PLAN APPROVAL APPLICATION FOR CONSTRUCTION OF A COMMERCIAL FACILITY FOR TREATMENT AND STORAGE OF HAZARDOUS AND RESIDUAL LIQUID WASTE STREAMS
FALLS TOWNSHIP, PENNSYLVANIA

PREPARED FOR:

ELCON RECYCLING SERVICES, LLC
FALLS TOWNSHIP, PENNSYLVANIA

SUBMITTED TO:

PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY
NORRISTOWN, PENNSYLVANIA

IES PROJECT NO. EV181065.01

OCTOBER 2018

TABLE OF CONTENTS

General Information Form

Application for Plan Approval to Construct a Commercial Facility for Treatment and Storage of Hazardous and Residual Waste Streams

Application for Plan Approval to Construct a Combustion Unit (relevant pages provided)

Attachment 1 — Project Background
Attachment 2 — Detailed Process Description
Attachment 3 — Emission Estimates with Supporting Calculations
Attachment 4 — Regulatory Review and Applicable Requirements
Attachment 5 — Best Available Technology Analysis
Attachment 6 — Proposed Monitoring Approach
Attachment 7 — Municipal Notification Letters
- Falls Township
- Bucks County
- Return Receipts

Attachment 8 — Air Pollution Control Act Compliance Review Form
Attachment 9 — Location Map
- 7 ½-Minute Series U.S.G.S. Site Location Map

Attachment 10 — Project Review Form

GENERAL INFORMATION FORM

0210-PM-PIO0001 4/2018
Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)		DEP USE ONLY
Client ID# 311804	APS ID#	Date Received & General Notes
Site ID# 782699	Auth ID#	
Facility ID#		

CLIENT INFORMATION

DEP Client ID#	Client Type / Code
311804	LLC

Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Dun & Bradstreet ID#
Elcon Recycling Services, LLC	46-2247013	

Individual Last Name	First Name	MI	Suffix	SSN
Ramesh	Rengarajan			

Additional Individual Last Name	First Name	MI	Suffix	SSN

Mailing Address Line 1	Mailing Address Line 2
11 LeParc Drive	

Address Last Line – City	State	ZIP+4	Country
Princeton	NJ	08550	USA

Client Contact Last Name	First Name	MI	Suffix
Ramesh	Rengarajan		

Client Contact Title	Phone	Ext
	(267) 243-3144	

Email Address	FAX
Ramesh.rengarajan@gmail.com	

SITE INFORMATION

DEP Site ID#	Site Name
782699	to be located at 100 Dean Sievers Place (Tax Parcel No. 13-51-1-5) in Falls Township, Bucks County, PA

EPA ID# PAR000544486 **Estimated Number of Employees to be Present at Site** 55

Description of Site
Commercial facility for treatment and storage of hazardous and residual liquid waste streams to be located at 100 Dean Sievers Place (Tax Parcel No. 13-51-1-5) in Falls Township, Bucks County, PA, former US Steel Site

County Name	Municipality	City	Boro	Twp	State
Bucks	Falls	☐	☐	☒	
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**
		☐	☐	☐	

Site Location Line 1	Site Location Line 2
100 Dean Sievers Place	

Site Location Last Line – City	State	ZIP+4
Morrisville	PA	19067

Detailed Written Directions to Site
Rt. 1 to S. PA. Ave. to River Road to S. PA. Ave. to Old Bordentown Rd, to S. Port Rd to Dean Sievers Pl.

Site Contact Last Name	First Name	MI	Suffix
Ramesh	Rengarajan		

Site Contact Title	Site Contact Firm
Elcon USA Representative	

Mailing Address Line 1	Mailing Address Line 2
11 LeParc Drive	

Mailing Address Last Line – City	State	ZIP+4
Princeton	NJ	08550

Phone	Ext	FAX	Email Address
(267) 243-3144			

NAICS Codes (Two- & Three-Digit Codes – List All That Apply)	6-Digit Code (Optional)
562	562211

Client to Site Relationship
OWNOP

FACILITY INFORMATION

Modification of Existing Facility

		Yes	No
1.	**Will this project modify an existing facility, system, or activity?**	☐	☒
2.	**Will this project involve an addition to an existing facility, system, or activity?**	☐	☒

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	DEP Fac ID#		Facility Type	DEP Fac ID#
☐	Air Emission Plant		☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	Mine DrainageTrmt/LandRecyProjLocation	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Oil & Gas Wastewater Storage Impoundment	
☐	Deep Mine Safety Operation -Anthracite		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Bituminous		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Residual Waste Operation	
☐	Encroachment Location (water, wetland)		☐	Storage Tank Location	
☐	Erosion & Sediment Control Facility		☐	Water Pollution Control Facility	
☐	Explosive Storage Location		☐	Water Resource	
			☐	Other:	

Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	40	10	6.6	74	45	38.9

Horizontal Accuracy Measure	Feet N/A --or-- Meters
Horizontal Reference Datum Code	☐ North American Datum of 1927 ☒ North American Datum of 1983 ☐ World Geodetic System of 1984
Horizontal Collection Method Code	EMAP
Reference Point Code	CNTAR
Altitude	Feet 19 --or-- Meters
Altitude Datum Name	☒ The National Geodetic Vertical Datum of 1929 ☐ The North American Vertical Datum of 1988 (NAVD88)
Altitude (Vertical) Location Datum Collection Method Code	SRVEY
Geometric Type Code	POINT
Data Collection Date	9/10/13
Source Map Scale Number	1 Inch(es) = 60 Feet
--or--	Centimeter(s) = Meters

PROJECT INFORMATION

Project Name
Elcon Recycling

Project Description
Treatment and storage of hazardous and residual liquid waste streams

Project Consultant Last Name	First Name	MI	Suffix
Fitzpatrick	Marjorie	J	

Project Consultant Title	Consulting Firm
Principal Project Manager	IES Engineers

Mailing Address Line 1			Mailing Address Line 2	
1720 Walton Road				
Address Last Line – City			**State**	**ZIP+4**
Blue Bell			PA	19422
Phone	**Ext**	**FAX**	**Email Address**	
610-828-3078		610-828-7842	mfitzpatrick@iesengineers.com	

Time Schedules	Project Milestone (Optional)
Ground breaking & construction	Upon approval by the Department

1. **Have you informed the surrounding community and addressed any concerns prior to submitting the application to the Department?** ☒ Yes ☐ No

2. **Is your project funded by state or federal grants?** ☐ Yes ☒ No
   Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.
   Aspect of Project Related to Grant
   Grant Source: _____
   Grant Contact Person: _____
   Grant Expiration Date: _____

3. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☒ Yes ☐ No
   Note: If "No" to Question 3, the application is not subject to the Land Use Policy.
   If "Yes" to Question 3, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1. **Is there an adopted county or multi-county comprehensive plan?** ☒ Yes ☐ No
2. **Is there an adopted municipal or multi-municipal comprehensive plan?** ☒ Yes ☐ No
3. **Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** ☒ Yes ☐ No
   Note: If the Applicant answers "No" to either Questions 1, 2 or 3, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 4 and 5 below.
   If the Applicant answers "Yes" to questions 1, 2 and 3, the Applicant should respond to questions 4 and 5 below.
4. **Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. ☒ Yes ☐ No
5. **Have you attached Municipal and County Land Use Letters for the project?** ☒ Yes ☐ No

*The intended use conforms to the current zoning designation for the property. See Exhibit A-1 for communications with Falls Township and Bucks County.

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?**	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?**	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?**	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?**	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?**	☐	Yes	☐	No
2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?**	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?**	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☐	Yes	☒	No

3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?**	☐	Yes	☐	No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*.	☐	Yes	☐	No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?**	☐	Yes	☐	No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage. **4.0.1 Total Disturbed Acreage** 11.5	☒	Yes	☐	No
5.0	**Does the project involve any of the following?** If "Yes", respond to 5.1-5.3. If "No", skip to Question 6.0.	☐	Yes	☒	No
5.1	**Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?**	☐	Yes	☐	No
5.2	**Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?**	☐	Yes	☐	No
5.3	**Floodplain Projects by the commonwealth, a Political Subdivision of the commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?**	☐	Yes	☐	No
6.0	**Will the project involve discharge of stormwater or wastewater from an industrial activity to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?**	☒	Yes	☐	No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?**	☒	Yes	☐	No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. **8.0.1 Estimated Proposed Flow (gal/day)**	☐	Yes	☒	No
9.0	**Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?**	☒	Yes	☐	No
	9.0.1 Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter. Approval required prior to 105/NPDES approval.	☐	Yes	☒	No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). **10.0.1 Gallons Per Year (residential septage)** _____ **10.0.2 Dry Tons Per Year (biosolids)**	☐	Yes	☒	No
11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. **11.0.1 Dam Name**	☐	Yes	☒	No
12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam. **12.0.1 Dam Name**	☐	Yes	☒	No

13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?** If "Yes", identify each type of emission followed by the amount of that emission.	☒	Yes	☐	No
	13.0.1 Enter all types & amounts of emissions; separate each set with semicolons. All pollutants are below major source thresholds. See attached application for emission estimates.				
14.0	**Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year?** If "Yes", check all proposed sub-facilities.	☐	Yes	☒	No
	14.0.1 Number of Persons Served				
	14.0.2 Number of Employee/Guests				
	14.0.3 Number of Connections				
	14.0.4 Sub-Fac: Distribution System	☐	Yes	☐	No
	14.0.5 Sub-Fac: Water Treatment Plant	☐	Yes	☐	No
	14.0.6 Sub-Fac: Source	☐	Yes	☐	No
	14.0.7 Sub-Fac: Pump Station	☐	Yes	☐	No
	14.0.8 Sub Fac: Transmission Main	☐	Yes	☐	No
	14.0.9 Sub-Fac: Storage Facility	☐	Yes	☐	No
15.0	**Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?**	☐	Yes	☒	No
16.0	**Is your project to be served by an existing public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project.	☒	Yes	☐	No
	16.0.1 Supplier's Name Keystone Industrial Port Complex				
	16.0.2 Letter of Approval from Supplier is Attached (Exhibit A-2)	☒	Yes	☐	No
17.0	**Will this project involve a new or increased drinking water withdrawal from a stream or other water body?** If "Yes", should reference both Water Supply and Watershed Management.	☐	Yes	☒	No
	17.0.1 Stream Name				
18.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed.	☒	Yes	☐	No
	18.0.1 Type & Amount Hazardous or residual liquid waste Hazardous or residual waste treatment: 194,558 ton/year capacity; Typical treatment: 165,000 ton/year Hazardous sludge generation: ≈3,300 ton/year Hazardous salt generation: ≈ 5,500 ton/year				
19.0	**Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities?**	☐	Yes	☒	No
20.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
	20.0.1 Enter all substances & capacity of each; separate each set with semicolons.				
21.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
	21.0.1 Enter all substances & capacity of each; separate each set with semicolons.				

22.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☒ Yes	☐ No
22.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**	Storage tanks may receive raw industrial hazardous or residual liquid waste containing: 120 mg/L of Mercury; 900 mg/L of Lead; and 340 mg/L of Cadmium. Treated wastewater contains: <0.025 mg/L of Mercury; <0.025 mg/L of Lead; and <0.025 mg/L of Cadmium.	
23.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☒ Yes	☐ No
23.0.1	**Enter all substances & capacity of each; separate each set with semicolons.**	See Exhibit A-3, a list of the storage tanks, including capacities	
24.0	**Will the intended activity involve the use of a radiation source?**	☐ Yes	☒ No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name Marjorie J. Fitzpatrick

Marjorie J. Fitzpatrick	Principal Project Manager	10/12/18
Signature	**Title**	**Date**

EXHIBIT A-1

DOCUMENTS FROM FALLS TOWNSHIP AND BUCKS COUNTY RELATED TO APPROPRIATENESS OF THE INTENDED USE OF THE SITE

FALLS TOWNSHIP
LETTER AND COMPLETED FORM

Township of Falls

188 Lincoln Highway, Suite 100
Fairless Hills, PA 19030
(215)-949-9000
E-Mail: admin@fallstwp.org
Website: www.fallstwp.com

August 1, 2017

Marcel L. Groen, Esquire
Fox Rothschild, LLP
10 Sentry Parkway, Suite 200
P.O. Box 3001
Blue Bell, PA 19422-3001

Re: Eleon Recycling Services, LLC zoning letter of consistency;

Dear Mr. Groen:

The requested signed and dated zoning consistency letter is enclosed.

Sincerely,

Thomas A. Bennett, CFM
188 Lincoln Highway, Suite 100
Fairless Hills, PA 19030
215-949-9000 x 251
tbennett@fallstwp.org

Date: 8-1-17

To: Pennsylvania Department of Environmental Protection
Southeast Regional Office

From: Falls Township

Re: Eleon Recycling Services, LLC

The municipality of Falls Township states that it:
X has adopted a municipal or multi-municipal comprehensive plan.
If yes, please provide date of adoption: 8/17/2004

____ has not adopted a municipal or multi-municipal comprehensive plan.

The municipality of Falls Twshp states that it:
X has adopted a county zoning ordinance, or a municipal or joint-municipal zoning ordinance.
____ has not adopted a county zoning ordinance, or a municipal or joint-municipal zoning ordinance.

If applicable:

The municipality of Falls states that its zoning ordinance is generally consistent with its municipal comprehensive plan and the county comprehensive plan.

The above-referenced proposed project
X meet the provisions of the local zoning ordinance.

If zoning approval is required for the project to proceed, the above-referenced project:
____ has received zoning approval.
____ has not received zoning approval.

If the proposed project has not received zoning approval:

What is the status of the zoning request for the proposed project? (e.g., Special Exception Approval from the Zoning Hearing Board required, Conditional Use approval from the Governing Body required)

Not applicable in this matter. Neither a variance, special exception or conditional use is required.

Is there a legal challenge by the applicant with regard to zoning for the proposed project?

No

Name and Contact Information for Municipal Zoning Officer:

Tom Bennett, Chief Code Enforcement Officer / ZoningOfficer
188 Lincoln Highway, Suite 100
Fairless Hills, PA 19030

Additional Comments (attach additional sheets if necessary):

Submitted By:

Name	Tom Bennett
Title	Chief Code Enforcement Officer / Zoning Officer
Contact Information (Address & Phone)	188 Lincoln Highway, Suite 100 Fairless Hills, PA 19030 (215) 949-9000, Ext. 251
Signature	
Date	8-1-17

HAND DELIVERY/PICKUP REQUEST

TO: MAILROOM
<Select>

DATE	REQUESTOR/ATTORNEY NAME	BILLING NUMBER	TELEPHONE NO.
AUGUST 8, 2017	JOEL BOLSTEIN, ESQ.	1214	x3644

CHARGE INFORMATION

SELECT ONE: ☒ CLIENT CHARGEABLE ☐ NON-CLIENT CHARGEABLE

CLIENT NO. 125173

MATTER NO. 1

IF NUMBER UNASSIGNED, INDICATE "NEW" ABOVE

CLIENT NAME ELCON

MATTER NAME GENERAL

EXPLANATION (DESCRIPTION OF DOCUMENT) FOR NON-CHARGEABLE: _____

SERVICE REQUESTED

☒ HAND DELIVER ☐ PICK UP ☐ ROUND TRIP

CHECK ONE: ☐ REGULAR *WITHIN 3 HOURS* ☐ OTHER *BY: P.M.* ☐ RUSH *1 HOUR*

LOCATION

PERSON'S NAME DAVID A. SEBASTION
COMPANY NAME
STREET ADDRESS
CITY/STATE/ZIP
TELEPHONE

SPECIAL INSTRUCTIONS: PLEASE GET A SIGNATURE THAT DELIVERY WAS RECEIVED. THANK YOU.

MESSENGER ASSIGNED:
PLEASE HAVE PERSON TO WHOM YOU MAKE DELIVERY INDICATE TIME AND ACKNOWLEDGE RECEIPT BELOW
TIME DELIVERED: _____ AM/PM REC'D BY: _____
COURIER – RETURN THIS FORM TO MAILROOM SUPERVISOR

WL USE ONLY
JOB NO. _____
COURIER NO. _____
TIME: _____
(PHILADELPHIA ONLY)

HAND DELIVERY/PICKUP REQUEST

TO: MAILROOM
<Select>

DATE	REQUESTOR/ATTORNEY NAME	BILLING NUMBER	TELEPHONE NO.
AUGUST 8, 2017	JOEL BOLSTEIN, ESQ.	1214	x3644

CHARGE INFORMATION

SELECT ONE: ☒ CLIENT CHARGEABLE ☐ NON-CLIENT CHARGEABLE

CLIENT NO. 125173

MATTER NO. 1

IF NUMBER UNASSIGNED, INDICATE "NEW" ABOVE

CLIENT NAME ELCON

MATTER NAME GENERAL

EXPLANATION (DESCRIPTION OF DOCUMENT) FOR NON-CHARGEABLE: _____

SERVICE REQUESTED

☒ HAND DELIVER ☐ PICK UP ☐ ROUND TRIP

CHECK ONE: ☐ REGULAR *WITHIN 3 HOURS* ☐ OTHER *BY: P.M.* ☐ RUSH *1 HOUR*

LOCATION

PERSON'S NAME COMMISSIONER CHARLES H. MARTIN
COMPANY NAME
STREET ADDRESS
CITY/STATE/ZIP
TELEPHONE

SPECIAL INSTRUCTIONS: PLEASE GET A SIGNATURE THAT DELIVERY WAS RECEIVED. THANK YOU

MESSENGER ASSIGNED:
PLEASE HAVE PERSON TO WHOM YOU MAKE DELIVERY INDICATE TIME AND ACKNOWLEDGE RECEIPT BELOW
TIME DELIVERED: _____ AM/PM REC'D BY: _____
COURIER – RETURN THIS FORM TO MAILROOM SUPERVISOR

WL USE ONLY
JOB NO. _____
COURIER NO. _____
TIME: _____
(PHILADELPHIA ONLY)

RECEIVED
AUG 08 2017
Robert G. Loughery

Error! Unknown document property name.

Fox Rothschild LLP
ATTORNEYS AT LAW

MEMORANDUM

TO: David A. Sebastion, Acting Executive Director, Bucks County Planning Commission

FROM: M. Joel Bolstein, on behalf of Elcon Recycling Services, LLC

CC: Commissioner Charles H. Martin, Chairman, Bucks County Commissioners

DATE: August 8, 2017

RE: Form to be Completed By County Planning Commission

I am the environmental attorney at Fox Rothschild representing Elcon Recycling Services, LLC, an Israeli company looking to build an industrial wastewater treatment/recycling facility at the KIPC site in Falls Township. I spoke with Chairman Martin, who told me that the attached letter and information package should be sent to you as the Acting Executive Director of the Planning Commission. I explained things to Chairman Martin, so if you have questions, you can contact him for additional information.

In addition to the letter, I have enclosed a copy of the form that was completed by the Code Officer for Falls Township and a blank form to be completed by the appropriate person at the County Planning Commission. The PADEP has instructed Elcon to obtain completed forms from both the Township's Code Enforcement Officer and the Bucks County Planning Commission. Our understanding is that while the County has a comprehensive plan, it is largely strategic in nature and does not require projects to obtain zoning or land use approval at the county level. The proposed Elcon facility is a heavy industrial facility, which would be built at the former USX industrial site at KIPC, where other heavy industrial operations currently exist. As you'll see from the form completed by the Falls Township Code Officer, the proposed project was found to be consistent with the township's local zoning ordinance. PADEP granted siting approval to the proposed facility and the next step is for PADEP to review the technical and engineering aspects of the project. Under the applicable PADEP policy, you are requested to return the completed form within 30 days.

If you have any questions, please feel free to contact me at (215) 918-3555. The completed form can be returned to me at our Warrington office or to Elcon Recycling Services, LLC at 11 LeParc Drive, Princeton, NJ 08550.

Thank you.

BUCKS COUNTY COMMUNICATIONS AND PROOF OF DELIVERY

Note: Bucks County did not reply to Elcon

elcon
recycling center

August 7, 2017

Lynne T. Bush
Executive Director
Bucks County Planning Commission
1260 Almshouse Road
Doylestown, PA 18901

Re: Elcon Recycling Services, LLC

Dear Ms. Bush:

Acts 67, 68 and 127, which amended the Municipalities Planning Code, direct state agencies to consider comprehensive plans and zoning ordinances when reviewing applications for permitting of facilities and infrastructure, and specify that state agencies may rely upon comprehensive plans and zoning ordinances under certain conditions as described in Sections 619.2 and 1105 of the Municipalities Planning Code. The Pennsylvania Department of Environmental Protection's Policy for Consideration of Local Comprehensive Plans and Zoning Ordinances in DEP Review of Permits for Facilities and Infrastructure (DEP 's Land Use Policy) provides direction and guidance to DEP staff, permit applicants, and local and county governments for the implementation of Acts 67, 68 and 127 of 2000. This policy can be found at www.depweb.state.pa.us; Keyword: Land Use.

By way of background, the permit application under consideration by DEP is for the construction and operation of a 70,000 square foot commercial facility for the treatment of hazardous and residual liquid waste streams by Elcon Recycling Services, LLC (the "Project"). The Project will be constructed on 33 acres at 100 Dean Sievers Place within the Keystone Industrial Port Complex (the "KIPC") in Falls Township, Bucks County. The Project treats the liquid waste in a four-step process: (1) liquids are screened and pre-treated in DEP permitted storage tanks; (2) solids and salts are removed, dried, and treated to remove any volatile organic compounds ("VOCs"); (3) VOCs are removed from the liquid as gases and treated in a pollution control system; and (4) the end products are distilled water (reused onsite), salts, and solids (disposed of off-site at a permitted facility). Additionally, energy created by the treatment process is captured and recycled.

On November 12, 2015, DEP acknowledged that the Project met the Phase I Siting Criteria under 25 Pa. Code Section 269a. The Project lies within the area designated as "MPM – Materials Processing and Manufacturing" under Falls Township's local zoning ordinance and Section 209-30 of the Falls Township Zoning Regulations. MPM zoned land allows for the following uses: large-scale industrial production; machinery for processing purposes; exceptionally large waste disposal facilities; fabrication activities which utilize massive or heavy equipment; and the manufacture of products from primary raw material sources. According to the ordinance, the principal permitted uses in the

MPM zone include: the processing, distribution, and storage of raw, semifinished or finished materials, fuels, products or by-products; power generation facilities; remanufacturing; blast furnaces; employee recreational facilities; and any use of the same general character or incidental to the previously listed uses. In addition, MPM zoned land may be used for any purpose consistent with the principal uses of: a Farming and Mining District (FM) under Section 209-26; a Light Industrial District (LID) under Section 209-27; a Planned Industrial Park District (PIP) under Section 209-28; and a Heavy Industrial District (HI) under Section 209-29. Collectively, these zoning districts allow for all industrial and manufacturing buildings; product distribution and warehousing; and transportation terminals and freight handling.

Currently, the following operations are being conducted within the MPM zoned land at KIPC or in the immediate vicinity on land in which other zoning designations are subsumed into the MPM zoned area:

- A hot-dip galvanizing facility within the MPM Zone handling ignitable, corrosive, and reactive waste;
- A ground or treated mineral earth manufacturing facility in the MPM Zone handling corrosive waste, chromium, and silver;
- A chemical products facility in the PIP Zone handling ignitable waste, arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, benzene, and more;
- A solid and hazardous waste facility in the PIP Zone handling ignitable waste, methyl-ethyl-ketone, and tetrachloroethylene.
- A chemical wholesaler in the PIP Zone handling ignitable and corrosive waste, methane, and dichloro-methylene chloride;
- A chemical wholesaler in the HI Zone handling ignitable, corrosive, and reactive waste, and nonhalogenated solids;
- A coating facility in the HI Zone handling ignitable waste, chromium, mercury, and methyl-ethyl-ketone;
- A coating facility in the HI Zone handling ignitable waste, arsenic, cadmium, lead, benzene, and more;
- An organic chemical facility in the HI Zone handling ignitable, corrosive, and reactive waste, arsenic, selenium, silver, carbon tetrachloride, and chloroform; and
- A gas manufacturing facility in the HI Zone handling ignitable waste, methane, and methyl chloride.

