Sanmina-SCI Facility

Former Robintech/Compudyne, Inc. Site Sub Slab Depressurization System Operations, Maintenance, and Monitoring Plan

1200 Taylor Road
Owego, New York
NYSDEC Site Number 754007

May 2010

Environmental Resources Management
5788 Widewaters Parkway
DeWitt, New York 13214

Former Robintech/Compudyne, Inc. Site Sub Slab Depressurization System Operations, Maintenance, and Monitoring Plan– Owego, New York
NYSDEC Site Number 07-54-007

CERTIFICATION:

I certify that the Operations, Maintenance, and Monitoring Plan were implemented and that construction activities were completed substantially in accordance with the requirements in NYSDEC document Draft DER-10.

John Mohlin, P.E.
ERM
Project Engineer

Date: 5/26/10

APPROVED BY:

Todd L. Marsh
ERM
Project Manager

FOR:
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ERM
Principal-in-Charge

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1.0 INTRODUCTION

1.1 PROJECT

The former Robintech/Compudyne, Inc. Site (the Site) is located at 1200 Taylor Road in the Town of Owego, New York (Figure 1). The Site is listed as a Class 2 Inactive Hazardous Waste Storage Site by the New York State Department of Environmental Conservation (NYSDEC) Site No. 07-54-007.

The Site is currently operated by Sanmina-SCI. The facility consists of two buildings; the Main Building and the Broadway Building. To control the migration of chlorinated volatile organic compound (CVOC) vapors beneath the facility, Sanmina operates two Sub-Slab Depressurization Systems (SSDS) that are designed to minimize indoor air concentration of CVOCs. The Main Building system controls the sub-slab vapor pressure in the Main and northern portion of the Broadway Building. The Broadway system controls the central and southern portions of the Broadway Building. A Site layout Map is provided as Figure 2.

1.2 PURPOSE OF OM&M MANUAL

This OM&M plan provides a guideline for routine maintenance of the Main Building and Broadway Building SSDS. The OM&M plan is divided into the following sections:

- **Introduction**
- **Site Description:** An outline of Site history, geology and hydrogeology, and past investigations is provided in this section;
- **Site Remedial Action:** The Site Remedial Action section provides an overview of the SSDS and summarizes the goals of the remedial action;
- **Sampling and Analysis:** This section provides a plan for monitoring the effectiveness of the SSDS;
- **Site Maintenance:** This section provides SSDS operating procedures, describes the functionality of the SSDS, presents a schedule for maintenance activities, and discusses the basic requirements for waste disposal;
- **Reports:** This section describes regulatory reporting requirements associated with operating the SSDS;
- **Personnel:** This section describes the role of individuals in the operation of the SSDS;

- **Health & Safety Plan:** This section includes a site-specific health & safety plan for environmental investigation and remediation tasks at the Sanmina Facility;
- **Records & Forms:** This section includes a list of forms and records that will be maintained to document SSDS operations;
- **Emergency Contingency Plan:** This section provides a plan of action for personnel working within the SSDS in the event of an emergency.

The OM&M is not intended to include guidance for large scale changes in the remediation and/or the re-building of system modules or equipment. If equipment is to be re-built or repaired, the reader is referred to **manufacturers' manuals or to trained mechanics, electricians and/or** engineers. Major changes to the SSDS will be documented in the semi-annual report, and the NYSDEC and New York State Department of Health (NYSDOH) will be notified of any changes that will alter the operation or function of the systems.

2.0 *SITE DESCRIPTION*

The Site is located approximately 0.5-miles east of the village of Owego, New York. The Site is located in a mixed use area with a combination of commercial, industrial, and residential properties nearby. Portions of the Site not covered by structures include paved parking areas, open grass and landscaped areas. The Site slopes moderately towards the south.

The Site consists of approximately 17.3-acres of land, which is bordered to the south by a municipal sewage treatment plant, to the east by Barnes Creek and a Lockheed Martin facility (formerly leased by IBM) NYSDEC Site Number 7-54-006 (Class 4), in addition, the Broadway Complex (formerly leased by IBM), NYSDEC Site Number 7-54-013 (Class 2) is located east and adjacent to the Site. To the north by Tioga County Route 20 (Taylor Road) and property used by ACHIEVE! (Formerly Broome Tioga ARC), land adjacent and to the west is undeveloped, land further to the west was formerly a car dealership and garage. The Susquehanna River is located approximately one mile to the south.

The Site is currently used to manufacture custom computer circuit boards for the commercial and industrial products industries. Similar operations have been performed at this facility since approximately 1975. Manufacturing operations primarily include machining, limited grinding, de-burring, testing, cleaning, lubricating, and assembly.

Geology

The Susquehanna River Valley was a main conduit for glacial melt water discharged during the Pleistocene glaciation events. The geologic materials deposited on-site are representative of the varying conditions during the repetitive rising and lowering of the prehistoric Susquehanna River consisting of glacial outwash deposits composed of river bank, over bank and sand bar deposits. In the northern part of the Site, shallow soils also contain sediment from the eroding valley wall. Prior to the deposition of the glacial outwash deposits, a dense gravel till was deposited during one or more of the glaciation stages. In general the surficial materials are heterogeneous and non-continuous due to the nature of the deposits and the erosion of sediment as the river meandered and flow volumes varied through time.

Several subsurface investigations have occurred at the Site. There is a good understanding of the stratigraphy and geologic materials underlying the Site. Bedrock consisting of siltstone and shale of the Upper Devonian West Falls Group, more specifically, the Beers Hill Shale and Grimes

Siltstone formations underlie the surficial deposits. Bedrock does not crop out on-site but bedrock float can be seen in the banks and stream bed of Barnes Creek. The bedrock surface dips to the south and ranges between 60- to 90-feet below ground surface (bgs), shallower to the north. Several on-site wells have been drilled and exist as open boreholes into the bedrock

The surficial materials on-site are derived from soil and rock eroded from the gully of Barnes Creek and re-worked by glaciers and the pre-historic Susquehanna River. In the northern portion of the Site a dense, hard glacial till overlies the bedrock. Recent Site investigations have shown that the till is has an irregular upper surface at dips to the west-southwest. In general the northern portion of the site contains interbedded layers of sandy-silt and silty-sand gravels that become finer upward. At a depth of 15- to 20-feet bgs a thin (3- to 5-ft. thick) layer of sandier material (sand to sandy gravel) exists. Underlying this sandy unit, a coarser sandy gravel unit overlies the relatively hard glacial till. These units are non-continuous and can not be correlated even in tightly spaced boreholes. Lenses described as clay, and/or silt, have been encountered in some borings. These fine-grained deposits are not continuous and do not present a barrier to the deeper soils. The southern portion of Site contains numerous, thin units of re-worked coarser-grained materials that inter-finger with the thicker sandy-silt gravel unit to the north. As previously mentioned bedrock is deeper to the south, approximately 90-feet bgs and the glacial till unit is thinner or non-existent.

Hydrogeology

Based on hydrological and lithological criteria, ERM has divided the ground water bearing materials into three units. These units have been designated as the shallow overburden, deep overburden and bedrock zones. ERM does not believe these are separate aquifers, rather separate geologic units with different physical parameters that affect the movement of ground water on Site. Based on closely spaced wells, there appears to be a downward vertical hydraulic gradient. However, the horizontal gradient seems to have a greater influence on ground water flow based on gradients shown on ground water contour maps. Ground water flow, in all three units, is towards the southwest and is strongly influenced by the remediation system pumping wells.

Hydraulic conductivity (K) values obtained by performance of slug tests in the shallow overburden zone show variability of flow rates, ranging from 0.65- to 48.21-feet per day. Pumping tests, a better indicator of the natural permeability of the aquifer, performed in the deep overburden

zone by two separate consultants produced K-values of 2.8- to 4.6-feet per day. The hydraulic conductivity of the bedrock as calculated by a slug test was reported at 2.35-feet per day, very similar to the deep overburden zone.

Sustainable yield tests performed in the ground water units are also an indicator of relative ground water flow in the aquifer. A range of aquifer yields from each unit has been calculated using data from multiple wells screened in each unit. The shallow overburden zone yielded 0.3- to 0.4-gallons per minute (gpm); deep overburden wells produced 1- to 7-gpm; and the bedrock wells yielded 5- to 35-gpm. The lower yield test values from the shallow overburden unit seem to suggest it contains more silt and that the geologic materials are less continuous than in the deep overburden zone. The hydrologic properties in the deep overburden zone and bedrock zone are similar if data from the high yield well are dismissed. The hydraulic conductivity and yield calculated from bedrock wells is dependent on the number of fractures the well boring intercepts, a difference of several orders of magnitude can occur.

Contaminant Flow Patterns

Based on the geology and hydrogeology of the Site, dissolved phase CVOCs migrate to south/southwest following preferential pathways within the coarser grained soils. The basal till unit is a possible barrier to downward migration of CVOCs. The southern portion of the Site, which contains coarser overburden materials, would increase the diffusion rate of CVOCs due to the larger volume of ground water that flows through the unit.

2.1 HISTORY

As presented by the Record of Decision (ROD) issued by NYSDEC in March 1995, the potential source area for hazardous waste in the subsurface is a former Robintech chemical storage area located under the **existing "clean room" of the Main Building.**

A ground water monitoring program was initiated at the site on 16 April 1997 pursuant to a NYSDEC approved Performance Monitoring Program (PMP). As a result of ground water analytical data obtained during monitoring, ERM installed and is presently operating a pump and treat (P&T) system at the site on behalf of Sanmina-SCI. The P&T system is designed to hydraulically control migration of VOCs that are present in ground water at the Site. This system has been in operation for 12-years as prescribed by the ROD. Groundwater is extracted from three pumping

wells (RW-4, RW-5 and RW-6), treated onsite using aeration methods to strip contaminants and discharge the effluent to the Town of Owego's Publicly Owned Treatment Works (POTW). ERM's review of the treatment performance indicates that the P&T approach is withdrawing VOC mass from the subsurface and creating a cone of depression sufficient to provide hydraulic capture and contaminant migration control. However, due to the low solubility of the contaminants and the presence of a residual source, the P&T system will operate into the indefinite future.

Because of VOC concentrations in ground water, the NYSDEC requested a soil vapor intrusion evaluation at the Site in 2004. In December 2004, ERM collected indoor air and sub-slab soil vapor samples in the Main Building and the Broadway Building. Results of this sampling event were presented to the NYSDEC in a Sampling Report dated 9 May 2005.

