere from one second up to four minutes.

NOTE : The bottom line of the display will be blank until the first averaging interval is completed. The top line will however be updated each second.

RESPONSE FACTOR - A response factor may be used in order to relate a particular gas to the calibration gas. When computing the concentration the micrprocessor multiplies the concentration by the response factor and displays the result. If the response factor is one then the concentration is not changed. Chapter four and five explain some uses of the response factor.

LAMP SELECTION - The 580B allows for calibration data to be saved for one 10.0 eV lamp and one 11.8 eV lamp. A lamp serial number may also be entered. This allows lamps to be switched in the field without requiring recalibration.

ALARM - An alarm level may be selected. The 580B will sound an audible alarm (the top line will also indicate an alarm) whenever the concentration goes above the selected alarm level.

ACCESS - The 580B provides four access levels so that various features may be "locked out." User identification number and instrument number are also provided.

CLOCK - The 580B has an internal clock which will run even when the instrument power is cut off.

COMMUNICATION - The 580B has a serial communication port for outputing data to a serial printer. Many of the 580B features may be accessed from a remote computer through the serial communication port (there is communication software available which will run on an IBM PC or clone).

DISPLAY LOGGED DATA - The logged data may be displayed on the 580B's two line display.

SECTION 2

Principle of Operation

2.1 INTRODUCTION

The 580B has seven switches located just below the display. They are labeled:

ON/OFF MODE/STORE RESET LIGHT +/INC -/CRSR SPKR

The ON/OFF switch toggles the lamp and pump power between on and off. The MODE/STORE, RESET, +/INC, -/CRSR and SPKR switches all have various meanings (including none at all) depending upon the mode. The SPKR switch normally is used to toggle the insturment speaker between on and off. Pressing the MODE/STORE switch will cause the 580B to return to the Run mode. Except when the 580B is already in the run mode. In which case it will cause the 580B to enter the log mode.

The LIGHT switch is used to illuminate the display.

The 580B has several modes. Some of the modes may have sub modes. The modes and sub modes are tabulated below.

- Run mode
  - Concentration meter normal
  - Max hold
- Log mode
- Parameter mode
  - Calibration mode
- Access mode
- Clock mode
- Communication mode

The following sections will describe each mode and how to get to them and through them. It is strongly suggested that this section be carefully read and that the 580B be used along with the manual in order to reinforce the manual.

2.2 RUN AND LOG MODE

2.2.1 POWER FOR LAMP AND PUMP

When the 580B is first turned on (see section 1.3) the display will indicate that the lamp is not lit. Pressing the ON/OFF switch will tell the microprocessor to turn on the lamp and the pump. The microprocessor will send power to the lamp and pump and then "look" to see if the lamp actually lit. If it did not light then the microprocessor will try again. If after fourteen seconds the lamp still will not light then the microprocessor will indicate a lamp out condition.

In the event that the microprocessor is unable to light the lamp, check the seating of the lamp (see section 3.1). If the problem persists call service.

Once the lamp is lit the display will show the PPM (parts per million) on the bottom line. The top line will either be a bar graph or the maximum reading (see section 2.2.2).

To turn the the lamp and pump off simply press the ON/OFF switch.

2.2.2 RUN MODES

The 580B has two run modes, Max Hold and Concentration meter. The run mode is selected in the Parameters section (see section 2.3). In the concentration meter mode the top line of the display will be a bar graph. The bar graph is a logarithmic bar graph over the range of 0 to 2000 PPM. The bar graph is intended as a rough visual indication of the current PPM. The bottom line will indicate the exact PPM.

In the Max Hold mode the top line of the display will indicate the maximum reading. The bottom line of the display will indicate the current PPM. Whenever a new maximum is seen the top line will be updated. The Max Hold reading may reset by pressing the RESET switch while in the run mode.

2.2.3 LOG MODE

The ability to "log" data is one of the 580B's greatest features. Readings may be stored for later analysis. Each reading will have a date and time as well as a location code associated with it. Up to over 700 readings may be stored. Logged data may even be sent to a printer or computer via an RS- 232 serial communication port (see section 2.6).

The Log mode is entered from the Run mode by pressing the MODE/STORE switch. When this switch is pressed from the Run mode the display will show:

LOG THIS VALUE?

on the top line and either PPM or MAX PPM on the bottom line depending upon which run mode the 580B is currently in. By pressing the +/INC switch the display will then show:

LOC. CODE 000001

on the top line (the actual location code may not be 000001). The location code may now be entered. By pressing the +/INC switch the number above the cursor may be incremented. By pressing the -/CRSR switch the cursor may be moved to the next digit. The 580B automatically increments the location code each time a data point is logged.

Once the desired location code has been entered pressing the MODE/STORE switch will "log" the data point. This means that the reading displayed on the bottom line along with the location code, the current date and the current time will be stored into the 580B's memory. The 580B will then return to the Run mode.

If for any reason logging is not desired, pressing the RESET switch rather than the MODE/STORE switch will cause the value not to be stored. The 580B will then go back to displaying:

LOG THIS VALUE?

Pressing the mode switch will now return the 580B to the Run mode.

2.2.3.1 AUTO LOGGING MODE

The 580B may be instructed to automatically log data according to a predefined time interval. AUTO LOGGING is selected from within the Parameters section (see section 2.3). At the end of the logging interval (setable from 1 second up to 99 minutes and 59 seconds) the current average ppm value will be logged and the logging interval will be restarted.

NOTE : Auto logging is not allowed with the Max Hold mode.

2.2.4 SPEAKER

While the 580B is in the Run mode the speaker may be turned on. The speaker will generate a "clicking" which will increase in speed as the concentration increases. The purpose of the speaker is to give to operator an audible indication of the PPM. The speaker may be turned on or off by pressing the SPKR switch. The speaker rate may also be changed by changing the switches located inside of the side door (see section 1.2). Only one of the four speaker rate switches should be on (in the down position) at any time.

2.2.5 LOW BATTERY

The 580B will display a warning when the battery is low. The warning will be a flashing B in the left hand corner of the bottom line of the display when the 580B is in the Run mode. The 580B should be recharged when the low battery warning is activated.

2.2.6 OVERRANGE

The 580B will display an overrange warning if the concentration goes above 2000 PPM. The top line of the display will show:

OVERRANGE

Once an overrange condition occurs the instrument will "lock out". This means that the overrange warning will continue to be displayed until the instrument is brought to a "clean" area. A clean area is defined to be an area where the concentration of organic vapors is below 20 PPM. The 580B will continue to indicate PPM on the bottom line during an overrange condition.

2.7 ALARM

The 580B has an alarm which will sound if the PPM rises above the alarm setting. The alarm setting is entered in the Parameters mode (see section 2.4.3). If the speaker is not activated then the alarm will of course not be heard. Once the PPM drops below the alarm setting the alarm will turn off. The top line of the display will also indicate when there is an alarm condition.

2.3 MAIN MENU

By pressing the MODE/STORE switch from the Run mode and then pressing the -/CRSR switch when asked if logging is desired, the 580B will display the main menu:

R/COMM -/PARAM
+/ACCESS S/CLOCK

The other four operating modes (Communication, Parameters, Access and Clock) may be entered from the Main menu. The operating mode may always be returned to by pressing the MODE/STORE switch.

2.4 PARAMETERS MODE

All of the 580B operating parameters are entered in the Parameters mode. Ths 580B is also calibrated from within the Parameters mode. The Parameters mode may be entered by pressing the -/CRSR switch from the main menu.

There are eight different sections in the parameters mode.

1. Run mode selection
2. Auto Logging selection
3. Average time selection
4. Alarm setting
5. Lamp selection
6. Response factor setting
7. Calibration
8. Free space indication

Pressing the +/INC switch will advance the 580B to the next section. Pressing the -/CRSR will advance the 580B to the previous section. Each section and any of its sub-sections will be described in the following pages. It is important to note that when the 580B is in a sub-section of any of the above sections that the +/INC and -/CRSR switches will have a different meaning. This may seem confusing at first but will become clear after stepping through each section.

2.4.1 RUN MODE SELECTION

There are two Run modes. Concentration meter normal and Max Hold (see section 2.2.2). The top line of the display will show:

CONC. METER

the bottom line will show:

"RESET" TO CHG

The bottom line will alternate every two seconds with:

MAX HOLD

if the 580B is in the Max Hold mode. Pressing the RESET switch will cause the 580B to show:

MAX HOLD
+ = USE/ − = NO

if the + / INC switch is pressed then the Max Hold mode will be selected. If the − / CRSR switch is pressed then the Concentrameter normal mode will be selected. In either case the 580B will then return to the previous screen.

2.4.2 AUTO LOGGING SELECTION

The 580B can be configured to automatically log data points. The top line of the display will show:

AUTO LOGGING

The bottom line will alternate between "RESET TO CHG." and "ON" or "OFF". Pressing the RESET shitch will cause the 580B to show:

AUTO LOGGING
+ / ON − / OFF

Pressing the - / CRSR switch will turn auto logging off and return operation to the previous screen. Pressing the + / INC switch will enable auto logging and allow setting of the logging interval. The display will show:

INTERVAL 00:01
"RESET"WHEN DONE

The + / INC switch will increment the number above the cursor and the − / CRSR switch will move the cursor. The logging interval format is MM:SS (where M is minute and S is second). Pressing the RESET switch will return operation to the first auto logging screen.

2.4.3 AVERAGE TIME SELECTION

The 580B can be configured to display the average PPM from once a second up to once every four minutes. The display will show:

AVERAGE = 0:01
"RESET" TO CHG

Pressing the RESET switch will cause the 580B to show:

AVERAGE = 0:01
"RESET"WHEN DONE

The + / INC switch will increment the number above the cursor and the − / CRSR switch will move the cursor. The average time format is M:SS (where M is minutes and S is seconds).

NOTE : The maximum averaging interval is four minutes.

2.4.4 ALARM SETTING

The 580B will display the current alarm setting on the top line of the display. The setting may be changed by simultaneously pressing the RESET switch with either the + / INC switch to increment the digit above the cursor or the − / CRSR switch to move the cursor.

2.4.5 LAMP SELECTION

The 580B will display:

LAMP

on the top line. The bottom line will alternate every two seconds between:

"RESET" TO CHG

and the currently selected lamp setting and its associated serial number.
i.e.

11.8eV 000000

By pressing the RESET switch, the 580B will display:

+/10eV −/11eV

on the bottom line. Pressing the +/INC switch will select the 10.0 eV lamp. Pressing the −/CRSR switch will select the 11.8eV lamp. In either case the 580B will then allow editing of the lamp serial number. The display will show:

SERIAL # 000000
"RESET"WHEN DONE

The +/INC switch will increment the number above the cursor and the −/CRSR switch will move the cursor. Pressing the RESET switch will return operation to the original lamp screen.

2.4.6 RESPONSE FACTOR SETTING

The current Response Factor setting will be displayed on the top line of the display. The Response Factor may be changed by simultaneously pressing the RESET switch with either the +/INC switch to increment the digit above the cursor or the −/CRSR switch to move the cursor.

The response factor is used to equate the response of one organic vapor with that of the calibration gas. The current reading is allways multiplied by the response factor in order to obtain the displayed concentration. A response factor of one will not change the displayed concentration.

2.4.7 CALIBRATION

The 580B will display:

"RESET" TO
CALIBRATE

The calibration mode may be entered by pressing the RESET switch.
The 580B will display:

RESTORE BACKUP
+ = YES

The previous calibration information may be restored by pressing the +/INC switch. The 580B will then return to the previous screen. If the backup is not desired, by pressing the −/INC switch the calibration routine will continue. The display will show:

ZERO GAS
RESET WHEN READY

Once zero gas has been introduced the RESET switch should be pressed. The 580B will then zero the instrument. The 580B will display:

MODEL 580B
ZEROING

Once the 580B has been zeroed the 580B will display:

SPAN PPM = 0000

The Span gas concentration may now be entered by simultaneously pressing the RESET switch and either the +/INC switch to increment the digit above the cursor or the −/CRSR switch to move the cursor. Once the span gas concentration has been entered the +/INC switch should be pressed.

The 580B will then display:

SPAN GAS
RESET WHEN READY

Once the span gas has been introduced the RESET switch should be pressed. The 580B will then calibrate the instrument. The 580B will display:

MODEL 580B
CALIBRATING

Once the 580B has been calibrated the 580B will go back to the beginning and display:

"RESET" TO
CALIBRATE

If during the zeroing or calibrating of the 580B a steady reading was not seen then the 580B will display:

CAL ERROR
RESET WHEN READY

Pressing the RESET switch will return the 580B to zeroing or calibrating (depending of course on which it came from).

See section 4.1 for tips on calibrating the 580B.

2.4.8 FREE SPACE INDICATION

This section will give a rough indication of how much room is left for logging data points. The screen will display a bar graph on the top line and the amount of free space on the bottom line. The number indicates the total number of bytes which are available. Each data point takes fifteen bytes. Other bytes may also be needed in order to store other important information. This is why only a rough indication of room may be given.

2.5 ACCESS MODE

The Access mode is entered by pressing the +/INC switch from the main menu. The 580B has four access levels, zero through three. Level zero will only allow the operator to log data points and of course to change access levels (only if the access code is known). Level one will also allow the user to change the user identification number. Level two will allow the user complete access to the Parameters mode, and allow viewing of the date and time. Access level three allows complete access.

The access mode has three sections:

1. Access level
2. User identification number
3. Instrument number

Pressing the +/INC switch will advance the 580B to the next section. Pressing the −/CRSR switch will advance the 580B to the previous section.

TABLE OF ACCESS LEVELS

ACCESS LEVEL	OPERATIONS ALLOWED
0	Change access level Log data
1	All above operations View time and date View communication format Display logged data Change user I.D.
2	All above operations Change operating Parameters Reset logged data
3	All operations available

2.5.1 ACCESS LEVEL

The screen will display:

ACCESS LEVEL 3
"RESET" TO CHG

By pressing the RESET switch the 580B will display:

KEY 00003
"RESET" WHEN DONE

Please note that in both screens the 3 indicates the current access level and may not nescessarily be a three.

In order to change the access level the +/INC switch may be pressed to increment the digit above the cursor and the −/CRSR switch may be pressed to move the cursor. The desired access level should be entered in the right most digit. Note that only access levels between zero and three are legal. The remaining four digits are the access code. The access code will be 0000 when the instrument is shipped. The access code should then be entered. Once this is done press the RESET switch. The 580B will then return to the previous screen.

If the access code entered was not the proper access code, or if the access level was not a legal access level then the access level will not be changed.

The last and most important point regarding the access level is how to change the access code. The access code is the four rightmost digits of the instrument number. The instrument number is only viewable (and therefore only changable) while in access level three.

2.5.2 USER IDENTIFICATION NUMBER

The screen will display:

I.D. # 014563977
"RESET" TO CHG

By pressing the RESET switch the 580B will display:

I.D. # 014563977
"RESET" WHEN DONE

the – /CRSR switch to move the cursor. The user identification number is a nine digit number (just right for fitting a social security number). Once the user identification number has been entered press the RESET switch and the 580B will return to the previous screen.

2.5.3 INSTRUMENT NUMBER

The screen will display:

INSTR # 000000
"RESET" TO CHG

By pressing the RESET switch the 580B will display:

INSTR # 000000
"RESET" WHEN DONE

The instrument number may be changed by pressing the + /INC switch to increment the digit above the cursor and the – /CRSR switch to move the cursor. Once the instrument number has been entered the RESET switch should be pressed. The 580B will then display the previous screen.

When the instrument number is changed it is very important that the last four digits be remembered. These digits are the access code and therefore will need to be known in order to change the access level.

2.6 CLOCK MODE

The Clock mode is entered from the Main menu by pressing the SPKR switch. The screen will display the date and time on the top line. The bottom line will display:

"RESET" TO CHG

By pressing the RESET switch the 580B will display:

"RESET" WHEN DONE

The date and time may be changed by pressing the + /INC switch to increment the number (or in the case of the month the months abreviation) above the cursor. The – /CRSR switch will move the cursor. Once the proper month has been entered the RESET switch should be pressed. The 580B will return to the previous screen.

The date and time will be maintained even when the instrument is turned off! It is however advisable that the date and time periodically be checked to ensure that it is correct.

2.7 COMMUNICATION MODE

The Communication mode is entered from the main menu by pressing the RESET switch. The Communications mode has four sections.

1. Communicate with printer or computer
2. Display logged data
3. Reset logged data
4. Set communication parameters

Pressing the – /CRSR switch will advance the 580B to the next section.

NOTE : A detailed discussion of communication protocol is given in appendix A. Further discussion of communication may be found in chapter seven.

2.7.1 COMMUNICATE WITH PRINTER OR COMPUTER

The 580B is capable of communicating with a computer or outputing logged data to a printer. The 580B will display:

COMMUNICATE?
"+" = YES

if the computer format is selected or it will display:

OUTPUT TO PRINTER
"+" = YES

if the printer format is selected. In either case pressing the +/INC switch will cause the 580B to try to establish communication. Pressing the −/CRSR switch instead will cause the 580B to advance to the next section.

2.7.2 DISPLAY LOGGED DATA

If at least one data point has been logged the 580B will display:

DISP. LOG DATA?
"+" = YES

By pressing the +/INC switch the 580B will display the first data point. The date and time which the data point was logged will be displayed on the top line. The bottom line will alternate between the location code and the PPM. Pressing the +/INC switch will advance to the next logged data point. This will continue until there are no more data points at which time the 580B will display:

NO DATA STORED

The MODE/STORE switch may be pressed to return to the Run mode.

2.7.3 RESET LOGGED DATA

The logged data can be erased so that more data points may be logged. The screen will display:

RESET LOG DATA?
"+" = YES

Pressing the +/INC switch will erase all of the logged data points. The 580B will then advance to the next section.

2.7.4 COMMUNICATIONS PARAMETERS

The 580B can be configured to communicate with a printer or a computer. The baud rate may also be set for 9600, 4800, 2400, 1200, 900, 600, 300, or 150 baud. The 580B will display the current communication format (computer or printer) on the top line and the current baud rate on the bottom line. Pressing the RESET switch will cause the 580B to display:

COMPUTER FORMAT
+ = USE − = NO

Pressing the +/INC switch will select the computer format and the 580B will advance to the baud rate screen (see below). Pressing the −/CRSR switch will cause the 580B to display:

PRINTER FORMAT
+ = USE − = NO

Pressing the +/INC switch will select the printer format and the 580B will advance to the baud rate screen (see below). Pressing the −/CRSR switch will cause the 580B to display the previous screen.

The baud rate screen will display the currently selected baud rate on the top line. The bottom line will display:

+ = USE − = NO

Pressing the +/INC switch will cause the displayed baud rate to be selected and the 580B to show the selected format on the top line and the baud rate on the bottom line. Pressing the −/CRSR switch instead will cause the next lowest baud rate to be displayed.

2.8 BATTERY / CHARGER

The model 580B uses a 1.2 amp hour lead acid (gel cell) battery. There is protection circuitry potted directly on top of the battery. The battery is rechargable with the charger provided with the instrument.

The charger is regulated so that there is no danger of "over charging" the battery. The charger has an LED which indicates when the battery is being charged. The LED's brightness is proportional to the current being delivered into the battery.

SECTION III

Routine Maintenance

The routine maintenance of the 580B involves the calibration of the instrument, the cleaning of the lamp window, and the maintaining of charge on the battery. The following pages give instructions for routine maintenace. Figure 3.1 illustrates the detector assembly.

3.1 LAMP INSERTION AND REMOVAL

3.1.1 REMOVAL

NOTE: The 580B must be off while removing the lamp.

In order to remove the lamp the four screws which hold the case top and bottom together must first be loosened. The case bottom should be placed flat on the table and the top placed on its side next to the bottom.

The high voltage power supply is removed next by loosening the thumb screws on each side and then pulling the power supply towards the rear of the instrument (see figure 3.1). The lamp may now be removed by loosening the lamp nut.

3.1.2 INSERTION

Insertion of the lamp is accomplished by performing the above tasks in the reverse order. The lamp should be placed flat against the o-ring and the lamp nut fastened down in order to create a proper seal. The high voltage power supply should then be inserted and the thumb nuts fastened down. There are three pins protruding from the high voltage power supply which should fit snugly into connectors located beneath the detector. The lamp spring (mounted in the center of the high voltage power supply) should make contact with the lamp ring.

3.1.3 LAMP CLEANING

On occasion the lamp should be removed for cleaning. Cleaning of the lamp is accomplished by cleaning the lens surface of the UV lamp. This is accomplished by using the aluminum oxide scouring powder provided with the 580B.

The procedure for cleaning the lamp is as follows. First place a small amount of aluminum oxide scouring powder on the lens of the UV lamp. Next gently scour this lens with a soft tissue or cloth. Scour the lens in a rotary type motion. After scouring the lens surface gently blow the remaining powder from the lens. Throughly wipe the lamp lens with a clean tissue to remove the last traces of cleaning powder. The lamp is now able to be inserted into the detctor.

3.2 CALIBRATION

NOTE : Chapter four should be read before calibrating the 580B in order to gain a better understanding of the concepts behind calibration of the 580B.

The following is a brief discussion of calibration as it relates to different lamps. One of the parameters in the Parameters mode (see section 2.3) allows selection of lamp setting. The two types of lamps are the 10.0 eV and the 11.8 eV lamp. Whenever a new lamp is used the 580B must be calibrated. This is true even if the new lamp is the same type. For example the new and old lamp are both 10.0 eV. This is due to the fact that each lamp will have a slightly different sensitivity.

It is important to note that the 11.8 eV lamp will in general be less sensitive than the 10.0 eV lamp. This is true despite the higher energy level of the 11.8 eV lamp. The 11.8 eV lamp will however "see" certain gases which the 10.0 eV lamp will not. See table E.1 for a list of common organic vapors and their associated ionization potentials. Any questions regarding the use of the 580B should be directed to Thermo Environmental's Application Laboratory.

The 580B is quite simple to calibrate. A source of "zero air" and "span gas" are all that is needed to calibrate the 580B.

BILL OF MAT'L			
ITEM	PART NO.	DESCRIPTION	QTY.
1	580B-6003	DETECTOR SUB ASSY.	1
2	580S-2010	NUT-LAMP (13507)	1
3	580S-6019	PWR. SUPPLY ASSY. (13560)	1
4	12082	NUT-KNURLED	2
5	2140-0014	U.V. LAMP 10.0	1
6	580S-6035	DETECTOR WIRING ASSY. (13575)	1
7	580B-6001	BASE HARNESS ASSY.	1
8	4166	STRAIN RELIEF	1
9	580S-6028	SIGNAL CABLE (13568)	1
10	5814	4-40 1/4" BINDER HD. SCREW	2
11	4629	INSERT	1
12	10140	DELRIN FITTING	1
13	5510	TEFLON-TUBING - 1/8" (APPROX. 8" LG)	1

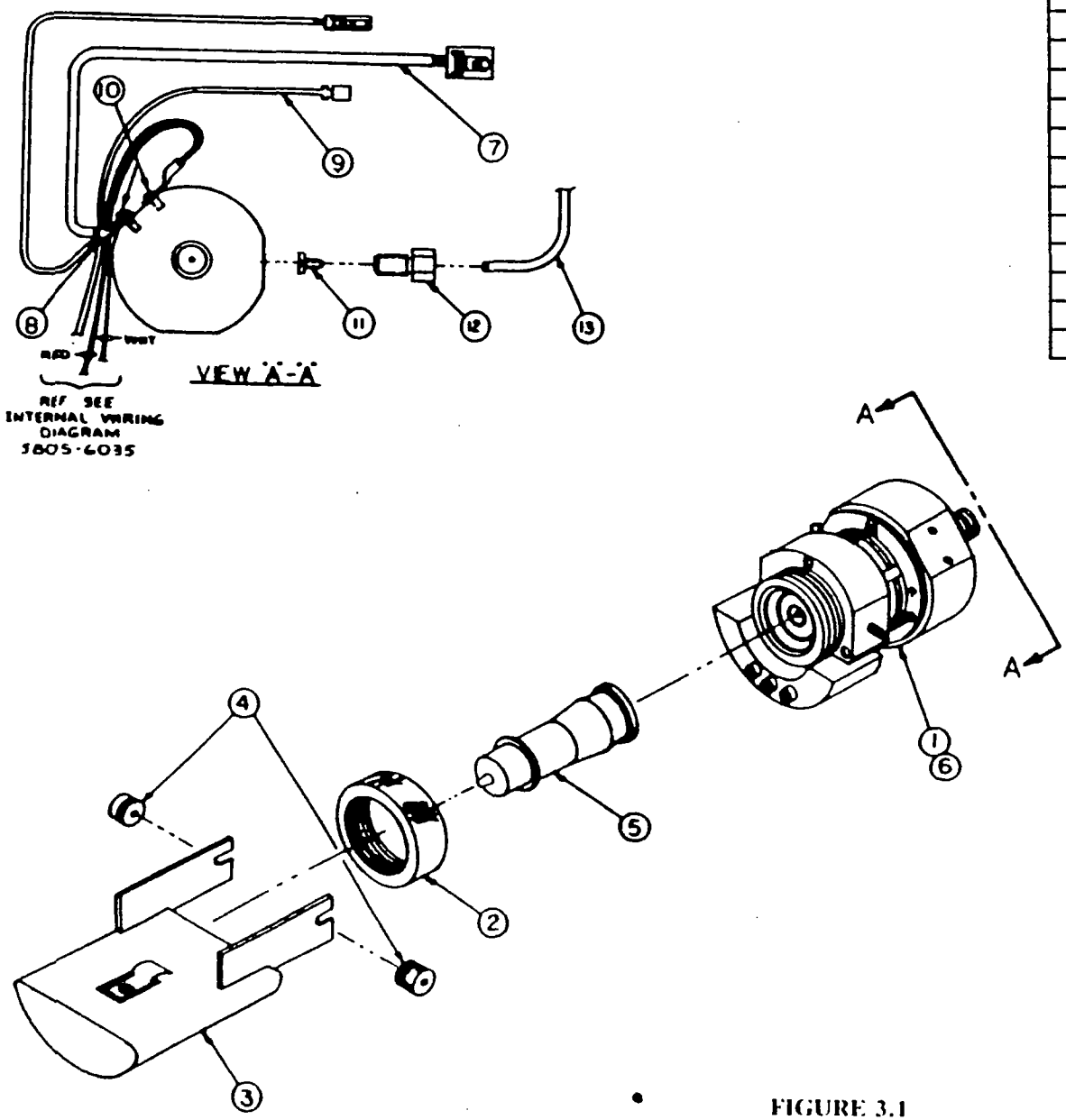


FIGURE 3.1

TITLE		
DETECTOR ASSY.		
SIZE C	DRAWING NUMBER 580B-6004	REV.

The zero air is introduced to the 580B in order to determine the "background" signal. The concentration of the span gas is then selected. The span gas is finally introduced to the 580B. The instrument makes all of the necessary calculations (including linearization) to arrive at a "calibration constant." When in the Run mode the signal is multiplied by the calibration constant in order to arrive at the current PPM.

$$\text{CALIBRATION CONSTANT} = \frac{\text{SPAN PPM}}{\text{SPAN ZERO SIGNAL}}$$

$$\text{PPM} = (\text{SPAN SIGNAL} - \text{ZERO SIGNAL})\ \text{CALIBRATION CONSTANT}$$

NOTE : The PPM is then multiplied by the RESPONSE FACTOR before being displayed. Chapter four explains the use of response factors when calibrating.

Section 2.4.6 gives a detailed explanation of which buttons to press in order to calibrate the 580B. The flow chart at the back of this manual may also be helpfull.

3.3 CHARGE

When there is a flashing "B" in the lower left corner of the display (while in the run mode) the battery is low. The battery is recharged by pluging the charger into the RUN/CHARGE plug at the rear of the 580B. The instrument runs while it is charging. The charger has an LED which indicates the amount of current being drawn. The LED gets brighter as more current is drawn. The LED can therefore be used as a rough indication of the charge on the battery.

SECTION IV

Calibration

4-1 GENERAL

The Model 580B Organic Vapor Meter is indeed a quantitative instrument and can certainly be used as such. It makes use of the Photoionization Detection System using a lamp with an ionization energy of 10.0 eV which is standard in the Model 580B. Almost all organic materials will be ionized at this energy level. There are some organic materials, such as a few of the freons, methane, ethane and propane that are not ionized and thus will not be detected. The ionization potentials for the various organic materials will simply tell whether the material will be detected by the Photoionization Detector. It does not give any clue as to the sensitivity of that detector for that particular material. Certainly, different organic vapors will have different sensitivities. It is important to understand that the Model 580B does indeed sense most organic vapors and that its response to these different organic vapors will indeed be different.

In this section of the manual, the aspects of calibrating the Model 580B for various vapors will be discusssed. In the following section discussing applications, various ways of using the features of the Model 580B will be explained along with the various methods for calibration of the 580B. There will also be applications of the Model 580B in specific instances where the organic vapors or the mixtures of organic vapors are completely unknown. The 580B can be an extremely useful tool, even in areas such as those.

FACTORY CALIBRATION OF THE MODEL 580B

To complete testing and operation in the checkout area, each Model 580B has been calibrated and linearity checked at the factory. The particular gas chosen for this calibration is isobutylene. The Model 580B has good response for isobutylene. Isobutylene standards prepared in air are relatively stable with time, undergoing no serious adsorption or reaction problems.

4-2 METHODS OF GENERATING CONCENTRATIONS OF VARIOUS MATERIALS IN AIR.

This section is not intended to be exhaustive as far as the preparation of gas and vapor standards in air are concerned. Only those methods that have been found most practical for the calibration of the 580B are discussed here. There are basically two types of standards. Static standards in which a known volume of the gas or vapor is mixed with a known volume of air and the concentration of the gas or vapor in air calculated from knowing these volumes. The second method used is what is called a dynamic standard. Dynamic standard preparation involves mixing gases or vapors with air under a flowing condition whereby the flow rate of both gases are known prior to their mixing. The concentration then is calculated from flow rates.

Certainly commercially available standard cylinders of gaseous materials in air offer the most convenient method of calibration. However, these are static standards. Standards prepared in this fashion in air for vapors of various organic liquids often show concentration reduction with time due to adsorption problems. In general, gases when mixed with air will maintain their concentrations with time since adsorption is generally not a problem. However, some gases are sufficiently reactive that chemical reaction of the gas will cause a reduction of it in air. These precautions must be observed when using commerically prepared standards for calibration of the Model 580B. It is for this reason that isobutylene in air was chosen as a reference standard for factory calibration. Static standards can be prepared in a laboratory and in general are reasonable ways of calibrating the Model 580B. However, it is important that these standards be used shortly after their preparation to reduce the significance of any adsorption problems. Static standards prepared for calibration of the Model 580B are best prepared in collapsible plastic bags. This is opposed to a fixed volume container. The sampling rate of the 580B, which is 500 ml/min, requires an appreciable amount of sample. Even one minute's sampling out of a fixed container will remove 500 ml/min from it. This should not significantly reduce the pressure inside the container. Thus, the collapsible bag provides the best means as opposed to a fixed volume. A 5 gallon polyethylene bag is a convenient size to use for the preparation of static standard.

A tube is inserted into the opened end of the bag and the bag opening then sealed around the tube. The tube should have a cutoff valve or some means of closing the volume of the bag. The volume of air introduced into the bag must be measured. This is most conveniently measured by a wet test meter. However, a source of air flowing through a flow meter can be used if the flow can be held constant, then time is a measure of the volume of the air placed into the bag. All air is expelled from

the bag by completely collapsing it prior to connection to the source of air. It can then be connected to a wet test meter or flow meter via a short length of rubber tubing hooked to the plastic tube of the bag. The air flow is started into the bag at a rate of approximately 5 l/min. A total of 10 liters is a convenient volume for a 5 gallon bag. This would mean approximately 2 minutes for filling the bag.

For gaseous samples, the trace organic will be added via a glass hypodermic syringe. The 1 cc Tuberculin syringe is a convenient size. For an isobutylene standard, the 1 cc syringe is flushed with pure isobutylene and then filled to the 1 cc mark. While the air is flowing into the plastic bag, the short piece of rubber tubing is pierced by the needle from the 1 cc syringe and the plunger slowly depressed such that the 1 cc of isobutylene is added to the air flowing into the plastic bag. When 10 liters of air have been added to the plastic bag, the flow is immediately stopped and the valve on the tube or the closing clamp is applied to contain the air and isobutylene within the plastic bag. It is best at this stage of the procedure not to rely solely on the diffusion of isobutylene to form a uniform mixture inside the plastic bag. Slight kneeding of the plastic bag will hasten the mixing of the isobutylene in air. The plastic tube from the bag is then connected to the probe on the Model 580B via a short length of rubber tubing and the valve on the plastic tube immediately opened. The Model 580B withdraws a sample from the bag at the sampling rate of 500 ml/min. Thus, 10 liters of sample in the bag will provide approximately 20 minutes. Certainly the calibration of the 580B can be accomlished in a shorter period of time. The concentration of isobutylene in ppm by volume will be equal to the sample size, which was 1 cc, divided by the volume of the bag in liters, which would be 10 liters, times 1000. In this particular instance, the concentration would be:

$$\text{Conc (ppm by Vol)} = \frac{1\text{cc Isobutylene} \times 1000}{10 \text{ L Air}} = 100 \text{ ppm}$$

For organic materials, which are normally liquids at room temperature, the procedure is essentially the same except that an extremely small liquid sample is injected into the flowing air stream rather than the gas sample. This technique works well only for relatively volatile organic materials. The flowing air stream must vaporize all of the material or the calculation will be off. If the material is not rapidly volatile in that flowing air stream, the liquid should be injected through the surface of the plastic bag. Immediately after withdrawing the needle, the hole in the plastic bag should be covered with a piece of plastic tape.

Again significant kneeding of the bag will hasten the evaporation of the sample and mixing of the vapor into the air to provide homgeneous samples. The introduction of this sample into the 580B is the same as before. The calculation of the concentration of the vapor in air is a two-step procedure whereby the small volume of liquid injected into the air stream or into the plastic bag is converted to a volume of vapor. This volume of vapor is then used in the same manner as the volume of gas in the case of isobutylene. The following equations apply:

$$\text{Volume Vapor (ul)} = \frac{\text{Liquid Volume (ul)} \times \text{Liquid Density} \times 24.45}{\text{Molecular Weight}}$$

The above equation gives the vapor volume at atmospheric pressure (760 torr) and 25 C (77 F).

Then:

$$\text{Concentration (ppm by Volume)} = \frac{\text{Vapor Volume (ul)} \times 1000}{\text{Air Volume (liters)}}$$

The following is a sample calculation for benzene.

Liquid Volume = 2 ul

Benzene Density = 0.879 g/cc

Molecular Weight Benzene = 78.1

Air Volume = 10 liters

$$\text{Vapor Volume} = \frac{2 \times 0.879 \times 24.45}{78.1} = 0.55 \text{ ul Benzene Vapor}$$

$$\text{Conc} = \frac{0.55 \times 1000}{10} = 55 \text{ ppm (vol)}$$

The syringe used for the measurement of liquids in this particular instance is a small volume-type such as those manufactured by the Hamilton Company. A convenient size syringe is the 10 microliter volume.

Dymanic standards can be prepared of both gases and vapors by using the techniques of either permeation tubes for gases or diffusion tubes for vapors. These permeation or diffusion devices supply a very small flow of either the gas or vapor. This is mixed with a known flow rate of air providing a flowing stream that has a known amount of either gas or vapor in the air stream. These are probably the most reliable and accurate standards available for low level concentration of gases and vapors in air. However, the techniques require some additional instrumentation in order to implement the use of these devices. The reader is referred to Thermo Environmentals applications notebook for the use of these techniques in the dymanic generation of standards.

SECTION 4.0

KEYSTONE STEEL & WIRE COMPANY

General Conditions of the Contract for Construction

TABLE OF ARTICLES

1. Contract Documents
2. Owner
3. Contractor
5. Time
6. Payments and Completion
8. Insurance
9. Changes in the Work
11. Termination of the Contract
12. Miscellaneous Provisions

INDEX

General Conditions of the Contract for Construction

DESCRIPTION	ARTICLE
Acceptance of Defective or Non-Conforming Work	10.3
Access to Work	2.3.1
Accident Prevention	2.3.1, 7
Addendum, Definition of	1.1.1
Additional Work	9
Administration of the Contract	2.3
Agreement, Extent of	1.1, 1.2
Applications for Payment	2.3.2, 6.2, 6.3, 6.4, 6.5
Arbitration, Owner-Contractor Claims and Disputes	12.5
Bonds, Contract (Performance, Labor and Material Payment)	12.7
Builder's Risk Insurance (see Property Insurance)	8
Certificates of Insurance	8.1.4
CHANGES IN THE WORK	9
Changes, Minor	2.3.4, 9.2
Change Orders	2.3.4, 9.1
Change Orders, Definition of	9.1.2
Claims and Disputes Between the Contractor and the Owner	12.5
Claims for Additional Time	5.3.2
Claims for Damages	12.6
Claims of the Subcontractor	4.3.1.4
Clean Up	3.15
Commencement of the Work	5.1.2
Communications	3.9
COMPLETION, PAYMENTS AND	6
Completion, Substantial	2.3.5, 5.1.3, 5.2.5, 6.5
Contract, Definition of	1.1.2
Contract Bonds	12.7
CONTRACT DOCUMENTS	1
Contract Documents, Copies Furnished and Ownership of	1.3
Contract Documents, Definition of	1.1.1
Contract Documents, Execution, Correlation, Intent and Interpretations	1.2
Contract Modifications	1.1.1, 1.2.2, 9
Contract Sum, Changes of	9.1, 9.2
Contract Sum, Definition of	6.1
Contract Termination by Contractor	11.1
Contract Termination by Owner	11.2
Contract Time	5.1.1
CONTRACTOR	3
Contractor, Definition of	3.1

DESCRIPTION	ARTICLE
Contractor, Termination of the Contract by the	11.1
Contractor's Liability Insurance	11.1
Contractor's Relations with Subcontractors	4.3
Contractor's Responsibility for Protection and Safety	7.1, 7.2
Contractor's Responsibility for Those Performing the Work	3.10
Contractor's Review of Contract Documents	3.2
Contractor's Superintendent	3.9, 7.2.5
Contractor's Supervision and Construction Procedures	3.3
Coordination of Work	3.5
Copies Furnished of Drawings and Specifications	1.3.1
Correction of Work	10.2
Cuttings and Patching of Work	3.14
Damages, Claims for	12.6
Day, Definition of	5.1.4
Debris Removal	3.15
Deductions for Uncorrected Work	2.5, 10.3
Defective or Non-Conforming Work, Acceptance of	10.3
Delays and Extensions of Time	5.3
Documents, Execution of the Contract	1.2.1
Drawings and Specifications at the Site	3.7
Drawings and Specifications, Ownership of	1.3.2
Easements	2.2.2
Execution, Correlation, Intent and Interpretations of the Contract Documents	1.2
Extensions of Time	5.3, 9.1
Extras	9
Field Orders	1.2.2
Final Payment	6.5
Fire, Extended Coverage, Vandalism and Malicious Mischief Insurance	8.1.5, 8.1.6
Governing Law	12.1
Guarantee Bonds	12.7
Guarantee	6.3.3, 10.2.2
Indemnification	3.19
Information and Services Required of the Owner	2.2
Inspections	2.3, 3.17, 12.13
INSURANCE	8
Insurance, Builders Risk (See Property Insurance)	8.1.5, 8.1.6
Insurance, Certificates of	8.1.4
Insurance, Contractor's Liability	8.1.1, 8.1.2, 8.1.3, 8.1.6
Insurance, Fire, Extended Coverage, Vandalism, and Malicious Mischief	8.1.5, 8.1.6

DESCRIPTION	ARTICLE
PERSONS AND PROPERTY, PROTECTION OF	7
Progress and Completion	5.2
Progress Payments	6.3, 6.4
Progress Schedule	3.11
Property Insurance	8.1.5, 8.1.6
PROTECTION OF PERSONS AND PROPERTY	7
Rejection of Work	2.3.3, 10.2
Releases of Waivers and Liens	6.5.4, 6.5.5
Remedies, Rights and	12.8
Responsibility for Those Performing the Work	3.10
Retainage	4.4.1, 6.3
Review of Contract Documents by the Contractor	3.2
Rights and Remedies	12.8
Risk of Loss	12.12
Royalties and Patents	12.9
Safety of Persons and Property	7.2
Safety Precautions and Programs	7.1
Samples,	3.8
Schedule of Values	6.2
Schedule, Progress	3.11
Site, Use of	3.13
Special Hazards Insurance	8.1.7
Stopping the Work	2.4
SUBCONTRACTORS	4
Subcontractor, Claims of	4.3.1.4
Subcontractor, Definition of	4.1.1
Subcontracts, Award of	4.2
Subcontractual Relations	4.3
Substantial Completion and Final Payment	2.3.5, 6.5
Substantial Completion, Date of	2.3.5, 5.2.5
Sub-subcontractor, Definition of	4.1.2
Successors and Assigns	12.3
Supervision and Construction Procedures	3.3
Superintendent, Contractor's	3.9, 7.2.5
Surveys	2.2.1
Taxes	3.12
Temporary Facilities	3.18
Termination by the Contractor	11.1
Termination by the Owner	11.2
TERMINATION OF THE CONTRACT	11
Tests	3.17, 12.13

DESCRIPTION	ARTICLE
TIME	5
Time, Definition of	5.1
Time, Delays and Extensions of	5.3, 9.1
Title of Work	6.3
UNCOVERING AND CORRECTION OF WORK	10
Uncovering of Work	10.1
Unit Prices	9.1.3, 9.1.5
Use of Site	3.13
Values, Schedule, of	6.2
Waiver of Claims by the Contractor	6.5.5
Waiver of Claims by the Owner	6.5.4
Warranty	3.6. 6.3.3, 10.2
Words, Recognized Meanings of	1.2.1
Work, Definition of	1.1.3
Written Notice	12.4

GENERAL CONDITIONS

ARTICLE 1

Contract Documents

1.1 DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Invitation of Bid, the Instruction for Bidders, the Proposal, the Conditions of the Contract (General, Supplementary and other Conditions), the Drawings, the Specifications, all Addenda issued prior to the last date on which Proposals may be submitted, and all Modifications thereto. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, or (3) a written order for a minor change in the Work issued by the Owner Pursuant to Paragraph 9.2. A Modification may be made only after acceptance of the Proposal.

1.1.2 THE CONTRACT

The Contract Documents form the Contract. The Contract represents the entire and wholly integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements. The Contract may be amended or modified as defined in Subparagraph 1.1.1.

1.1.3 THE WORK

The term Work includes all labor necessary to produce the construction required by the Contract Documents, and all materials and equipment incorporated in such construction.

1.2 EXECUTION, CORRELATION, INTENT AND INTERPRETATION OF DOCUMENTS

1.2.1 The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. The intention of the Documents is to include all labor, materials, equipment and other items necessary for the proper execution and completion of the Work. Work not covered under any heading, class or trade of the specifications shall be supplied if it is required elsewhere in the Contract Documents or is reasonably inferable therefrom as being necessary to produce the intended results. Words which have well-known technical or trade meanings are used herein in accordance with such recognized meanings.

1.2.2 Written interpretations necessary for the proper execution or progress of the Work, in the form of drawings or otherwise will be issued with reasonable promptness by the Owner and in accordance with any schedule agreed upon. Such interpretations shall be consistent with and reasonably inferable from the Contract Documents, and may be effected by field order.

1.3 COPIES FURNISHED AND OWNERSHIP

1.3.1 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, all copies of Drawings and Specifications reasonably necessary for the execution of the Work.

1.3.2 All Drawings, Specifications and copies thereof furnished by the Owner are and shall remain his property.

ARTICLE 2

Owner

2.1 DEFINITION

2.1.1 The Owner is Keystone Steel & Wire Company, a Division of Keystone Consolidated Industries, Inc., and is referred to throughout the Contract Documents as if masculine in gender. The term Owner means the Owner or his authorized representative.

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 The Owner shall furnish all surveys describing the physical characteristics, legal limits and utility locations for the Site of the Project.

2.2.2 The Owner shall secure and pay for any easements necessary for the progress of the Work.

2.2.3 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.

2.3 ADMINISTRATION OF THE CONTRACT

2.3.1 The Owner shall at all times have access to the Work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so the Owner may perform his functions under the Contract Documents. The Owner will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Owner will not be responsible for construction means, methods, techniques, sequences or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

2.3.2 Based on such observations and Contractor's Application for Payment, the Owner will determine the amounts owed to the Contractor and will pay in such amounts, as provided in Paragraph 6.3.

2.3.4 The Owner will prepare Change Orders in accordance with Article 9 and will have authority to order minor changes in the Work as provided in Subparagraph 9.2.1.

2.3.5 The Owner will conduct inspections to determine the dates of Substantial Completion and Final Completion, will receive and review written guarantees and related documents required by the Contract and assembled by the Contractor and will issue final Payment.

2.4 OWNER'S RIGHT TO STOP THE WORK

2.4.1 If the Contractor fails to correct defective Work or persistently fails to supply materials or equipment in accordance with the Contract Documents, the Owner may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

2.5 OWNER'S RIGHT TO CARRY OUT THE WORK

2.5.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to preform any provision of the Contract, the Owner may, after seven (7) days' written notice to the Contractor and without prejudice to any other remedy he may have, make good such deficiencies. In such cases, an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such

deficiencies. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

2.6 OWNER'S RIGHT TO OCCUPY

2.6.1 The Owner reserves the right to occupy any portion of the Project before it has been entirely completed, with the distinct understanding that such occupancy shall in no way constitute acceptance of the Work in whole or in part thereof or of any Work performed under the Contract.

ARTICLE 3

Contractor

3.1 DEFINITION

3.1.1 The Contractor is the person or organization identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

3.2 REVIEW OF CONTRACT DOCUMENTS

3.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Owner any error, inconsistency or omission he may discover. The Owner does not warrant the sufficiency of the Contract Documents. If the Contractor does not notify the Owner of any error or omission, which he discovered or reasonably should have discovered, prior to submitting his Proposal, then he shall be deemed to have included allowance in his Proposal of the Work necessary to correct said error or omission. If the Contractor does not notify the Owner of any inconsistency in the Contract Documents, which he discovered or reasonable should have discovered, prior to submitting his Proposal, then he shall be deemed to have included allowance in his Proposal for the better quality and greater quantity of the Work. The Contractor shall do no Work without drawings, specifications or modifications. The Contractor shall verify all measurements of the Work and shall be responsible for all the Work fitting into place in a satisfactory and workmanlike manner. The Contractor shall examine the drawings and shall note any features, peculiarities and limitations or space available for equipment, and necessary deviation shall be referred to the Owner for verification and adjustment before the Work is done.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

3.4 LABOR AND MATERIALS

3.4.1 Unless otherwise specifically note, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work. It is mandatory that all building products manufactured by the Owner be used in the Owner's Work where these materials are required, such as nails, fence, reinforcing material, etc. Substitutions will be permitted only with written approval of the Owner.

3.4.2 All material and equipment supplied by Owner is specifically listed as such in the Contract Documents. All other material and equipment necessary for the satisfactory completion of the Work shall be supplied as specified on the drawings and in the detailed specifications. Substitution will be permitted only with written approval of the Owner.

3.4.3 When material and equipment are furnished by the Owner to be installed by Contractor, arrangements shall be made between them for the time and place of delivery. After the acceptance of the delivery of any such material and equipment by the Contractor, he shall be responsible for its condition and he shall replace without charge any items which may be lost, stolen or damaged before completion of his Work, even though the material may have been installed.

3.4.4 All materials and equipment furnished by the Contractor will be United States of American origin or manufacture. Alternate bids must be supplied where materials and equipment of foreign origin or manufacture are considered and the alternate bids must state the item involved, the source of the item, and the applicable price.

3.4.5 All material and equipment shall be handled and stored in such fashion that it is in like new condition when applied.

3.4.6 All manufactured articles, materials, and equipment to be incorporated in the Work shall be installed, cleaned and conditioned in accordance with manufacturer's applicable directions and in conformity with job conditions.

3.4.7 No claim by the Contractor concerning the unsuitability of any article or material specified or his inability to produce satisfactory Work with it will be considered unless such claim is made in writing to the Owner not less than five (5) days prior to bid opening date.

3.4.8 Where items of equipment and materials are specifically identified herein by manufacturer's name, model or catalog number, only such specific items may be used in the Base Bid.

3.4.9 Items of material and equipment of the Contractor's choice may be offered as an alternate to the items named in the Specifications on the Bidder's letterhead. Alternate Proposals must be accompanied by full descriptive and technical data on article proposed, together with statement of amount of addition or deduction from the base bid if alternate is accepted. Prior approval by the Owner is not required on items submitted as alternate bids.

3.4.10 After acceptance of the Proposal, substitution of equipment of makes other than those specifically named in the Contract Documents will be approved by the Owner only if the equipment proposed for substitution is equal to or superior to equipment named, in construction, efficiency and utility, and further that the equipment named in the Contract Documents cannot be delivered to the job in time to complete the Work in proper sequence to the Work of other Contractors, due to conditions beyond control of the Contractor.

3.4.11 To receive consideration, request for substitution must be accompanied by documentary proof of equality and difference in price and delivery, if any, in the form of certified quotations from suppliers of both specified and proposed equipment. In case of a difference on price the Owner shall receive all benefit of the difference in cost involved in any substitution and the Contract altered by Change Order to credit the Owner with any savings so obtained.

3.4.12 All materials and equipment shall be installed in a neat and workmanlike manner. The Owner reserves the right to direct the removal and replacement of any items, which in his opinion will not present an orderly and reasonable neat or workmanlike appearance, provided such item can be properly installed in such orderly way by the usual methods in such Work. Such removal and replacement shall be done when directed in writing by the Owner at the Contractor's expense without additional cost to the Owner.

3.4.13 All material and equipment supplied by the Contractor shall be delivered to the Job Site and consigned to the Contractor's attention. Under no conditions will be the Owner receive, store, unload or handle any material and equipment furnished by the Contractor. Any material and equipment, furnished by the Contractor, directly shipped or consigned to the Owner will be returned to the supplier.

3.4.14 If at any time it becomes necessary to move materials and equipment temporarily located, which are to enter into the construction, the Contractor, shall when so directed by the Owner, move them to another location at his own expense.

3.4.15 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him.

3.4.16 The Contractor and his employees shall not bring cameras, radios, television sets, firearms, explosives unrelated to the Work, alcoholic beverages, drugs or narcotics on the Owner's property, and the Contractor and his employees shall not report for Work under the influence of alcohol, drugs or narcotics.

3.19 INDEMNIFICATION

3.19.1 The Contractor shall indemnify and hold harmless the Owner and his agents and employees from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from the performance of the Work, provided that such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, provided that the Owner is not guilty of a negligent act or omission which was the proximate cause of such injury.
In the event part of this Subparagraph 3.19.1 is deemed to violate public policy as expressed by the statutes or courts of the governing jurisdiction, such part shall be eliminated from the Subparagraph, and the remaining portion of the Subparagraph shall remain operative.

3.19.2 In any and all claims against the Owner or any of his agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph 3.19 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under worker's compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 5

Contract Time

5.1 DEFINITIONS

5.1.1 The Contract Time is the period of time allotted in the Contract Documents for completion of the Work.

5.1.2 The Date of Commencement of the Work is the date established in a Notice To Proceed. If there is no Notice To Proceed, it shall be the date of the acceptance of the Proposal, or such other date as may be established in the Proposal.

5.1.3 The Date of Substantial Completion of the Work or designated portion thereof is the date acknowledged in writing by the Owner when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the Work or designated portion thereof for the use for which it is intended.

5.1.4 The term Day as used in the Contract Document shall mean calendar day.

5.2 PROGRESS AND COMPLETION

5.2.1 All time limits stated in the Contract Documents are of the essence of the Contract.

5.2.2 The Contractor shall begin the Work on the Date of Commencement as defined in Subparagraph 5.1.2. He shall carry the Work forward expeditiously with adequate forces and shall complete it within the Contract Time.

5.2.3 The Contractor shall, when possible, schedule and do his Work such that Work in any area will, after being started, continue without any interruption of delay until Work in that area is completed.

5.2.4 Lengthy interruption of any existing service, to any area, or interruption of any existing service, other than as authorized by the Owner, will not be tolerated.

5.2.5 If a Date or Time of Completion is included in the Contract, it shall be the Date of Substantial Completion as defined in Subparagraph 5.1.3, including authorized extensions thereto, unless otherwise provided.

5.3 DELAYS AND EXTENSIONS OF TIME

5.3.1 If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner, or by his employees, or by any separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delays in transportation, unavoidable casualties, or any causes beyond the Contractor's control, or by delay authorized by the owner pending arbitration, or by any other just cause, then the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine.

5.3.2 All claims for extension of time shall be made in writing to the Owner no more than twenty (20) days after the occurrence of the delay; otherwise they shall be waived. In the case of a continuing cause of delay only one (1) claim is necessary.

.2 Faulty or defective Work appearing after substantial completion;

.3 Failure of the Work to comply with the requirements of the Contract Documents; or

.4 Terms of any special guarantees required by the Contract Documents.

6.5.5 The acceptance of final Payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and still unsettled.

ARTICLE 8

Insurance

8.1 INSURANCE

8.1.1 The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under worker's compensation, disability benefit and other similar employee benefit acts;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees, and claims insured by usual personal injury liability coverage;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees, and claims insured by usual personal injury liability coverage; and

.4 Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

8.1.2 The insurance required by Subparagraph 8.1.1, above, shall include contractual liability insurance as applicable to the Contractor's obligations under Paragraph 3.19.

8.1.3 The insurance required by Subparagraph 8.1.1, above, shall be written for not less than any limits of liability required by law or the limits specified below, whichever is greater:

.1 Worker's compensation and occupational disease insurance to insure the entire liability to pay such compensation. (Coverage A - statutory limit, and Coverage B - Employer's Liability $1,000,000.00)

.2 Contractor's public liability insurance (including contractual liability insurance):

A minimum of $500,000.00 for injuries, including accidental death, to any one person and the minimum of $1,000,000.00 for any one (1) accident involving two (2) or more persons.

.3 Contractor's property damage liability insurance:

$5,000,000.00 minimum for each accident and $5,000,000.00 minimum in the aggregate.

.4 Comprehensive automobile public liability insurance owned, hired, and other non-owned vehicles of the Contractor with the minimum of $500,000.00 for injuries including accidental death, to any one (1) person, and a minimum of $1,000,000.00 for any one (1) accident involving two (2) or more persons, and a minimum of $500,000.00 covering all property damage to owned, hired, and other non-owned vehicles per occurrence.