Almost all of the above facilities are classified by U.S. EPA as large quantity generators of hazardous waste. Many of them have approval to receive and store large quantities of raw chemicals, hazardous materials, hazardous waste, and residual waste (i.e., commercial waste) in tanks. Accordingly, the MPM zoning designation allows for facilities that store and use hazardous substances and generate significant quantities of hazardous waste. It also allows for facilities that use heavy equipment for processing, conduct waste generation and treatment, and virtually any and all light or heavy industrial operation.

Moreover, the Bucks County Comprehensive Plan (the "Plan") sets forth eight principles to promote the growth of Bucks County. Applicable here is Principle Four, which seeks to protect water resources and reduce waste. The Project furthers Principle Four by: (1) using state-of-the-art pollution control equipment so that air emissions are 99.9% free of contaminants, (2) being designed so all treatment and storage areas will be five feet above the 100 year floodplain and above the 500 year floodplain, (3) implementing an industrial wastewater management plan to ensure that zero wastewater is being discharged from the facility; (4) implementing spill prevention measures that meet or exceed all state and federal requirements; and (5) allowing manufacturers in Bucks County that generate hazardous and residual liquid waste streams to utilize a more sustainable and environmentally-friendly treatment option than currently available, such as deep well injection or incineration. Therefore, the Project promotes and facilitates with the Bucks County Comprehensive Plan.

In accordance with DEP's Land Use Policy, enclosed please find a General Information Form (GIF) completed for this project and a Municipal Land Use form that is to be submitted with our permit application to DEP. In addition to the blank form being sent to your office, we are including a completed copy of the same form as it was completed by the Chief Code Enforcement Officer/Zoning Officer for Falls Township. Falls Township's response indicates that the project meets the provisions of the local zoning ordinance and that no zoning request is required. Consistent with DEP's Land Use Policy, please complete the attached form and return it to the address below within 30 days:

Name of Applicant: Elcon Recycling Services, LLC

Address of Applicant: 11 LePare Drive
Princeton, NJ 08550

Please do not send this form to DEP, as we must include the completed forms with our permit application. If we do not receive a response from you **within 30 days,** we shall proceed to submit our permit application to DEP without the form from the county. If a completed form from the County Planning Commission is not submitted with our permit application, and we provide proof to DEP that we attempted to obtain it, DEP will assume there are no substantive land use conflicts at the county level and proceed with the normal application review process.

If you have any questions, please contact Dr. Rengarajan Ramesh at (609) 716-0785 or ramesh.rengarajan@gmail.com.

Sincerely,

Dr. Zvi Elgat

49625574.v2-8/4/17

Date: _____

To: Pennsylvania Department of Environmental Protection
Southeast Regional Office

From: Bucks County Planning Commission

Re: Elcon Recycling Services, LLC

The County of Bucks states that it:

_____ has adopted a county or multi-county comprehensive plan.
If yes, please provide date of adoption:

_____ has not adopted a county or multi-county comprehensive plan.

If applicable:

The above-referenced project:

_____ is consistent with the adopted county or multi-county comprehensive plan.
_____ is not consistent with the adopted county or multi-county comprehensive plan.

Additional Comments (attach additional sheets if necessary):

_____

_____

_____

Submitted By:

Name	
Title	
Contact Information (Address & Phone)	
Signature	
Date	

Date: 8-1-17

To: Pennsylvania Department of Environmental Protection
Southeast Regional Office

From: Falls Township

Re: Elcon Recycling Services, LLC

The municipality of Falls Township states that it:
X has adopted a municipal or multi-municipal comprehensive plan.
If yes, please provide date of adoption: 8/17/2004

____ has not adopted a municipal or multi-municipal comprehensive plan.

The municipality of Falls Twshp states that it:
X has adopted a county zoning ordinance, or a municipal or joint-municipal zoning ordinance.
____ has not adopted a county zoning ordinance, or a municipal or joint-municipal zoning ordinance.

If applicable:

The municipality of Falls states that its zoning ordinance is generally consistent with its municipal comprehensive plan and the county comprehensive plan.

The above-referenced proposed project
X meet the provisions of the local zoning ordinance.

If zoning approval is required for the project to proceed, the above-referenced project:
____ has received zoning approval.
____ has not received zoning approval.

If the proposed project has not received zoning approval:

What is the status of the zoning request for the proposed project? (e.g., Special Exception Approval from the Zoning Hearing Board required, Conditional Use approval from the Governing Body required)

Not applicable in this matter. Neither a variance, special exception or conditional use is required.

Is there a legal challenge by the applicant with regard to zoning for the proposed project?

No

Name and Contact Information for Municipal Zoning Officer:

Tom Bennett, Chief Code Enforcement Officer / Zoning Officer
188 Lincoln Highway, Suite 100
Fairless Hills, PA 19030

Additional Comments (attach additional sheets if necessary):

Submitted By:

Name	Tom Bennett
Title	Chief Code Enforcement Officer / Zoning Officer
Contact Information (Address & Phone)	188 Lincoln Highway, Suite 100 Fairless Hills, PA 19030 (215) 949-9000, Ext. 251
Signature	
Date	8-1-17

1300-PM-BIT0001 5/2012
Form

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

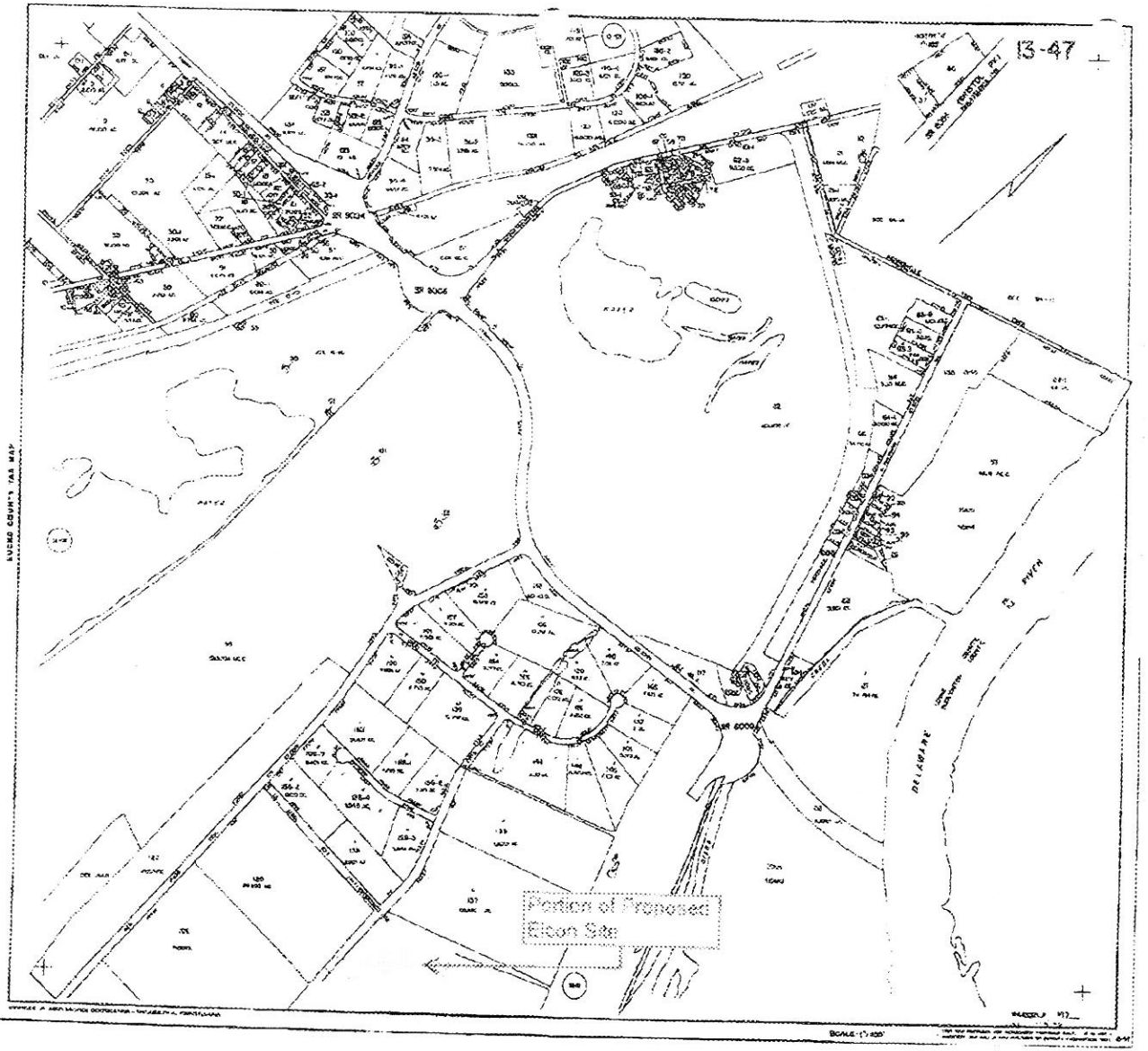
Related ID#s (If Known)				DEP USE ONLY
Client ID#	311804	APS ID#		Date Received & General Notes
Site ID#	782699	Auth ID#		
Facility ID#				

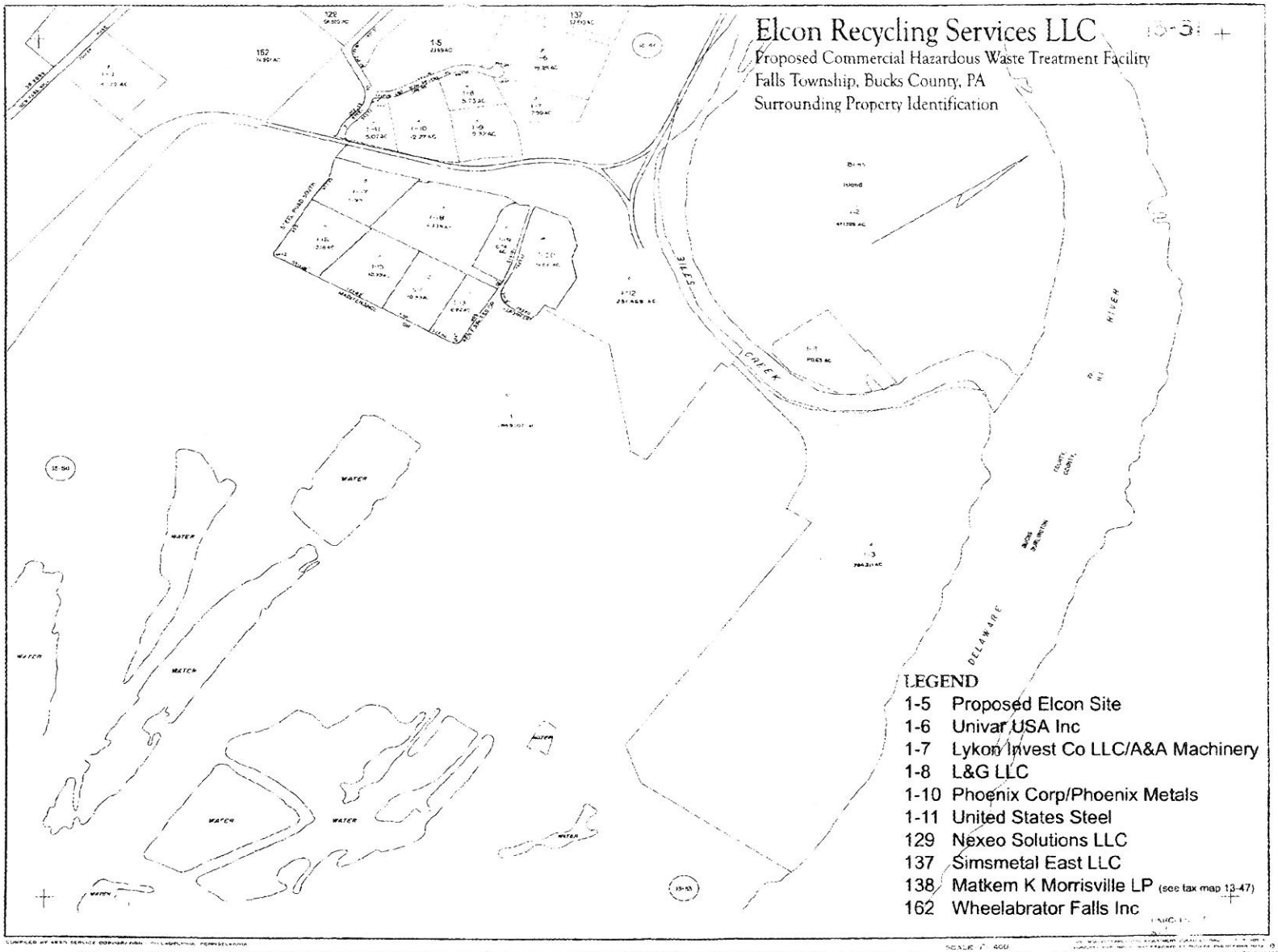
CLIENT INFORMATION

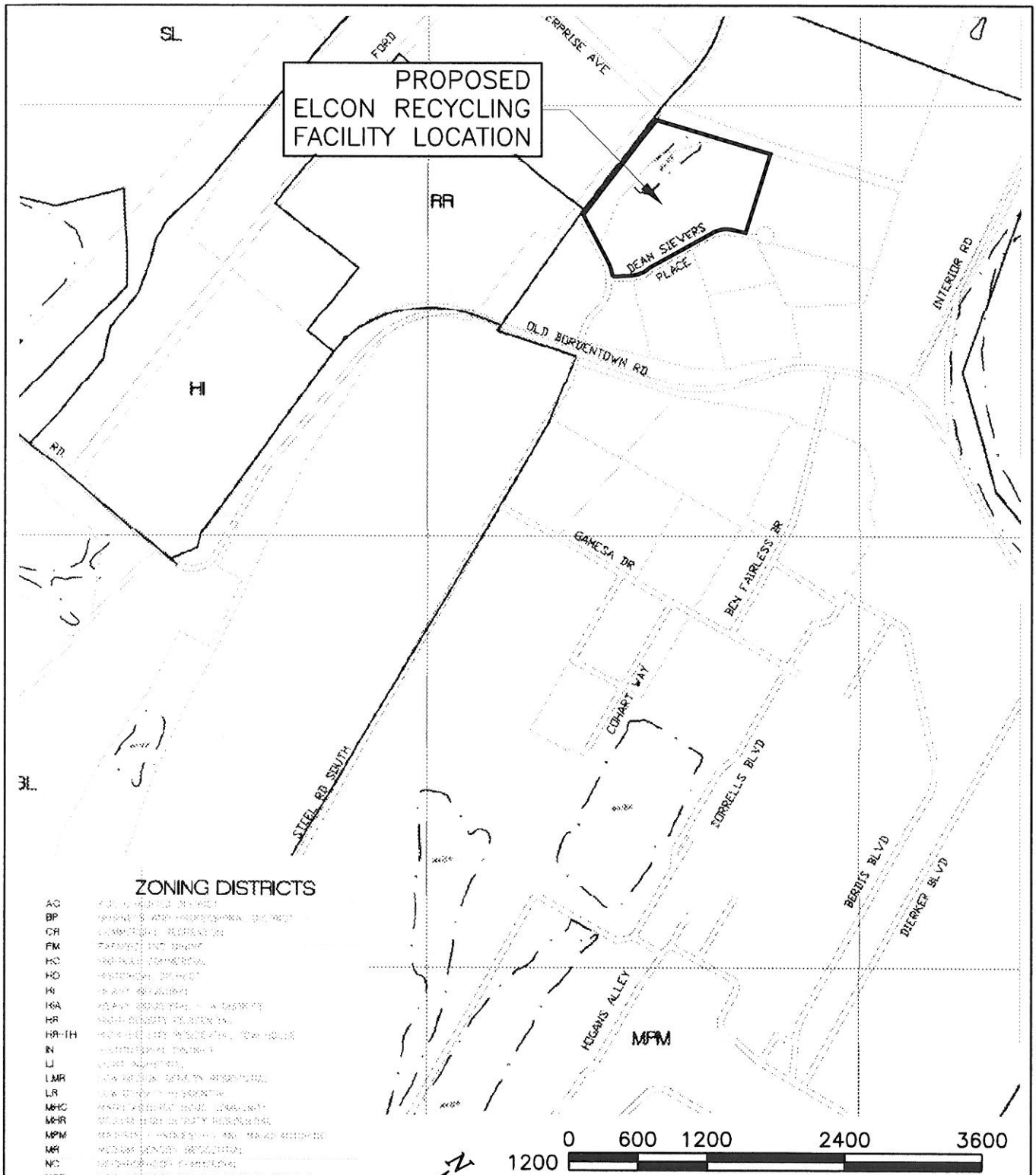
DEP Client ID#	Client Type / Code			
311804	LLC			
Organization Name or Registered Fictitious Name		**Employer ID# (EIN)**	**Dun & Bradstreet ID#**	
Elcon Recycling Services, LLC		46-2247013		
Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**
Ramesh	Rengarajan			
Additional Individual Last Name	**First Name**	**MI**	**Suffix**	**SSN**
Mailing Address Line 1		**Mailing Address Line 2**		
11 LeParc Drive				
Address Last Line – City	**State**	**ZIP+4**	**Country**	
Princeton	NJ	08550	US	
Client Contact Last Name	**First Name**	**MI**	**Suffix**	
Ramesh	Rengarajan			
Client Contact Title		**Phone**	**Ext**	
		(267) 243-3144		
Email Address		**FAX**		
Ramesh.rengarajan@gmail.com				

SITE INFORMATION

DEP Site ID#	Site Name				
782699	to be located at 100 Dean Sievers Place (Tax Parcel No. 13-51-1-5) in Falls Township, Bucks County, PA				
EPA ID# PAR000544486	**Estimated Number of Employees to be Present at Site** 55				
Description of Site					
Commercial facility for treatment of hazardous liquid waste streams to be located at 100 Dean Sievers Place (Tax Parcel No. 13-51-1-5) in Falls Township, Bucks County, PA, former US Steel Site					
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**
Bucks	Falls	☐	☐	☒	
County Name	**Municipality**	**City**	**Boro**	**Twp**	**State**
		☐	☐	☐	
Site Location Line 1		**Site Location Line 2**			
100 Dean Sievers Place					
Site Location Last Line – City		**State**	**ZIP+4**		
Morrisville		PA	19067		
Detailed Written Directions to Site					
Rt. 1 to S. PA. Ave. to River Road to S. PA. Ave. to Old Bordentown Rd. to S. Port Rd to Dean Sievers Pl.					
Site Contact Last Name	**First Name**	**MI**	**Suffix**		
Ramesh	Rengarajan				
Site Contact Title		**Site Contact Firm**			


13-47
Portion of Proposed
Elcon Site
DELAWARE
RIVER


Elcon Recycling Services LLC
Proposed Commercial Hazardous Waste Treatment Facility
Falls Township, Bucks County, PA
Surrounding Property Identification
LEGEND
1-5 Proposed Elcon Site
1-6 Univar USA Inc
1-7 Lykon Invest Co LLC/A&A Machinery
1-8 L&G LLC
1-10 Phoenix Corp/Phoenix Metals
1-11 United States Steel
129 Nexeo Solutions LLC
137 Simsmetal East LLC
138 Matkem K Morrisville LP (see tax map 13-47)
162 Wheelabrator Falls Inc
BILES CREEK
DELAWARE RIVER
WATER
BUCKS COUNTY TAX MAP



iES ENGINEERS	EXHIBIT A–1
	SECTION OF FALLS TOWNSHIP ZONING MAP
Date: 6–19–14 / File: EV141065.05	ELCON RECYCLING FACILITY FALLS TOWNSHIP, BUCKS COUNTY, PA

Proposed KIPC, Morrisville, Pa. Plant Process Description

General

Capacity: Nominal 175,000 metric tons/year (Units 20, 21, and 23 have a nominal 150,000 metric tons/year capacity, and Unit 12 has a nominal 25,000 metric tons/year capacity) of industrial RCRA Listed and Characteristic Wastewater from various sources

Daily capacity: Nominal 410 metric tons/day average flow

Mode of operations: 24 hours/day, 7 days/week

Technology: The technology used for Units 20, 21, and 23 include physical-chemical separation, thermal oxidation, thermal distillation of volatile organic compounds (VOCs), evaporation and salt crystallization. The technology used for Unit 12 includes physical-chemical separation.

Organics extraction: Flash Evaporation Distillation technology (FED)

Total plant area: 100,000 ft^2

Total area: 300,000 ft^2

Water discharge: **Zero Liquid Discharge**

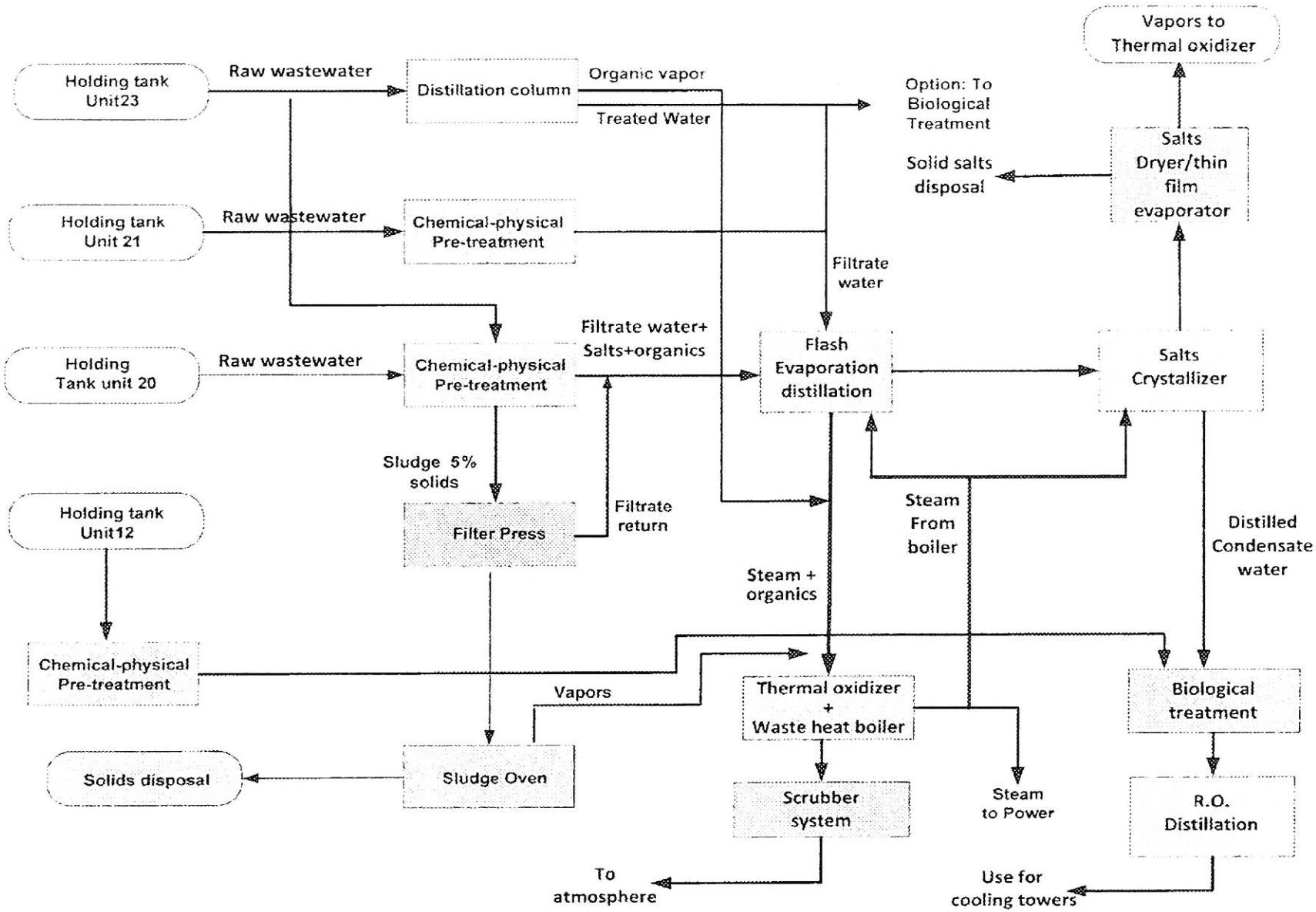
Number of employees: approximately 55

Control: Single control room for the plant. All is automatically controlled.