Based on the results of the December 2004 sampling event, ERM installed two SSDS in May 2005. The purpose of the SSDS is to create and maintain a vacuum beneath the buildings throughout all operating conditions and seasons to minimize vapor intrusion into the building.

Site contaminants present in ground water include the chlorinated ethenes trichloroethylene (TCE), perchloroethylene (PCE), dichloroethylene isomers (DCE) and vinyl chloride (VC). There are minor concentrations of chlorinated ethanes including trichloroethane (TCA) and dichloroethane (DCA) present. Also, minor concentrations of petroleum hydrocarbons, including benzene, toluene, ethyl-benzene and xylene (BTEX), have been detected.

3.0 SITE REMEDIAL ACTION

3.1 DESCRIPTION OF REMEDIAL ACTION

A sub slab depressurization system was installed in 2005 and to minimize infiltration of CVOC containing vapor into the Main building and the Broadway building. Both SSDS were designed and installed under guidance of a professional engineer and in general accordance with EPA Radon Mitigation Standard ASTM E-2121.

A negative pressure environment is created beneath the slab by the SSDS. Each SSDS utilizes a blower to transport sub-slab vapor through a closed piping network from sealed depressurization penetrations. The penetration locations were selected based on analytical results of the December 2004 sampling and the configuration of the buildings. SSD System A (the Broadway Building SSDS) consists of one depressurization penetration and three depressurization monitoring points (1A-1, 1A-2 and 1A-3) located in the southeast corner of the Broadway Building (Plate 1). Sub-slab vapor is extracted through the depressurization penetrations and exhausted to the atmosphere through a stack located outside the southeast corner of the Broadway Building.

SSD System B consists of two depressurization penetrations in the north end of the Broadway Building and three depressurization penetrations in the Main Building. Nine depressurization monitoring points (1B-1, 2B-1 to 2B-3, 3B-1 to 3B-3, 4B-1 to 4B-3 and 5B-1 to 5B-3; see Plate 1) are used to monitor pressure gradients between the sub-slab and indoor air environments. Sub Slab vapors extracted through System B are exhausted to the atmosphere through a stack located near the southwest corner of the main building.

3.2 GOALS OF REMEDIAL ACTION

The goal of the remedial actions is to minimize the potential for soil vapor intrusion to cause elevated CVOC concentrations in indoor air.

The objective is to maintain a negative pressure of at least 0.002-inches of water column (wci) beneath Main and Broadway buildings throughout all operating conditions.

4.0 SAMPLING ANALYSIS

4.1 MONITORING PLAN

The magnitude and effective radii of vacuum under the facility will be monitored from strategically placed depressurization monitoring points to ensure that negative pressure of 0.002-wci is being maintained under both buildings. An estimate of VOC concentrations will be calculated based on photoionization detector (PID) data collected from each SSDS emission stack.

4.1.1 *Elements of Monitoring Plan*

Three depressurization monitoring points were installed at a pre-determined radius from each depressurization penetration to monitor the magnitude of vacuum created by the SSDS under the facility (Plate 1).

4.1.2 *Basis of Design*

The SSDS was installed as described in the work plan submitted to the NYSDEC on 28 April 2005. A Sub Slab Depressurization report was submitted to NYSDEC in 15 March 2006, which discusses the construction, implementation, balancing and initial data from the SSDS start up.

The Process and Instrumentation Drawings (PIDs) for the Main Building and Broadway Building SSDS are presented as Figure 3 and Figure 4 respectively.

Plate 1 (Appendix A) details the location of the sub slab depressurization penetrations and depressurization monitoring points.

4.2 ENVIRONMENTAL EFFECTIVENESS MONITORING

4.2.1 *General*

The environmental effectiveness of the SSDS will be monitored by collecting vacuum measurements from beneath each buildings sub-slab and measuring the VOC concentration from the vapor train of the SSDS. Data are to be reviewed by the Sanmina-SCI EH&S Manager to ensure the negative pressure beneath the slabs is sufficient to meet the SSDS remedial goals of 0.002-wci throughout all operating conditions. Semi-annual reports will be submitted to the NYSDEC Site project manager detailing the effectiveness of the system.

4.2.2 *Sampling Program*

The sampling program involves the collection of vacuum measurements, condensate volume and VOC concentration from the depressurization monitoring points, blower condensate separator, system influent monitoring points, and system effluent monitoring points. These data will be collected monthly and recorded on the appropriate data collection sheets and logs (Appendix B).

4.3 *ON-SITE TREATMENT PLANT PERFORMANCE MONITORING*

4.3.1 *Influent Sampling and Procedures*

4.3.1.1 *Vacuum*

Vacuum at the sub-slab depressurization penetration points (wells in Plate 1) will be measured using an appropriately scaled differential pressure gauge and recorded on the Sub-Slab System Depressurization Point Logs (Appendix B). Care will be taken that the gauge is zeroed before each reading. Also vacuum measurements will be collected from the depressurization monitoring points installed near the sub-slab depressurization penetration points. These data will also be recorded on the Sub-Slab System Depressurization Point Logs.

4.3.1.2 *Volatile Organic Compounds*

VOC concentration in the vapor being removed by the SSDS will be measured from sample ports near each blower. Sample ports (SP306 and SP401) will be opened and a PID will be placed in the sample port opening to collect the vapors emitted from the system. The meter will remain in place for at least 2 minutes in order to collect a representative measurement. The reading will be logged in the Sub Slab Depressurization System VOC Log (Appendix B).

4.3.2 *Effluent Sampling & Procedures*

4.3.2.1 *Carbon Filtration On-line*

A measurement of the VOCs removed by the carbon filtration (if on-line) will be completed by opening the sample port (SP307) (mid-carbon) and measuring the VOC concentration with a PID. As with the influent measurement, the PID will remain in the port opening for a minimum of two minutes before a reading is collected. The same procedure will be completed on sample port (SP308) (effluent port). The readings will be recorded on the Sub Slab Depressurization System VOC Log. If VOCs are

detected on the discharge side of primary carbon vessel then the primary carbon filter will be changed. The secondary vessel will be moved into the primary position, and a new carbon vessel will be placed in the secondary position.

4.3.2.2 *Carbon Filtration Off-line and Broadway Building System*

To measure the effluent VOC concentration, sample port SP308 (Main building) and SP402 (Broadway Building) will be opened and a calibrated PID will be placed in the sample port opening to collect the vapor emitted from the system. The meter will remain in place for at least two minutes in order to collect a representative measurement. The reading will be logged in the Sub Slab Depressurization System Log. If the concentration **of VOCs is above the facility's regulatory discharge value of 5ppm, the** vapor train will need to be diverted through the carbon filtration portion of the system to reduce the VOC emissions.

4.4 *ANALYTICAL PROGRAM*

4.4.1 *Analytical Schedules and Methods*

The purpose of the sub slab depressurization system is to minimize migration of VOCs in sub-slab vapor into the buildings. If a negative pressure is maintained in the sub-slab relative to indoor air, then effectiveness of the system is confirmed. Therefore analytical sampling of indoor air is not necessary to measure system performance.

4.5 *EVALUATION OF MONITORING RESULTS*

Monitoring results will be reviewed monthly to verify that the system is performing as designed by the facility EH&S Manager. The data will be reviewed to ensure the negative pressure under the buildings is at least 0.002 wci in all locations. Emission levels will be reviewed to decide if the appropriate treatment method is being used. The results will be reviewed for data outliers that may suggest a problem with the SSDS.

4.6 *RECORDS*

Record data sheets will be stored (hard copy and electronic copy) at the Site.

5.0 *SITE MAINTENANCE*

Site maintenance will be performed by Sanmina-SCI technicians.

5.1 *MAINTENANCE ACTIVITIES*

The facility will be maintained in accordance with the procedures set forth in this OM&M manual.

5.2 *INSPECTION AND MAINTENANCE OF THE SUB SLAB DEPRESSURIZATION SYSTEM*

The system will be visually inspected daily by the Environmental Technician completing the production tour duties. The inspection will verify that the vacuum pumps are running and functioning. The daily **inspections are recorded in Sanmina's maintenance log book.**

Both sub-slab depressurization systems are connected to the internal Site fire alarm panel. If for any reason either sub-slab system shuts down, an alarm will triggered in the security office. Site security has procedures to contact the facility EH&S Manager or a person tasked with responsibility for the continued operation of the sub-slab systems.

5.3 *PREVENTATIVE MAINTENANCE.*

- The vacuum blower motors shall be inspected as per the **manufacturer's requirements.**
- Voltage and amp draws shall be checked and recorded at least once per year.
- One time per week the Environmental Technician performing Production Tour Duties will shut down the vacuum pumps and check the system for condensation accumulation.
- If condensation is present in the vacuum lines the system will be drained before restarting.

5.3.1 *Procedure for Draining the Condensate from the System*

- **Each blower is equipped with a moisture "knock-out" drum.** A 20-gallon water separator is used on SSDS A. A 55-gallon knock-out is used on SSDS B.

- Contact the Plant Protection Office and inform them that the SSDS will be shut down for maintenance.

- **To drain the SSDS B blower knock-out, switch the "Enable" switch on the main control console to "Off".**

- Open the PVC ball valve at the back of the Moisture Separator to collect the condensate in the Main Boiler Room. After all the condensate has drained close this valve and record the date/time and amount drained on the condensate log sheet.

- NOTE: Do not leave this valve open. The condensate will collect in the drain line and freeze

- Place the condensate in a labeled container that can be securely closed.

- Inform the Plant Protection Office that the SSDS will be starting up **and switch the "Enable" switch to "On".**

- The SSDS A unit should be drained quarterly during the summer months and monthly during the winter.

- Drain any condensate into a labeled 5-gallon bucket. Record the date and the amount of condensate drained on the condensate log sheet.

- Dispose of the condensate into a labeled container that can be securely closed.

5.3.2 *Vent System Low Point Draining*

- There is a low point drain located on the wall east of the northern entrance to the CEMCO/HASL, Reflow and All Copper Process area in the Broadway Building.

- This drain should be checked three times weekly in the winter months and weekly in the summer months.

- A quick way to decide if condensate is blocking the ventilation system is to open the 0.5-inch brass-ball valve on the Impedance Room penetration. There should be a steady audible suction. If the suction fluctuates/pulses or there is no suction, the low point drain must be emptied of condensate immediately.