.5 Completed operations or product insurance:

$500,000.00 each occurrence and $1,000,000.00 aggregate.

.6 Contractor's Pollution Liability:

$2,000,000.00

8.1.4 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates shall contain a provision that coverage afforded under the policies will not be canceled until at least thirty (30) days prior to written notice given to the Owner.

8.1.5 The Contractor will not be required to purchase and maintain property insurance upon the entire Work at the Site to the full insurable value thereof. This insurance shall include the interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work, and shall insure against the perils of fire, extended coverage, vandalism and malicious mischief.

8.1.6 Each certificate of insurance delivered by the Contractor hereunder shall contain the following endorsement:

"All rights of subrogation under this Contract are hereby waived by the Insurer with respect to claims against Keystone Consolidated Industries, Inc., and any of its subsidiary or affiliated companies or corporations."

8.1.7 If the Owner requests in writing that insurance for special hazards be included in the property insurance policy, the Contractor shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

8.1.8 Any insured loss is to be adjusted with the Owner and made payable to the Owner as trustee for the insurers, as their interests may appear.

8.1.9 The Owner as trustee shall have power to adjust and settle any loss with the insurers unless one (1) of the parties in interest shall object in writing within five (5) days after the occurrence of loss to the Owner's exercise of this power, and if such objection be made, arbitrators shall be chosen as provided in Paragraph 12.5. The Owner as trustee shall, in that case, make settlement with the insurers in accordance with the directions of such arbitrators. If distribution of the insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

8.1.10 The Owner shall deposit in a separate account any insurance proceeds so received, and shall distribute it in accordance with such agreement as the parties in interest may reach, or in accordance with an award by arbitration in which case the procedure shall be as provided in Paragraph 12.5. If after such los no other special agreement is made, replacement of damaged Work shall be covered by an appropriate Change Order.

ARTICLE 9

Changes in the Work

9.1 CHANGE ORDERS

9.1.1 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be executed under the applicable conditions of the Contract Documents.

9.1.2 A Change Order is a written order to the Contractor signed by the Owner, issued after the execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. A Change Order may also be signed by the Contractor if he agrees to the adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by a Change Order.

9.1.3 The cost or credit to the Owner resulting from a change in the Work shall be determined in one (1) or more of the following ways:

.1 By mutual acceptance of a lump sum properly itemized;

.2 By unit prices stated in the Contract Documents or subsequently agreed upon; or

.3 By cost and a mutually acceptable fixed or percentage fee.

9.1.4 If none of the methods set forth in Subparagraph 9.1.3 is agreed upon, the Contractor, provided he receives a Change Order, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Owner on the basis of the Contractor's reasonable expenditures and savings, including, in the case of an increase in the Contract Sum, a reasonable allowance of overhead and profit. In such case, and also under Clause 9.1.3.3, above, the Contractor shall keep and present, in such form as the Owner may prescribe, an itemized accounting together with appropriate supporting data. The amount of credit to be allowed by the Contract to the Owner for any deletion or change which results in a net decrease in cost will be the amount of the actual net decrease. When both additions and credits are involved in any one (1) change, the allowance for overhead and profit shall be figured on the basis of net increase, if any.

9.1.5 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed unit prices to the quantities of Work proposed will create a hardship on the Owner or the Contractor, the applicable unit prices will be equitably adjusted to prevent such hardship.

9.2 MINOR CHANGES IN THE WORK

9.2.1 The Owner shall have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes may be effected by Field Order or by other written order. Such changes shall be binding on the Contractor.

ARTICLE 11

Termination of the Contract

11.1 TERMINATION BY THE CONTRACTOR

11.1.1 If the Work is stopped for a period of sixty (60) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, then the Contractor may, upon ten (10) days' written notice to the Owner, terminate the Contract and recover from the owner payment for all Work executed, and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery, including reasonable profit and damages.

11.2 TERMINATION BY THE OWNER

11.2.1 If the Contractor is adjudged a bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a receiver is appointed on account of his insolvency, or if he refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the Owner may, without prejudice to any right or remedy and after giving the Contractor and his surety, if any, ten (10) days' written notice, terminate the employment of the Contractor and take possession of the Site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may, if he so elects, finish the Work by whatever method he deems expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor shall pay the difference to the Owner. If the Owner elects not to finish the Work, then Owner shall pay the Contractor for the value of the Work performed by the Contractor, less any damages sustained by the Owner. If the damages sustained by the Owner exceed the value of the Work completed, then the Contractor shall pay the difference to the Owner.

11.2.2 The Owner, upon ten (10) days' written notice, may terminate the Contract when the Owner for financial, legal, labor or other reasons must defer or abandon the Work. In such an event, the Owner shall pay the Contractor for the value of the Work performed by the Contractor.

ARTICLE 12

Miscellaneous Provisions

12.1 GOVERNING LAW

12.1.1 The Contract shall be governed by the laws of the state in which the Project is constructed.

12.2 INTEREST

12.2.1 Any money not paid when due to either party under this Contract shall bear interest at the legal rate in force in the state in which the Project is constructed.

12.3 SUCCESSORS AND ASSIGNS

12.3.1 The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any monies dues or to become due to him hereunder, without the previous written consent of the Owner.

12.4 WRITTEN NOTICE

12.4.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or to an officer of the corporation for whom it was intended, or if delivered at or sent by certified mail, return receipt requested, to the last business address known to him who gives the notice.

12.5 ARBITRATION

12.5.1 All claims, disputes and other matters in question arising out of, or relation to this Contract or the breach thereof, except for claims which have been waived by the making or acceptance of final payment as provided by Subparagraphs 6.5.4 and 6.5.5, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining unless the parties mutually agree otherwise. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

12.5.2 Notice of the demand for arbitration shall be file in writing with the other part to the Contract and with the American Arbitration Association. The demand for arbitration shall be made within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

12.5.3 The Contractor shall carry on the Work and maintain the Progress Schedule during any arbitration proceedings, unless otherwise agreed by him and the Owner in writing.

12.6 CLAIMS FOR DAMAGES

12.6.1 Should the Contractor suffer injury or damage to person or property because of any act or omission of the Owner or of any of his employees agents or others for whose acts he is legally liable, claim shall be made in writing to the Owner within a reasonable time after the first observance of such injury or damage.

12.7 PERFORMANCE BOND, AND LABOR AND MATERIAL PAYMENT BOND

12.7.1 The Owner shall have the right to require the Contractor to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder if and as required in the Instructions to Bidders or elsewhere in the Contract Documents.

12.8 RIGHTS AND REMEDIES

12.8.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

12.9 ROYALTIES AND PATENTS

12.9.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend all suites or claims for infringement of any patent rights and save the Owner harmless from loss on account thereof. In case the use of a patented apparatus in enjoined, the Contractor shall at his own expense either procure for the Owner the right to continue using the apparatus, replace same with an apparatus which does not infringe upon a patent, or remove said apparatus and refund the purchase price, and the transportation and installation costs thereof.

12.10 PERMITS AND FEES

12.10.1 The Owner shall obtain and pay for the building permit.

12.10.2 The Owner shall obtain and pay for additional permits that may be required by Federal or State Governing Agencies which have jurisdictional Authority over the Work.

12.10.3 Any other permit or licenses required by the Work shall be obtained and paid for by the Contractor. The Contractor shall make all necessary arrangements for inspections associated with his permits or licenses and notify the Owner when inspections will be made. Copies of the permit affidavits shall be furnished to the Owner upon request.

12.11 NOTICES, CODES, ORDINANCES AND LAWS

12.11.1 All Work shall be executed in accordance with applicable Local, State and Federal codes, ordinances, and laws in force at the time of construction. Where Work is shown or specified to be better quality than such standards, the Work shall be executed in conformity with the Drawings and Specifications.

12.11.2 Reference herein to known Standard Specifications of Governmental Agencies and Technical Societies, shall refer to the latest edition of such Specifications, adopted and published at the date of the Specifications.

12.12 RISK OF LOSS

12.12.1 Until the Contract has been fully performed and the Work has been accepted by the Owner, the Contractor shall bear the risk of any loss due to theft, vandalism, malicious mischief, or otherwise, to Work, material, equipment, and other property, even though it may have been installed. The Contractor shall make such arrangements for watchman service as he considers necessary.

12.13 TESTS

12.13.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to be inspected, tested or approved, the Contractor shall give the Owner timely notice of its readiness and of the date arranged so the Owner may observe such inspection, testing or approval.

The Contractor shall bear all costs of such inspections, tests, and approvals unless otherwise provided.

12.13.2 If after the commencement of the Work the Owner determines that any Work requires special inspection, testing or approval which Subparagraph 12.13.1 does not include, he will instruct the Contractor to order such special inspection, testing or approval, and the Contractor shall give notice as in Subparagraph 12.13.1. Such inspection, testing or approval will be done at the Contractor's expense.

12.13.3 Neither the observations of the Owner in his administration of the Contract, nor inspections, tests or approvals by persons other than the Contractor shall relieve the Contractor from his obligations to perform the Work in accordance with the Contract Documents.

12.14 LIENS

12.14.1 The Contractor shall keep the Owner's property free and clear from all liens and charges arising out of the Work, including materialmen, laborers and mechanics' liens, and shall give the Owner prompt written notice of actual and prospective claims of any such liens or charges known to the Contractor.

SECTION 5.0

ATTACHMENTS

INDEX

Description		Page
Attachment A -	List of Subcontractors (Not Required)	--
Attachment B -	Proposal Form	5-2
Attachment C -	Safety Regulations for Contractors and Subcontractors While on Keystone Property (Not Required)	--
Attachment D -	Payment Form	5-4
Attachment E -	Request Form	5-5
Attachment F -	Table of Contents Format for Bid Package	5-6

ATTACHMENT B

BID SCHEDULE[1]
(Page 1 of 2)

ANALYSIS[2]	UNIT COST[3]
TCLP Volatiles	
TCLP Semivolatiles	
TCLP Metals (Except Hg)	
TCLP Mercury	
TCLP Cyanide	
TCLP Hexavalent Chromium	
Ignitability (Solid/Waste)	
Corrosivity (Solid/Waste)	
Reactivity - Cyanide (Solid/Waste)	
Reactivity - Sulfide (Solid/Waste)	
Volatile Organics (Solid/Waste)	
Volatile Organics (Aqueous)	
Semivolatile Organics (Solid/Waste)	
Semivolatile Organics (Aqueous)	
Metals (Except Hg) (Solid/Waste)	
Metals (Except Hg) (Aqueous)	
Mercury (Solid/Waste)	
Mercury (Aqueous)	
Hexavalent Chromium (Solid/Waste)	
Hexavalent Chromium (Aqueous)	
Cyanide (Solid/Waste)	
Cyanide (Aqueous)	
TOC (Solid/Waste)	
TOC (Aqueous)	
Oil and Grease (Solid/Waste)	
Oil and Grease (Aqueous)	

ATTACHMENT B

BID SCHEDULE[1]
(Page 2 of 2)

NOTES:

(1) For the purpose of this bid, assume one solid sample for TCLP extraction/ analyses; one sample for analysis of the characteristics ignitability, corrosivity, and reactivity; one solid and one aqueous sample for volatiles, semivolatiles, metals (including hexavalent chromium and mercury), TOC, and oil and grease analyses.

(2) The unit costs for TCLP analyses are to include the preparatory TCLP extraction. Separate charges for the TCLP extraction will not be acceptable.

(3) The unit costs are to be inclusive of all laboratory Quality Control (QC) samples (e.g., matrix spike/matrix spike duplicates, laboratory duplicates, etc.) and any required dilutions/reanalyses, reextractions and/or reanalyses. Laboratory QC samples and mandatory reextraction and/or reanalysis will not be considered billable units.

ATTACHMENT D

STATE OF _____)
) SS
COUNTY OF _____)

TO: Keystone Steel & Wire Company
a Division of Keystone Consolidated Industries, Inc.

_____, being first duly sworn, upon his oath deposes and says that he is _____
(President, Owner, Partner, etc.)

of _____ which has contracted with Keystone
(Contractor's name)

for furnishing of _____

and that the following is a full, true and complete statement of all parties who have furnished or who will furnish materials and labor for said improvement and the amounts due or will become due each of them namely:

Name and Address	Contract for	Amount of Contract	Amount Paid to Date	Amount Now Due	Balance Due Upon Contract

Affiant further states as follows:

1. That the cost of the labor and materials necessary to complete said improvement which have not yet been contracted for or furnished has been estimated and the foregoing statement includes such estimates.
2. That there are no other contracts or accounts outstanding and there is nothing due or to become due to any party for labor or materials other than herein stated.
3. That statement is made for the purpose of procuring a _____
(Partial or Final)
payment of $ _____ on said contract leaving a balance of $ _____ still due thereon.

_____
(Signature)

Subscribed and sworn to before me this _____ day of _____, 19 _____.

_____

ATTACHMENT E

Request No. _____

Covering Work To _____

W.O. NUMBER	AMOUNT OF CONTRACT	AMOUNT DUE NOW	LESS 10%	AMOUNT THIS REQUEST	AMOUNT PAID TO DATE	BALANCE DUE

ATTACHMENT F

TABLE OF CONTENTS FORMAT
FOR BID PACKAGE

KEYSTONE STEEL & WIRE

Section	
1.0	Statement of Qualifications and Experience List of References
2.0	Response to "Instructions to Bidders, Preparation of Bids"
3.0	Cost Proposals Bid Summary Sheet
4.0	Bidder Miscellaneous

TABLE 1

RETENTION RESERVOIR
EP TOXICITY AND TCLP RESULTS FOR
SLUDGE AND NATURAL SOIL SAMPLES (1)
(Page 1 of 2)

Sample Location		KS-13			KS-14		KS-15		KS-16		KS-17	
Date Sampled		10/02/90	10/10/90	10/02/90	10/02/90	10/02/90	10/01/90	10/01/90	09/27/90	09/27/90	09/27/90	09/27/90
Parameter	Clean-up Objectives	Sludge	Sludge Rep	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil
EP Toxicity (ug/l)												
Arsenic	200	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	9.0	<8.0
Barium	5,000	490	380	510	750	1000	660	740	710	580	700	470
Cadmium	50	4.2	6.6	1.1	3.3	9.2	4.4	4.3	3.6	2.5	11	0.8
Chromium	1,000	14	<5.0	<5.0	48	<5.0	51	<5.0	42	<5.0	2000	[14]
Lead	100	7700	3400	5.0	26000	21	15000	21	13000	20	54000	520
Mercury	10	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Nickel	20,000	300	170	210	170	20	200	40	210	<10	350	<10
Selenium	20	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Silver	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TCLP (ug/l)												
Cadmium	50	(5.0)	(11)	--	13	--	5.0	--	7.6	--	(2.3)	5.6
Chromium	1,000	(20)	(23)	--	<5.0	--	40	--	71	--	(17)	<5.0
Lead	100	(8900)	(16000)	--	130	--	1400	--	6200	--	(11000)	540
pH	NA	7.72	7.02	8.14	7.46	7.52	7.58	8.39	6.69	7.04	6.33	6.19

TABLE 1

RETENTION RESERVOIR
EP TOXICITY AND TCLP RESULTS FOR
SLUDGE AND NATURAL SOIL SAMPLES (1)
(Page 2 of 2)

Sample Location		KS-18		KS-19		KS-20		KS-21		KS-22	
Date Sampled		09/27/90	09/27/90	09/26/90	09/26/90	09/26/90	09/26/90	09/25/90	09/25/90	09/24/90	09/24/90
Parameter	Clean-up Objectives	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil
EP Toxicity (ug/l)											
Arsenic	200	<8.0	20	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0	<8.0
Barium	5,000	360	1800	570	550	160	210	480	90	740	370
Cadmium	50	2.1	16	4.3	<0.5	1.2	<0.5	1.1	<0.5	2.4	0.9
Chromium	1,000	16	47	10	<5.0	<5.0	<5.0	10.0	<5.0	46	<5.0
Lead	100	11000	590	5600	12	9600	18	13000	[<5.0]	13000	12
Mercury	10	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	[<0.4]	<0.4	<0.4
Nickel	20,000	260	30	220	20	190	20	290	60	240	<10
Selenium	20	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Silver	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TCLP (ug/l)											
Cadmium	50	2.5	5.3	6.3	--	5.3	--	5.3	--	<2.0	--
Chromium	1,000	22	201	63	--	7.5	--	28	--	15	--
Lead	100	14000	30000	6200	--	28000	--	18000	--	21000	--
pH	NA	6.23	7.09	7.29	7.29	5.75	7.04	6.86	6.16	7.77	7.36

Note: (1) Samples analyzed for TCLP were collected in December 1990.
Key: () TCLP was performed with less than the required amount due to lack of sample.
[] Estimated value due to matrix spike recoveries that were outside the control limits.
-- Not analyzed.
NA -- If post-cleanup soil samples indicate the presence of the compound, Keystone Steel & Wire must submit a Closure Plan modification to the IEPA requesting clean-up objectives for the parameter(s) in question.

TABLE 2

RETENTION RESERVOIR
ORGANIC CONCENTRATIONS IN
SLUDGE AND NATURAL SOIL SAMPLES

Sample Location		KS-13			KS-14		KS-15		KS-16		KS-17	
Date Sampled		10/02/90	10/10/90	10/02/90	10/02/90	10/02/90	10/01/90	10/01/90	09/27/90	09/27/90	09/27/90	09/27/90
Parameter	Clean-up Objectives	Sludge	Sludge Rep	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil
Halogenated VOC (ug/kg)												
trans-1,2-Dichloroethylene	500	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethylene	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Trichloroethylene	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1,1-Trichloroethane	1,000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatic VOC (ug/kg)												
Ethyl Benzene	1,000	21	<10	<10	27	<10	<10	<10	<10	<10	17	<10
Toluene	5,000	26	<10	<10	73	<10	<10	<10	<10	<10	<10	<10
Xylene	10,000	140	<30	<30	95	<30	49	<30	<30	<30	55	<30
Benzene	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Volatile Organics (ug/kg)												
2-Butanone (MEK)	350	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
4-Methyl-2-Pentanone	350	<250	<250	<250	<250	<250	<250	260	<250	<250	<250	<250
Acetone	700	<250	<250	<250	<250	<250	<250	380	<250	250	<250	<250
Carbon Disulfide	3,000	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
Semivolatiles (ug/kg)												
Phenol	4,200	<200	<200	<200	<200	<200	<200	<200	<200	[<200]	<200	<200
Naphthalene	14,000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Methylnaphthalene	NA	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Dibenzofuran	NA	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Di-n-octylphthalate	NA	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Carcinogenic PNAs (ug/kg)												
Benzo (a) Anthracene		29	7	0.1	7	4.1	30	27	31	0.7	180	<0.1
Benzo (a) Pyrene		20	21	0.3	44	4.9	9	27	9	1.3	220	0.1
Benzo (b) Fluoranthene		38	21	0.3	56	8.2	23	54	22	1.3	210	0.4
Chrysene		15	30	0.4	31	9.3	21	49	18	1.7	360	0.7
Dibenzo (a,h) Anthracene		<2.0	4	<0.1	3	0.8	1	16	5	<0.1	<4.0	<0.1
Total:	13	<104	83	<1.2	141	27.3	84	173	85	<5.1	<974.0	<1.4
Noncarcinogenic PNAs (ug/kg)												
Acenaphthene		<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Acenaphthylene		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Anthracene		<100	<100	<100	<100	<100	<100	<100	<100	<100	350	<100
Benzo (g,h,i) Perylene		<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Benzo (k) Fluoranthene		<500	<500	<500	<500	<500	<500	<500	<500	<500	1000	<500
Fluorene		<200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Fluoranthene		210	<100	<100	150	<100	<100	100	100	110	220	<100
Indeno (1,2,3-c,d) Pyrene		<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Phenanthrene		<100	<100	<100	<100	<100	<100	100	<100	<100	1400	<100
Pyrene		240	<100	<100	180	<100	<100	170	130	110	1700	<100
Total:	20,000	<3650	<3400	<3400	<3530	<3400	<3400	<3470	<3430	<3420	<7170	<3400

Key: [ ] Estimated value due to matrix spike recoveries that were outside the control limits.
NA -- If post-cleanup soil samples indicate the presence of the compound, Keystone Steel & Wire must submit a Closure Plan modification to the IEPA requesting clean-up objectives for the parameter(s) in question.

TABLE 2

RETENTION RESERVOIR
ORGANIC CONCENTRATIONS IN
SLUDGE AND NATURAL SOIL SAMPLES

Sample Location		KS-18		KS-19		KS-20		KS-21		KS-22	
Date Sampled		09/27/90	09/27/90	09/26/90	09/26/90	09/26/90	09/26/90	09/25/90	09/25/90	09/24/90	09/24/90
Parameter	Cleanup Objectives	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil	Sludge	Natural Soil
Halogenated VOC (ug/kg)											
trans-1,2-Dichloroethylene	500	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Vinyl Chloride	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1-Dichloroethane	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Tetrachloroethylene	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	0.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Trichloroethylene	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,1,1-Trichloroethane	1,000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
1,3-Dichlorobenzene	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Aromatic VOC (ug/kg)											
Ethyl Benzene	1,000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Toluene	5,000	<10	<10	<10	<50	<10	<10	24	<10	95	<10
Xylene	10,000	<30	<30	<30	<30	<30	<30	40	<30	38	<30
Benzene	25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Volatile Organics (ug/kg)											
2-Butanone (MEK)	350	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
4-Methyl-2-Pentanone	350	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
Acetone	700	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
Carbon Disulfide	3,000	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25
Semivolatiles (ug/kg)											
Phenol	4,200	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Naphthalene	14,000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
2-Methylnaphthalene	NA	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Dibenzofuran	NA	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Di-n-octylphthalate	NA	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Carcinogenic PNAs (ug/kg)											
Benzo (a) Anthracene		2	1.4	2	<0.1	5	<0.4	19	<0.1	7.0	4.7
Benzo (a) Pyrene		8	2.3	3	<0.2	6	0.5	19	<0.1	19	4.6
Benzo (b) Fluoranthene		13	2.1	6	<0.1	3	0.5	32	<0.1	21	1.7
Chrysene		25	2.2	19	0.1	16	1.2	49	<0.1	52	5.4
Dibenzo (a,h) Anthracene		2	0.1	<2.0	<0.1	<2.0	<0.4	<2.0	<0.1	<2.0	0.4
Total:	13	50	8.1	<32.0	<0.6	<32.0	<3.2	<121.0	<0.5	<101.0	16.8
Noncarcinogenic PNAs (ug/kg)											
Acenaphthene		<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Acenaphthylene		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Anthracene		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Benzo (g,h,i) Perylene		<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Benzo (k) Fluoranthene		<500	<500	<500	<500	<500	<500	<500	<500	<500	<500
Fluorene		<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Fluoranthene		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Indeno (1,2,3-c,d) Pyrene		<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000	<1000
Phenanthrene		<100	<100	110	220	<100	<100	110	<100	120	720
Pyrene		<100	110	<100	<100	<100	<100	180	<100	<100	<100
Total:	20,000	<3400	<3410	<3410	<3520	<3400	<3400	<3490	<3400	<3420	<4020

Key: NA -- If post-cleanup soil samples indicate the presence of the compound, Keystone Steel & Wire must submit a Closure Plan modification to the IEPA requesting clean-up objectives for the parameter(s) in question.

TABLE 3

ANALYTICAL PARAMETERS, SAMPLE LOAD, AND METHOD REFERENCES

Parameter/Characteristic	Number of Analysis of Field Samples	Method Reference
Ignitability	22	SW-846 1010
Corrosivity	22	SW-846 9045
Reactivity (CN- and SO_2)	22	SW-846 Chapter 7.3
TCLP Preparation	53	SW-846 1311
Metals in TCLP Extracts	53	SW-846 6020
Cyanide in TCLP Extracts [1]	53	SW-846 9010
Cr^{+6} in TCLP Extracts[1]	53	SW-846 7196
Hg in TCLP Extract	53	SW-846 7471
Volatile Organics in TCLP Extracts	108	SW-846 8240
Semivolatile Organics in TCLP Extracts	22	SW-846 8270
Volatile Organics in Soil, Sludge, Waste, Aqueous	108	SW-846 8240
Semivolatile Organics in Soil, Sludge, Waste, Aqueous	22	SW-846 8270
Metals in Soil, Sludge, Waste, Aqueous	53	SW-846 6020
Cr^{+6} in Soil, Sludge, Waste	53	SW-846 3060 (Modified)[2]/7196
Cr^{+6} in Aqueous	--	SW-846 7196
Hg in Soil, Sludge, Waste, Aqueous	53	SW-846 7470/7471
CN in Soil, Sludge, Waste, Aqueous	53	SW-846 9010
TOC in Soil, Sludge, Waste, Aqueous	22	USEPA 415.1 (Modified)
Oil and Grease in Soil, Sludge, Waste, Aqueous	22	SW-846 9071

Notes:
(1) Using deionized water for extraction medium.
(2) The SW-846 Method 3060 modifications include a 2.5 gram digestion to a 100 mL final digest volume plus additional quality control measures.

TABLE 4

CHARACTERISTICS, ANALYTES, AND
REQUIRED DETECTION/REPORTING LIMITS
(Page 1 of 8)

CHARACTERISTIC	REQUIRED LIMIT
Ignitability	yes/no at - ° F
Corrosivity	pH, yes/no
Reactivity - Cyanide	100 mg/Kg
Reactivity - Sulfide	100 mg/Kg

AQUEOUS[1] OR TCLP EXTRACTS	REQUIRED LIMIT
Volatile Organics	
benzene	10 µg/L
carbon tetrachloride	10 µg/L
chlorobenzene	10 µg/L
chloroform	10 µg/L
1,2-dichloroethane	10 µg/L
1,1-dichloroethene	10 µg/L
2-butanone	10 µg/L
tetrachloroethene	10 µg/L
trichloroethene	10 µg/L
vinyl chloride	10 µg/L
Semivolatile Organics	
2-methylphenol	10 µg/L
3-methylphenol	10 µg/L
4-methylphenol	10 µg/L
1,4-dichlorobenzene	10 µg/L
2,4-dinitrotoluene	5 µg/L
hexachlorobenzene	5 µg/L
hexachlorobutadiene	5 µg/L
hexachloroethane	10 µg/L

TABLE 4

CHARACTERISTICS, ANALYTES, AND
REQUIRED DETECTION/REPORTING LIMITS
(Page 2 of 8)

AQUEOUS[1] OR TCLP EXTRACTS	REQUIRED LIMIT
Semivolatile Organics (Cont.)	
nitrobenzene	10 µg/L
pentachlorophenol	20 µg/L
pyridine	10 µg/L
2,4,5-trichlorophenol	50 µg/L
2,4,6-trichlorophenol	10 µg/L
Metals and Cyanide	
antimony	5 µg/L
arsenic	10 µg/L
barium	5 µg/L
beryllium	1 µg/L
cadmium	10 µg/L
total chromium	10 µg/L
hexavalent chromium	10 µg/L
lead	10 µg/L
nickel	10 µg/L
selenium	10 µg/L
silver	10 µg/L
thallium	10 µg/L
vanadium	50 µg/L
zinc	50 µg/L
mercury	1 µg/L
cyanide	10 µg/L

TABLE 4

CHARACTERISTICS, ANALYTES, AND
REQUIRED DETECTION/REPORTING LIMITS
(Page 3 of 8)

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Volatile Organics	Aqueous	Solid[3], [4]
trans-1,2-dichloroethene	10 µg/L	10 µg/Kg
methylene chloride	10 µg/L	10 µg/Kg
toluene	10 µg/L	10 µg/Kg
1,1,1-trichloroethane	10 µg/L	10 µg/Kg
carbon disulfide	10 µg/L	10 µg/Kg
chloromethane	10 µg/L	10 µg/Kg
bromomethane	10 µg/L	10 µg/Kg
vinyl chloride	10 µg/L	10 µg/Kg
chloroethane	10 µg/L	10 µg/Kg
trichlorofluoromethane	10 µg/L	10 µg/Kg
1,1-dichloroethene	10 µg/L	10 µg/Kg
1,1-dichloroethane	10 µg/L	10 µg/Kg
chloroform	10 µg/L	10 µg/Kg
1,2-dichloroethane	10 µg/L	10 µg/Kg
carbon tetrachloride	10 µg/L	10 µg/Kg
bromodichloromethane	10 µg/L	10 µg/Kg
1,2-dichloropropane	10 µg/L	10 µg/Kg
trans-1,3-dichloropropene	10 µg/L	10 µg/Kg
cis-1,3-dichloropropene	10 µg/L	10 µg/Kg
trichloroethene	10 µg/L	10 µg/Kg
benzene	10 µg/L	10 µg/Kg
dibromochloromethane	10 µg/L	10 µg/Kg
1,1,2-trichloroethane	10 µg/L	10 µg/Kg
2-chloroethylvinyl ether	10 µg/L	10 µg/Kg
bromoform	10 µg/L	10 µg/Kg
1,1,1,2-tetrachloroethane	10 µg/L	10 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND
REQUIRED DETECTION/REPORTING LIMITS
(Page 4 of 8)

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Volatile Organics	Aqueous	Solid[3], [4]
1,1,2,2-tetrachloroethane	10 µg/L	10 µg/Kg
tetrachloroethene	10 µg/L	10 µg/Kg
chlorobenzene	10 µg/L	10 µg/Kg
ethyl benzene	10 µg/L	10 µg/Kg
total xylenes	10 µg/L	10 µg/Kg
1,3-dichlorobenzene	10 µg/L	10 µg/Kg
1,2-dichlorobenzene	10 µg/L	10 µg/Kg
1,4-dichlorobenzene	10 µg/L	10 µg/Kg
acetone	50 µg/L	50 µg/Kg
2-butanone	50 µg/L	50 µg/Kg
vinyl acetate	50 µg/L	50 µg/Kg
4-methyl-2-pentanone	50 µg/L	50 µg/Kg
2-hexanone	50 µg/L	50 µg/Kg
styrene	10 µg/L	10 µg/Kg

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
phenol	10 µg/L	330 µg/Kg
2-chlorophenol	10 µg/L	330 µg/Kg
4-methylphenol	10 µg/L	330 µg/Kg
2-methylphenol	10 µg/L	330 µg/Kg
2-nitrophenol	10 µg/L	330 µg/Kg
2,4-dimethylphenol	10 µg/L	330 µg/Kg
2,4-dichlorophenol	10 µg/L	330 µg/Kg
4-chloro-3-methylphenol	10 µg/L	330 µg/Kg
2,4,6-trichlorophenol	10 µg/L	330 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND
REQUIRED DETECTION/REPORTING LIMITS
(Page 5 of 8)

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
2,4,5-trichlorophenol	10 µg/L	330 µg/Kg
2,4-dinitrophenol	50 µg/L	1650 µg/Kg
4-nitrophenol	50 µg/L	1650 µg/Kg
2-methyl-4,6-dinitrophenol	50 µg/L	1650 µg/Kg
pentachlorophenol	50 µg/L	1650 µg/Kg
benzoic acid	50 µg/L	1650 µg/Kg
naphthalene	10 µg/L	330 µg/Kg
acenaphthylene	10 µg/L	330 µg/Kg
acenaphthene	10 µg/L	330 µg/Kg
fluorene	10 µg/L	330 µg/Kg
phenanthrene	10 µg/L	330 µg/Kg
2-propyl-n-ol[5]	10 µg/L	330 µg/Kg
anthracene	10 µg/L	330 µg/Kg
fluoranthene	10 µg/L	330 µg/Kg
pyrene	10 µg/L	330 µg/Kg
benzo(a)anthracene	10 µg/L	330 µg/Kg
chrysene	10 µg/L	330 µg/Kg
benzo(b)fluoranthene	10 µg/L	330 µg/Kg
benzo(k)fluoranthene	10 µg/L	330 µg/Kg
benzo(a)pyrene	10 µg/L	330 µg/Kg
indeno(1,2,3-cd)pyrene	10 µg/L	330 µg/Kg
dibenzo(a,h)anthracene	10 µg/L	330 µg/Kg
benzo(g,h,i)perylene	10 µg/L	330 µg/Kg
2-methylnaphthalene	10 µg/L	330 µg/Kg
2-chloronaphthalene	10 µg/L	330 µg/Kg
N-nitrosodimethylamine	10 µg/L	330 µg/Kg
bis(2-chloroethyl)ether	10 µg/L	330 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND
REQUIRED DETECTION/REPORTING LIMITS
(Page 6 of 8)

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
1,3-dichlorobenzene	10 µg/L	330 µg/Kg
1,2-dichlorobenzene	10 µg/L	330 µg/Kg
1,4-dichlorobenzene	10 µg/L	330 µg/Kg
bis(2-chloroisopropyl)ether	10 µg/L	330 µg/Kg
N-nitrosodi-*n*-propylamine	10 µg/L	330 µg/Kg
hexachloroethane	10 µg/L	330 µg/Kg
nitrobenzene	10 µg/L	330 µg/Kg
isophorone	10 µg/L	330 µg/Kg
bis(2-chloroethoxyl)methane	10 µg/L	330 µg/Kg
1,2,4-trichlorobenzene	10 µg/L	330 µg/Kg
hexachlorobutadiene	10 µg/L	330 µg/Kg
hexachlorocyclopentadiene	10 µg/L	330 µg/Kg
dimethylphthalate	10 µg/L	330 µg/Kg
2,6-dinitrotoluene	10 µg/L	330 µg/Kg
2,4-dinitrotoluene	10 µg/L	330 µg/Kg
4-chlorophenylphenyl ether	10 µg/L	330 µg/Kg
diethylphthalate	10 µg/L	330 µg/Kg
1,2-diphenylhydrazine	10 µg/L	330 µg/Kg
N-nitrosodiphenylamine	10 µg/L	330 µg/Kg
4-bromophenylphenyl ether	10 µg/L	330 µg/Kg
hexachlorobenzene	10 µg/L	330 µg/Kg
di-*n*-butyl phthalate	10 µg/L	330 µg/Kg
benzidine	50 µg/L	1650 µg/Kg
butylbenzyl phthalate	10 µg/L	330 µg/Kg
bis(2-ethylhexyl)phthalate	10 µg/L	330 µg/Kg
3,3′-dichlorobenzidine	20 µg/L	660 µg/Kg
di-*n*-octyl phthalate	10 µg/L	330 µg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND
REQUIRED DETECTION/REPORTING LIMITS
(Page 7 of 8)

AQUEOUS[2] AND SOLIDS	REQUIRED LIMITS	
Semivolatile Organics	Aqueous	Solid[3]
benzyl alcohol	50 µg/L	1650 µg/Kg
4-chloroaniline	50 µg/L	1650 µg/Kg
2-nitroaniline	50 µg/L	1650 µg/Kg
3-nitroaniline	50 µg/L	1650 µg/Kg
4-nitroaniline	50 µg/L	1650 µg/Kg
dibenzofuran	10 µg/L	330 µg/Kg
Metals and Cyanide		
antimony	5 µg/L	0.5 mg/Kg
arsenic	10 µg/L	1.0 mg/Kg
barium	5 µg/L	0.5 mg/Kg
beryllium	1 µg/L	0.1 mg/Kg
cadmium	10 µg/L	1.0 mg/Kg
total chromium	10 µg/L	1.0 mg/Kg
hexavalent chromium[6]	10 µg/L	0.4 mg/Kg
lead	10 µg/L	1.0 mg/Kg
nickel	10 µg/L	1.0 mg/Kg
selenium	10 µg/L	1.0 mg/Kg
silver	10 µg/L	1.0 mg/Kg
thallium	10 µg/L	1.0 mg/Kg
vanadium	50 µg/L	5.0 mg/Kg
zinc	50 µg/L	5.0 mg/Kg
mercury	1 µg/L	0.1 mg/Kg
cyanide	10 µg/L	1.0 mg/Kg
Total Organic Carbon	1.0 mg/L	5.0 mg/Kg
Oil and Grease	0.1 mg/L	4.0 mg/Kg

TABLE 4

CHARACTERISTICS, ANALYTES, AND REQUIRED DETECTION/REPORTING LIMITS

NOTES:

[1] The Toxicity Characteristic Leaching Procedure (TCLP) list will be applied to aqueous field blanks and trip blanks sent with solid samples that have been requested for TCLP extraction/analysis.

[2] The field blanks and trip blanks sent with solid samples that have been requested for total analysis.

[3] Although all results (i.e., positive and nondetected) will be reported on a dry-weight basis, the limits presented assume 100 percent solids. Accordingly, the sample-specific limits for solids will be somewhat higher.

[4] See Section 2.2.2 of this Request for Proposal.

[5] Subject to change.

[6] Aqueous samples will be analyzed directly by using SW-846 Method 7196. Solid samples will be analyzed by using the modified version of SW-846 Method 3060 (i.e., 2.5 gram digestion to 100 mL final digest volume plus additional quality control measures).

TABLE 5
HOLDING TIME REQUIREMENTS

(Page 1 of 2)

Type/Media	Parameter	Preservative	Method	Holding Time[1]
TCLP Extraction	Volatile Organics	-	SW-846 1311	14 days
	Semivolatile Organics	-	SW-846 1311	14 days
	Metals (Except Mercury)	-	SW-846 1311	6 months
	Mercury	-	SW-846 1311	28 days
	Hexavalent Chromium[2]	-	SW-846 1311	7 days
	Cyanide[2]	-	SW-846 1311	14 days
TCLP Extracts	Volatile Organics	acidified, cool 4° ± 2° C	SW-846 8240	14 days (from TCLP extraction)
	Semivolatile Organics	cool 4° ± 2° C	SW-846 8270	7 days from TCLP extraction to solvent, 40 days from solvent extraction to analysis
	Metals (Except Mercury)	HNO_3, pH<2	SW-846 6020	6 months for digestion/analysis
	Mercury	HNO_3, pH<2	SW-846 7471	28 days (from TCLP extraction)
	Hexavalent Chromium	cool 4° ± 2° C	SW-846 7196	24 hours (from TCLP extraction)
	Cyanide	NaOH, pH>12, cool 4° ± 2° C	SW-846 9010	14 days for distillation/analysis (from TCLP extraction)
Aqueous	Volatile Organics	HCL, pH<2, cool 4° ± 2° C	SW-846 8240	14 days
	Semivolatile Organics	cool 4° ± 2° C	SW-846 8270	7 days to extraction, 40 days from extraction to analysis
	Metals (Except Hg)	HNO_3, pH<2	SW-846 6020	6 months for digestion/analysis
	Mercury	HNO_3, pH<2	SW-846 7470	28 days for digestion/analysis
	Hexavalent Chromium	cool 4° ± 2° C	SW-846 7196	24 hours
	Cyanide	NaOH, pH>12 cool 4° ± 2° C	SW-846 9010	14 days for distillation/analysis
	TOC	H_2SO_4, pH<2 cool 4° ± 2° C	USEPA 415.1	28 days
	Oil and Grease	H_2SO_4, pH<2 cool 4° ± 2° C	SW-846 9071	28 days

TABLE 5
HOLDING TIME REQUIREMENTS

(Page 2 of 2)

Type/Media	Parameter	Preservative	Method	Holding Time[1]
Solids	Volatile Organics	cool 4° ± 2° C	SW-846 8240	14 days
	Semivolatiles	cool 4° ± 2° C	SW-846 8270	14 days to extraction, 40 days from extraction to analysis
	Metals (Except Hg)	cool 4° ± 2° C	SW-846 6020	6 months for digestion/analysis
	Mercury	cool 4° ± 2° C	SW-846 7471	28 days for digestion/analysis
	Hexavalent Chromium	cool 4° ± 2° C	SW-846 3060(Modified[3])/7196	7 days to digestion, 24 hours from digestion to analysis
	Cyanide	cool 4° ± 2° C	SW-846 9010	14 days for distillation/analysis
	TOC	cool 4° ± 2° C	USEPA 415.1 (modified)	28 days
	Oil and Grease	cool 4° ± 2° C	SW-846 9071	28 days
	Ignitability	cool 4° ± 2° C	SW-846 1010	48 hours
	Corrosivity	cool 4° ± 2° C	SW-846 9045	48 hours
	Reactive Cyanide	cool 4° ± 2° C	SW-846 Chapter 7.3	14 days
	Reactive Sulfide	cool 4° ± 2° C	SW-846 Chapter 7.3	7 days

Notes: (1) From sample collection.

(2) Hexavalent chromium and cyanide TCLP extractant will consist of deionized water. The cyanide TCLP extract must be preserved with NaOH to a pH >12 immediately following leachate generation.

(3) The SW-846 Method 3060 modifications include a 2.5 gram digestion to a 100 ml final digest volume plus additional quality control measures.

SECTION V

Applications

5-1 GENERAL

This section discusses six applications which were done on the old model 580. These applications are discussed as they relate to the model 580B. The following applications of the Model 580B are given to show some different uses and means of calibration of the Model 580B in various practical applications. It is certainly not intended to be an exhaustive list of the uses of the Model 580B. In each situation, the stress is placed on the means of calibration and the interpretation of the readout of the Model 580B. Since the Photoionization Detector responds to virtually all organic materials and since its responce varies for the different organic materials, questions can certainly arise as to just how the numbers presented on the digital display relate to anything meaningful. These applications will hopefully illustrate several ways in which these numbers can be quantitative and also illustrate uses of the 580B where accurate quantitation may be impossible.

5-2 VINYL CHLORIDE MONOMER IN REACTION VESSELS.

This particular application involved measuring the vinyl chloride content in vinyl chloride polymerization vessels following the polymerization reaction and the removal of the polymer slurry. Any residual vinyl chloride left in the reaction vessel has to be flushed and scrubbed prior to the opening of the vessel. The vinyl chloride content must be below a certain prescribed level prior to this opening. The reactionvessel is flushed with nitrogen to remove the vinyl chloride from the vessel and purge it through the filter media which remove the vinyl chloride from the nitrogen stream for recovery. During this particular operation, it is known that vinyl chloride monomer comprises significantly more than 90% of the entire organic material. In this instance, if the Model 580B is calibrated for vinyl chloride measurement, indeed the readout will be virtually the true vinyl chloride concentration inside the reactor vessel. The nitrogen exit stream prior to the vinyl chloride recovery was the point used for the analysis.

Since the plant was a considerable distance from the laboratory and since the study would require a significant period of time encompassing several weeks, it was decided to calibrate the Model 580B with the isobutylene reference standard and determine a response factor setting for a vinyl chloride standard in the laboratory. With the response factor set at 1.0, the instrument was calibrated with isobutylene. The Model 580B was then presented with a known concentration of vinyl chloride monomer in nitrogen. The response factor for the vinyl chloride was then set in order for the Model 580B to read the correct concentration of vinyl chloride in the nitrogen. Static standards of vinyl chloride are very definitely not stable with time due to the reaction of the vinyl chloride with itself. Thus, standards need to be prepared fresh each time vinyl chloride is to be used to calibrate an instrument. Since bag preparation, which was the technique used for this laboratory calibration of the 580B, would have been impractical at the plant; the use of a stable reference standard of isobutylene was chosen. Thus, at the plant site, the Model 580B could be calibrated using the isobutylene standard from a cylinder. This of course, greatly simplified the plant use of the Model 580B. This relationship to a reference standard reduces the time and equipment required at the plant such that the survey of all of the reactor vessels was completed in a short period of time with the items established for the nitrogen flush of the reactor vessels prior to opening the reactor vessels.

5-3 MONITORING ISOLATED PLANT AREAS FOR TOLUENE AND METHYL ISOBUTYL KETONE.

Two areas of an extensive plant operation were required to be monitored for the levels of methyl isobutyl ketone and toluene. Both of these areas were relatively isolated. In one area, methyl isobutyl ketone was the only solvent to which the atmosphere was exposed other than the potential leaks that might occur in process equipment in that same area. There were no other known solvents in use in that area and the ventilating system in effect isolated this area from other areas in the plant. In the second area, toluene had just very recently been substituted as a solvent in place of benzene due to the lower TLV for benzene. Average workplace levels were therefore needed for the toluene concentration in this work area. Again, toluene was the only solvent in this area and there was no other process equipment in the immediate area for even possible leak problems.

Notice that in both of these areas in the plant, it is certainly known from the processes occuring in that area and its relative isolation from the other areas in the plant, exactly which organic vapors will be by far the predominant vapors in the workplace

air. In many instances, by simply knowing the processes involved and the chemicals in use in those processes, the qualitative aspects of the environment can indeed be established without the use of instrumentation. This is one of the most overlooked aspects in establishing what organic vapors are present in the environment. It simply involves determining what are the possible organic vapors that can be present. In general, this narrows it to several and in many cases, a single organic vapor.

In these cases, the Model 580B can be calibrated specifically for these materials and will provide quantitative data on the levels of these materials in the workplace environment. in this particular instance, even though the laboratory to be used for the calibration of the Model 580B was at the plant site, it was desired to use a single 580B to monitor both work areas sequentially and several times throughout the course of a single day. This was to be done over a period of time to establish the variations of both methyl isobutyl ketone and the toluene in these work areas. In this particular instance, changing the response factor setting can avoid considerable calibration changes, as one moves from determining concentrations of mthyl isobutyl ketone to the area where one is measuring the concentrations of the toluene vapor.

For calibration, the Model 580B response factor was set at 1.0 and the instrument spanned properly using a known reference standard of isobutylene. The Model 580B was then presented with a flowing air stream containing toluene vapor as generated in the Thermo Electron Model 360 using a toluene diffusion tube. The response factor was then adjusted so that the readout of the Model 580B corresponded to the toluene concentration in this standard.

The Model 580B was then presented with a flowing air stream containing methyl isobutyl ketone. This also was generated via a diffusion tube in the Model 360 Standards Generator. Once again, the response factor was adjusted so that the digital display gave the correct reading for the concentration for the methyl isobutyl ketone presented to the instrument.

With the instrument then calibrated with the reference isobutylene standard and knowing the proper settings of the response factors for methyl isobutyl ketone and toluene, the Model 580B was then ready for its plant survey. The area containing the toluene was monitored for a period of time with the toluene levels as noted by the 580B being recorded. The response factor was set for this toluene reading. The instrument was then moved directly to the methyl isobutyl ketone area and the response factor adjusted to read methyl isobutyl ketone. The 580B was then able to read directly the methyl isobutyl ketone concentration in the second area. There was the possibility of leaks in process equipment in this particular area. The area in general was surveyed. If significant changes in the reading of the 580B were observed, the 580B was used as a leak sourcing instrument as described in a later section. In this fashion, it could be determined if some of the varying concentrations in this area were indeed coming from a leak in the process equipment. During the survey of this particular area, no leaks from process equipment were observed, therefore, the readings obtained on the 580B could indeed be considered the methyl isobutyl ketone concentration in this particular area.

Throughout the survey of these two workplaces, the 580B could move back and forth rapidly due to its portability and could be, in effect, recalibrated for each of the two different vapors by the mere setting of the response factor.

5-4 PETROLEUM ETHER VAPORS IN WORKSPACE AIR.

A given workplace was using petroleum ether as a paint solvent and for cleaning purposes. It was desired to quantitate the amount of petroleum ether in the air being recirculated in this particular area. Petroleum ether is a distillation fraction from crude oil. Its boiling point is slightly lower than the boiling point of gasoline. This means that petroleum ether is not a single chemical entity, but a multitude of hydrocarbons in a certain boiling range fraction. Reasonable quantitative data can be obtained here without knowing the exact chemical composition of each hydrocarbon that composes petroleum ether. For this purpose, the Model 580B can be used to measure these vapors. The 580B is initially calibrated with the response factor set at 1.0 using a reference standard of isobutylene.

The 580B is calibrated on isobutylene. Then a bag sample is prepared, as detailed above, for the quantitation of the instrument to measure the petroleum ether. In this particular instance, the petroleum ether is injected into the bag in the same fashion that liquid samples are injected. The calculation, however, has to change slightly because the ppm on a volume basis cannot be calculated without knowing the exact chemical composition of the petroleum ether. However, in a situation such as this, one can still quantitate it on a weight basis of the solvent in air. The equations below show this calculation.

$$\text{Weight Vapor (mg)} = \text{Liquid Volume (uL)} \times \text{Density g/mL}$$

$$\text{Conc (mg/m3)} = \frac{\text{Weight Vapor (mg} \times 1000)}{\text{Air Volume (liters)}}$$

For Petroleum Ether In This Example:

$$\text{Liquid Volume} = 3 \text{ uL}$$

$$\text{Petroleum Ether Density} = 0.66 \text{ g/mL}$$

$$\text{Air Volume} = 10 \text{ liters}$$

$$\text{Vapor Weight} = 3 \text{ uL} \times 0.66 \text{ g/mL} = 1.98 \text{ mg}$$

$$\text{Conc} = \frac{1.98 \times 1000}{10} = 198 \text{ mg/m3}$$

This sample in the bag is then presented to the Model 580B and the response factor adjusted so that the digital readout on the front panel provides the proper reading in mg/m3. The setting of the response factor that is needed for this reading is noted. The Model 580B can now be used to monitor reasonably quantitatively the petroleum ether in the workplace environment. Any further calibration of the instrument can be done using the reference standard of isobutylene. This is a reasonably accurate way of giving quantitative information on the amount of solvent in air even though the results are not reported in ppm on a volume basis.

This technique can be used in general when the solvents are a mixture of materials which in general will probably be petroleum distillation fractions. It would certainly also be used in the case of gasoline vapors in air. Notice from the equations used versus the equations for determining the ppm concentration in bag samples for pure liquids, the only real thing missing is the molecular weight of the material. It may be possible to assume an average molecular weight of the solvent mixture and actually report a ppm by volume basis.

5-5 LEAK SOURCING

In this particular instance, the Model 580B is to be used for determining the prescence, or absence of leaks in a chemical process plant. The Model 580B is uniquely adapted to this particular operation due to its light weight. In this particular instance, it is not necessary to accurately attempt to quantitate the readings from the Model 580B. It will be used simply to determine presence of leaks and to locate these leaks.

The Model 580B is simply calibrated against a reference standard of isobutylene as normal. No further calibration is used. It is not necessary to know the particular chemicals flowing in the different pipes or what they are in the various reaction chambers. It is only necessary to know that these materials will have some response on the Photoionization Detector. That is, that their ionization potentials are below the energy of the lamp. The standard probe of the Model 580B, with the 580B fully operational, is then simply moved along the various pipes and reactor vessels in the chemical process.

All seals are traced clear around the seal with the end of the probe. As one approaches a leak, the concentration of the organic materials in the air being sampled by the Model 580B will increase significantly. The point of maximum reading will indicate the point of the leaks. As one moves further away from the leak, the concentration of the organics in air will certainly decrease. In this very rapid fashion, the presence of leaks can be detected and their source fairly accurately pinpointed so that the leak can be repaired.

In many instances, it is not necessarily the workplace hazards of these leaks that is important, but the economics of the chemical process itself. In this instance, as in many instances, the exact composition of the organic materials being measured is really unimportant to the successful use of the 580B in a specific application. Also the exact numbers that are displayed on the digital readout of the 580B are unimportant. It is only relative magnitudes that are important in this instance.

5-6 AFTERBURNER EFFICIENCY

In a particular coating process, the material, after it has been coated, is passed into a dryer where the solvents of the coating are removed. These solvents are then vented into a stack. To reduce the hydrocarbon emmission from this plant, an afterburner had been installed to combust the organic solvents from the coating prior to release to the atmosphere. It is important to determine the efficiency of this afterburner and to follow the efficiency of the afterburner to avoid dumping excess solvent into the atmosphere and, thus, become subject to pollution fines.

The Model 580B is ideally suited to this type of operation. Again, it will be unnecessary to know the exact chemical composition of the coating solvent. The Model 580B is simply standardized against the reference standard isobutylene in the usual fashion. The Model 580B is then connected to sample the stack gas in the dryer prior to the afterburner, noting the steady state number displayed on the digital panel meter. The 580B is then connected to the exhaust gases from the stack following the afterburner. Again, the steady state number, as displayed on the Model 580B, is noted.

The reading prior to the burner minus the reading after the burner divided by the reading prior to the burner times 100 gives efficiency of the afterburner in the stack. This number is quite accurate, even though the Model 580B was not calibrated specifically for the solvents or solvent mixture used in this particular coating operation. The individual readings before and after the afterburner may not have the exact quantitative relationship to the actual amount of material, but their ratio will be accurate since basically the same chemical or mixture of chemicals is being measured before and after the afterburner.

5-7 SAMPLE COLLECTION OF UNKNOWN ENVIRONMENTS

The Model 580B can also be used in areas where organics are known to be present, but perhaps the exact composition of the environment is not known. This may be due to several solvents being in the same general workplace or various separate processes occuring in that same workplace, all of which could and possibly are admitting organic vapors. In plant areas such as these, the Model 580B can still be extremely useful.

The 580B is calibrated against a reference standard of isobutylene, as mentioned above. The 580B is then used as a survey tool throughout the entire plant area. The readings are logged, especially changes in these readings. The exact numbers displayed will not, in general, be a quantitative measure of the ppm of the organic vapor since it is impossible to know what organic chemical or mixture of chemicals should be used for the calibration. When high readings are obtained on the Model 580B, an evacuated sample bag can be connected to the rear of the 580B at the sample exhaust port. This bag could be virtually identical to the type of bag used for standards preparation. The Model 580B is sampling the atmosphere at the rate of 500 mL/min. The detection system of Photoionization is a nondestructive system such that the sample that is exiting the Model 580B is indeed the same material that is giving the readings on the 580B. When the 580B is seeing high readings, this is the time the bag is connected to the rear for sample collection. The bag, if the same type is used for sample preparation, can hold approximately 10 liters of air sample; which would permit a sampling time of 20 minutes. This bag sample can then be closed on removal from the 580B and transported to a laboratory for subsequent analysis to identify the individual chemical compounds present in the sample causing the high readings and to ascertain if the workplace environment is harmful at those high readings.

The use of the Model 580B coupled with the bag collection ensures that the sample that is returned to the laboratory for analysis is a sample containing the desired organic vapors. This is assured because the bag collection is used only when the Model 580B is detecting high levels of organic vapor in the environment. This is an instance of the use of the Model 580B when the type of organic vapors are not known and it is desired to know them. The 580B has a very useful function even in these areas. It should be noted that a charcoal tube could be connected to the rear of the 580B as well as an evacuated plastic bag. The charcoal tube will pass the bulk of the sample, which is air, and adsorb the organic vapors. This charcoal tube can be returned to the lab for subsequent analysis for both a qualitative identitification of the materials present as well as a quantitative measure of their levels.