Process steps: 8

Process Summary

- Facility receives Resource Conservation and Recovery Act (RCRA) listed and characteristic wastewater in tanks from trucks.
- Wastewater is stored and treated in various tanks and reactors.
- Sludge and salt is removed from the wastewater and dried.
- The dried sludge and salt are treated to remove VOCs for recycling.
- The VOCs in the wastewater are extracted.
- The VOCs in gaseous form from the FED are vented from different areas throughout the plant and are then sent to the thermal oxidizer to be oxidized. The energy is recycled into the process.


Holding tank Unit23
Raw wastewater
Distillation column
Organic vapor
Treated Water
Option: To Biological Treatment
Vapors to Thermal oxidizer
Solid salts disposal
Salts Dryer/thin film evaporator
Holding tank Unit 21
Raw wastewater
Chemical-physical Pre-treatment
Filtrate water
Filtrate water+ Salts+organics
Holding Tank unit 20
Raw wastewater
Chemical-physical Pre-treatment
Flash Evaporation distillation
Salts Crystallizer
Sludge 5% solids
Filter Press
Filtrate return
Steam From boiler
Distilled Condensate water
Holding tank Unit12
Steam + organics
Chemical-physical Pre-treatment
Vapors
Thermal oxidizer + Waste heat boiler
Biological treatment
Solids disposal
Sludge Oven
Scrubber system
Steam to Power
R.O. Distillation
To atmosphere
Use for cooling towers

Summary of the Regulatory Approach

- All RCRA listed and characteristic wastewater stored and/or treated will require a RCRA Permit, subject to 40 CFR270.
- All salts and sludges will be derived from the listed hazardous wastewater and will, therefore, be considered hazardous. All storage, treatment, and drying of these salts and sludges will require a RCRA Permit unless or until they are delisted.
- Wastewater from various parts of the process will "contain" hazardous waste and must be managed as hazardous waste until "contained-out".
- All VOC emissions extracted from the wastewater will be in gaseous form and treated by a thermal oxidizer.
- All VOC emissions obtained from the drying of the salts, sludges, and other parts of the process, will be in gaseous form and treated by a thermal oxidizer.
- Since the VOCs treated by the Thermal Oxidizer will not be solids, liquids, or contained gases, they are not solid or hazardous waste and not subject to RCRA.
- Emissions from the thermal oxidizer will be subject to applicable air permitting requirements. "Best Available Technology" requires 98% destruction of VOCs.

Step 1 – Receiving Tanks

The plant will receive industrial wastewater deliveries, some with high organic concentrations and/or acids, from tanker trucks 24 hours/day, 7 days/week. The unloading station will be in a contained area and the wastewater will be piped from the trucks to onsite storage tanks. These tanks will be closed and vented to the thermal oxidizer and then scrubbed to regulate air emissions. Separate storage tanks will be onsite for the varying types of incoming wastewater. The site will contain RCRA-regulated hazardous waste storage tanks and tanks that contain fresh acid and alkaline. The tanks will:

- Contain the raw wastewater from the various clients
- Contain acid and alkaline waste, used as a hydrological buffer for the process
- Be located within secondary containment areas

The contents and nominal capacities of the tanks are:

- 10 acid waste tanks, approximately 184,800 gallons total capacity
- 1 alkaline waste tank, approximately 11,000 gallons total capacity
- 4 flammable waste tanks, approximately 52,900 gallons total capacity
- 10 aqueous waste tanks, approximately 1,360,000 gallons total capacity
- 1 fresh caustic tank, approximately 11,000 gallons total capacity

Step 2 – Unit 20 (Main Unit) Chemical-Physical Treatment

Incoming wastewater will be sent to three separate but similar treatment units, depending on characteristics of the wastewater. Unit 20 is the main wastewater treatment unit. This unit contains continuous reactors and settling tanks. Reagents are added to the reactors to facilitate neutralization and the settling of solids at a rate of approximately 5,300 gallons/hour.

Function:

- Acid and base neutralization
- Flocculent and coagulant addition
- Dissolved metals precipitation and separation
- Suspended solids separation and filtration

Process description:

a. First RCRA Treatment Tank: pH control and coagulation

The pH of the wastewater in the first reactor is adjusted to 9-10. The addition of acid or caustic soda is computer controlled. Then, coagulation material is added in the form of ferric chloride or ferric sulfate. The pH is also maintained at 9-10 as necessary, by addition of bases. The capacity of this system is 20 tons/hour.

b. Second RCRA Treatment Tank: flocculation

Polymeric flocculation material is added in the second reactor. The flocculation material acts as a binder to capture small particles formed by the previous process of coagulation. Once the particles form, they are difficult to capture since they are too small. The polymeric flocculent is a long chain of polymer material that captures the small particles to form much larger particles that are easier to filter. The capacity of this system is 20 tons/hour.

c. Third RCRA Treatment Tanks: settling in two phases

Water and particles are gravity separated into two phases in the settling tanks. In the lower phase the large, heavy particles formed through coagulation and flocculation settle to the bottom of the tank to form sludge. The water in the upper phase is clear of suspended matter. The two types of contaminants that remain in the wastewater after this phase separation are:

- Soluble organic matter, like solvents, and
- Soluble inorganic matter, like salts.

The clear water phase will be sent to a holding tank to be sent to the Flash Evaporator Distillation (FED) holding tank.

Sludge phase – 7% dry matter then goes to the 3,000-gallon sludge treating reactors.

The tanks in this area are to be vented to a thermal oxidizer and then scrubber.

Step 2 – Unit 21 Chemical-Physical Treatment

This unit receives wastewater that contains salts and no VOCs. This unit contains batch reactors for neutralization and flocculation. Reagents are added to the reactors to facilitate neutralization and the settling of solids. After neutralization, the solids are removed by using a filter press. The treated wastewater contains only dissolved salts and is then sent to the FED (Flash Evaporation Distillation). The tanks are to be vented to a thermal oxidizer and then scrubber. Capacity of this system is approximately 3 tons/hour.

Step 2 – Unit 12 Chemical-Physical Treatment

This unit receives wastewater with a high acid content but does not contain VOCs or salts. The unit treats acid in several concentrations. This unit contains batch reactors for neutralization. Reagents and lime (pH ~9-10) is added to the reactors to facilitate neutralization and the settling of solids. After neutralization, the solids are removed by using a filter press or centrifuge. The waste acid does not contain any VOCs or salts so the resultant sludge is not hazardous. The tanks are to be vented to a thermal oxidizer and then scrubber.

Step 3 – Sludge Processing

a. Sludge Filtration and Dewatering

The sludge in the holding tank is RCRA hazardous pursuant to the "derived from rule". The sludge is filtered in a filter press to remove the water so the remaining solid sludge contains about 30% dry matter. The filtrate water from the filter press flows to the clear water holding tank and is sent to the FED holding tank to be further treated. From the filter press the dry sludge falls into a closed hopper that directs the sludge to the next process, the sludge dryer oven. Hoods shall be located over the sludge dewatering and drying area to vent all emissions to the thermal oxidizer and scrubber. The capacity of this process is 1 ton/hour of wet cake, 30% solids.

b. Sludge Dryer

The sludge dryer heat treatment oven is a completely closed process unit. The drying process is accomplished using a rotary dryer. The process is continuous and

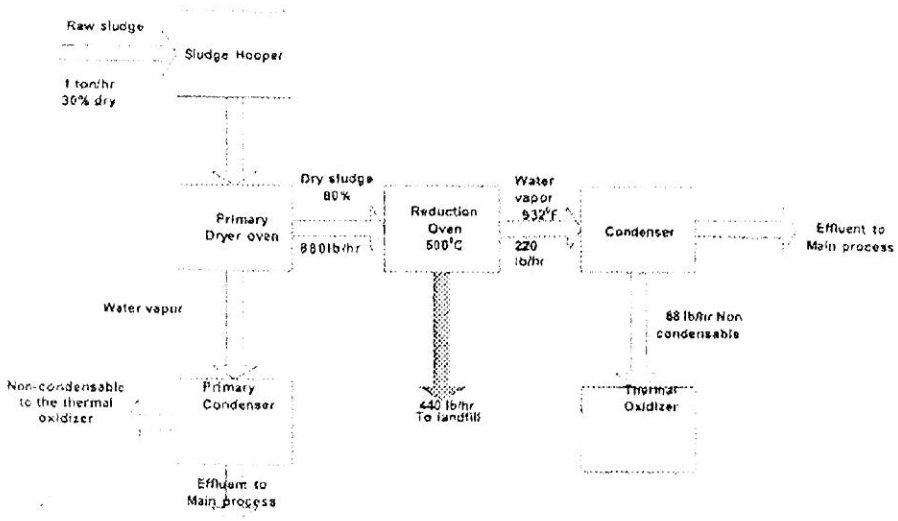
the sludge retention time and the temperature dictate the final moisture content of the product. The water from the sludge is vaporized. The emissions from the rotary oven contain particulate matter, which is removed by a cyclone. Downstream of the cyclone, the emissions are vented through the thermal oxidizer, and then a scrubber. The water which has been condensed flows back to the water holding tank where it is recycled to be treated in the plant.

The dry sludge then contains 70-85% dry matter and is ready for the next and final process of thermal treatment, where any remaining organics in the sludge are removed. The capacity of this section is approximately 1 ton/hour of wet cake, 30% solids at the inlet to the dryer, 880 lbs/hr of dry sludge (75% solids) at the outlet of the dryer.

c. Sludge Thermal Treatment

The sludge contains mainly oxides and other materials that need further treatment to separate the organic materials in the sludge. In the thermal process, the sludge is heated by a thermal screw to 550 °C (1,022 °F). As a result, all the residual organics are removed in gaseous form. The dried sludge will be collected in a closed silo. The RCRA hazardous sludge can then be transported and appropriately disposed or delisted. The dried sludge will still be hazardous pursuant to the "derived from rule". The organic vapor phase flows into a thermal oxidizer, where the organics are treated and the energy is captured and re-used. A bag filter will be located in the treatment area to collect any dust distribution in the air.

Schematic process diagram for the entire sludge process



Note: The projected flow rates, above, are approximate values

Step 4 – Unit 20 Flash Evaporation Distillation

The water, after settling and filtration, flows to the holding tank for the next process (FED holding tank). The water flows into the Flash Evaporation Distillation (FED) process to remove the entire organic load from the water by using steam as the organics extraction agent in the FED). The FED is comprised of an evaporator and flash chamber in which the wastewater is circulated. The wastewater enters the evaporator and is superheated with steam coming from the waste heat boiler to about 112 °C (233.6 °F). When the wastewater exits the evaporator and enters the flash chamber, the wastewater boils spontaneously (flashing), and the resultant steam which contains all the organics from the wastewater is pumped out of the flash chamber into the thermal oxidizer.

The FED combines complete organics extraction with distillation to achieve total organics destruction with evaporation distillation.

The FED is designed for 22 tons/hour with 100,000 COD and 4% total dissolved solids (TDS).

The FED conditions are important in order to achieve best performance, so all conditions are highly controlled: pH, steam flow, temperature, steam pressure, water temperature, circulation ratio, etc. The steam with the gaseous volatile organics rises from the top of the FED unit, and the VOC and steam mixture are sent to the thermal oxidizer.

The treatment of the VOCs is subject to Air Permitting, rather than RCRA, since the gaseous VOCs are neither solid nor liquid and therefore, not a hazardous waste. The water from the bottom of the FED unit flows into a holding tank, which acts as the hydraulic buffer between the FED process and the next process. Although still RCRA hazardous, the contaminants now left in the water are primarily the dissolved salts which must be distilled in order for the process to be complete and the water can be released. The wastewater is then biologically treated at a rate of 4 tons/hour.

Step 4 – Unit 23 Distillation

In case there is not enough VOCs in the main unit (Unit 20), it is possible to treat high concentrated organic waste (10-30% VOCs). The organic waste is distilled in a dedicated distillation column or in an evaporating vessel. The concentrated VOCs (about 70-80% VOCs) are then sent in a gaseous phase to the thermal oxidizer to be treated. The water is sent to the FED for further treatment along with the main unit's wastewater. The capacity of this system is approximately 10,000 tons/year.

Step 5 – Thermal Oxidation

In the proposed Elcon Recycling Facility, the thermal oxidizer is the main process to achieve destruction of the gaseous organics that were extracted from the wastewater in the FED unit.

The thermal oxidizer is regulated under the Air Program and operates at a minimum of 1,800 °F (approximately 1,000 °C). It is expected that at that temperature, 99.9% of the organics will be oxidized. The process is continuous and steady state.

The heat of combustion of the organics in the thermal oxidizer is captured using the waste heat boiler to generate steam. This steam is re-used in the FED unit for the next cycle. This technology allows for the process to be energy neutral when the feed wastewater contains more than 3% organics, which is expected for this facility.

All of the organic emission sources in the facility will be vented though the thermal oxidizer and then to a scrubber, before being vented to the atmosphere. The majority of the VOC emissions from the plant will be from the FED and distillation column. When the FED and thermal oxidizer are shut down due to process issues, the storage tanks and other vessels that emit negligible amounts VOCs shall be vented to a carbon filter.

The thermal oxidizer is designed for maximum of 1400 °C (2,552 °F) and will generate about 48 MM BTU/hr of energy that will be used for steam production. In the thermal oxidizer, the VOCs are oxidized to CO_2 and H_2O. The waste heat boiler is at the exit of the thermal oxidizer and will produce steam, which is then transmitted to the entire plant, where the steam is used in the FED process unit.

After passing through the waste heat boiler, the hot gases are cooled to 300 °C (572 °F) and flow through an air-air heat exchanger, which uses the residual heat in the hot air to heat up the incoming fresh air to the thermal oxidizer. This maximizes the recycling of the BTUs in the VOCs and minimizes external energy consumption. The flue gases shall be treated with urea for NOx reduction, when necessary, and then in a NaOH solution scrubber to treat any halogens at the outlet. The clean flue gases shall be vented to the atmosphere through a stack.

Step 6 – Water Distillation – Flash Evaporation Distillation (FED)

The separation distillation process is carried out using Flash Evaporation Distillation (FED) technology. The FED evaporation process combines distillation with evaporation and the organics extraction into the thermal oxidizer. It is more reliable than membrane reverse osmosis (RO), which frequently has plugging problems. The brine (salts) concentration can be approximately 25% TDS. This means that the FED process can deliver a concentration ratio of 1:5 when the incoming wastewater concentration is about 5% TDS.

In the FED process 60%-70% of the wastewater evaporates through the thermal oxidizer with the organic materials (the VOC) and passing through the scrubber.

The remaining 30%-40% of the wastewater which is now concentrated with salts is directed to a holding tank prior to the salt crystallization and drying process.

The thermal distillation has a nominal capacity of 22 tons/hour of wastewater. The concentrated brine at 15%-25% TDS, derived from hazardous waste after the FED process, flows to a holding tank from which it flows to crystallization, the next process.

Step 7 – Brine (Salts) Crystallization

The concentrated brine flows from the previous process (FED) to the brine holding tank where it is held for crystallization.

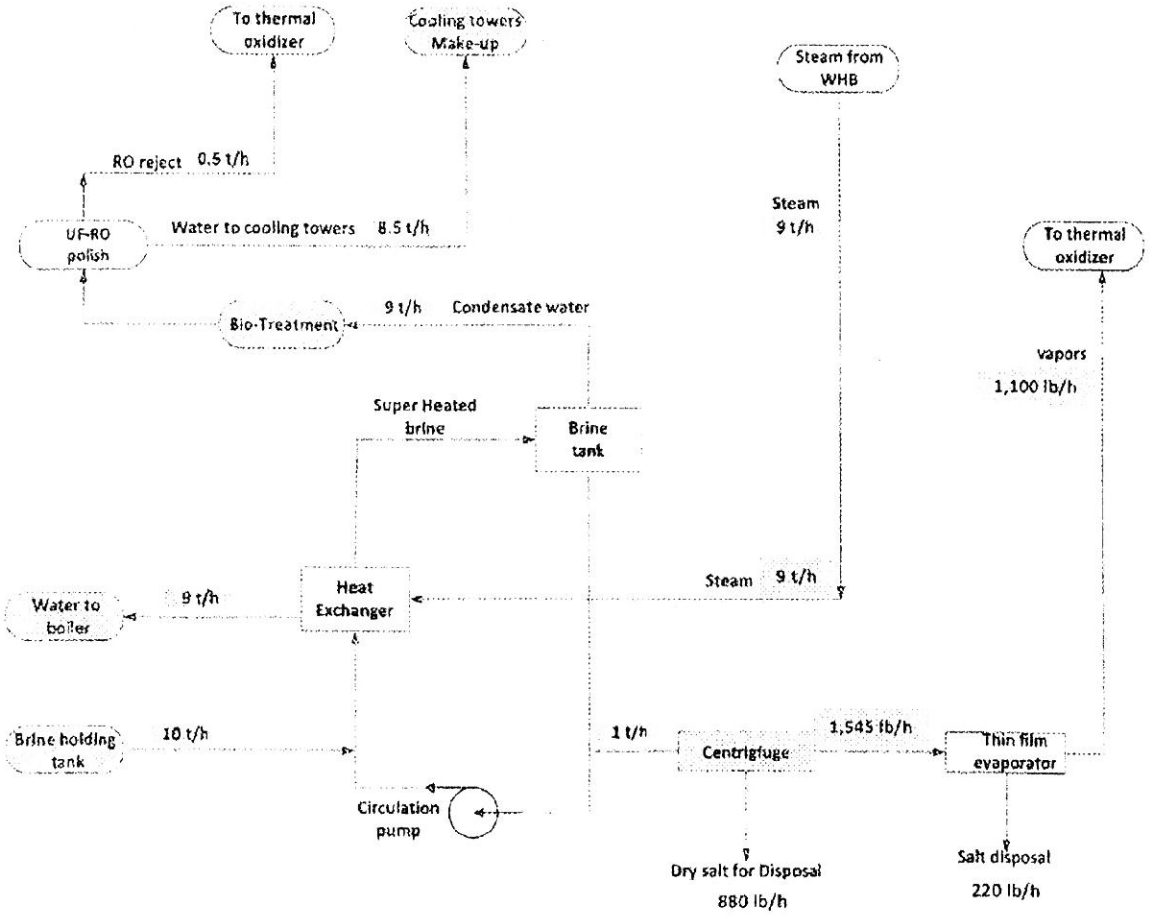
From the holding tank the concentrated wastewater (brine) containing 15%-20% salts flow through the heat exchanger where it is heated and enters the brine tank. In the brine tank the brine boils and the vapors are emitted from the top, collected, cooled and condensed into water that flows to the biological treatment unit.

The brine in the brine tank thus is further concentrated to achieve 75% salts concentration, by circulation using a circulation pump through a decanter-thin film evaporator unit. The salt crystals are removed with the decanter-thin film evaporator combination unit.

The steam to the heat exchanger is supplied from the waste heat boiler recovered from the waste. The crystallized salts flow to the centrifuge and then, into the brine dryer, in which the next process of drying takes place. The total capacity of this step is 10 tons/hour, with 15%-20% TDS at the inlet.

About 19 MM BTUs/hr of steam will be used to heat the crystallizer and about 1 ton/hour of salts 80-90% TDS will be removed.

Salts crystallization process diagram

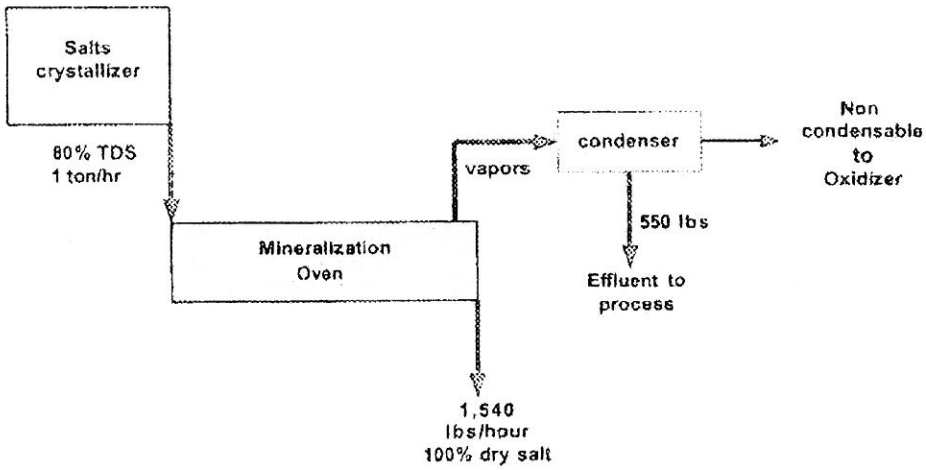


Note: The projected flow rates, above, are approximate values

Step 8 –Salt Drying

The salts, that are still hazardous pursuant to the "derived from" rule, are now in the form of liquid crystals. After crystallization at a temperature of 100 °C (212 °F), they flow to the drying salts oven, which is electrically heated and operates at max 240 °C (464 °F). The salts achieve 100% dry matter and the residual organic content of the salts is removed. The salts will be appropriately disposed as hazardous waste, or they can subsequently be delisted. The VOCs, in gaseous form, are oxidized in the thermal oxidizer, and then scrubber.

Schematic Salts Oven Drying Process Diagram



Note: The projected flow rates, above, are approximate values

Wastewater Discharge

The process has Zero Liquid Discharge

Air Emissions

The facility will be a minor air pollution emission source under the Clean Air Act and state regulations. The entire facility will utilize best available technology for air emissions control through the use of a thermal oxidizer as the main control device. When the process is not operating, emissions will be vented through activated carbon adsorption, as a backup.

The design will have the following:

1. **Tanks and Reactors**

   All tanks will be connected to a main blower that is directly vented to the thermal oxidizer unit, which will operate 24/7 to ensure compliance with Air Pollution requirements.

2. **Exhaust Air Treatment**

   The exhaust gases from the thermal oxidizer are vented as follows:

   - Rapid quenching of the air to cool from about 200 °C to 60 °C (392 °F to 140 °F)
   - Scrubber with caustic soda to eliminate all traces of acids such as HCl.

EXHIBIT A-2

LETTER FROM USS REAL ESTATE REGARDING PROPERTY DEVELOPMENT

USS Real Estate
One Ben Fairless Drive
Fairless Hills, PA 19030
215-736-4063 (direct)
215-736-4061 (reception)
FAX: 215-736-3940

D. I. Buschmann
Utility Services Manager

Exhibit A-2

September 17,2012

Elcon Recycling
C/0 Angstroms LLC
Rengarajan Ramesh
11 LeParc Drive
Princeton Junction, NJ 08550

To Whom It May Concern:

RE: Proposed property development; Falls Township, PA, 100 Dean Sievers Place

Dear Sir or Madam:

We are in receipt of your request regarding water and sewerage services to the proposed development location. Businesses surrounding this lot are now being served (water and sewerage) by the USS Real Estate Utilities. USS fully expects that this lot, Lot 1, Phase 3, will be provided water services by USS as part of your development planning.

The USS Real Estate water supply and sanitary wastewater treatment operations are currently providing services to the businesses in the immediate area. The sewage treatment plant and conveyances operate well below the permitted capacity of 1,000,000 gallons per day.

The actual treatment flows are well below this design capacity and the anticipated near term growth is not expected to exceed the current design capacity within the next 5 years.