- To drain the condensate from the low point drain, secure a labeled 5-, 20- or 55-gallon container and set it up close enough to the drain point (see paragraph 5.2.2.1) for the hose to hang into the container.

- Contact Plant Protection and inform them that you will be shutting the Main Plant SSDS down.

- Shut down SSDS B by switching the control to the "off" position.

- Return to the CEMCO Area Low point drain and open the valve. Monitor the condensate container regularly to prevent overflow. It may take up to 2-hours to drain the system.

- If the system takes longer than 2-hours to drain, terminate the drainage. Call Plant Protection and restart the system. Operate the system for 2-hours, and then repeat above procedure until the system is drained.

- Place the condensate into a labeled container that can be securely closed.

- Close the drain valve; inform Security that the system is restarting and the switch the main control switch back to "Auto".

5.3.3 *Draining water from the Photo Lab Penetration Point.*

- Dress out in accordance with the area dress protocols.

- Check the condition of the water separator drain line which should be routed without kinks into a sealable and labeled 5-gallon or 20-gallon container.

- Make a note of the volume of water in the separator and record the date and the amount of condensate drained on the condensate log sheet.

- Close the 4-inch butterfly valve on the penetration point vent line.

- Collect the water from the separator and place the condensate into a labeled container that can be securely closed.

5.4 *DISPOSING OF COLLECTED CONDENSATE WATER*

Dispose of the collected water by using the Groundwater Remediation Shallow Bed Stripper located in the SBR Building. Use metering pump to pump condensate water into the shallow bed air stripper. Document in the Ground Water Remediation daily log the volume of water injected into the system from the SSDS. This must also be documented in the SSDS Monitoring Log.

6.0 REPORTS

6.1 SEMI-ANNUAL REPORTS

Data collected monthly will be combined into semi-annual reports that will be submitted to the NYSDEC project manager, NYSDOH project manager, and a copy of the transmittal letter will be sent to the Regional Hazardous Waste Remediation Engineer (RHWRE) in Syracuse, New York. The semi-annual report can be included with the semi-annual Performance Monitoring Program (PMP) report for the ground water recovery system also located at the Site. The report will include the following sections:

- Brief Introduction;
- Key Actions;
- Problems/Resolutions;
- Anticipated Actions;
- Summary table of data collected for the semi-annual period; and
- Brief Summary and certification statement to the effectiveness of the SSDS.
- The semi-annual report will be completed by a licensed Professional Engineer or other environmental professional meeting the requirements of Section 4.6 of the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York Section (October 2006) with a certification statement that the system is in place and performing effectively and as designed.

The report schedule will be as follows with the report due to the NYSDEC one month after the end of the semi-annual period.

- November to April (report due in May); and
- May to October (report due in November).

7.0 CITIZEN PARTICIPATION

A citizen participation plan is not required for this Sub Slab Depressurization System.

8.0 PERSONNEL

- Environmental control Technicians are responsible for the day-to-day monitoring of the Sub Slab Depressurization System.

- Sanmina maintenance personnel are responsible for the mechanical repair to the system and mechanical preventive maintenance.

- The Environmental Control Supervisor is responsible to ensure the completion and maintenance of system reporting and completion of maintenance.

- The EH&S Manager is responsible to insure that the System is running within specified parameters and ensuring that VOC emissions from the SSDS are within applicable facility limits.

9.0 HEALTH AND SAFETY PLAN

All personnel performing monitoring or maintenance activities associated with the SSDS must review and sign the Sanmina-SCI Health and Safety Plan as provided by Sanmina-SCI.

10.0 RECORDS AND FORMS

Operating and record forms are included as Appendix B to this plan.

11.0 EMERGENCY CONTINGENCY PLAN

Emergency personnel can be reached by dialing (607) 689-5555. Failure of the system does not require an emergency response procedures or an evacuation plan. The SSD System is a precautionary environmental control.

11.1 HAZARDOUS SPILL RESPONSE PROCEDURE

The Sanmina-SCI Site specific hazardous spill response procedure is presented in Appendix C.

11.2 ACCIDENT INVESTIGATION PROCEDURES

The Sanmina-SCI Site specific accident investigation procedure is presented in Appendix D.

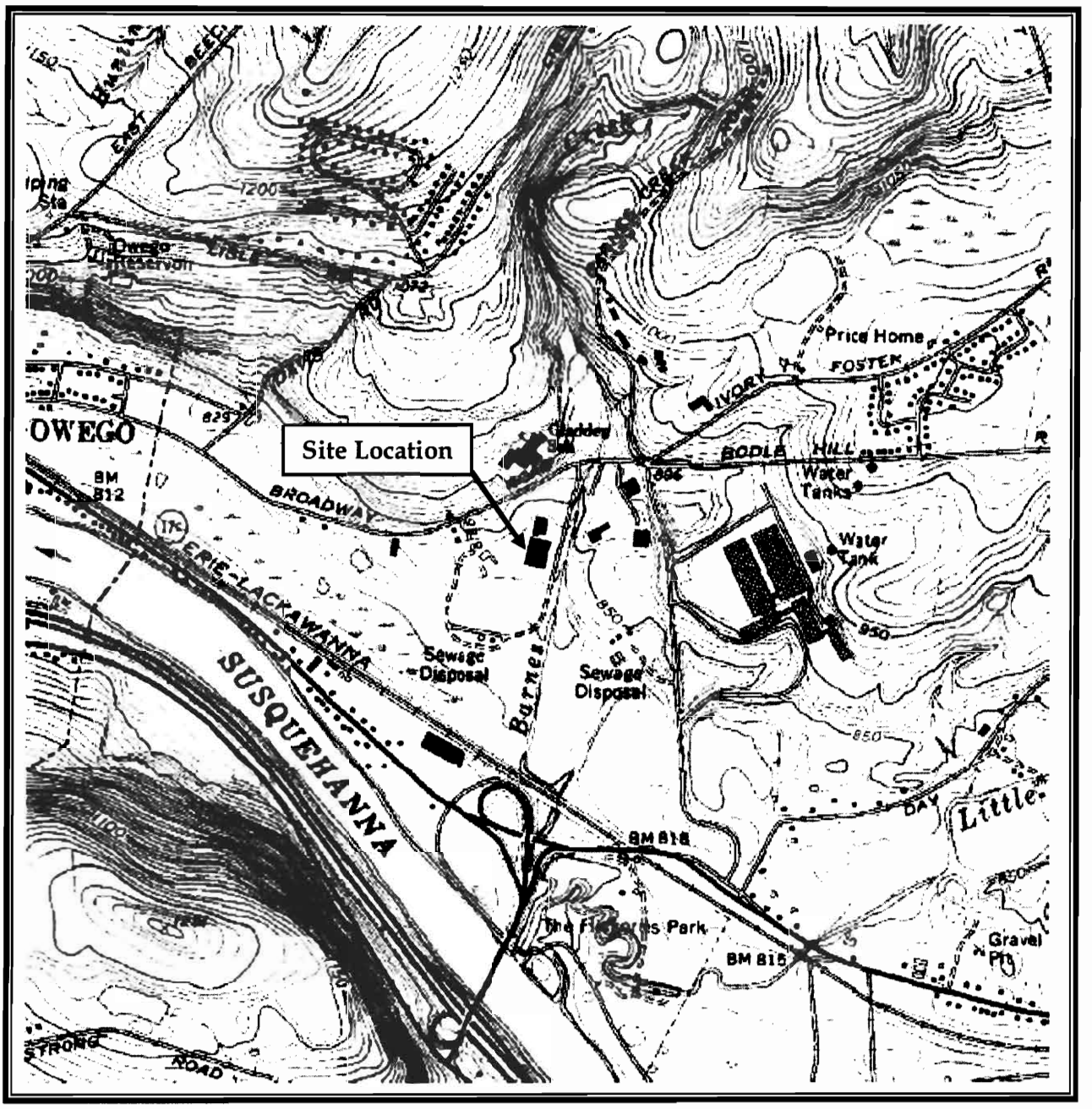
12.0 RECORD DRAWINGS

Site location, layout, and system Figures attached. A Plate that includes the location of the sub slab depressurization points is included in Appendix A to this plan.