SECTION VI

Collection Techniques

6-1 GENERAL

As mentioned in the Application Section, it is possible to use the 580B in completely unknown areas as far as the organic vapors present are concerned and still obtain meaningful data. One of the techniques described here is the use of the 580B as a means of collecting the representative samples for further identification in the laboratory regarding the specific organics that may be present in addition to their concentrations.

Two techniques were mentioned in the section under the heading "Sample Collection of Unknown Environments". One of these techniques involves the use of a bag for collection and the other involves the use of charcoal tubes as a means of trapping organic vapors. In this section, each of these techniques will be explored in further depth as to the proper way of using the 580B to collect the samples for subsequent analysis. These collection techniques are quite useful when one is using the Model 580B simply as a survey instrument. When readings on the 580B become quite high in certain areas it is impossible to determine the exact source of the high readings to perhaps pinpoint the specific organic chemical giving rise to the reading, one may very well want to identify what the chemical or chemical mixture is that is providing the high reading. This will have to be done with instrumentation significantly more sophisticated than the Model 580B; namely, an instrument that can provide specificity as well as qualitative identification. A Gas Chromatograph is such an instrument.

If it is desired to collect some of the air to send to a laboratory for further analysis, one needs to be sure that the proper samples are taken at the proper time. This means simply that one needs to be assured that the sample sent to the laboratory is indeed a sample that has a high concentration of organic vapor present in the sample. The 580B is used to indicate the presence of the high level organic vapors. The sample then is gathered at the exit port of the 580B when the 580B is reading high values. This assures that the sample sent to the laboratory does indeed have the high level vapors present in it. This generally simplifies the sampling technique of the environment and reduces the number if samples and, therefore, the expense needed to accurately identify the organics present and to quantitate them in a laboratory.

Two design features of the Model 580B make this type of operation possible. The first is that the detection system used in the Model 580B is the Photoionization Detector which is basiccally a nondestructive detector. Thus, the instrument is able to sense the organic vapor using the detector and virtually the same concentration of the same materials exits the detector as entered it. This does make it possible for the collection of the exact sample contributing to the high readings.

The second feature of the 580B that allows this sample collection is that a positive displacement pumping system is used to draw the sample into the Model 580B. It is a very simple procedure then to attach to the exit of this positive displacement pump and trap the sample exiting the 580B after it has passed through the detector.

6-2 BAG SAMPLE COLLECTION.

One of the most convenient ways to sample the environmental air is to simply trap the entire air sample in a collection bag. As discussed before, the bags used for the calibration of the Model 580B, as discussed under the Calibration Section, can certaiinly be used for collection of the air samples. There are several precautions that must be mentioned immediately relative to the use of bag sample collection. When a bag has been filled with air that has organic vapor in the air sample, the organic vapor molecules will adsorb onto the inside surface of the bag. This adsorption will begin immediately on introduction of the air into the bag. It will continue to progress with time until the vapor molecules adsorb onto the wall of the bag are in equilibrim with the vapor molecules in the air. This equilibrium depends very strongly on the bag material and the chemical entity of the vapor itself. The ambient temperature also has some effect.

As mentioned under the Calibration Procedure, when one is preparing a known vapor concentration in a bag, the bag should be analyzed very rapidly after its preparation to ensure proper calibration of the instrument. The technique here is to use the standard prepared in this fashion as soon as possible such that the adsorption that has occurred is an absolute minimum amount. This adsorption becomes a bit more serious problem in using bags for sample collection. The first problem is simply when one is reusing the bag, one has to be sure that the sample contained in the bag previously has been completely desorbed from the wall. This, in general, can be checked by using clean air to fill a bag allowing the bag to set for a short period of

time, about 1 hour, and then analyzing the air in the bag. If on using the 580 to analyze this air, it shows measureable organics, then the air in the bag should be dumped and new air introduced and allowed to set for the same period of time. There will be a reduction of organic vapor on the second go- around. If it is still too high, this procedure is repeated until the bag shows virtually no organic vapor. The bag can be evacuated and reused.

The other problem associated with adsorption and sample collection is that the sample that is collected in the bag must analyzed as soon as possible after collection if one is going to determine quantitatively the amount of organic vapor in that bag sample. The longer the sample stays in contact with the bag, the greater will be the adsorption of the organic vapors on the surface of the bag and, therefore, the lower the concentration of the organic vapors in the air sample.

If one is interested here in only doing a qualitative analysis of the organic vapors, that is identify what vapors are present in the air sample, the bag certainly is a convenient way of taking the sample. If one in addition to getting the qualitative analysis desires to quantitate one or more of the specific organic vapors in the sample, the bag sample should be analyzed within an hour of taking this sample. If the bag sample cannot be analyzed this soon, it is recommended that one use the charcoal tube technique explained in the next section.

There are two considerations to be given relative to the size of the bag and, therefore, the size of the sample taken. The first consideration is the amount of sample needed by the laboratory for its analysis. If the analysis is to be done by gas chromatography directly on the air sample, in general only 1 to 5 mL of sample would be required for the analysis. Therefore, this does not become a major consideration here. If, however, other analytical techniques were to be used that would require significantly higher volumes of sample, this should be taken into account.

The other consideration is the sampling time. The Model 580B samples at the rate at which the bag attached to the exit port of the 580B will be filled. If the bag can conveniently hold 10 liters of air, this means that the sampling time can be up to 20 minutes. In general, collection techniques using the Model 580B are not intended to supply a four or eight hour integrated sample. They are used simply to help identify the materials contributing to a high concentration and possibly the analysis of individual toxic organic vapors in that particular air sample. Thus, a 20 minute limitation on sampling time should not be too severe. Certainly larger bags could be used on the exit of the 580B, allowing up to several hours of sampling time should this be desired. The difficulty then becomes that the bags are quite large and physically become difficult to manipulate. It was recommended back in the Calibration Section that perhaps a 10 liter bag would certainly be the convenient bag for the calibration of the 580B. It would appear to be also a convenient bag for collection of the samples. For this purpose, a bag that has no adsorbed vapors on the interior surface is evacuated and closed to the atmosphere. Several of these bags could be carried in a very small container. When the Model 580B is reading high values, and it is impossible to determine the source of the high values, then a bag can be connected to the exit port of the 580B and immediately opened to accept the sample exiting the 580B. The bag is kept connected to this exit as long as the 580B is giving high readings or until the bag has reached its volume capacity. At this point, the bag is removed from the exit port of the 580B, immediately closed, and returned to the laboratory for analysis.

6-3 COLLECTION USING CHARCOAL TUBES

A technique very common in industrial hygiene-type analysis is to use a small charcoal tube as a collection device. An air sample is pulled through the charcoal tube at a known flow rate for a known period of time. This flow rate and time determine the total volume of air or total sample size. The organic vapors in the air are adsorbed on the charcoal in the tube. These vapors are then desorbed from the charcoal by adding a known volume of desorbing solvent, usually carbon disulfide. The organics end up in the carbon disulfide. The carbon disulfide is then injected into a gas chromatograph using Flame Ionization Detection. The individual organic vapors can then be identified and quantitated.

The usual charcoal tubes that are used for this type of work contain two sections. One section has approximately 100 milligrams of charcoal and a backup section has 50 milligrams. The backup section is analyzed separately from the main section to determine if there is organic vapor breakthrough in the main section. These particular size tubes have a recommended maximum flow in the neighborhood of 250 to 300 mL/min. The exit of the Model 580 is at 500 mL/min. The most advantageous way of using a smaller charcoal tube would be to split the exit stream and pass it through two parallel charcoal tubes. This would give approximately 250 mL through each tube. For analysis purposes, the charcoal of each tube is removed and combined using double the amount of solvent that would be required for a single tube.

The amount of total air that can be passed through charcoal tubes certainly depends on the concentration of organic vapor in the air. It also depends to some extent on the particular organic vapor. In general, a total sample through the smaller

charcoal tube of 10 liters is a reasonably safe number to use. Since the flow is split exiting the 580B using the smaller charcoal tubes, only 250 mL/min is going through the tube. It would take 40 minutes to accumulate 10 liters passing through each of the tubes. There are charcoal tubes available in the marketplace containing 300 milligrams of charcoal in the front section and 150 milligrams of charcoal in the rear section. These tubes have correspondingly larger diameter and can accommodate higher volumetric throughputs. One of these tubes could be hooked to the exit of the 580B without doing the split. Conceivably since it contains 3 times the amount of charcoal, a safe oeprating total volumetric throughput would be approximately 30 liters. This would be a full hour's operating time on the Model 580B. Again, it must be stressed that the 580B when used in the particular form, is not being used as a personnel sampler to end up with the time weighted average concentration over an eight hour period. The intent here is to identify the high level organics observed on the 580B and to quantitate them following identification to determine the safe working area.

SECTION VII

Communication

The 580B provides a serial (as opposed to parallel) communication port. There is also a communication cable provided for easy link up to a serial printer or RS-232 port of a computer. Logged data may be "dumped" (sent through the communication port) to a serial printer. Many of the 580B parameters may be set by a remote computer by useing the serial port and the 580B communication software (the software is an option part number 580A-9014).

7.1 PRINTER

The 580B can be instructed to send all of it's logged data through the serial port to a printer (or a dumb terminal). The 580B printer mode should be selected (see section 2.7.4).The serial communication cable should then be plugged into the RS-232 port at the rear of the instrument and the other end of the cable plugged into the serial port of a printer. The 580B should finally be instructed to output to the printer (see section 2.7.1).

7.2 COMPUTER

The 580B provides capabilities for remote operation. Appendix A includes a detailed technical explanation of the 580B printer and computer interface protocol. The information in this appendix is sufficient for custom software to be developed for interfacing to the 580B. Thermo Environmental however has developed communication software which implements all of the available communication capabilities in a simple "menu driven" format. Remote communication may also be accomplished by using generic communication software such as CrossTalk. Appendix A will be helpful if this route is taken.

NOTE : Generally the RS-232 port on an IBM PC (or compatible) is a male connector. Since the communication cable provided with the 580B is also male, a "gender changer" (a DB-25 connector which converts from male to female) is needed.

7.3 COMMUNICATION SOFTWARE (OPTIONAL)

There is communication software available which will run on an IBM PC or compatible. The software provides the capability of obtaining or changing the 580B parameters (alarm setting, response factor, or operating mode to name a few). Logged data may be stored to disk or printed to a parallel printer. Concentrations may be read and displayed on the comuter screen. There are a few operations which may not be accomplished remotely (for obvious reasons). The lamp may not be changed remotely. The lamp and pump may not be turned on from the computer either.

NOTE : The communication software will not work unless the 580B is attached via the communication cable.

7.3.1 HOW TO GUIDE FOR COMMUNICATION SOFTWARE

#1. The 580B must be turned on and connected to the computers RS-232 port. The 580B must be in the computer mode (this is the default setting).

#2. The floppy disk should be inserted into the computer. Type 580A (this software was originally developed for the 580A) and then hit return. The introduction screen will appear.

#3. The software defaults to 2400 baud (as does the 580B). If some other baud rate is desired it must match the setting on the 580B.

#4. After selection of the baud rate press return. The main menu will appear.

NOTE : If the computers screen goes blank and the main menu does not appear then there is a problem with the communication link. Check to be sure that the communication cable is plugged into the RS-232 port and that the 580B is on.

SECTION VIII

Flow Chart

There are two flow charts which illustrate the structure of the 580B software. The first is a "Quick Start-up" flow chart. Much of the detail is not included in this flow chart in order to diagram the basic structure of the software. The second flow chart includes extensive detail of each screen and the function of the seven buttons. These flow charts provide an easy method for determining how to get at each of the many facilities provided by the 580B.

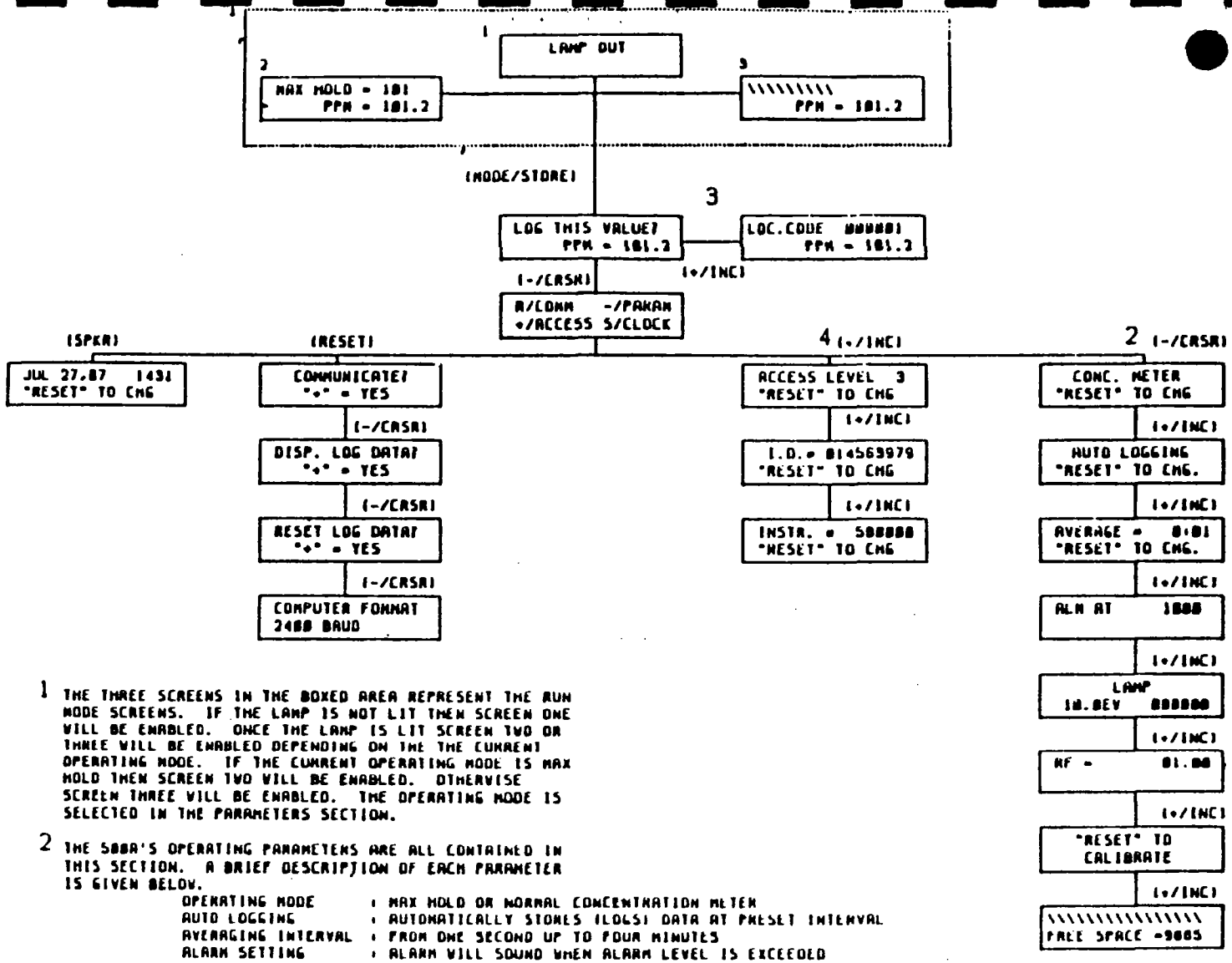
8.1 QUICK START-UP

The Quick Start-up flow chart shows each of the top level screens. The screens are ordered according to the hierarchy of the 580B software. The particular button (which advanced the 580B to the next screen) is shown in parenthesis above each screen. This flow chart does not illustrate any of the associated screens or operations (see the detailed flow chart for more in depth information).

The Quick Start-up flow chart should be fully understood before moving on to the more detailed flow chart. The best way to learn each of the flow charts is to have the 580B with You and to follow along verifying each step.

8.2 DETAILED FLOW CHART

The detailed flow chart illustrates many of the lower level screens as well as the function of buttons. Screens are shown in rectangles with the text written inside. The buttons are shown in elipses (actually a rather flattened elipse) with the button identifier written inside. There are a few conventions which need to be explained. The button identifiers have been abbreviated. For example the +/INC button is simply denoted as +. When two buttons need to be pressed simultaneously each identifier is shown with a slash between them. For example RESET/+ indicates that the RESET and +/INC buttons should be pressed together. Arrows indicate the direction of flow from one screen to the next.



1 THE THREE SCREENS IN THE BOXED AREA REPRESENT THE RUN MODE SCREENS. IF THE LAMP IS NOT LIT THEN SCREEN ONE WILL BE ENABLED. ONCE THE LAMP IS LIT SCREEN TWO OR THREE WILL BE ENABLED DEPENDING ON THE THE CURRENT OPERATING MODE. IF THE CURRENT OPERATING MODE IS MAX HOLD THEN SCREEN TWO WILL BE ENABLED. OTHERWISE SCREEN THREE WILL BE ENABLED. THE OPERATING MODE IS SELECTED IN THE PARAMETERS SECTION.

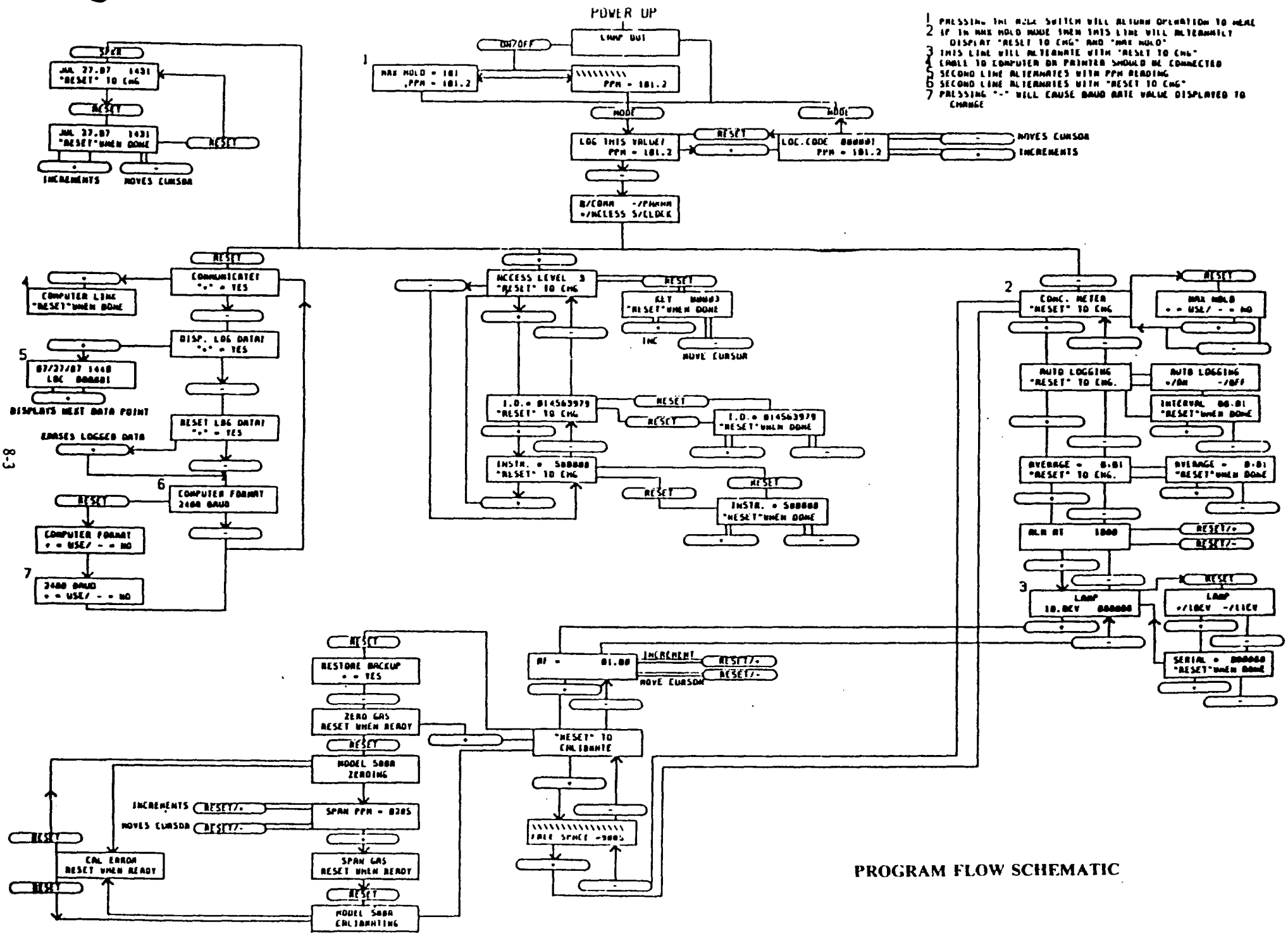
2 THE 500A'S OPERATING PARAMETERS ARE ALL CONTAINED IN THIS SECTION. A BRIEF DESCRIPTION OF EACH PARAMETER IS GIVEN BELOW.

OPERATING MODE	: MAX HOLD OR NORMAL CONCENTRATION METER
AUTO LOGGING	: AUTOMATICALLY STORES (LOGS) DATA AT PRESET INTERVAL
AVERAGING INTERVAL	: FROM ONE SECOND UP TO FOUR MINUTES
ALARM SETTING	: ALARM WILL SOUND WHEN ALARM LEVEL IS EXCEEDED
LAMP SETTING	: SELECTS 10.0 OR 11.0 EV LAMP (SERIAL NUMBER ALSO)
RESPONSE FACTOR	: CORRELATES AN ORGANIC TO THE CALIBRATION GAS
CALIBRATION	: SECTION WHERE 500A IS CALIBRATED
FREE SPACE	: INDICATION OF AMOUNT OF ROOM LEFT FOR DATA STORAGE

3 THESE ARE THE SCREENS USED FOR LOGGING (STORING) DATA POINTS. AFTER ENTERING THE DESIRED LOCATION CODE, SIMPLY PRESSING THE MODE/STORE SWITCH WILL LOG THE VALUE (AS WELL AS A DATE AND TIME STAMP) AND RETURN OPERATION TO THE RUN MODE.

4 THE ACCESS (SECURITY) LEVEL IS SET IN THIS SECTION. ACCESS LEVEL THREE GIVES THE OPERATOR ACCESS TO ALL OF THE 500A'S FACILITIES. LOWER ACCESS LEVELS ARE PROGRESSIVELY MORE RESTRICTIVE. ACCESS LEVEL ZERO ONLY ALLOW READING AND LOGGING OF DATA.

PROGRAM FLOW SCHEMATIC QUICK START-UP



1 PRESSING THE HOLD SWITCH WILL RETURN OPERATION TO NORM
2 IF IN MAX HOLD MODE THEN THIS LINE WILL ALTERNATELY DISPLAY "RESET TO CHG" AND "MAX HOLD"
3 THIS LINE WILL ALTERNATE WITH "RESET TO CHG"
4 CABLE TO COMPUTER OR PRINTER SHOULD BE CONNECTED
5 SECOND LINE ALTERNATES WITH PPM READING
6 SECOND LINE ALTERNATES WITH "RESET TO CHG"
7 PRESSING "-" WILL CAUSE BAUD RATE VALUE DISPLAYED TO CHANGE

PROGRAM FLOW SCHEMATIC

APPENDIX A

Communication

A-1 Introduction

The 580B is capable of communicating over an RS-232 link with any peripheral device which adheres to the communication protocol outlined in this document. The 580B will communicate with a peripheral device in one of two modes. While in the PRINTER mode the 580B responds to commands from its keypad and can be commanded to send characters out its RS-232 port to a peripheral device. In the COMPUTER mode the 580B responds to commands from a peripheral computer and can be commanded to send and receive data and to perform other tasks. Regardless of the mode used, the 580B sends and expects to receive data in the following format:

No Parity
1 Start Bit
8 Data Bits
1 Stop Bit
Baud Rate = 150, 300, 600, 1200, 2400, 4800 or 9600

The Baud Rate may be selected from the 580B keypad (see section 2.7)

A-2 PRINTER MODE Interface

In the PRINTER mode the 580B can be instructed to send its log data out the RS-232 port to a peripheral device such as a printer.

The 580B can be manually instructed from its keypad to output its log data. In this case the 580B sends all the log data points it has acquired thus far. The log data is saved in 580B memory and will NOT be automatically erased upon output. While in the PRINTER mode, the 580B log data file must be erased (reset) from the keypad. An example of a log data output is shown on page A- 17. Notice that the 580B also sends header information which includes the following parameters: instrument number, user ID, and mode of operation. The date at the top of the header corresponds to the time when the first log data point was taken with the parameters set as shown in the header. If any of the parameters are changed and then new log data points are acquired, the 580B will send an updated header before it sends the new data points. It is also important to note that every log data point is time stamped to show when it was stored.

HARDWARE INTERFACE, PRINTER MODE

580B		PERIPHERAL
TxD	(B)	RxD
CTS	(E)	(or "printer ready")
GND	(A)	GND

The connections shown above are required before the 580B can successfully send its log data to the peripheral. An example of a cable used for PRINTER MODE communication is shown below:

SAMPLE CABLE, 580B TO HP THINKJET PRINTER

580B		PRINTER
TxD	(B)	RxD (3)
CTS	(E)	DTR (20)
GND	(A)	(1)
GND	(F)	GND (7)

Thinkjet connector = TRW/CINCH DB-25P plug connector

Please remember that the 580B must be placed into the PRINTER mode prior to output of log data to a printer. This is done from the 580B keypad (refer to 580B Technical Manual for key sequence).

HARDWARE HANDSHAKING, PRINTER MODE

The 580B will send log data out the port to a peripheral device as long as its CTS line is asserted (+V). If the peripheral has temporarily fallen behind, and consequently clears its DTR line (-V), the 580B will stop transmitting data. It will resume transmitting as soon as the peripheral re-asserts (+V) its DTR line.

A-3 COMPUTER MODE Interface

In the COMPUTER mode the 580B will respond to commands sent by a peripheral computer. The 580B will respond to 3 types of commands; DO, GET, and SET commands.

An example of a DO command is "DO RESET LOG (ret)" in which the 580B is instructed to reset its log which, in effect, clears all previously stored log data points.

A GET command such as "GET ALARM (ret)" allows the peripheral to change a specified parameter in the 580B to a value provided by the peripheral.

A combination of DO, SET, and GET commands allow the operator at the peripheral to perform a variety of functions needed to prepare a 580B for acquiring data.

The 580B can also be operated under "computer control". For example, the 580B can be commanded to acquire readings at specified intervals and then store the readings in a log data file. The 580B can subsequently be commanded to send its log data to a printer, a file or the screen of the peripheral computer. This can all be accomplished through commands issued by the peripheral computer. So, effectively the 580B is under "computer control".

HARDWARE INTERFACE, COMPUTER MODE

```
580B                    COMPUTER

T x D (B) ______________) R x D
R x D (C) (______________ T x D
CTS   (E) (______________ DTR
                    !_____ DSR
GND   (A) ______________ GND
                     _____ CTS
                    !_____ RTS
```

The connections shown above are required before the peripheral computer can successfully communicate with the 580B. In addition, the 580B must be placed into COMPUTER mode. This is done from the 580B keypad (refer to 580B Technical Manual for key sequence).

An example of a cable used for COMPUTER MODE communication is shown below:

SAMPLE CABLE, 580B TO IBM PC

```
580B                    COMPUTER

T x D (B) ___________) R x D  (3)
R x D (C) (___________ T x D  (2)
CTS   (E) (___________ DTR    (20)
                !_____ DSR    (6)

GND   (A) ___________ GND     (7)
                !_____ GND    (1)

                _____ CTS     (5)
                !_____ RTS    (4)
```

If the peripheral's DTR line is asserted (+V), the 580B will look for and then respond to peripheral commands. As long as DTR remains high, the 580B will NOT perform functions such as counting, updating the display, storing log data, etc. If DTR is asserted, the 580B will display the following message:

"COMPUTER LINK"
"WAITING FOR COMM"

The 580B must be allowed 100ms between the time the peripheral aserts DTR and the time it sends the 580B its first message.

If the 580B is busy communicating the display will read:

"COMPUTER LINK"
"COMMUNICATING"

When DTR is low (-V), the 580B will return to its normal mode of operation where it counts, updates the display, etc. and will NOT respond to peripheral commands.

XON/XOFF HANDSHAKING, COMPUTER MODE

If the 580B is transmitting log data and detects that an XOFF has been received, it will stop transmitting. The 580B will not resume transmission until the peripheral device sends XON. The 580B will respond to XON and XOFF characters only if it is NOT communicating with the computer (i.e., if 580B CTS is NOT asserted).

It is important to note that if the 580B receives an XOFF it will stop transmitting and will simply wait for the peripheral to send XON, it will not acquire data, update the display or perform other functions. The 580B is essentially "locked up" until it receives XON. For this reason, it would be good programming practice to send out an XON to the 580B prior to 580B/peripheral communication and afterwards also. Consequently, if an XOFF character is sent to the 580B inadvertently, the 580B will not be locked up indefinitely.

PERIPHERAL/580B COMMAND MESSAGES

A command message is a string of upper-case ASCII characters terminated by an ASCII carriage return. The carriage return may immediately follow the command or a space may separate the command and the carriage return as shown in the example below. The command messages which the 580B will accept from the peripheral are listed in TABLE 1 (see page 8-9). The 580B will accept the messages as shown in TABLE 1 or the command portion of the message can be abbreviated as follows:

"S R F 01.00 (ret)" instead of
"SET RESPONSE FACTOR 01.00 (ret)"

Please note that the abbreviation must contain the first letter of each and every word of the command. There are some additional guidelines for abbreviating the SET OPERATING MODE commands. Please see the list of valid abbreviations for these commands on page 18.

If the abbreviated version of a command is sent, an ASCII blank must separate each letter of the command and must separate the command from the data. Note that the command message will contain data only if a SET command is being sent.

If the spelled-out version of a command is sent, an ASCII blank must separate each word of the command and must separate the command from the data.

Every SET command message contains a data value. The data sent as part of a SET command must conform to the formats described in TABLE 1. It is important to note that the 580B does NOT perform error-checking on data sent as part of a SET command. It is up to the user to insure that the data value is "reasonable" and formatted as shown in TABLE 1.

The following are examples of valid command messages:

"SET ACCESS LEVEL 3 (ret)"
or "S A L 3 (ret)"

"SET REAL TIME 02/15/86 1723 (ret)"
or "S R T 02/15/86 1723 (ret)"

580B/PERIPHERAL RESPONSE MESSAGES

A response message is a string of upper-case ASCII characters terminated by an ASCII carriage return. The response messages which the 580B will send to the peripheral are listed in TABLE 1. The messages which the 580B sends in response to a GET command contain data formatted as shown. The notes which follow TABLE 1 describe the GET command response messages in more detail.

SOFTWARE HANDSHAKING, COMPUTER MODE

Every command message must be preceded by the "WAKE UP/PROCEED" sequence. This sequence begins when the peripheral sends a WAKE UP ("?") character to the 580B. The 580B must respond with a PROCEED ("!") character before the computer can send a command message. In the discussion to follow, the WAKE UP/PROCEED sequence will be referred to as (WAKE UP/PROCEED).

The peripheral sends command messages to the 580B an entire line at a time. When the 580B receives the command line it will echo the line back to the peripheral. The peripheral will examine the echo to determine if the 580B received the command correctly. If the echo was correct, the peripheral will signal the 580B with the PROCEED character. The 580B will then perform the task specified by the command message. In the discussion ahead, the command message and echo sequence will be referred to as (COMMAND/ECHO/PROCEED).

The software handshaking sequences for each of the 3 types of commands are given below:

DO COMMANDS

The handshake sequence for a DO command is as follows:

1. (WAKE UP/PROCEED)
2. (COMMANDS/ECHO/PROCEED)
3. 580B performs task
4. 580B sends PROCEED or ERR

If the 580B was able to successfully complete the task it will send a PROCEED character in step 4, otherwise it will send the error message ("ERR").

GET COMMANDS

The handshake sequence below applies to all of the GET commands with the exception of GET LOG DATA and GET CONTINUED LOG:

1. (WAKE UP/PROCEED)
2. (COMMAND/ECHO/PRODEED)
3. 580B sends data message
4. Peripheral echos data message
5. 580B sends PROCEED or ERR

The message sent by the 580B in response to a GET command are shown in TABLE 1. When the peripheral receives the message containing the data it echos the entire message back to the 580B. If the echo is correct the 580B will send the PROCEED character so that the peripheral knows it received the data correctly. If the echo is not correct, the 580B will send "ERR".

The GET LOG DATA and GET CONTINUED LOG commands differ from the other GET commands in that the 580B sends an indefinite number of data values. The handshake sequence for these commands is as follows:

1. (WAKE UP/PROCEED)
2. (COMMAND/ECHO/PROCEED)
3. 580B sends a log data point message
4. If message = "EOT" (end of transmission) then DONE, otherwise go on to step 5.
5. Peripheral echos entire message
6. 580B sends PROCEED or ERR
7. Peripheral sends PROCEED
8. Go to step 3

In step 4, the 580B sends "EOT" if it has sent all the log data points available. If some time later the peripheral sends "GET CONTINUED LOG (ret)" the 580B will send any additional data points it may have acquired since the GET LOG DATA command. In step 6, the 580B will send PROCEED if the peripheral echoed the message correctly in step 5. The 580B will also increment its data buffer pointer. If however, the peripheral did **NOT** correctly echo the message in step 5, the 580B will send "ERR" in step 6 and will **NOT** increment its data buffer pointer. This means that the next time through step 3, the 580B will send the same data point again. In either case, the peripheral must send a PROCEED in step 7.

SET COMMANDS

The handshaking sequence for a SET command is as follows:

1. (WAKE UP/PROCEED)
2. (COMMAND/ECHO/PROCEED)
3. 580B sets parameter to value
4. 580B sends PROCEED or ERR

In step 3 the 580B sets the parameter specified by the command to the value provided by the peripheral in the command message. The data value sent in the SET command message must be formatted as shown in TABLE 1. If the 580B is able to successfully set the parameter it will send the PROCEED character, otherwise it will send "ERR".

NOTE

The flowcharts shown in figures 1-4 (see pages 8-13 - 8-16) are included to further explain the software handshaking sequences required for successful communication between the peripheral and the 580B.

TABLE 1

Message Formats

PERIPHERAL COMMAND	580B RESPONSE
DO COMMANDS	
DO END COMMUNICATIONS(ret)	! (ret)
DO RESET LOG (ret)	! (ret)
GET COMMANDS	
GET ACCESS LEVEL (ret)	ACCESS LEVEL I (ret)
GET ALARM SETTING (ret)	ALARM SETTING IIII (ret)
GET CONTINUED LOG (ret)	(see notes which follow)
GET INSTRUMENT NUMBER (ret)	INSTRUMENT # IIIIII (ret)
GET LOCATION CODE (ret)	LOCATION CODE IIIIII (ret)
GET LOG DATA (ret)	(see notes which follow)
GET OPERATING MODE (ret)	OPERATING MODE: ASCII (50) (ret)
GET MAX READING (ret)	LAST MAX VALUE IIII ASCII (8) (ret)
GET RATEMETER READING (ret)	LAST CONC VALUE IIII ASCII (8) (ret)
GET REAL TIME (ret)	REAL TIME CLOCK II/II/II IIII (ret)
GET USER ID (ret)	USER I.D. # IIIIIIII (ret)
GET RESPONSE FACTOR (ret)	RESPONSE FACTOR II.II (ret)
GET SPAN CONCENTRATION (ret)	SPAN CONCENTRATION IIII (ret)
GET VERSION NUMBER (ret)	580B VERSION 1.0 (ret)
GET LOGGING INTERVAL (ret)	I:II (ret)
SET COMMANDS	
SET ACCESS LEVEL I (ret)	! (ret)
SET ALARM SETTING IIII (ret)	! (ret)
SET INSTRUMENT NUMBER IIIIII (ret)	! (ret)
SET LOCATION CODE IIIIII (ret)	! (ret)
SET OPERATING MODE ASCII (50) (ret)	! (ret)
SET REAL TIME II/II/II/ IIII (ret)	! (ret)
SET USER ID IIIIIIII (ret)	! (ret)
SET RESPONSE FACTOR II.II (ret)	! (ret)
SET SPAN CONCENTRATION IIII (ret)	! (ret)
SET LOGGING INTERVAL I:II (ret)	! (ret)

NOTES ON TABLE 1

The peripheral will receive data back from the 580B in response to a GET command only. The 580B response to a DO or SET command is the PROCEED ("!") character. This is because the 580B does not actually return data but signals the peripheral with the PROCEED character if it was able to perform the task requested. If for some reason the 580B is unable to perform the task it will send an error message "ERR" rather than PROCEED.

The data values sent by the peripheral as part of a SET command message and the data received by the peripheral in response to a GET command must be formatted as shown in TABLE 1. The data format codes used in TABLE 1 are described below:

I	a single digit
III . . . II	an integer "string", the number of I's shown indicates the length of the string. Note: the "string" MUST be the length specified, use leading zeros if necessary.
ASCII (n)	an ASCII string with a maximum of n characters

Several of the command messages listed in TABLE 1 require additional explanation. These comments are listed according to the command name:

DO RESET LOG

This command instructs the 580B to clear its log data file. All log data values acquired previously will be erased.

GET CONTINUED LOG

This command instructs the 580B to send any log data points acquired since the last GET LOG DATA command. The format of the 580B response will be the same as the response to the GET LOG DATA command. A sample GET LOG DATA response is shown on page E-17.

GET LOG DATA

This command instructs the 580B to send all of its log data points. A sample GET LOG DATA response is shown on page 21. The log data file is saved in 580B memory and is NOT automatically erased upon output. The log data file may be erased (reset) with the DO RESET LOG command.

GET OPERATING MODE

The 580B responds to a GET OPERATING MODE command by sending a string "MODE: ", followed by an ASCII string which describes the current 580B mode of operation. The 580B responses to the GET OPERATING MODE command are listed below:

OPERATING MODE: CONCENTRATION METER NORMAL
OPERATING MODE: CONCENTRATION METER MAX HOLD

GET MAX READING

The 580B responds to a GET MAX READING command by sending the max value as shown in TABLE 1. After the 580B sends the max reading it resets the max value to 0.

GET REAL TIME

The 580B will return its real time as an ASCII string in the following format: "05/29/86 1422"

SET ACCESS LEVEL

The access level must be an integer in the range 0 to 3

The instrument number is a string of 6 integers. If the instrument number = 2 then the number must be represented as 000002 (i.e. leading zeros must fill in excess spaces). An example of a valid SET INSTRUMENT NUMBER command is "SET INSTRUMENT NUMBER 000002 (ret)".

SET LOCATION CODE

The location code is a string of 6 integers. If the location code = 234 then the correct SET LOCATION CODE command is "SET LOCATION CODE 000234 (ret)". (Leading zeros must fill excess spaces.)

SET OPERATING MODE

As shown in TABLE 1, the command SET OPERATING MODE must be followed by an ASCII string which describes the mode. The list of valid SET OPERATING MODE commands along with valid abbreviations are listed below:

SET OPERATING MODE CONCENTRATION (ret)
S O M C (ret)

SET OPERATING MODE MAX HOLD (ret)
S O M M H (ret)

SET REAL TIME

The format for setting the real time is as follows:

```
II/II/II IIII
. . . . .
. . . . ..................... minutes (max=59
. . . ...................... hours (max=23)
. . ......................... year
. ............................ day
............................... month
```

For example: SET REAL TIME 02/15/86 1723 (ret)
This instructs the 580B to set its real time clock to February 15, 1986 5:23 p.m.

SET USER ID

The user ID is a string of 9 integers. To set user ID = 66, use the following command "SET USER ID 000000066 (ret)" (leading zeros must fill in excess spaces).

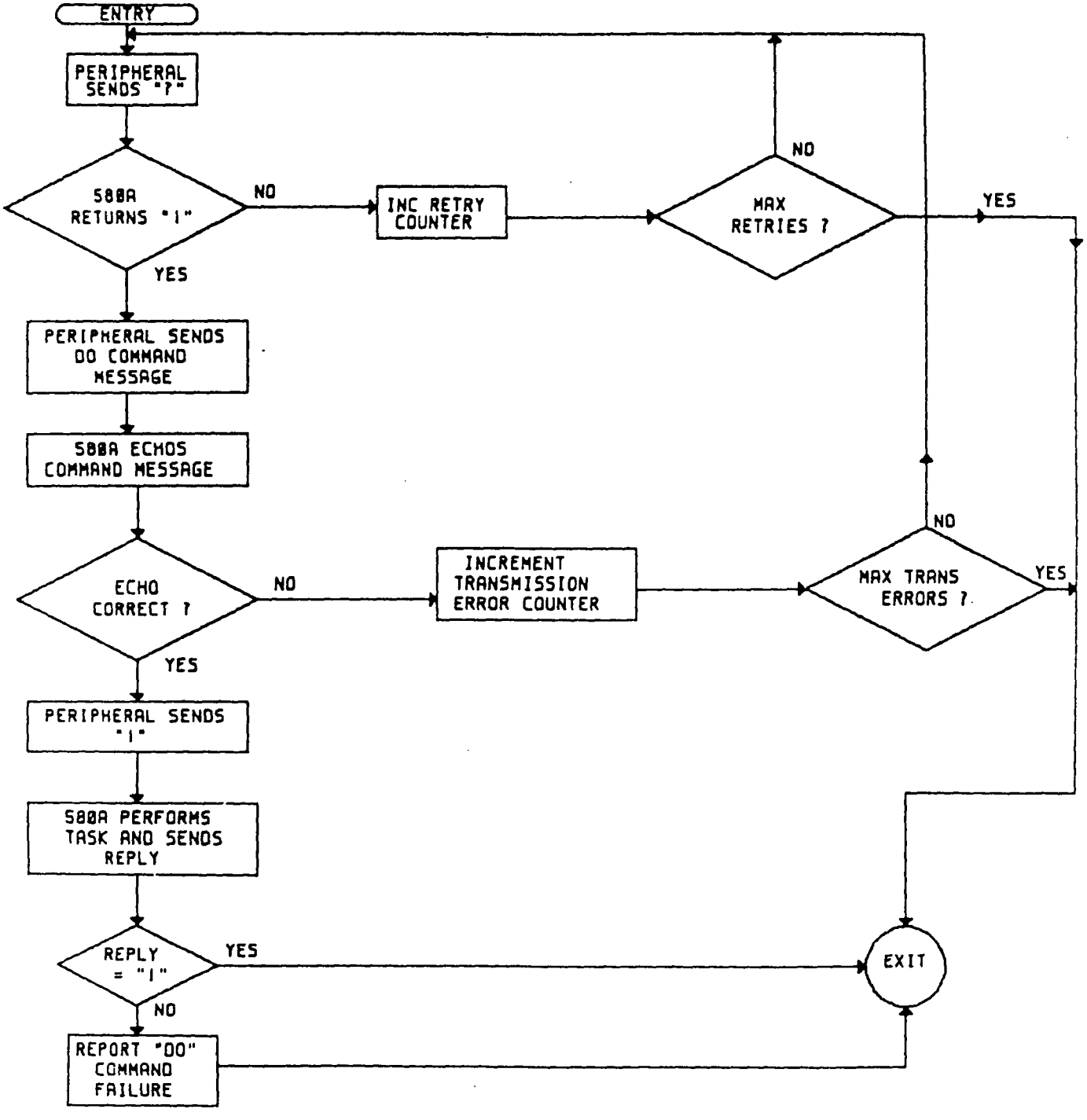


FIGURE 1

SOFTWARE HANDSHAKE
DO COMMANDS

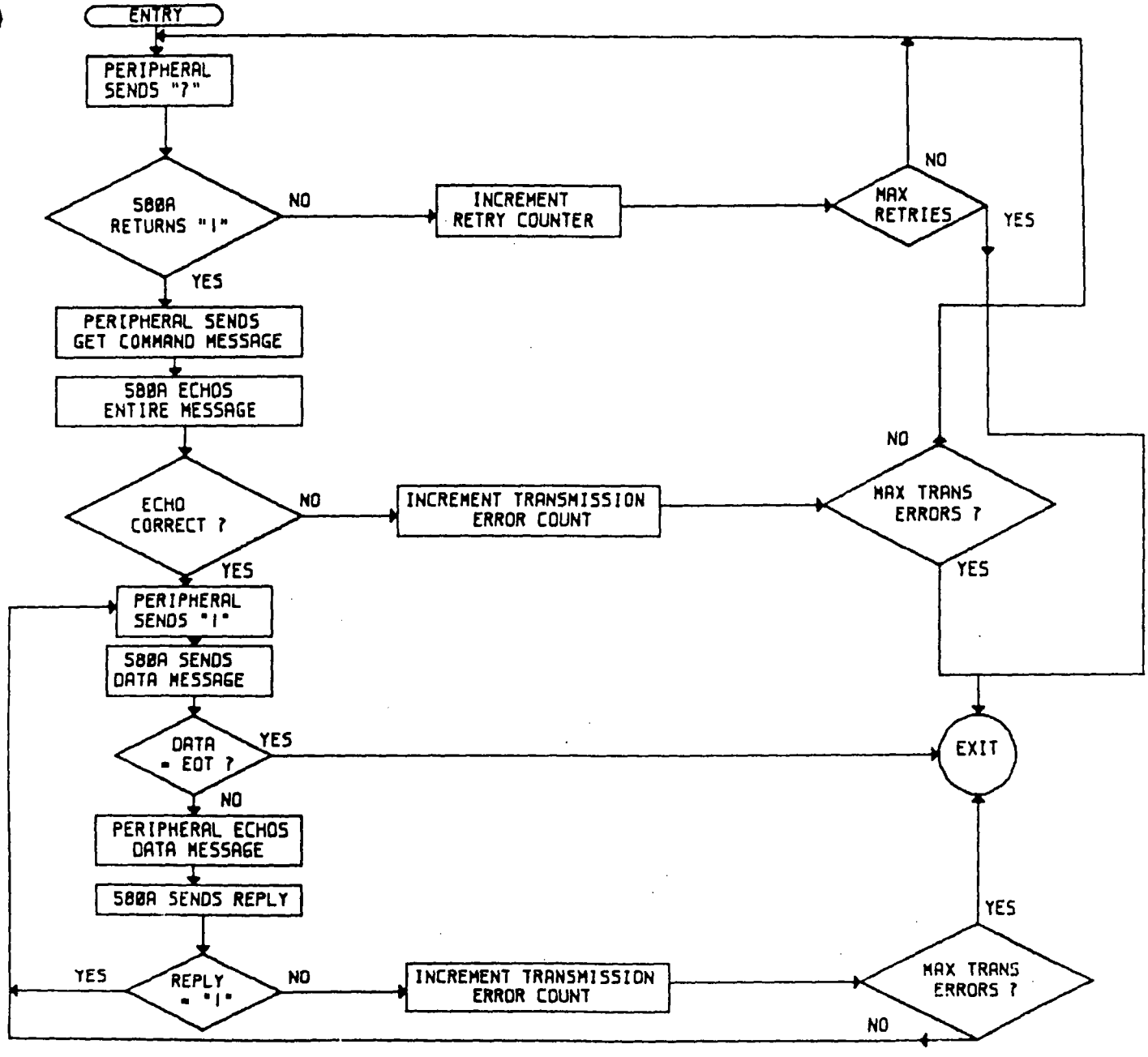


FIGURE 2

SOFTWARE HANDSHAKE
GET LOG DATA, GET CONTINUE LOG COMMAND

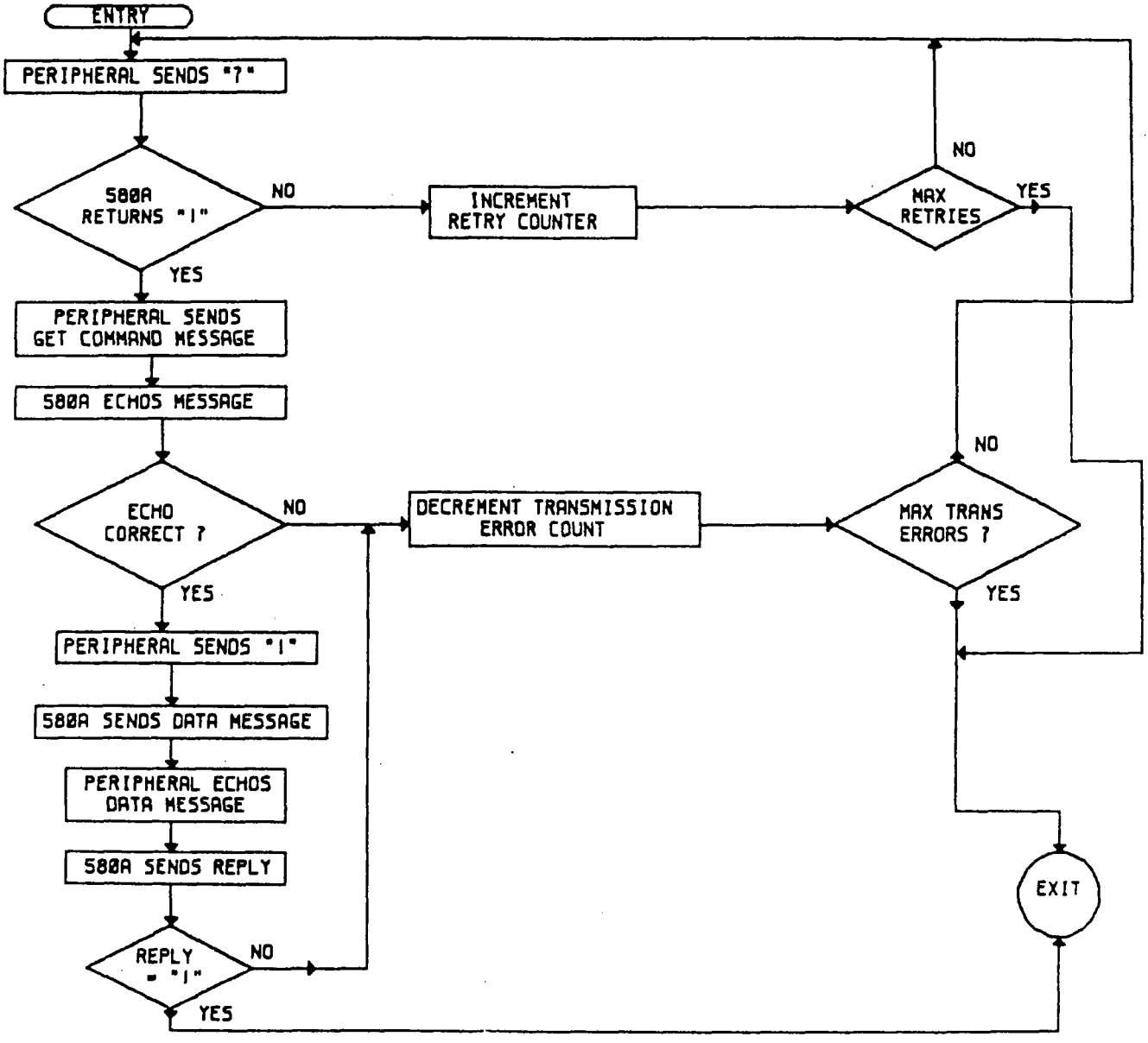
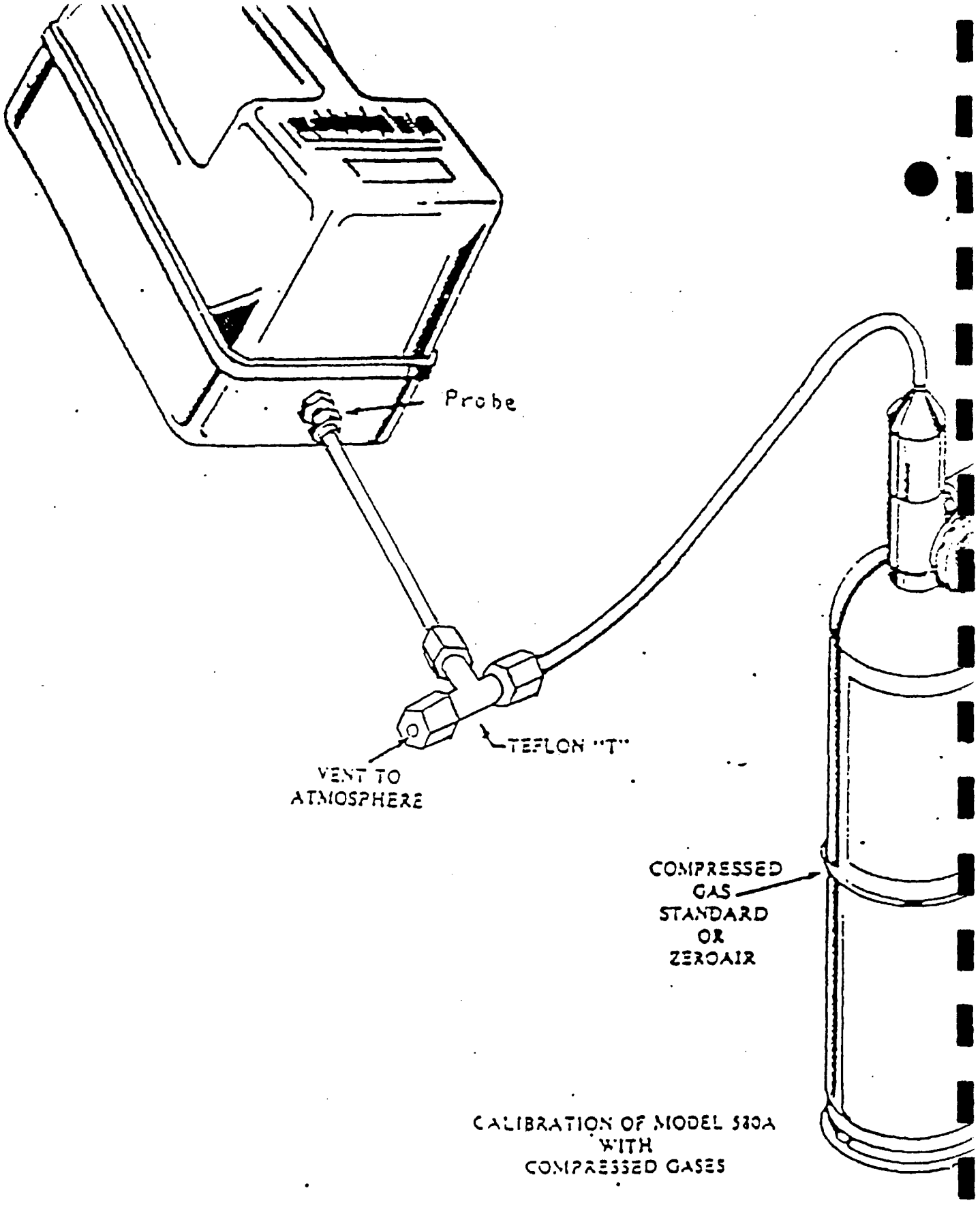


FIGURE 3

SOFTWARE HANDSHAKE
GET COMMAND
(EXCEPT GET LOG DATA, GET CONTINUE LOG)



CALIBRATION OF MODEL 580A
WITH
COMPRESSED GASES

FIGURE 1

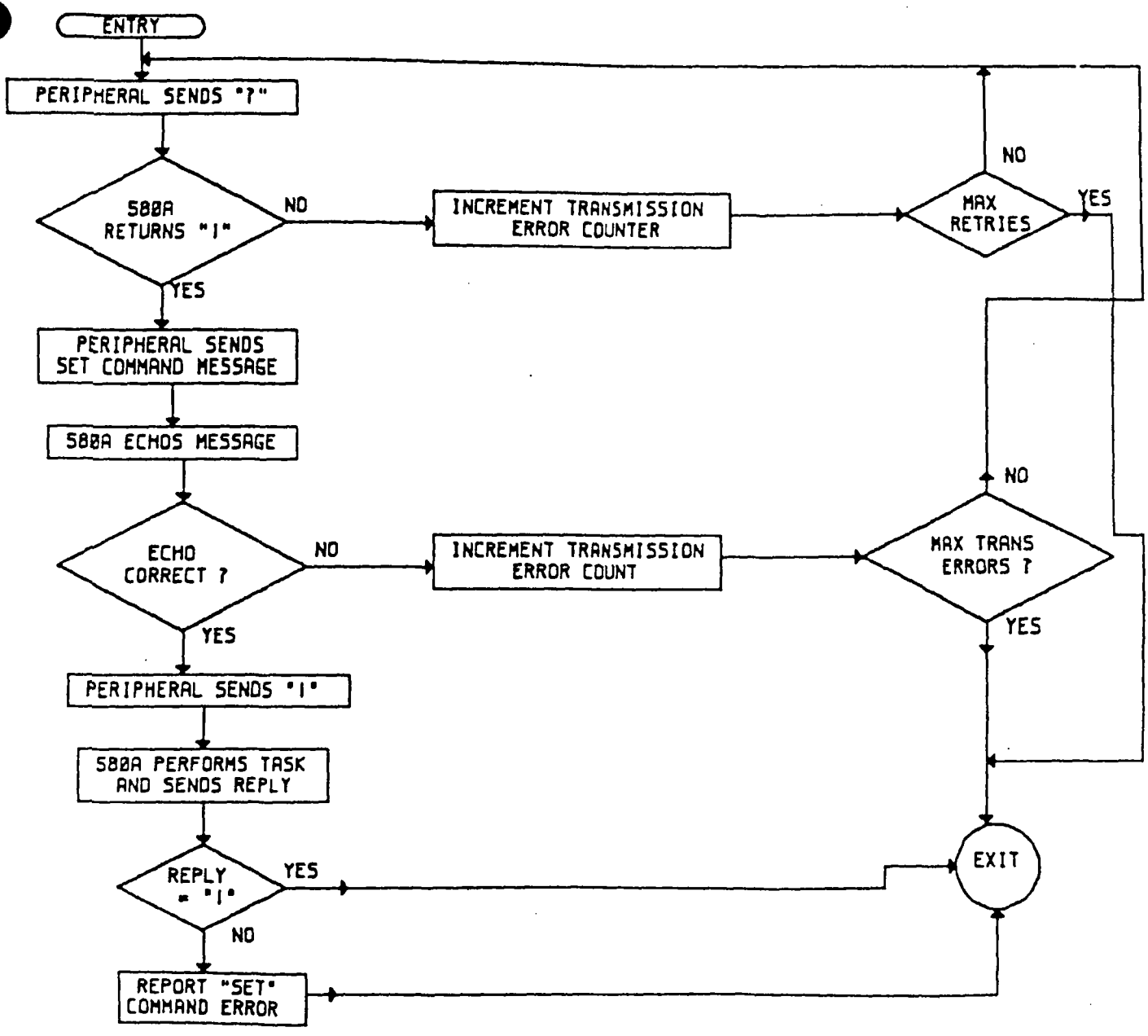


FIGURE 4

SOFTWARE HANDSHAKE
SET COMMANDS

MODEL 580B, 580S, 580A CALIBRATION PROCEDURE

Set up calibration assembly with zero air cylinder as described in figure 1.