In addition, our Potable Water Filtration and Distribution facilities are operating with significant reserve capacity. The

proposed facilities at 100 Dean Sievers Place are expected to present water requirements (less than 1,500 gallons per day) that are well within the capabilities of the existing infrastructure. USS Real Estate anticipates providing water and sewerage services to this property.

As an additional note, Industrial Wastewater collection plumbing is not installed in this area and USS does not intend expanding their Industrial Wastewater collection to this address.

I trust this information is adequate for your needs at this time.

If we can be of any further service in the approval process, please feel free to contact us.

Sincerely,

D. I. Buschmann

Attachments

cc: P. McNulty-Veolia Water Operations
D. Jones-USS Real Estate
S. Bilan-USS Real Estate

EXHIBIT A-3

STORAGE AND PROCESS TANKS

EXHIBIT A-3
STORAGE AND PROCESS TANKS

Tag No.		Service	Contents	Nominal Volume (gal)
STORAGE TANKS				
T-	12102	Storage tank unit 12	Waste water	26,500
T-	80122	Acids storage tank	Acids	26,500
T-	80124	Acids storage tank	Acids	13,100
T-	80126	Acids storage tank	Acids	13,100
T-	80128	Acids storage tank	Acids	13,100
T-	80130	Acids storage tank	Acids	13,100
T-	80134	Acids storage tank	Acids	13,100
T-	80140	acids storage tank	Acids	13,100
T-	80143	Acids storage tank	Acids	26,500
T-	12101	Storage tank unit 12	Waste water	26,500
T-	80160	Caustic soda storage tank (fresh caustic, not waste)	Caustic soda	11,200
T-	80162	Caustic soda storage tank (waste)	Caustic soda	11,200
T-	20357	Rich distillate tank	Organic waste to 80% VOC	13,200
T-	23100	Unit 23 feed tank	Organic waste water to 30% VOC	13,200
T-	23101	Unit 23 feed tank	Organic waste water to 30% VOC	13,200
T-	23341	C-23344 feed tank	Organic waste water to 30% VOC	13,200
T-	20120A	Storage tank unit 20	Waste water	136,000
T-	20120B	Storage tank unit 20	Waste water	136,000
T-	20121A	Storage tank unit 20	Waste water	136,000
T-	20121B	Storage tank unit 20	Waste water	136,000
T-	20122A	Storage tank unit 20	Waste water	136,000
T-	20122B	Storage tank unit 20	Waste water	136,000
T-	21100A	Storage tanks	Waste water	136,000
T-	21100B	Storage tanks	Waste water	136,000
T-	21101A	Storage tanks	Waste water	136,000
T-	21101B	Storage tanks	Waste water	136,000
T-	Future	Storage tanks	Waste water	136,000
PROCESS TANKS				
T-	12231	Water Tank	Clean water	3,000
T-	20224	Overflow Tank from Settler Unit 20	Waste water	500
T-	20262	Antifoam tank	Antifoam	500
T-	20401	FED Feed	Waste water	25,000
T-	20411	FED Flash Tank	Waste water	5,000
T-	20402	Crystilizer Feed Tank	Brine	32,000
T-	20501	Crystilizer	Brine	5,000
T-	20528	Crystilizer Condensate Tank	Effluent water	1,500
T-	20525	Centrifuge Effluent	Concentrated Brine	500
T-	20613	Scrubber tank	Sludge and water	3,000
T-	20623	Sludge silo - product	Dry sludge	20,000
T	20633	Scrubber tank	Sludge and water solution	500
T-	80150	Lime Silo (not waste)	Lime	18,500
T-	80170	Urea storage tank (not waste)	Urea 25%	13,000
T-	80190	Acid daily tank	Acids	500
T-	80191	Caustic daily tank	Caustic soda	500
T-	90120	Treating water collection tank	Effluent water	4,000
T-	90204	Biologic tratment feed tank	Effluent water	26,500
T-	90206	Biologic tratment feed tank	Effluent water	18,500
T-	90222A	Overflow	Effluent water	500
T-	90222B	Overflow	Effluent water	500
T-	90226	Overflow	Effluent water	1,500
T-	90235	Clean water tank	Effluent water	110,000
T-	90241	Clean water tank	Effluent water	110,000
T-	90260	Clean water tank	Effluent water	40,000
T-	90402	Overflow	Effluent water	750
T-	90405	MVR feed tank	Effluent water	26,400
T-	90411	MVR flash tank	Effluent water	5,000
T-	12270	Process Water Tank	Process water	11,000
T-	20221	Clarifier Tank	Wastewater	7,000
T-	20392	Injection Tank	Waste liquid solvent	500

PLAN APPROVAL APPLICATION FORM
PROCESSES

2700-PM-AQ0007 Rev. 7/2004

Submit in Triplicate

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

PROCESSES

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application must be submitted with the General Information Form (GIF).

Before completing this form, read the instructions provided for the form.

Section A - Facility Name, Checklist And Certification

Organization Name or Registered Fictitious Name/Facility Name: **Elcon Recycling Services, LLC**

DEP Client ID# (if known): **311804**

Type of Review required and Fees:

- ☐ Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD:..... $____
- ☒ Source requiring approval under NSPS or NESHAPS or both: **$3,400**
- ☐ Source requiring approval under NSR regulations:..... ..... $____
- ☐ Source requiring the establishment of a MACT limitation:..... ..... $____
- ☐ Source requiring approval under PSD: .... $____

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

- ☒ **General Information Form (GIF)**
- ☒ **Processes Plan Approval Application**
- ☒ **Compliance Review Form** or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: _____
- ☒ **Copy and Proof of County and Municipal Notifications**
- ☒ **Permit Fees**
- ☐ **Addendum A:** Source Applicable Requirements (only applicable to existing Title V facility) **NA**

Certification of Truth, Accuracy and Completeness by a Responsible Official

I, **Dr. Zvi Elgat**, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature): _____ Date: 9/26/2018

Name (Print): **Dr. Zvi Elgat** Title: **CEO**

OFFICIAL USE ONLY

Application No. ____ Unit ID ____ Site ID ____

DEP Client ID #: ____ APS. ID ____ AUTH. ID ____

Date Received ____ Date Assigned ____ Reviewed By ____

Date of 1st Technical Deficiency ____ Date of 2nd Technical Deficiency ____

Comments: ____

NOTE: Elcon Recycling Services, LLC is certifying this Document and Attachments as Operator of the site. Elcon intends to purchase the property prior to issuance of the permit.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

101 - Storage Tanks and Pumping Systems. See Attachment 1 (Table 1-1) for equipment that is part of this Source ID.

Manufacturer	Model No.	Number of Sources
Various, mostly Elcon design, custom build	**NA**	**28**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 101	**≈ 200 gpm**	**≈ 200 gpm**

Type of Material Processed
Industrial wastewater, acid and alkaline, and flammable liquids tanks

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**365**	**8,760**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner **NA**

Manufacturer	Type and Model No.	Number of Burners

Description:

Rated Capacity	Maximum Capacity

4. Process Storage Vessels

A. For Liquids:

Name of material stored
Industrial wastewater, acid, caustic, flammable liquids (hazardous and residual liquid waste)

Tank I.D. No.	Manufacturer	Date Installed
See Attachment 1	**Various**	**Upon Approval**

Maximum Pressure	Capacity (gallons/Meter^3)
Ambient	**Various – see Table 1-1 in Attachment 1**

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)
NA – closed vent system

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)
NA	**Various**

Type of Roof: Describe:
Fixed Roof

Total Throughput Per Year	Number of fills per day (fill/day): **10-25 tank truckloads per day. Average 20** Filling Rate (gal./min.): **≈ 170** Duration of fill hr./fill): **≈ 0.67**
194,558 tpy	

B. For Solids **NA**

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored

Silo/Storage Bin I.D. No.	Manufacturer	Date Installed

State whether the material will be stored in loose or bags in silos	Capacity (Tons)
Turn over per year in tons	Turn over per day in tons

Describe fugitive dust control system for loading and handling operations

Describe material handling system

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
102 – Pretreatment. See Attachment 1 (Table 1-2) for equipment that is part of this Source ID.

Manufacturer	Model No.	Number of Sources
Various, most Elcon design, custom build	**NA**	**10**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 102	**≈ 33.1 ton/hr**	**≈ 33.1 ton/hr**

Type of Material Processed
Industrial Wastewater

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner NA

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels - NA

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
103 - Sludge Treatment. See Attachment 1 (Table 1-2) for equipment that is part of this Source ID.

Manufacturer	Model No.	Number of Sources
Gas Dryer – Freeco **Filter Presses – US Filter** **Electric Dryer - Electrotherm**	**NA**	**10**
Source Designation **Source ID 103**	Maximum Capacity **≈ 1.1 ton/hr (Dry Sludge)**	Rated Capacity **≈ 1.1 ton/hr (Dry Sludge)**

Type of Material Processed
Sludge

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	**≈ 2,500** SCFH	**21** X 10^6 SCF	**Negl** grain/100 SCF	**Negl**	**≈ 1,000** Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner

Manufacturer	Type and Model No.	Number of Burners
Maxon or similar		**1**

Description:
Direct-fired natural gas burner on Oven 1 (Oven 2 is electric.)

Rated Capacity	Maximum Capacity
2.5 MMBtu/hr	**2.5 MMBtu/hr**

4. Process Storage Vessels NA

A. For Liquids:

Name of material stored

Tank I.D. No.	Manufacturer	Date Installed

Maximum Pressure	Capacity (gallons/Meter^3)

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)

Type of Roof: Describe:

Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):

B. For Solids NA

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe **See Source ID 109 for silo**	Name of Material Stored

Silo/Storage Bin I.D. No.	Manufacturer	Date Installed

State whether the material will be stored in loose or bags in silos	Capacity (Tons)

Turn over per year in tons	Turn over per day in tons

Describe fugitive dust control system for loading and handling operations

Describe material handling system

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
104 - Flash Evaporation Distillation. See Attachment 1 (Table 1-2) for equipment that is part of this Source ID.

Manufacturer	Model No.	Number of Sources
FED – Elcon design, custom build	NA	**4**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 104	**≈ 33.1 ton/hr**	**≈ 33.1 ton/hr**

Type of Material Processed
Industrial Wastewater

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner **NA**

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels **NA**

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids **NA**

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
105 - Biological Treatment. See Attachment 1 (Table 1-2) for equipment that is part of this Source ID.

Manufacturer	Model No.	Number of Sources
Various	**Various**	**20**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 105	**≈ 11 tons/hr**	**≈ 11 tons/hr**

Type of Material Processed
Industrial Wastewater

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner **NA**

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels **NA**

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids **NA**

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
106 – Distillation. See Attachment 1 (Table 1-2) for equipment that is part of this Source ID.

Manufacturer	Model No.	Number of Sources
Column – Koch Gliltch design, custom build	**NA**	**2**
Source Designation **Source ID 106**	Maximum Capacity **≈ 3,150 lb/hr**	Rated Capacity **≈ 3,150 lb/hr**

Type of Material Processed
Industrial Wastewater

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner **NA**

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels **NA**

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids **NA**

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

107 – Salt Concentration and Crystallization. See Attachment 1 (Table 1-2) for equipment that is part of this Source ID.

Manufacturer	Model No.	Number of Sources
Crystalizer, Elcon design, custom build Thin Film Evaporator - Canzler	**NA**	**12**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 107	**≈ 1.4 ton/hr (salt output)**	**≈ 1.4 ton/hr (salt output)**

Type of Material Processed
Industrial wastewater concentrated with salts

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner NA

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels NA – Distilled water only

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids NA

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed **Upon approval**
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system **Enclosed conveying system**		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
108 – Lime Silo

Manufacturer	Model No.	Number of Sources
Portasilo, or similar	**NA Custom**	**1**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 108	**≈ 1.225 ton/hr**	**≈ 1.225 ton/hr**

Type of Material Processed
Lime

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner NA

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels NA

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids

Type: ☒ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored **Lime**	
Silo/Storage Bin I.D. No. **Lime Silo**	Manufacturer	Date Installed **Upon approval**
State whether the material will be stored in loose or bags in silos **Silo**	Capacity (Tons) **50**	
Turn over per year in tons **≈ 148**	Turn over per day in tons **<1**	
Describe fugitive dust control system for loading and handling operations **Bin vent filter controls loading/unloading**		
Describe material handling system **Enclosed conveying system**		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
109 - Sludge Silo

Manufacturer	Model No.	Number of Sources
Portosilo, or similar	**NA**	**1**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 109	**≈ 1.1 ton/hr**	**≈ 1.1 ton/hr**

Type of Material Processed
Dried sludge

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner NA

Manufacturer	Type and Model No.	Number of Burners

Description:

Rated Capacity	Maximum Capacity

4. Process Storage Vessels NA

A. For Liquids:

Name of material stored

Tank I.D. No.	Manufacturer	Date Installed

Maximum Pressure	Capacity (gallons/Meter^3)

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)

Type of Roof: Describe:

Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):

B. For Solids

Type: ☒ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored **Dried Sludge**

Silo/Storage Bin I.D. No. **Sludge Silo**	Manufacturer	Date Installed **Upon approval**

State whether the material will be stored in loose or bags in silos **Silo**	Capacity (Tons) **100**
Turn over per year in tons **≈ 33 (3,300 tons/yr-annual throughput)**	Turn over per day in tons **< 1**

Describe fugitive dust control system for loading and handling operations
Bin vent filter controls loading/unloading

Describe material handling system
Enclosed conveying system

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
110 – Cooling Tower

Manufacturer	Model No.	Number of Sources
Marley SPX or similar	**NA**	**3**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 110	**30 MMBtu/hr (total)**	**30 MMBtu/hr (total)**

Type of Material Processed
Water

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,400**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)
NA

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner **NA**

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels **NA**

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids **NA**

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
111 – Equipment Leaks

Manufacturer	Model No.	Number of Sources
Pumps – Durco, Goulds, Sandpiper, or similar	**Various**	**~1,600 (in VOC service)**
Source Designation **Source ID 111**	Maximum Capacity **Various**	Rated Capacity **Various**

Type of Material Processed
Industrial Wastewater/organics

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**350**	**8,760**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)
NA

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	**NA**	**NA**	**NA**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner **NA**

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels **NA**

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids **NA**

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
112 – Emergency Generator

Manufacturer	Model No.	Number of Sources
Caterpillar , Inc., or similar	**G3512, or similar**	**1**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 112	**1,000 KW**	**1,000 KW**

Type of Material Processed
Natural Gas

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
Variable	**Variable**	**Variable**	**As needed**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
9,300 scfh	**NA**	**NA**	**2.8 MMscf**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	**9,300** SCFH	**2.8** X 10^6 SCF	**Negligible** grain/100 SCF	**Negligible**	**~ 1,000** Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner

Manufacturer	Type and Model No.	Number of Burners
As Above		

Description:

Rated Capacity	Maximum Capacity
9,300 scf/hr	**9,300 scf/hr**

4. Process Storage Vessels NA

A. For Liquids:

Name of material stored

Tank I.D. No.	Manufacturer	Date Installed

Maximum Pressure	Capacity (gallons/Meter^3)

Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)

Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)

Type of Roof: Describe:

Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):

B. For Solids NA

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored

Silo/Storage Bin I.D. No.	Manufacturer	Date Installed

State whether the material will be stored in loose or bags in silos	Capacity (Tons)

Turn over per year in tons	Turn over per day in tons

Describe fugitive dust control system for loading and handling operations

Describe material handling system

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.
113 – Fire Pumps (two)

Manufacturer	Model No.	Number of Sources
Cummins Inc., or similar	**CFP9E-F50, or similar**	**2**
Source Designation	Maximum Capacity	Rated Capacity
Source ID 113	**300 HP (each)**	**300 HP (each)**

Type of Material Processed
Diesel

Maximum Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
Variable	**Variable**	**Variable**	**As needed**

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
15.3 gph (each)	**NA**	**NA**	**4,600 gal/yr (each)**

Operating Schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
NA	**NA**	**NA**	**NA**

Seasonal variations (Months) From to

If variations exist, describe them

NA

2. Fuel NA

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number **Diesel**	**15.3 (each)** GPH @ 60°F	**4.6 (each)** X 10^3 Gal	**0.0015**% by wt	**Negl.**	**137,000** Btu/Gal. & **6.94** Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner **As above**

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels **NA**

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids **NA**

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information (Continued)

6. Miscellaneous Information

Attach flow diagram of process giving all (gaseous, liquid and solid) flow rates. Also, list all raw materials charged to process equipment, and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, collection hoods, or other pickup points, etc.). Describe collection hoods location, design, airflow and capture efficiency. Describe any restriction requested and how it will be monitored.
See Attachments 1 and 2 for detailed process description and process flow diagrams.

Describe fully the facilities provided to monitor and to record process operating conditions, which may affect the emission of air contaminants. Show that they are reasonable and adequate.
Key operational parameters such as throughput, air flow rates, temperatures, and pH, will be monitored in a central control room. Hours of operation will be monitored for the generator and fire pumps. See Attachment 6 for additional details on the proposed monitoring approach.

Describe each proposed modification to an existing source.
NA – New facility.

Identify and describe all fugitive emission points, all relief and emergency valves and any by-pass stacks.

All vessels will be closed and process emissions from the tanks, dryers, flash evaporation distillation, etc. will be vented from the vessels directly through pipes to the thermal oxidizers, so there are minimal fugitive emissions. Equipment leaks (flanges, valves, etc.) will be minimized through a Leak Detection and Repair (LDAR) program as stipulated under 40 CFR Part 264 Subpart BB.

Each thermal oxidizer will be equipped with a pressure relief valve, which will be vented to the atmosphere. However, there will be alarms and interlocks to shut down the system before the pressure gets high enough to open the pressure relief valve.

If one of the interlocks shuts down the system, the flash evaporation distillation and distillation process (that account for most of the emissions) and the thermal oxidizer will shut down. Emissions from the tanks and any other processes still emitting minor concentrations of VOCs will be vented through a carbon filter until the thermal oxidizer is operational.

During shutdown periods, breathing losses from the tanks and other process vessels which may contain liquids will be vented to a carbon adsorption system.

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

Processes will not begin operations until the air pollution control systems are operating. There are interlocks in place that shut down the equipment or divert the exhaust of vessels containing organic liquids to the carbon adsorption unit should a failure occur with the air pollution control system.

Emergency generator and fire pumps will be operated during the startup and shutdown in accordance with the manufacturer's specifications and good operating practices. The facility will minimize engine time spent at idle and during startup. The generator and fire pumps will operate periodically for testing and maintenance purposes.

Anticipated Milestones:

i. Expected commencement date of construction/reconstruction/installation: **Upon Approval**
ii. Expected completion date of construction/reconstruction/installation: **Upon Approval**
iii. Anticipated date of start-up: **Upon Approval**

Section C - Air Cleaning Device

1. Precontrol Emissions*

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM					
PM_{10}					
SO_x					
CO					
NO_x					
VOC					
Others: (e.g., HAPs)	-----	-----	-----	-----	-----
See Attachment 3 for emissions calculations.					

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Gas Cooling

Water quenching ☐ Yes ☐ No Water injection rate _____ GPM

Radiation and convection cooling ☐ Yes ☐ No

Air dilution ☐ Yes ☐ No
If yes, _____CFM

Forced Draft ☐ Yes ☐ No

Water cooled duct work ☐ Yes ☐ No

Other **Waste heat recovery boilers follow thermal oxidizers. Numbers below are for waste heat boilers for each thermal oxidizer.**

Inlet Volume **124,400** ACFM
@ **1,742** °F **~40** % Moisture

Outlet Volume **~43,100** ACFM
@ **302** °F **~40** % Moisture

Describe the system in detail.

Waste heat boilers will be used to recover heat from the air stream following the thermal oxidizers. The waste heat boilers will generate approximately 39,600 pounds (18 metric tons) of stream per hour for each oxidizer for process usage.

Section C - Air Cleaning Device (Continued)

3. Settling Chambers - NA

Manufacturer	Volume of gas handled _____ACFM @ _____°F	Gas velocity (ft/sec.)

Length of chamber (ft.)	Width of chamber (ft.)	Height of chamber (ft.)	Number of trays

Water injection ☐ Yes ☐ No	Water injection rate (GPM)

Emissions Data

Inlet	Outlet	Removal Efficiency (%)

4. Inertial and Cyclone Collectors C10 – Cyclone on Oven No. 1

Manufacturer **Integral to dryer (Freeco or similar)**	Type **Cyclone**	Model No. **NA**
Pressure drop (in. of water) **0.5-8 (to be verified at startup)**	Inlet volume **≈ 3,800** ACFM @ **302** °F	Outlet volume **≈ 3,800** ACFM @ **302** °F

Number of individual cyclone(s) **1**	Outlet straightening vanes used? ☐ Yes ☒ No

Length of Cyclone(s) Cylinder (ft.) **~ 6.72 ft**	Diameter of Cyclone(s) Cylinder (ft.) **~ 2.95 ft (top)**	Length of Cyclone(s) cone (ft.) **~ 5.9 ft**

Inlet Diameter (ft.) or duct area (ft.^{2}) of cyclone(s) **≈ 1.95 ft**	Outlet Diameter (ft.) or duct area (ft.^{2}) of cyclone(s) **≈ 1.77 in**

If a multi-clone or multi-tube unit is installed, will any of the individual cyclones or cyclone tubes be blanked or blocked off?
NA

Describe any exhaust gas recirculation loop to be employed.
NA

Attach particle size efficiency curve

Emissions Data

Inlet	Outlet	Removal Efficiency (%)
~ 90 lb/hr	**~ 45 lb/hr**	**~ 50%**

Section C - Air Cleaning Device (Continued)

3. Settling Chambers - NA

Manufacturer	Volume of gas handled _____ACFM @ _____°F	Gas velocity (ft/sec.)

Length of chamber (ft.)	Width of chamber (ft.)	Height of chamber (ft.)	Number of trays

Water injection ☐ Yes ☐ No	Water injection rate (GPM)

Emissions Data

Inlet	Outlet	Removal Efficiency (%)

4. Inertial and Cyclone Collectors C11 – Cyclone on Dryer No. 2

Manufacturer	Type	Model No.
Integral to Dryer (Electrotherm or similar)	**Cyclone**	**NA**
Pressure drop (in. of water) **0.5-8 (to be verified at startup)**	Inlet volume **≈ 389** ACFM @ **1,022** °F	Outlet volume **≈ 389** ACFM @ **1,022** °F

Number of individual cyclone(s)	Outlet straightening vanes used?
1	☐ Yes ☒ No

Length of Cyclone(s) Cylinder (ft.)	Diameter of Cyclone(s) Cylinder (ft.)	Length of Cyclone(s) cone (ft.)
~ 2 ft	**~ 1 ft**	**~ 3 ft**

Inlet Diameter (ft.) or duct area (ft.^{2}) of cyclone(s)	Outlet Diameter (ft.) or duct area (ft.^{2}) of cyclone(s)
≈ 0.25 ft	**≈ 0.33 in**

If a multi-clone or multi-tube unit is installed, will any of the individual cyclones or cyclone tubes be blanked or blocked off?
NA

Describe any exhaust gas recirculation loop to be employed.
NA

Attach particle size efficiency curve

Emissions Data

Inlet	Outlet	Removal Efficiency (%)
~ 90 lb/hr	**~ 45 lb/hr**	**~ 50%**

Section C - Air Cleaning Device (Continued)

5. Fabric Collector

Equipment Specifications – C05 – Lime silo bin vent

Manufacturer	Model No.	
WAM, or similar	**Silotop 24.5, or similar**	☒ Pressurized Design ☐ Suction Design

Number of Compartments	Number of Filters Per Compartment	Is Baghouse Insulated?
1	**8**	☐ Yes ☒ No

Can each compartment be isolated for repairs and/or filter replacement? ☐ Yes ☒ No

Are temperature controls provided? (Describe in detail) ☐ Yes ☒ No

Dew point at maximum moisture **Ambient conditions** °F | Design inlet volume **≈ 265** SCFM

Type of Fabric

Material **Polyester** ☐ Felted ☐ Membrane

Weight _____ oz/sq.yd ☐ Woven ☐ Others: List: _____

Thickness _____ in ☐ Felted-Woven

Fabric permeability (clean) @ ½" water-Δ P _____ CFM/sq.ft.