Figures

Figure 1

Site Location Map

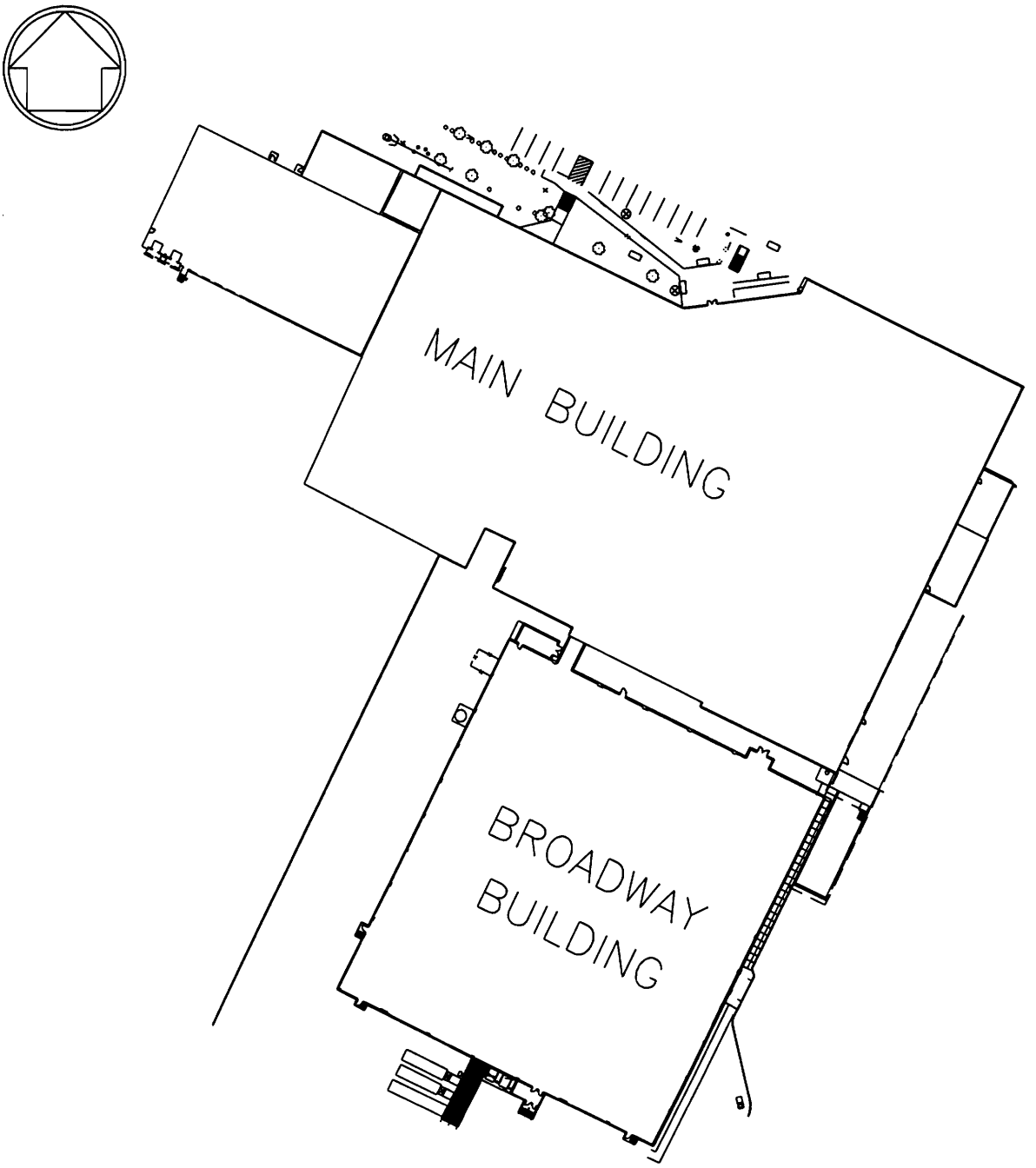


1200 Taylor Road
Owego, NY 13827

Approximate Scale

1-inch equals 1,550-feet

ERM



SANMINA–SCI
BUILDING LOCATION MAP
OWEGO, NEW YORK

PREPARED FOR

SANMINA–SCI

ERM
Environmental Resources Management
5788 Widewaters Pkwy. Dewitt, New York 13214

SCALE	FIGURE
1" = 100'	2
DATE 05/10	

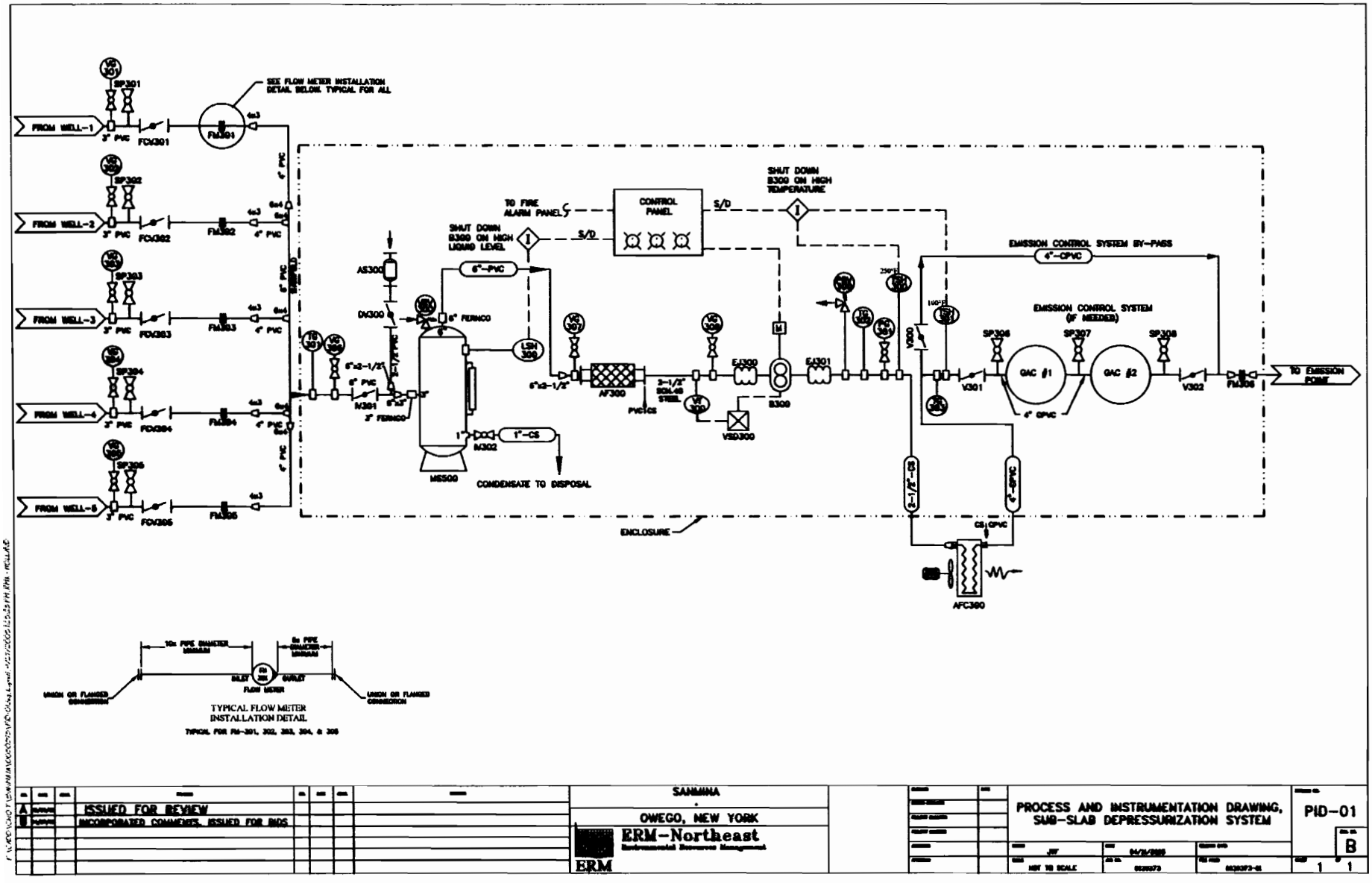

FROM WELL-1
FROM WELL-2
FROM WELL-3
FROM WELL-4
FROM WELL-5
SEE FLOW METER INSTALLATION DETAIL BELOW TYPICAL FOR ALL
TO FIRE ALARM PANEL
CONTROL PANEL
S/D
SHUT DOWN B300 ON HIGH LIQUID LEVEL
SHUT DOWN B300 ON HIGH TEMPERATURE
EMISSION CONTROL SYSTEM BY-PASS
EMISSION CONTROL SYSTEM (IF NEEDED)
GAC #1
GAC #2
TO EMISSION POINT
CONDENSATE TO DISPOSAL
ENCLOSURE
AFC300
TYPICAL FLOW METER INSTALLATION DETAIL
ISSUED FOR REVIEW
INCORPORATED COMMENTS, ISSUED FOR BIDS
SANMINA
OWEGO, NEW YORK
ERM-Northeast
PROCESS AND INSTRUMENTATION DRAWING, SUB-SLAB DEPRESSURIZATION SYSTEM
P&D-01
B