Power up instrument using power plug.
Depress ON/OFF key to ignite lamp and initiate sample pump
Depress MODE/STORE key
Depress -/CRSR key in response to LOG THIS VALUE? prompt
Depress -/CRSR key to select Parameters Mode from the main menu
Depress -/CRSR key to advance thru CONC. METER "RESET "TO CHG.
Depress -/CRSR Key to advance thru FREE SPACE =____
Depress RESET key to initiate calibration sequence
Depress -/CRSR key to decline restoration of the backup calibration
Display will read ZERO GAS RESET WHEN READY
Connect teflon tubing to valve on zero air cylinder (figure 1)
(If immediate area is free of contamination, ambient air can be used instead of zero air.)
open valve to zero air and wait 5 seconds
Depress RESET key to zero the model 580
Display reads MODEL 580 ZEROING
The next prompt will say SPAN PPM = 100 "+" TO CONTINUE
Depress the =+ key prompt will read SPAN GAS RESET WHEN READY
Close valve and switch cylinders to 100PPM Isobutelyne
Connect teflon tubing as in figure 1
Open valve to introduce gas to model 580
Depress the RESET key
Prompt reads MODEL 580 CALIBRATING
When unit reads "RESET" TO CALIBRATE you are finished.
Depress MODE/STORE to return to normal operation.
You can test the calibration by introducing the isobutelyne to the model 580.

Contacts
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St. Louis, MO 63132
1-800-888-4642
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580B VER. 1.1
07/11/88 1508
INSTRUMENT # 580000
USER I.D. # 014569373
OPERATING MODE: CONC. METER, MAX HOLD

		LOC.	PPM	STATUS
07/11/88	1508	000000	0012	
07/11/88	1508	000001	0047	
07/11/88	1508	000002	0000	
07/11/88	1508	000003	0050	
07/11/88	1508	000004	0021	
07/11/88	1508	000005	0010	
07/11/88	1509	000006	0061	
07/11/88	1509	000007	0046	
07/11/88	1509	000008	0004	
07/11/88	1509	000009	0104	ALARM
07/11/88	1509	000010	0076	

07/11/88 1509
INSTRUMENT # 580000
USER I.D. # 014569373
OPERATING MODE: CONC. METER

		LOC.	PPM	STATUS
07/11/88	1509	000011	0000	
07/11/88	1509	000012	0064	
07/11/88	1509	000013	0052	
07/11/88	1509	000014	0001	
07/11/88	1509	000015	0007	
07/11/88	1509	000016	0101	ALARM

07/11/88 1510
INSTRUMENT # 580000
USER I.D. # 014569373
OPERATING MODE: CONC. METER, MAX HOLD

		LOC.	PPM	STATUS
07/11/88	1510	000017	0012	
07/11/88	1510	000018	0023	
07/11/88	1510	000019	0108	ALARM
07/11/88	1510	000020	0084	

FIGURE 5

DATA LOG OUTPUT

COMMON ORGANIC SOLVENTS AND GASES DATA SHEET

CHEMICAL MATERIALS	F.W.(G/MOLE)	DENSITY(G/ML)	BP(°C)*	I.P(EV)**	TWA(PPM)***
Acetaldehyde	44.05	0.788	21	10.21	200
Acetamide	59.07	1.159	221	9.77	
Acetic acid	60.05	1.049	116-117	10.37	10
Acetic anhydride	102.1	1.10	138-140	9.88	5
Acetone	58.1	0.79	56	9.69	1000
Acetonitrile	41.1.	0.79	82	12.22	40 cell
Acetophenone	120.15	1.033	202	9.27	
Acetyl bromide	122.96	1.52	75-77	10.55	
Acetyl chloride	78.50	1.104	52	11.02	
Acetylene	26.02	0.90		11.41	
Acrolein	56.06	0.8389	53	10.10	0.1
Acrylonitrile	53.06	0.8004	77	10.91	10
Allyl alcohol	58.1	0.85	96-98	9.67	2
Allyl chloride	76.5	0.94	44-46	9.9	1
Aniline	93.1	1.02	184	7.70	5
Anisole	108.13	0.9956	154	8.22	
Ammonia	17.03	gas		10.15	
Arsine	77.9	gas			0.05
Benzaldelyde	106.12	1.053	178-185	9.53	
Benzene	78.1	0.88	80	9.25	1
Benzonitrile	103.12	1.010	188	9.71	
Benzotriflouride	146.11	1.1886	102	9.68	
Benzyl chloride	126.6	1.10	177-181	9.14	1
Biophenyl	154.21	0.992	255		
Bromine	159.81	3.1023	58.8	10.55	0.1
Bromobenzene	157.02	1.495	156	8.98	
1-bromobutene	137.03	1.276	100-04	10.13	
2-bromobutene	137.03	1.255	91	9.98	
1-bromo-2-chlorethene	143.42	1.723	106-07	10.63	
Bromochloromethane	129.39	1.991	68	10.77	
1-bromo-2-flourobenzene	175.01	1.593	150	8.99	
Bromoform	252.8	2.9	150-01	10.47	0.5
1-bromo-2-methyl propane	137.03	1.260	90-92	10.09	
2-bromo-2-methyl propane	137.03	1.189	72-74	9.89	
1-bromopentane	151.05	1.218	130	10.10	
1-bromopropane	123.00	1.354	71	10.18	
2-bromopropene	123.00	1.310	59	10.08	
1-bromopropene	120.98	1.413	58-63	9.30	
3-bromopropene	120.98	1.398	70-71	9.70	
2-bromothiophene	163.04	1.684	149-151	8.63	
M-bromotoluene	171.04	1.4099	183.7	8.81	
O-bromotoluene	171.04	1.431	58-60	8.79	
P-bromotoluene	171.04	1.431	184	8.67	
1,3-butadiene	54.1	gas	9.07		1000
Butane	58.12	gas	10.63		
	90.19	.842	9.14		

* BP = Boiling Point Degrees Centigrade
** IP = Ionization Potential
*** TWA = Time Weighted Average = Parts Per Million

TABLE E-1

CHEMICAL MATERIALS	F.W.(G/MOLE)	DENSITY(G/ML)	BP(°C)*	I.P(EV)**	TWA(PPM)***
2-butanone	72.1	0.81	80	9.53	200
1-butene	56.10	0.6255		9.58	
N-butyl acetate	116.2	0.88	124-26	10.01	150
S-butyl acetate	116.2	0.88	111-12	9.91	150
N-butyl alcohol	74.1	0.81	117.7	10.04	100
N-butyl amine	73.1	0.73	78	8.71	5
S-butyl amine	73.1	0.73	63	8.70	5
T-butyl amine	73.1	0.73	46	8.64	5
N-butyl benzene	134.21	0.8604	183	8.69	
S-butyl benzene	134.21	0.8604	173-04	8.68	
T-butyl benzene	134.21	0.8669	169	8.68	
N-butyraldehyde	72.10	0.8016	75	9.86	
N-butyric acid	88.10	0.959	162	10.16	
N-butyronitrile	69.10	0.7954	115-17	11.67	
Camphor	152.2	0.99	204	8.76	2 mg/m
Carbon dioxide	44.01	gas		13.79	5000
Carbon Monoxide	28.01	gas		14.01	50
Carbon tetrachloride	153.8	1.59	77	11.47	10
Chlorine	70.90	gas		11.48	1 cell
Chlorobenzene	112.6	1.10	132	9.07	75
Chloroform	119.4	1.48	60.5-61.5	11.37	50 cell
1-chloro-2-methylpropane	92.57	.883	68-69	10.66	
2-chloro-2-methylpropane	101.64	.851	51-52	10.61	
1-chloropropane	78.54	.892	46-47	10.82	
2-chloropropane	78.54	.859	34-36	10.78	
3-chloropropane	76.53	.939	44-46	10.04	
2-chlorothiophene	118.59	1.286	127-29	8.68	
M-chlorotoluene	126.58	1.076	160-162	8.83	
O-chlorotoluene	126.58	1.0826	157-159	8.83	
P-chlorotoluene	126.58	1.0697	162	8.70	
M-cresol	108.1	1.034	203	8.52	5 cell
O-cresol	108.1	1.048	191	8.50	5 cell
P-cresol	108.1	1.034	202	8.38	5 cell
Crotonaldehyde	70.09	0.853	104	9.73	2
Cumene	120.2	0.86	152-154	8.75	50
Cyanogen	52.04	0.9537		13.80	
Cyclohexane	84.2	0.81	80.7-81	9.98	300
Cyclohexane	100.2	0.96	160-161	10.0	50
Cyclohexanone	98.1	0.95	155	9.14	50
Cyclohexene	82.1	0.81	83	8.95	300
Cyclo-octatetraene	104.15	0.925	142-43	7.99	
Cyclopentane	70.13	0.7460	50	10.53	
Cyclopentanone	84.11	1.4366	130-131	9.26	
Cyclopentene	68.12	0.744	44	9.01	
Cyclopropane	42.08	gas		9.91	
Diborane	27.68	gas		11.00	
Diazomethane	42.0	gas		9.0	0.2

* BP = Boiling Point Degrees Centigrade
** IP = Ionization Potential
*** TWA = Time Weighted Average = Parts Per Million

CHEMICAL MATERIALS	F.W.(G/MOLE)	DENSITY(G/ML)	BP(°C)*	I.P(EV)**	TWA(PPM)***
Dibromodiflouromethane	209.83	2.297	22-23	11.07	
1,2-dibromoethane	187.87	2.180	131-32	9.45	
1,3-dibromopropane	201.90	1.937	167	10.07	
Dibutylphthlate	278.3	1.04	340		5 mg/m
M-dichlorobenzene	147.01	1.288	172-73	9.12	50
O-dichlorobenzene	147.01	1.306	179-180	9.07	50
P-dichlorobenzene	147.01	1.241	173	8.94	75
1,1-dichlorethane	99.0	1.18	57	11.06	100
1,2-dichlorethane	98.96	1.256	83	11.12	
1,2-dichlorethylene	9 7.0	1.28	46-60	9.66	200
Dichloromethane	84.93	1.325	39.8-40	11.35	
1,2-dichloropropane	112.99	1.156	95-96	10.87	
1,3-dichloropropane	112.99	1.190	120-22	10.85	
2,3-dichloropropane	110.97	1.204	94	9.82	
N,N-diethyl acetamide	115.18	0.925	182-86	8.60	
Diethylamine	73.1	0.71	55	8.01	25
Diethyl ether	74.12	0.7134	34.6	9.53	
N,N-diethyl formamide	101.15	0.908	176-77	8.89	
Diethyl ketone	86.13	0.816	102	9.32	
diethyl sulfide	90.19	.837		8.43	
Diethyl sulfite	138.19	1.883	158-60	9.68	
Dihydropyran	84.12	0.922	86	8.34	
Diisopropylamine	101.2	0.72	84	7.73	5
1,1-dimethoxyethane	90.12	0.863	64	9.65	
N,N-dimethyl acetamide	87.12	0.937	164.5-66	8.81	10
Dimethyl amine	45.1	0.68		8.24	10
N,N-dimethyl aniline	122.2	0.96	193-94	7.13	
2,2-dimethyl butane	86.18	0.649	50	10.06	
2,3-dimethyl butane	86.18	0.662	50	10.02	
3,3-dimethyl butanone	100.16	0.801	106	9.17	
N,N-dimethyl formamide	73.09	0.9445	153	9.12	10
Dimethlyl sulfide	63.13	0.846	38	8.69	
P-dioxane	88.1	1.03	100-102	9.13	100
Dipropyl amine	101.19	0.738	105-110	7.84	
Durene	134.12	0.84	80-82	8.03	
Epichlorohydrin	92.5	1.18	115-117		5
Ethane	30.07	gas		11.65	
Ethanethiol	62.13	0.8315	35	9.29	
Ethyl acetate	88.1	0.90	76.5-77.5	10.11	400
Ethyl alcohol	46.1	0.80	78	10.48	1000
Ethyl amine	45.1	0.69	19-20	8.86	10
Ethyl benzene	106.2	0.87	136	8.76	100
Ethyl bromide	109.0	1.45	37-40	10.29	200
Ethyl butyl ketone	114.2	0.82	146-49	9.02	50
Ethyl chloride	64.52	0.9214		10.98	1000
Ethyl disulfide	122.25	0.993	153	8.27	
Ethylene dibromide	187.9	2.17	131-132	10.52	20
Ethylene dichloride	99.0	1.26	83	11.32	50

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Ethyl ether	74.1	0.73	34.6	9.59	400
Ethyl formate	74.1	0.92	52-54	10.61	100
Ethyl iodide	155.98	1.950	67-73	9.33	
Ethyl isothiocyanate	87.15	1.003	60	9.14	
Ethyl methyl sulfide	76.16	0.842	66-67	8.55	
Ethyl nitrate	75.07	0.90	112	11.22	
Ethyl propionate	102.13	0.891	99	10.00	
Ethyl thiocyanate	87.14	1.007		9.89	
Ethynylbenzene	102.13	0.9300	142-44	8.82	
Flourine	37.99	gas		15.70	0.1
Flourobenzene	96.10	1.024	85	9.20	
O-flourophenol	112.10	1.256	172-74	8.95	
M-flourotoluene	110.13	0.997	178	8.92	
O-flourotoluene	110.13	1.004	171-172	8.92	
P-flourotoluene	110.13	1.001	185	8.79	
Formaldehyde	30.03	1.083		10.87	3
Formamide	45.04	1.1334	210	10.25	
Formic acid	46.02	1.220	100-101	11.05	
2-furaldehyde	96.09	1.160	182	9.21	250
Furan	68.07	0.9371		8.89	
Heptane	100.2	0.68	98	10.08	500
2-heptanone	114.18	0.8068	149-50	9.33	
Hexane	86.2	0.66	68-69	10.18	500
1-hexane	84.16	0.673	64	9.46	
Hexone	100.2	0.80		9.53	100
Hydrogen	2.017	gas		15.43	
Hydrogen bromide	80.92	gas		11.62	3
Hydrogen chloride	36.47	gas		12.74	5 cell
Hydrogen cyanide	27.03	0.687		13.91	10
Hydrogen flouride	20.01	gas		15.77	3
Hydrogen iodide	127.93	gas		10.38	
Hydrogen selenide	80.98	gas		9.88	0.05
Hydrogen sulfide	34.08	gas		9.88	20 cell
Hydrogen telluride	129.63	gas		9.14	
Iodine	253.81	4.93		9.28	0.1 cell
Iodobenzene	204.02	1.8384	188	8.73	
1-iodobutene	184.02	1.617	130-31	9.21	
2-iodobutene	184.02	1.4991	119-120	9.09	
1-iodo-2-methylpropane	184.02	1.599	120-21	9.18	
				9.02	
1-iodopentane	198.05	1.517	154-55	9.19	
1-iodopropane	169.99	1.743	101-02	9.26	
2-iodopropane	169.99	1.703	88-90	9.17	
O-iodotoluene	218.04	1.713	211	8.62	
M-iodotoluene	218.04	1.698		8.61	
P-iodotoluene	218.04		211.5	8.50	
Isoamyl acetate	130.2	0.88	142	9.94	
Isoamyl alcohol	88.2	0.81	130.1	10.42	100

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***TWA = Time Weighted Average = Parts Per Million

CHEMICAL MATERIALS	F.W.(G/MOLE)	DENSITY(G/ML)	BP(°C)*	I.P(EV)**	TWA(PPM)***
Isobutyl amine	73.14	0.724	64-71	8.70	
Isobutyl formate	102.13	0.885	98.4	10.46	
Isobutyraldehyde	72.11	0.794	63	9.74	
Isobutyric acid	88.11	0.950	153-54	10.02	
Isoctane	114.2	0.70	98-99	17.9	400
Isopentane	114.23	0.692	30	10.32	
Isoprene	68.12	0.681	34	8.85	
Isopropyl acetate	102.1	0.87	85	9.99	250
Isopropyl alcohol	60.1	0.79		10.16	400
Isopropyl amine	59.1	0.69	33-34	8.72	5
Isopropyl benzene	120.2	0.86	152-54	8.75	50
Isopropyl ether	102.2	1.37	68-69	9.20	500
Isovaleraldehyde	86.13	0.785	90	9.71	
2,3-lutidine	107.15	0.945	162-63	8.85	
2,4-lutidine	107.15	0.927	159	8.85	
2,6-lutidine	107.15	0.9252	143-45	8.85	
Malaic anhydride	98.1	0.93	200	11.1	
Mesitylene	120.19	0.8637	162-64	8.40	
Mesityl oxide	98.14	0.8592	129	9.08	
Methane	16.04	gas		12.98	
Methanethiol	48.11	0.96		9.44	
N-methyl acetamide	73.10	0.957	204-05	8.90	
Methyl acetate	74.08	0.9279	57.5	10.27	
Methyl acrylate	86.1	0.96	80	9.9	10
Methyl amine	31.06	gas	48	8.97	
Methyl bromide	95.0	gas		10.53	
2-methyl-1-butane	70.16	0.650	31	9.12	
3-methyl-1-butane	70.14	0.627	20	9.51	
3-methyl-2-butane	70.14	0.643		8.67	
Methyl butyl ketone	100.6	0.83	127	9.34	100
Methyl butyrate	102.13	0.898	102-103	10.07	
Methyl chloride	50.5			11.28	100
Methyl cyclohexane	98.19	0.770	101	9.85	
Methyl disulfide	94.20	1.046	109	8.46	
Methyl ethyl ketone	72.10	0.805	80	9.53	
Methyl formate	60.1	1.34	34	10.815	100
2-methyl furan	82.10	0.827	63-66	8.39	
Methyl iodide	142.0	2.28	41-43	9.54	5
Methyl isobutyl ketone	100.2	0.80	117-18	9.30	100
Methyl isobutyrate	102.13	0.891	90	9.98	
Methyl isopropyl ketone	86.12	0.805	94-95	9.32	
Methyl isothiocyanate	73.12		37-39	9.25	
Methyl methacrylate	100.1	0.94	100	9.9	100
1-methyl napthalene	142.20	1.001	240-243	7.96	
2-methyl napthalene	142.20	1,000	241-242	7.96	
2-methyl pentane	86.18	0.653	62	10.12	
3-methyl pentane	86.18	0.664	64	10.08	
Methyl propionate	88.11	0.915	79	10.15	

* BP = Boiling Point Degrees Centigrade
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CHEMICAL MATERIALS	F.W.(G/MOLE)	DENSITY(G/ML)	BP(°C)*	I.P(EV)**	TWA(PPM)***
Methyl propyl ketone	86.13	0.809	100-01	9.39	
2-methyl styrene	165.4	1.068	131	10.07	
Monomethyl aniline	107.16	0.989			
Monomethyl hydrazine	46.1	0.87			
Morpholine	87.1	1.01	129	8.88	20
Naphthalene	93.7	1.16	217.7	8.12	10
Nitric oxide	162.2	1.01		9.25	
P-nitroaniline	138.1				1.0
Nitrobenzene	123.1	1.21	210-211	9.92	1.0
4-nitrobiphenyl	199.2				
P-nitrochlorobenzene	157.6	1.52		9.96	1.0 mg/m
Nitrogen dioxide	46.01	1.448		9.78	
Nitroethane	75.1	1.38	112	10.81	100
Nitromethane	61.0	1.13	100.8-101	11.08	100
1-nitropropane	89.1	0.99	131-32	10.88	25
2-nitropropane	89.1	0.98	120	10.71	25
N-nitrosodimethylamine	74.1	1.00	153	9.07	
Nitrotoluene	137.1	1.16	225-238	11.63	5
Oxygen	31.9988	gas		12.08	
Ozone	48.00	gas		12.08	
Pentaborane	63.17	0.61		10.40	
Pentane	72.15	0.62638	35	10.35	
2,4-pentanedione	70.13	0.6429	140.4	8.87	
1-pentene	70.13	0.6503	29.9-30.1	9.50	
Phenetol	122.16	0.967	169-70	8.13	
Phenol	94.1	1.07	182	8.50	5
Phenyl hydrazine	108.1	1.1	238-41	7.86	5
Phenyl isocyanate	119.12	1.0887	162-63	8.77	
Phenyl isothiocyanate	135.18	1.1288	221	8.52	
Phosgene	98.9	gas		11.77	0.4 mg/m
Phosphine	34.0	gas			0.3
Phosphorous pentachloride	208.2	1.6		10.7	1 mg/m
Phosphorous trichloride	137.3	1.57	76	10.5	
2-picoline	93.12	0.950	128-29	9.02	
3-picoline	93.12	0.9613	144	9.02	
4-picoline	93.12	0.9571	145	9.04	
Propane	44.09	gas		11.07	
1-propanethiol	76.16	0.841	67-68	9.20	
Propiolactone	72.06	1.146	162	9.70	
Propionic acid	74.08	0.99336	141	10.24	
Propionaldehyde	58.08	0.8071	46-50	9.98	
Propionitrile	55.08	0.7818	97	11.84	
N-propyl acetate	102.1	0.84	120	10.04	200
Propyl alcohol	60.10	0.804	97	10.20	
Propyl amine	59.11	0.719	48	8.78	
Propyl benzene	120.20	0.862	159	8.72	
Propylene	42.08	gas		8.73	
Propylene oxide	58.08	0.859	34	10.22	

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CHEMICAL MATERIALS	F.W.(G/MOLE)	DENSITY(G/ML)	BP(°C)*	I.P(EV)**	TWA(PPM)***
Propyl ether	102.17	0.7360	88-90	9.27	
Propyl formate	88.10	0.901		10.54	
Pyrene	202.3	gas		7.41	
Pyridine	79.1	0.98	115	9.32	5
Pyrrole	67.09	0.9691	131	8.20	
Styrene	104.14	9.9059	145-146	8.47	
Styrene oxide	120.2	1.054	194	9.04	
Tetrachloroethylene	165.9	1.63	121	9.32	100
Tetrahydrofuran	72.10	0.8892	67	9.54	
Tetrahydropyran	86.13	0.8814	88	9.26	
Thiophene	84.1	1.53	84	8.86	
Toluene	93.13	0.866	111	8.82	
O-toluidine	107.2	1.01	199-200	7.44	5
Trichloroethene	131.40	1.4649	87	9.45	
Triethylamine	101.19	1.069	88.18	7.50	
Trimethyl amine	59.11	0.636	3-4	7.82	
2,2,4-trimethyl pentane	114.23	0.692	98-99	9.86	
Tripropyl amine	143.27	0.753	155-58	7.23	
Valeraldehyde	86.13	0.8095	103	9.82	
Valeric acid	102.13	0.939	185	10.12	
Vinyl acetate	118	0.94	72-73	9.19	10
Vinyl bromide	106.96	1.517	16	9.80	
Vinyl chloride	62.5	gas		10.00	1
Water	18.016	1.00	100	12.59	
M-xylene	106.16	0.8684	138-39	8.56	100
O-xylene	106.16	0.8801	143-45	8.56	100
P-xylene	106.16	0.8614	138	8.45	100

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APPENDIX D

ATTACHMENT 7 SOIL VOLATILE SAMPLING PROCEDURES

ATTACHMENT 7

Soil Volatile Sampling Procedures

Procedure:

A. PREPARATION AND DECONTAMINATION OF SOIL SAMPLER (i.e. STAINLESS STEEL, BRASS, BRONZE, COPPER, etc.). An example of these samplers would be a shelby tube, split-barrel sampler with metal tube inserts or california sampler. These are only examples there maybe more types available. Also, the sample tube must be at least six inches long.

*1. Wash tubing or sampler with hot water and a nonfoaming detergent.
2. Rinse with hot water.
*3. Rinse with a solvent, such as hexane or acetone.
4. Rinse with very hot water to drive off solvent.
5. Rinse with deionized distilled water.
6. Air Dry
7. Store the sampler in aluminum foil until ready for use.
*Consult the laboratory for specific recommendations.

B. SOIL SAMPLING FOR VOLATILE ORGANICS

1. Using a properly decontaminated sampler (refer to preparation and decontamination instructions), push or drive the sampler to obtain a representative soil sample.

2. DO NOT remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.

3. Immediately add clay or other cohesive material (i.e. wetted bentonite) to the ends of the sample to eliminate head space, if necessary.

4. Cover both ends of the sampler with aluminum foil. If possible, cover the aluminum foil with a cap.

5. Put the sample in storage at 4 degrees centigrade immediately.

6. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24 hours of sampling.

NOTE:

Soil samples which will be tested for volatile organic constituents <u>cannot</u> be composited because of the volatilization which would result from any compositing method.

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APPENDIX E

FIELD SAMPLING FORM AND CHAIN-OF-CUSTODY FORM

RETENTION RESERVOIR REMEDIATION
FIELD LOG FORM FOR DELISTING SAMPLING

KEYSTONE STEEL & WIRE COMPANY
BARTONVILLE, ILLINOIS

Sample #: _____ **Date:** _____ **Time:** _____ **am pm**
Samplers and Affiliation: _____
Total depth (ft): _____

Sample Interval 0 - 3 ft

Recovery (ft): _____
Color: _____
Moisture: dry moist wet (circle one)
Consistance: firm slightly firm soft (circle one)
P.I.D. Reading (Vppm): _____ 0-1 ft _____ 1-2 ft _____ 2-3 ft
Observations: _____
_____
_____

Sample Interval 3 - 6 ft

Recovery (ft): _____
Color: _____
Moisture: dry moist wet (circle one)
Consistance: firm slightly firm soft (circle one)
P.I.D. Reading (Vppm): _____ 3-4 ft _____ 4-5 ft _____ 5-6 ft
Observations: _____
_____
_____

Sample Interval 6 - 9 ft

Recovery (ft): _____
Color: _____
Moisture: dry moist wet (circle one)
Consistance: firm slightly firm soft (cirlce one)
P.I.D. Reading (Vppm): _____ 6-7 ft _____ 7-8 ft _____ 8-9 ft
Observations: _____
_____
_____

VOC Analysis

Interval selected for VOC analysis (ft): _____
Recovery (ft): _____
Observations: _____
_____
_____

ERM-North Central, inc.

Sample Chain of Custody

W.O.No.:

Project Name:

Sampler:

ERM Sample Number	Date	Time	COMP	GRAB	Station Location	Number of Containers							Remarks

Sample Relinquished by:	Date	Time	Sample Received by:	Date	Time	Reason for Transfer

COPIES: White & Yellow copies accompany sample shipment to laboratory. Yellow copy retained by laboratory. White copy to be returned to ERM for files. Pink copy retained by sampler. Gold copy extra copy as needed

-521-M-6

cc Peer & USEPA

JRA
MC

ERM-North Central, Inc.

ERM

1630 Heritage Landing Drive
Suite 100
St. Charles, MO 63303
314-928-0300
314-928-2050 Fax

A Member of the Environmental
Resources Management Group

March 17, 1993

RECEIVED

MAR 1 8 1993

IEPA - BOL
PERMIT SECTION

Mr. Lawrence W. Eastep, P.E.
Manager - Permits Section
Division of Land Pollution Control
Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, IL 62794

RE: Analytical Specification for Delisting
Sampling in Retention Reservoir at
Keystone Steel & Wire Company, Bartonville, Illinois
ERM Project 92135

Dear Mr. Eastep:

Enclosed are three (3) copies of the analytical specification for laboratory services during delisting sampling within the Retention Reservoir at Keystone Steel & Wire Company (Keystone) in Bartonville, Illinois. The specification package was issued on March 16, 1993 to four laboratories with the capability of using ICP-MS methodology for metals analysis in order to achieve sufficiently low method detection limits. The laboratories involved are as follows:

IEA Laboratories
Cary, North Carolina

West Coast Analytical
Santa Fe Springs, California

Enseco-RMA
Houston, Texas

Oxford Laboratories
Wilmington, North Carolina

Competitive bids are due in Keystone's offices on March 26, and a laboratory selection will be made by April 2, 1993.

ERM

Removal of excess water accumulating from precipitation and from water released from treated sediment materials due to consolidation is ongoing. This activity is essential to allow for unincumbered delisting sampling due to free water at the surface and to increase the bearing capacity of the treated material to improve access. It is anticipated that delisting sampling could potentially begin during the week of April 5, 1993. However, if unfavorable weather conditions prevail, sampling activities will have to be postponed.

The analytical specifications are provided to the Illinois Environmental Protection Agency (IEPA) for purposes of information transfer and to provide the IEPA an opportunity to comment on the intended coarse of action by Keystone.

Please call me at (314) 928-0300 if you have any questions concerning the content of the analytical specifications, have any specific problem with the intended scope of work or laboratories being used, or need additional information.

Sincerely,

ERM-NORTH CENTRAL, INC.

Elton D. Breland, P.E.
Senior Project Manager

EDB/jcv

Enclosures

XC: USEPA V
Peoria Reg
ORIG TO FILE

WW Engineering & Science
A Summit Company

January 19, 1993

1430050001- Peoria Co
Keystone Steel & Wire
ILD000714881
Subpart F

CERTIFIED MAIL: P374 153 626

Mr. Kenneth Lovett
Illinois Environmental Protection Agency
Permit Section
Division of Land Pollution Control
2200 Churchill Road
P.O. Box 19276
Springfield, IL 62794-9276

Dear Mr. Lovett:

RE: Keystone Steel & Wire Company, HWMUs Quarterly Ground Water Monitoring Technical Memorandum for November, 1992.

Enclosed is one copy of the above referenced report. Three additional copies were also sent Certified Mail to Mr. Lawrence Eastep.

Four of the figures in the August, 1992 quarterly report (submitted December, 1992) contained errors that should be noted in your file copies. The errors have been corrected in the updated figures contained in the current report. The errors in the August, 1992 quarterly report are:

- Figure 57: This figure should have contained a time-series plot for cadmium for well W-4D. The plot for lead was incorrectly shown on the figure. Refer to Figure 56 in the November, 1992 quarterly report for an updated plot of cadmium for well W-4D.

- Figure 63: This figure shows the time-series plot for chromium for well W-4D. However, the word cadmium is incorrectly shown on the figure and should be replaced with the word chromium. Refer to Figure 62 in the November, 1992 quarterly report for an updated plot of chromium for well W-4D.

BL/mke/REA/b:/KEYSTONE/07029.02/1/KL011993.doc

5010 Stone Mill Road Bloomington, IN 47408 812/336-0972 Fax 812/336-3991
Bloomington, IN Chattanooga, TN Columbus, OH Detroit, MI Grand Rapids, MI Indianapolis, IN Milwaukee, WI Minneapolis, MN

- Figure 66: This figure incorrectly shows the Class I limit for lead as 5.0 ug/L. The Class I limit should be changed to 7.5 ug/L.

- Figure 67: This figure incorrectly shows the Class I limit for lead as 5.0 ug/L. The Class I limit should be changed to 7.5 ug/L. Also, the lead value of 5.0 ug/L shown for the 08/24/88 sampling event should be reported as <5.0 ug/L. Refer to Figure 66 in the November, 1992 quarterly report for an updated plot of lead for well W-2D.

Please contact me if you have any questions or need additional information.

Sincerely,

Robert E. Aten

Robert E. Aten
Vice President

Enclosure

cc: L. Eastep
D. Bennington
R. End
A. Running

C-521-M-6

RECEIVED
MAR 18 1993
IEPA - BOL
PERMIT SECTION

CONTRACT DOCUMENTS

FOR

ANALYTICAL SERVICES

RCRA DELISTING STUDY

FOR

KEYSTONE STEEL & WIRE

Division of Keystone Consolidated Industries, Inc.

Peoria, Illinois

PROJECT ENGINEERS: Elton Breland - ERM-North Central, Inc.
Dale Bennington-Keystone Steel & Wire
David Semelroth - Keystone Steel & Wire

DATE OF ISSUE: March 16, 1993

QUOTATION REF. #: 31593-A

TABLE OF CONTENTS

		Page
LIST OF TABLES		
1.0	INVITATION TO BID	1-1
2.0	INSTRUCTIONS TO BIDDERS	2-1
3.0	GENERAL SCOPE OF WORK	3-1
4.0	GENERAL CONDITIONS OF THE CONTRACT	4-1
5.0	ATTACHMENTS AND FORMS	5-1

LIST OF TABLES

Number	Description
1	Retention Reservoir EP Toxicity and TCLP Results for Sludge and Natural Soil Samples
2	Retention Reservoir Organic Concentrations in Sludge and Natural Soil Samples
3	Analytical Parameters, Sample Load, and Method References
4	Characteristics, Analytes, and Required Detection/Reporting Limits
5	Holding Time Requirements

SECTION 1.0

INVITATION TO BID

Your firm has been selected to provide a proposal for analytical services to Keystone Steel and Wire, Inc. (Keystone) for samples generated in support of a Resource Conservation and Recovery Act (RCRA) delisting petition for a unit located on Keystone's property in Bartonville, Illinois. This work will be performed under the direction of Keystone's representative, Environmental Resources Management-North Central, Inc. (ERM-North Central).

The materials which will be sampled by ERM-North Central will consist of inorganic sediment treated with a lime/cement reagent blend and undisturbed soils representing background conditions in the area. Treated materials should have expected alkalinities ranging between 115,000 and 215,000 mg/Kg, as $CaCO_3$, relatively high total metals, and low soluble metals.

Sediment and underlying soil samples have been taken from the RCRA unit in question and analyzed prior to treatment. A summary of the resulting inorganic and organic analytical data has been included as Tables 1 and 2, respectively, in order to inform the bidder of the analytes and concentrations that can be expected in the samples received. Toxicity Characteristics Leaching Procedure (TCLP) levels for metals should be at or near the method detection limits in samples taken from the treated materials due to the effects of lime treatment.

The proposal shall be submitted on the basis of a contract sum comprised of a firm per analysis price as described in Subsection 4.9 of the specifications package. Modifications to the contract sum may be made during the course of the project in order to adjust for the total quantity of analyses made.

Bidders are required to submit proposals for this work to Keystone at the following address:

Keystone Steel & Wire Company
7000 S.W. Adams Street
Peoria, Illinois 61641
Attention: Mr. Wilber Bahr

Proposals are due in Keystone's offices by 2:00 p.m. on Friday, March 26, 1993. It is anticipated that the contract will be awarded by Friday, April 2, 1993 and the first samples generated during the week of April 5, 1993 pending favorable weather conditions.

Should Bidders have questions concerning the intent or content of the specifications, please contact Mr. Elton Breland from ERM-North Central at (314) 928-0300.

This request for a proposal does not obligate Keystone (the Owner), the owner's representative, or the representative's subcontractors to pay any costs for the preparation and submission of a proposal. Keystone reserves the right to accept or reject all proposals if that is determined to be in the best interest of Keystone. Award may be made without discussion; hence, the requested proposal should be submitted initially on the most favorable terms.

SECTION 2.0

INSTRUCTIONS FOR BIDDERS

2.1 RECEIPT OF BIDS

Keystone Steel & Wire Company (owner) will accept six copies of the sealed bids at their offices located at 7000 S.W. Adams St., Peoria, Illinois, 61641, Attention: Mr. Wilber Bahr. The proposals shall address the complete performance of the work as defined in the "General Scope of Work" Section 3. Proposals shall be submitted on the bidder's letterhead on or before 2:00 p.m. Friday, March 26, 1993. Facsimile (FAX) transmitted bids will not be accepted.

2.2 PREPARATION OF BIDS

2.2.1 Bidders shall present bids with Total Contract Sums comprised of a firm per analysis price. The quantity of samples actually analyzed will be determined during the course of the project and appropriate additions/deductions made to the Total Contract Sum based on the firm per analysis price. The format of the bids shall be in accordance with that requested in Attachment F.

2.2.2 The work consists of furnishing labor, materials, and equipment and performing all work in strict accordance with these specifications, unless specifically excepted. The work will be executed in the best and most professional manner by technically experienced, qualified, careful, and efficient staff. Each Bidder must complete a Bid Schedule. The enclosed Bid Schedule (Attachment B) is based on the technical specifications provided herein. Any modification to the Bid Schedule by the bidder is to be approved in writing by Environmental Resources Management-North Central, Inc. (ERM-North Central) before submission.

2.2.3 The work involves laboratory analysis of samples of soil, sludge/waste, water, and Toxicity Characteristics Leaching Procedure (TCLP) extracts. The sample collection and analyses of samples are being performed as part of a Resource Conservation and Recovery Act (RCRA) delisting study in accordance with an agreement between ERM-North Central's client and the State of Illinois. All work must be performed in full accordance with the most current U.S. Environmental Protection Agency (USEPA) SW-846 methods (except Method 3060) and USEPA methodologies, including all applicable acceptance criteria and corrective actions (e.g., chain-of-custody procedures, method blanks, surrogate recoveries, calibrations, etc.). Deliverables must conform to the data package deliverables specified in Section 3.0 of these specifications.

2.2.4 As part of the laboratory selection process, ERM-North Central may wish to perform an audit of the Bidder's facilities and procedures. Each Bidder must agree to such an audit by ERM-North Central or its representatives.

2.2.5 For all samples, the laboratory will provide the appropriate sample containers, required preservatives, blue ice, sample container labels and seals, shipping containers, shipping container seals and labels and chain-of-custody forms. The costs of shipping materials to and from the site must be included in the unit costs. The laboratory will prepare all trip blanks and will provide analyte-free water for field blanks. Sample containers must be "virgin bottleware," equivalent to I-Chem™ Series 200 or better. Recycled bottleware is not acceptable. Preservatives must be equivalent for Ultrex™ grade. All aqueous volatile organic compound (VOC) trip blank samples must be preserved with hydrochloric acid (HCl) by the bidder. Field blank samples will be preserved on site by ERM-North Central.

2.2.6 The laboratory will prepare all matrix spikes/matrix spike duplicates (MS/MSDs) and laboratory duplicates required for analyses. The laboratory quality control (QC) samples are not billable units, and the cost of these QC samples must be included in the unit costs. In addition, one sample analysis, regardless of the mandatory requirements of reextraction/reanalysis, dilutions, etc., will be considered one billable unit.

2.2.7 It is a requirement of the contract that no work will be performed by subcontractors. All samples must be analyzed by the laboratory submitting this bid proposal.

2.2.8 All excess solids from soil and sludge/waste samples will be returned to the site for disposal. The laboratory will ship solids in their original sample bottles back to the site six months after the completion of the data package for that sample. Shipment to the site will be by United Parcel Service, second day delivery, and the costs for this packaging and shipment will be included in the Bid proposal. Shipping containers must comply with all regulations, but sample preservation need not be a consideration. The lowest cost shipping container that still meets shipping regulations should be used.

2.2.9 Throughout the project, the Bidder's work will be rigorously scrutinized by ERM-North Central and/or its consultant, Environmental Standards, Inc. of Valley Forge, Pennsylvania. The laboratory will be responsible for timely responses (within two business days) to consultant inquires about the work for the purposes of such reviews.

2.2.10 In the event that resampling or reanalysis is required because of laboratory error or omission in the specified analytical procedures, testing requirements, or sample holding times, the laboratory will be required to reimburse ERM-North Central for the cost of resampling and perform the reanalysis at no charge.

2.2.11 The Bidder must designate a Technical Project Manager and a secondary designate. This individual (or designate) will be responsible for initiating frequent communications with ERM-North Central during the project activities that involve sampling and analysis. Any problems observed during sample receipt (e.g., broken bottles, errors in paperwork, inappropriate pH and/or temperature, etc.) must be communicated to ERM-North Central verbally and via facsimile (FAX) transmission within 24 hours (preferably three hours) after discovery. Any phone calls initiated by ERM-North Central during normal working hours to the Bidder must be returned within two hours if the Technical Project Manager (or designate) is not available at the initiation of the phone call.

2.2.12 The Bidder must identify all personnel expected to participate in the project. If personnel changes are made during any part of the project, the laboratory must inform ERM-North Central in writing.

2.3 WITHDRAWAL OF BIDS

No bid shall be withdrawn for a period of thirty (30) days after the bids are due without consent of the Owner.

2.4 REJECTION OF BIDS

The Owner reserves the right to reject any or all bids.

2.5 ADDENDA

Should a bidder find discrepancies in, or omissions from this Specification, or should he be in doubt as to their meaning, he shall notify the Owner's Representative who will issue addenda to the Specification. Requests for interpretations for this Specification shall be made in writing to the Owner's Representative not less than three (3) working days before the date set for receiving

bids. Any addenda issued to bidders prior to the date on which bids may be submitted shall be a part of the Contract Documents.

2.6 APPROVAL OF SUBCONTRACTORS

The bidder shall use no subcontractor to perform any part of this work. All analytical work outlined in the Scope of Work must be performed by the bidder awarded this contract.

2.7 OVERTIME

No overtime will be paid by the Owner to complete the project within the scheduled time frame.

2.8 INSURANCE

Given that the bidder will not be required to perform work on Keystone's property, only General Liability (Contractual Liability) Insurance for a minimum of $1,000,000 for each incident and $1,000,000 minimum in aggregate will apply. There are no requirements for Worker's Compensation and Occupational Disease Insurance, Comprehensive Automobile Public Liability Insurance, Contractor's Pollution Liability Insurance, or Contractor's Property Damage Liability Insurance. These insurance requirements supersede the requirements summarized in Article 8 of the "General Conditions of the Contract for Construction" included in Section 4.0 of this document.

2.9 PROPOSAL

Each bidder shall be required to submit a proposal, following the Table of Contents format provided in Attachment F, on his own proposal form and a Bid Summary on the Bid Summary Sheet (Attachment B) provided.

2.10 PAYMENTS AND COMPLETION

The basis by which the successful Contractor will be paid for the work will be as follows:

2.10.1 On or before the 10th day of each calendar month the successful bidder shall furnish to the Owner a written and itemized application for payment for such services and the Owner shall make payments in accordance with Section 4, Paragraph 6.3, of "General Conditions of the Contract for Construction."

2.10.2 Payment for analytical services shall be handled on the basis of a firm per analysis price for the chemical analysis of all samples in accordance with the procedures described in the "General Scope of Work" section of this proposal.

The performance of the laboratory will be evaluated by the Owner's Representative and will be based on data validation by Environmental Standards, Inc. Upon acceptance of the QA/QC analytical results, the Owner will make a progress payment equivalent to 90% of the total invoiced amount within 45 days of approval by Owner's Representative.

Subsequent to completion of delisting analytical testing and confirmation of test results by the Owner's Representative, the Owner will make the final progress payment equivalent to 10% of the total invoiced amount. This approval procedure will require a sixty (60) day minimum period after receipt of all results by the Owner's representative to establish Owner payment.

SECTION 3.0

GENERAL SCOPE OF WORK

3.0 GENERAL SCOPE OF WORK

3.1 Number of Sample Matrices

This Bid is to provide laboratory support for a RCRA delisting study. The contract will involve laboratory support for approximately 816 analyses. These analyses do not include trip blanks, field blanks, and laboratory QC samples. The actual number of field samples may increase or decrease as the project progresses. A breakdown of the estimated number of analysis of investigative samples, double-blind duplicates, and double-blind performance evaluation samples generated in the field is presented in Table 3.

3.2 Analytical Requirements

The samples will be submitted to the Bidder for laboratory analysis by using the methods specified in Table 3.

3.2.1 The analyte lists and detection/reporting limits that will be required for this project are specified on Table 4.

3.2.2 The Bidder's detection limits and reporting limits must be included in the Bidder's proposal, and the Bidder must highlight any limits that are greater than the required limits specified on Table 4. If for each such samples these limits cannot be met during the analysis, a justifiable explanation (e.g., dilution factor, interference, etc.) shall

be provided with the data package. Excessive, unnecessary dilutions on any samples for this project will not be acceptable. Specifically, all volatile organic analytes (VOAs) for solid samples must be analyzed by direct-heated purge and trap, unless screening data can unequivocally justify the use of the medium-level extraction. If undiluted analyses are performed and indicate the necessity for dilutions, all data for the undiluted as well as the diluted analysis will be required for submission.

3.2.3 The required holding times are specified on Table 5.

Holding times begin at the time the sample is taken. The samples should be in good condition and will be received by the Bidder within one day of sampling, unless different arrangements are made in advance with the Bidder's authorized representative. For shipments to be received by the Bidder after normal business hours (Monday through Friday), prior arrangements should be made so that Bidder personnel are available to receive the samples. For samples that are not received by the Bidder as described above, the Bidder should make every reasonable effort to meet the specified holding times, but will be held harmless for costs incurred for their resampling.

The holding times listed in Table 5 must be adhered to, subject to the limitations specified above. Although subsequent analyses or extractions will not apply to the definition of meeting the required holding time, the Bidder must make every attempt to meet the primary holding times, but will be held harmless for costs incurred for resampling. Failure to adhere to the stated holding times may result in resampling. The costs of resampling will be borne by the Bidder.

3.2.4 The integrity of the samples delivered to the Bidder should be maintained through proper handling/storage procedures and preparation/analysis within the holding times. Documentation of the performance of these procedures and the chain-of-custody must be maintained by the Bidder.

3.2.5 The Bidder must specify the types of QC samples, frequency, acceptance criteria, and corrective action for each type of analysis. The Bidder is required to prepare storage blanks for each batch of samples received for VOC analysis. In addition, each batch of TCLP extractions must include a preparation blank that also has undergone TCLP extraction. The results and raw data for the VOC storage blank and the TCLP extraction blank must be included with each individual data package. These requirements should be considered inclusive in the unit costs.

3.2.6 Laboratory sample custody begins when the samples arrives at the laboratory. Details regarding laboratory sample custody should be included in the Bidder's proposal. At a minimum, the Laboratory Sample Custodian will be required to note any damaged sample containers or discrepancies between the sample label and information on the field chain-of-custody record when logging in the samples. The Bidder will also be required to check and record the pH for the aqueous samples that have undergone acid/base preservation with the exception of VOAs. In addition, for solid and aqueous samples, the temperature of a Bidder-supplied designated bottle of ultra-pure water (clearly labeled "For Temperature") will be obtained, and the temperature will be recorded to verify (by analogy) that project samples were received at <6° C. Temperatures above 6° C must be communicated to ERM-North Central within 24 hours (preferably within three hours) of laboratory sample log-in so

that proper corrective action can be taken. The chain-of-custody form will be signed by both the relinquishing and receiving parties each time the sample changes hands and the reason for the transfer must be indicated on the form.

An internal chain-of-custody form must be used by the Bidder to document sample possession from the Laboratory Sample Custodian to the Analyst and to the final disposition. All chain-of-custody information must be supplied with the data packages for inclusion in the document control file.

3.2.7 All QC procedures employed by the Bidder will be in full accordance with those described in the required analytical methods (i.e., with previous holding time exceptions notwithstanding). General QC protocols for analyses will be required as follows.

Method blanks must be performed for and with each batch of samples prepared together. The goal for all method blank analyses is no measurable contamination. However, because this is not always possible, contamination concentrations up to the method quantitation limit will be acceptable. Any result that indicates that the applicable method blank is contaminated above the method quantitation limit may not be acceptable and may result in resampling.

MS/MDSs must be prepared and analyzed for all organics analyses with the exception of the TCLP analyses, which will require MSs. The laboratory must adhere to the current QC requirements promulgated in the final rule for TCLP (published November 24, 1992, 40 CFR Part 261). For non-TCLP metals analyses (including chromium in solid samples), a laboratory duplicate and one

predigestion matrix spike will be prepared and analyzed at a minimum frequency of one set per 20 samples of the same matrix. ERM-North Central field personnel shall indicate which sample(s) are to undergo spiking. For metals analysis, the method of standard additions will be performed in accordance with SW-846 protocols because this project is a delisting study.

For those analyses that require surrogate spikes, the recoveries must be reported along with the applicable control limits, and any recoveries outside of the control limits must be confirmed. All procedures specified in the method must be performed. Confirmation must consist of repreparation and/or reanalysis of the sample as necessary to determine whether the problem was caused by the sample matrix. In all instances, both sets of data are required deliverables unless the repreparations/reanalysis is performed within the primary holding times, in which case only the data for the most QC compliant analysis is required.

3.2.8 Complete data packages, including all raw data, should be submitted for each of the analyses. Sample results must not be blank corrected, and all solids must be reported on a dry-weight basis. Case narratives must be provided that document any nonstandard occurrences. Any and all problems with the analyses should be relayed to the Project Manager and the Project Quality Assurance Manager. The Managers will then be responsible for notifying the appropriate personnel and implementing project-level corrective action, such as resampling. The data packages for all analyses should be provided by using Contract Laboratory Program "(CLP)-like" deliverables.

The specific data package deliverables consist of the following:

<u>TCLP Extraction</u> - Copies of all internal extraction logs, including weights, volumes, pH information, dates, times, and other pertinent information. It is imperative that the extraction log indicates: (1) the pH of the TCLP extracts (for metals and cyanide) after the addition of HNO_3, and NaOH, respectively, but before digestion and distillation, respectively, and (2) the date and time that the final leachate was generated.

<u>TCLP Volatiles</u> - CLP Statement of Work (SOW) 2/88 deliverables (modified Form III, VI, and VII).

<u>TCLP Semivolatiles</u> - CLP SOW 2/88 deliverables (modified Form III, VI, and VII).

<u>TCLP Metals (Except Mercury)</u> - CLP SOW 10/91 deliverables (low concentration water).

<u>TCLP Cyanide</u> - CLP SOW 2/88 deliverables (as appropriate).

<u>Hexavalent Chromium</u> - Formal analytical result forms, case narratives, chains-of-custody (internal and external), and QC summary forms; copies of the analyst's notebook pages showing the date/time of each analysis, raw data for absorbances and concentrations of initial calibrations (an initial calibration curve must be performed with each analytical batch), continuing calibrations, samples, field and laboratory QC samples, sample volumes, pH values, and a summary of all calibration and QC sample results. In addition, the order of the analysis on these notebook pages must be the exact order in which the analysis was performed.

TCLP Mercury - CLP SOW 2/88 deliverables (as appropriate).

Ignitability - Formal analytical result forms, case narratives, chains-of-custody (internal and external), and QC summary forms; and copies of the analyst's notebook pages showing the date/time of each analysis, flashpoint temperature check, duplicate results, and summarized QC information.

Corrosivity - Formal analytical result forms, case narratives, chains-of-custody (internal and external), and QC summary forms; and copies of the analyst's notebook pages showing the date/time of each analysis, raw data for calibration of the pH meter, continuing calibration checks, duplicate results and summarized QC information. In addition, the order of the analysis on these notebook pages must be the exact order in which the analysis was performed.