Filter dimensions Length **55 in.** Diameter/Width **31.5 in.**

Effective area per filter **260 ft²** | Maximum operating temperature (°F) **176**

Effective air to cloth ratio Minimum _____ Maximum **1.4**

Drawing of Fabric Filter **NA – bin vent**

A sketch of the fabric filter showing all access doors, catwalks, ladders and exhaust ductwork, location of each pressure and temperature indicator should be attached.

Operation and Cleaning

Volume of gases handled **≈ 265** ACFM @ **Ambient** °F

Pressure drop across collector (in. of water). **0.5-6 (to be verified at startup)**
Describe the equipment to be used to monitor the pressure drop. **Magnehelic**

Type of filter cleaning

☐ Manual Cleaning ☐ Bag Collapse ☒ Reverse Air Jets
☐ Mechanical Shakers ☐ Sonic Cleaning ☐ Other: _____
☐ Pneumatic Shakers ☐ Reverse Air Flow

Describe the equipment provided if dry oil free air is required for collector operation **NA**

Cleaning Initiated By

☒ Timer Frequency if timer actuated **during loading and 15 minutes after loading**

☐ Expected pressure drop range _____ in. of water ☐ Other Specify _____

Does air cleaning device employ hopper heaters, hopper vibrators or hopper level detectors? If yes, describe.

NA – material drops into silo

Describe the warning/alarm system that protects against operation when the unit is not meeting design requirements.

Pressure drop readings

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
Particulate Matter	**~ 1 gr/dscf**	**< 0.01 gr/dscf**	**≈ 99.5%**

Section C - Air Cleaning Device (Continued)

5. Fabric Collector

Equipment Specifications – C07 – Sludge processing area fabric filter

Manufacturer	Model No.	
WAM, or similar	**Silo top 24.5, or similar**	☒ Pressurized Design ☐ Suction Design

Number of Compartments	Number of Filters Per Compartment	Is Baghouse Insulated?
1	**8**	☐ Yes ☒ No

Can each compartment be isolated for repairs and/or filter replacement? ☐ Yes ☒ No

Are temperature controls provided? (Describe in detail) ☐ Yes ☒ No

Dew point at maximum moisture **Ambient** °F | Design inlet volume **≈647** SCFM

Type of Fabric

Material **Polyester (coated)** ☐ Felted ☒ Membrane

Weight _____ oz/sq.yd ☐ Woven ☐ Others: List: _____

Thickness _____ in ☐ Felted-Woven

Fabric permeability (clean) @ ½" water-Δ P _____ CFM/sq.ft.

Filter dimensions Length **55 in.** Diameter/Width **≈ 31.5**

Effective area per filter **260 ft²** | Maximum operating temperature (°F) **176**

Effective air to cloth ratio Minimum _____ Maximum **2.5**

Drawing of Fabric Filter

A sketch of the fabric filter showing all access doors, catwalks, ladders and exhaust ductwork, location of each pressure and temperature indicator should be attached.

Operation and Cleaning

Volume of gases handled **≈ 647** ACFM @ **ambient** °F

Pressure drop across collector (in. of water). **0.5-6 (to be verified at startup)**
Describe the equipment to be used to monitor the pressure drop. **Magnehelic**

Type of filter cleaning

☐ Manual Cleaning ☐ Bag Collapse ☒ Reverse Air Jets
☐ Mechanical Shakers ☐ Sonic Cleaning ☐ Other: _____
☐ Pneumatic Shakers ☐ Reverse Air Flow

Describe the equipment provided if dry oil free air is required for collector operation

Cleaning Initiated By

☒ Timer Frequency if timer actuated **≈ every 15 min, to be verified at startup**

☐ Expected pressure drop range _____ in. of water ☐ Other Specify _____

Does air cleaning device employ hopper heaters, hopper vibrators or hopper level detectors? If yes, describe.

NA

Describe the warning/alarm system that protects against operation when the unit is not meeting design requirements.

Pressure drop readings

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
Particulate Matter	**~ 1 gr/dscf**	**< 0.01 gr/dscf**	**≈ 99.5%**

Section C - Air Cleaning Device (Continued)

5. Fabric Collector

Equipment Specifications – C09 Sludge silo bin vent

Manufacturer	Model No.	
Mix, or similar	**SFL0902FP, or similar**	☒ Pressurized Design ☐ Suction Design

Number of Compartments	Number of Filters Per Compartment	Is Baghouse Insulated?
1	**16**	☐ Yes ☒ No

Can each compartment be isolated for repairs and/or filter replacement? ☐ Yes ☒ No

Are temperature controls provided? (Describe in detail) ☐ Yes ☒ No

Dew point at maximum moisture **Ambient** °F | Design inlet volume **294** SCFM

Type of Fabric

Material **Nomex** ☐ Felted ☐ Membrane

Weight _____ oz/sq.yd ☐ Woven ☐ Others: List: _____

Thickness _____ in ☐ Felted-Woven

Fabric permeability (clean) @ ½" water-Δ P _____ CFM/sq.ft.

Filter dimensions Length **82 in.** Diameter/Width **32 in.**

Effective area per filter **622 ft²** | Maximum operating temperature (°F) **392**

Effective air to cloth ratio Minimum **0.4** Maximum **0.5**

Drawing of Fabric Filter **NA bin vent**

A sketch of the fabric filter showing all access doors, catwalks, ladders and exhaust ductwork, location of each pressure and temperature indicator should be attached.

Operation and Cleaning

Volume of gases handled **≈ 294** ACFM @ **ambient** °F

Pressure drop across collector (in. of water). **0.5-6 (to be verified at startup)**
Describe the equipment to be used to monitor the pressure drop. **Magnehelic**

Type of filter cleaning

☐ Manual Cleaning ☐ Bag Collapse ☒ Reverse Air Jets

☐ Mechanical Shakers ☐ Sonic Cleaning ☐ Other: _____

☐ Pneumatic Shakers ☐ Reverse Air Flow

Describe the equipment provided if dry oil free air is required for collector operation **NA**

Cleaning Initiated By

☒ Timer Frequency if timer actuated **during loading and 15 minutes after loading**

☐ Expected pressure drop range _____ in. of water ☐ Other Specify _____

Does air cleaning device employ hopper heaters, hopper vibrators or hopper level detectors? If yes, describe.

NA – material drops into silo

Describe the warning/alarm system that protects against operation when the unit is not meeting design requirements.

Pressure drop readings

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
Particulate matter	**~ 1 gr/dscf**	**< 0.01 gr/dscf**	**≈ 99.5%**

Section C - Air Cleaning Device (Continued)

6. Wet Collection Equipment

Equipment Specifications – C06 – Sludge Area Venturi Scrubber

Manufacturer	Type	Model No.
Sly, Inc.	**Venturi**	**NA**

Design Inlet Volume (SCFM)	Relative Particulate/Gas Velocity (ejector scrubbers only)
2,775	**NA**

Describe the internal features (e.g., variable throat, gas/liquid diffusion plates, spray nozzles, liquid redistributors, bed limiters, etc.).
Adjustable Venturi throat

Describe pH monitoring and pH adjustment systems, if applicable.
pH will be monitored and adjusted, as needed, to maintain pH in range of 6 to 8.

Describe mist eliminator or separator (type, configuration, backflush capability, frequency).
Cyclonic separation

Attach particulate size efficiency curve.
NA

Operating Parameters

Inlet volume of gases handled **≈ 4,190** (ACFM) @ **338** °F	Outlet volume of gases handled **≈ 3,480** (ACFM) @ **164** °F **Sat** % Moisture

Liquid flow rates. Describe equipment provided to measure liquid flow rates to scrubber (e.g., quenching section, recirculating solution, makeup water, bleed flow, etc.)

Approximately 35 gpm flow rate. Water flow will be monitored.

Describe scrubber liquid supply system (amount of make-up and recirculating liquid, capacity of recirculating liquid system, etc.)

Water will be supplied, as needed. Amount to be determined at start-up; anticipate 5 to 10%.

State pressure drop range (in water) across scrubber (e.g., venturi throat, packed bed, etc.) only. Describe the equipment provide to measure the pressure drop. Do not include duct or de-mister losses.

Anticipate 12-30 in H_2O, to be verified at startup. Pressure drop is adjustable.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements. **Water flow rate, pH, and pressure drop will be monitored continuously.**

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
Particulate Matter	**≈ 90 lb/hr**	**≈ 4.50 lb/hr**	**≈ 95%**
Acid gases*	**Nominal**	**Nominal**	**Slight**

*** Anticipate some removal of acid gases with this scrubber. Primary acid gas control system will be control device C02A & C02B.**

Section C - Air Cleaning Device (Continued)

8. Adsorption Equipment

Equipment Specifications – C04 – Carbon unit back-up unit

Manufacturer	Type	Model No.
TetraSolv, or Similar	**Activated carbon**	**20YDRB 2943 cfm**

Design Inlet Volume (SCFM)	Adsorbent charge per adsorber vessel and number of adsorber vessels
~ 7,500	**1 charge per vessel / 1 vessel**

Length of Mass Transfer Zone (MTZ), supplied by the manufacturer based upon laboratory data.
To be provided

Adsorber diameter (ft.) and area ft^2.)	Adsorption bed depth (ft.) **~ 9 ft**
≈ 8' x 20'; 160 ft^2	

Adsorbent information

Adsorbent type and physical properties. **Activated Carbon, adsorb VB1 and Ecosorb GXB, or similar**

Working capacity of adsorbent (%)	Heel percent or unrecoverable solvent weight % in the adsorbent after regeneration. **N/A**
720 ft^3	

Operating Parameters

Inlet volume of gases handled **~ 7,500** (ACFM) @ **ambient** °F

Adsorption time per adsorption bed	Breakthrough capacity:
NA	Lbs. of solvent / 100 lbs. of adsorbent = **≈ 20 - 30**
Vapor pressure of solvents at the inlet temperature	Available steam in pounds to regenerate carbon adsorber (if applicable) **NA**
Various	

Percent relative saturation of each solvent at the inlet temperature

Various

Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

This system will be used when primary air pollution control system is down. The carbon in the unit will be replaced in accordance with the carbon supplier recommendations. There will be a temperature indicator in the carbon bed.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
VOC, including organic HAPs	**< 5 lb/hr**	**<0.05 lb/hr**	**99%**

Section C - Air Cleaning Device (Continued)

9. Absorption Equipment

Equipment Specifications – C02A and C02B – Quench scrubber

Manufacturer	Type	Model No.
Koch Glitch, or similar	**Packed Tower**	**Custom Design**

Design Inlet Volume (SCFM) **29,800 (each)**	Tower height (ft.) and inside diameter (ft.) **Height 30 ft, ~9.5 ft diameter**
Packing type and size (if applicable) **Snowflake of intalox (or similar)**	Height of packing (ft.) (if applicable) **11 ft**
Number of trays (if applicable) **NA**	Number of bubble caps (if applicable) **NA**

Configuration

☒ Counter-current ☐ Cross flow ☐ Cocurrent flow

Describe pH and/or other monitoring and controls.

pH monitoring, recording, alarm, and interlock. Automatic control of NaOH additions.

Absorbent information

Absorbent type and concentration. **NaOH solution**	Retention time (sec.) **1.25 second**

Attach equilibrium data for absorption (if applicable)

NA

Attach any additional information regarding auxiliary equipment, absorption solution supply system (once through or recirculating, system capacity, etc.) to thoroughly evaluate the control equipment. Indicate the flow rates for makeup, bleed and recirculation.

For each system, bleed will be low (<10 gal/min), make-up water to system will be approximately 20-30 gal/min. NaOH (20 - 40%) make-up to the system will be approximately 110 lb/hr. Caustic concentration will vary from 20 to 40%, based on season. The scrubbing liquid flow rate will be maintained between 375-500 gal/min and will be verified during start-up/de-bugging phase.

Operating Parameters

Volume of gas handled (ACFM)	Inlet temperature (°F)	Pressure drop (in. of water) and liquid flow rate. Describe the monitoring equipment.
≈ 43,100 (each)	**≈ 302**	**Anticipate 0.5-8 in H_2O**

State operating range for pH and/or absorbent concentration in scrubber liquid.

pH will be maintained between 7.0 – 8.5. An automatic system will be in place to feed NaOH to maintain appropriate pH.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Alarms and interlocks will be used for flow volume, pH, outlet gas temperature, pressure drop across the column and liquid levels in the column. The outlet gas temperature will be maintained at or below 140^{0}F.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
HCl	**≈ 200 lb/hr (both max)**	**≈ 2.0 lb/hr (both max)**	**99%**
Particulate matter	**≈ 4.5 lb/hr**	**<0.01 gr/dscf**	**~ 95%**

Section C - Air Cleaning Device (Continued)

10. ☐ **Selective Catalytic Reduction (SCR)**
☒ **Selective Non-Catalytic Reduction (SNCR)**
☐ **Non-Selective Catalytic Reduction (NSCR)**

Equipment Specifications - C03A and C03B NOx control system (two identical units)

Manufacturer	Type	Model No.
Dürr	**SNCR (2 systems)**	**Integral with oxidizer**

Design Inlet Volume (SCFM)	Design operating temperature (°F)
29,800 (each, includes cooling steam)	**≈ 1,742, including cooling steam**

Is the system equipped with process controls for proper mixing/control of the reducing agent in gas stream? If yes, give details.

A NO_x monitor will be installed to regulate reducing agent (urea) to system. NO_x controls will be used to maintain NO_x emissions at < 4.0 lb/hr. There may be ammonia in exhaust stream, so SNCR will be used as needed.

Attach efficiency and other pertinent information (e.g., ammonia slip)

Operating Parameters

Volume of gases handled **124,400 (each)** (ACFM) @ **1,742** °F

Operating temperature range for the SCR/SNCR/NSCR system (°F) From **1,700** °F To **1,800** °F

Reducing agent used, if any	Oxidation catalyst used, if any
Urea	**NA**

State expected range of usage rate and concentration.

Will vary depending on nitrogen content of feed to facility.

Service life of catalyst	Ammonia slip (ppm)
NA	**<10 ppm**

Describe fully with a sketch giving locations of equipment, controls systems, important parameters and method of operation.

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

A NO_x monitor will be in place to monitor outlet NO_x emissions.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
NO_x	**Variable***	**6.5 lb/hr.**	**Variable***

*** NOx control will be used, as needed. Loading is dependent upon wastewater stream processed.**

Section C - Air Cleaning Device (Continued)

11. Oxidizer/Afterburners – C01A and C01B – Thermal oxidizer (two identical units)

Equipment Specifications

Manufacturer	Type	Model No.
Dürr	☒ Thermal ☐ Catalytic	**Ecopure* VAR**

Design Inlet Volume (SCFM)	Combustion chamber dimensions (length, cross-sectional area, effective chamber volume, etc.)
15,000 (each)	**Diameter ≈ 10.66 ft; length ≈ 46 ft; Effective volume = ~ 4,060 ft^3 (each)**

Describe design features, which will ensure mixing in combustion chamber.

Air will be injected at angles into the combustion chamber creating turbulence. Minimum residence time will be 2.0 sec. Residence time depends on flow rate and temperature.

Describe method of preheating incoming gases (if applicable). **N/A**	Describe heat exchanger system used for heat recovery (if applicable). **Waste heat boilers**

Catalyst used	Life of catalyst	Expected temperature rise across catalyst (°F)	Dimensions of bed (in inches).
NA	**NA**	**NA**	Height: **NA** Diameter or Width: **NA** Depth: **NA**

Are temperature sensing devices being provided to measure the temperature rise across the catalyst? ☐ Yes ☒ No

If yes, describe. **NA**

Describe any temperature sensing and/or recording devices (including specific location of temperature probe in a drawing or sketch.

Temperature indicators, recorders, alarms, and interlocks on thermal oxidizer. Temperature monitored at outlet of stream generator and outlet of air preheater.

Burner Information

Burner Manufacturer	Model No.	Fuel Used
Dürr	**Custom**	**Natural gas**
Number and capacity of burners	Rated capacity (each)	Maximum capacity (each)
~70 MMBtu/hr (each oxidizer)	**~70 MMBtu/hr (each oxidizer)**	**~70 MMBtu/hr (each oxidizer)**

Describe the operation of the burner	Attach dimensioned diagram of afterburner
A pilot light burner will be used to bring the oxidizer up to temperature and as needed, maintain temperature.	

Operating Parameters

Inlet flow rate (ACFM) **18,800** @ **203** °F	Outlet flow rate (ACFM) **121,800** @ **~1,832** °F
State pressure drop range across catalytic bed (in. of water). **NA**	Describe the method adopted for regeneration or disposal of the used catalyst. **NA**

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Temperature, flow rate, pressure, and flame detector will be continuously monitored and recorded. Alarms and interlocks will be used when parameters are outside designated limits.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)
VOCs including organic HAPs	**4,400 Lb/hr (max - both)**	**4.4 Lb/hr (max - both)**	**99.9%**

Section C - Air Cleaning Device (Continued)

14. Costs

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost
Thermal oxidizers & SNCR	**$ 2.2 million**	**$ 2.5 million**	**$4.7 million**	**$2 million**
Scrubbers (packed tower)	**$ 1 million**	**$800,000**	**$ 1.8 million**	**$75,000**
Carbon adsorption	**$200,000**	**$100,000**	**$300,000**	**$5,000**
Lime silo bin vent	**$30,000**	**$30,000**	**$60,000**	**$1,000**
Sludge silo bin vent	**$45,000**	**$15,000**	**$60,000**	**$1,000**
Sludge area baghouse	**$15,000**	**$10,000**	**$25,000**	**$1,000**
Venturi Scrubber	**$200,000**	**$75,000**	**$275,000**	**$10,000**
Sludge Oven Cyclones	**$40,000**	**$25,000**	**$65,000**	**$2,000**
15. Miscellaneous				

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

Bin vents – materials will be dropped back into silos.

Sludge area baghouse – Dust will be removed and disposed in accordance with applicable requirements.

Spent carbon - will be removed by supplier

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

Not available – will be provided at purchase

Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase air contaminant emissions.

Equipment will be maintained in accordance with the manufacturers' recommendations.

Section D - Additional Information

Will the construction, modification, etc. of the sources covered by this application increase emissions from other sources at the facility? If so, describe and quantify.

NA – New facility

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards.

a. Prevention of Significant Deterioration permit (PSD), 40 CFR 52? ☐ YES ☒ NO

b. New Source Review (NSR), 25 Pa. Code Chapter 127, Subchapter E? ☐ YES ☒ NO

c. New Source Performance Standards (NSPS), 40 CFR Part 60? ☒ YES ☐ NO
(If Yes, which subpart) **Kb, IIII, JJJJ**

d. National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61? (If Yes, which subpart) **E** ☒ YES ☐ NO

e. Maximum Achievable Control Technology (MACT) 40 CFR Part 63? ☒ YES ☐ NO
(If Yes, which part) **ZZZZ**

Attach a demonstration showing that the emissions from any new sources will be the minimum attainable through the use of best available technology (BAT).

See Attachment 4

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last five (5) years for applicable PSD pollutant(s) if the facility is an existing major facility (PSD purposes).

See Attachment 3 for emission calculations. Facility is not major under PSD program. This is a new facility; actual emissions for the last 5 years are zero.

Section D - Additional Information (Continued)

Indicate emission increases and decreases in tons per year (tpy), for volatile organic compounds (VOCs) and nitrogen oxides (NOx) for NSR applicability since January 1, 1991 or other applicable dates (see other applicable dates in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from exempted source(s), etc.

Permit number (if applicable)	Date issued	Indicate ***Yes*** or ***No*** if emission increases and decreases were used previously for netting	Source I. D. or Name	VOCs		NOx	
				Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)	Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)
NA – New facility							

If the source is subject to 25 Pa. Code Chapter 127, Subchapter E, New Source Review requirements,

a. Identify Emission Reduction Credits (ERCs) for emission offsets or demonstrate ability to obtain suitable ERCs for emission offsets. **NA**

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable). **NA**

c. Provide an analysis of alternate sites, sizes, production processes and environmental control techniques demonstrating that the benefits of the proposed source outweigh the environmental and social costs (if applicable). **NA**

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III and applicable requirements of the Clean Air Act adopted thereunder The Department may request additional information to evaluate the application such as a standby plan, a plan for air pollution emergencies, air quality modeling, etc. **See Attachment 3 for emission calculations.**

Section E - Compliance Demonstration

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below **Also See Attachment 6**

☒ Monitoring ☒ Testing ☒ Reporting

☒ Recordkeeping ☒ Work Practice Standard

Monitoring:

a. Monitoring device type (Parameter, CEM, etc): **Pressure drop, flow rate (water and air), pH, temperature, NO_x, SO_2, CO, flow, O_2 and total organic carbon (CEMS), non-resettable hour meter on generator and fire pump engines**

b. Monitoring device location: **Pressure drop – across all devices**
Water flow and pH scrubbers
NO_x, SO_2, CO, O_2, total organic carbon, and flow – In stack
Hours of Operation, Fuel usage – generator and fire pump engines

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

All parameters are continuously monitored during operations.

Testing:

a. Reference Test Method: Citation **As per Department. Anticipate testing on main exhaust PM (Method 5), VOCs (Method 25A) NOx (Method 7E), and metals (Method 29), and HCl (Method 26/26A).**

b. Reference Test Method: Description **US EPA Reference Methods**

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:

All parameters above will be recorded continuously (at least one every 15 minutes). Records will be maintained for 5 years.

Reporting:

a. Describe what is to be reported and frequency of reporting:

Records will be provided to the Department upon request

b. Reporting start date: **As requested by Department**

Work Practice Standard:

Describe each: **Equipment will be operated in accordance with good air pollution controls. Emergency generator and fire pump engines will be operated and maintained according to the manufacturer's specifications.**

Section F - Flue and Air Contaminant Emission

1. Estimated Atmospheric Emissions*

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM				
PM_{10}				
SO_x				
CO				
NO_x				
VOC				
Others: (e.g., HAPs)	-----	-----	-----	-----

See Attachment 3 for emission calculations

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number **S01 – Main process exhaust stack**

List Source(s) or source ID exhausted to this stack:
Source IDs 101, 102, 103, 104, 105, 106, 107, and 109

% of flow exhausted to stack: **100%**

Stack height above grade (ft.) **≈ 98**
Grade elevation (ft.) **≈ 20 ft**

Stack diameter (ft) or Outlet duct area (sq. ft.)
≈ 5 ft

f. Weather Cap
☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
≈ 200 ft

Does stack height meet Good Engineering Practice (GEP)?
No

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume **≈49,400** ACFM Temperature **≈ 172** °F Moisture **≈ 40-45** % Saturated

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
Ports will be installed per EPA Reference Method 1

Exhauster (attach fan curves)_____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

2. **Stack and Exhauster**		
Stack Designation/Number **S04 - Carbon unit back-up stack**		
List Source(s) or source ID exhausted to this stack: **Source ID 101 102, 103, 104, 105, 106, and 107 (during shut down)**	% of flow exhausted to stack: **100%**	
Stack height above grade (ft.) **≈ 15 ft** Grade elevation (ft.) **≈ 20 ft**	Stack diameter (ft) or Outlet duct area (sq. ft.) **≈ 2 ft**	f. Weather Cap ☐ YES ☒ NO
Distance of discharge to nearest property line (ft.). Locate on topographic map. **≈ 500 ft**		
Does stack height meet Good Engineering Practice (GEP)? **No**		
If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.		