FIGURE 3

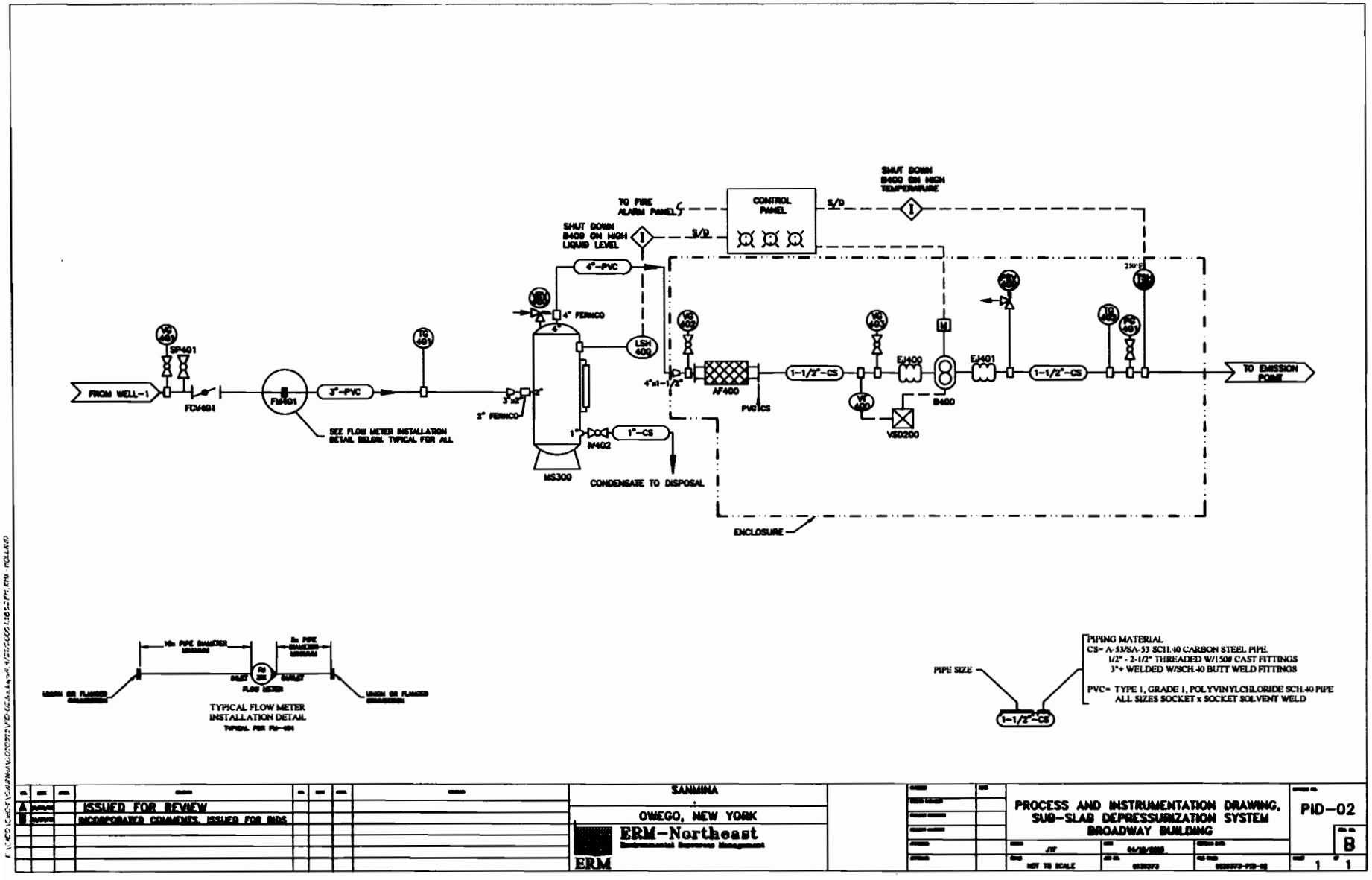
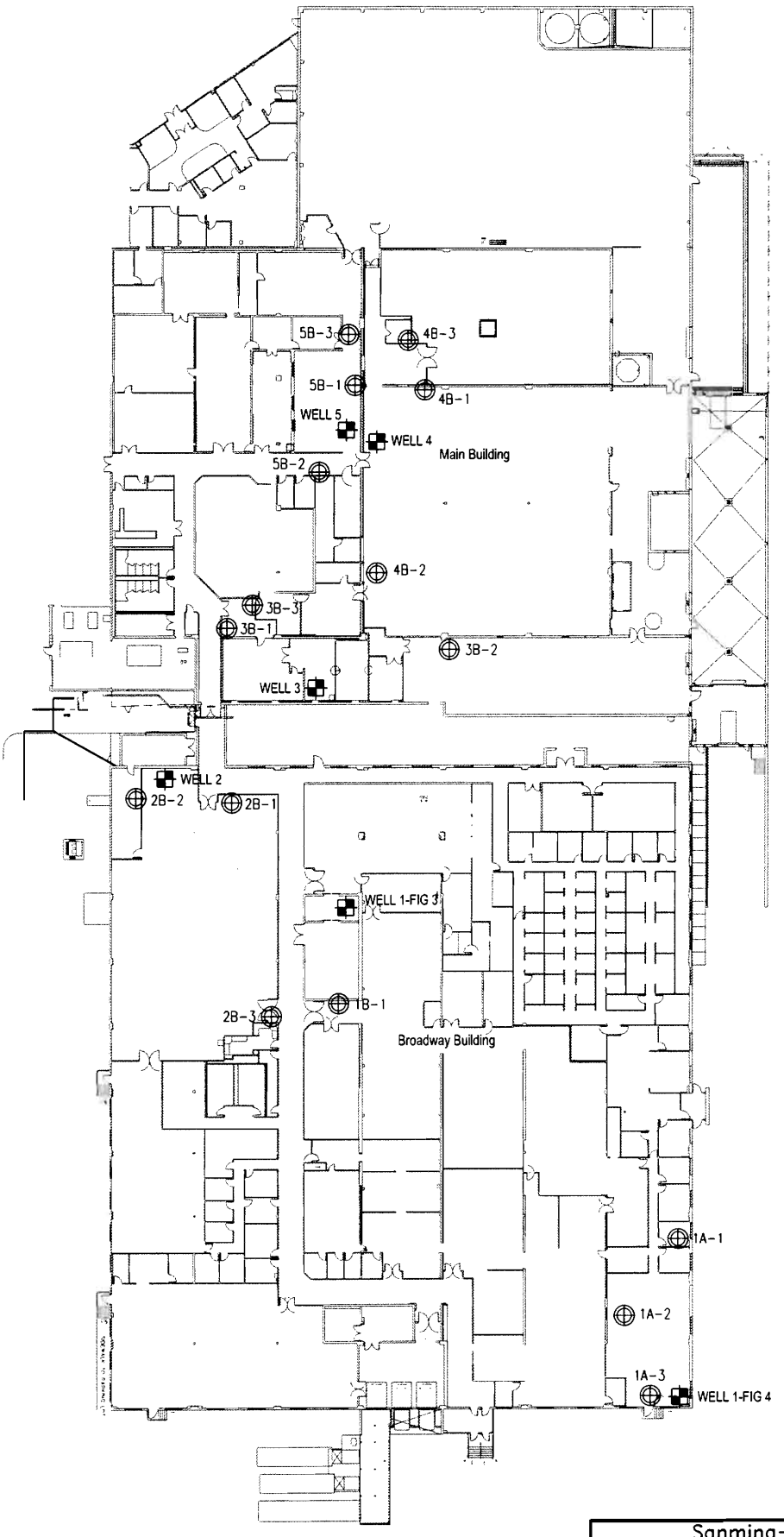

SHUT DOWN B400 ON HIGH TEMPERATURE
TO FIRE ALARM PANEL
CONTROL PANEL
S/D
SHUT DOWN B400 ON HIGH LIQUID LEVEL
4"-PVC
4" FERNCO
LSH 400
FROM WELL-1
SP401
FCV401
FM401
3"-PVC
SEE FLOW METER INSTALLATION DETAIL BELOW. TYPICAL FOR ALL
2" FERNCO
MS300
1"
1"-CS
R402
CONDENSATE TO DISPOSAL
4"x1-1/2"
AF400
PVC/CS
1-1/2"-CS
EJ400
B400
EJ401
VSD200
TO EMISSION POINT
ENCLOSURE
10x PIPE DIAMETER MINIMUM
5x PIPE DIAMETER MINIMUM
INLET
OUTLET
FLOW METER
UNION OR FLANGED CONNECTION
TYPICAL FLOW METER INSTALLATION DETAIL
PIPE SIZE
1-1/2"-CS
PIPING MATERIAL
CS= A-53/SA-53 SCH.40 CARBON STEEL PIPE
1/2" - 2-1/2" THREADED W/150# CAST FITTINGS
3"+ WELDED W/SCH.40 BUTT WELD FITTINGS
PVC= TYPE 1, GRADE 1, POLYVINYLCHLORIDE SCH.40 PIPE
ALL SIZES SOCKET x SOCKET SOLVENT WELD
A ISSUED FOR REVIEW
B INCORPORATED COMMENTS, ISSUED FOR BIDS
SANMINA
OWEGO, NEW YORK
ERM-Northeast
ERM
PROCESS AND INSTRUMENTATION DRAWING, SUB-SLAB DEPRESSURIZATION SYSTEM BROADWAY BUILDING
PID-02
B
NOT TO SCALE

FIGURE 4

Appendices

Appendix A
Plate 1 Sub-Slab Depressurization
Monitoring Points



LEGEND:

- DEPRESSURIZATION MONITORING POINT
- DEPRESSURIZATION PENETRATION POINT

Scale (1"=60')

30 0 30 60 120

Sanmina-SCI

Sub-Slab Depressurization Monitoring Points

Owego, New York

ERM

5788 WIDEWATERS PARKWAY
DEWITT, NEW YORK 13214

SCALE: NA

DATE: 10/2009

Plate: 1

G:\Graphics\Clients\Sanmina\Owego, NY\CAD\Plate 1.dwg (05/24/2010 - 9:21am Boston)

Appendix B
Log Sheets

ERM

Sanmina-SCI
Sub-Slab System Depressurization Condensate Log

Date	Time	Volume Drained	Location Where Condensate was Collected

ERM

Sanmina-SCI
Sub-Slab System Depressurization Point No.1A Log

Date	Time	Vacuum Reading (in H2O)			
		1A-1	1A-2	1A-3	Well 1

ERM

Sanmina-SCI
Sub-Slab System Depressurization Point No.1B Log

Date	Time	Vacuum Reading (in H2O)		
		1B-1	Well 1	

ERM

Sanmina-SCI
Sub-Slab System Depressurization Point No.2B Log

Date	Time	Vacuum Reading (in H2O)			
		2B-1	2B-2	2B-3	Well 2

ERM

Sanmina-SCI
Sub-Slab System Depressurization Point No.3B Log

		Magnehelic Reading (in H2O)			
Date	Time	3B-1	3B-2	3B-3	Well 3

Sanmina-SCI
Sub-Slab System Depressurization Point No.4B Log

Date	Time	Vacuum Reading (in H2O)			
		4B-1	4B-2	4B-3	Well 4

Sanmina-SCI

Sub-Slab System Depressurization Point No.5B Log

Date	Time	Vacuum Reading (in H2O)			
		5B-1	5B-2	5B-3	Well 5

Sanmina-SCI
Sub-Slab System Depressurization Point VOC Log

Date	Time	Photoionization Detector Reading (ppm)					
		SP306	SP307	SP308	Effluent Main	SP401	Effluent Broadway

Appendix C
Hazardous Spill Response Procedures

☒ Owego

Procedure Number: 2S1656-00-20 **Updated By:** Steve Sill
Issue Date: 08/06/09 **Revision Date:** 08/06/11 **Dept. Resp.:** Safety
Areas Affected: Wet Process, Imm Au, Facilities, Env. Control, Maintenance, Receiving, Plant Mgr., Oxide, Dryfilm, I/L Dryfilm, Probimer, DES, Process Eng.

SAFETY PROCEDURE: GENERAL RESPONSE TO HAZARDOUS MATERIALS INCIDENT

	DATE	REVISION LOG
01	03/22/01	Revision to Sections 9.2.2, 10.5.9, Addition of Sections 4.1.2.1-4.1.2.6 w/ subsequent renumbering
	03/18/02	Addition of Section 11.0, 4.1.4, 4.1.4.1; Revision to Sections 1.1, 3.3, 4.1.2.2, 8.1.1, 8.1.2, 8.1., 8.2.1, 9.1.1, 9.2.3, 9.2.4.3, 10.4.4, 10.5.9; Deletion of Section 8.1.5
	12/05/02	Revision to Sections 5.1.2.2, 6.1.1, 6.1.4; Addition of Sections 6.1.7, 7.1.8, 7.1.9
	01/12/05	Revision of Sections 7.1.3, 9.1.5 (table), Addition of Sections 8.1.5, 8.3.4
	07/05/07	Revisions to sections 4.1.2.1, 9.2.3, 9.2.5.1, 9.2.5.4, 10.5.1.2, 11.4.2.7, 11.4.2.8. Addition of section 9.2.3.1. Deletion of sections 11.4.2.6, 11.4.3, 11.4.3.1, 11.4.3.2, 11.4.3.3, 11.4.3.4 with subsequent renumbering of affected sections.
	08/06/09	**No Changes**

Notes:

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1.0 PURPOSE/SCOPE:

1.1 This document is written as a ready reference to be used when responding to incidents involving some of the more hazardous materials stored and used at the Sanmina Corporation, Owego Division.