Reactivity - Formal analytical result forms, case narratives, chains-of-custody (internal and external), and QC summary forms; and copies of the analyst's notebook pages showing the date/time of each analysis, raw data for initial calibrations, continuing calibrations, sample weights, volumes, raw sample data, field and laboratory QC sample data, and a summary of all calibration and QC sample results. In addition, the order of the analysis on these notebook pages must be the exact order in which the analysis was performed.

Volatile Organics (Aqueous/Solids) - CLP SOW 2/88 deliverables.

Semivolatile Organics (Aqueous/Solids) - CLP SOW 2/88 deliverables.

Metals [Except Mercury (Aqueous/Solids)] - CLP SOW 10/91 deliverables.

Mercury (Aqueous/Solids) - CLP SOW 2/88 deliverables (as appropriate).

Cyanide (Aqueous/Solids) - CLP SOW 2/88 deliverables (as appropriate).

Hexavalent Chromium (Aqueous/Solids) - Formal analytical result forms, case narratives, chains-of-custody (internal and external), and QC summary forms; and copies of the analyst's notebook pages showing the date/time of each analysis, raw data for absorbances and concentrations of initial calibrations (an initial calibration curve must be performed with each analytical batch), continuing calibrations, samples, field and laboratory QC samples, sample volumes, pH values, and a summary of all calibration and QC sample results. A digestion log for solid samples showing the date/time of digestion will be required. In addition, the order of the analysis on these notebook pages must be the exact order in which the analysis was performed.

Oil and Grease - Formal analytical result forms, case narratives, chains-of-custody (internal and external), and QC summary forms; and copies of the analyst's notebook pages showing the date/time of each analysis, raw data for initial calibrations, continuing calibrations, sample weights, volumes, raw sample data, field and laboratory QC sample data, and a summary of all calibration and QC sample results. In addition, the order of the analysis on these notebook pages must be the exact order in which the analysis was performed.

3.3 Scheduling and Reporting

3.3.1 A preliminary report will be required that includes the analytical results of samples and blanks, internal and external chains-of-custody forms, dates of collection, and dates of analysis. For the purposes of the Bid proposal, the Bidder should assume that the preliminary report will be due within 20 business days of sample receipt. Following this report, two complete bound data packages must be submitted to ERM-North Central and one complete, unbound data package must be submitted to ERM-North Central's consultant, Environmental Standards, Inc. in Pennsylvania, within 30 business days after the last sample in a sample delivery group (SDG) is received by the laboratory. An SDG is considered to include all samples received in a seven-day period to a maximum of 20 investigative samples. Data packages must be provided for each SDG, and must not contain fewer than 20 samples unless fewer than 20 samples were received within the applicable seven-day period. Complete data packages must conform to data package deliverables specified in Section 3.2.8.

3.3.2 In addition to the data packages, a hard copy and disk of all of the analytical results must be presented on spreadsheets (Lotus 1-2-3 and/or Borland Quattro Pro). The Bidder must provide an example of the proposed spreadsheet format with their proposal.

3.3.3 The collection of samples covered in this specification is expected to begin during the first week in April 1993 and conclude in two to three weeks.

3.3.4 All data, instrument output, and reports generated by the laboratory must be stored for six years after the completion of the project, or at ERM-North Central's request, must be turned over at the completion of the contract.

3.4 Required Bid Documents

3.4.1 As part of the Bid package, the Bidder is required to submit the information listed in this section.

3.4.2 A presentation of the Bidder's qualifications to perform the work, include:

- An organizational chart that identifies all participants in the project by name. A brief description of each participant's role and responsibilities, specifically with reference to Section 2.2.11.

- Resumes of <u>all</u> environmental laboratory staff.

- A summary of corporate experience, including work performed that has been reviewed and approved by the State of Illinois.

- Current licenses and certifications.

- The most recent performance evaluation scores, preferably for drinking water and waste water analyses, from the state in which the Bidder resides.

3.4.3 A description of facilities and equipment, including laboratory location and layout; type, number, and age of equipment; and the equipment maintenance program.

3.4.4 A listing of the Bidder's reporting limits for all required analytes.

3.4.5 A detailed description of the laboratory's quality assurance/quality control program and any other pertinent information that demonstrates the quality of the Bidder's work.

3.4.6 The Bidder must specify types of QC samples, frequency, acceptance criteria, and corrective action for each type of analysis.

3.4.7 An example data spreadsheet in Lotus 1-2-3 and/or Borland Quattro Pro (Section 3.3.2).

3.4.8 A description of general laboratory services, including scheduling of analytical services, courier services, technical support, computerized data management systems, record retention, sample storage, operating hours, sample receipt hours and security.

3.4.9 A completed Bid schedule indicating the cost of each analysis and the total cost for the project. Unit costs for samples must include all laboratory QC samples. Billing for sample reanalysis reextractions, reinjections, dilutions, etc. because of initially failing QC will not be acceptable. Unit costs must also include provision of all necessary bottleware, paperwork, blueice, coolers, and shipping costs to and from the site.

3.4.10 A statement that describes the limits of insurance currently held by the Bidder. The insurance must include liability coverage for sample loss or destruction during shipping.

3.4.11 Any exceptions to the specifications provided must be explicitly stated. Similarly, an authorizing signature stating that the laboratory understands the project requirements should be included in the Bidder's cover letter.

3.5 Payment Schedule

The basis by which the successful Contractor will be paid is detailed in Item 2.10, Section 1 of this document, entitled "Payments and Completion".

ILLINOIS POLLUTION CONTROL BOARD
May 23, 1991

RECEIVED

IN THE MATTER OF:	)	
	)	
PETITION OF KEYSTONE STEEL AND	)	AS 91-1
WIRE COMPANY FOR HAZARDOUS	)	(Adjusted Standard)
WASTE DELISTING	)	
	)	

ORDER OF THE BOARD (by J. Anderson):

This matter comes before the Board on the May 2, 1991 "motion for 150-day extension to file a recommendation" filed by the Illinois Environmental Protection Agency (Agency). In support of its motion the Agency states that until the new delisting regulations of R90-17 were finalized and effective, "a comprehensive review of the [adjusted standard] petition could not be initiated due to the lack of detailed standards for review and limited resources" at the Agency. Also, the Agency states that the USEPA's Delisting Section's initial technical review of a delisting petition takes "2-5 weeks to perform at approximately 200 man hours on the average." In addition, USEPA contracts with private consultants to perform that initial technical review. Finally, the Agency notes that there is no statutory time frame for decision in adjusted standard petitions and that no environmental harm will result in granting the extension because Keystone Steel and Wire Company (Keystone) is in compliance with all applicable laws.

Keystone filed its "response to motion for extension" on May 9, 1991. Keystone's response notes that the Agency has had the delisting petition since January 22, 1991 and that the Board has already granted the Agency one continuance of these proceedings. Since this matter was originally filed with USEPA in August of 1990, and because significant daily costs are accruing while the matter is pending, Keystone has requested, in this and prior pleadings, that this matter proceed expeditiously. In light of these facts, Keystone is concerned with the Agency's lack of progress and the length of the requested extension. Keystone has asked the Board to establish a reasonable schedule for submission of the Agency's recommendation.

This matter has been closely tied with the proceeding in R90-17 which adopted adjusted standard procedural rules specifically tailored to handle delisting petitions for hazardous wastes. R90-17 was initiated after USEPA delegated the authority to delist hazardous waste to Illinois on March 1, 1990. When Keystone filed its adjusted standard delisting petition with the Board, R90-17 was still pending. As a result, the Agency and Keystone requested, respectively, that the time for filing a recommendation and for filing proof of publication be extended

until after the adoption of R90-17. The Board granted the motions after calculating that the rules would be effective about April 15, 1991. R90-17 was filed and effective as of May 9, 1991.

As mentioned, R90-17 adopted the general adjusted standard procedures for the delisting of hazardous waste. Pursuant to Section 106.714, within 30 days after an adjusted standard petition has been filed with the Board, the Agency must file a response recommending either grant or denial of the petition. During the public comment period for R90-17, the Agency filed comments which did not mention any problems with this time frame. Neither did any of the other public comments received by the Board. As a result, the regulations, as adopted, require an Agency response within 30 days of the filing of an adjusted standard delisting petition.

The Board understands that the Agency has more limited resources than USEPA and that the detailed administration of the delisting authority may not yet be known. Even so, technically, when Keystone filed its adjusted standard petition, the Agency knew of the proposed "detailed standards for review" in R90-17 and applicable to delisting petitions. As such, the Agency has already had 120 days for preliminary review and assessment of the administrative and resource requirements of adjusted standard delisting petitions. In light of these facts and Keystone's continued request for an expeditious proceeding, the Board denies the Agency's request for 150-day extension to file its recommendation. But, in recognition of the problems being confronted by the Agency for the first time, the Board hereby grants the Agency 60 days from the date of this Order to file its recommendation pursuant to Section 106.714.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Order was adopted on the 23rd day of May, 1991, by a vote of 6-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In the matter of:	)	
	)	
PETITION OF KEYSTONE STEEL AND WIRE COMPANY FOR ADJUSTED STANDARD FROM 35 ILL. ADM. CODE 721.132	)	AS 93-7 (RCRA DeListing Adjusted Standard)

KEYSTONE'S REPLY TO ILLINOIS ENVIRONMENTAL PROTECTION AGENCY RESPONSE TO PETITION FOR RCRA ADJUSTED STANDARD

Petitioner, Keystone Steel & Wire Company ("Keystone"), by its attorneys, submits its reply to the response of the Illinois Environmental Protection Agency ("Illinois EPA") to Keystone's RCRA Adjusted Standard Petition ("Petition").[1]

1. In the Response of Illinois Environmental Protection Agency to Keystone Steel & Wire's Petition for RCRA Adjusted Standard filed with the Board on November 11, 1993, Illinois EPA recommends approval of Keystone's Petition.

2. Illinois EPA also requests that the Board impose conditions upon the adjusted standard consistent with the proposed language, set forth in its response at Section 3(f), therein.

3. Keystone is in general agreement with the revisions to the proposed adjusted standard as set forth in Illinois EPA's response and incorporates these changes in the attached Second Amendment to Keystone's RCRA Delisting Adjusted Standard Petition ("Second Amendment) with minor additional

[1] On November 24, 1993, Keystone requested that the Illinois Pollution Control Board ("Board") grant Keystone an extension of time until December 6, 1993 in which to file its reply. The Board granted this request on December 2, 1993.

changes. First, in the proposed adjusted standard, Keystone has revised the test procedure by expanding the definition of containers to be tested as "rolloff or other containers, a minimum of 20 cubic yards in size." This is the minimum size container contemplated by Keystone in the proposed validation procedures in using the generic term "roll-off container". Adding the ability to use containers other than "roll-offs" will provide Keystone more flexibility in conducting the excavation and removal.

Second, the chart at paragraph 2(c) of the proposed adjusted standard states TCLP values in mg/kg and provides a value of 0.092 mg/kg for cadmium. The proper unit of measurement is mg/l and the proper value for cadmium is 0.082 mg/l. These errors have been corrected in the Second Amendment to this Petition.

4. In paragraph 5(a), of Illinois EPA's response, the Agency contends that Keystone's USEPA delisting petition, although part of the Petition, is not consistent with the Petition in its description of the proposed adjusted standard. Response at p. 10. Illinois EPA advises that "the Petition and the USEPA delisting petition should seek relief from 35 Ill. Adm. Code § 721.132 for the treated K062 wastes."

Keystone has amended the description of the proposed delisting action in the USEPA delisting petition, Appendix A, page A-2, Section A.5, to specifically state that relief is sought from 35 IAC § 721.132, but retains the

additional explanation provided in that paragraph. See, Second Amendment, filed herewith.

Paragraph A.5, states that Keystone seeks exclusion from 35 IAC Parts 720-728, and clarifies that the K-062 wastes currently exist in two conditions. Keystone seeks a "one-time exclusion" for K-062 sediments which already have been treated and are located in the Retention Reservoir. Keystone seeks an "upfront exclusion" for currently untreated wastes located in other surface impoundments, designated by the Consent Order, to be effective upon treatment and subsequent verification sampling.

5. Also in its response, Illinois EPA noted a few miscellaneous errors and clarifications to the Petition which Keystone corrects in its Second Amendment.

6. Keystone hereby withdraws its request for a hearing in this matter and also requests that the Board waive the hearing, unless one is requested by the public, for several reasons. First, the Board is not required to conduct a hearing. The Board indicated in a previous decision, that it may not follow the mandatory public hearing requirement of 35 IAC §106.415(a). In the matter of: The Petition of Cabot Corp. for an Adjusted Standard, AS 91-10, fn. 1, March 26, 1992. The Board explained in a footnote in Cabot Corp. that current amendments to the Environmental Protection Act ("Act"), Ill. Rev. Stat. 1989, ch. 111½, par. 1028.1(d) eliminated the former mandatory hearing requirement. Instead, the Act now requires that the Board or another person may request a public hearing after public notice.

Id. Therefore, the existing provision, 35 IAC §106.415(a), adopted in 1987 pursuant to contrary statutory language, no longer reflects the current provisions of the Act, and hearings for adjusted standard petitions are no longer mandatory.

Second, Keystone believes that there is little need for a hearing on this matter since both the Illinois EPA and Keystone support the delisting petition and Illinois EPA counsel informally has advised Keystone's counsel, that it would support withdrawal of the hearing request. Third, Keystone is attempting to expeditiously comply with a Consent Order timetable for site remediation which includes delisting of the K062-listed wastes. Eliminating a hearing in this case will allow the Board to move more quickly to a decision on the Petition enabling Keystone to conduct remediation at the facility that much sooner.

WHEREFORE, Keystone respectfully requests that the Board proceed to decision without a public hearing in this matter, at the earliest opportunity afforded in the Board's schedule, unless a Board member or another person requests that a public hearing be held. It further requests that the Board adopt the proposed adjusted standard as set forth in Keystone's

Petition, incorporating the revisions noted in the Second Amendment filed herewith.

Respectfully submitted,

KEYSTONE STEEL & WIRE COMPANY

By: Karen Prena
One Of Its Attorneys

Andrew R. Running, Esq.
Karen L. Prena, Esq.
KIRKLAND & ELLIS
200 East Randolph Drive
Chicago, Illinois 60601
(312) 861-2000

Of Counsel:

Ralph P. End, Esq.
General Counsel
Keystone Consolidated Industries
Three Lincoln Center
5430 LBJ Freeway, Suite 1740
Dallas, Texas 75240
(214) 450-4297

Dated: December 6, 1993

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

In the matter of:	)	
	)	
PETITION OF KEYSTONE STEEL AND WIRE COMPANY FOR ADJUSTED STANDARD FROM 35 ILL. ADM. CODE 721.132	)	AS 93-7 (RCRA DeListing Adjusted Standard)

SECOND AMENDMENT TO
KEYSTONE'S RCRA ADJUSTED STANDARD PETITION

Petitioner, Keystone Steel & Wire Company ("Keystone"), through its attorneys, hereby submits this second amendment to Keystone's RCRA Delisting Adjusted Standard Petition ("Petition") which incorporates proposed changes offered by the Illinois Environmental Protection Agency, in its response to Keystone's Petition and also clarifies and amends certain miscellaneous provisions. This Second Amendment should be read in tandem with the original Petition and the Amended Petition.

I. Amendments and Revisions

A. Petition

p.1. I. Introduction.

Insert as footnote after first sentence:

"This facility employs approximately 1,700 persons."

p.7. V. Nature of the Petitioner's Activity Which Is the Subject of the Proposed Adjusted Standard.

Insert line 1, after "Bartonville, Illinois.":

"This facility employs approximately 1,700 persons."

p.31 VIII.B. Description of Proposed Adjusted Standard.

Insert after: "This exclusion is subject to the following:", and delete existing paragraphs 1 and 2 at pp. 31-33:

1. Performance testing of the lime stabilization/Portland cement solidification process of the sediments located in the North Ditch, Mid-Mill Ditch, South Ditch-North Half, South Ditch-South Half, Surface Drainage Ditch, North Dredge Pile, South Dredge Pile, and the Lower South Ditch. (Performance testing of the Retention Reservoir treatment project has already been documented.)

The alkalinity of the sediment will be tested in each treatment cell following the initial mixing of quicklime and Portland cement. A treatment cell shall be no larger than 100 cubic yards in volume. Treatment will be considered acceptable if the alkalinity is within the range of 130,000 mg/kg to 192,000 mg/kg. Where the measured alkalinity is within the range of 115,000 mg/kg to 130,000 mg/kg or 192,000 mg/kg to 215,000 mg/kg, the sample also will be analyzed for TCLP lead. Samples where TCLP analysis is performed will be considered passing if the TCLP value for lead does not exceed 0.246 mg/1.

2. Verification testing of the treated sediments located in the Retention Reservoir and all of the other waste management units. Verification testing will consist of sampling roll-off or other containers, a minimum of 20 cubic yards in size ("Containers") of the treated sediment during the removal of the sediments from the waste management units. The sampling frequency and analytical protocols will be as follows:

(a) For Day 1 of treated sediment excavation and removal, every Container will be sampled with a minimum of sixty (60) Containers being sampled. If sixty (60) Containers are not sampled on Day 1, the Day 1 sampling frequency shall carry over into succeeding days until sixty (60) Containers have been sampled. Each sample will be analyzed for alkalinity. Every third sample in addition will be analyzed for TCLP cadmium, chromium, lead and zinc.

(b) After Day 1, but not before sixty (60) Containers have been sampled, every tenth Container will be sampled. Each sample will be analyzed for alkalinity. Every second sample in addition will be analyzed for TCLP cadmium, chromium, lead and zinc.

(c) Samples where only alkalinity is measured will be considered passing if the alkalinity is within the range of 130,000 mg/kg to 192,000 mg/kg. Samples where only alkalinity is measured and where the

alkalinity is within the range of 115,000 mg/kg to 130,000 mg/kg or 192,000 mg/kg to 215,000 mg/kg will then be subject to TCLP analysis for cadmium, chromium, lead and zinc. Samples where TCLP analysis is performed will be considered passing if the TCLP values are less than the delisting values as follows:

Analyte	TCLP Level
Cadmium	0.082 mg/l
Chromium	1.64 mg/l
Lead	0.246 mg/l
Zinc	115 mg/l

(d) The sediments in all Containers where the alkalinity lies outside the range of 115,000 mg/kg to 215,000 mg/kg, and the TCLP values exceed the levels given in Item (c) will be retreated and sampled.

(e) Following Day 1, if any sample fails to meet the criteria outlined in (c), the subsequent sampling frequency for Containers will revert to the Day 1 sampling schedule.

B. **Appendix A: USEPA Delisting Petition**

A-2. A.5. Insert at beginning of second paragraph. The first two sentences should now read:

"Keystone seeks an Adjusted Standard from 35 IAC § 721.132, for treated K062-listed lime stabilized sediments present in the Retention Reservoir as a "One-Time" Standard Exclusion from the regulations under 35 IAC Parts 720-728. In addition, Keystone is submitting this Delisting Petition for the purpose of obtaining an Adjusted Standard from 35 IAC § 721.132 as an "Upfront Exclusion" from the regulations under 35 IAC Parts 720-728 for subsequently treated sediments . . ."

B-6 6.C. Delete existing sections numbered 1-5 and replace with the following:

(a) For Day 1 of treated sediment excavation and removal, every roll-off or other container, a minimum of 20 cubic yards in size ("Container") will be sampled with a minimum of sixty (60) Containers being sampled. If sixty (60) Containers are not sampled on Day 1, the Day 1 sampling frequency shall carry over into succeeding days until sixty (60) Containers have been sampled. Each sample

will be analyzed for alkalinity. Every third sample in addition will be analyzed for TCLP cadmium, chromium, lead and zinc.

(b) After Day 1, but not before sixty (60) Containers have been sampled, every tenth Container will be sampled. Each sample will be analyzed for alkalinity. Every second sample in addition will be analyzed for TCLP cadmium, chromium, lead and zinc.

(c) Samples where only alkalinity is measured will be considered passing if the alkalinity is within the range of 130,000 mg/kg to 192,000 mg/kg. Samples where only alkalinity is measured and where the alkalinity is within the range of 115,000 mg/kg to 130,000 mg/kg or 192,000 mg/kg to 215,000 mg/kg will then be subject to TCLP analysis for cadmium, chromium, lead and zinc. Samples where TCLP analysis is performed will be considered passing if the TCLP values are less than the delisting values as follows:

Analyte	**TCLP Level**
Cadmium	0.082 mg/l
Chromium	1.64 mg/l
Lead	0.246 mg/l
Zinc	115 mg/l

(d) The sediments in all Containers where the alkalinity lies outside the range of 115,000 mg/kg to 215,000 mg/kg, and the TCLP values exceed the levels given in Item (c) will be retreated and sampled.

(e) Following Day 1, if any sample fails to meet the criteria outlined in (c), the subsequent sampling frequency for Containers will revert to the Day 1 sampling schedule.

Respectfully submitted,

KEYSTONE STEEL & WIRE COMPANY

By: _____
One Of Its Attorneys

Andrew R. Running, Esq.
Karen L. Prena, Esq.
KIRKLAND & ELLIS
200 East Randolph Drive
Chicago, Illinois 60601
(312) 861-2000

Of Counsel:

Ralph P. End, Esq.
General Counsel
Keystone Consolidated Industries
Three Lincoln Center
5430 LBJ Freeway, Suite 1740
Dallas, Texas 75240
(214) 450-4297

Dated: December 6, 1993

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF KEYSTONE STEEL	)	AS 93-7
AND WIRE COMPANY FOR	)	(RCRA Delisting
ADJUSTED STANDARD FROM	)	Adjusted Standard)
35 Ill. Adm. Code §721.132	)	

KEYSTONE'S MOTION FOR EXTENSION TO FILE REPLY

Petitioner, Keystone Steel and Wire Company ("Keystone"), by its attorneys, respectfully requests that the Illinois Pollution Control Board ("Board") grant an extension of time for Keystone to file its reply to the Illinois Environmental Protection Agency's ("IEPA") response to Keystone's RCRA Delisting Adjusted Standard Petition until December 6, 1993.

In support of this motion, Keystone states as follows:

1. The IEPA filed its response to Keystone's RCRA delisting adjusted standard petition with the Board on November 11, 1993.

2. Keystone's attorneys did not receive a copy of the response from the Agency until November 19, 1993, because an incorrect address was typed on the Notice of Filing.

3. Keystone's response is due on November 29, 1993, the Monday after the Thanksgiving Holiday.

4. In light of the shortened timeframe that Keystone has to reply to IEPA's response, Keystone needs additional time to prepare its reply.

5. Petitioner has discussed this extension request with the IEPA, and they have no objection.

WHEREFORE, Keystone requests the Board to extend the filing deadline for Keystone's reply until December 3, 1993.

Respectfully submitted,

KEYSTONE STEEL & WIRE COMPANY

By: _____
One Of Its Attorneys

Andrew R. Running, Esq.
Karen L. Prena, Esq.
KIRKLAND & ELLIS
200 East Randolph Drive
Chicago, Illinois 60601
(312) 861-2000

Of Counsel:

Ralph P. End, Esq.
General Counsel
Keystone Consolidated Industries
Three Lincoln Center
5430 LBJ Freeway, Suite 1740
Dallas, Texas 75240
(214) 450-4297

Dated: November 24, 1993

8TH FLOOR

TO RCRA ENFORCEMENT
→ IL/IN TES
CUNNINGHAM

BEFORE THE POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:	)	
	)	
PETITION OF KEYSTONE STEEL	)	AS 93-7
AND WIRE COMPANY FOR ADJUSTED	)	(RCRA DeListing
STANDARD FROM 35 ILL. ADM.	)	Adjusted Standard)
CODE 721.132	)	

NOTICE

Dorothy Gunn, Clerk
Illinois Pollution Control Board
Suite 11-500
100 West Randolph Street
Chicago, Illinois 60601

William Denham
Illinois Department of Energy
and Natural Resources
325 West Adams, Room 300
Springfield, Illinois 62704

Andrew Running
Karen L. Prena
Kirkland & Ellis
200 East Randolph Drive
Suite 6100
Chicago, Illinois 60601

Jim Kent
U.S. EPA
Office of Solid Waste and
Emergency Response
OS-333 DeListing Section
401 M Street, S.W.
Washington, D.C. 20460

U.S. EPA
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the MOTION FOR EXTENSION OF THE FILING DEADLINE FOR THE AGENCY'S RESPONSE TO PETITION FOR ADJUSTED STANDARD of the Illinois Environmental Protection Agency, a copy of which is herewith served upon you.

ENVIRONMENTAL PROTECTION AGENCY
OF THE STATE OF ILLINOIS

By: Mark V. Gurnik
Mark V. Gurnik
Assistant Counsel
Division of Legal Counsel

DATE: September 15, 1993
Agency File #: 570-93-AS
Illinois Environmental
Protection Agency
2200 Churchill Road
P.O. Box 19276
Springfield, IL 62794-9276

THIS FILING IS SUBMITTED ON RECYCLED PAPER

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD
OF THE STATE OF ILLINOIS

IN THE MATTER OF:	)	
	)	
PETITION OF KEYSTONE STEEL	)	AS 93-7
AND WIRE COMPANY FOR ADJUSTED	)	(RCRA DeListing
STANDARD FROM 35 ILL. ADM.	)	Adjusted Standard)
CODE 721.132	)	

MOTION FOR EXTENSION OF THE FILING DEADLINE FOR THE AGENCY'S RESPONSE TO PETITION FOR ADJUSTED STANDARD

Respondent, the Illinois Environmental Protection Agency ("Agency"), by its attorney, respectfully requests the Illinois Pollution Control Board ("Board") to extent the deadline for the Agency to file its response to the Petitioner's Petition for an Adjusted Standard from 35 Ill. Adm. Code 721.132 until and including November 11, 1993.

In support of this motion, the Agency states as follows:

1. Keystone filed a RCRA delisting adjusted standard petition with the Board for certain K062-listed sediments and contaminated soils on August 2, 1993. The petition was accompanied by a Motion For Stay of the Board's Proceedings to allow the petitioner to amend its petition to include necessary quality assurance/quality control documentation from the laboratory conducting the analytical tests on samples of soils and treated sediments.

2. The amended petition containing the additional information was filed with the Board by the Petitioner on August 25, 1993 and received by the Agency on August 30, 1993. The amended petition was accompanied by a Motion For Leave To File The Amended Petition.

3. The Board issued its Order of August 26, 1993, granting the Petitioner's Motion For Leave To File its Amended Petition. At the same time the Board stated that the Agency's response period for the petition for an adjusted standard would run from the time of filing of the amended petition.

The Board regulations at 35 Ill. Adm. Code 106.414 provides the Agency with a twenty-one day period in which to review the petition and file its response to the petition with the Board. The Agency is unable to complete its review of the amended petition within the review period set by the Board Regulations because the member of the Agency's technical staff assigned to review the amended petition has been on vacation from August 26, 1993 through September 13, 1993. The amended petition was not received by the Agency until after that individual left for vacation. Additionally, due to the press of Agency business, the individual performing the review will not be able to begin a detailed review of the petition until September 27, 1993.

4. The petition in this matter is thirty-seven pages long, and it is accompanied by an appendix with over 700 pages of text, tables and figures. The amended petition has an additional 100 pages of information. Because of the considerable volume of material and data contained in the amended petition, the Agency believes that it will need at least forty-five days to perform a thorough and complete review of the documents, and prepare its response to the amended petition. A period of forty-five days, beginning on September 27, 1993, the earliest date that the Agency can begin its technical review of the amended petition, will run through November 11, 1993.

5. The Agency has conferred with the petitioner about the time period it needs to review the amended petition and to prepare its response to the petition. The petitioner has no objection to an extension of the filing deadline for the Agency's response through and including November 11, 1993.

Wherefore, the Agency requests the Board to extend the filing deadline for the Agency's response to the amended petition through and including November 11, 1993.

Respectfully Submitted

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY

By: Mark V. Gurnik
Assistant Counsel
Division of Legal Counsel

DATED: September 15, 1993

Illinois Environmental
Protection Agency
2200 Churchill Road
P.O. Box 19276
Springfield, IL 62794-9276

STATE OF ILLINOIS)
)
COUNTY OF SANGAMON)

PROOF OF SERVICE

I, the undersigned, on oath state that I have served the attached **MOTION FOR EXTENSION OF THE FILING DEADLINE FOR THE AGENCY'S RESPONSE TO PETITION FOR ADJUSTED STANDARD** upon the person to whom it is directed, by placing a copy in an envelope addressed to:

Dorothy Gunn, Clerk
Illinois Pollution Control Board
Suite 11-500
100 West Randolph Street
Chicago, Illinois 60601

William Denham
Illinois Department of Energy
and Natural Resources
325 West Adams, Room 300
Springfield, Illinois 62704

Andrew Running
Karen L. Prena
Kirkland & Ellis
200 East Randolph Drive
Suite 6100
Chicago, Illinois 60601

Jim Kent
U.S. EPA
Office of Solid Waste and
Emergency Response
OS-333 DeListing Section
401 M Street, S.W.
Washington, D.C. 20460

U.S. EPA
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

and mailing it from Springfield, Illinois, on September 15, 1993, with sufficient postage affixed, by overnight mail.

Sandra J Britton

SUBSCRIBED AND SWORN TO BEFORE ME

this 15th day of September, 1993

Barbara K. McGee
Notary Public

OFFICIAL SEAL
BARBARA K. McGEE
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 4-13-95

THIS FILING SUBMITTED ON RECYCLED PAPER

BCC J. [illegible] - M. [illegible] Henning - J. J. Monroe

4

Keystone Group

7000 SOUTH WEST ADAMS STREET, PEORIA, IL 61641 (309) 697-7020

May 6, 1981

RECEIVED

APR 1 . 1984

ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

Ms. Jacqui Sales WH565
Office of Solid Waste
Hazardous & Industrial Waste Division
United States Environmental Protection Agency
401 M. Street S.W.
Washington, D.C. 20460

RE: 2/13/81 PETITION TO DELIST KEYSTONE - BARTONVILLE PLANT WASTE WATER TREATMENT SLUDGE AS A HAZARDOUS WASTE (#K063).

Dear Ms. Sales:

In accordance with our phone conversation on March 13, 1981; I have had four additional sludge samples collected and analyzed for EP toxicity by Daily Analytical Laboratories. These four samples (#1089-02,-03,-04 and -05) were collected on March 30, 1981.

Attached is the original of Daily's lab report dated April 29, 1981 and a copy of the associated Daily cover letter to me dated May 1, 1981.

The results show that the EP leachate levels of lead and chromium are consistent and well below the levels that would make the sludge a hazardous waste. The level of hexavalent chrome is also extremely low.

I hope that this additional data on sludge EP toxicity will be sufficient for you to grant us delisting of this sludge as a hazardous waste.

Very truly yours,

Dale L. Bennington

DALE L. BENNINGTON, P.E.
MANAGER, ENVIRONMENTAL ENGINEERING

DLB:bmk
Attachment(s)

cc: U.S. EPA - Region V, J.S. Goldstein
IEPA - Springfield, D. Umfleet
Lynn Grills
Jill Schaller

RECEIVED

MAR 20 1984

E.P.A. — D.L.P.C.
STATE OF ILLINOIS

Daily Analytical Laboratories
7807 N. Pioneer Lane • Peoria, Illinois 61615 Tel. 309-692-5252

Eugene J. Daily, Chairman
John P. Higgins, President
Otis E. Michels, Vice President
James F. Dallmeyer
Laboratory Director

May 1, 1981

Keystone Steel & Wire Company
7000 S. W. Adams Street
Peoria, IL 61641

ATTN: Mr. Dale Bennington RE: Sludge Lagoon Delisting

Dear Dale:

I am writing you to document the method of collection and analysis of your four sludge samples. Report attached.

Samples were collected by Mr. John LaPayne and Mr. Kurt Stepping on Monday, March 30, 1981. Samples were collected at a depth of 3 to 4 feet from four locations. The first sample was collected near the pipe inlet, about 30 feet from the north side of the lagoon. Subsequent samples were collected at 20 yard intervals, moving east of the inlet pipe.

Samples were extracted in accordance with the Extraction Procedure Toxicity test, described in the May 19, 1980, Federal Register, Part 261, Appendix II. The Leachate was then analyzed for Lead, Total and Hexavalent Chromium. Lead and Total Chrome were analyzed by conventional Flame Atomic Absorption (USEPA Methods Manual). Hexavalent Chrome was analyzed by the Diphenylcarbizide Method 218.4 (USEPA Methods Manual).

We appreciate this opportunity to extend our services to you. I hope that the above information will meet your requirements. If I may provide any additional information or be of any further service, please call me.

Very truly yours,

DAILY ANALYTICAL LABORATORIES

James F. Dallmeyer
Laboratory Director

JFD:djd

Encl.

RECEIVED
MAR 30 1984
E.P.A. — D.L.P.C.
STATE OF ILLINOIS

RECEIVED
ENV. ENG.
DATE MAY 4 1981

Eugene J. Daily, President

Otis E. Michels
John P. Higgins
Walter H. Johansen
Lyn A. Denton
Woodrow C. Chenault, Jr.
Thomas B. Jordan
Philip W. Jacobs

Daily Analytical Laboratories

7807 N. Pioneer Lane • Peoria, Illinois 61615 Tel. 309-692-5252

TO: Keystone Steel & Wire Company
7000 S. W. Adams Street
Peoria, IL 61641

ATTENTION: Mr. Ken Bittner

DATE RECEIVED 3-30-81
CLIENT P.O. # W10008
D/A PROJECT # 5060.10
DATE OF REPORT 4-29-81

D/A SAMPLE NO.		1089-02	1089-03	1089-04	1089-05	
SAMPLE DESCRIPTION		Sludge 1 EP TOXICITY	Sludge 2 EP TOXICITY	Sludge 3 EP TOXICITY	Sludge 4 EP TOXICITY	
SAMPLE DATE		3/30/81	3/30/81	3/30/81	3/30/81	
Acidity, (as $CaCO_3$)	mg/l					
Alkal., Total, (as $CaCO_3$)	mg/l					
BOD-5, Total	mg/l					
[illegible].D.	mg/l					
[illegible]lved Oxygen	mg/l					
[illegible]rogen, Ammonia (as N)	mg/l					
Oils & Grease	mg/l					
pH	Units					
Solids, Dissolved	mg/l					
Solids, Tot. Suspended	mg/l					
Solids, Volatile Sus.	mg/l					
Iron, Total	mg/l					
Coliforms, Total	#/100					
Coliforms, Fecal	#/100					
Fecal Streptococci	#/100					
Lead	mg/l	0.45	0.45	0.45	0.45	
Chrome	mg/l	0.02	0.03	0.02	0.05	
Chrome, Hex.	mg/l	< 0.02	< 0.02	< 0.02	< 0.02	

RECEIVED
MAR 20 1984
E.P.A. — D.L.P.C.
STATE OF ILLINOIS

abbreviated report sheet

Analysis Certified By: John R. LaPayne
John R. LaPayne, Chief Chemist

Analysis and Testing shall be performed in accord with U.S. EPA's current manual of practice or with other procedures acceptable to U.S. EPA and IEPA.

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Keystone Group

7000 SOUTH WEST ADAMS STREET, PEORIA, IL 61641 (309) 697-7020

May 13, 1981

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ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

Ms. Jacqui Sales WH565
Office of Solid Waste
Hazardous & Industrial
Waste Division
United States Environmental
Protection Agency
401 M. Street, S.W.
Washington, D.C. 20460

RE: 2/13/81 PETITION TO DELIST KEYSTONE - BARTONVILLE PLANT WASTEWATER TREATMENT SLUDGE AS A HAZARDOUS WASTE (#K063).

Dear Ms. Sales:

As we discussed on the phone yesterday, you requested the total content of lead and chromium contained in our sludge on a dry weight basis.

The first of the eight sludge samples was analyzed on a dry weight basis for lead and chromium as follows:

Collection Date - December 16, 1980
Collected by: Daily Analytical Laboratories - Sample #0351-14

Analysis Results (Daily Analytical Laboratory Report dated 1-13-81).

Total Lead: 240 mg/l total dry weight basis
0.08 mg/l EP Leachate-*

Total Chromium: 460 mg/l total dry weight basis
0.03 mg/l EP Leachate-*

*-EP Leachate reported in the delisting petition to Mr. Miles Morse on February 13, 1981.

Daily Analytical Laboratories has preserved all eight sludge samples should you require additional analyses or data for final delisting purposes.

Please call me on my direct line should you need additional information.

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STATE OF ILLINOIS

Very truly yours,

Dale L. Bennington

DALE L. BENNINGTON, P.E.
MANAGER, ENVIRONMENTAL ENGINEERING

DLB:bmk

SUPERFUND

6

Keystone Group

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ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

May 22, 1981

Regional Administrator
USEPA Region V
Sites Notification
Chicago, Illinois 60604

Dear Administrator:

Enclosed is completed USEPA From 8900-1 which is the required hazardous waste notification form for complying with The Comprehensive Environmental Response, Compensation, and Liability Act of 1980PL96-510 (Superfund).

The landfill described in the notification form has been properly closed since October 1, 1978. Quarterly monitoring of ground water has shown no release of hazardous waste to the environment.

Very truly yours,

Dale L. Bennington

Dale L. Bennington, PE
Manager of Environmental
Engineering

DLB/nle
Enclosure
CC: Rauf Piskin, Manager Hydrogeology Unit,
Division of Land Pollution Control,
Illinois EPA

bcc: J. W. Mahannah
L. Phillips
R. End
S. Emery
M. Henning

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STATE OF ILLINOIS

EPA Notification of Hazardous Waste Site

United States Environmental Protection Agency
Washington DC 20460

This initial notification information is required by Section 103(c) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 and must be mailed by June 9, 1981.

Please type or print in ink. If you need additional space, use separate sheets of paper. Indicate the letter of the item which applies.

A Person Required to Notify:

Enter the name and address of the person or organization required to notify.

Name: Keystone Group - Bartonville Plant
Street: 7000 S. Adams Street
City: Peoria State: IL Zip Code: 61641

B Site Location:

Enter the common name (if known) and actual location of the site.

Name of Site: Peoria County Landfill #14300501
Street: 7000 S. Adams Street
City: Peoria County: Peoria State: IL Zip Code: 61641

C Person to Contact:

Enter the name, title (if applicable), and business telephone number of the person to contact regarding information submitted on this form.

Name (Last, First and Title): Bennington, Dale-Manager, Environmental Engineering for Keystone Group
Phone: (309) 697-7552

D Dates of Waste Handling:

Enter the years that you estimate waste treatment, storage, or disposal began and ended at the site.

From (Year): 1970 To (Year): 1976

E Waste Type: Choose the option you prefer to complete

Option I: Select general waste types and source categories. If you do not know the general waste types or sources, you are encouraged to describe the site in Item I—Description of Site.

General Type of Waste: Place an X in the appropriate boxes. The categories listed overlap. Check each applicable category.

1. ☐ Organics
2. XX Inorganics
3. ☐ Solvents
4. ☐ Pesticides
5. ☐ Heavy metals
6. ☐ Acids
7. ☐ Bases
8. ☐ PCBs
9. ☐ Mixed Municipal Waste
10. ☐ Unknown
11. ☐ Other (Specify)

Source of Waste: Place an X in the appropriate boxes.

1. ☐ Mining
2. ☐ Construction
3. ☐ Textiles
4. ☐ Fertilizer
5. ☐ Paper/Printing
6. ☐ Leather Tanning
7. ☐ Iron/Steel Foundry
8. ☐ Chemical, General
9. ☐ Plating/Polishing
10. ☐ Military/Ammunition
11. ☐ Electrical Conductors
12. ☐ Transformers
13. ☐ Utility Companies
14. ☐ Sanitary/Refuse
15. ☐ Photofinish
16. ☐ Lab/Hospital
17. ☐ Unknown
18. XX Other (Specify) Iron & Steel Manufacturing

Option 2: This option is available to persons familiar with the Resource Conservation and Recovery Act (RCRA) Section 3001 regulations (40 CFR Part 261).

Specific Type of Waste: EPA has assigned a four-digit number to each hazardous waste listed in the regulations under Section 3001 of RCRA. Enter the appropriate four-digit number in the boxes provided. A copy of the list of hazardous wastes and codes can be obtained by contacting the EPA Region serving the State in which the site is located.

K-061		

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STATE OF ILLINOIS

Form Approved
OMB No. 2000-0138

EPA Form 8900-1

Notification of Hazardous Waste Site — Side Two

F Waste Quantity:

Place an X in the appropriate boxes to indicate the facility types found at the site.

In the "total facility waste amount" space give the estimated combined quantity (volume) of hazardous wastes at the site using cubic feet or gallons.

In the "total facility area" space, give the estimated area size which the facilities occupy using square feet or acres.

Facility Type

1. ☐ Piles
2. ☐ Land Treatment
3. XX Landfill
4. ☐ Tanks
5. ☐ Impoundment
6. ☐ Underground Injection
7. ☐ Drums, Above Ground
8. ☐ Drums, Below Ground
9. ☐ Other (Specify) _____

Total Facility Waste Amount

cubic feet 1,000,000

gallons _____

Total Facility Area

square feet 90,000

acres _____

G Known, Suspected or Likely Releases to the Environment:

Place an X in the appropriate boxes to indicate any known, suspected, or likely releases of wastes to the environment. ☐ Known ☐ Suspected ☐ Likely XX None

4 Monitoring Wells Show No Releases to the Environment

Note: Items H and I are optional. Completing these items will assist EPA and State and local governments in locating and assessing hazardous waste sites. Although completing the items is not required, you are encouraged to do so.

H Sketch Map of Site Location: (Optional)

Sketch a map showing streets, highways, routes or other prominent landmarks near the site. Place an X on the map to indicate the site location. Draw an arrow showing the direction north. You may substitute a publishing map showing the site location.

Keystone Drawing No. 77756-Rev. 1 is attached which shows the site location, closure material and the four monitoring wells.

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I Description of Site: (Optional)

Describe the history and present conditions of the site. Give directions to the site and describe any nearby wells, springs, lakes, or housing. Include such information as how waste was disposed and where the waste came from. Provide any other information or comments which may help describe the site conditions.

History: Keystone deposited (RCRA-K061) baghouse dust at the site from 1970-1976. The site is located in the regulatory floodplain and Keystone obtained a U.S. Army Corps of Engineers Permit #I3407802 to properly close this site. Closure by placing a clay cover over the fill was completed by October 1, 1978.

Since closure, quarterly monitoring reports from two ground water locations (G101, G102) and from two deep well (S101, S102) have been submitted to the Illinois EPA per their requirements (Illinois EPA Site Inventory #14300501. These analyses show no release of hazardous wastes to the environment.

J Signature and Title:

The person or authorized representative (such as plant managers, superintendents, trustees or attorneys) of persons required to notify must sign the form and provide a mailing address (if different than address in item A). For other persons providing notification, the signature is optional. Check the boxes which best describe the relationship to the site of the person required to notify. If you are not required to notify check "Other".

Name Keystone Group-Div. of Keystone Consolidated Industries

Street 7000 S. Adams Street

City Peoria State IL Zip Code 61641

Signature Dale L. Bennington Date 5/22/84

Manager of Environmental Engineering

XX Owner, Present
☐ Owner, Past
☐ Transporter
XX Operator, Present
☐ Operator, Past
☐ Other

ATTACHMENT D

Thursday
August 6, 1981

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STATE OF ILLINOIS

Federal Register

Part III

Environmental Protection Agency

Hazardous Waste Management System; Identification and Listing of Hazardous Waste

Photocopy of
Keystone-Bartonville
Plant Delisting of
#K063 Sludge as a
HAZARDOUS WASTE
PBennington 6/28/

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 261

[SWH-FRL-1891-1]

Hazardous Waste Management System: Identification and Listing of Hazardous Waste

AGENCY: Environmental Protection Agency.

ACTION: Grant of temporary exclusions and request for comment.

SUMMARY: The Environmental Protection Agency (EPA) is today temporarily excluding solid wastes generated at several particular generating facilities from the lists of hazardous waste contained in 40 CFR 261.31 and 261.32. This action responds to delisting petitions submitted under 40 CFR 260.20, (which allows any person to petition the Administrator to modify or revoke any provisions of Part 260 through 265 of the Resource Conservation and Recovery Act Regulations), and §260.22, which specifically provides the generators the opportunity to petition the Administrator to exclude waste on a "cite specific" basis from the hazardous waste list, and gives the Administrator the authority to grant temporary exclusions from the hazardous waste list when there is a substantial likelihood that a final exclusion will be granted. The effect of this action is to temporarily exclude certain hazardous wastes generated at particular facilities from listing as hazardous waste under 40 CFR Part 261.

DATES: Effective date: August 6, 1981.

EPA will accept public comments on these temporary exclusions until October 5, 1981. Any person may request a hearing on these temporary exclusions by filing a request with John P. Lehman, whose address appears below, by August 27, 1981. The request must contain the information prescribed in 40 CFR 260.20(d).

ADDRESSES: Comments should be sent to the Docket Clerk, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, 401 M Street SW., Washington, D.C. 20460. Communications should identify the regulatory docket number "Section 3001/Delisting Petitions."

Requests for hearing should be addressed to John P. Lehman, Director, Hazardous and Industrial Waste Division, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, Washington, D.C. 20460.

The public docket for these temporary exclusions is located in Room 2711, U.S. Environmental Protection Agency, 401 M St. SW., Washington, D.C. 20460 and is available for viewing from 9 a.m. to 4 p.m., Monday through Friday, excluding holidays.

FOR FURTHER INFORMATION CONTACT: Myles Morse, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, 401 M St. SW., Washington, D.C. (202) 755-9187.

SUPPLEMENTARY INFORMATION: On January 16, 1981, as part of its final and interim final regulations implementing Section 3001 of RCRA, EPA published an amended list of hazardous wastes from non-specific and from specific sources. See 40 CFR 261.31 and 261.32 (46 FR 4614). These wastes were listed as hazardous because they typically and frequently exhibit the characteristics of hazardous wastes identified in Subpart C of Part 261 (ignitability, corrosivity, reactivity and EP toxicity) or meet the criteria for listing contained in §§ 261.11(a)(2) or 261.11(a)(3).

The Agency, however, recognizes that individual waste streams may vary depending on raw materials, industrial processes and other factors. Thus, while a type of waste described in these regulations generally is hazardous, a specific waste meeting the listing description from an individual facility may not be. For this reason, §§ 260.20 and 260.22 provide an exclusion procedure, allowing persons to demonstrate that a specific waste from a particular generating facility should not be regulated as a listed hazardous waste. To be excluded, petitioners must show that the waste produced at their facilities does not meet any of the relevant criteria under which the waste was listed. (See § 260.22(a) and Background Documents for listed wastes.) Wastes which are "delisted" (i.e., excluded from listing in Part 261, Subpart D) may, however, still be hazardous if they exhibit any of the characteristics of a hazardous waste in Part 261, Subpart C, and generators remain obligated to make this determination.

In addition to wastes listed as hazardous in §§ 261.31 and 261.32, residues from the treatment, storage, or disposal of listed hazardous wastes also are eligible for exclusion and remain hazardous wastes until excluded. (See §§ 261.3 (c) and (d)(2).) Again, the substantive standard for "delisting" is that the waste not meet any of the criteria for which the waste was listed originally. Where the waste is derived from one or more listed hazardous wastes, the demonstration may be made with respect to each constituent listed waste, or the waste mixture as a whole. (See § 260.22(b).) Like other excluded waste treatment, storage or disposal residues remain subject to Subpart C of Part 261, and so may be hazardous if they exhibit any of the characteristics of hazardous waste.

EPA recognizes as well that there will be circumstances where immediate action on petitions is appropriate. Therefore, upon Agency review of a submitted petition, the Administrator may under § 260.22(m) grant a temporary exclusion if there is substantial likelihood that an exclusion will finally be granted.

It should be noted that the Agency has not yet run spot checks on the test data submitted to date in exclusion petitions. The Agency believes that the sworn affidavits submitted with each petition sufficiently binds the petitioners to ensure presentation of truthful and accurate test results. The Agency may, however, spot sample and analyze wastes or groundwater before a final decision is made whether to exclude any particular waste from the hazardous waste lists.

We also note that the temporary exclusions granted today apply only to the Federal hazardous waste management system established under RCRA. States remain free to take any action they deem appropriate with regard to these wastes.

The temporary exclusions published today involve the following petitioners: International Minerals Chemical Corporation, Terre Haute, Indiana; Timken Company, Canton, Ohio; General Electric, Mattoon, Illinois; Whirlpool Corporation, Fort Smith, Arkansas; Great Lakes Steel, Detroit, Michigan; Whirlpool Corporation, Danville, Kentucky; Cresman Air Guns, Fairport, and East Bloomfield, New York; the Keystone Group, Bartonville, Illinois; Mansfield Products Company, Mansfield, Ohio; Gould Inc., Spartanburg, South Carolina; General Battery Corporation, Reading, Pennsylvania; Maytag Company, Newton, Iowa; Whirlpool Corporation, Marion, Ohio; Talon, Division of Textron, Meadville, Pennsylvania; Bentley Nevada Corporation, Minden, Nevada; Peerless Chain Company, Winona, Minnesota; Whirlpool Corporation, Findlay, Ohio; Mearl Corporation, Peekskill, New York; Industrial Liquids Recycling Inc., Mount Pleasant, Tennessee; Empire-Detroit Steel Division/Cyclops Corporation, Dover, Ohio; Hamblet and Hayes Co., Salem, Massachusetts; and Chem-Clear Inc., Cleveland, Ohio.

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associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum. Whirlpool has petitioned to delist its waste because it does not meet the criteria for which it was listed.

Whirlpool claims that the production processes which generate the waste do not use cadmium, hexavalent chromium, nickel, or cyanide, the constituents for which the waste is listed. They therefore claim that their treated wastewater sludge is non-hazardous due to the absence of these constituents in the sludge. They also claim that any other toxic compounds used in their process are removed from the sludge by the treatment process.

Whirlpool has submitted a detailed description of its waste treatment system, EP toxicity test results for cadmium, total chromium and nickel, and constituent analyses of the sludge for these metals and cyanide. Samples were obtained over a seven month period which the petitioner claims to be representative of any variation of the constituent concentration in the waste. The treatment system involves lime/alum neutralization, flocculation, clarification, and vacuum filtration.

Constituent analyses of the final treatment sludge revealed cadmium, total chromium, nickel and free cyanide concentrations of 0.35, 118.-8.3, and 0.187 ppm, respectively. EP toxicity tests involving cadmium, total chromium and nickel produced maximum leachate levels of <.020, 1.01, and 2.66 ppm, respectively.

B. Agency Analyses and Action

Whirlpool has demonstrated that its waste treatment system produces a non-hazardous sludge. Whirlpool claims that its production process does not use cadmium, hexavalent chromium, nickel or cyanide. Low concentrations of cadmium, nickel and cyanide are present in the waste; their occurrence probably results from unknown minor sources of contamination and background levels, rather than from the direct use of these constituents in the plating processing. In addition, the EP extract concentration for cadmium is well below the maximum EP toxicity limit for this constituent while that for nickel is not considered to be of regulatory concern.

With respect to hexavalent chromium, the petitioner claimed that hexavalent chromium was not used in the process, but provided no analytical data to support their case (i.e., analysis of sludge for hexavalent chromium). However, since the EP extract concentration for total chromium [6] is well below the maximum EP toxicity limit for this constituent, the Agency has not asked the petitioner to provide any additional data. The Agency, therefore, has granted a temporary exclusion to the Whirlpool Corporation facility in Danville, Kentucky, for its treated electroplating sludge, as described in its petition.

VII. Crosman Air Guns

A. Petition for Exclusion

Crosman Air Guns, located in East Bloomfield and Fairport, New York, (Crosman), involved in the production of BB and pellet guns, has petitioned the Agency to exclude its residue generated from the treatment of EPA Hazardous Waste No. K062-Spent pickle liquor from steel finishing operations; and its wastewater treatment sludge, presently listed as EPA Hazardous Waste No. F006-Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum. Crosman has petitioned to exclude its waste because it does not meet the criteria for which these wastes were listed.

The production processes which generate the waste at Crosman include zinc castings deburring, zinc plating on carbon steel, black oxide bluing and copper coating processes. The zinc plating process involves acid pickling of the metal prior to plating. Crosman claims that the treated wastewater sludge it generates is non-hazardous due to the effectiveness of its treatment system.

Crosman has submitted a detailed description of its waste treatment system; EP toxicity test results for cadmium, lead, total chromium and nickel; and constituent analyses of the sludge for cyanide. Samples were obtained over a six month period which the petitioner claims to be representative of any variation of constituent concentration in the waste.

The treatment system process for the spent pickle liquor, the cleaning bath solutions, and the rinsewater over-flow wastes involves pH adjustment with either caustic soda or sulfuric acid, flocculation, settling, and sludge dewatering. EP toxicity tests involving cadmium, total chromium, lead and nickel produced maximum leachate levels of .03, .05, <.2 and .06 ppm, respectively. Cyanide was not detected in the samples.

B. Agency Analysis and Action

Crosman has demonstrated that its waste treatment system produces a non-hazardous sludge. The EP extract concentrations for cadmium and total chromium are all below the national interim primary drinking water standards for these constituents [7] while that for lead is well below the maximum EP toxicity limits. Cyanide was not detected in the sludge. The nickel leachate concentrate is not considered to be of regulatory concern. These low leachate levels indicate that the constituents are present in essentially an immobile form. The Agency, therefore, has granted a temporary exclusion to Crosman Air Gun facilities at Fairport and East Bloomfield, New York, for its treated electroplating sludge and its treated spent pickle liquor, as described in its petition.

VIII. The Keystone Group

A. Petition for Exclusion

The Keystone Group—Bartonville Plant (Keystone), involved in the manufacture of steel, wire and wire products, has petitioned the Agency to exclude its sludge, formerly listed as EPA Hazardous Waste No. K063 (sludge from lime treatment of spent pickle from steel finishing operations). [8] Keystone has petitioned to exclude its waste because it does not meet the criteria for which the waste was originally listed.

Keystone utilizes the processes of cold drawing, acid pickling and lime treatment, sodium hydroxide degreasing and etching in the production of wire from carbon steel wire rods. Its waste treatment process for spent pickle liquor involves neutralization, lime and polymer flocculation, settling, and sludge lagoon dewatering. They claim their sludge is environmentally stable and non-hazardous, and specifically that the sludge does not contain hazardous levels of hexavalent chromium and lead, the constituents of concern for which the spent pickle liquor (K062) is listed.