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume **7,500** ACFM Temperature **Ambient** °F Moisture **Ambient** %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
NA

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

2. **Stack and Exhauster**		
Stack Designation/Number **S05 – Lime silo bin vent exhaust**		
List Source(s) or source ID exhausted to this stack: **Source ID 108**	% of flow exhausted to stack: **100%**	
Stack height above grade (ft.) **≈ 35 ft** Grade elevation (ft.) **≈ 20 ft**	Stack diameter (ft) or Outlet duct area (sq. ft.) **≈ 0.1 ft²**	f. Weather Cap ☐ YES ☒ NO
Distance of discharge to nearest property line (ft.). Locate on topographic map. **≈ 200 ft**		
Does stack height meet Good Engineering Practice (GEP)? **No**		
If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.		

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume **265** ACFM Temperature **Ambient** °F Moisture **Ambient** %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
NA

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

2. **Stack and Exhauster**		
Stack Designation/Number **Z01 – Fugitive Emissions (Cooling tower exhaust and Equipment Leaks)**		
List Source(s) or source ID exhausted to this stack: **Source ID 110 and Source ID 111**	% of flow exhausted to stack: **NA - fugitive**	
Stack height above grade (ft.) **NA** Grade elevation (ft.) **≈ 20 ft**	Stack diameter (ft) or Outlet duct area (sq. ft.) **NA**	f. Weather Cap ☐ YES ☒ NO
Distance of discharge to nearest property line (ft.). Locate on topographic map. **≈ 200 ft**		
Does stack height meet Good Engineering Practice (GEP)? **NA**		
If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.		

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust (**Fugitive – flow and temperature are estimates for cooling tower)**
Volume **260,000** ACFM Temperature **93** °F Moisture **saturated** %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
NA

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

2. **Stack and Exhauster**		
Stack Designation/Number **S112 – Emergency Generator Exhaust**		
List Source(s) or source ID exhausted to this stack: **Source ID 112**	% of flow exhausted to stack: **100**	
Stack height above grade (ft.) **~10-15 ft.** Grade elevation (ft.) **≈ 20 ft**	Stack diameter (ft) or Outlet duct area (sq. ft.)	f. Weather Cap ☐ YES ☒ NO
Distance of discharge to nearest property line (ft.). Locate on topographic map. **≈ 200 ft**		
Does stack height meet Good Engineering Practice (GEP)? **N/A**		
If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.		

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume **8,366** ACFM Temperature **984**°F Moisture **5** %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
NA

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

2. **Stack and Exhauster**		
Stack Designation/Number **S113 – Fire Pumps (two) Exhausts**		
List Source(s) or source ID exhausted to this stack: **Source ID 113**	% of flow exhausted to stack: **100**	
Stack height above grade (ft.) **~10-15 ft.** Grade elevation (ft.) **≈ 20 ft**	Stack diameter (ft) or Outlet duct area (sq. ft.) **4 inches diameter (each)**	f. Weather Cap ☐ YES ☒ NO
Distance of discharge to nearest property line (ft.). Locate on topographic map. **≈ 200 ft**		
Does stack height meet Good Engineering Practice (GEP)? **N/A**		
If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.		

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume _____ ACFM Temperature **~1,000** °F Moisture **5** %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.
NA

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section G - Attachments

Number and list all attachments submitted with this application below:

Attachment 1 — Project Background
Attachment 2 — Detailed Process Description
Attachment 3 — Emission Estimates and Supporting Calculations
Attachment 4 — Regulatory Review and Applicable Requirements
Attachment 5 — Best Available Technology Analysis
Attachment 6 — Proposed Monitoring Approach
Attachment 7 — Municipal Notification Letters
- Falls Township
- Bucks County
- Return Receipts

Attachment 8 — Air Pollution Control Act Compliance Review Form
Attachment 9 — Location Map
- 7 ½-Minute Series U.S.G.S Site Location Map

Attachment 10 — Project Review Form

PLAN APPROVAL APPLICATION FORM

BOILER

Section B - Combustion Unit Information

1. Combustion Units: ☐ Coal ☐ Oil ☒ Natural Gas Other: _____

Description: **Boiler 031**

Manufacturer	Model No.	Number of units
Cleaver Brooks (or equivalent)	**To be determined**	**1**

Maximum heat input (Btu/hr)	Rated heat input (Btu/hr)	Typical heat input (Btu/hr)	Furnace Volume
9,000,000	**9,000,000**	**Varies**	**N/A**

Grate Area (if applicable)	Method of firing
N/A	**Automatic**

Indicate how combustion air is supplied to boiler
Ambient Air

Indicate the Steam Usage: **This boiler will be used to satisfy the steam demands of buildings and piping when the waste heat boiler is not in operation.**

Mark and describe soot Cleaning Method:

i. Air Blown
ii. Steam Blown
iii. Brushed and Vacuumed
iv. Other _____
v. Frequency of Cleaning _____

N/A

Maximum Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
24	**7**	**365**	**8,760**

Operational restrictions taken or requested, if any (e.g., bottlenecks or voluntary restrictions to limit potential to emit)

Capacity (specify units)

Per hour	Per day	Per week	Per year
N/A	**N/A**	**N/A**	**36 MMcf/yr**

Typical Operating schedule

Hours/Day	Days/Week	Days/Year	Hours/Year
As needed			

Seasonal variations (Months): If variations exist, describe them. **N/A**

Operating using primary fuel: _____ From _____ to _____
Operating using secondary fuel: _____ Form _____ to _____
Non-operating: From _____ to _____

2. Specify the primary, secondary and startup fuel. Furnish the details in item 3.
Natural Gas

Section B - Combustion Unit Information (Continued)

3. Fuel

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	**9,000** SCFH	**36** X 10^6 SCF	**Negl** gr/100 SCF	**Negl**	**1,000** Btu/SCF
Gas (other)	SCFH	X 10^6 Gal	gr/100 SCF		Btu/SCF
Coal					
Other*					

* Note: Describe and furnish information separately for other fuels in Addendum B.

4. Burner

Manufacturer	Model Number	Type of Atomization (Steam, air, press, mech., rotary cup)
Cleaver Brooks or similar	**To be determined**	

Number of Burners	Maximum fuel firing rate (all burners)	Normal fuel firing rate
1	**9,000,000 Btu/hr**	**Varies**

If oil, temperature and viscosity.
N/A

Maximum theoretical air requirement
~2,000 SCFM (exhaust)

Percent excess air 100% rating
15 %

Turndown ratio
5 to 1

Combustion modulation control (on/off, low-high fire, full automatic, manual). Describe.
Fully Automatic

Main burner flame ignition method (electric spark, auto gas pilot, hand-held torch, other). Describe.
To be determined

5. Nitrogen Oxides (NO_x) control Options

Mark and describe the NO_x control options adopted

Low excess air (LEA)	Flue gas recirculation	Other._____
Over fire air (OFA)	Burner out of service	
Low-NO_x burner	Reburning	
Low NO_x burners with over fire air	Flue gas treatment (SCR / SNCR)	

Section B - Combustion Unit Information (Continued)

6. Miscellaneous Information

Describe fly ash reinjection operation
N/A

Describe, in detail, the equipment provided to monitor and to record the source(s) operating conditions, which may affect emissions of air contaminants. Show that they are reasonable and adequate.

Natural gas usage will be monitored for the boiler using either natural gas meter or gas bills. Emissions are calculated using emission factor and fuel usage.

Describe each proposed modification to an existing source.

NA – New facility.

Describe how emissions will be minimized especially during start up, shut down, combustion upsets and/or disruptions. Provide emission estimates for start up, shut down and upset conditions. Provide duration of start up and shut down.

Good combustion and engineering practices, and operation and maintenance in accordance with manufacturer recommendations. Use of low NOx burner and flue gas recirculation.

Describe in detail with a schematic diagram of the control options adopted for SO_2 (if applicable).
N/A

Anticipated milestones:

Expected commencement date of construction/reconstruction: **Upon Approval**
Expected completion date of construction/reconstruction: **Upon Approval**
Anticipated date(s) of start-up: **Upon Approval**

Section C - Air Cleaning Device

1. Precontrol Emissions*

Emission Rate

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM					
PM_{10}					
SOx					
CO					
NO_x					
VOC					
Others: (e.g., HAPs)	-----	-----	-----		-----
See Attachment 3 for emissions calculations.					

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Gas Conditioning - N/A

Water quenching ☐ YES ☐ NO Water injection rate _____GPM

Radiation and convection cooling ☐ YES ☐ NO

Air dilution ☐ YES ☐ NO
If YES, _____ CFM

Forced draft ☐ YES ☐ NO

Water cooled duct work ☐ YES ☐ NO

Other _____

Inlet volume
_____ ACFM@ _____ °F

Outlet volume
_____ ACFM@ _____ °F _____ % Moisture

Describe the system in detail.

Section C - Air Cleaning Device (Continued) - Not Applicable

10. Costs

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

Device	Direct Cost	Indirect Cost	Total Cost	Operating Cost
Low- NO_x burner/FGR	$40,000	$8,000	$48,000	$4,000

11 MISCELLANEOUS

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

NA- Natural gas is only fuel.

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

NA

Attach the maintenance schedule for the control equipment and any part of the process equipment that, if in disrepair, would increase air contaminant emissions.

NA

Section E - Compliance Demonstration

Note: Complete this section if the facility is not a-Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below.

☒ Monitoring ☐ Testing ☐ Reporting
☒ Recordkeeping ☐ Work Practice Standard

Monitoring:

a. Monitoring device type (stack test, CEM etc.): **Natural Gas Meter or gas bills**

b. Monitoring device location: **Boiler**

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter: **Natural gas usage will be monitored monthly.**

Testing:

a. Reference Test Method Citation:

b. Reference Test Method Description:

Recordkeeping:

Describe the parameters that will be recorded and the recording frequency:

Natural gas usage will be recorded monthly.

Reporting:

a. Describe the type of information to be reported and the reporting frequency:

Records will be provided to the Department upon request

b. Reporting start date: **As requested by Department**

Work Practice Standard: Describe each

Section F - Flue and Air Contaminant Emission

1. Estimated Maximum Emissions*

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
PM				
PM_{10}				
SO_x				
CO				
NO_x				
VOC				
Others: (e.g., HAPs)	-----	-----	-----	-----

See Attachment 3 for emissions calculations.

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Stack and Exhauster

Stack Designation/Number **S31**

List Source(s) or source ID exhausted to this stack:
031

% of flow exhausted to stack: **100**

Stack height above grade (ft.) **≈ 20 ft.**
Grade elevation (ft.) **≈ 20 ft.**

Stack diameter (ft) or Outlet duct area (sq. ft.)
~ 0.5 ft.

Weather Cap
☐ YES ☒ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.
≈ 200 ft

Does stack height meet Good Engineering Practice (GEP)?
N/A

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.

Location of Stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack Exhaust

Volume **~3000** ACFM Temperature **~ 372** °F Moisture **~10** %

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____ RPM.

** If the datum and collection method information and codes differ from those provided on the General Information Form - Authorization Application, provide the additional required by that form on a separate sheet.

ATTACHMENT 1

PROJECT BACKGROUND

ATTACHMENT 1
PROJECT BACKGROUND

1.1 GENERAL PROJECT DESCRIPTION

Elcon Recycling Services, LLC (Elcon) is proposing to construct a commercial facility for treatment and storage of hazardous and residual waste to be located at the Keystone Industrial Port Complex (KIPC) in Falls Township, Pennsylvania.

The facility is proposing to use various chemical and physical treatment technologies to remove hazardous constituents from liquid waste streams. The waste streams will be generated by a variety of different off-site operations, such as pharmaceutical manufacturing operations, petroleum refineries, semi-conductors, and petrochemicals. Major operational steps in the proposed operation will consist of acid/base neutralization; coagulation; dissolved metals precipitation and separation; suspended solids separation; sludge filtration, dewatering, drying, and thermal treatment; distillation; flash evaporation distillation; crystallization; and salt drying. The main air pollution control train consists of the thermal oxidizers, selective non-catalytic reduction, and scrubber to control air emissions from the process operations. Baghouses and other localized controls (cyclones and scrubbers) will be used to control handling of dry materials. There will also be a natural gas-fired boiler, an emergency generator, and fire pump engines associated with this facility.

Attachment 2 provides a detailed description of the process. Figure 1-1 provides a simplified schematic of the operations and shows the proposed Source IDs for the equipment.

This project will also involve the submission of several other environmental permit applications, including the following:

- Resource Conservation and Recovery Act (RCRA) application for storing and treating hazardous and residual waste (i.e., a RCRA Part B application). This application was submitted in March 2017 and was determined to be administratively complete by the Department in August 2018.
- National Pollutant Discharge Elimination System (NPDES) General Permit application for discharges of stormwater associated with industrial activity. This application will be submitted to the Department within approximately 1 month.
- A tank registration for a caustic storage tank. This tank will be deemed to operate under a Permit-by-Rule, with the proper submission of the registration form. The registration must be submitted to the Department within 30 days of installation.
- NPDES Permit for stormwater discharges associated with construction activities. The Department and Bucks County will also be involved with this application and permit.
- Delaware River Basin Commission (DRBC) Docket application in order to bring wastewater into the DRBC's jurisdictional area. The DRBC will issue this document.
- Act 537 Notification. The initial mailer was submitted to the Department. Further efforts will be completed when the Land Development package is submitted to Falls Township.

1.2 EMISSION SOURCES AND OVERVIEW OF AIR POLLUTION CONTROLS

Emissions from the proposed facility will be less than major source thresholds for all pollutants.

The emission sources at the proposed facility have been divided into the following Source IDs:

Source ID	Equipment Description
031	Boiler
101	Storage tanks and pumping systems
102	Pretreatment
103	Sludge treatment, including sludge ovens
104	Flash evaporation distillation
105	Biological treatment
106	Distillation
107	Salt Concentration/Crystallization
108	Lime silo
109	Sludge silo
110	Cooling tower
111	Equipment Leaks
112	Emergency generator
113	Fire Pump Engines (2)

Table 1-1 provides a detailed list of the equipment associated with Source ID 101 (Storage Tanks). Table 1-2 provides a similar list for the remaining Source IDs.

The process operations (Source IDs 101 through 107 and 109) will ultimately exhaust to thermal oxidizers for control of organic compounds, a urea injection system for control of oxides of nitrogen, and scrubbers for control of particulate matter and acid gases. The urea injection system will be used, as needed, depending on nitrogen and ammonia loadings. To reduce the load of some pollutants to the main exhaust system, Elcon will use local controls at the sludge ovens (cyclone and scrubbers), sludge silo (bin vent filter), and sludge area fugitive emissions (baghouse) to reduce emissions of particulate matter and some acid gas from the sludge drying ovens. These air pollution controls will ultimately exhaust to the main control system. Additional details on the configuration of the main control system is provided below in Section 1.3.

There is a bin vent filter on the lime silo that will vent directly to the atmosphere.

Finally, there is a back-up carbon adsorption system with its own vent to atmosphere that will be used to control breathing losses from the tanks and other equipment when the main air pollution control system is down.

An overview of the air pollution exhaust systems is shown on Figure 1-1.

1.3 MAIN AIR POLLUTION CONTROL SYSTEM CONFIGURATION

As shown on Figure 1-1, the main air pollution control system controlling the common exhaust stream from the processes consists of two parallel air pollution control trains. Each train includes a thermal oxidizer, a selective non-catalytic reduction (SNCR) system, two waste heat boilers with

economizers, and a quench system and scrubber. Ultimately, the parallel air pollution control trains will vent through a common stack. This air pollution control system is being designed to operate under two scenarios:

- Normal Operating Condition – During normal operations, 50 percent of the exhaust will vent to each of the air pollution control trains, with 100 percent of the exhaust venting through the Main Stack. The estimated maximum airflow rate from the exhaust stack will be 41,194 scfm. The burner on each thermal oxidizer will operate at approximately 45 MMBtu/hr, without consideration of the heat content provided by the volatile organic compounds.

- Design Condition – Each air pollution control train will be designed to treat the emissions generated when the production is operating at up to 75 percent of the full capacity. This will provide back-up air pollution control capacity in the event that any portion of either of the air pollution control trains is offline for preventive maintenance or other activities. The estimated maximum airflow rate from the single operating train will be 31,236 scfm. The burner on the thermal oxidizer in use will operate at approximately 70 MMBtu/hr, without consideration of the heat content provided by the volatile organic compounds.

Figure 1-2 provides additional details on the airflow rates associated with the individual components of the main air pollution control system. Table 1-3 provides a tabular summary of the information. The calculations are provided in the spreadsheet that follows the text of this attachment.

TABLE 1-1
LIST OF STORAGE TANKS IN SOURCE ID 101

	Tag No.	Service	Contents	Nominal Volume (gal)	Nominal Dimensions	Materials of Construction
T-	12102	Storage tank unit 12	Waste water	26,500	I.D. 13.2', height 25.9'	PE/PP/HDPE
T-	80122	Acids storage tank	Acids	26,500	I.D. 13.2', height 25.9'	PE/PP/HDPE
T-	80124	Acids storage tank	Acids	13,100	I.D. 12', height 15.5'	PE/PP/HDPE
T-	80126	Acids storage tank	Acids	13,100	I.D. 12', height 15.5'	PE/PP/HDPE
T-	80128	Acids storage tank	Acids	13,100	I.D. 12', height 15.5'	PE/PP/HDPE
T-	80130	Acids storage tank	Acids	13,100	I.D. 12', height 15.5'	PE/PP/HDPE
T-	80134	Acids storage tank	Acids	13,100	I.D. 12', height 15.5'	PE/PP/HDPE
T-	80140	Acids storage tank	Acids	13,100	I.D. 12', height 15.5'	PE/PP/HDPE
T-	80143	Acids storage tank	Acids	26,500	I.D. 13.2', height 25.9'	PE/PP/HDPE
T-	12101	Storage tank unit 12	Waste water	26,500	I.D. 13.2', height 25.9'	PE
T-	80160	Caustic soda storage tank (fresh caustic, not waste)	Caustic soda	11,200	I.D. 11.48', height 14.44'	CS
T-	80162	Caustic soda storage tank (waste)	Caustic soda	11,200	I.D. 11.48', height 14.44'	CS
T-	80190	Acid daily tank	Acids	500	I.D. 3'3", length 16'	PE/PP/HDPE
T-	80191	Caustic daily tank	Caustic soda	500	I.D. 3'3", length 16'	PE/PP/HDPE
T-	23100	Unit 23 feed tank	Organic waste water to 30% VOC	13,200	I.D. 10', length 22.5'	CS/SS
T-	23101	Unit 23 feed tank	Organic waste water to 30% VOC	13,200	I.D. 10', length 22.5'	CS/SS

TABLE 1-1
LIST OF STORAGE TANKS IN SOURCE ID 101

	Tag No.	Service	Contents	Nominal Volume (gal)	Nominal Dimensions	Materials of Construction
T-	23341	C-23344 feed tank	Organic waste water to 30% VOC	13,200	I.D. 10', length 22.5'	SS
T-	20120A	Storage tank unit 20	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	20120B	Storage tank unit 20	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	20121A	Storage tank unit 20	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	20121B	Storage tank unit 20	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	20122A	Storage tank unit 20	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	20122B	Storage tank unit 20	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	21100A	Storage tanks	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	21100B	Storage tanks	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	21101A	Storage tanks	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	21101B	Storage tanks	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating
T-	Future	Storage tanks	Waste water	136,000	I.D. 21.5', height 50'	CS - epoxy coating

Notes:

1 All tanks are vertical except for Tanks T-20357, T23100, T-23101, and T-23341. These tanks are horizontal.

2 All tanks are designed to operate at ambient temperature.

3 All tanks are designed to operate at atmospheric pressure or at a slight negative pressure.

4 Materials of construction abbreviations: PE - polyethylene; PP - polypropylene; HDPE; - high density polyethylene; CS - carbon steel; SS - stainless steel; FRP - fiberglass reinforced plastic

5 All tanks containing organic materials will vent to the main air pollution control train. Venting of tanks containing only inorganic liquids (i.e., caustic acid) is optional.

TABLE 1-2
LIST OF MAJOR PIECES OF PROCESS EQUIPMENT IN SOURCE IDs 102 TO 113 AND 031
MISCELLANEOUS UNITS

Source ID	Tag No.		Service	Agitated tank	Contents	Nominal Volume (gal)	Nominal Dimensions	Temperature, C (operating/design)	Materials of Construction
031		N/A	Boiler		Natural Gas	9,000,000 Btu/hr	N/A	N/A	N/A
102	R-	12201	Unit 12 Reactor	yes	Acidic Wastewater	13,000	11' 2 ½" D X 17' 11" H	amb / 60	FRP 470
102	R-	12213	Lime reactor	yes	Lime Reactor	3,000	I.D. 8' , length 8'	amb / 60	CS
102	T-	12215	Lime reactor	yes	Lime Reactor	3,000	I.D. 8' , length 8'	amb / 60	SS
102	T-	12231	Water Tank		Effluent water	3,000	I.D. 8' , length 8', cone - 3'	amb / 60	PE/PP/SS
102	R-	12267	Reactor	yes	Effluent water	500	I.D. -3'3", length 16'	amb/60	PE
102	T-	12263	Settler		Effluent water	5,000	I.D. 7 ' 3" , length 13' - 16'	amb/60	PE/PP/FRP 470
102	R-	20206	Non-continuous Reactor	yes	Wastewater	13,000	I.D.11' 6" , length 17'	amb / 60	SS/FRP 470
102	R-	20210	Non-continuous Reactor	yes	Wastewater	13,000	I.D.11' 6" , length 17'	amb / 60	SS/FRP 470
102	R-	20214	Non-continuous Reactor	yes	Wastewater	13,000	I.D.11' 6" , length 17'	amb / 60	SS/FRP 470
102	R-	23201	Unit 23 reactor	yes	Organic waste water 10% VOC	3,000	I.D. 8' , length 8'	amb / 100	SS
103	D-	20220	Settler unit 20		Wastewater	30,000	I.D. 20', length 15' , cone - 6.5'	amb / 60	CS with epoxy or PE lining
103	T-	20224	Overflow Tank from Settler Unit 20		Wastewater	700	I.D. 4'6" , length - 4'	amb / 60	SS
103	F-	12240	Centrifuge -- gypsum		Gypsum	25 gpm	12' L X 5' W X 5' H	amb/60	SS316
103	F-	12243	Centrifuge -- gypsum		Gypsum	25 gpm	12' L X 5' W X 5' H	amb/60	SS316
103	T-	12270	Process Water Tank		Process water	13,200	11 2 ½ D 17' 11" H	amb/60	FRP
103	FP-	20218A	Filter Press		Wastewater	1 m^2/43 plates/1 m^3	16' L X 5' W X 5' H	amb/60	PP