1.2 While this procedure does not address all Clean Air Act Requirements of a "Risk Management Plan" it covers the elements of "Best Management Practices" considering the hazards associated with handling hazardous materials. Many elements of the OSHA Process Safety Standard are also addressed.

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2.0 SAFETY AGENDA:

2.1 When responding to any incident, safety is the first priority.

2.2 Priority Order When Making Decisions

2.2.1 Personal safety--life and well being--first.

2.2.2 Protect the life and well being of others.

2.2.3 Protection of the environment (including land, air and water resources).

2.2.4 Protection of company resources.

2.3 Responders are not to address incidents for which they have not been trained, that have unknown hazards, or are not properly equipped (including PPE) for involvement.

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3.0 RESPONSIBILITY:

3.1 The EH&S Manager or on-duty Shift Manager/delegate is responsible for administration of this procedure in response to hazardous materials incidents.

3.1.1 During incident response this role is defined as "Incident Command".

3.2 The Sanmina Corporation Owego HIT Team is responsible for following the strategic plan defined by the Incident Commander.

3.3 In the event that any incident requires outside resources such as community Hazardous Materials Teams (HAZMAT), Incident Command is transferred to the HAZMAT Team Director and that individual is responsible for implementation of this procedure unless he/she decides to leave the control function with Sanmina-SCI personnel.

.3.4 The EH&S Department is responsible for making outside notification to regulatory agencies as required to meet local, state, and federal incident reporting requirements.

3.5 The Incident Commander is responsible for completing internal incident reports.

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4.0 BASIC RESPONSE PROCEDURES AND INFORMATION:

4.1 Spill Response

4.1.1 Follow protocols as defined in the Integrated Emergency Contingency Plan #2S1651-00-05 for proper notification.

4.1.2 Action Plan

4.1.2.1 Trained Responders are available on every shift.

4.1.2.2 Components of basic plan

- **Assessment:** Set up teams to obtain MSDS, PPE, Clean up Equipment, Air Sampling Equipment, decontamination equipment, medical support, communications, et cetera.
- **Isolation** to include identifying "Hot Zones" and controlling access. This will always include establishing response team member-s to patrol the boundary of the HOT Zone with detection and PPE equipment to tract the progress of the incident and make determinations for additional areas to evacuate and control access.
- **Stabilization:** Set up ventilation fans, open doors turn on emergency ventilation, set up spill dykes et cetera to control the spread of the incident.

- **Mitigation and remediation:** after which operations can be returned to normal

4.1.2.3 Eliminate exposure to unprotected personnel

4.1.2.4 Minimize impact to the environment and equipment/facility damage

4.1.2.5 Stop source of any leaks or contamination resulting in reaction

4.1.2.6 Ventilation (shut of HVAC Systems that may spread fumes and vent to exterior of plant if possible.

4.1.3 Clean Up

4.1.3.1 The Incident Commander must generate a clean up plan that complies with the requirements set forth in the Integrated Emergency Contingency Plan.

4.1.3.2 Outside resources may be employed if the extent of the incident goes beyond Sanmina Corporation personnel training or equipment capabilities.

4.1.4 Communications

4.1.4.1 Incident Command must follow communications procedures outlined in the Integrated Emergency Contingency Plan 2S1656-00-05 to keep Plant Management appraised of the progress of the incident, particularly when there is an evacuation involved.

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5.0 SPECIFICS FOR NITRIC AND SULFURIC ACID SPILLS:

5.1 Locations

5.1.1 Sulfuric Acid can be found in almost any wet processing area of the facility.

5.1.2 Nitric Acid Locations

5.1.2.1 Electroless Copper (Perm-Dep Line)

5.1.2.2 PAL/Ludy Copper-Solder-Tin/Lead-Nickel-Gold Plating Lines

5.1.2.3 Solder Stripper

5.1.2.4 Electroless Nickel – Immersion Gold Plating Lines

5.1.2.5 Waste Water Treatment

5.1.2.6 Chemical Warehouse Chemical Drum Storage Area

5.2 Hazard Information

Chemical	NIOSH TWA	IDLH
Sulfuric	1 mg/m3	15 mg/m3)
Nitric	2ppm	25 ppm

5.2.1 Chemical solutions in the above mentioned process lines contain varying concentrations of nitric acid solutions (20%-45% by weight).

5.2.2 Sulfuric acid solutions are found in practically every wet process line in the facility with concentrations from 1% to 20% (working bath) to as high as 98% for chemical feed and drum solutions.

5.2.3 Nitric acid and sulfuric acid are both strong oxidizers and have the ability to ignite combustibles or explode strong reducing compounds.

5.2.4 Besides the heat generated from oxidizer-reducer reaction these acids are characterized by strong heat of dilution when mixed with weaker acids or water.

5.2.4.1 In closed vessels, temperatures can exceed 212° F

5.2.4.2 Rupture or melting of containers can occur.

5.2.5 Reaction with strong alkaline materials can create great amounts of dangerous steam.

5.2.6 Decomposition from heat or flame can release noxious sulfur dioxide (sulfuric acid) or nitrous oxide and nitrides (nitric acid).

5.3 Incompatibilities

5.3.1 Reducing Agents

5.3.2 Cyanide compounds (release HCN gas)

5.3.3 Reacts violently when mixed with organics.

5.3.4 Strong alkaline materials

5.3.5 Combustibles (will generate fire)

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6.0 SPECIFICS FOR AMMONIA SPILL

6.1 Locations

6.1.1 Strip/Etch/Strip (SES) Line in outerlayer Wet Process

6.1.2 Phase I Chemical Pad

6.1.3 Bulk Etch Storage Area (PAL Plating Area)

6.1.4 Alkaline Etch Distribution System (from Phase I Bulk Storage)

6.1.5 Waste Water Treatment

6.1.6 Chemical Warehouse Chemical Drum Storage Area

6.1.7 ME Baker Electroless Nickel Immersion Gold (ENIG) line

6.2 Hazard Information

Chemical	NIOSH TWA	NIOSH IDLH
Ammonia	25 ppm	300 ppm

6.2.1 Ammonia solutions will release toxic ammonia vapors.

6.2.2 Ammonia vapor will cause intense eye, nose, and throat irritation.

6.2.3 Tissue damage with extended contact.

6.2.4 Ammonia gas is flammable with LEL of 15% and UEL of 28%.

6.2.5 Ammonia is heavier than air and therefore can be an asphyxiant.

6.3 Incompatibilities

6.3.1 Oxidizing Agents

6.3.2 Silver and zinc salts

6.3.3 Acids

6.3.4 Halogens

6.4 Spill Response

6.4.1 Additional Components for Action Plan

6.4.1.1 Stabilization – A weak solution of sulfuric acid (0.5-10% can be used to acidify an ammonia spill and stop the evolution of ammonia gas)

6.4.1.2 Ammonia solutions are strong complexers and should not be allowed to enter the wrong drain in possible

6.4.2 Additional Components for Clean Up

6.4.2.1 Pump all contaminated ammonia solutions into clean, well-marked drums and store indoors until Environmental Control can evaluate and disposition.

6.4.2.2 Absorbent materials should be collected and stored in clearly marked open top drums for analysis and disposal by Environmental Control.

7.0 SPECIFICS FOR HYDROGEN PEROXIDE SPILL

7.1 Locations

7.1.1 Innerlayer Preclean Area

7.1.2 PAL/Ludy Copper-Solder-Tin/Lead Plating Lines

7.1.3 Alternate Oxide Line

7.1.4 Electroless Nickel – Immersion Gold Plating Line

7.1.5 Waste Water Treatment

7.1.6 Hot Air Level and Reflow Areas

7.1.7 Chemical Warehouse

7.1.8 PTH Line

7.1.9 Horizontal Plate (Atotech)

7.2 Hazard Information

Chemical	NIOSH TWA	NIOSH IDLH
Hydrogen Peroxide (H2O2)	1 ppm	75 ppm

7.2.1 Chemical solutions in the above mentioned process lines contain varying concentrations of hydrogen peroxide solutions (2.5%-30% by weight).

7.2.2 Hydrogen peroxide is the strongest oxidizer in the facility and it has the ability to ignite combustibles or explode strong reducing compounds.

7.2.3 Besides the heat generated from oxidizer-reducer reaction, hydrogen peroxide is characterized by its instability.

7.2.3.1 High concentrations can react with even small amounts of contamination releasing explosive oxygen gas and exothermic heat and steam.

7.2.4 Reaction within a sealed drum or container will cause violent rupture.

7.2.5 Decomposition from heat or flame can release large amounts of flammable oxygen gas.

7.3 Incompatibilities

7.3.1 Reducing Agents

7.3.2 Metals

7.3.3 Reacts violently when mixed with organics.

7.3.4 Strong acid materials

7.3.5 Combustibles (will generate fire)

7.3.6 Heat (causes spontaneous decomposition)

7.4 Spill Response

7.4.1 Additional Components for Action Plan

7.4.1.1 Stabilization...flush with large amounts of water until reaction is halted.

8.0 SPECIFICS FOR CYANIDE SPILL

8.1 Locations

8.1.1 Ludy Nickel Gold Plating Line

8.1.2 Technic Tab Plate Line

8.1.3 Electroless Nickel/Immersion Gold Line

8.1.4 Gold Reclaim Storage Cage

8.1.5 Security Office Safe

8.2 Hazard and Exposure Information

Chemical	NIOSH TWA	NIOSH IDLH
Hydrogen Cyanide	4.7 ppm	50 ppm

8.2.1 Chemicals in the Ludy Nickel Gold, the Gold Tab Plate Lines and the Electroless Nickel/Immersion Gold Line contain Potassium Gold Cyanide.

8.2.1.1 Since gold plating processes at SANMINA typically involve solutions with a pH of 4 to 6, the risk of releasing hydrogen cyanide gas (HCN) during normal operations is minimal.

8.2.1.2 If the cyanide contacts an acidic solution (pH 0 to 3), HCN gas may be released.

8.2.1.3 HCN has a vapor density of 0.94, which means that it is slightly lighter than ambient air.

- It can easily be captured and exhausted from the work environment.
- General ventilation (or room exhaust) in the area is maintained negative relative to the adjacent work areas to provide additional safeguard.