Keystone submitted a detailed description of their sludge treatment system, and EP toxicity test results for all toxic constituents specified in § 261.24 of the regulations. The samples were taken over a one month period which the petitioner claims to be representative of any variation of

[6] See Footnote 2.

[7] See Footnote 2.

[8] See Footnote 1.

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constituent concentration in the waste. EP toxicity tests revealed maximum total chromium and lead levels in the waste extract of 0.05 and 0.45 ppm, respectively.

Agency Analysis and Action

The constituents of concern in this waste are hexavalent chromium and lead. EP extracts from sludge samples analyzed by Keystone show lead and total chromium consistently well below the maximum EP toxicity limits.[9] These low leachate levels indicate that the constituents are present in essentially an immobile form. A final pH of 8.3 indicates that Keystone's waste treatment process effectively neutralizes its spent pickle liquor wastes. The Agency, therefore, has granted a temporary exclusion to the Keystone Group's facility in Bartonville, Illinois, for its treated spent pickle liquor, as described in its petition.

IX. Mansfield Products Company

A. Petition for Exclusion

Mansfield Products Company (Mansfield), Mansfield, Ohio, involved in the manufacture of washers, dryers, ranges, and dry cleaning machines, has petitioned the Agency to exclude its treated sludge presently listed as EPA Hazardous Waste No. F006–Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum. The production processes at Mansfield Products which generate the listed hazardous wastes are nickel plating and chromate conversion coating. Mansfield Products has petitioned to exclude its waste because it does not meet the criteria for which it was listed.

Mansfield has submitted a description of its electroplating and wastewater treatment processes, and EP toxicity test results for cadmium, total chromium, and nickel, and a constituent analysis for cyanide.

Mansfield's treatment process involves the batch reduction of chromic rinse waste, lime and polymer neutralization and flocculation, clarification, and vacuum filtration dewatering. Samples were collected over a 2 month period which the petitioner claims to be representative of any variation of constituent concentration in the waste. EP toxicity tests involving cadmium, total chromium and nickel produced maximum leachate levels of <0.1, 0.1 and 12.8 ppm, respectively. Total constituent analysis for cyanide was of 5.0 ppm.

B. Agency Analysis and Action

The constituents for which EPA Hazardous Waste No. F006 are listed are cadmium, hexavalent chromium, nickel and cyanide. EP extracts show cadmium and total chromium well below the EP toxicity limits.[10] Nickel extract values are also not considered to be regulatory concern.[11] The reported cyanide levels are not considered to be of regulatory concern. The Agency, therefore, has granted a temporary exclusion to Mansfield Product's facility in Mansfield, Ohio, for its treated wastes, as described in its petition.

X. Gould Incorporated

A. Petition for Exclusion

Gould Incorporated (Gould), involved in the manufacturing of electrical busses, has petitioned the Agency to exclude its wastewater treatment sludge presently listed as EPA Hazardous Waste No. F006–Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum. Gould has petitioned to exclude its waste because it does not meet the criteria for which it was listed.

Gould's electroplating processes use copper and silver; cadmium, chromium and nickel are claimed not to be used in any of Gould's processes. Production processes used at Gould include nitric acid stripping, copper bright dip, bronze strike, copper plating, silver strike and silver plating. Cyanides are used in these processes, and Gould's treatment system includes cyanide destruction, equalization, neutralization, caustic precipitation, clarification, lagooned storage, and plate and frame filtration.

Gould has submitted a description of its wastewater treatment process; EP toxicity test results for cadmium, total chromium, nickel, and cyanide; and total constituent analyses of the sludge for cadmium, total chromium, nickel, and free cyanide.

EP toxicity tests for cadmium, total chromium, and nickel produced maximum leachate concentrations of <0.01, <0.05, 0.26 ppm, respectively. Distilled water leachate tests for cyanide produced a maximum level of 0.059 ppm. Constituent analyses of the wastewater sludge indicated maximum cadmium, total chromium, and cyanide concentrations of 5.4, 56.0 and 118 ppm, respectively.

B. Agency Analysis and Action

The constituents for which EPA Hazardous Waste No. F006 are listed are cadmium, hexavalent chromium, nickel and cyanide. Gould has demonstrated that its copper, bronze and silver plating operations do not involve the use of cadmium or chromium. The low concentrations of cadmium and chromium in the sludge are probably a result from unknown minor sources of contamination rather than from the direct use of these constituents in the plating process. In addition, EP extracts show cadmium and total chromium[12] levels consistently below the interim primary drinking water standard. With respect to nickel, the petitioner did not provide any specific analysis for nickel in the sludge and therefore, the Agency has no data to support their claims. However, since the level of nickel in the EP extract is not considered to be of regulatory concern, the Agency has not asked the petitioner to provide any additional data. Finally, the level of free cyanide in the dewatered sludge is considered negligible and is therefore, not of regulatory concern.

The concentration of total complexed cyanides, however, is of concern to the Agency. The Agency has data indicating that complexed cyanides if exposed to sunlight may photodecompose to free cyanide (see background documents for EPA Hazardous Wastes F006 and K086). Gould has requested to empty their lagoon, and dispose of the sludge at a landfill. Gould has also requested to continue using their lagoon (after it is emptied) for sludge placement. The Agency is not presently at a point where

[9] See Footnote 2.

[10] See footnote 2.

[11] In the previous set of delisting petitions which were published in the Federal Register (46 FR 17196 March 18, 1981), the Agency had published an interim nickel leachate level of 10 ppm in considering petitions for exclusion. However, after consideration of additional nickel toxicity data, the Agency is amending the allowable nickel leachate level from 10 ppm to 20 ppm. By doing this, the Agency now believes that in most cases, the concentration of nickel in the waste extract at less than 20 ppm would not be of regulatory concern. This new level is based in part on the Agency's re-evaluation of the nickel water quality criterion value, with an upward multiplier allowing for some attenuation and dilution of the contaminant.

[12] See Footnote 2.

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 261

[SWH-FRL 1890-1]

Hazardous Waste Management System: Identification and Listing of Hazardous Waste

AGENCY: Environmental Protection Agency.

ACTION: Interim final rule and request for comments.

SUMMARY: The Environmental Protection Agency (EPA) is today amending the regulations for hazardous waste management by conditionally exempting spent pickle liquor (which is hazardous waste) from the requirements of the regulations. This exemption applies to facilities which reuse spent pickle liquor, to generators and brokers who accumulate spent pickle liquor, and to those who transport spent pickle liquor, where in all cases the spent pickle liquor is to be reused in wastewater treatment at a facility holding a National Pollution Discharge Elimination System (NPDES) permit. EPA is taking this action because the management of spent pickle liquor before reuse in wastewater treatment does not appear to pose a substantial hazard to human health or the environment and because the objectives of the hazardous waste regulations appear to be met without imposition of explicit regulations. This amendment will reduce the regulatory burden to those individuals who reuse spent pickle liquor in wastewater treatment and now comply with the requirements of the hazardous waste management regulations. This amendment will also encourage more spent pickle liquor to be reused.

DATES: Interim final rule effective September 8, 1981; the Agency will accept comments until November 9, 1981.

ADDRESS: Comments should be sent to the Docket Clerk, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460. Communications should identify the regulatory docket number "section 3001/ Spent Pickle Liquor Reuse".

FOR FURTHER INFORMATION CONTACT: RCRA Hotline at (202) 554-1404 or toll-free at (800) 424-9346. For technical information contact Matthew Straus, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. (202) 755-9187.

SUPPLEMENTARY INFORMATION:

I. Background

Under Subtitle C of the Resource Conservation and Recovery Act of 1976, as amended, EPA has issued regulations for hazardous waste management. These regulations are published in the *Code of Federal Regulations* (CFR) at 40 CFR Parts 260–267 and 122–124. In these regulations, EPA has given special consideration to hazardous wastes which are used, reused, recycled or reclaimed. These specific provisions are found in § 261.6 of the regulations.

EPA presently is considering a revised approach to regulation of hazardous wastes which are used, reused, recycled or reclaimed. It will be some months, however, before EPA can promulgate and implement revised regulations. In the interim, the Agency wishes to remove certain restrictions on the reuse of certain hazardous wastes which are now regulated substantively under the Subtitle C regulations. These reuses are not likely to be regulated under a revised regulatory approach, and in any case probably can be conducted safely outside the Subtitle C regulatory framework.

One such reuse is the reuse of spent pickle liquor—EPA hazardous waste No. K062—in treatment of wastewater. Spent pickle liquor is generated in the pickling of iron and steel products prior to the application of a final surface coating or finish. The pickling process involves immersion of the iron or steel product in a heated solution of concentrated acid (or acids) to remove undesirable surface characteristics such as rust, scale, and grease, etc. The residual waste liquor is highly corrosive (pH<1) and also is contaminated with toxic metals (that is, hexavalent chromium, lead, and nickel).

Spent pickle liquor often is used beneficially in wastewater treatment. Its principal function is as a phosphorus precipitant, and it also is used as a sludge conditioner. Pickle liquor so reused is as effective, and in some cases more effective, than commercial chemicals used for the same purpose. (1, 2) One of these commercial chemicals, ferric chloride, can be virtually as corrosive and as metal-contaminated as spent pickle liquor (and is sometimes more so) (3), and so presents a similar environmental risk of safekeeping prior to use. (Another principal phosphorus precipitant, aluminium sulfate ("alum") is also quite corrosive although somewhat less so than either ferric chloride or spent pickle liquor.)

Reuse of spent pickle liquor in wastewater treatment already is relatively widespread and could be expected to increase as facilities seek a less costly alternative to the use of commercial chemicals. Most facilities presently engaging in this reuse are Publicly Owned Treatment Works (POTWs), but private facilities also are starting to reuse this material. Furthermore, the Agency believes it a fair inference that more private facilities would reuse spent pickle liquor in wastewater treatment if they did not have to comply with the RCRA recordkeeping requirements and obtain hazardous waste storage permits.

The volume of spent pickle liquor reused in wastewater treatment is substantial, estimated by the Agency at up to 50 million gallons annually (roughly 5 percent of the total amount generated). Individual wastewater treatment facilities likewise handle significant volumes of the material. For example, the Blue Plains facility, a large POTW in the Washington, D.C. area, reuses 45,000 gallons per day of Bethlehem Steel's spent pickle liquor. (4)

Spent pickle liquor is marketed in a number of ways. Generators often arrange directly with wastewater treatment facilities for the delivery of the spent pickle liquor. Generators may provide transportation of the material to the facility, or hire an independent transporter. In some situations, the cost of transportation is divided between the facility and the generator, and in other cases the facility pays the generator to obtain the material. In some cases, generators will employ brokers to find a user for their spent pickle liquor. In these situations, the broker may take possession of the spent pickle liquor prior to transport to the wastewater treatment facility. In other cases, the broker may act as transporter or hire a transporter to ship the material to the facility. Some brokers also take possession of spent pickle liquors from a number of generators, blend them and sell the resulting mixture to wastewater treatment facilities. (5)

Reuse of spent pickle liquor generally results in significant cost savings to both generators and user facilities. Generators save treatment or disposal costs, which may be quite high, particularly in light of the volumes of the waste which are reused and otherwise would have to be treated or disposed of. User facilities save the cost of alternative commercial chemicals, which again are very high. Blue Plains' personnel estimate annual savings from reuse of spent pickle liquor at $1.2 million annually. (4)

In sum, reuse of spent pickle liquor in wastewater treatment is a well-recognized technology and is becoming widespread. It provides significant

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NOV - 2 1993

environmental benefits from the standpoint of wastewater treatment, hazardous waste management, and resource conservation and recovery. Potential cost savings from this reuse are substantial, and there is a further energy saving since raw materials are not being consumed. Moreover, the Agency is not aware of any damage incidents resulting from reuse of spent pickle liquor for wastewater treatment (although there have been damage incidents from improper *disposal* of spent pickle liquor (6)). The Agency thus believes it should amend the current regulations to encourage this desirable reuse.

II. The Current Regulatory Structure Affecting Reuse of Spent Pickle Liquor in Wastewater Treatment

The current RCRA regulatory structure controlling spent pickle liquor reuse varies somewhat depending upon whether the ultimate reuser is a POTW or a private wastewater treatment plant. POTWs, under § 122.26(c) of the regulations, have a RCRA permit-by-rule to accept hazardous wastes (including spent pickle liquor) provided they comply with certain of the Subtitle C administrative standards. Private facilities and brokers who accumulate spent pickle liquor prior to reuse, on the other hand, are required to comply with Subtitle C standards applicable to storage facilities (see § 261.6(b)). Generators of this waste are subject to the Part 262 generator requirements, including the § 262.34 requirements for spent pickle liquor accumulated on-site for less than 90 days. This provision requires the generator to comply with certain of the Part 265 technical and administrative requirements applicable for storage facilities storing wastes in containers or in tanks. Generators accumulating spent pickle liquor for over 90 days must obtain a permit as a hazardous waste storage facility. Finally, transporters of the waste are subject ot the Part 263 transporter requirements.

The Agency has received information, and finds it reasonable to believe, that these provisions discourage reuse of spent pickle liquor, particularly when a private wastewater treatment plant is involved. Such facilities presently have to obtain site specific storage permits if they wish to reuse this material. Moreover, some facilities wishing to reuse the material for the first time will not be eligible for interim status, and so will have to obtain a storage permit prior to engaging in the reuse.

The Agency believes that although the Subtitle C regulatory requirements are needed to adequately protect human health and the environment in many reuse contexts, these requirements are not needed when spent pickle liquor is reused in wastewater treatment. The remainder of this preamble sets out the Agency's basis for this conclusion and describes its revised regulatory scheme.

III. Revised Regulatory Scheme

A. The Decision Not to Impose Substantive Storage Requirements

EPA has determined that reuse of spent pickle liquor in wastewater treatment does not require substantive regulation under the RCRA Subtitle C regulations, provided the reuse occurs at a facility holding a National Pollution Discharge Elimination System (NPDES) permit. The Agency is taking this step in part to encourage a desirable reuse, but also because the objectives of the Subtitle C regulations appear to be met without imposition of explicit regulations. The hazardous waste regulations which are applicable to reused materials seek to assure secure storage prior to reuse, and proper tracking of the reused material from the generator to the point of final reuse. A number of factors tend to assure proper storage of spent pickle liquor which is reused in wastewater treatment. First, since spent pickle liquor is corrosive, it must be stored in special corrosion-resistant tanks; it will otherwise corrode through most conventional metal tanks and do extensive damage to the physical plant and to exposed workers. Thus, the risks of improper containment are so high and so immediately obvious that every effort is typically made to ensure secure storage. In fact, spent pickle liquor normally is stored in specialized tanks made of fiberglass reinforced with a plastic liner, a rubber liner or brick coating. (3,4,7)[1]

There is little risk of significant overaccumulation of the pickle liquor prior to reuse. Because the volumes of spent pickle liquor involved are so large (up to tens of thousands of gallons daily per facility), storage capacity available at any facility handling the material—whether the generator, an intermediate broker, or the user facility—is usually far less than the amount of spent pickle liquor handled over time.

Thus, there is a strong incentive to assure constant turnover of the material. These facilities' only alternative would be to add huge amounts of storage capacity, an unrealistic option because of the costs of specialized tanks and land. Retention time of the material at most facilities actually averages only a few days, and in some cases, hours (5). In addition, reusing facilities have a further strong incentive to ensure material turnover, since they must reuse the spent pickle liquor in order to comply with their NPDES permit limitations.

In considering whether any storage requirements should be imposed on this reuse, the Agency also is aware that the commercial chemical for which spent pickle liquor often substitutes in wastewater treatment—ferric chloride—is equally hazardous, but is not subject to RCRA regulation (it is not a waste). In this type of situation, the Agency hesitates to assert regulatory control over storage of spent pickle liquor when facilities may well turn to the equally corrosive and metal-contaminated ferric chloride under the same conditions and not be subject to RCRA regulation. This factor takes on particular importance when there appears to be adequate assurance of secure storage of the spent pickle liquor in any case. In addition, the facilities are aware of the problems of properly storing corrosive reagents such as ferric chloride, and so already have the equipment and know-how to handle spent pickle liquor properly.

With regard to storage of spent pickle liquor, therefore, the Agency believes that human health and the environment are adquately protected without imposition of regulatory standards. Existing storage practices already appear to satisfy the RCRA tank design standards. There is minimal risk of overaccumulation of the spent pickle liquor. The Agency also notes that as a practical matter many generators of spent pickle liquor will remain subject to most applicable Subtitle C regulations dealing with waste storage (particularly § 262.34) because they commingle the spent pickle liquor destined for reuse with spent pickle liquor destined for disposal. Thus, some measure of regulatory control is maintained for storage of the material at these facilities. In sum, the Agency does not believe that imposition of storage standards is needed to control spent pickle liquor being reused, or being accumulated for reuse, in wastewater treatment at NPDES-permitted facilities.

B. The Decision Not To Impose Tracking Standards

EPA also does not believe that it is necessary to impose tracking (*i.e.* manifest) or related administrative requirements on persons handling spent pickle liquor for reuse, or prior to its reuse, in wastewater treatment at NPDES facilities. In part, this is because the material is needed by the user

[1] Pickle liquors containing low concentrations of acid may, however, feasibly be stored in some metal-lined tanks.

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facility as a commodity for its wastewater treatment operations, and the facility will be unable to meet its NPDES permit obligations unless it receives the material. The facility thus has a strong incentive to assure that its shipments arrive safely.

Furthermore, the spent pickle liquor meets the Department of Transportation's definition of a corrosive hazardous material and so in most cases (that is, all those involving an interstate shipment or an interstate carrier) must be shipped in compliance with Department of Transportation hazardous materials regulations, which specify standards for placarding, labeling, marking, and packaging. In addition, each shipment of the material must be accompanied by a DOT shipping paper containing a description of the material, its destination and other pertinent information. These requirements, coupled with the material's use as a commodity appear to the Agency to provide reasonable assurance that the spent pickle liquor will be transported safely to and arrive at the user facility.

The Agency also does not believe it necessary to impose any reporting requirements on NPDES facilities engaging in reuse of the spent pickle liquor, or on persons accumulating spent pickle liquor prior to such reuse. Since the reuse itself is well documented and understood, the Agency sees no gain from imposing these administrative requirements.

C. The Revised Regulation

EPA has therefore determined that spent pickle liquor reused in wastewater treatment at an NPDES facility does not require regulation under the RCRA Subtitle C waste management system. The Agency is amending § 261.6(a) of the regulations to indicate that spent pickle liquor, when so reused, may be managed without regulation.

EPA, under section 6002 of RCRA, also is considering the development of a procurement guideline for the reuse of spent pickle liquor in wastewater treatment for the purpose of phosphorous removal. Such a guideline, if implemented, would allow procuring agencies using Federal funds to purchase chemicals for the purpose of phosphorous removal in wastewater treatment, and would encourage spent pickle liquor to be bid as an alternate material for reuse. The guideline would not apply if spent pickle liquor is unavailable (or if its reuse would be technically inappropriate for a particular treatment operation). This guideline may not appear until after the close of the comment period to the present regulation, so EPA desires comments on the general appropriateness of a procurement guideline to be submitted along with other comments to this regulation.

D. Recordkeeping

By this amendment, the Agency is deleting any regulatory requirements for keeping records which document that spent pickle liquor is in fact being reused, or is destined for reuse, at an NPDES facility. However, in any enforcement proceeding, the burden to show that the spent pickle liquor is actually being accumulated or reused for this purpose rests on the person making the claim. Documentation substantiating the claim may include shipping papers, bills of lading or other records showing a contractual agreement among the generator, transporter, broker or NPDES facility.

E. Interim Final Promulgation and Effective Date of Regulation

EPA has determined under section 553 of the Administrative Procedure Act, 5 U.S.C. 553, that there is good cause for promulgating these amendments without prior notice and comment. This amendment lessens the regulatory burden on the public, and will have the effect of encouraging a desirable reuse. Delay could result in unnecessary expense for NPDES facilities which otherwise would reuse spent pickle liquor in their wastewater treatment operations. If promulgation is delayed, generators would have to dispose of a material which otherwise can be used beneficially. Furthermore, the Agency believes that human health and the environment will not be harmed, and in fact will benefit by this reuse. Under these circumstances, EPA believes good cause exists to promulgate these rules without prior notice and comment. (Readers will, of course, have ample opportunity to comment on these amendments before they are issued in "final final" form.)

EPA also is providing that these regulations take effect immediately. Although section 3010(b) of RCRA provides that EPA hazardous waste regulations take effect six months after their promulgation, the purpose of this requirement is to allow persons handling hazardous waste sufficient lead time to prepare to comply with new regulatory requirements. This rationale ordinarily is inapplicable when a rulemaking is deregulatory in effect. Further, the Agency has determined that the current regulatory standards may discourage a desirable type of reuse, so that immediate effectiveness of this amendment promotes RCRA's material recovery goals. The Agency therefore believes that delaying this regulation's effective date would be counterproductive, and has decided to opt for immediate effectiveness.

F. Compliance With Executive Order 12291

Under Executive Order 12291, EPA must determine whether a regulation is "major" and therefore subject to the requirement of a Regulatory Impact Analysis. The present regulation reduces burdens, and therefore is not a major regulation under the Executive Order. For the same reason this regulation will not have a significant economic impact on a number of small entities and therefore, does not require a Regulatory Flexibility Analysis. This regulation was submitted to the Office of Management and Budget for review as required by the Executive Order.

Dated: August 28, 1981.

John W. Hernandez, Jr.,

Acting Administrator.

References

1. Kerecz, Mohr, and Jones (1980) "Use of Spent Pickle Liquor to Remove the Phosphates in Municipal Sewage Treatment Plants."
2. Ernest, Birner and Munsey, "Eight Years of Successful Phosphorus Removal in an Activated Sludge Plant Treating 140 M.G.D.", presented at Central States Water Pollution Control Association 52d Annual Conference, Pheasant Run, Illinois (1979). (It should be noted that many additional references for this point are available. The Agency is citing two which are illustrative.)
3. U.S. EPA, "Process Design Manual for Phosphorus Removal" Chapter 10, EPA 625/1-76-001a (1976).
4. Personal Communication of Agency staff with Ed Jones III, Chief Process Engineer, Blue Plains Wastewater Treatment Plant (May, 1981).
5. Personal Communication of Agency staff with American Iron and Steel Institute, Office of Environmental Affairs, May 21, 1981.
6. U.S. EPA, Hazardous Waste Listing Background Document for Spent Pickle Liquor (1980).
7. Personal Communications of Agency staff with Reiss, Inc., By-products Management, Inc., and Conservation Chemicals, Inc., all waste exchange brokers handling spent pickle liquor (June, 1981).

For the reasons set out in the preamble, Title 40 of the Code of Federal Regulations is amended as follows:

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

1. The authority citation for Part 261 reads as follows:

Authority: Secs. 1006, 2002(a), 3001 and 3002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and

NOTE in "D" ABOVE, THAT IT IS STILL KEYSTONES' RESPONSIBILITY TO PROVE (IF NECESSARY) THAT THE WPL IS REUSED PROPERLY

Recovery Act of 1976; as amended (42 U.S.C. 6905, 6912(a), 6921 and 6922).

2. Section 261.6 is amended by revising paragraph (a) and the introductory text of paragraph (b) and by adding paragraph (a)(3)(i) to read as follows:

§ 261.6 Special requirements for hazardous waste which is used, reused, recycled or reclaimed.

(a) Except as otherwise provided in paragraph (b) of this section, a hazardous waste which meets any of the following criteria is not subject to regulation under Parts 262 through 265 or Parts 122 through 124 of this Chapter and is not subject to the notification requirements of Section 3010 of RCRA until such time as the Administrator promulgates regulations to the contrary:

* * * * *

(a) (3) It is one of the following materials being used, reused, recycled or reclaimed in the specified manner:

(i) Spent pickle liquor which is reused in wastewater treatment at a facility holding a National Pollutant Discharge Elimination System (NPDES) permit, or which is being accumulated, stored, or physically, chemically or biologically treated before such reuse.

(b) Except for those wastes listed in paragraph (a)(3) of this section, a hazardous waste which is a sludge, or which is listed in Subpart D, or which contains one or more hazardous wastes listed in Subpart D; and which is transported or stored prior to being used, reused, recycled or reclaimed is subject to the following requirements with respect to such transportation or storage:

* * * * *

[FR Doc. 81-25989 Filed 9-4-81; 8:45 am]
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Keystone Group

7000 SOUTH WEST ADAMS STREET, PEORIA, IL 61641 (309) 697-7020

February 13, 1981

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ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

Mr. Miles Morse
Office of Solid Waste
Hazardous & Industrial Waste Division
United States Environmental Protection Agency
401 M. Street S.W.
Washington, D.C. 20460

Dear Mr. Morse:

Enclosed is the formal petition for hazardous waste delisting of Keystone Group - Bartonville Plant waste water treatment sludge (formerly hazardous waste #K063), generated from the lime neutralization of spent pickle liquor (K062). Our RCRA facility I.D. # is ILD 000714881 as obtained from USEPA - Region V.

I believe that the Agency will find all the data necessary to grant delisting in accordance with 40CFR260.22.

Keystone appreciates the action you have already taken in delisting the sludge at our sister facility in Crawfordsville, Indiana. Your early review of this similar petition for our Bartonville facility will be greatly appreciated.

If you need additional information, please call me on my direct phone A/C 309-697-7552.

Very truly yours,

Dale L. Bennington

DALE L. BENNINGTON, P.E.
MANAGER, ENVIRONMENTAL ENGINEERING

DLB:bmk
Enclosure

cc: U.S. EPA - Region V, J.S. Goldstein
IEPA - Springfield, D. Umfleet

bcc: J. W. Mahannah
M. H. Henning
J. J. Monroe

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Keystone Group - Bartonville Plant; Peoria, Illinois, involved in the manufacture of steel, wire and wire products, hereby petitions the United States Environmental Protection Agency for the delisting of its Waste Water Treatment Plant (WWTP) Sludge, formerly listed as EPA Hazardous Waste No. K063 (sludge from the lime treatment of spent pickle liquor from a steel finishing operation).

On November 12, 1980 (45FR74884), the EPA removed waste K063 from the Hazardous Waste List (261.32). However, since lime treatment sludge is generated from the treatment of a hazardous waste (K062), it still is considered to be a hazardous waste (261.3(c)(2)). Further, this waste will remain hazardous until it no longer meets any of the characteristics of a hazardous waste and is delisted (261.3(d) (2)).

40CFR 260.20 (b)

1. The petitioner's name and address:

   Keystone Group - Bartonville Plant
   7000 South Adams St.
   Peoria, Illinois 61641

2. A statement of the petitioner's interest in the proposed action:

   Since the lime treatment of this spent pickle liquor is properly conducted at this facility, the generated sludge is rendered non-hazardous. The waste sludge is the only material stored in these sludge lagoons on Keystone property. Delisting of this sludge as a hazardous waste will remove the very considerable burden, both technical and financial, of managing a hazardous waste storage/ disposal facility under the RCRA regulations. Delisting will also remove adverse local public opinion associated with hazardous waste storage and disposal.

3. A description of the proposed action, including (where appropriate) suggested regulatory language:

   An exclusion in response to a delisting petition submitted in accordance with 40CFR260.20 and 260.22 and granted pursuant to 40CFR260.22 (M):

   "That the Waste Water Treatment Plant sludge generated from this facility be excluded from the list of hazardous waste under 40CFR 261, and from the management standards issued by EPA under Sections 3002 through 3006 of RCRA (40CFR Parts 262 through 265 and 122 through 124)."

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4. A statement of the need and justification of the proposed action, including any supporting tests, studies or other information:

The primary concern of the waste sludge is that it is derived from a hazardous waste (spent pickle liquor from steel finishing - K062) which may contain high concentrations of lead and chromium. It is believed that these heavy metals will be found in excessive concentrated form in the waste and that a potential hazard is eminent if uncontrolled leaching occurs. As the result of an effectively conducted lime treatment process, the waste sludge that is generated from this facility has been proven to be non-hazardous by laboratory analysis. The concentrations of lead and chromium in the EP waste extracts (leachate) are significantly less than the maximum concentration levels for lead and chromium contained in 261.24. Additionally, all four sample extracts were analyzed for the other toxic metals. Analysis results show that the concentrations of these toxic metals in the leachate are significantly less than the maximum concentration levels specified in 261.24. One sample was also analyzed for the leachate of toxic organics. The analysis results show that these organics are not present.

40CFR260.22(i):

1. The name and address of the laboratory facility performing the sampling and tests of the waste:

Daily Analytical Laboratories
7807 N. Pioneer Lane
Peoria, Illinois 61615

2. The names and qualifications of the persons sampling and testing the waste:

Daily Analytical Laboratories performed the total analysis including the sampling and analysis.

Daily Analytical Laboratories is approved by the Illinois Environmental Protection Agency for the analysis of drinking water for certain organic and inorganic parameters. Their certification number is 100180.

The staff of Daily Analytical Laboratories and their qualifications are enclosed as Page 3.

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Daily Analytical Laboratories
7807 N. Pioneer Lane • Peoria, Illinois 61615 Tel. 309-692-5252

Eugene J. Daily, Chairman
John P. Higgins, President
Otis E. Michels, Vice President
James F. Dallmeyer
Laboratory Director

STAFF

Peoria, Illinois

Employee	Formal Education	Major	Function	Area of Responsibility	Experience	Average Hours/We
James F. Dallmeyer	B.S.	Chemistry	Laboratory Director	Chemistry Bacteriology Trace Organics	1 year USDA 7 years DAL	40+
John R. LaPayne	B.S.	Chemistry Biology	Chief Chemist	Chemistry Bacteriology	2 years DAL	40+
Kurt Stepping	B.S.	Chemistry	Staff Chemist	Chemistry	1 year Chillicothe San. Dist. 1 year DAL	40+
Diane Osborne-Heakin	B.S.	Agriculture Biology	Microbiologist	Bacteriology	1 year USDA 1 year DAL	40+
Parimala Kothandaraman	B.S.	Chemistry	Staff Chemist	Chemistry Bacteriology	2 years ISWS 5 years DAL	30+
Susan A. Wahls	B.S.	Chemistry	Staff Chemist	Trace Organics	1 year Harris Research 1 year G.D. Searle 1 year DAL	20
Jean Y.W. Chang	M.S.	Chemistry	Staff Chemist	Chemistry	7 years Carnegie-Mellon Institute 3 years DAL	20
Dorothy J. Dunn	H.S.		Secretary		5 years DAL	32+

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3. The Dates of Sampling and Testing:

(DAL) SAMPLE #	SAMPLE NAME	SAMPLING DATE	TESTING DATES	REPORT DAT
0351-14	Sludge-EP Toxicity	12-16-80	12-16-80/1-13-81	1-13-81
0358-69	" "	12-23-80	12-23-80/1-08-81	1-08-81
1013-18	" "	1-13-81	1-13-81/1-22-81	1-22-81
1020-22	" "	1-20-81	1-20-81/2-02-81	2-02-81

4. The location of the generating facility:

Keystone Group - Bartonville Plant
7000 South Adams Street
Peoria, Illinois 61641

5. A description of the manufacturing process or other operations and feed materials producing the waste and an assessment of whether such processes, operations or feed materials can or might produce a waste that is not covered by the demonstration:

The Keystone Group - Bartonville Plant - utilizes the process of cold drawing, acid pickling and lime treatment in the production of wire from carbon steel wire rods. This process would not produce a waste that is not covered by this demonstration. The sludge is generated by our Waste Water Treatment Plant operated in accordance with our NPDES Permit No. IL 0002526. Enclosed is a copy of Drawing No. 50008 which shows the waste water flow and the lime neutralization process in schematic form.

6. A description of the waste and an estimate of the average and maximum monthly and annual quantities of the waste covered by the demonstration:

Eighty-five (85) percent of the waste sludge is generated from lime neutralizating solutions of sulfuric acid and water which is used to remove scale from the wire rod surface (pickle liquor).

Fifteen (15) percent results from steam generating boiler blowdown plus preparation of wire through coating operations. The coating operations include sodium hydroxide solutions for degreasing and etching, flash hydrochloric acid contact and hot dip galvanizing operations.

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1013-18	" "	1-13-81	1-13-81/1-22-81	1-22-81
1020-22	" "	1-20-81	1-20-81/2-02-81	2-02-81

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6. Continued

Currently, seventy (70) tons of this waste sludge is generated daily. The maximum generating capacity is eighty-five (85) tons per day at full production. The average and maximum annual quantities of generated waste is 15,000 to 18,000 tons per year respectively. The resulting sludge is composed of twenty (20) percent solids by weight and eighty (80) percent water by weight while having a mud-like consistency.

7. Pertinent data on and discussion of the factors delineated in the respective criterion for listing a hazardous waste, where the demonstration is based on the factors in 261.11(a)(3):

Since the primary concern with lime treatment sludges is whether they will leach significant concentrations of lead and chromium, consideration of this petition is requested based on the laboratory data that proves concentrations of lead and chromium in EP waste extracts are significantly less than the maximum levels contained in 261.24, without consideration of other delisting factors.

8. A description of the methodologies and equipment used to obtain the representative samples:

Representative 'Grab-type' samples were taken directly from the active south sludge lagoon. All waste samples were taken in accordance with guidelines established by USEPA's, Samplers and Sampling Procedures for Hazardous Waste Streams, EPA-600/2-80-018. Samples were collected approximately 25' from shore in the vicinity of the Inlet Pipe with the use of an Echmann Dredge (Wildlife Supply Co., Saginaw, MI).

All samples were tagged as to sample location, date, time, client, sampler and transporter. In addition, a short description of sample location, sample and techniques used was entered into a field sample log which is kept on file at the laboratory.

9. A description of the sample handling and preparation techniques, including techniques used for extraction, containerization and preservation of samples:

Samples were placed in nitric acid rinsed glass jars with Aluminum Foil liners at the sampling location. Each sample was assigned a unique sample number and stored at 4°C until analysis. All work is recorded in permanent laboratory notebooks, with bound, numbered pages in ink. Work is dated and initialled. All procedures used are those described in Federal Register May 19, 1980, Appendix II-EP Toxicity Test Procedure and Test Methods for Evaluating Solid Waste (SW-846). All completed samples are currently retained in storage at the laboratory.

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10. A description of the tests performed (including results) are as follows:

A total of four sludge samples were collected over a six week period to represent the variability of or the uniformity of the waste in accordance with 40CFR260.22 (h).

The first sludge sample (DAL Sample #0351-14) was analyzed for ignitability, corrosivity, reactivity (cyanide, sulfide), and all the EP Toxicity Contaminants per Table I in 40CFR261.24.

The subsequent three samples were analyzed for all the heavy metal EP toxic (Table I) contaminants.

The test results for these sludge samples are listed below:

Hazardous Waste (No.)-Characteristic		Daily Sample No. 0351-14 (12-16-80)	0358-69 (12-23-80)	1013-18 (1-13-81)	1020-22 (1-20-81)	Allowable (Max.)
(D001)-Ignitability, flashpoint		>200°F	NT	NT	NT	140°F
(D002)-Corrosivity, Ph		8.3	"	"	"	<2, >12.5
(D[illegible]-Reactivity -						
Tot.Cyanide	(mg/l)	0.02	"	"	"	N/A
Tot.Sulfide	"	43.	"	"	"	N/A
EP Toxicity (No) - Substance						
(D004)-Arsenic	(mg/l)	<0.001	<0.001	<0.001	<0.001	5.0
(D005)-Barium	"	2.2	1.3	0.59	4.2	100.0
(D006)-Cadmium	"	<0.01	<0.01	<0.01	<0.01	1.0
(D007)-Crome(total)	"	<0.03	<0.03	<0.02	<0.01	5.0
(D008)-Lead	"	0.08	0.60	0.39	1.20	5.0
(D009)-Mercury	(PPb)	<0.04	0.34	<0.04	<0.04	200.0
(D010)-Selenium	(mg/l)	0.02	0.016	0.008	0.033	1.0
(D011)-Silver	"	<0.02	<0.02	<0.01	<0.01	5.0
(D012)-Endrin	"	<0.01	NT	NT	NT	0.02
(D013)-Lindane	"	<0.003	"	"	"	0.40
(D014)-Methoxychlor	"	<0.05	"	"	"	10.00
(D015)-Toxaphene	"	<0.20	"	"	"	0.50
(D016)-2,4-D	"	<0.01	"	"	"	10.0
(D017)-2,4,5-TP Silvex	"	<0.01	"	"	"	1.0

N/A = Not Available
NT = No Test

The test results show that the sludge is not a hazardous waste. Note that all four samples were tested for all the heavy metal leachates not just lead and chromium. The results show that the toxic organics are not present in the waste leachate and that all the heavy metals are considerably less than the allowable leachate levels.

11. The names and model numbers of the instruments used in performing the tests:

Fisher/Tag Open Flashpoint Tester No. 13-512-1
Millipore Hazardous Waste Filtration System OM0100
Corning Model 110 Expand Scale pH Meter
Orion Model 399A pH Meter
Chemtrix Model 45AC pH Controller
Master Flex No. 7543-20 Pump Drive with 7017 head
Phipps and Bird Laboratory 6 Paddle Stirrer
Bausch and Lomb Spectronic 20
Perkin-Elmer Model 305A Atomic Absorption Spectrophotometer
Perkin-Elmer Model HGA 400 Graphite Furnace
Perkin-Elmer Model 2380 AAS
Mettler PC 180 Top Loading Balance
Mettler H 20, Semi-Micro Balance
Strip Chart Recorders, 4 each
Perkin-Elmer 3920 Gas Chromatograph with dual ECD and FID
Perkin-Elmer Sigma 4, Thermal Conductivity Detector
Other equipment/glassware indigenous to an analytical laboratory
Include hot plates, drying ovens, balances

12. Statement to be signed by generator of waste or authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possibility of fine and imprisonment.

Dale L. Bennington, P.E 2/13/1981.

DALE L. BENNINGTON, AUTHORIZED AGENT
MANAGER, ENVIRONMENTAL ENGINEERING
KEYSTONE GROUP, A DIVISION OF
KEYSTONE CONSOLIDATED INDUSTRIES, INC.

RECEIVED
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STATE OF ILLINOIS

TRADE SECRET
Attachment L is
claimed as a Trade Secret

ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF KEYSTONE STEEL	)	As 90-
AND WIRE COMPANY FOR HAZARDOUS	)	(Adjusted Standard)
WASTE DELISTING	)	

NOTICE OF FILING

PLEASE TAKE NOTICE that on Tuesday, January 22, 1991, we filed the Petition for Delisting and Adjusted Standard with the Clerk of the Pollution Control Board, a copy of which is attached hereto and served upon you.

Respectfully submitted,

KEYSTONE STEEL AND WIRE COMPANY

By: Melissa A. Wynne
One of its Attorneys

Lee R. Cunningham
Melissa A. Wynne
GARDNER, CARTON & DOUGLAS
321 North Clark Street
Suite 3100
Chicago, Illinois 60610-4795
(312) 644-3000

9098w

TRADE SECRET
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ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF:	)	
	)	
PETITION OF KEYSTONE STEEL	)	As 90-
AND WIRE COMPANY FOR HAZARDOUS	)	(Adjusted Standard)
WASTE DELISTING	)	

PETITION FOR DELISTING AS AN ADJUSTED STANDARD

Keystone Steel and Wire Company (Keystone), through its attorneys, hereby petitions the Board to delist its treated K061 waste produced at its facility in Peoria County.

The United States Environmental Protection Agency (U.S. EPA) has designated electric arc furnace (EAF) dust as a listed hazardous waste (K061) under RCRA, and Illinois has adopted that listing as State law. This document is a petition to exclude the EAF dust produced in the manufacturing process at Keystone from the K061 listing after Super Detox stabilization. This petition sets forth the information required by the Board for delisting pursuant to an adjusted standard proceeding, which includes the criteria required for delisting as set forth at 40 CFR 260.20 and 260.22, Section 3001(f) of the Resource Conservation and Recovery Act (RCRA) and the Vertical and Horizontal Spread (VHS) groundwater transport model (50 Fed. Reg. 48886-910, November 27, 1986). General guidance was received from the U.S EPA and its contractor, ICF Technology, as well as specific U.S. EPA reference materials such as <u>Petitions to Delist Hazardous Waste - A Guidance Manual</u> for use in preparation of this delisting petition. Keystone's treated EAF dust

is proposed for delisting following all applicable delisting procedures and using the Super Detox Process which has been specifically designed to treat EAF dust through chemical stabilization to render it non-hazardous.

Keystone produces an electric arc furnace dust that is listed as a hazardous waste. Present disposal is to an off-site hazardous waste (Part B) landfill. Keystone desires to use the Super Detox process to chemically stabilize its EAF dust such that leaching of hazardous constituents will not occur at concentrations that exceed the National Primary Drinking Water Standard in conjunction with the VHS model, which standards and model are the only ones presently used for delisting by the U.S. EPA.

The effectiveness of the Super Detox stabilization process has been confirmed by the U.S. EPA through its May 22, 1989 granting of two delisting petitions for the same wastes treated by the same stabilization process for two Bethlehem Steel plants. The Super Detox process which Keystone proposes to use is licensed by Bethlehem Steel. In granting Bethlehem Steel's delisting requests the U.S. EPA

> determined that the hazardous constituents found in the waste would not pose a threat to human health and the environment. Specifically, the Agency used its vertical and horizontal spread (VHS) model to predict the potential mobility of the hazardous constituents in the petitioned waste. Based on this evaluation, the Agency determined that the constituents in Bethlehem's waste would not leach and migrate at concentrations above the health-based levels used in delisting decision-making. (54 Fed. Reg. 21941).

The U.S. EPA further stated that it "believes that Bethlehem's stabilization process effectively immobilizes all of the EP toxic metals, nickel and cyanide. (54 Fed. Reg. 21944).

On-site treatment that provides for chemical stabilization and subsequent conversion of EAF dust from a hazardous to a non-hazardous material is not only a very reliable approach but also very attractive from the standpoint of reducing bulk hazardous waste destined for landfilling in already strained TSD facilities. From an environmental perspective chemical stabilization produces a material that is non-hazardous and can be disposed of without adverse environmental impact. Keystone seeks to use the Super Detox process to obtain a non-hazardous classification of the treated Keystone EAF dust to significantly reduce the cost burden associated with the hazardous waste disposal of approximately 10,000 tons of EAF dust per year. In short, chemical stabilization using the Super Detox process is a far more environmentally sound and cost-effective approach to EAF dust management.

A. STANDARD FROM WHICH ADJUSTED STANDARD IS SOUGHT (Section 106.705(a))

Keystone seeks an adjusted standard from 35 Ill. Adm. Code 721.132 for treated K061: Emission control dust/sludge from the primary production of steel in electric furnaces in the Iron and Steel industry. This section is applicable to Keystone's EAF emission control dust, even after Super Detox stabilization, and has the effect of requiring stabilized EAF dust to be handled

and disposed of as a RCRA hazardous waste, despite the fact that after Super Detox stabilization, the material exhibits no hazardous waste characteristics. Section 721.132 became effective on May 17, 1982, pursuant to Section 700.106.

B. SECTION 721.132 IMPLEMENTS RCRA (Section 106.705(b))

Section 721.132 was adopted as a rule identical in substance to 40 C.F.R. §261.32, which is part of the U.S. EPA's RCRA program implementing the Resource Conservation and Recovery Act.

C. LEVEL OF JUSTIFICATION (Section 106.705(c))

Section 721.132 does not specify a level of justification. However, pursuant to Section 720.122(n)(2), delistings which have not been adopted by the U.S. EPA may be proposed to the Board as a petition for an adjusted standard, and in such case the justification "is as specified in subsection (a), *et seq.*, as applicable to the waste in question." Subsection (a), *et seq.* sets forth the conditions under which the Board will grant the petition based upon the type of waste. Subsection (d) applies to K061 since it is listed as code "T" in Section 721.132.

Subsection (d) requires the petitioner to demonstrate that the waste: does not contain the constituents that caused the waste to be listed (Section 720.122(d)(1)(A)), or although containing such constituents, does not meet the criterion of 35 Ill. Adm. Code 721.111(a)(3) when considering the factors used

in 35 Ill. Adm. Code 721.111(a)(3)(A) through (K) under which the waste was listed as hazardous (Section 720.122(d)(1)(B)). Further, the petitioner must demonstrate that the waste does not exhibit any hazardous waste characteristics (paragraph (d)(4)). Finally, any demonstration by the petitioner must include analysis of at least four representative samples taken over a period sufficient to represent variability (subsection (h)) and must include all of the information required by subsection (i). Each of these factors is discussed below.

1. **Although Containing Constituents Causing The Waste To Be Listed, Treated EAF Dust Does Not Meet The Criterion Of 35 Ill. Adm. Code 721.111(a)(3) When Considering The Factors Of 35 Ill. Adm. Code 721.111(a)(3)(A)-(K)**

Pursuant to Appendix G of 35 Ill. Adm. Code 721, K061 is listed as a hazardous waste due to the presence of hexavalent chromium, lead and cadmium. Keystone's EAF dust does in fact contain these constituents. Thus, the EAF dust does not qualify for delisting pursuant to Section 720.122(d)(1)(A), and to qualify for delisting Keystone must proceed pursuant to paragraph (d)(1)(B) to demonstrate that the stabilized EAF dust is "not capable of posing a substantial or potential hazard to human health or the environment" in light of the factors set forth at Section 721.111(a)(3)(A)-(K). A discussion of these factors is set forth below.

(a) The Nature of the Toxicity (721.111(a)(3)(A))

Keystone proposes to chemically stabilize its EAF dust and dispose of it at a properly permitted non-hazardous landfill. While chromium, lead and cadmium all have known adverse environmental impacts when released to the environment, the proposed stabilization process will render these constituents unavailable to the environment at concentrations sufficient to cause environmental harm. When properly managed, the low permeability of the stabilized material will virtually eliminate the potential to generate leachate or release heavy metals due to the inability of the low permeability material to saturate and, therefore, generate leachate. That is, while unstabilized EAF dust will leach, when stabilized these constituents will be bound up and will not leach into the groundwater at concentrations which exceed the human health criteria leachate standard. The Vertical and Horizontal Spread (VHS) Groundwater Transport Model is a complex mathematical model, having the objective of predicting attenuation of dissolved metals in groundwater. USEPA selected this approach as a reasonable worst-case scenario for determining the impact of waste disposal sites on downstream wells or aquifers. For EAF dusts, the upper limit of metals concentration in TCLP Leachate is 6.3 times the standards. (See, 54 Fed. Reg. 21943).

(b) Concentration of Constituent in Waste (721.111(a)(3)(B))

Keystone's EAF dust is composed of approximately 0.109% chromium, 1.535% lead and 0.046% cadmium. However, after stabilization using the Super Detox Process, these concentrations will be somewhat lower due to its mixture with other materials. The combined mixture of additives and EAF dust used in the Super Detox process will generally be less than a total combined factor of 1.4 times the original weight of the EAF dust.

(c) Migration Potential (721.111(A)(3)(C))

After stabilization, the elements of concern in the EAF dust will not leach out in quantities exceeding six times the National Primary Drinking Water Standard (NPDWS). Based upon the VHS model, this means that outside landfill boundaries, the NPDWS will be met. In granting Bethlehem Steel's delisting requests the U.S. EPA concluded that:

> The VHS model analysis provides a conservative and reasonable worst-case evaluation of the waste's effect on the underlying aquifer. The predicted compliance point concentrations resulting from this conservative analysis were below the levels of concern used for delisting purposes. (54 Fed. Reg. 21943).

(d) Persistence and Degradation (721.111(a)(3)(D))

Once stabilized, the constituents of concern will persist and will not degrade. That is the point of the stabilization process: they will be bound up and will not leach into the environment.

(e) Degradation Into Non-Harmful Constituents (721.111(a)(3)(E))

See (d), above.

(f) Bioaccumulation (721.111(a)(3)(F))

Lead can bioaccumulate. However, once stabilized, the constituents of concern are bound up such that they are not available to the ecosystem for bioaccumulation.

(g) Plausible Improper Management (721.111(a)(3)(G))

Landfill disposal is a reasonable worst-case management scenario, and the conditions which would have to exist to cause any adverse environmental impact are implausible. Such adverse impact could not occur unless the material were continuously left exposed and subjected to extreme acidic washes over an extended period of time. Multiple extraction procedure tests have demonstrated that the material will not break down and leach after repeated acidic washes in accordance with the required protocol. Landfill conditions which would approximate these test conditions could not be reasonably anticipated.

In granting Bethlehem Steel's delisting requests the U.S. EPA stated:

> Landfill disposal is a reasonable worst-case management scenario for Bethlehem's solidified waste. Contamination of surface water might occur, therefore, through runoff from the petitioned waste. However, U.S. EPA believes that the concentrations of any hazardous constituents in that run-off will tend to be lower than the levels in the EP leachate analysis reported in the proposal due to the acidic medium of the EP test. Furthermore, any transported constituents would be further diluted in the surface water body. (54 Fed. Reg. 21943).

Keystone believes that these same conclusions apply to its stabilized wastes.

(h) Waste Quantities Generated (721.111(a)(3)(H))

At peak periods Keystone's electric arc furnaces are operated three shifts, 24 hours per day, six and one-half days per week, 50 weeks per year. At normal operating capacity, the furnaces generate approximately 30 tons of baghouse dust per day or 10,000 tons per year.

(i) Improper Management Environmental Impacts (721.111(a)(3)(I))

None. (See, (c) and (g), above).

(j) Other Governmental Actions (721.111(a)(3)(J))

Federal delisting petitions seeking the same relief for the same process were granted to Bethlehem Steel's Johnstown, Pennsylvania and Steelton, Pennsylvania Mills on May 22, 1989 at 54 Fed. Reg. 21941. The Super Detox process would be used pursuant to a license from Bethlehem Steel.

(k) Other Factors (721.111(a)(3)(K))

None.

2. The Waste Is Not Otherwise Hazardous (720.122(d)(3))

The characteristic of ignitibility is not of concern in a material such as Keystone's EAF dust which has been exposed to processing temperatures greater than 3000°F. (See, Section 721.121). Further, no constituents added during the Super Detox process are ignitible. Corrosivity is not exhibited since treated EAF dust, in water, yields pH levels within the range of

2.0 to 12.5. (See, Section 721.122). It has none of the properties of reactivity set forth at Section 721.123.

Based upon the laboratory analyses, the EAF dust is non-hazardous for oil and grease, nickel, sulfide, cyanide and all other constituents or characteristics of hazardous waste. Volatile organics were not included in the analytical work because organics which may have been present in the furnace feed would have been quickly volatilized and destroyed under the very high electric arc furnace temperatures, and no organics are added in the Super Detox process. This is substantiated by the U.S. EPA EAF dust guidance documents that specify heavy metals as contaminants of concern, and these have all been tested. There are no dioxin forming precursors in the furnace feed such that no dioxin is formed.

Keystone does not believe that there are any other factors which could cause its stabilized waste to be hazardous. Once again, the conclusions reached by the U.S. EPA in considering Bethlehem Steel's requests are equally applicable to Keystone:

> Furthermore, in delisting evaluations, U.S. EPA considers all the factors for which the waste was listed, as well as factors other than those for which the waste was originally listed that could cause the waste to be hazardous. See 42 U.S.C. §6921(f). For this specific wastestream. . . U.S. EPA does not believe that any other factors, including elevated total concentrations of the inorganic constituents of concern and nickel, could cause this wastestream to present a hazard to human health and the environment.

* * *

> Additionally, due to the physical and chemical nature of Bethlehem's stabilized waste (i.e. monolithic and non-friable), the Agency believes that direct contact from airborne exposure to hazardous contaminants from the [EAF dust] is unlikely. (54 Fed. Reg. 21943).

3. Representative Sampling (720.122(h))

Sampling was carried out over a period of 24 days. One sample was taken each day and these were ranked by metal concentration. The three highest samples were individually analyzed and the remaining 21 samples were divided into three groups of seven samples. Each group was composited for analysis. Thus, a total of six samples were analyzed (exceeding the minimum of four), and given the low variability seen over the 24-day sampling period, that period is sufficient to represent the variability or uniformity of the waste as required.

4. Information Required by Section 720.122(i)

(a) Sampling and Testing Program (720.122(i)(1))

i. Name and Address of Analytical Laboratory

Conversion Systems, Inc.
200 Welsh Road
Horsham, PA 19044
(215) 784-0990

ii. QA/QC Procedures

(1) Quality Control

Conversion Systems maintains an active quality control program which is essential to laboratory operations in order to guarantee and document accurate testing. Its quality control program includes the following elements:

- Representative sample collection, proper preservation and storage techniques, and analysis within appropriate holding time.

- Adherence to proper approved standard testing procedures.

- Awareness of potential interference which may affect applicability of routine procedures.

- Analysis of quality control check samples, duplicates and spiked samples.

- Permanent records documenting all other aspects of the program.

Conversion Systems' laboratory has a 17 year history as the analytical support arm of an environmental services organization. Awareness of, and compliance with, regulatory requirements and the related protocols have, of necessity, been an integral portion of this laboratory function. Frequent review of protocol and techniques takes place to maintain and continuously upgrade analytical skills.

Other important aspects of Conversion Systems, Inc.'s quality control program include the following:

- Sample containers are selected and prepared in accordance with U.S. EPA protocols. Preservatives are routinely included in proper bottles for sampling personnel convenience and for immediate stabilization of the samples. Bound laboratory notebooks are maintained to record pertinent sample information and to assign laboratory sample identification.

- An internal quality control program includes routine analysis of standard or certified check samples, replication of samples and sample analysis, and spiked sampling. The technique used for a specific test may include one or more of these approaches as

appropriate. Check or certified samples may be prepared in-house, or purchased from outside organizations (National Bureau of Standards or U.S. Environmental Protection Agency) supplying reputable standards. Analyses of quality control testing are evaluated to determine acceptability with regard to accuracy and repeatability of results.

- Detailed instructions of quality control procedures, sample handling and U.S. EPA approved test procedures are utilized from appropriate sections of laboratory manuals or directly from the approved source.

(2) Quality Assurance

Quality control of Conversion Systems, Inc. testing programs assures that analytical test results are accurate. The complete quality assurance program documents quality control activity assuring the quality of the test results and of maintenance of that quality.

The primary components of the Quality Assurance Program in the Conversion Systems' Laboratory are analysts that have received adequate training, use of approved U.S. EPA or equivalent procedures, routine control of precision and accuracy, frequent outside confirmation of internal control, along with records and documentation of activities.