TABLE 1-2
LIST OF MAJOR PIECES OF PROCESS EQUIPMENT IN SOURCE IDs 102 TO 113 AND 031
MISCELLANEOUS UNITS

Source ID	Tag No.		Service	Agitated tank	Contents	Nominal Volume (gal)	Nominal Dimensions	Temperature, C (operating/design)	Materials of Construction
103	FP-	20218B	Filter Press		Wastewater	1 m^2/43 plates/1 m^3	16' L X 5' W X 5' H	amb/60	PP
103	FP-	20218C	Filter Press		Wastewater	1 m^2/43 plates/1 m^3	16' L X 5' W X 5' H	amb/60	PP
103	O-	20608	Rotary oven		Sludge	1,500 kg/hr	46 L X 1.3' I.D.	150/800	CS
103	O-	20621	Drying heater		Sludge	1,100 kg/hr	23' L, 3.2'I,D.	550/700	SS
104	T-	20401	FED Feed		Wastewater	25,000	I.D. 13'-15', length 20-30'	amb / 100	CS
104	T-	20411	FED Flash Tank		Wastewater	5,000	I.D. 7 ' 3" , length 13' - 16'	110 / 180	SS
104	H-	20410C	FED Evaporator		Waste liquid solvent	9E6 kcal/hr	4' L X 4' W	Shell:170/200 Tube: 110/180	SS
104	H-	20410D	FED Evaporator		Waste liquid solvent	9E6 kcal/hr	4' L X 4' W	Shell:170/200 Tube: 110/180	SS
105	T-	90120	treating water collection tank	yes	Effluent water	5,000	I.D. 7 ' 3" , length 13' - 16'	amb/60	PE
105	T	90204	Biologic treatment feed tank		Effluent water	26,500	13' 2 ½" dia. X 25' 10 ¾" tall	amb / 60	PE / HDPE/CS/SS
105	T	90206	Biologic treatment feed tank		Effluent water	26,500	13' 2 ½" dia. X 25' 10 ¾" tall	amb / 60	PE / HDPE/CS/SS
105	R-	90208	Aerobic reactor		Effluent water	1,500	I.D. 2', length 49'6"	amb / 60	PE / HDPE/PP
105	R-	90209	Aerobic reactor		Effluent water	66,000	I.D. 13'6", length 55'6"	amb / 60	SS
105	R-	90220A	Biologic treatment		Effluent water	110,000	8 x 8 x 6	amb/60	CS, with epoxy
105	R-	90220B	Biologic treatment		Effluent water	110,000	8 x 8 x 6	amb/60	CS, with epoxy
105	R-	90221A	Biologic treatment		Effluent water	110,000	8 x 8 x 6	amb/60	CS, with epoxy
105	R-	90221B	Biologic treatment		Effluent water	110,000	8 x 8 x 6	amb/60	CS, with epoxy

TABLE 1-2
LIST OF MAJOR PIECES OF PROCESS EQUIPMENT IN SOURCE IDs 102 TO 113 AND 031
MISCELLANEOUS UNITS

Source ID	Tag No.		Service	Agitated tank	Contents	Nominal Volume (gal)	Nominal Dimensions	Temperature, C (operating/design)	Materials of Construction
105	T-	90226	Overflow		Effluent water	500	I.D. 4'6" , length - 4'	amb/60	SS
105	D-	90225	Settler		Effluent water	25,000	I.D. 20', length 15' , cone - 6.5'	amb/60	CS with epoxy or PE lining
105	T-	90235	Clean water tank		Effluent water	110,000	I.D. 21' 4", length 39' 5"	amb/60	CS
105	T-	90241	Clean water tank		Effluent water	110,000	I.D. 21' 4", length 39' 5"	amb/60	CS
105	T-	90260	Clean water tank		Effluent water	55,000	I.D. 21' 4", length 20' 5"	amb/60	CS
105	R-	90401	Ammonia treatment reactor		Effluent water	800	I.D. 4'5", 7'H	amb/60	CS/SS/PE
105	T-	90402	Overflow		Effluent water	800	I.D. 4'5", 7'H	amb/60	CS/SS
105	T-	90405	MVR feed tank		Effluent water	26,500	I.D. 13', H 27'	amb/60	CS
105	T-	90411	MVR flash tank		Effluent water	5,000	I.D. 7 ' 3" , length 13' - 16'	110 / 180	SS
105	T-	90240	Ultra-filtration system		Treated wastewater	Per vendor	Varies	amb/60	Varies
105	F-	90250	RO & NF Treatment		Treated wastewater	Per vendor	Varies	amb/60	Varies
106	T-	20357	Rich distillate tank		Organic waste to 80% VOC	13,200	I.D. 10', length 22.5'	amb	CS/SS
106	C-	23344	Distillation column		Wastewater	1,750	I.D. 1.5' , length - 33'	111 / 180	SS
107	T	20402	Crystallizer Feed Tank	yes	Brine	32,000	I.D. 13', length 15' , cone - 6.5'	amb / 100	CS with epoxy or PE lining
107	T-	20501	Crystallizer	yes	Brine	5,000	I.D. 7 ' 3" , length 13' - 16'	110 / 180	SS
107	T	20528	Crystallizer Condensate Tank		Effluent water	1,500	I.D. 6', length 7'	amb / 100	SS
107	T-	20525	Centrifuge Effluent		Concentrated Brine	500	I.D. 2.5 '- 3' 3" , length 13' - 16'	110 / 180	SS
107	H-	20540	Thin Film Evaporators (4)		Brine	1,500	I.D. 6', length 7'	60 / 180	SS

TABLE 1-2
LIST OF MAJOR PIECES OF PROCESS EQUIPMENT IN SOURCE IDs 102 TO 113 AND 031 MISCELLANEOUS UNITS

Source ID	Tag No.		Service	Agitated tank	Contents	Nominal Volume (gal)	Nominal Dimensions	Temperature, C (operating/design)	Materials of Construction
107	H-	20513A	Crystallizer re-boiler		Brine	3E6 kcal/hr	4' L X 4' W	Shell:170/200 Tube: 110/180	SS
107	F-	20522	Salts centrifuge		Brine	25 gpm	13' L X 5' W	112/140	SS316
107	F-	20524	Salts centrifuge		Brine	25 gpm	13' L X 5' W	112/140	SS316
107	T-	20509	Thin Film Evaporator Feed Tank		Brine	2,000	4.5' I.D., 12' H	amb/60	SS
108	T-	80150	Lime Silo		Lime	18,500	N/A	amb	CS
109	T-	20623	Sludge silo - product		Dry sludge	20,000	I.D. 9'-10', length - 25'-30'	amb/60	CS
110		N/A	Cooling Towers (3)		Water	30 MMBtu/hr (total)	N/A	amb	
111		N/A	Equipment Leaks		VOCs	N/A	N/A	amb	N/A
112		N/A	Emergency Generator		Natural Gas	1,000 kW	N/A	N/A	N/A
113		N/A	Fire Pump (2)		Diesel	300 hp (each)	N/A	N/A	N/A

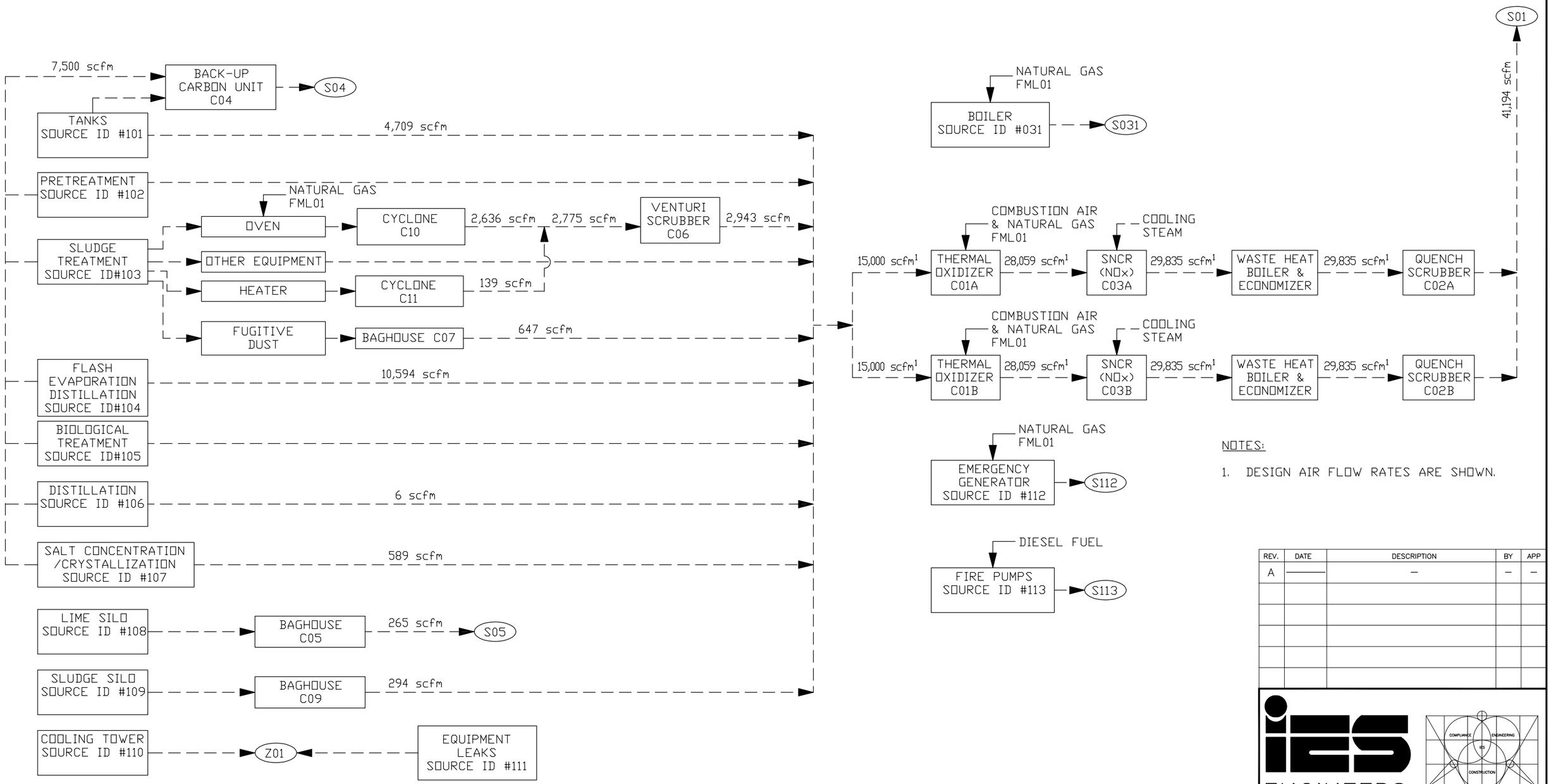
Notes:

1 Smaller tanks and service vessels may not be listed. However, all equipment will comply with RCRA requirements, such as containment, inspections, etc.

2 All tanks are designed to operate at atmospheric pressure or at a slight negative pressure, except as follows: 1) FP-12240, F-12243, FP-20218 A/B/C are at 8 barg; 2) Shell of H-2041 OC/D and H-25513A is at 7/12 barg, where the first number is operating and second is design; and 3) F-20522 and F-20524 is at atm/8 barg.

3 Materials of construction abbreviations: PE - polyethylene; PP - polypropylene; HDPE; - high density polyethylene; CS - carbon steel; SS - stainless steel; FRP - fiberglass reinforced plastic

4 Tank T-20357 is physically located in the storage tank farm area.



NOTES:

1. DESIGN AIR FLOW RATES ARE SHOWN.

REV.	DATE	DESCRIPTION	BY	APP
A	—	—	—	—

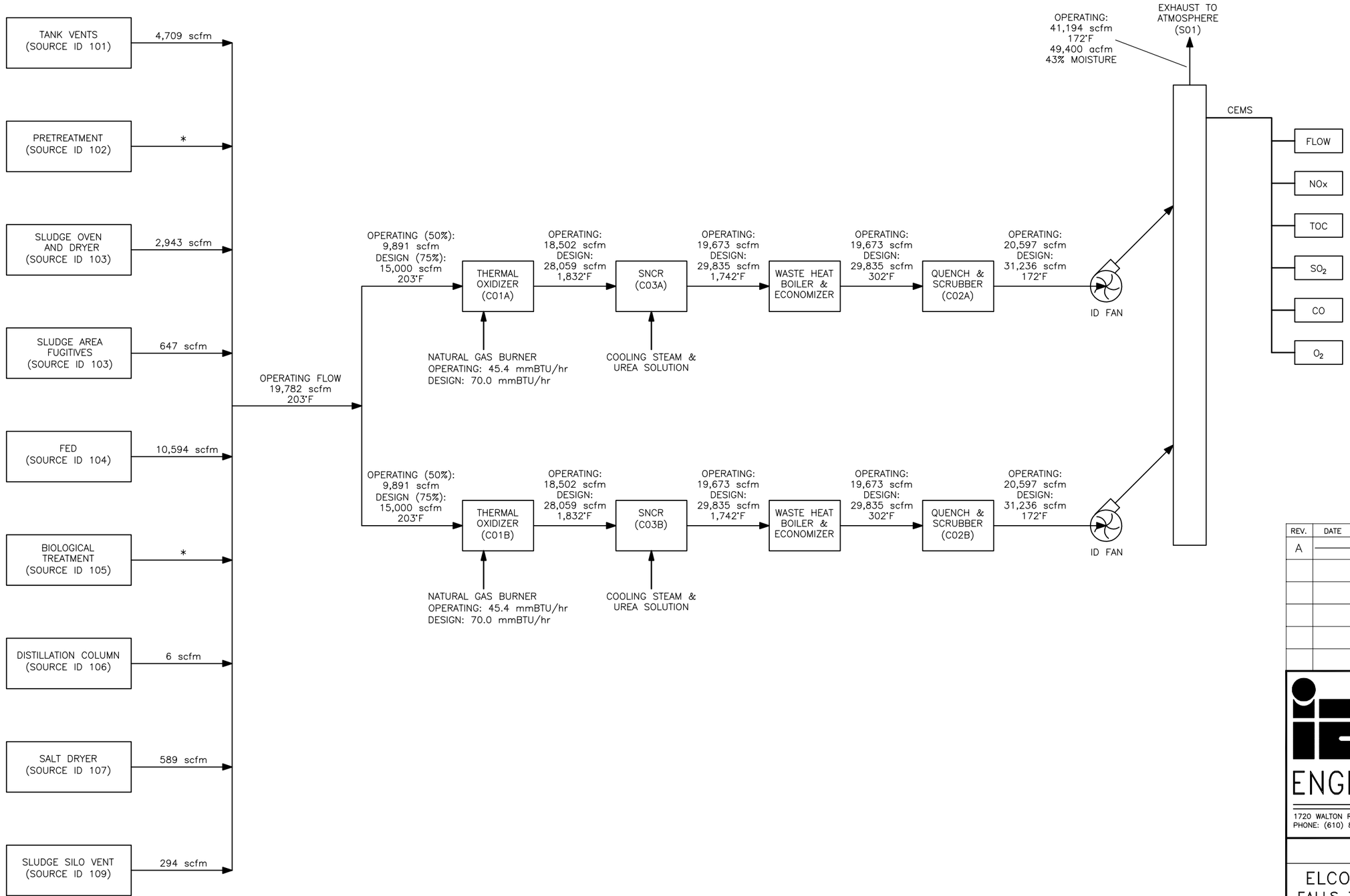
IES ENGINEERS
ENGINEERING FOR INDUSTRY
1720 WALTON ROAD, PA 19422
PHONE: (610) 828-3078
BLUE BELL, PA 19422
FAX: (610) 828-7842

Figure 1-1

ELCON RECYCLING SERVICES
FALLS TOWNSHIP, BUCKS COUNTY, PA

GENERAL SCHEMATIC
AIR POLLUTION EMISSION SOURCES

Date:	File:	Dwg. No.	Revision:
09-24-18	EV181065.01	FIGURE 1-1	A



* INCLUDED IN TANK VENTS (SOURCE ID 101)

REV.	DATE	DESCRIPTION	BY	APP
A	———	—	—	—

ENGINEERS
ENGINEERING FOR INDUSTRY
1720 WALTON ROAD, PA 19422
PHONE: (610) 828-3078
BLUE BELL, PA 19422
FAX: (610) 828-7842

Figure 1-2

ELCON RECYCLING SERVICES
FALLS TOWNSHIP, BUCKS COUNTY, PA

THERMAL OXIDIZER SYSTEM
PROCESS FLOW DIAGRAM

Date:	File:	Dwg. No.	Revision:
10-04-18	EV181065.01	FIGURE 1-2	A

TABLE 1-3
AIRFLOW RATES FOR COMPONENTS OF
MAIN AIR POLLUTION CONTROL SYSTEM

Parameters	Operating	Design
Flow from sources to thermal oxidizers, scfm	19,800	
Temperature, F	203	
Flow at temperature, acfm	24,800	
Thermal oxidizer inlet flow (each), scfm	9,900	15,000
Temperature, F		203
Flow at temperature, acfm	12,400	18,800
Thermal oxidizer outlet (each), scfm	18,500	28,100
Temperature, F		1,832
Flow at temperature, acfm	80,300	121,800
SNCR after cooling (each), scfm	19,700	29,800
Temperature, F		1,742
Flow at temperature, acfm	82,000	124,400
Waste heat boiler outlet flow (each), scfm	19,700	29,800
Temperature, F		302
Flow at temperature, acfm	28,400	43,100
Scrubber outlet flow (each), scfm	20,600	31,200
Temperature, F		172
Flow at temperature, acfm	24,700	37,400
Combined stack flow, scfm	41,200	
Temperature, F	172	
Flow at temperature, acfm	49,400	

SPREADSHEETS SHOWING AIRFLOW RATE CALCULATIONS FOR MAIN AIR POLLUTION CONTROL SYSTEM

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - Summary

	No VOC	Max VOC		No VOC	Max VOC	
Operating Flows						
Total flow to thermal oxidizer(s)	33,610	32,644	m^3/hr	19,782	19,214	cfm
Moisture content				52.9%	53.8%	
Temperature	95	95	C	203	203	F
Mass flow rate	32,313	32,610	kg/hr	71,238	71,894	lb/hr
VOC Rate		2,000	kg/hr		4,409	kg/hr
Assume flow is spit between 2 units						
Unit flow to TO	16,805	16,322	m^3/hr	9,891	9,607	cfm
TO operating temperature	1,000	1,000	C	1,832	1,832	F
Heat required to heat to TO temperature	5,401,800	5,924,417	kcal/hr	21,436,059	23,509,970	BTU/hr
VOC heat release		6,500,000	kcal/hr		25,794,067	BTU/hr
VOC combustion air		7,304	m^3/hr		257,941	scfh
Gas flow required	1,285	564	m^3/hr	45,386	9,959	scfh
Combustion air	13,345	5,857	m^3/hr	471,292	103,417	scfh
TO exhaust flow	31,436	27,141	m^3/hr	18,502	15,974	scfm
Cooling steam flow	1,490	1,292	kg/hr	3,285	2,849	lb/hr
SNCR flow	33,425	28,866	m^3/hr	19,673	16,990	scfm
SNCR Temperature	950	950	C	1,742	1,742	F
Heat removed by boiler and economizer	9,427,809	8,171,595	kcal/hr	37,412,545	32,427,489	BTU/hr
Temperature at inlet to quench	150	150	C	302	302	F
Flow rate after quench	34,995	30,224	m^3/hr	20,597	17,789	scfm
Moisture content				42.9%	44.0%	by vol
Scrubber outlet temperature	77.9	78.0	C	172.2	172.3	F
Combined operating flow	69,990	60,447	m^3/hr	41,194	35,578	scfm
	83,798	72,391	am^3/hr	49,321	42,608	acfm

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - Summary

	No VOC	Max VOC		No VOC	Max VOC	
Design Flows						
Thermal oxidizer inlet (per unit)	25,485	25,485	m^3/hr	15,000	15,000	scfm
TO gas	1,949		m^3/hr	68,829		scfh
TO exhaust flow	47,673	42,377	m^3/hr	28,059	24,942	scfm
SNCR exhaust flow	50,690	45,071	m^3/hr	29,835	26,528	scfm
Scrubber outlet flow	53,071	47,191	m^3/hr	31,236	27,776	scfm

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - No VOCs

Thermal Oxidizer System Flow Breakdown From Users

Flows assume base temperature of 20 C 68 F

	Source ID	m^3/hr	cfm	Moisture (Vol%)
Tank vents	101	8,000	4,709	4%
Pretreatment	102	inc in tank vents		
Sludge oven and dryer	103	5,000	2,943	20%
Sludge area fugitives	103	1,100	647	3%
FED	104	18,000	10,594	90%
Biological treatment	105	inc in tank vents		
Distillation column	106	10	6	5%
Salt dryer	107	1,000	589	20%
Sludge silo vent	109	500	294	3%
Total flow to thermal oxidizer		33,610	19,782	
Round to		33,980	20,000	
Install 2 legs, each sized for			75% of flow	
Capacity of each leg		25,485	15,000	
Approximate mixed stream temperature		95 C	203 F	

Assuming the balance above is air (neglecting VOC and combustion products)
Then the dry gases will be 20.9% oxygen and 79.1% nitrogen
Gas breakdown to the thermal oxidizer is

	Nitrogen scfm	Oxygen scfm	Carbon Dioxide scfm	Water Vapor scfm	Dry Gases scfm
Tank vents	3,575.5	944.7	0.0	188.3	4,520.3
Pretreatment	0.0	0.0	0.0	0.0	0.0
Sludge oven and dryer	1,862.3	492.1	0.0	588.6	2,354.3
Sludge area fugitives	496.8	131.3	0.0	19.4	628.0
FED	838.0	221.4	0.0	9,535.0	1,059.4
Biological treatment	0.0	0.0	0.0	0.0	0.0
Distillation column	4.4	1.2	0.0	0.3	5.6
Salt dryer	372.5	98.4	0.0	117.7	470.9
Sludge silo vent	225.8	59.7	0.0	8.8	285.5
Total	7,375.2	1,948.7	0.0	10,458.1	9,324.0

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - No VOCs

This flow will be split to 2 units
Operating flow per unit is then

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	3,688	37.3%	16,091	45.2%
Oxygen	32	974	9.9%	4,859	13.6%
Carbon dioxide	44	0	0.0%	0	0.0%
Water vapor	18	5,229	52.9%	14,669	41.2%
Total		9,891	100.0%	35,619	100.0%

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	6,265	37.3%	7,299	45.2%
Oxygen	32	1,655	9.9%	2,204	13.6%
Carbon dioxide	44	0	0.0%	0	0.0%
Water vapor	18	8,884	52.9%	6,654	41.2%
Total		16,805	100.0%	16,157	100.0%

Thermal Oxidizer Heat Requirements

Design thermal oxidizer temperature	1,000 C	1,832 F
Assumed ambient temperature	21 C	70 F

Heat required for process gases from inlet to TO operating temperature

	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	243.82	1,779,614	438.87	7,062,075
Oxygen	226.21	498,587	407.18	1,978,552
Carbon dioxide	249.01	0	448.22	0
Water vapor	469.46	3,123,598	845.03	12,395,431
Total		5,401,800		21,436,059

Heat will be provided by natural gas for heating this material
Assumed heat value for gas

Higher heat value	8,899 kcal/m^3	1,000 BTU/scf
Lower heat value	8,054 kcal/m^3	905 BTU/scf

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - No VOCs

The burner will be provide with combustion air to insure proper combustion in the flame zone

Stoichiometric combustion air to gas ratio		9.44 scf air/scf gas
Assumed excess air		10%
Total air requirement		10.384 scf air/scf gas
Use lower heat value since there is no condensation in TO		905 BTU/scf
Assume gas and air are ambient temperature before entering the TO		
Heat to heat gas to TO temperature		-71.5 BTU/scf gas
Heat to heat combustion air to TO temperature		-361.2 BTU/scf gas
Net heat available from gas	4,203 kcal/m^3	472.3 BTU/scf gas
Natural gas flow required per system	1,285 sm^3/hr	45,386 scfh
Combustion air flow required	13,345 sm^3/hr	471,292 scfh
Natural gas flow required total	2,570 sm^3/hr	90,773 scfh
Each system is to be designed for	25,485 m^3/hr	15,000 scfm
Based on a ratio to the flow, the maximum heat required is		
Burner size required in each	1,949 sm^3/hr	68,829 scfh
Based on higher heat value, burner size	17.64 10^6 kcal/hr	70.0 10^6 BTU/hr
	20,515 kW	

Products of combustion at operating flow (per unit)

	m^3/hr	scfm	Vol% Wet	Vol% Dry
Nitrogen	10,556	6,213	72.2%	87.5%
Oxygen	219	129	1.5%	1.8%
Carbon dioxide	1,285	756	8.8%	10.7%
Water vapor	2,570	1,513	17.6%	
Total	14,631	8,611	100.0%	100.0%

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - No VOCs

Flow at discharge of TO (Process gases plus combustion products)

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	9,901	53.5%	43,204	59.3%
Oxygen	32	1,103	6.0%	5,501	7.6%
Carbon dioxide	44	756	4.1%	5,187	7.1%
Water vapor	18	6,742	36.4%	18,912	26.0%
Total		18,502	100.0%	72,804	100.0%
Design		28,059			

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	16,822	53.5%	19,597	59.3%
Oxygen	32	1,874	6.0%	2,495	7.6%
Carbon dioxide	44	1,285	4.1%	2,353	7.1%
Water vapor	18	11,455	36.4%	8,579	26.0%
Total		31,436	100.0%	33,024	100.0%
Design		47,673			

Selective Non Catalytic Reduction System

Operating temperature of SNCR	950 C	1,742 F
The TO flow will be cooled by steam to the SNCR temperature		
Assumed steam pressure	7.0 barg	101.5 psig
Saturated steam temperature	170.5 C	339 F
Heat absorbed by steam	405.81	730.47 BTU/lb

Cooling to SNCR temperature

	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	14.46	283,328	26.02	1,124,337
Oxygen	13.36	33,351	24.06	132,346
Carbon dioxide	15.39	36,208	27.70	143,685
Water vapor	29.35	251,775	52.83	999,123
Total		604,662		2,399,491

Steam required	1,490 kg/hr	3,285 lb/hr

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - No VOCs

Flow from SNCR to waste heat boiler and economizer

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	9,901	50.3%	43,204	56.8%
Oxygen	32	1,103	5.6%	5,501	7.2%
Carbon dioxide	44	756	3.8%	5,187	6.8%
Water vapor	18	7,913	40.2%	22,197	29.2%
Total		19,673	100.0%	76,089	100.0%
Design		29,835 scfm			

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	16,822	53.5%	19,597	59.3%
Oxygen	32	1,874	6.0%	2,495	7.6%
Carbon dioxide	44	1,285	4.1%	2,353	7.1%
Water vapor	18	13,444	42.8%	10,069	30.5%
Total		33,425	106.3%	34,514	104.5%
Design		50,690			

Waste Heat Boiler

The exhaust gases will be cooled in the waste heat boiler, economizer system.
No mass is added.