8.2.1.4 Since cyanide-containing compounds may also react with carbon dioxide fire extinguishers, only dry chemical fire extinguishers should be used during an incipient stage fire in the plating area.

- The Owego Fire Department (OFD) must

handle large fires in the plating area.

8.2.1.5 An average adult can tolerate up to 54 ppm HCN for 0.5 to 1 hour without immediate or delayed health effects.

- Based on a conservative recommended exposure level (published by NIOSH in 1976), Sanmina has set a 10-minute maximum exposure limit of 4.7 ppm.

- The cyanide alarm system is set to audible alarm (alert) at 5.0 ppm.

8.2.2 Potassium gold cyanide can enter the body through inhalation, absorption, and ingestion.

8.2.3 Human health effects of mild to moderate overexposure include skin irritation with discomfort or rash, eye irritation or burns with tearing or blurred vision, headache, dizziness, nausea, and feeling of weakness.

8.2.4 Severe overexposure leads to rapid, deep respiration, loss of consciousness, convulsions, respiratory arrest, and death within minutes.

8.2.5 A concentration of 2 ppm can be detected (bitter almond odor) by less than 40% of the general population; olfactory fatigue (inability to detect the odor at high concentrations after extended exposure) can occur.

8.3 Incompatibilities

8.3.1 Generates HCN when mixed with acid.

8.3.2 Generates nitrogen oxides when mixed with nitrites (Solder Stripper).

8.3.3 Reacts violently when mixed with oxidizers due to organic nature.

8.3.4 Persons exposed to high levels of CN^- may become unconscious. **IMMEDIATELY** administer amylnitrate ampules or injection (EMT) to revive and/or

prevent death. Cyanide kit with amylnitrate is located in the First Aid room.

9.0 CYANIDE ALARM RESPONSE PROCEDURES

9.1 Detection and Alarm Systems

9.1.1 A Drager, stationary alarm system (digital readout, audible alarm, blue and red strobe lights) is installed in the plating area.

9.1.2 This alarm system uses sensors to continuously monitor for HCN gas in the work area.

9.1.3 When a level of 5.0 ppm HCN is detected at any monitoring point, a blue light initiates the alert mode.

9.1.4 A hand held Toxi-Rae Unit, available from Plant Protection, provides a digital display of the HCN Concentration in ppm.

9.1.5 A third unit is the Multi-Rae which utilizes an air pump to pull ambient air over detectors to measure oxygen, cyanide, carbon monoxide and hydrogen sulfide.

Instrument	**Parameters Measured**	**Calibration Responsibility**	**Calibration Frequency**	**Records Location**
Drager	Cyanide	Maintenance	Monthly	MAXIMO
Toxi-Rae Model PGM-35	Cyanide	Security	Semi- annual	Plant Protection
Multi-Rae Plus Model PGM-5P	Cyanide, Ammonia Oxygen, LEL Volatiles	Security	Semi- annual	Plant Protection

9.1.6 Cyanide gas detection systems are sensitive to other interference that can result in false low or high readings.

9.1.6.1 C yanogen

9.1.6.2 Hydrogen sulfide

9.1.6.3 Carbon monoxide

9.1.6.4 Sodium bisulfite

9.1.6.5 Chlorine

9.1.6.6 Nitric acid

9.1.6.7 Nitrous oxide (gas engine emissions).

9.2 Drager Alarm Panel and Operator Response Procedures

9.2.1 The alarm panels have four sensors located remotely in the plating areas.

9.2.2 A BLUE caution light is mounted in a conspicuous location.

9.2.2.1 This blue light will activate and flash when the Drager Control Panel senses a cyanide level of 5 ppm.

9.2.2.2 This is the "ALERT" mode.

9.2.3 When the alert mode is activated, the line operator must notify Plant Protection via telephone and ask the on duty officer to notify the I.C. on the situation.

9.2.3.1 The I.C. will deploy a 2 man team to investigate the alarm equipped with the hand held Toxi Rae to verify readings.

9.2.4 The operator then will go to the Drager Control panel and locate which sensor is in alarm and where it is located.

9.2.4.1 The panel readings for each sensor must be written immediately in the Drager System Log.

9.2.4.2 Log is located beside the control panel.

9.2.4.3 After recording readings the panel may be reset. If the readings have returned to normal (between 0.0 and 4.9 ppm).

9.2.5 Employing the Handheld Toxi-Rae:

9.2.5.1 If panel is still in alarm with readings between 2-9.9 ppm, the operator and/or the H.I.T Member will use the hand held unit to confirm the reading and attempt to identify the cause.

9.2.5.2 If there is a gold solution leak, deploy the HIT Team by announcing "Code Yellow Location " and evacuate the area.

9.2.5.3 If the panel is at 10 ppm or more (even after reset) the red revolving light will illuminate and an alarm horn will sound; **DO NOT ENTER THE AREA!**

9.2.5.4 A full H.I.T. response will be initiated by the I.C. and the area will be evacuated.

9.2.6 If the panel goes immediately from a no alarm condition to 10 ppm, the red revolving light will illuminate and an audible alarm will sound.

9.2.6.1 Evacuate the area immediately.

9.2.6.2 Announce "Code Yellow" over the PA system.

10.0 HIT RESPONSE TO CODE YELLOW CYANIDE ALARM

10.1 Confirm all personnel have evacuated from the plating area.

10.2 The Plating Area Team Leader is responsible for accounting for all personnel and determining what operating conditions might have caused the alarm.

10.3 Upon arriving at the plating area, the responding HIT members will be briefed on the situation/operating conditions by the on-duty Incident Commander or his/her designee.

10.3.1 The HIT Incident Commander (IC) takes command of the situation and assumes control of the area, relieving the Plating Area Team Leader from his/her duties.

10.3.2 The HIT members will secure a portable cyanide gas detection meter, turn it on, and confirm it reads 0 ppm while outside the response area. (As a backup to the electric instruments Drager or Sensodyne tubes may be used to confirm or referee.)

NOTE: The Drager Stationary detection system uses a "electrochemical" sensor to measure cyanide concentration. The system is prone to frequent interference from a number of airborne materials including carbon monoxide, nitric acid, sodium bisulfite, chlorine, acetylene etc. If in doubt utilize alternative detector tubes to confirm the presence of cyanide but do not risk exposure to levels of cyanide at the IDLH of 50 ppm.

10.3.3 If the Drager System Panel still reads above 20 ppm, HIT members will dress out in Level A protection with radio equipped SCBA's to enter the space and attempt to correct the cause of the alarm.

10.3.4 If the Drager System Panel reads less than 19.9 ppm, HIT members may enter the space with Level B protection and radio equipped SCBA's.

10.4 The Rules of Engagement

10.4.1 Monitor oxygen concentration with the LEL/O2 meter (IDLH: less than 19.6%) in addition to monitoring the presence of HCN.

10.4.2 Incident Command must stay in contact with responders at all times via radio.

10.4.3 There will be a minimum of two responders dressing out to either relieve the first response team or to perform any rescue as required.

10.4.4 Maximum time in the "HOT" zone response area is 20 minutes with a 30-minute SCBA and 45 minutes with a one-hour SCBA.

10.4.4.1 Incident Command will assign another responder to note each responder, the time in the hot zone and any cyanide readings taken by the responders.

10.4.4.2 Drager System Panel readings should be taken at the same time for comparison.

10.4.5 All possible entrances to the hot zone must be identified and a HIT guard posted to prevent entry by non-response authorized personnel.

10.4.6 The Incident Commander can give an "all-clear" and return the management of the plating area to the Plating Area Manager/Team Leader when:

10.4.6.1 A false alarm has been identified

10.4.6.2 The source of the problem has been identified and corrected and the cyanide levels in the response area (hot zone) return to below 5 ppm.

10.5 Spill Control by HIT Members

10.5.1 Inside the Hot Zone

10.5.1.1 Control the spread by circling the spill with sorbent or diking material.

10.5.1.2 Use Turbo Vacuums to prevent liquids from entering the floor trench, if possible.

10.5.1.3 Post signs to alert others about the spill area.

10.5.2 Ensure any equipment used is not contaminated with acidic residue (pH less than 4 may form HCN).

10.5.3 If a leak has occurred in a drum, ensure drum is upright if possible, and/or pump contents into a compatible drum to limit further leaking.

10.5.4 If a leak has occurred in a tank, pump material from tank into compatible drums to limit further leaking.

10.5.5 Neutralize carefully from the perimeter inward.

pH	**Type of Neutralizer**
0 to 3	apply base
3.1to 14	None required

10.5.5.1 Test the pH of the spilled material.

10.5.5.2 Neutralization often results in heat and spattering, therefore, slowly and thoroughly mix the neutralizer into the spill with a scoop or squeegee.

10.5.6 Using wet vacuum, remove spill and any excess rinse from the floor.

10.5.6.1 If absorbent materials are necessary, use a dustpan

10.5.6.2 Absorb all spilled material

10.5.6.3 Transfer it to a properly labeled pail or drum and seal.

10.5.7 Transfer solution in wet vacuum to a compatible drum and attach appropriate labels.

10.5.8 Do NOT hose concentrated chemicals down trench.

10.5.9 Hypochlorite solution may be used to neutralize cyanide in the spill area as long as the pH is at least 6.5. This may cause the Drager System to go into "fault" from a minus reading.

10.5.9.1 Dilute concentrated hypochlorite solutions to 10% concentration with water or dilute (1-10%) caustic).

10.5.9.2 DO NOT put hypochlorite solution on a strong acid surface or chlorine gas will be evolved.

10.5.10 Label all waste drums with a Hazardous Waste label (including identity of material, date, and initials/Employee ID #).

10.5.11 Notify the Incident Commander that the cleanup is complete so that operations can resume.

10.5.12 If the emergency is beyond the capability of the HIT, the IC will call the on-call Emergency Response Contractor for response assistance. (See SANMINA

Owego Hazardous Incident Team Members list for number.)

10.5.13 It may be appropriate to conduct a limited response involving control (stopping the release), containment (stopping the spread), and/or open the exhaust ducts in advance of the Emergency Response Contractor's arrival at the scene.