The designated quality control officer or analyst is responsible for preparation of control samples, acquisition of reference samples, program coordination and display of records. Individual analysts are responsible for analysis of control samples at designated frequency, standardizations and recordkeeping. Analysts are expected to evaluate their performance

through frequent self-appraisal. Periodic review of analytical methods with an eye to possible interferences for particular samples and spike analysis for such samples give the analyst confidence in such samples and provide documentation.

(b) Names and Qualifications of Project Team (720.122(i)(2))

The project team for this Petition consists of personnel from Keystone Steel and Wire Corp. and from Conversion Systems, Inc. as follows:

Keystone Steel and Wire Corp.
7000 S.W. Adams Street
Peoria, Illinois 61641

Mr. Dale Bennington
Manager, Energy and Environmental Engineering

Mr. Norman Olmstead
Engineer, Energy and Environmental Engineering

Conversion System, Inc.
200 Welsh Road
Horsham, Pennsylvania 19044

Dr. Yei-Shong Shieh
Director Technical Services
Project Coordination and Administration

Mr. Charles L. Smith
Chief Chemist
Testing Coordination

Mr. John Y. Stevens
Senior Chemist
Protocols and Testing

(c) Sampling and Testing Dates (720.122(i)(3))

A sampling and testing program was developed and subsequently approved on May 1, 1990 by the U.S. Environmental Protection Agency, Washington, DC office of Solid Waste and

Emergency Response. Actual sampling was for a consecutive twenty-four (24) day period, begun February 7, 1990 and completed March 3, 1990. Review of data set forth in Attachment A discloses little variability in the Keystone EAF dust composition. The samples were shipped to Conversion Systems, Inc., Horsham, Pennsylvania laboratory for compositing followed by Super Detox process treatment. The Toxicity Characteristic Leaching Procedure and Multiple Extraction Procedure analytical work was completed by May 9, 1990. An outline of the EAF dust study is set forth in Attachment B. Attachments C and D set forth the testing program chronology.

(d) Generating Facility Location (720.122(i)(4))

Keystone Steel and Wire
7000 S.W. Adams Street
Peoria, Illinois 61641

Contact Person: Dale L. Bennington
Manager, Energy and Environmental Engineering
(309) 697-7020

Facility EPA I.D. No. ILD 000714881

Keystone Steel and Wire Corporation is an independent steel making facility located on 639 acres in the southern portion of Peoria, Illinois. A map showing the location appears in Attachment E.

(e) Description of Manufacturing Process (720.122(i)(5))

Operation of the Keystone facility includes the following activities:

i. The inventory and preparation of scrap materials and fluxes for the steel making facilities.

ii. Two electric arc furnaces complete with charging and steel handling equipment for the production of steel.

iii. A six-strand billet caster to produce 5-inch square billets for use in the Morgan Rod Mill.

iv. A Morgan two-strand Rod Mill which produces rod for the wire trade and internal use by Keystone's wire mill.

v. A Wire Mill for the production of various fencing, welded fabric, special wire products, and nails.

In addition to the production facilities, the Peoria plant includes plant security, fire protection equipment and facilities, a complete mechanical and electrical maintenance organization, materials handling equipment, and steam generation. The ages of these facilities vary considerably and based upon the current level of operation, some of the power house and material handling facilities are down. Power from the Central Illinois Light Company is distributed by Keystone's power distribution system. A general process flow diagram for the facility appears in Attachment F.

The Keystone plant uses several specific grades of scrap to produce steel in two Whiting electric arc furnaces. These consist of two 22 ft. diameter, 56 megawatt electric arc furnaces, each of which is rated at 160-180 tons per heat. The manufacturing process involves the introduction of some 170 tons of sized and graded scrap steel into one of the two electric furnaces and melting the scrap at approximately 3000°F to a molten liquid state. A determination of specific additives required

such as silicomanganese or ferrosilicon is made using spectrographic chemical analysis. Calcined dolomite and burnt lime are also added as needed. The molten steel is then poured through a casting machine to form billets which are cooled, then reheated and rolled/pressed into the final product rod. EAF dust is generated during the steel making process and is collected in two EAF baghouses.

Keystone Steel uses a fairly standard selection of scrap materials. A breakdown of the grades of scrap purchased from August 1989 to February 1990 and scrap usage in charge tons is set forth in Attachment G. The full complement of additives in pounds used for the seven months from August 1989 to February 1990 is shown in Attachment G.

The only source of oil and grease in the steel making process is a minor amount of residue that may be present on scrap components. This residue is quickly volatilized when the scrap enters the high temperature furnace.

(f) Waste Description and Production (720.122(i)(6))

The EAF dust is a fine red brown dust with particles which generally range in size between 0.1 to 14 microns. The dust is fairly uniform in composition. Major components include the following:

	Average Percentage (Reported as Elements)
Iron	25.50
Manganese	4.14
Aluminum	7.02
Magnesium	3.52

Calcium	8.85
Zinc	13.64
Silicon Dioxide	3.20
Sulfur	0.500
Arsenic	0.001
Barium	0.003
Lead	1.536
Cadmium	0.046
Silver	0.005
Chromium	0.109
Mercury	0.0003
Selenium	<0.00013
Nickel	0.015
Cyanide	<0.00007
Oil & Grease	0.031

The percentage composites of the above elements in the dust is fairly uniform. Further, any minor variation which does exist due to the type of scrap being melted is taken into consideration through the structure of the sampling program which is discussed in detail below.

The dust is collected in two baghouses. As noted earlier, under normal operating conditions, the two Keystone electric arc furnaces generate approximately 30 tons of baghouse dust per day, or 10,000 tons per year.

(g) Hazardous Waste Characteristics (720.122(i)(7))

Based upon the factors set forth in Section 721, the waste to be delisted will not be hazardous by characteristic, as more fully discussed at (C)(2), above.

(h) Methodology and Equipment Used in Representative Sampling (720.122(i))

A proposed sampling plan was drafted in January 1990 and submitted to Dr. Chi-Chang Chen of the Variance Section, Office of Solid Waste and Emergency Response, U.S. Environmental

Protection Agency, Washington, DC office by correspondence dated February 26, 1990. The plan was reviewed by U.S. EPA and it's contractor, ICF Technology. Subsequent approval, with modifications, was received by letter date May 1, 1990. (See, Attachment H). The sampling plan required that EAF dust samples be taken daily from each of the two Keystone baghouses at the hopper discharge prior to entering the storage silo. Multiple daily samples were composited to provide one daily composite for each of twenty-four (24) days.

(i) Sample Handling and Preparation Techniques (720.122(i)(9))

The twenty-four (24) daily composites, prepared from multiple samplings from each of two Keystone baghouses, consisted of approximately one quart of composite in each of twenty-four containers. Sampling was carried out by Mr. Norman Olmstead, Keystone's Engineer, Energy & Environmental Engineering. He is knowledgeable of Keystone's facility, having several years experience, and is qualified to collect representative EAF dust samples from daily production.

The baghouses are drawn down daily. Production variables are minimal at the facility, and there was relatively little variation during the sampling period. These samples, along with Chain-of-Custody forms, were forwarded to Conversion Systems, Inc., Horsham, Pennsylvania laboratory. Each sample was packed in a sealed one gallon or one quart plastic container, clearly labeled with a sampling date (which coincides with sampling identification).

In the laboratory, the samples were individually analyzed as per the protocols delineated below. Analyses of the samples shown in Attachment I are based on total metal concentrations. The three highest daily composites (based on total metal concentrations), were tested individually. These composites were not significantly different from the other twenty-one daily composites, as Attachment I indicates. These remaining twenty-one daily composites were divided into three chronologically determined test composites of seven samples each. (See, Attachments B and J).

The compositing used for tests differs slightly from the U.S. EPA's recommendation of at least one month's sampling since that recommendation was not received until after the testing was completed. However, the small differences in daily composites, as shown in Attachment A, indicate that the minor differences in the compositing method would be expected to cause minimal (and for delisting purposes, totally insignificant) analytical differences.

The Super Detox treatment Toxicity Characteristic Leaching Procedure and Multiple Extraction Procedure testing chronologies are presented in Attachment D.

The specific daily EAF dust samples were transferred and composited utilizing clean plastic measuring scoops; the composites were subsequently thoroughly mixed in clean plastic containers for Super Detox process stabilization work. Figure 3 of Attachment B represents the handling, preparation and

analysis steps. Chain-of-Custody records are included in Attachment J. All individual EAF dust samples and composites treated via the Super Detox process were placed in clean plastic containers and clearly labeled for laboratory TCLP or MEP analysis.

(j) Tests Performed and Equipment Utilized (720.122(i)(10))

Analyses were performed as outlined in Attachment B utilizing the equipment listed in Attachment J. The substitution of TCLP for EP leading into the MEP protocol had been previously recommended by telephone contact with Mr. Narendra Chaudharia of U.S. EPA's Delisting Section on April 4, 1990. (See, Attachment H)

Analyses for arsenic, barium, cadmium, total chromium, mercury, lead, selenium, silver, nickel, total cyanide, oil and grease and total sulfide were carried out on the twenty-four (24) daily composited samples. Total sulfide and total cyanide levels are well below 500 mg/kg and 250 mg/kg, respectively. These low levels eliminated the need for reactive sulfide and reactive cyanide determinations.

After Super Detox process treatment, each sample was crushed to pass #100 mesh and subjected to an initial TCLP test, followed by the Multiple Extraction Procedure. The leachate from these protocols was analyzed for silver, arsenic, barium, cadmium, chromium, lead, mercury, selenium and nickel. Total

cyanide, total sulfide and oil and grease were not tested due to the absence of those constituents in the earlier tests. Results of the initial TCLP tests are presented in Attachment I. The Multiple Extraction Procedure analyses on the six test composites are set forth in Attachment K.

The analyses of the Keystone EAF dust and extracts of the treated samples were performed in accordance with methods specified in TEST METHODS FOR EVALUATING SOLID WASTE-SW846 OR METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES-EPA. (See, Attachment J). Conversion Systems' laboratory used the Method of Standard Additions for certain metal analyses carried out by atomic absorption, to ensure the validity of the analytical results. These results parallel those obtained using a standard curve. Therefore, the latter was used to analyze all metal samples from extraction procedures and from total metal analyses. The quality assurance/control (QA/QC) protocol specified in SW846 and in METHODS FOR THE CHEMICAL ANALYSIS OF WATER AND WASTES were maintained throughout the analytical program.

The analytical results presented in this petition demonstrate that the Keystone Electric Arc Furnace Dust can be treated and rendered non-hazardous by use of the Super Detox process. Attachment L outlines details concerning types and ratios of reagents used in the Super Detox process, which are held as "Trade Secret/Confidential and Proprietary Company Information." In that process, the dust will be pneumatically conveyed to the Super Detox process equipment for treatment

where it will be carefully mixed in batches using a microprocessor controlled mixing system. The System measures prescribed dry and wet Super Detox process reagents for treatment of the dust to render the primary metal contaminants (lead, cadmium and hexavalent chromium, as well as other heavy metals for which the dust is not listed under 40 CFR Part 261 Appendix VII) chemically stable and very resistant to leaching consistent with the TCLP/MEP tests and the VHS model for groundwater protection. Super Detox process additives do not introduce reagents which cause the product to exhibit any hazardous characteristics.

As described previously, care was taken to design a dust sampling program that would account for variations encountered in the heavy metal constituents of the electric arc furnace dust. The dust analyses presented in Attachment A are consistent, reflecting consistency in Furnace Scrap Feed. To allow for the minimal variation that does occur, each daily sample was a composite of individual samples taken throughout the twenty-four hour operating day.

Following the sampling program, the individual daily composites were thoroughly blended, resulting in a series of 24 individual samples. A portion of each of these raw dust composite samples were segregated and submitted to total constituent analysis for arsenic, barium, cadmium, total chromium, mercury, lead, selenium, silver, nickel, total cyanide, oil and grease, and total sulfide. These data are presented in Attachment A. In reviewing total constituent analysis, it became clear that:

Total cyanide, ranging from <0.25 to 2.25 mg/kg and averaging <0.69 mg/kl, is below the 250 mg/kg level, above which reactive cyanide must be determined. Furthermore, TCLP Leachate---by dilution--is well below 0.7 mg/kg; no cyanide analysis of TCLP or MEP leachates is therefore required.

Total sulfide, all samples being <10 mg/kg, was found to be well under 500 mg/kg, above which level analyses for reactive sulfide must be performed.

Oil and grease levels ranged from 160 to 492 mg/kg, well under the 10,000 mg/kg level at which the treated wastes must individually be analyzed.

TCLP and MEP extracts were analyzed for silver, arsenic, barium, cadmium, chromium, lead, mercury, selenium and nickel.

(k) TCLP and MEP Test Results

Each of the six (6) final composite samples were treated and subjected to the TCLP followed by nine cycles of MEP extraction. (Note that the Super Detox process samples can be tested immediately after treatment; no curing is required). Analysis was made after each extraction for the constituents in Attachment A which were detected above the threshold level for leachate analysis. The results for the TCLP and nine (9) MEP extractions are set forth in Attachment K. Test protocols are given in Attachment J.

(l) Instruments Used (720.122(i)(11))

The names and model numbers of the instruments used in performing the tests are set forth in Attachment J.

(m) Certification (720.122(i)(12))

The necessary certification appears in Attachment M.

D. NATURE OF ACTIVITY (Section 106.705(d))

The location and description of Keystone's facility is fully set forth at C(4)(d) and (e), above.

E. COMPLIANCE ALTERNATIVES (Section 106.705(e))

Keystone is currently in compliance with all State and federal laws applicable to its handling and disposal of K061. It is seeking delisting of its stabilized waste based upon its demonstration in this petition that the wastes after stabilization can safely be disposed at a non-RCRA facility.

Only three basic options for handling the hazardous (less than 15% zinc subcategory) EAF dust are available to steel producers. These involve: 1) disposal of the dust off-site in a permitted hazardous waste landfill in compliance with the land disposal restrictions, 2) recycling of the dust to recapture metals such as zinc and 3) chemical treatment of the dust to render it non-hazardous. Keystone has explored all three options. Due to the large volume of dust produced at Keystone (some 10,000 tons per year), off-site transportation and disposal in a commercial hazardous waste landfill is unreasonably expensive. (See, cost comparison under Section F, below). While recycling of EAF dust to recapture metals such as zinc is in practice in other areas, such recycling facilities are presently not available to Keystone, nor are they anticipated to be available in the near future. Keystone, therefore, desires to employ chemical stabilization using the Super Detox process. As

demonstrated herein, the Super Detox process is a far more environmentally sound and cost effective approach to management of EAF dust for Keystone than any of the alternatives. This will allow conversion of the dust to a non-hazardous material followed by placement in an appropriately permitted off-site landfill.

F. PROPOSED ADJUSTED STANDARD AND COMPLIANCE COSTS (Section 106.705(f))

Keystone requests that the treated K061 waste generated at its Peoria facility be delisted as a hazardous waste after stabilization by the Super Detox process. Keystone requests the Board to make the following determination:

> Emission control dust/sludge from the primary production of steel in electric furnaces at the Keystone Steel and Wire Corporation's steel making facility located at 7000 S.W. Adams Street in Peoria, Illinois, is not a hazardous waste pursuant to 35 Ill. Adm. 721.132 after stabilization by the Super Detox process.

Such Board action will allow Keystone to stabilize its EAF dust using the process described in Attachment L and to dispose of the stabilized EAF dust at a non-RCRA landfill at a cost of approximately $140-150 per ton for hauling, treatment, and disposal. This compares to a cost of more than $200 per ton for RCRA disposal, representing a savings of more than $500,000 per year.

G. COMPARATIVE ENVIRONMENTAL IMPACT (Section 106.705(g))

Keystone can continue to comply with the regulations by disposing of its EAF dust at a RCRA landfill. The stringent

RCRA-mandated design and operating requirements should reduce the likelihood that any leachate produced would be made available to the environment.

However, using Keystone's proposed disposal method, leachate will not be produced containing concentrations of hazardous constituents at levels which could cause any adverse environmental impact. Thus, there is no need to contain the leachate produced, rendering the stringent RCRA requirements superfluous. This has the benefit of reducing dependence on scarce, and expensive, hazardous waste landfill capacity.

Another beneficial aspect of Keystone's proposal is demonstrated by a consideration of cross-media impacts. The only cross-media impact is that EAF dust is quite light, and under present transportation and disposal operations, it is susceptible to the production of fugitive emissions. Under Keystone's proposal, the Super Detox process equipment will be tailored and adapted to the existing Keystone EAF dust collection system. The dust will be pneumatically conveyed to the treatment equipment for processing. The equipment is designed to eliminate fugitive emissions that might occur during the handling, transfer and treatment of the EAF dust by using sealed couplings and joints, among other things, thereby generating no fugitive emissions.

H. **STATEMENT OF JUSTIFICATION (Section 106.705(h))**

Keystone believes that the testing which it has performed, as described under Section 106.705(c) above, demonstrates that the treatment of its EAF dust by the Super Detox process will render its listed K061 waste characteristically non-hazardous such that it can be safely disposed of at a non-RCRA landfill. In fact, Keystone believes that its proposed treatment and disposal program will be more protective of the environment than its present compliance with the RCRA regulations.

I. **CONSISTENCY WITH FEDERAL LAW (Section 106.705(i))**

In R90-17 the Board indicated that the rules it adopted were in substance identical to the federal RCRA rules. Thus, compliance with the Board's rules is compliance with federal law.

Keystone does not believe that there are any federal procedural requirements applicable to the Board's decision which are not required by 35 Ill. Adm. Code 106, Subpart G.

J. **WAIVER OF HEARING (Section 106.705(j))**

Keystone hereby waives hearing on this matter.

K. **PETITION VERIFICATION (Section 106.705)**

An affidavit verifying the material facts asserted in this petition is attached. (Attachment M).

WHEREFORE, Keystone Steel and Wire requests the Board to grant it an adjusted standard which would have the effect of delisting treated K061 waste generated at its Peoria facility.

Respectfully submitted,

KEYSTONE STEEL AND WIRE CORPORATION

By:_____
One of Its Attorneys

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7899c

TABLE VI

Keystone Untreated EAF Dust Total Constituent Analysis

Total Constituents Analysis (mg/kg)

Daily Composite Date	As	Ba	Cd	Cr(T)	Hg	Pb	Se	Ag	Ni	Total CN	O&G	Total Sulfide	pH
2-07-90	3	25	425	1000	2.0	15,100	<1	47	147	<.25	164	<10	12.2
2-08-90	10	24	425	1150	2.0	16,100	2	49	140	<.25	160	<10	12.2
2-09-90	3	21	425	1125	3.0	19,500	<1	55	143	<.25	436	<10	12.2
2-10-90	7	25	425	1175	3.0	18,975	2	53	136	<.25	300	<10	12.2
2-11-90	1	28	400	1125	2.0	18,500	3	47	126	<.25	160	<10	12.3
2-12-90	10	27	425	1100	3.0	21,800	<1	49	135	<.25	300	<10	12.2
2-13-90	16	47	400	1175	2.6	17,800	2	49	137	<.25	312	<10	12.2
2-14-90	16	32	425	1050	4.5	16,775	<1	54	142	0.30	212	<10	12.3
2-15-90	10	37	400	1050	4.5	16,475	<1	51	147	<.25	304	<10	12.2
2-16-90	16	29	650	1175	2.6	16,575	2	44	150	0.30	376	<10	12.2
2-17-90	20	34	450	1075	2.0	15,225	<1	46	120	<.25	412	<10	12.2
2-18-90	10	43	400	1100	2.8	17,925	<1	48	144	0.85	384	<10	12.3
2-19-90	6	27	375	1050	3.3	19,175	<1	46	145	2.25	272	<10	12.3
2-20-90	16	32	425	1175	3.8	19,500	<1	48	152	2.10	260	<10	12.2
2-21-90	12	28	375	1175	2.6	21,225	<1	46	175	1.15	300	<10	12.2
2-22-90	14	30	525	1225	3.8	19,600	<1	49	170	1.20	396	<10	12.2
2-23-90	5	33	475	1200	6.0	18,225	<1	45	151	1.20	492	<10	12.2
2-24-90	9	27	450	1075	4.5	18,475	<1	47	131	0.90	268	<10	12.3
2-26-90	10	35	500	1225	6.8	21,000	<1	58	161	1.80	364	<10	12.2
2-27-90	8	23	400	1300	3.3	17,400	<1	47	146	<.25	264	<10	12.3
2-28-90	10	27	525	1125	3.8	20,350	<1	58	166	0.75	268	<10	12.2
3-01-90	8	27	475	1150	4.5	19,775	<1	70	210	0.50	308	<10	12.2
3-02-90	6	32	625	1275	5.3	26,275	<1	58	137	1.20	268	<10	12.2
3-03-90	10	34	550	1175	3.3	20,950	<1	52	139	0.40	444	<10	12.2
Average:	9.8	30.3	456	1090	3.5	18,863	<1.3	51	150	<0.69	309	<10	12.2

Q-029

PROPOSED K061 WASTE SAMPLING AND ANALYSIS PLAN

I. Sampling Plan

Twenty-one (21) representative daily samples of Electric Arc Furnace Dust will be obtained during different operating days, conditions, and product mix at each of the Steel Company facilities. The general make-up of EAF dust remains fairly constant from mill to mill. The proposed program follows a petition guidance manual, "Petitions to Delist Hazardous Wastes."

Each sample would be taken directly from the fresh dust collected in the storage silo on a daily basis by the Steel Company employee. The amount of each daily sample collected will be one quart.

Chain-of-Custody forms will be completed for each group of samples as they are sent to CSI laboratory in Horsham for Waste Characterization Stabilization Study and subsequent analysis.

II. Sample Analysis

Twenty-one (21) samples of Electric Arc Furnace Dust will be evaluated as per the following outline.

1) All 21 samples will be analyzed for:

Arsenic	Selenium
Barium	Silver
Cadmium	Nickel
Chromium	Cyanide
Lead	Available Lime
Mercury	Oil & Grease

2) Six samples will be prepared for evaluation in the Super Detox Process; these being:

   (a) Highest metals concentration of the 21 samples
   (b) Second highest metals concentration of the 21 samples
   (c) Third highest metals concentration of the 21 samples
   (d) A composite of earliest six remaining 18 samples
   (e) A composite of (chronological) middle six remaining 18 samples
   (f) A composite of most recent six of remaining 18 samples

3) Each of the six samples from "2" above, will be given Super Detox processing, then each will be:

(a) Given the Toxicity Characteristic Leaching procedure
(b) The leachate from "a" will be analyzed for:

Arsenic	Mercury
Barium	Selenium
Cadmium	Silver
Chromium (total)	Nickel
Chromium (hexavalent)	Cyanide
Lead	

(c) Given the Multiple Extraction Procedure, with sufficient number of extractions to indicate a leveling concentration or discontinued leaching potential for all metals tested (see below).

(d) Metals to be determined initially, and until a leveling concentration or discontinued leaching potential is achieved:

Arsenic	Mercury
Barium	Selenium
Cadmium	Silver
Chromium	Nickel
Lead	

4) CSI will prepare a proper written report, including all information on testing for inclusion with the Delisting Petition.

OUTLINE OF K061 EAF DUST STUDY

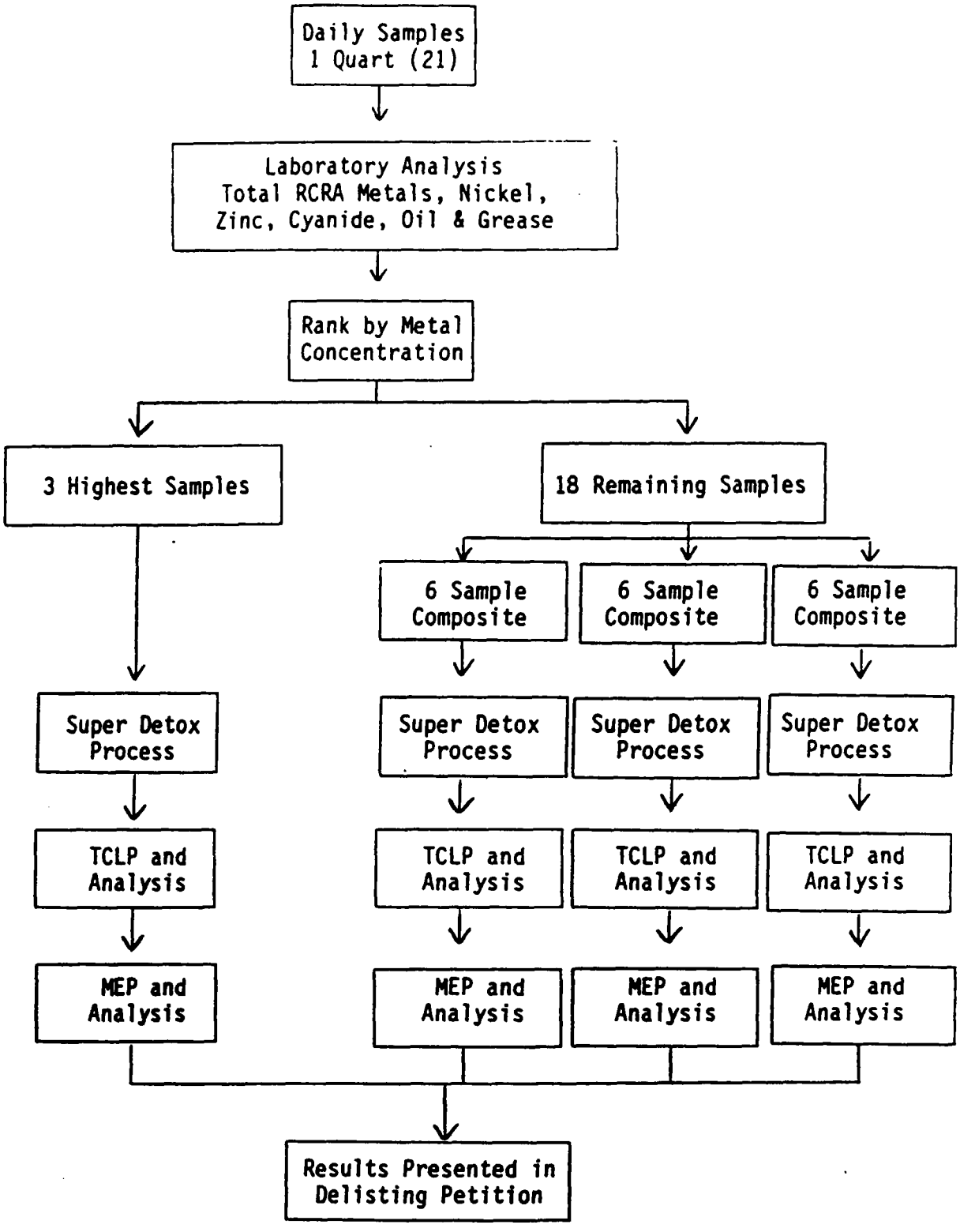


FIGURE 3

OUTLINE OF K061 EAF DUST STUDY

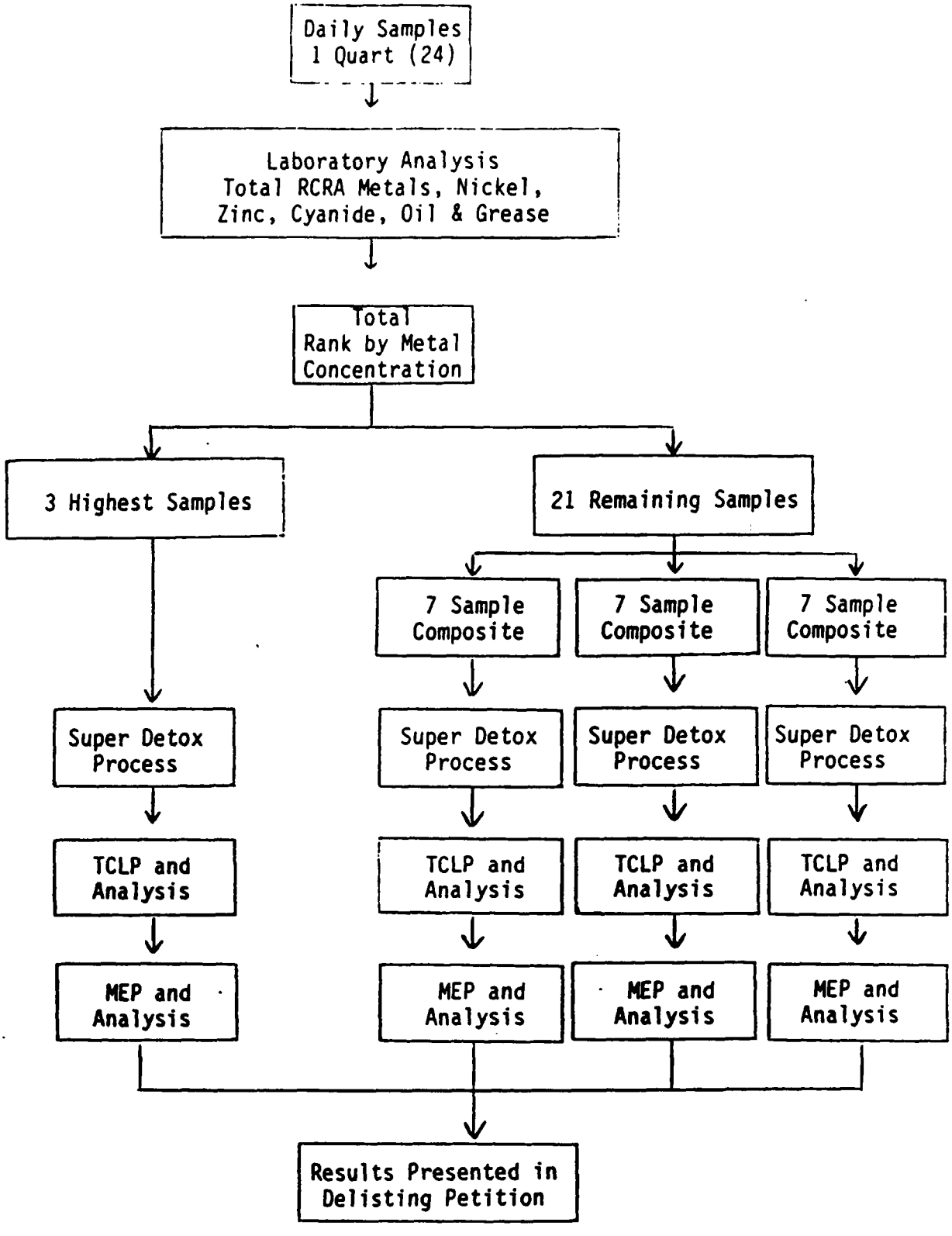


TABLE III

KEYSTONE EAF DUST

SAMPLING AND TESTING PROGRAM CHRONOLOGY

SAMPLE IDENTIFICATION AND SAMPLING DATE	TOTAL CONSTITUENT TESTING DATES
FEB 12	3/4 - 3/27
FEB 21	3/4 - 3/27
MAR 2	3/4 - 3/27
FEB 7	3/4 - 3/27
FEB 8	3/4 - 3/27
FEB 9	3/4 - 3/27
FEB 10	3/4 - 3/27
FEB 11	3/4 - 3/27
FEB 13	3/4 - 3/27
FEB 14	3/4 - 3/27
FEB 15	3/4 - 3/27
FEB 16	3/4 - 3/27
FEB 17	3/4 - 3/27
FEB 18	3/4 - 3/27
FEB 19	3/4 - 3/27
FEB 20	3/4 - 3/27
FEB 22	3/4 - 3/27
FEB 23	3/4 - 3/27
FEB 24	3/4 - 3/27
FEB 26	3/4 - 3/27
FEB 27	3/4 - 3/27
FEB 28	3/4 - 3/27
MAR 1	3/4 - 3/27
MAR 3	3/4 - 3/27

T-012

TABLE IV

KEYSTONE EAF DUST COMPOSITE

SAMPLING AND TESTING PROGRAM CHRONOLOGY

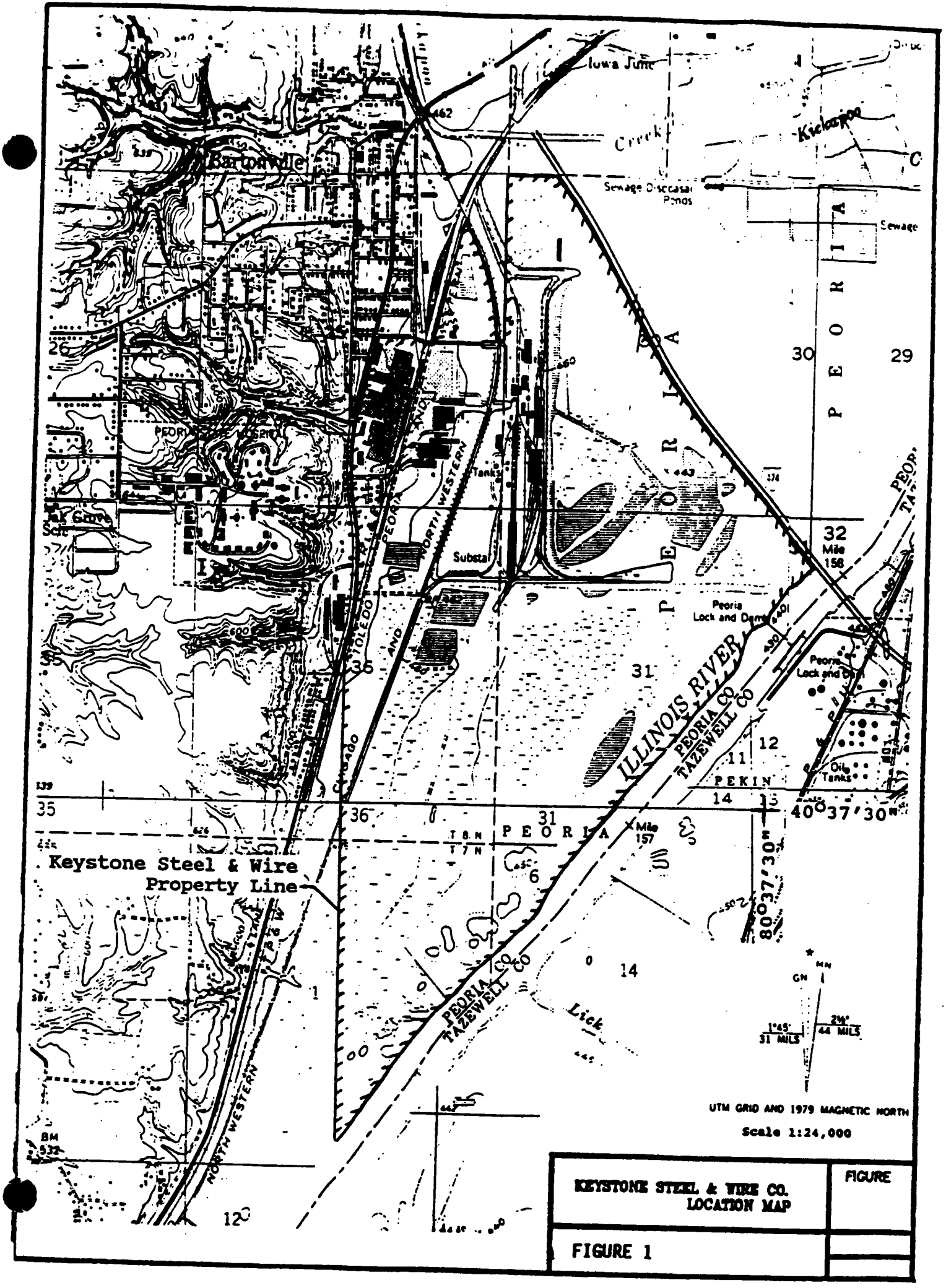
TEST COMPOSITE NUMBER	SUPER DETOX TCLP TEST DATES
1	4/23 - 4/30
2	4/23 - 4/30
3	4/23 - 4/30
4	4/23 - 4/30
5	4/23 - 4/30
6	4/23 - 4/30

TABLE V

KEYSTONE SUPER DETOX COMPOSITION

TESTING PROGRAM CHRONOLOGY

TEST COMPOSITE NUMBER	SUPER DETOX MEP TEST DATES
1	4/24 - 5/9
2	4/24 - 5/9
3	4/24 - 5/9
4	4/24 - 5/9
5	4/24 - 5/9
6	4/24 - 5/9



KEYSTONE STEEL & WIRE CO. LOCATION MAP	FIGURE
FIGURE 1	

KEYSTONE STEEL & WIRE CO.
SCHEMATIC OF THE MANUFACTURING PROCESS

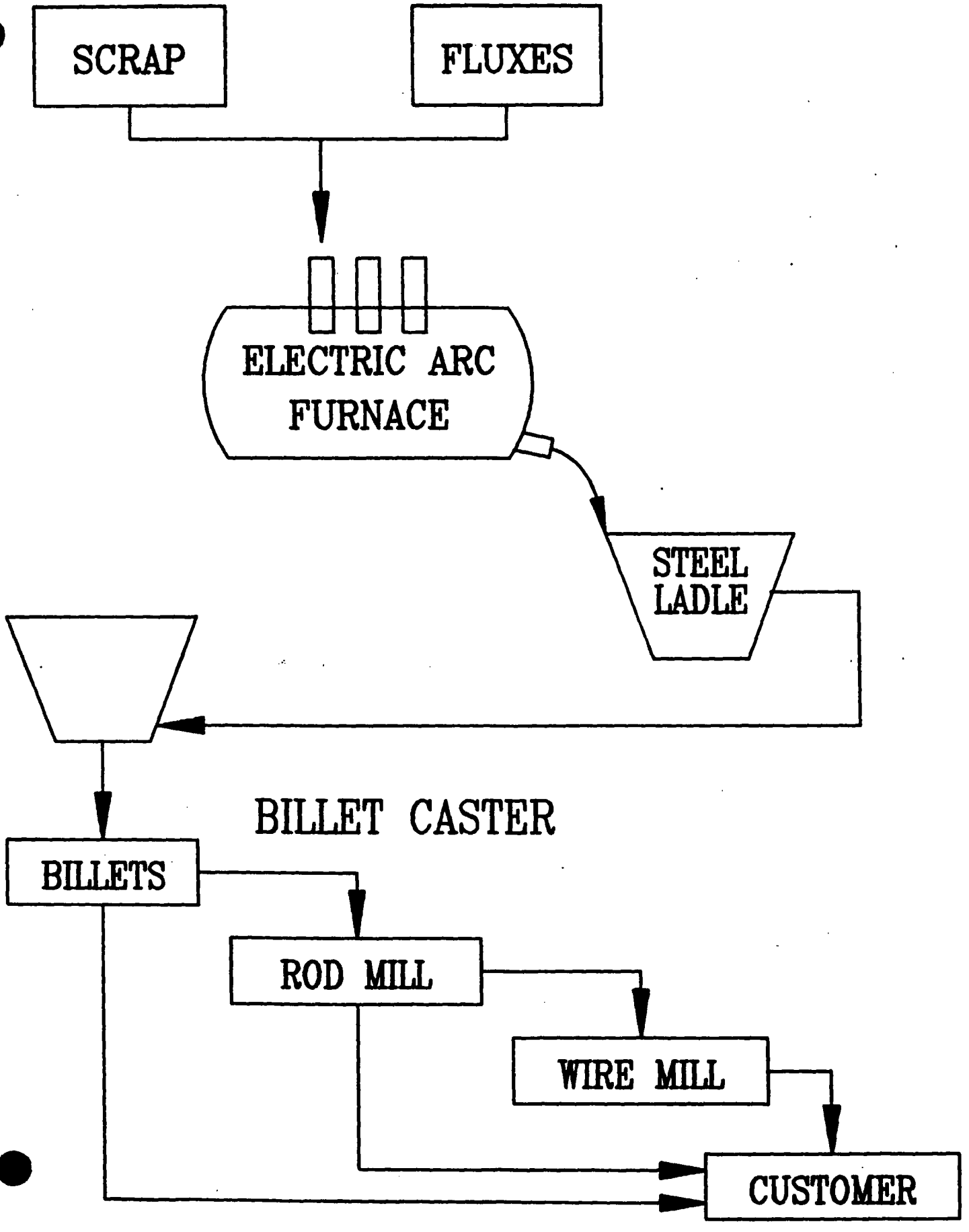


FIG 2

TABLE I

KEYSTONE STEEL & WIRE
STEEL WORKS SCRAP INVENTORY ROLL FORWARD
FEBRUARY 1990

	BEGINNING INVENTORY	PURCHASED RECEIPTS	YARD TRANSFERS	HOME GENERATION	TOTAL AVAILABLE	TONS USED	"BOOK" INVENTORY	PHYSICAL INVENTORY	GAIN (LOSS) NET TONS
Molds & Stools	0.00				0.00		0.00	0.00	0.00
Borings	135.85	844.09	177.70		1,157.64	1,116.35	41.29	0.00	(41.29)
Shred	6,854.38	9,386.23			16,240.61	11,732.80	4,507.81	4,132.13	(375.68)
#2 Heavy Melt	66.83	501.65	3,062.70		3,631.18	3,924.55	(293.37)	10.75	304.12
#1 Heavy Melt	9,002.88	8,822.23	3,620.50	140.12	21,585.73	17,407.90	4,177.83	4,661.41	483.58
Factory Bols	202.55	0.00	4,192.23		4,394.78	3,991.10	403.68	241.74	(161.94)
Hi Density	0.00	1,674.04	3,567.78	0.00	5,241.82	5,616.65	(374.83)	22.00	396.83
Dealer Bols	0.00	1,329.98	1,544.85		2,874.83	2,920.20	(45.37)	152.65	198.02
Bushelling	2,710.48	3,274.29	0.00	0.00	5,984.77	1,914.80	4,069.97	4,122.62	52.65
Hobs	8,971.55	4,414.75			13,386.30	4,977.20	8,409.10	8,091.84	(317.26)
Turnings	0.00	166.23	0.00		166.23	174.80	(8.57)	0.00	8.57
Total Purchased	27,944.52	30,413.49	16,165.76	140.12	74,663.89	53,776.35	20,887.54	21,435.14	547.60
Wire Blocks	30.60		1,207.98		1,238.58	1,230.40	8.18	0.00	(8.18)
Pit Scrap Unprepared	255.00			1,534.73	1,789.73	1,648.73	141.00	141.00	0.00
Pit Scrap Prepared	14.80			1,648.73	1,663.53	1,670.40	(6.87)	0.00	6.87
Billets	0.00		1,188.73	0.00	1,188.73	1,115.95	72.78	0.00	(72.78)
Cobble, Wire	57.68		69.38	2,284.53	2,411.59	2,046.20	365.39	101.68	(263.71)
Total Revert	358.08	0.00	2,466.09	5,467.99	8,292.16	7,711.68	580.48	242.68	(337.80)
Total Scrap	28,302.60	30,413.49	18,631.85	5,608.11	82,956.05	61,488.03	21,468.02	21,677.82	209.80
Std. Fe Mang.	0.00				0.00	0.00	0.00	0.00	0.00
Med. Fe Mang.	0.00	0.00			0.00	0.00	0.00	0.00	0.00
Silico Mang.	840.00	0.00			840.00	302.79	537.21	485.00	(52.21)
Fe Sil. 50%	100.00	89.58			189.58	94.35	95.23	100.00	4.77
Fe Sil. 75%	0.00				0.00	0.00	0.00	0.00	0.00
P.C. Graphite	0.00				0.00	0.00	0.00	0.00	0.00
Low Sul. Alum.	0.00				0.00	0.00	0.00	0.00	0.00
Low Fce. Coke	80.00	333.16			413.10	316.50	96.60	40.00	(56.60)
Hi Fce. Coke	5.00	20.00			25.00	3.14	21.86	18.00	(3.86)
Total Alloys/Additions	1,025.00	442.68	0.00	0.00	1,467.68	716.78	750.90	643.00	(107.90)
GRAND TOTAL	29,327.60	38,856.17	18,631.85	5,608.11	84,423.73	62,284.81	22,218.92	22,320.82	101.90

Home generation of cobble, wire scrap includes material switched directly from the wire mill.

Usage of pit scrap unprepared equals pit scrap usage home generation.

R-023

TABLE I (continued)

KEYSTONE STEEL & WIRE
STEEL WORKS SCRAP INVENTORY ROLL FORWARD
JANUARY 1990

	BEGINNING INVENTORY	PURCHASED RECEIPTS	YARD TRANSFERS	HOME GENERATION	TOTAL AVAILABLE	TONS USED	"BOOK" INVENTORY	PHYSICAL INVENTORY	GAIN (LOSS) NET TONS
Molds & Stools	0.00				0.00		0.00	0.00	0.00
Borings	0.00	1,741.41	0.00	1,480.10	1,741.41		261.31	135.85	(125.46)
Shred	11,772.18	4,678.43			16,442.61	9,222.00	7,220.61	6,854.38	(366.23)
#2 Heavy Melt	251.53	0.00	1,568.48		1,820.01	1,911.85	(91.84)	66.83	158.67
#1 Heavy Melt	12,236.98	7,962.62	2,570.15	121.75	22,891.50	14,498.65	8,392.85	9,002.38	610.03
Factory Bols	635.00	0.00	3,741.45		4,376.45	4,317.15	59.30	202.55	143.25
Hi Density	98.98	1,030.98	2,912.65	0.00	4,042.61	4,218.75	(176.14)	0.00	176.14
Dealer Bols	19.00	1,345.90	620.65		1,985.55	1,987.40	(1.85)	0.00	1.85
Bushelling	5,116.00	0.00	0.00	0.00	5,116.00	2,257.50	2,858.50	2,710.48	(148.02)
Hobs	10,819.25	2,883.01			13,702.26	4,527.35	9,174.91	8,971.55	(203.36)
Turnings	0.00	125.85	0.00		125.85	129.80	(3.95)	0.00	3.95
Total Purchased	40,948.92	19,760.20	11,413.38	121.75	72,244.25	44,550.55	27,693.70	27,944.52	250.82
Wire Blocks	0.00		1,585.10	0.00	1,585.10	1,509.25	75.85	30.60	(45.25)
Pit Scrap Unprepared	265.00			2,055.41	2,320.41	2,065.41	255.00	255.00	0.00
Pit Scrap Prepared	286.08			2,065.41	2,351.49	2,476.65	(125.16)	14.80	139.96
Billets	377.53		1,133.33	53.20	1,564.06	1,484.85	79.21	0.00	(79.21)
Cobble, Wire	254.05			2,352.20	2,606.25	2,435.45	170.80	57.68	(113.12)
Total Revert	1,182.66	0.00	2,718.43	6,526.22	10,427.31	9,971.61	455.70	358.08	(97.62)
Total Scrap	42,131.58	19,760.20	14,131.81	6,647.97	82,671.56	54,522.16	28,149.40	28,302.60	153.20
Std. Fe Mang.	0.00				0.00	0.00	0.00	0.00	0.00
Med. Fe Mang.	0.00	0.00			0.00	0.00	0.00	0.00	0.00
Silico Mang.	1,169.00	0.00			1,169.00	299.19	869.81	840.00	(29.81)
Fe Sil. 50%	85.00	95.68			180.68	84.27	96.41	100.00	3.59
Fe Sil. 75%	0.00				0.00	0.00	0.00	0.00	0.00
P.C. Graphite	0.00				0.00	0.00	0.00	0.00	0.00
Low Sul. Alum.	0.00				0.00	0.00	0.00	0.00	0.00
Low Fce. Coke	45.00	256.83			301.83	330.75	(28.92)	80.00	108.92
Hi Fce. Coke	2.00	20.00			22.00	5.21	16.79	5.00	(11.79)
Total Alloys/Additions	1,301.00	372.51	0.00	0.00	1,673.51	719.42	954.09	1,025.00	70.91
GRAND TOTAL	43,432.58	20,132.71	14,131.81	6,647.97	84,345.07	55,241.58	29,103.49	29,327.60	224.11

Home generation of cobble, wire scrap includes material switched directly from the wire mill.

Usage of pit scrap unprepared equals pit scrap usage home generation.

R-023

TABLE I (continued)

KEYSTONE STEEL & WIRE
STEEL WORKS SCRAP INVENTORY ROLL FORWARD
DECEMBER 1989

	BEGINNING INVENTORY	PURCHASED RECEIPTS	YARD TRANSFERS	HOME GENERATION	TOTAL AVAILABLE	TONS USED	"BOOK" INVENTORY	PHYSICAL INVENTORY	GAIN (LOSS) NET TONS
Molds & Stools	0.00				0.00		0.00	0.00	0.00
Borings	0.00	999.26	0.00		999.26	955.60	43.66	0.00	(43.66)
Shred	11,214.79	8,655.26			19,870.05	8,090.60	11,779.45	11,772.18	(7.27)
#2 Heavy Melt	489.19	106.65	2,216.40		2,812.24	2,782.80	29.44	251.53	222.09
#1 Heavy Melt	10,178.03	7,499.80	0.00	0.00	17,677.83	5,618.55	12,059.28	12,236.98	177.70
Factory Bols	1,179.90	0.00	0.00		1,179.90	575.15	604.75	635.00	30.25
Hi Density	790.10	694.20	2,167.95	0.00	3,652.25	3,548.90	103.35	98.98	(4.37)
Dealer Bols	0.00	823.55	601.65		1,425.20	1,489.10	(63.90)	19.00	82.90
Busheling	5,410.87	(16.75)	0.00	0.00	5,394.12	324.10	5,070.02	5,116.00	45.98
Mobs	7,231.45	8,961.23			16,192.68	5,034.80	11,157.88	10,819.25	(338.63)
Turnings	0.00	91.90	0.00		91.90	105.10	(13.20)	0.00	13.20
Total Purchased	36,494.33	27,815.10	4,986.00	0.00	69,295.43	28,524.70	40,770.73	40,948.92	178.19
Wire Blocks	42.99		946.95	0.00	989.94	970.30	19.64	0.00	(19.64)
Pit Scrap Unprepared	750.00			1,473.86	2,223.86	1,958.86	265.00	265.00	0.00
Pit Scrap Prepared	208.13			1,958.86	2,166.99	1,604.15	562.84	286.08	(276.76)
Billets	0.00		1,387.17	0.00	1,387.17	1,018.45	368.72	377.53	8.81
Cobble, Wire	284.30			1,286.48	1,570.78	1,321.50	249.28	254.05	4.77
Total Revert	1,285.42	0.00	2,334.12	4,719.20	8,338.74	6,873.26	1,465.48	1,182.66	(282.82)
Total Scrap	37,779.75	27,815.10	7,320.12	4,719.20	77,634.17	35,397.96	42,236.21	42,131.58	(104.63)
Std. Fe Mang.	0.00				0.00	0.00	0.00	0.00	0.00
Med. Fe Mang.	0.00	0.00			0.00	0.00	0.00	0.00	0.00
Silico Mang.	1,300.00	0.00			1,300.00	175.84	1,124.16	1,169.00	44.84
Fe Sil. 50%	67.00	99.15			166.15	56.28	109.87	85.00	(24.87)
Fe Sil. 75%	0.00				0.00	0.00	0.00	0.00	0.00
P.C. Graphite	0.00				0.00	0.00	0.00	0.00	0.00
Low Sul. Alum.	0.00				0.00	0.00	0.00	0.00	0.00
Low Fce. Coke	80.00	80.63			160.63	109.50	51.13	45.00	(6.13)
Hi Fce. Coke	6.00	0.00			6.00	2.66	3.34	2.00	(1.34)
Total Alloys/Additions	1,453.00	179.78	0.00	0.00	1,632.78	344.28	1,288.50	1,301.00	12.50
GRAND TOTAL	39,232.75	27,994.88	7,320.12	4,719.20	79,266.95	35,742.24	43,524.71	43,432.58	(92.13)

Home generation of cobble, wire scrap includes material switched directly from the wire mill.

Usage of pit scrap unprepared equals pit scrap usage home generation.

R-023

TABLE 1 (continued)

KEYSTONE STEEL & WIRE
STEEL WORKS SCRAP INVENTORY ROLL FORWARD
NOVEMBER 1989

	BEGINNING INVENTORY	PURCHASED RECEIPTS	YARD TRANSFERS	HOME GENERATION	TOTAL AVAILABLE	TONS USED	"BOOK" INVENTORY	PHYSICAL INVENTORY	GAIN (LOSS) NET TONS
Molds & St	0.00				0.00		0.00	0.00	0.00
Borings	116.25	1,234.23	0.00		1,350.48	1,292.95	57.53	0.00	(57.53)
Shred	7,333.03	17,780.59			25,113.62	13,124.45	11,989.17	11,214.79	(774.38)
#2 Heavy Melt	584.70	466.53	2,310.35		3,361.58	3,174.35	187.23	489.19	301.96
#1 Heavy Melt	11,141.52	10,866.43	2,423.65	45.35	24,476.95	14,478.65	9,998.30	10,178.03	179.73
Factory Bols	979.51	1,121.45	1,990.90		4,091.86	2,939.10	1,152.76	1,179.90	27.14
Hi Density	604.25	1,288.71	2,782.37	73.10	4,748.43	4,341.95	406.48	790.10	383.62
Dealer Bols	0.00	1,024.30	895.60		1,919.90	1,973.60	(53.70)	0.00	53.70
Busheling	3,603.80	2,972.59	0.00	0.00	6,576.39	1,613.85	4,962.54	5,410.87	448.33
Hobs	3,056.31	7,838.97			10,895.28	3,563.45	7,331.83	7,231.45	(100.38)
Turnings	0.00	79.98	0.00		79.98	94.75	(14.77)	0.00	14.77
Total Purchased	27,419.37	44,673.78	10,402.87	118.45	82,614.47	46,597.10	36,017.37	36,494.33	476.96
Wire Blocks	0.00		1,259.55	0.00	1,259.55	1,253.70	5.85	42.99	37.14
Pit Scrap Unprepared	632.00			2,050.03	2,682.03	1,932.03	750.00	750.00	(0.00)
Pit Scrap Prepared	15.00			1,932.03	1,947.03	1,988.60	(41.57)	208.13	249.70
Billets	46.37		1,758.43	68.90	1,873.70	1,671.40	202.30	0.00	(202.30)
Cobble, Wire	179.03			2,176.12	2,355.15	2,026.40	328.75	284.30	(44.45)
Total Revert	872.40	0.00	3,017.98	6,227.08	10,117.46	8,872.13	1,245.33	1,285.42	40.09
Total Scrap	28,291.77	44,673.78	13,420.85	6,345.53	92,731.93	55,469.23	37,262.70	37,779.75	517.05
Std. Fe Mang.	0.00				0.00	0.00	0.00	0.00	0.00
Med. Fe Mang.	0.00	0.00			0.00	0.00	0.00	0.00	0.00
Silico Mang.	47.50	1,562.58			1,610.08	270.96	1,339.12	1,300.00	(39.12)
Fe Sil. 50%	20.00	118.03			138.03	79.75	58.28	67.00	8.72
Fe Sil. 75%	0.00				0.00	0.00	0.00	0.00	0.00
P.C. Graphite	0.00				0.00	0.00	0.00	0.00	0.00
Low Sul. Alum.	0.00				0.00	0.00	0.00	0.00	0.00
Low Fce. Coke	140.00	96.58			236.58	150.00	86.58	80.00	(6.58)
Hi Fce. Coke	2.00	20.00			22.00	7.54	14.46	6.00	(8.46)
Total Alloys/Additions	209.50	1,797.19	0.00	0.00	2,006.69	508.25	1,498.44	1,453.00	(45.44)
GRAND TOTAL	28,501.27	46,470.97	13,420.85	6,345.53	94,738.62	55,977.48	38,761.14	39,232.75	471.61

Home generation of cobble, wire scrap includes material switched directly from the wire mill.

Usage of pit scrap unprepared equals pit scrap usage home generation.

S-002

TABLE I (continued)
KEYSTONE STEEL & WIRE
STEEL WORKS SCRAP INVENTORY ROLL FORWARD
OCTOBER 1989

	BEGINNING INVENTORY	PURCHASED RECEIPTS	YARD TRANSFERS	HOME GENERATION	TOTAL AVAILABLE	TONS USED	"BOOK" INVENTORY	PHYSICAL INVENTORY	GAIN (LOSS) NET TONS
Molds & St	0.00				0.00		0.00	0.00	0.00
Borings	0.00	1,876.66	0.00		1,876.66	1,691.05	185.61	116.25	(69.36)
Shred	4,424.90	18,279.70			22,704.60	15,354.60	7,350.00	7,333.03	(16.97)
#2 Heavy Melt	658.79	1,228.00	2,210.90		4,097.69	3,912.45	185.24	584.70	399.46
#1 Heavy Melt	10,482.47	11,638.50	3,636.15	50.65	25,534.77	15,616.15	9,918.62	11,141.52	1,222.90
Factory Bols	1,089.96	1,052.09	2,820.18		4,962.23	3,934.60	1,027.63	979.51	(48.12)
Hi Density	561.59	2,467.47	3,298.03	169.50	6,496.59	5,597.00	899.59	604.25	(295.34)
Dealer Bols	832.70	1,239.10	809.12		2,880.92	3,161.60	(280.68)	0.00	280.68
Busheling	1,901.28	3,662.20	0.00	0.00	5,563.48	1,539.75	4,023.73	3,603.80	(419.93)
Mobs	0.00	5,757.35			5,757.35	2,427.95	3,329.40	3,056.31	(273.09)
Turnings	0.00	285.35	0.00		285.35	363.75	(78.40)	0.00	78.40
Total Purchased	19,951.69	47,486.42	12,501.38	220.15	80,159.64	53,598.90	26,560.74	27,419.37	858.63
Wire Blocks	0.00		1,790.10	0.00	1,790.10	1,717.90	72.20	0.00	(72.20)
Pit Scrap Unprepared	450.00			2,399.68	2,849.68	2,217.68	632.00	632.00	0.00
Pit Scrap Prepared	0.00			2,217.68	2,217.68	2,353.85	(136.17)	15.00	151.17
Billets	5.05		1,580.87	96.61	1,682.53	1,413.65	268.88	46.37	(222.51)
Cobble, Wire	68.48			2,642.65	2,711.13	2,178.05	533.08	179.03	(354.05)
Total Revert	523.53	0.00	3,370.97	7,356.62	11,251.12	9,881.13	1,369.99	872.40	(497.59)
Total Scrap	20,475.22	47,486.42	15,872.35	7,576.77	91,410.76	63,480.03	27,930.73	28,291.77	361.04
Std. Fe Mang.	0.00				0.00	0.00	0.00	0.00	0.00
Med. Fe Mang.	0.00	0.00			0.00	0.00	0.00	0.00	0.00
Silico Mang.	207.50	177.15			384.65	312.38	72.27	47.50	(24.77)
Fe Sil. 50%	120.00	(0.08)			119.92	101.60	18.32	20.00	1.68
Fe Sil. 75%	0.00				0.00		0.00	0.00	0.00
P.C. Graphite	0.00				0.00		0.00	0.00	0.00
Low Sul. Alum.	0.00				0.00		0.00	0.00	0.00
Low Fce. Coke	15.00	346.88			361.88	247.00	114.88	140.00	25.12
Hi Fce. Coke	11.00	0.00			11.00	6.24	4.76	2.00	(2.76)
Total Alloys/Additions	353.50	523.95	0.00	0.00	877.45	667.22	210.23	209.50	(0.73)
GRAND TOTAL	20,828.72	48,010.37	15,872.35	7,576.77	92,288.21	64,147.25	28,140.96	28,501.27	360.31

Home generation of cobble, wire scrap includes material switched directly from the wire mill.

Usage of pit scrap unprepared equals pit scrap usage home generation.

S-003

TABLE I (continued)

KEYSTONE STEEL & WIRE
STEEL WORKS SCRAP INVENTORY ROLL FORWARD
SEPTEMBER 1989

	BEGINNING INVENTORY	PURCHASED RECEIPTS	YARD TRANSFERS	HOME GENERATION	TOTAL AVAILABLE	TONS USED	"BOOK" INVENTORY	PHYSICAL INVENTORY	GAIN (LOSS) NET TONS
Molds & St	0.00				0.00		0.00	0.00	0.00
Borings	23.30	731.76	94.80		849.86	759.10	90.76	0.00	(90.76)
Shred	3,256.89	15,557.02			18,813.91	13,868.15	4,945.76	4,424.90	(520.86)
#2 Heavy Melt	587.20	385.75	3,322.15		4,295.10	3,874.15	420.95	658.79	237.84
#1 Heavy Melt	12,505.72	8,933.56	2,248.43	87.41	23,775.12	13,572.20	10,202.92	10,482.47	279.55
Factory Bols	1,395.07	0.00	3,113.02		4,508.09	3,349.50	1,158.59	1,089.96	(68.63)
Hi Density	653.00	1,209.12	4,326.05	49.10	6,237.27	6,409.35	(166.08)	561.59	727.67
Dealer Bols	3,331.85	895.98	612.55		4,840.38	3,864.20	976.18	832.70	(143.48)
Busheling	3,639.28	0.00	0.00	0.00	3,639.28	1,758.40	1,880.88	1,901.28	20.40
Mobs	2,255.60	0.00			2,255.60	2,223.85	31.75	0.00	(31.75)
Turnings	137.75	192.48	0.00		330.23	356.00	(26.57)	0.00	26.57
Total Purchased	27,785.66	27,905.67	13,717.00	136.51	69,544.84	50,029.70	19,515.14	19,951.69	436.55
Wire Blocks	16.70		1,096.38	0.00	1,113.08	1,123.40	(10.32)	0.00	10.32
Pit Scrap Unprepared	800.00			1,968.50	2,768.50	2,318.50	450.00	450.00	0.00
Pit Scrap Prepared	11.65			2,318.50	2,330.15	2,416.00	(85.85)	0.00	85.85
Billets	11.30		1,975.57	32.11	2,018.98	1,445.30	573.68	5.05	(568.63)
Cobble, Wire	0.00			2,190.55	2,190.55	2,029.51	161.04	68.48	(92.56)
Total Revert	839.65	0.00	3,071.95	6,509.66	10,421.26	9,332.71	1,088.55	523.53	(565.02)
Total Scrap	28,625.31	27,905.67	16,788.95	6,646.17	79,966.10	59,362.41	20,603.69	20,475.22	(128.47)
Std. Fe Mang.	0.00				0.00	0.00	0.00	0.00	0.00
Med. Fe Mang.	0.00	0.00			0.00	0.00	0.00	0.00	0.00
Silico Mang.	507.50	0.00			507.50	288.41	219.09	207.50	(11.59)
Fe Sil. 50%	30.00	184.63			214.63	98.40	116.23	120.00	3.77
Fe Sil. 75%	0.00				0.00		0.00	0.00	0.00
P.C. Graphite	0.00				0.00		0.00	0.00	0.00
Low Sul. Alum.	0.00				0.00		0.00	0.00	0.00
Low Fce. Coke	111.00	291.23			482.23	303.00	99.23	15.00	(84.23)
Hi Fce. Coke	17.00	(0.60)			16.40	3.27	13.13	11.00	(2.13)
Total Alloys/Additions	665.50	475.26	0.00	0.00	1,140.76	693.08	447.68	353.50	(94.18)
GRAND TOTAL	29,290.81	28,380.93	16,788.95	6,646.17	81,106.86	60,055.49	21,051.37	20,828.72	(222.65)

Home generation of cobble, wire scrap includes material switched directly from the wire mill.

Usage of pit scrap unprepared equals pit scrap usage home generation.

S-004

TABLE 1 (continued)

KEYSTONE STEEL & WIRE
STEEL WORKS SCRAP INVENTORY ROLL FORWARD
AUGUST 1989

	BEGINNING INVENTORY	PURCHASED RECEIPTS	YARD TRANSFERS	HOME GENERATION	TOTAL AVAILABLE	TONS USED	"BOOK" INVENTORY	PHYSICAL INVENTORY	GAIN (LOSS) NET TONS
Molds & St	0.00				0.00		0.00	0.00	0.00
Borings	0.00	1,052.42	0.00		1,052.42	1,002.95	49.47	23.30	(26.17)
Shred	4,298.39	10,755.67			15,054.06	12,232.90	2,821.16	3,256.89	435.73
#2 Heavy Melt	814.16	421.43	2,125.05		3,360.64	3,180.15	180.49	587.20	406.71
#1 Heavy Melt	10,081.33	12,272.25	997.48	110.88	23,461.94	11,036.10	12,425.84	12,505.72	79.88
Factory Bols	1,607.13	576.35	1,779.30		3,962.78	2,497.55	1,465.23	1,395.07	(70.16)
Hi Density	450.00	1,495.95	1,763.75	0.00	3,709.70	3,352.85	356.85	653.00	296.15
Dealer Bols	4,409.64	756.00	1,226.35		6,391.99	3,080.20	3,311.79	3,331.85	20.06
Busheling	2,580.94	2,095.17	0.00	(16.40)	4,659.71	976.65	3,683.06	3,639.28	(43.78)
Hobs	2,047.20	4,565.84			6,613.04	4,062.80	2,550.24	2,255.60	(294.64)
Turnings	0.00	432.00	0.00		432.00	326.90	105.10	137.75	32.65
Total Purchased	26,288.79	34,423.08	7,891.93	94.48	68,698.28	41,749.05	26,949.23	27,785.66	836.43
Wire Blocks	302.14		1,352.72	0.00	1,654.86	1,558.95	95.91	16.70	(79.21)
Pit Scrap Unprepared	812.00			2,108.80	2,920.80	2,120.80	800.00	800.00	0.00
Pit Scrap Prepared	37.50			2,120.80	2,158.30	2,370.05	(211.75)	11.65	223.40
Billets	0.00		2,331.90	0.00	2,331.90	2,109.60	222.30	11.30	(211.00)
Cobble, Wire	259.51			2,047.50	2,307.01	2,302.25	4.76	0.00	(4.76)
Total Revert	1,411.15	0.00	3,684.62	6,277.10	11,372.87	10,461.65	911.22	839.65	(71.57)
Total Scrap	27,699.94	34,423.08	11,576.55	6,371.58	80,071.15	52,210.70	27,860.45	28,625.31	764.86
Std. Fe Mang.	0.00				0.00	0.00	0.00	0.00	0.00
Med. Fe Mang.	0.00	0.00			0.00	0.00	0.00	0.00	0.00
Silico Mang.	787.50	0.00			787.50	263.89	523.61	507.50	(16.11)
Fe Sil. 50%	30.00	92.23			122.23	83.18	39.05	30.00	(9.05)
Fe Sil. 75%	0.00				0.00		0.00	0.00	0.00
P.C. Graphite	0.00				0.00		0.00	0.00	0.00
Low Sul. Alum.	0.00				0.00		0.00	0.00	0.00
Low Fce. Coke	120.00	245.63			365.63	357.00	8.63	111.00	102.37
Hi Fce. Coke	13.00	20.60			33.60	6.06	27.54	17.00	(10.54)
Total Alloys/Additions	950.50	358.46	0.00	0.00	1,308.96	710.13	598.83	665.50	66.67
GRAND TOTAL	28,650.44	34,781.54	11,576.55	6,371.58	81,380.11	52,920.83	28,459.28	29,290.81	831.53

Home generation of cobble, wire scrap includes material switched directly from the wire mill.

Usage of pit scrap unprepared equals pit scrap usage home generation.

S-005

ATTACHMENT 3

RECEIVED
MAY 03 1990
TECHNOLOGY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Yei-Shong Shieh, Ph.D., P.E.
Director, Technical Services
Conversion Systems, Inc.
200 Welsh Road
Horsham, Pennsylvania 19044

MAY 1 1990

Dear Dr. Shieh:

This letter concerns your proposed waste sampling and analysis plan (Petition File No. D0805) submitted to the Agency on February 26, 1990 for a contemplated upfront delisting petition. The proposed (or draft) sampling and analysis plan will be used to collect representative samples of electric arc furnace dust (EAFD). The EAFD waste is presently listed as EPA Hazardous Waste No. K061.

While your draft sampling and analysis plan (containing only three pages) shows a general approach towards sample collection and waste analysis, you did not provide for our evaluation any specific descriptions of waste generation from various interested facilities, sampling equipment, detailed sampling and chain-of-custody procedures, test methods and the associated detection limits, or the Super Detox Process to be used for EAFD stabilization/treatment. However, we reviewed your draft plan, and provide the following comments.

Sample Collection

The draft sampling and analysis plan states that 21 daily samples of the raw (i.e. unstabilized) EAFD will be collected during different operating days, conditions, and product mixes for each of the steel facilities to be included in the stabilization study. At each of the facilities, daily, one-quart samples will be collected from the fresh EAFD collection/storage silo by facility personnel. The samples will be then sent to CSI for waste stabilization study and analyses.

This sample collection approach appears to be adequate provided: (1) qualified personnel collect the samples; (2) each daily sample collected is representative of the waste generated on that date; (3) the collection/storage silos are emptied daily; (4) the sampling occurs over a sufficient time (at least one month) to capture all aspects of waste variability at each

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facility; and (5) waste samples are obtained for all facilities for which you intend to treat the EAFD. In addition, please be sure to include in the formal petition a detailed discussion of how the samples were collected and what types of sampling equipment were used. Documentation such as waste batch discharge logs should be submitted to demonstrate that samples collected account for any process variation.

Waste Analysis

The draft sampling and analysis plan states that 21 daily samples of the raw EAFD will be analyzed for the total concentrations of all the EP toxic metals, nickel, cyanide, available lime, and oil and grease.

The above list of analytes should be expanded to include analyses for the total concentrations of reactive sulfide, reactive cyanide. You must also document that the treated wastes will not exhibit the characteristics of ignitability, corrosivity, and reactivity. Please note, however, that analyses for reactive sulfide and reactive cyanide are not necessary if the levels of total sulfide and total cyanide are less than 500 mg/kg and 250 mg/kg, respectively. In addition, analyses for dioxins would be necessary if the raw EAFD is generated at a facility that contains dioxin-forming precursors (such as polyvinyl chloride coated wiring and parts). Further, you must justify in the formal petition that the other hazardous organic constituents listed on 40 CFR 261, Appendix VIII and the constituents acetone, ethylbenzene, isophorone, 4-methyl-2-pentanone, styrene, and xylenes are not present in the raw waste streams.

The draft sampling and analysis plan also states that the 21 samples collected daily will be ranked according to total metal concentrations. A set of six sample groups will then be picked using the following procedure:

> Of the 21 daily samples, the three samples having the highest metals concentrations will be selected as the "3 highest samples" (i.e., the first highest, second highest, and third highest metal concentrations). The remaining 18 samples will be ranked chronologically, and composited into the earliest six, middle six, and latest six sample composites.

I surmise the "3 highest samples" would represent the worst-case wastes. Nevertheless, it is unclear how the criteria for ranking the metals concentrations will be established for the selection of these samples. For example, the metals lead, chromium, cadmium, and nickel are all likely to be of concern in

raw EAF dust. Therefore, I suggest that you first establish the appropriate criteria prior to sampling. On the other hand, the "3 highest samples" should be also included in the composite samples so that the overall variability of the waste produced during an appropriate sampling period will be fully characterized, without discounting the waste chacteristics of the "3 highest samples". Therefore, we recommend that your sampling strategy be modified, such that the 21 daily samples (or whatever number is sufficient to account for the expected waste variability) will be chronologically grouped into four or more composites, while the "3 highest samples" will be still maintained as worst-case wastes for separate analysis and study. Each composite sample should be composed of no more than five individual samples.

The draft sampling and analysis plan states that the "3 highest samples" and the composite samples will be treated using Bethlehem's Super Detox Process. These samples of stabilized electric arc furnace dust will be analyzed for the TCLP leachate concentrations of all the EP toxic metals (including both total and hexavalent chromium), nickel, and cyanide.

We believe that the above list of analytes is adequate, as long as the TCLP extraction for cyanide is performed using distilled water in place of the acetate buffer. However, in the unlikely event that the waste exhibits a total oil and grease content in excess of one percent, you must replace the TCLP with the Oily Waste Extraction Procedure (OWEP; see SW-846 method number 1330). The OWEP requires an initial solvent extraction to remove oily material, followed by the use of the EP (SW-846 Method 1310) to determine leachable metals in the solid residue. We recommend that you use the TCLP in place of the EP for this step in the OWEP.

The draft sampling and analysis plan also states that the grouped samples (the "3 highest samples" and composite samples) also will be analyzed for the Multiple Extraction Procedure (MEP) concentrations of all the EP toxic metals, and nickel. MEP analyses for cyanide and hexavalent chromium are not planned.

We believe that the above list of analytes for the MEP analyses is adequate, as long as the TCLP concentration of cyanide is less than 0.7 mg/l. If the TCLP concentration of cyanide is greater than 0.7 mg/l, then MEP analyses must be performed for cyanide. The first extraction used in the MEP method is the EP test, and the resulting solid residue is then re-extracted with the synthetic acid rain extraction fluid. We encourage you to use the TCLP in place of the EP as the first step in the MEP. In this way, you will avoid having to do both the TCLP and EP tests. However, in the unlikely event that the

waste exhibits a total oil and grease content in excess of one percent, CSI must perform the first extraction using the OWEP as discussed above.

The draft sampling and analysis plan states that the MEP analyses will be continued "until a leveling concentration or discontinued leaching potential is achieved."

We note that the MEP test procedure requires that the daily, sequential extractions be carried out over the course of nine days. However, as specified by the method, if the MEP concentration of any constituent on day nine is significantly higher than the day 7 or day 8 concentration, the daily extractions must be continued until the MEP concentration falls below the day 7 or day 8 concentration (see SW-846 Method 1320). In addition, the draft sampling plan does not indicate whether the samples of stabilized EAFD will be ground and passed through a 100X mesh screen prior to the MEP analyses. Please be sure to incorporate this grinding and sizing procedure into your MEP analyses.

Lastly, the draft sampling and analysis plan does not specify if the TCLP or MEP analyses will be performed on the cured or uncured CSEAFD. If your demonstration is based on analyses of the fully-cured material, any potential exclusion would only apply to the fully-cured material. If you wish the demonstration to be for the uncured material, the TCLP and the MEP analyses must be performed on the uncured material.

Changes In Delisting Policy

We note that the Agency has finalized the Toxicity Characteristic (TC) rule which replaces the Extraction Procedure (EP) Toxicity test found in 40 CFR Part 261.24 with the Toxicity Characteristic Leaching Procedure (TCLP) (see 55 FR 11798, March 29, 1990). The TCLP is currently used for other Agency programs, and the procedure is described in Appendix II of 40 CFR Part 261 as revised in the final TC rule. In the future, we will publish a Federal Register notice of our intent to require TCLP data in place of EP data for all delisting demonstrations. You should plan to use the TCLP for any sampling and analyses conducted to support the delisting petition.

We will continue to require analysis of total constituent concentrations of metals, cyanide, and sulfide, and any organic constituents of concern in the petitioned wastes. As mentioned previously, the OWEP should be used for those wastes which contain more than one percent total oil and grease, and the MEP should be used for stabilized wastes. We plan to continue to require the use of the MEP and the OWEP procedures for delisting

demonstrations because the TCLP currently has no special provisions for oily wastes or for assessing the long-term stability of chemically stabilized wastes.

Conclusion

We believe that your draft sampling and analysis plan is adequate provided the aforementioned modifications are incorporated. We also believe that we have addressed to the fullest extent your draft sampling and analysis plan; therefore, we are closing your petition file (#D0805).

If you choose to submit a formal petition in the future, your petition will be assigned a new petition number and reviewed in chronological order along with all new petitions. We remind you that your formal petition (if submitted) must contain all of the information discussed in the "Petitions to Delist Hazardous Wastes - A Guidance Manual," U.S. EPA, Office of Solid Waste, (EPA/530-SW-85-003), April 1985. Please forward any petition to the following address:

Mr. James Kent
U.S. Environmental Protection Agency
Office of Solid Waste, Mail Code OS-343
401 M Street, S.W.
Washington, D.C. 20460

Should you have any questions regarding today's correspondence, please call me at (202) 382-4782, or the technical reviewer of your draft sampling and analysis plan, Howard Finkel of ICF Incorporated, at (703) 934-3656.

Sincerely,

Chichang Chen

Chichang Chen
Variances Section

cc: David Friedman, Region III
Bob Greaves, Region III
Bob Kayser, EPA HQ
Jim Kent, EPA HQ
Howard Finkel, ICF Incorporated

TABLE VII

KEYSTONE STEEL & WIRE COMPANY

TCLP LEACHATE ANALYSIS: TREATED TEST COMPOSITES 1-6

COMPOSITE NO.	Ag	As	Ba	Cd	Cr	Pb	Hg	Ni	Se
1	0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	0.25	0.0[illegible]
2	0.05	0.02	<1.0	<0.01	<0.05	<0.05	<0.002	0.30	0.027
3	0.05	0.04	<1.0	<0.01	<0.05	<0.05	<0.002	0.30	0.035
4	0.05	0.04	<1.0	<0.01	<0.05	<0.05	<0.002	0.25	0.035
5	0,05	0.03	<1.0	<0.01	<0.05	<0.05	<0.002	0.20	0.029
6	0.05	0.05	<1.0	<0.01	<0.05	0.13	<0.002	0.20	0.047

T-013

TABLE XIV

ANALYTICAL METHODS AND EQUIPMENT
USED FOR CONSTITUENT ANALYSIS

PARAMETER	METHOD	DESCRIPTION	EQUIPMENT
Arsenic	7060 SW846	Furnace AA	Perkin Elmer 5000 with HGA-2200
Barium	7080 SW846	Flame AA	Perkin Elmer 5000 with HGA-2200
Cadmium	7130 SW846	Flame AA	Perkin Elmer 5000 with HGA-2200
Chromium	7190 SW846	Flame AA	Perkin Elmer 5000 with HGA-2200
Lead	7421 SW846	Furnace AA	Perkin Elmer 5000 with HGA-2200
Mercury	7470 SW846	Cold Vapor Generation/AA	Perkin Elmer 5000 with HGA-2200
Selenium	7741 SW846	Hydride Generation/ Flame AA	Perkin Elmer 5000 with HGA-2200
Nickel	7520 SW846	Flame AA	Perkin Elmer 5000 with HGA-2200
Cyanide	9010 SW846	Distillation/Colorimetric	Bausch & Lomb Spectronic 70
TCLP	1311 SW846	Leaching Procedure with HAc	Containers, Rotary Agitator
Oil & Grease	9071 SW846	Soxlet Extraction/Gravimetric	Soxlet Extractor, Collection Vessel
Multiple Extraction Procedure	1320 SW846	Leach Procedure with 60/40 H_2SO_4/HNO_3 (TCLP substituted for EP Toxicity)	Containers, Rotary Agitator
pH	9040 SW846	Electrode Method	Fisher Model 600 pH Meter
Total Sulfide	ASTM C-114	Titration with KI and KIO_3 using Starch Indicator	Glassware & Buret

CONVERSION SYSTEMS, INC.

CHAIN OF CUSTODY RECORD

Plant Name Keystone Steel & Wire Co

Location of Sampling Peoria IL Plant

Sample Name	Date	Time	Approximate Quantity & Description
Feb 27 K061	Feb 27 1990		K061 waste Approx 5 lb
Feb 28	Feb 28 1990		
Mar 1	Mar 1, 1990		
Mar 2	Mar 2 1990		
Mar 3	Mar 3, 1990		

Sample Preservation None Required

Additional Field Information

Sampled by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Dale Bennington	Mar 3, 1990	Arnold Meyerman	3/3/90
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Arnold Meyerman	3/4/90	[illegible]	6 MAR 90 9 05 AM
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

Method of Shipment:

NOTE: "CHAIN OF POSSESSION" SHOULD INCLUDE EVERYONE WHO HANDLES THE SAMPLE, STARTING WITH THE SAMPLE COLLECTOR AND ENDING WITH THE PERSON HAVING FINAL CUSTODY (E.G., THE LAB ANALYST).

Distribution: Original - Accompany Shipment
1 Copy - Survey Coordinator; Field Files

CONVERSION SYSTEMS, INC.

CHAIN OF CUSTODY RECORD

Plant Name Keystone Steel & Wire Co

Location of Sampling Peoria IL Plant

Sample Name	Date	Time	Approximate Quantity & Description
Feb 13 K061	Feb 13 1990		K061 waste Approx 5ll
14	Feb 14 1990		
15	Feb 15 1990		
16	Feb 16 1990		
17	Feb 17 1990		
18	Feb 18 1990		
19	Feb 19 1990		
20	Feb 20 1990		
21	Feb 21 1990		
22	Feb 22 1990		
23	Feb 23 1990		
24	Feb 24 1990		
26	Feb 26 1990		

Sample Preservation None Required

Additional Field Information

Sampled by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Dale Bennington	Feb 26, 1990	Arnold Meyerman	2/26/90
Relinquished by: (Signature)	**Date/Time**	**Received by: (Signature)**	**Date/Time**
Arnold Meyerman	3/4/90	Chris Eth	6 MAR 90 905A
Relinquished by: (Signature)	**Date/Time**	**Received by: (Signature)**	**Date/Time**

Method of Shipment:

NOTE: "CHAIN OF POSSESSION" SHOULD INCLUDE EVERYONE WHO HANDLES THE SAMPLE, STARTING WITH THE SAMPLE COLLECTOR AND ENDING WITH THE PERSON HAVING FINAL CUSTODY (E.G., THE LAB ANALYST).

Distribution: Original - Accompany Shipment
1 Copy - Survey Coordinator; Field Files

CONVERSION SYSTEMS, INC.

CHAIN OF CUSTODY RECORD

Plant Name Keystone Steel & Wire Co.

Location of Sampling Peoria, IL, plant

Sample Name	Date	Time	Approximate Quantity & Description
Feb 7 K061	Feb 7, 1990		K061 waste Approx 5 lb
" 8 "	Feb 8 1990		
" 9 "	Feb 9 1990		
" 10 "	Feb 10 1990		
" 11 "	Feb 11 1990		
" 12 "	Feb 12 1990		

Sample Preservation None Required

Additional Field Information

Sampled by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Dale Bennington	Feb 12 1990	Arnold Meyerman	2/12/90
Relinquished by: (Signature)	**Date/Time**	**Received by: (Signature)**	**Date/Time**
Arnold Meyerman	2/14/90	Charles Ellis	16 Feb 90 10:30 AM
Relinquished by: (Signature)	**Date/Time**	**Received by: (Signature)**	**Date/Time**

Method of Shipment:

NOTE: "CHAIN OF POSSESSION" SHOULD INCLUDE EVERYONE WHO HANDLES THE SAMPLE, STARTING WITH THE SAMPLE COLLECTOR AND ENDING WITH THE PERSON HAVING FINAL CUSTODY (E.G., THE LAB ANALYST).

Distribution: Original - Accompany Shipment
1 Copy - Survey Coordinator; Field Files

TABLE II

DESCRIPTION OF COMPOSITIONS

TEST COMPOSITION DESCRIPTION	DAILY COMPOSITES IN TEST COMPOSITES
1	FEB 12
2	FEB 21
3	MAR 2
4	FEB 7,8,9,10,11,13,14
5	FEB 15,16,17,18,19,20,22
6	FEB 23,24,26,27,28 MAR 1,3

R-040

TABLE VIII

Keystone Treated EAF Dust Multiple
Extraction Procedure Test Results--
Test Composite Sample #1

Constituent Concentration (ppm)

	Ag	As	Ba	Cd	Cr	Pb	Hg	Ni	Se
Extraction									
1	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.019
2	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.013
3	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.011
4	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.009
5	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.006
6	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
7	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
8	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
9	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
Mean Constituent Leaching	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.0087
Maximum VHS	0.315	0.315	6.30	0.063	0.315	0.315	0.0126	3.15	0.063

Q-029

TABLE IX

Keystone Treated EAF Dust Multiple
Extraction Procedure Test Results--
Test Composite Sample #2

Constituent Concentration (ppm)

	Ag	As	Ba	Cd	Cr	Pb	Hg	Ni	Se
Extraction									
1	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.019
2	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.012
3	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.012
4	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.008
5	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.007
6	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
7	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
8	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
9	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
Mean Constituent Leaching	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.0087
Maximum VHS	0.315	0.315	6.30	0.063	0.315	0.315	0.0126	3.15	0.063

Q-029

TABLE X

Keystone Treated EAF Dust Multiple
Extraction Procedure Test Results--
Test Composite Sample #3

Constituent Concentration (ppm)

	Ag	As	Ba	Cd	Cr	Pb	Hg	Ni	Se
Extraction									
1	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.028
2	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.015
3	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.014
4	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.008
5	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.006
6	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.005
7	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
8	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
9	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
Mean Constituent Leaching	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.0101
Maximum VHS	0.315	0.315	6.30	0.063	0.315	0.315	0.0126	3.15	0.063

Q-029

TABLE XI

Keystone Treated EAF Dust Multiple
Extraction Procedure Test Results--
Test Composite Sample #4

Constituent Concentration (ppm)

Extraction	Ag	As	Ba	Cd	Cr	Pb	Hg	Ni	Se
1	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.023
2	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.013
3	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.010
4	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.008
5	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.006
6	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
7	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
8	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
9	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
Mean Constituent Leaching	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.0089
Maximum VHS	0.315	0.315	6.30	0.063	0.315	0.315	0.0126	3.15	0.063

Q-029

TABLE XII

Keystone Treated EAF Dust Multiple
Extraction Procedure Test Results--
Test Composite Sample #5

Constituent Concentration (ppm)

	Ag	As	Ba	Cd	Cr	Pb	Hg	Ni	Se
Extraction									
1	<0.05	0.02	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.021
2	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.014
3	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.010
4	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.006
5	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.006
6	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
7	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
8	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
9	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
Mean Constituent Leaching	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.0086
Maximum VHS	0.315	0.315	6.30	0.063	0.315	0.315	0.0126	3.15	0.063

Q-029

TABLE XIII

Keystone Treated EAF Dust Multiple
Extraction Procedure Test Results--
Test Composite Sample #6

Constituent Concentration (ppm)

	Ag	As	Ba	Cd	Cr	Pb	Hg	Ni	Se
Extraction									
1	<0.05	0.02	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.025
2	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.015
3	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.009
4	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.009
5	<0.05	0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.005
6	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
7	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
8	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
9	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	<0.005
Mean Constituent Leaching	<0.05	<0.01	<1.0	<0.01	<0.05	<0.05	<0.002	<0.20	0.0092
Maximum VHS	0.315	0.315	6.30	0.063	0.315	0.315	0.0126	3.15	0.063

Q-029

CERTIFICATION

I, Dale Bennington, certify under penalty of law that I have personally examined and am familiar with the information submitted in this petition, and all attached documents other than Attachment L and, based on inquiry of the person or persons immediately responsible for obtaining the information, I believe it to be true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Dale Bennington

Dale Bennington, Manager
Energy and Environmental Engineering
Keystone Steel and Wire Corp.

Subscribed and sworn to
before me this 18TH day
of JANUARY, 1991.

Notary Public

7899c

OFFICIAL SEAL
C. M. KIRKHAM
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. OCT. 8, 1992

CERTIFICATION

I, Charles L. Smith, certify under penalty of law that I have personally examined and am familiar with the information contained in Attachment L to this petition and, based upon inquiry of the person or persons immediately responsible for obtaining the information, I believe it to be true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Charles L. Smith
Chief Chemist
Conversion System, Inc.

Subscribed and sworn to
before me this 17th day
of January, 1990.
1991

Nancy A. Wagner
Notary Public

7899c

NOTARIAL SEAL
NANCY A. WAGNER, Notary Public
Horsham Twp., Montgomery Co.
My Commission Expires Nov. 9, 1992

CERTIFICATE OF SERVICE

I, the undersigned, certify that I have served the attached Petition for Delisting and Adjusted Standard which was filed with the Clerk of the Pollution Control Board, a copy of which is attached hereto and served upon you by U.S. Mail, First Class, postage prepaid on January 22, 1991.

9098w

IUSEPA

Illinois Environmental Protection Agency · P.O. Box 19276, Springfield, IL 62794-9276

217/782-6762

Refer to: 1430050001--Peoria County
Keystone Steel and Wire
ILD000714881
RCRA Permit & Compliance

August 15, 1991

Dale L. Bennington, P.E.
Manager, Energy and Environmental Engineering
Keystone Steel & Wire Co.
7000 S.W. Adams Street
Peoria, Illinois 61641

Dear Mr. Bennington:

This is in response to your submittal of August 7, 1991 to Mr. Andrew A. Vollmer of the Agency requesting a complete waiver from the insurance requirements of 35 IAC 725.247(a) and (b). The Agency has reviewed this submittal and has determined that it has not been properly filed with the Agency. This determination is based upon the following:

1. 35 IAC 725.247(c), which establishes the criteria and procedures for such a request, requires that this request be processed as if it were a permit modification under 35 IAC 702.184(e)(3) and 705.128. Based upon a review of the applicable regulations pertaining to permit modifications, the Agency has determined that this request should be submitted as a Class I modification request subject to Agency approval.

2. The submittal was not accompanied by a certification meeting the requirements of 35 IAC 702.126.

Based upon the above determination that the subject request was not properly filed, the Agency has deemed your submittal to be incomplete and is returning it to you herewith. This determination shall serve as final action on the subject submittal. If you would like to pursue this request further, you should make a formal submission of this request to the Agency as a Class I permit modification request subject to Agency approval in accordance with the procedures and requirements specified in 35 IAC 703.281. Please note that any resubmittal must include a certification which meets the requirements of 35 IAC 702.126.

As a final comment, the Agency would like to point out that the potential for or presence of groundwater contamination at this site is very important in evaluating a request for relief from the insurance requirements of 35 IAC 725.247(a) and (b). Therefore, any resubmittal should thoroughly address this

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issue and contain sufficient information to justify all conclusions/statements made regarding groundwater contamination at this site. Please note that the Agency is especially concerned with the trichloroethene and 1,1,1-trichloroethane which has been detected in the groundwater at the site and is the subject of an on-going investigation and remediation project.

If you have any questions regarding this letter, please contact James K. Moore, P.E. of my staff at 217/782-6762.

Very truly yours,

Lawrence W Eastep by CAZ

Lawrence W. Eastep, P.E., Manager
Permit Section
Division of Land Pollution Control

LWE:JKM:jm

Enclosure

cc: Division File
Andrew Vollmer
Division of Legal Counsel
Peoria Region
Kenn Liss
Ken Lovett
George Hamper, USEPA-Region V

RECEIVED
MAR 25 1991
OFFICE OF
Waste Management
U.S. EPA

ILLINOIS POLLUTION CONTROL BOARD
February 28, 1991

IN THE MATTER OF:	)	
PETITION OF KEYSTONE STEEL AND	)	AS 91-1
WIRE COMPANY FOR HAZARDOUS	)	(Adjusted Standard)
WASTE DELISTING	)	

ORDER OF THE BOARD (by J. Anderson):

On January 22, 1991, Keystone Steel and Wire Company filed a petition for adjusted standard from 35 Ill. Adm. Code 721.132. Keystone seeks to have its electric arc furnace dust (K061) waste, produced at its facility in Peoria County, delisted as a hazardous waste after treatment by a "Super Detox" destabilization process; untreated K061 waste is specifically listed as a hazardous waste under the RCRA regulations. The petition was accompanied by a letter claiming trade secret protection for Attachment L to the petition pursuant to 35 Ill. Adm. Code 120.201.

On March 1, 1990, USEPA delegated authority to Illinois to administer several additional components of the RCRA program. (55 Fed. Reg. 7320). This included Board authority to delist hazardous waste, in lieu of USEPA, pursuant to 35 Ill. Adm. Code 720.122.

This matter is procedurally complicated by the fact that, as of the time of the filing of the petition, the Board was in the process of adopting adjusted standard procedural rules specifically tailored to the handling of delisting petitions such as this. These regulations were adopted today. In the Matter of: RCRA Delisting, R90-17, February 28, 1991. Due to the pendancy of this rulemaking, on January 30, 1991, the Agency moved that this proceeding be continued until after final adoption of R90-17, and specifically that the time for the Agency's response to the petition, required pursuant to 35 Ill. Adm. Code 106.714, be extended until 30 days after the adoption of R90-17. On January 31, Keystone stated that it had no objection to the Agency's request. On February 20, 1991, Keystone moved for an extension of time in which to file proof of publication of newspaper notice of the filing of the petition, required until 14 days after the adoption of R90-17. Keystone asserts that it has delayed newspaper publication since, if the R90-17 were not to be adopted, such publication would be a useless act. The motion recites that the Agency has no objection to the motion.

The manner in which the parties have suggested this action proceed is generally acceptable. However, the Board notes that

the R90-17 RCRA Delisting rules are not effective until filed, and that the Board delays filing of identical in substance rules for a post-adoption comment period of 30 days to allow agencies involved in the RCRA authorization process a final review period. The Board accordingly believes it more appropriate to calculate the time periods suggested by the parties from approximately April 15, rather than today's date. Keystone shall file the proof of publication required by 35 Ill. Adm. Code 106.711 on or before May 1, 1991. The Agency shall file its response to the petition required by 35 Ill. Adm. Code 106.714 on or before May 15, 1991. The Clerk of the Board is directed to provide trade secret protection to Attachment L of the petition pursuant to 35 Ill. Adm. Code 120 unless and until otherwise directed by the Board.

IT IS SO ORDERED.

I, Dorothy M. Gunn, Clerk of the Illinois Pollution Control Board, hereby certify that the above Order was adopted on the 28th day of February, 1991, by a vote of 6-0.

Dorothy M. Gunn

Dorothy M. Gunn, Clerk
Illinois Pollution Control Board

PROOF OF SERVICE

I, the undersigned, on oath state that I have caused to be served copies of **Keystone Steel & Wire Petition For Delisting As An Adjusted Standard (AS 91-1)** upon the USEPA, Region V, 230 South Dearborn Street, Chicago, Illinois 60604 and the U.S. EPA, Office of Solid Waste and Emergency Response, Washington, D.C. 20460 by first class mail deposited in a mailbox at 321 North Clark Street in Chicago, postage prepaid this 11th day of March, 1991.

Gail L. Bell

Subscribed and sworn to
before me this 11th day
of March, 1991.

Pepi A. Hooczko

Notary Public

OFFICIAL SEAL
PEPI A. HOOCZKO
NOTARY PUBLIC STATE OF ILLINOIS
MY COMMISSION EXP. AUG. 20,1994

9782c

GARDNER, CARTON & DOUGLAS
SUITE 3400-QUAKER TOWER
321 NORTH CLARK STREET
CHICAGO, ILLINOIS 60610-4795
(312) 644-3000
TELEX: 25-3628
TELECOPIER: (312) 644-3381
WASHINGTON, D.C.

WRITER'S DIRECT DIAL NUMBER
LEE R. CUNNINGHAM
(312) 245-8742

March 11, 1991

RECEIVED
MAR 14 1991
Office of
Waste Management
U.S. EPA

United States Environmental
Protection Agency - Region V
230 South Dearborn Street
Chicago, Illinois 60604

Re: AS 90-1

To whom it may concern:

In compliance with the Illinois Pollution Control Board's new regulations authorizing RCRA delistings to be requested through a state adjusted standard proceeding, I have enclosed a copy of Keystone Steel & Wire's Petition for Delisting As An Adjusted Standard (AS 91-1), which was filed with the Board on January 22, 1991.

If you have any questions or desire further information, please call me at (312) 245-8742.

Very truly yours,

Lee R Cunningham

Lee R. Cunningham

LRC/glb

Enclosure

9790c

Keystone Group

7000 SOUTH WEST ADAMS STREET, PEORIA, IL 61641 (309) 697-7020

Complainant Ex. 4

February 13, 1981

RECEIVED
APR 1 1984
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

Mr. Miles Morse
Office of Solid Waste
Hazardous & Industrial Waste Division
United States Environmental Protection Agency
401 M. Street S.W.
Washington, D.C. 20460

Dear Mr. Morse:

Enclosed is the formal petition for hazardous waste delisting of Keystone Group - Bartonville Plant waste water treatment sludge (formerly hazardous waste #K063), generated from the lime neutralization of spent pickle liquor (K062). Our RCRA facility I.D. # is ILD 000714881 as obtained from USEPA - Region V.

I believe that the Agency will find all the data necessary to grant delisting in accordance with 40CFR260.22.

Keystone appreciates the action you have already taken in delisting the sludge at our sister facility in Crawfordsville, Indiana. Your early review of this similar petition for our Bartonville facility will be greatly appreciated.

If you need additional information, please call me on my direct phone A/C 309-697-7552.

Very truly yours,

Dale L. Bennington

DALE L. BENNINGTON, P.E.
MANAGER, ENVIRONMENTAL ENGINEERING

DLB:bmk
Enclosure

cc: U.S. EPA - Region V, J.S. Goldstein
IEPA - Springfield, D. Umfleet

bcc: J. W. Mahannah
M. H. Henning
J. J. Monroe

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STATE OF ILLINOIS

Keystone Group - Bartonville Plant; Peoria, Illinois, involved in the manufacture of steel, wire and wire products, hereby petitions the United States Environmental Protection Agency for the delisting of its Waste Water Treatment Plant (WWTP) Sludge, formerly listed as EPA Hazardous Waste No. K063 (sludge from the lime treatment of spent pickle liquor from a steel finishing operation).

On November 12, 1980 (45FR74884), the EPA removed waste K063 from the Hazardous Waste List (261.32). However, since lime treatment sludge is generated from the treatment of a hazardous waste (K062), it still is considered to be a hazardous waste (261.3(c)(2)). Further, this waste will remain hazardous until it no longer meets any of the characteristics of a hazardous waste and is delisted (261.3(d) (2)).

40CFR 260.20 (b)

1. The petitioner's name and address:

   Keystone Group - Bartonville Plant
   7000 South Adams St.
   Peoria, Illinois 61641

2. A statement of the petitioner's interest in the proposed action:

   Since the lime treatment of this spent pickle liquor is properly conducted at this facility, the generated sludge is rendered non-hazardous. The waste sludge is the only material stored in these sludge lagoons on Keystone property. Delisting of this sludge as a hazardous waste will remove the very considerable burden, both technical and financial, of managing a hazardous waste storage/disposal facility under the RCRA regulations. Delisting will also remove adverse local public opinion associated with hazardous waste storage and disposal.

3. A description of the proposed action, including (where appropriate) suggested regulatory language:

   An exclusion in response to a delisting petition submitted in accordance with 40CFR260.20 and 260.22 and granted pursuant to 40CFR260.22 (M):

   "That the Waste Water Treatment Plant sludge generated from this facility be excluded from the list of hazardous waste under 40CFR 261, and from the management standards issued by EPA under Sections 3002 through 3006 of RCRA (40CFR Parts 262 through 265 and 122 through 124)."

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4. A statement of the need and justification of the proposed action, including any supporting tests, studies or other information:

The primary concern of the waste sludge is that it is derived from a hazardous waste (spent pickle liquor from steel finishing - K062) which may contain high concentrations of lead and chromium. It is believed that these heavy metals will be found in excessive concentrated form in the waste and that a potential hazard is eminent if uncontrolled leaching occurs. As the result of an effectively conducted lime treatment process, the waste sludge that is generated from this facility has been proven to be non-hazardous by laboratory analysis. The concentrations of lead and chromium in the EP waste extracts (leachate) are significantly less than the maximum concentration levels for lead and chromium contained in 261.24. Additionally, all four sample extracts were analyzed for the other toxic metals. Analysis results show that the concentrations of these toxic metals in the leachate are significantly less than the maximum concentration levels specified in 261.24. One sample was also analyzed for the leachate of toxic organics. The analysis results show that these organics are not present.

40CFR260.22(i):

1. The name and address of the laboratory facility performing the sampling and tests of the waste:

Daily Analytical Laboratories
7807 N. Pioneer Lane
Peoria, Illinois 61615

2. The names and qualifications of the persons sampling and testing the waste:

Daily Analytical Laboratories performed the total analysis including the sampling and analysis.

Daily Analytical Laboratories is approved by the Illinois Environmental Protection Agency for the analysis of drinking water for certain organic and inorganic parameters. Their certification number is 100180.

The staff of Daily Analytical Laboratories and their qualifications are enclosed as Page 3.

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Daily Analytical Laboratories
7807 N. Pioneer Lane • Peoria, Illinois 61615 Tel. 309-692-5252

Eugene J. Daily, Chairman
John P. Higgins, President
Otis E. Michels, Vice President
James F. Dallmeyer
Laboratory Director

STAFF

Peoria, Illinois

Employee	Formal Education	Major	Function	Area of Responsibility	Experience	Average Hours/W
James F. Dallmeyer	B.S.	Chemistry	Laboratory Director	Chemistry Bacteriology Trace Organics	1 year USDA 7 years DAL	40+
John R. LaPayne	B.S.	Chemistry Biology	Chief Chemist	Chemistry Bacteriology	2 years DAL	40+
Kurt Stepping	B.S.	Chemistry	Staff Chemist	Chemistry	1 year Chillicothe San. Dist. 1 year DAL	40+
Diane Osborne-Heakin	B.S.	Agriculture Biology	Microbiologist	Bacteriology	1 year USDA 1 year DAL	40+
Parimala Kothandaraman	B.S.	Chemistry	Staff Chemist	Chemistry Bacteriology	2 years ISWS 5 years DAL	30+
Susan A. Wahls	B.S.	Chemistry	Staff Chemist	Trace Organics	1 year Harris Research 1 year G.D. Searle 1 year DAL	40
Dean Y.W. Chang	M.S.	Chemistry	Staff Chemist	Chemistry	7 years Carnegie-Meilon Institute 3 years DAL	20
Dorothy J. Dunn	H.S.		Secretary		5 years DAL	32+

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3. The Dates of Sampling and Testing:

(DAL) SAMPLE #	SAMPLE NAME	SAMPLING DATE	TESTING DATES	REPORT DAT
0351-14	Sludge-EP Toxicity	12-16-80	12-16-80/1-13-81	1-13-81
0358-69	" "	12-23-80	12-23-80/1-08-81	1-08-81
1013-18	" "	1-13-81	1-13-81/1-22-81	1-22-81
1020-22	" "	1-20-81	1-20-81/2-02-81	2-02-81

4. The location of the generating facility:

Keystone Group - Bartonville Plant
7000 South Adams Street
Peoria, Illinois 61641

5. A description of the manufacturing process or other operations and feed materials producing the waste and an assessment of whether such processes, operations or feed materials can or might produce a waste that is not covered by the demonstration:

The Keystone Group - Bartonville Plant - utilizes the process of cold drawing, acid pickling and lime treatment in the production of wire from carbon steel wire rods. This process would not produce a waste that is not covered by this demonstration. The sludge is generated by our Waste Water Treatment Plant operated in accordance with our NPDES Permit No. IL 0002526. Enclosed is a copy of Drawing No. 50008 which shows the waste water flow and the lime neutralization process in schematic form.

6. A description of the waste and an estimate of the average and maximum monthly and annual quantities of the waste covered by the demonstration:

Eighty-five (85) percent of the waste sludge is generated from lime neutralizating solutions of sulfuric acid and water which is used to remove scale from the wire rod surface (pickle liquor).

Fifteen (15) percent results from steam generating boiler blowdown plus preparation of wire through coating operations. The coating operations include sodium hydroxide solutions for degreasing and etching, flash hydrochloric acid contact and hot dip galvanizing operations.

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STATE OF ILLINOIS

6. Continued

Currently, seventy (70) tons of this waste sludge is generated daily. The maximum generating capacity is eighty-five (85) tons per day at full production. The average and maximum annual quantities of generated waste is 15,000 to 18,000 tons per year respectively. The resulting sludge is composed of twenty (20) percent solids by weight and eighty (80) percent water by weight while having a mud-like consistency.

7. Pertinent data on and discussion of the factors delineated in the respective criterion for listing a hazardous waste, where the demonstration is based on the factors in 261.11(a)(3):

Since the primary concern with lime treatment sludges is whether they will leach significant concentrations of lead and chromium, consideration of this petition is requested based on the laboratory data that proves concentrations of lead and chromium in EP waste extracts are significantly less than the maximum levels contained in 261.24, without consideration of other delisting factors.

8. A description of the methodologies and equipment used to obtain the representative samples:

Representative 'Grab-type' samples were taken directly from the active south sludge lagoon. All waste samples were taken in accordance with guidelines established by USEPA's, Samplers and Sampling Procedures for Hazardous Waste Streams, EPA-600/2-80-018. Samples were collected approximately 25' from shore in the vicinity of the Inlet Pipe with the use of an Echmann Dredge (Wildlife Supply Co., Saginaw, MI).

All samples were tagged as to sample location, date, time, client, sampler and transporter. In addition, a short description of sample location, sample and techniques used was entered into a field sample log which is kept on file at the laboratory.

9. A description of the sample handling and preparation techniques, including techniques used for extraction, containerization and preservation of samples:

Samples were placed in nitric acid rinsed glass jars with Aluminum Foil liners at the sampling location. Each sample was assigned a unique sample number and stored at 4°C until analysis. All work is recorded in permanent laboratory notebooks, with bound, numbered pages in ink. Work is dated and initialled. All procedures used are those described in Federal Register May 19, 1980, Appendix II-EP Toxicity Test Procedure and Test Methods for Evaluating Solid Waste (SW-846). All completed samples are currently retained in storage at the laboratory.

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10. A description of the tests performed (including results) are as follows:

A total of four sludge samples were collected over a six week period to represent the variability of or the uniformity of the waste in accordance with 40CFR260.22 (h).

The first sludge sample (DAL Sample #0351-14) was analyzed for ignitability, corrosivity, reactivity (cyanide, sulfide), and all the EP Toxicity Contaminants per Table I in 40CFR261.24.

The subsequent three samples were analyzed for all the heavy metal EP toxic (Table I) contaminants.

The test results for these sludge samples are listed below:

Hazardous Waste (No.)-Characteristic		Daily Sample No. 0351-14 (12-16-80)	0358-69 (12-23-80)	1013-18 (1-13-81)	1020-22 (1-20-81)	Allowable (Max.)
(D001)-Ignitability, flashpoint		>200°F	NT	NT	NT	140°F
(D002)-Corrosivity, Ph		8.3	"	"	"	<2, >12.5
(D003)-Reactivity -						
Tot. Cyanide	(mg/1)	0.02	"	"	"	N/A
Tot. Sulfide	"	43.	"	"	"	N/A
EP Toxicity (No) - Substance						
(D004)-Arsenic	(mg/1)	<0.001	<0.001	<0.001	<0.001	5.0
(D005)-Barium	"	2.2	1.3	0.59	4.2	100.0
(D006)-Cadmium	"	< 0.01	<0.01	<0.01	<0.01	1.0
(D007)-Crome(total)	"	< 0.03	<0.03	<0.02	<0.01	5.0
(D008)-Lead	"	0.08	0.60	0.39	1.20	5.0
(D009)-Mercury	(PPb)	<0.04	0.34	<0.04	<0.04	200.0
(D010)-Selenium	(mg/1)	0.02	0.016	0.008	0.033	1.0
(D011)-Silver	"	< 0.02	<0.02	<0.01	<0.01	5.0
(D012)-Endrin	"	< 0.01	NT	NT	NT	0.02
(D013)-Lindane	"	< 0.003	"	"	"	0.40
(D014)-Methoxychlor	"	<0.05	"	"	"	10.00
(D015)-Toxaphene	"	<0.20	"	"	"	0.50
(D016)-2,4-D	"	<0.01	"	"	"	10.0
(D017)-2,4,5-TP Silvex	"	<0.01	"	"	"	1.0

N/A = Not Available
NT = No Test

The test results show that the sludge is not a hazardous waste. Note that all four samples were tested for all the heavy metal leachates not just lead and chromium. The results show that the toxic organics are not present in the waste leachate and that all the heavy metals are considerably less than the allowable leachate levels.

11. The names and model numbers of the instruments used in performing the tests:

Fisher/Tag Open Flashpoint Tester No. 13-512-1
Millipore Hazardous Waste Filtration System OM0100
Corning Model 110 Expand Scale pH Meter
Orion Model 399A pH Meter
Chemtrix Model 45AC pH Controller
Master Flex No. 7543-20 Pump Drive with 7017 head
Phipps and Bird Laboratory 6 Paddle Stirrer
Bausch and Lomb Spectronic 20
Perkin-Elmer Model 305A Atomic Absorption Spectrophotometer
Perkin-Elmer Model HGA 400 Graphite Furnace
Perkin-Elmer Model 2380 AAS
Mettler PC 180 Top Loading Balance
Mettler H 20, Semi-Micro Balance
Strip Chart Recorders, 4 each
Perkin-Elmer 3920 Gas Chromatograph with dual ECD and FID
Perkin-Elmer Sigma 4, Thermal Conductivity Detector
Other equipment/glassware indigenous to an analytical laboratory
Include hot plates, drying ovens, balances

12. Statement to be signed by generator of waste or authorized representative:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including possibility of fine and imprisonment.

Dale L. Bennington, P.E 2/13/1981.

DALE L. BENNINGTON, AUTHORIZED AGENT
MANAGER, ENVIRONMENTAL ENGINEERING
KEYSTONE GROUP, A DIVISION OF
KEYSTONE CONSOLIDATED INDUSTRIES, INC.

RECEIVED
MAR 20 1984
E.P.A. — D.L.P.C.
STATE OF ILLINOIS