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11.0 SPECIFICS FOR CHLORINE RELEASE

11.1 Locations and scenarios with the most likely potential for chlorine release

11.1.1 Bulk Chemical Tank Farm

11.1.2 Cupric DES Process Area

11.1.3 Black Oxide Process Area

11.1.4 Contamination of a "bleach treatment" to a process tank with an acid.

11.1.5 Contamination of hydrochloric acid with and oxidizer (sodium persulfate, hydrogen peroxide, nitric acid et cetera).

11.1.6 Contamination of sodium chlorate with an acid or oxidizer.

11.1.7 Zinc metal immersed in hydrochloric acid.

11.2 Hazard Information

Chemical	NIOSH TWA	NIOSH IDLH
Chlorine Gas (Cl2)	0.5 ppm	10 ppm

11.2.1 Chemical solutions in the listed areas are not designed to operate or store chlorine gas in its volatile state. If there is a release then something has gone wrong.

11.2.2 Chlorine gas will generate a strongly oxidizing atmosphere. When venting a release contact with flammables should be avoided.

11.2.3 At 3 ppm and greater chlorine is extremely irritating to the eyes and respiratory tract. It combines with moisture in the membranes to form hydrochloric acid.

11.2.4 Can react with high concentration ammonia vapors (over 500 ppm) and result in explosion.

11.3 Incompatibilities

11.3.1 Reducing Agents

11.3.2 Metals

11.3.3 Reacts violently when contact is made with flammables or ammonia.

11.3.4 Strong acid materials

11.3.5 Combustibles (can generate fire)

11.4 Response for Chlorine Generation In the DES Etcher

11.4.1 **Chlorine Detector Function Indicators:**

11.4.1.1 Alarm 1 (Blue Light) at 0.5-1.0 ppm.

11.4.1.2 Alarm 2 (Red Light) over 1.0 ppm

11.4.1.3 Audible alarm will also sound off at these concentration levels.

11.4.1.4 Red lights outside the DES room are illuminated when chlorine concentrations are elevated

11.4.1.5 Evacuate DES room at red light.

11.4.2 Safety steps to be taken (Blue or Red Light)

11.4.2.1 Close the oxidizer (sodium chlorate) and acid (hydrochloric) manual valve on etcher.

11.4.2.2 Non essential personal shall evacuate the D.E.S. room immediately. Leave all etcher pumps on.

11.4.2.3 Notify Supervision/Team Leader, Maintenance and Engineering.

11.4.2.4 Confirm that the Emergency Ventilation system is operating (Automatic Variable Speed Drive located in the Layer "Feed Room" should be above 85%).

11.4.2.5 If the chlorine level red alarm goes on for more than 90 seconds, call Ext. 5555 and give Security the following:

- The Chlorine generation location.
- The Chlorine concentration.
- Whether or not the situation is under control.

11.4.2.6 In the meantime (before Eng./Maint. arrives), designated person(s) by Supervision should enter the Feed/Catch with an SCBA. (the person must be certified on an SCBA)

11.4.2.7 The first person entering the D.E.S. area should don the SCBA only after a second "backup person" is on the scene and is prepared to don a second SCBA as a back-up

11.4.2.8 Utilize a portable Chlorine Detector (ToxiRae is located in the Supplied Air Mask Cabinet) to confirm the presence of Chlorine and attempt to trace the exact source or location. Relay this information to Maintenance and the Team Leader.

11.4.2.9 When the chlorine has been confirmed, return to DES Feed and utilize the portable Chlorine detector to monitor the Chlorine level in the feed room while feeding the etcher copper (unless directed otherwise by Process Engineering of Incident command) as much as possible to stop chlorine generation. Use any of the following materials:

- 2-oz, 18 X 24 copper clad bare laminates. Double-file laminates through etcher. Run etcher conveyor at 2-oz speed (4.0 feet per minute).

- Emergency copper that has been designated to the lines in case of

  an emergency.

- Only as a last resort any available circuit layers: scrap or production layers.

11.4.2.10 When chlorine odor dissipates completely (Detector must read below 1 ppm), notify supervisor.

11.4.2.11 Wait for further instructions from Engineering.

11.5 **Chlorine Response in Areas Other than DES**

11.5.1 Black Oxide Process Area

11.5.1.1 Follow the procedures detailed in Section 4.1 Spill/Release Response.

11.5.1.2 In addition the following options can be considered in the formulation of a response plan:

- Insure Ventilation Systems for the PAL Oxide Line are operating at maximum.
- Dispatch responders with proper PPE (Respirator minimum) to set up exhaust fans at the "Utility Building" entrance into the Oxide Area. Open the exterior doors in the Utility Building and direct flow out side with a series of fans. (Two fans located in the HIT Cage Area.)
- Secure the door into the Water Treatment Area to minimize impact to operations there. Post responders to monitor adjacent areas and evacuate if chlorine goes over 0.5 ppm.
- Chlorine evolution is exacerbated under low pH (Acidic) conditions. Employ dilute caustic (or sodium carbonate) solutions to elevate pH and lower the chlorine gas vapor pressure.

11.5.2 Bulk Chemical Tank Farm

11.5.2.1 Follow the procedures detailed in Section 4.1 Spill/Release Response.

11.5.2.2 In addition the following options can be considered in the formulation of a response plan:

- Verify that emergency ventilation system is operating
- Secure doors to adjacent area (Duct tape can be used to seal door to door jam cracks). Duct Tape can be secured in the HIT Cage or through the Maintenance Stock Room.
- Direct all delivery vehicles to move away from the West Side Warehouse dock doors at least 150 feet.
- Dispatch responders with proper PPE (Respirator minimum) to set up exhaust fans at the "Tank Farm" entrances into the Chemical Warehouse Area. Open the dock doors and direct flow out side with a series of fans. (Two fans located in the HIT Cage Area.)
- Secure the doors into the hallways and adjacent area to prevent spread of vapors.
- Chlorine evolution is exacerbated under low pH (Acidic) conditions. Employ dilute caustic (or sodium carbonate) solutions to elevate pH and lower the chlorine gas vapor pressure.

Appendix D
Accident Investigation Procedures

☒ Owego

Procedure Number: 2S1656-00-16 **Updated By:** Marie Mead
Issue Date: 12/06/08 **Revision Date:** 12/06/10 **Dept. Resp.:** Safety

Areas Affected: All Managers

SAFETY PROCEDURE: ACCIDENT INVESTIGATING PROCEDURE

	DATE	REVISION LOG
	11/17/04	Revision to Section 2.1.1.4
	12/06/06	Revision to Section 2.2.1
	12/06/08	**No Changes**

Notes:

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1.0 PURPOSE/SCOPE:

1.1 This document defines mandatory procedures for all employees, Team Leaders, managers, or other personnel involved with on-the-job injuries and fatalities in compliance with the Occupational Safety and Health Act (OSHA) of 1970.

1.2 To ensure employee's prompt treatment in the event of injuries and to outline a standard for investigating and reporting all industrial accidents and incidents.

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2.0 RESPONSIBILITIES:

2.1 Industrial Incidents - Nonfatal

2.1.1 Manager

2.1.1.1 Instruct all personnel to report all work-related injury/illness or non-injury incidents before the end of the work-shift in which they occur.

2.1.1.2 Instruct personnel to obtain medical treatment from the Sanmina-SCI First Aid Team.

- If the injury occurs at a remote site, the injured person should be taken to the nearest doctor or hospital for treatment.

2.1.1.3 Injuries incurred by or to an outside contractor will be treated in the same manner as for a Sanmina-SCI employee.

- In addition, the case must be investigated by the Team Leader and manager.

2.1.1.4 Complete appropriate forms and submit to Safety Specialist within 24 hours of the incident occurring or notification that an incident has occurred.

- Accident Investigation Form (required)

- Job Safety & Health Analysis Form (required)

- First Aid Report (submitted by First Aid team)

- Consent and Medical Information Authorization Form (optional)

- Post-accident fitness for duty authorization form (optional)

- In no case shall a copy of any of the above forms be given to anyone outside of the company by anyone other than the Safety Specialist, EHS Manager, Human Resource Representative or Corporate

Legal Department or as designated above.

2.1.2 The Injured/Employee

2.1.2.1 Report injury/illness or non-injury to a department supervisor, manager or the Safety Specialist before the end of the work day in which the incident occurred, then seek and obtain appropriate medical treatment as directed by the Sanmina First Aid provider or Safety Specialist.

- This is mandated by the OSHA standard 29CFR Part 1904 (Recording and Reporting Occupational Injuries and Illnesses).

2.1.2.2 Assist the manager, supervisor in accurately completing the necessary forms.

2.1.2.3 In addition, the employee shall be given the Temporary Alternative Work Notification Form for their review and the Medical Capabilities Form for the attending physician to complete.

- The employee must provide both of these forms to any medical provider they treat with for a work injury or illness and return these completed forms to the Sanmina Safety Specialist, Human Resources Department, Department Team Leader or Manager within 24 hours of leaving the medical providers office, or prior to their next scheduled work shift, whichever comes first.

2.1.3 Safety Specialist

2.1.3.1 Review completed forms and provide guidance in elimination of the root cause of the incident.

2.1.3.2 Ensure the completion of the necessary Workers' Compensation, OSHA forms and any other applicable reports.

2.2 Industrial Fatalities or Catastrophes

2.2.1 Any employee who becomes aware of a fatality/catastrophe will immediately contact a Team Leader, manager, or find the nearest phone and call Plant Protection - Emergency number x-5555.

2.2.2 Plant Protection shall notify the appropriate in-house H.I.T. and medical personnel.

2.2.3 The Plant Protection Officer will immediately contact the Safety Specialist, Environmental Health and Safety Manager by phone or pager and then proceed to follow the direction of the on site incident commander.

2.2.4 The Environmental Health and Safety Manager must notify the employee's manager, the Business Unit Manager, the Human Resource Manager, the Corporate Environmental Safety and Health Manager, and the Corporate Legal Counsel.

2.2.5 Communication with the news media must be approved by both Corporate Legal and Corporate Human Resources.

2.2.6 The Human Resource Manager shall notify a family member of the employee, if necessary.

2.3 Transporting the Sick or Injured Employees

2.3.1 The method of transporting an employee to an off-site medical treatment facility shall be determined by the treating first aid provider.

2.3.2 Methods of transportation shall be determined following an appropriate assessment in accordance with the first aid providers training.

2.3.3 Transportation may include but is not limited to:

- Family Member

- Taxi or Public Transportation

- Ambulance

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