Cooled temperature 150 C 302 F

	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	215.67	4,226,346	388.20	16,771,485
Oxygen	200.51	500,356	360.92	1,985,573
Carbon dioxide	221.34	520,761	398.41	2,066,546
Water vapor	415.19	4,180,346	747.34	16,588,940
Total		9,427,809		37,412,545

Quench and Scrubber
Final adiabatic saturation temperature 77.87 C 172.17 F
(iterated for balance)

Cooling required	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	17.96	351,916	32.32	1,396,514
Oxygen	16.13	40,262	29.04	159,774
Carbon dioxide	15.98	37,597	28.76	149,198
Water vapor	32.63	328,582	58.74	1,303,917
Total		758,357		3,009,403

Heat absorbed by evaporating water 645.0 kcal/kg 1,161 BTU/lb

Water vaporization rate 1,176 kg/hr 2,592 lb/hr
19.6 l/min 5.18 gpm

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - No VOCs

Scrubber outlet flow per unit is then

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	9,901	48.1%	43,204	54.9%
Oxygen	32	1,103	5.4%	5,501	7.0%
Carbon dioxide	44	756	3.7%	5,187	6.6%
Water vapor	18	8,837	42.9%	24,789	31.5%
Total		20,597	100.0%	78,681	100.0%
Design		31,236			

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	16,822	48.1%	19,597	54.9%
Oxygen	32	1,874	5.4%	2,495	7.0%
Carbon dioxide	44	1,285	3.7%	2,353	6.6%
Water vapor	18	15,014	42.9%	11,244	31.5%
Total		34,995	100.0%	35,689	100.0%
Design		53,071			

For adiabatic saturation, the moisture content must equal the saturation content at the assumed temperature.

The saturation moisture content at this temperature is	42.90%
Difference to content above (iterate to zero with scrubber temp)	0.00%

Total stack flow for both units is then

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	19,802	48.1%	86,408	54.9%
Oxygen	32	2,206	5.4%	11,002	7.0%
Carbon dioxide	44	1,513	3.7%	10,374	6.6%
Water vapor	18	17,674	42.9%	49,578	31.5%
Total		41,194	100.0%	157,362	100.0%

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	33,644	48.1%	39,194	54.9%
Oxygen	32	3,748	5.4%	4,990	7.0%
Carbon dioxide	44	2,570	3.7%	4,706	6.6%
Water vapor	18	30,028	42.9%	22,488	31.5%
Total		69,990	100.0%	71,378	100.0%

Stack flow is then 83,798 am^3/hr 49,321 acfm

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - High VOCs

Thermal Oxidizer System Flow Breakdown From Users

Flows assume base temperature of 20 C 68 F

	Source ID	m^3/hr	cfm	Moisture (Vol%)
Tank vents	101	8,000	4,709	4%
Pretreatment	102	inc in tank vents		0%
Sludge oven and dryer	103	5,000	2,943	20%
Sludge area fugitives	103	1,100	647	3%
FED	104	18,000	10,594	90%
Biological treatment	105	inc in tank vents		0%
Distillation column	106	10	6	5%
Salt dryer	107	1,000	589	
Sludge silo vent	109	500	294	
Total flow to thermal oxidizer		33,610	19,782	
Round to		33,980	20,000	
VOC delivered to the system, maximum		2,000 kg/hr	4,409.2 lb/hr	
Assume an average VOC molecular weight of			90	
Volume of VOC		534.11 m^3/hr	314.4 cfm	
Assume that this flow is added to above		34,144 m^3/hr	20,096 cfm	
Install 2 legs, each sized for			75% of flow	
Capacity of each leg		25,485	15,000	
Approximate mixed stream temperature		95 C	203 F	

Assuming the balance above is air (neglecting combustion products)
Then the dry gases will be 20.9% oxygen and 79.1% nitrogen
Gas breakdown to the thermal oxidizer is

	Nitrogen scfm	Oxygen scfm	Carbon Dioxide scfm	Water Vapor scfm	Dry Gases scfm
Tank vents	3,575.5	944.7	0.0	188.3	4,520.3
FED	0.0	0.0	0.0	0.0	0.0
Salt dryer	1,862.3	492.1	0.0	588.6	2,354.3
Sludge oven	496.8	131.3	0.0	19.4	628.0
Distillation column	838.0	221.4	0.0	9,535.0	1,059.4
Sludge silo vent	0.0	0.0	0.0	0.0	0.0
Baghouse vent	4.4	1.2	0.0	0.3	5.6
Total (plus VOC)	6,777.0	1,790.6	0.0	10,331.6	8,567.6

This flow will be split to 2 units

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - High VOCs

Operating flow per unit is then

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	3,388	35.3%	14,786	41.1%
Oxygen	32	895	9.3%	4,465	12.4%
Carbon dioxide	44	0	0.0%	0	0.0%
Water vapor	18	5,166	53.8%	14,491	40.3%
VOC	90	157	1.6%	2,205	6.1%
Total		9,607	100.0%	35,947	100.0%

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	5,757	35.3%	6,707	41.1%
Oxygen	32	1,521	9.3%	2,025	12.4%
Carbon dioxide	44	0	0.0%	0	0.0%
Water vapor	18	8,777	53.8%	6,573	40.3%
VOC	90	267	1.6%	1,000	6.1%
Total		16,322	100.0%	16,305	100.0%

Thermal Oxidizer Heat Requirements

Design thermal oxidizer temperature	1,000 C	1,832 F
Assumed ambient temperature	21 C	70 F

Heat required for process gases from inlet to TO operating temperature

	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	243.82	1,635,259	438.87	6,489,228
Oxygen	226.21	458,144	407.18	1,818,060
Carbon dioxide	249.01	0	448.22	0
Water vapor	469.46	3,085,803	845.03	12,245,446
VOC	745.21	745,212	1,341.38	2,957,237
Total		5,924,417		23,509,970

Heat capacity of VOC	6,500 kcal/kg	11,700 BTU/lb
Heat provided by VOC	6,500,000	25,794,067
Air is required for combustion. Since the VOC is unknown, use a heat release ratio of		100 BTU/scf
Combustion air required	7,304 m^3/hr	257,941 scfh
	8,775 kg/hr	19,346 lb/hr
Heat required for this air	200.68 kcal/kg	361.2 BTU/lb
Heat required for this air	1,760,921 kcal/hr	6,987,894 BTU/hr
Net heat required from gas fire	1,185,338 kcal/hr	4,703,798 BTU/hr

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - High VOCs

Heat will be provided by natural gas for heating this material

Assumed heat value for gas		
Higher heat value	8,899 kcal/m^3	1,000 BTU/scf
Lower heat value	8,054 kcal/m^3	905 BTU/scf

The burner will be provide with combustion air to insure proper combustion in the flame zone

Stoichiometric combustion air to gas ratio		9.44 scf air/scf gas
Assumed excess air		10%
Total air requirement		10.384 scf air/scf gas
Use lower heat value since there is no condensation in TO		905 BTU/scf
Assume gas and air are ambient temperature before entering the TO		
Heat to heat gas to TO temperature		-71.5 BTU/scf gas
Heat to heat combustion air to TO temperature		-361.2 BTU/scf gas
Net heat available from gas	4,203 kcal/m^3	472.3 BTU/scf gas
Natural gas flow required per system	282 sm^3/hr	9,959 scfh
Combustion air flow required	2,928 sm^3/hr	103,417 scfh
Natural gas flow required total	564 sm^3/hr	19,919 scfh
Combustion air flow required total	5,857 sm^3/hr	206,835 scfh

VOC products of combustion at operating flow (per unit)

	m^3/hr	scfm	Vol% Wet	Vol% Dry
Nitrogen	5,778	3,401	73.4%	82.5%
Oxygen	362	213	4.6%	5.2%
Carbon dioxide	861	506	10.9%	12.3%
Water vapor	875	515	11.1%	
Total	7,875	4,635	100.0%	100.0%

Gas products of combustion at operating flow (per unit)

	m^3/hr	scfm	Vol% Wet	Vol% Dry
Nitrogen	2,316	1,363	72.2%	87.5%
Oxygen	48	28	1.5%	1.8%
Carbon dioxide	282	166	8.8%	10.7%
Water vapor	564	332	17.6%	
Total	3,210	1,890	100.0%	100.0%

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - High VOCs

Flow at discharge of TO (Process gases plus combustion products)

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	8,152	51.0%	35,574	56.7%
Oxygen	32	1,137	7.1%	5,668	9.0%
Carbon dioxide	44	672	4.2%	4,611	7.4%
Water vapor	18	6,013	37.6%	16,868	26.9%
Total		15,974	100.0%	62,721	100.0%
Design		24,942			

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	13,851	51.0%	16,136	56.7%
Oxygen	32	1,931	7.1%	2,571	9.0%
Carbon dioxide	44	1,143	4.2%	2,092	7.4%
Water vapor	18	10,216	37.6%	7,651	26.9%
Total		27,141	100.0%	28,450	100.0%
Design		42,377			

Selective Non Catalytic Reduction System

Operating temperature of SNCR	950 C	1,742 F
The TO flow will be cooled by steam to the SNCR temperature		
Assumed steam pressure	7.0 barg	101.5 psig
Saturated steam temperature	170.5 C	339 F
Heat absorbed by steam	405.81	730.47 BTU/lb

Cooling to SNCR temperature

	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	14.46	233,294	26.02	925,786
Oxygen	13.36	34,362	24.06	136,358
Carbon dioxide	15.39	32,188	27.70	127,733
Water vapor	29.35	224,552	52.83	891,094
Total		524,397		2,080,972

Steam required	1,292 kg/hr	2,849 lb/hr

Flow from SNCR to waste heat boiler and economizer

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	8,152	48.0%	35,574	54.3%
Oxygen	32	1,137	6.7%	5,668	8.6%
Carbon dioxide	44	672	4.0%	4,611	7.0%
Water vapor	18	7,029	41.4%	19,716	30.1%
Total		16,990	100.0%	65,570	100.0%
Design		26,528			

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - High VOCs

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	13,851	51.0%	16,136	56.7%
Oxygen	32	1,931	7.1%	2,571	9.0%
Carbon dioxide	44	1,143	4.2%	2,092	7.4%
Water vapor	18	11,942	44.0%	8,943	31.4%
Total		28,866	106.4%	29,742	104.5%
Design		45,071			

Waste Heat Boiler

The exhaust gases will be cooled in the waste heat boiler, economizer system.
No mass is added.

Cooled temperature 150 C 302 F

	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	215.67	3,480,002	388.20	13,809,756
Oxygen	200.51	515,525	360.92	2,045,769
Carbon dioxide	221.34	462,949	398.41	1,837,127
Water vapor	415.19	3,713,119	747.34	14,734,837
Total		8,171,595		32,427,489

Quench and Scrubber
Final adiabatic saturation temperature 77.96 C 172.33 F
(iterated for balance)

Cooling required	kcal/kg	kcal/hr	BTU/lb	BTU/hr
Nitrogen	17.94	289,409	32.28	1,148,465
Oxygen	16.11	41,432	29.01	164,414
Carbon dioxide	15.96	33,383	28.73	132,475
Water vapor	32.59	291,495	58.67	1,156,746
Total		655,719		2,602,100

Heat absorbed by evaporating water 645.0 kcal/kg 1,161 BTU/lb

Water vaporization rate 1,017 kg/hr 2,241 lb/hr
16.9 l/min 4.48 gpm

Scrubber outlet flow per unit is then

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	8,152	45.8%	35,574	52.5%
Oxygen	32	1,137	6.4%	5,668	8.4%
Carbon dioxide	44	672	3.8%	4,611	6.8%
Water vapor	18	7,828	44.0%	21,958	32.4%
Total		17,789	100.0%	67,811	100.0%
Design		27,776			

Elcon Recycling Services, Falls Township, PA
Thermal Oxidizer System Flow Calculation - High VOCs

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	13,851	45.8%	16,136	52.5%
Oxygen	32	1,931	6.4%	2,571	8.4%
Carbon dioxide	44	1,143	3.8%	2,092	6.8%
Water vapor	18	13,299	44.0%	9,960	32.4%
Total		30,224	100.0%	30,759	100.0%
Design		47,191			

For adiabatic saturation, the moisture content must equal the saturation content at the assumed temperature.

The saturation moisture content at this temperature is	43.06%
Difference to content above (iterate to zero with scrubber temp)	-0.94%

Total stack flow for both units is then

	MW	scfm	Vol % Wet	lb/hr	Wt %
Nitrogen	28	16,305	45.8%	71,148	52.5%
Oxygen	32	2,273	6.4%	11,336	8.4%
Carbon dioxide	44	1,345	3.8%	9,222	6.8%
Water vapor	18	15,655	44.0%	43,915	32.4%
Total		35,578	100.0%	135,622	100.0%

	MW	m^3/hr	Vol % Wet	kg/hr	Wt %
Nitrogen	28	27,702	45.8%	32,272	52.5%
Oxygen	32	3,862	6.4%	5,142	8.4%
Carbon dioxide	44	2,285	3.8%	4,183	6.8%
Water vapor	18	26,598	44.0%	19,920	32.4%
Total		60,447	100.0%	61,517	100.0%

Stack flow is then 72,391 am^3/hr 42,608 acfm

ATTACHMENT 2

DETAILED PROCESS DESCRIPTION

Proposed KIPC, Morrisville, Pa. Plant Process Description

General

Capacity: Nominal 175,000 metric tons/year (Units 20, 21, and 23 have a nominal 150,000 metric tons/year capacity, and Unit 12 has a nominal 25,000 metric tons/year capacity) of industrial RCRA Listed and Characteristic Wastewater from various sources

Daily capacity: Nominal 410 metric tons/day average flow

Mode of operations: 24 hours/day, 7 days/week

Technology: The technology used for Units 20, 21, and 23 include physical-chemical separation, thermal oxidation, thermal distillation of volatile organic compounds (VOCs), evaporation and salt crystallization. The technology used for Unit 12 includes physical-chemical separation.
Organics extraction: Flash Evaporation Distillation technology (FED)
Total plant area: 100,000 ft^2
Total area: 300,000 ft^2
Water discharge: **Zero Liquid Discharge**

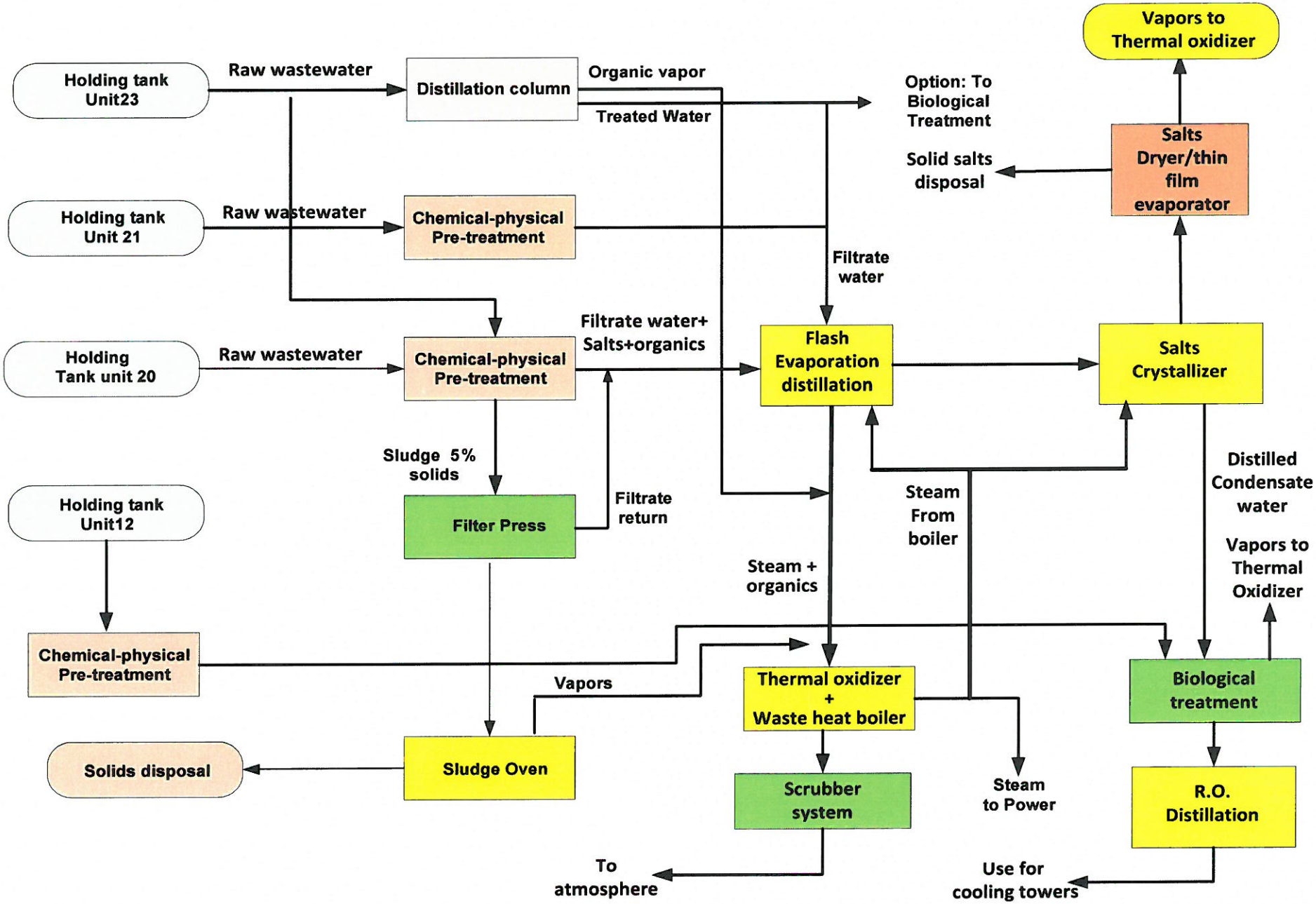
Number of employees: approximately 55

Control: Single control room for the plant. All is automatically controlled.

Process steps: 8

Process Summary

- Facility receives Resource Conservation and Recovery Act (RCRA) listed and characteristic wastewater in tanks from trucks and rail cars.
- Wastewater is stored and treated in various tanks and reactors.
- Sludge and salt is removed from the wastewater and dried.
- The dried sludge and salt are treated to remove VOCs for recycling.
- The VOCs in the wastewater are extracted.
- The VOCs in gaseous form from the FED are vented from different areas throughout the plant and are then sent to the thermal oxidizer to be oxidized. The energy is recycled into the process.


Holding tank Unit23
Raw wastewater
Distillation column
Organic vapor
Treated Water
Option: To Biological Treatment
Vapors to Thermal oxidizer
Solid salts disposal
Salts Dryer/thin film evaporator
Holding tank Unit 21
Raw wastewater
Chemical-physical Pre-treatment
Filtrate water
Filtrate water+ Salts+organics
Holding Tank unit 20
Raw wastewater
Chemical-physical Pre-treatment
Flash Evaporation distillation
Salts Crystallizer
Sludge 5% solids
Filter Press
Filtrate return
Steam From boiler
Distilled Condensate water
Holding tank Unit12
Steam + organics
Vapors to Thermal Oxidizer
Chemical-physical Pre-treatment
Vapors
Thermal oxidizer + Waste heat boiler
Biological treatment
Solids disposal
Sludge Oven
Scrubber system
Steam to Power
R.O. Distillation
To atmosphere
Use for cooling towers

Summary of the Regulatory Approach

• All RCRA listed and characteristic wastewater stored and/or treated will require a RCRA Permit, subject to 40 CFR270.
• All salts and sludges will be derived from the listed hazardous wastewater and will, therefore, be considered hazardous. All storage, treatment, and drying of these salts and sludges will require a RCRA Permit unless or until they are delisted.
• Wastewater from various parts of the process will "contain" hazardous waste and must be managed as hazardous waste until "contained-out".
• All VOC emissions extracted from the wastewater will be in gaseous form and treated by a thermal oxidizer.
• All VOC emissions obtained from the drying of the salts, sludges, and other parts of the process, will be in gaseous form and treated by a thermal oxidizer.
• Since the VOCs treated by the Thermal Oxidizer will not be solids, liquids, or contained gases, they are not solid or hazardous waste and not subject to RCRA.
• Emissions from the thermal oxidizer will be subject to applicable air permitting requirements. "Best Available Technology" requires 98% destruction of VOCs.

Step 1 – Receiving Tanks

The plant will receive industrial wastewater deliveries, some with high organic concentrations and/or acids, from tanker trucks 24 hours/day, 7 days/week. The unloading station will be in a contained area and the wastewater will be piped from the trucks to onsite storage tanks. These tanks will be closed and vented to the thermal oxidizer and then scrubbed to regulate air emissions. Separate storage tanks will be onsite for the varying types of incoming wastewater. The site will contain RCRA-regulated hazardous waste storage tanks and tanks that contain fresh acid and alkaline. The tanks will:

- Contain the raw wastewater from the various clients
- Contain acid and alkaline waste, used as a hydrological buffer for the process
- Be located within secondary containment areas

The contents and nominal capacities of the tanks are:

- 10 acid waste tanks, approximately 184,800 gallons total capacity
- 1 alkaline waste tank, approximately 11,000 gallons total capacity
- 4 flammable waste tanks, approximately 52,900 gallons total capacity
- 10 aqueous waste tanks, approximately 1,360,000 gallons total capacity
- 1 fresh caustic tank, approximately 11,000 gallons total capacity

Step 2 – Unit 20 (Main Unit) Chemical-Physical Treatment

Incoming wastewater will be sent to three separate but similar treatment units, depending on characteristics of the wastewater. Unit 20 is the main wastewater treatment unit. This unit contains continuous reactors and settling tanks. Reagents are added to the reactors to facilitate neutralization and the settling of solids at a rate of approximately 5,300 gallons/hour.

Function:

- Acid and base neutralization
- Flocculent and coagulant addition
- Dissolved metals precipitation and separation
- Suspended solids separation and filtration

Process description:

a. First RCRA Treatment Tank: pH control and coagulation

The pH of the wastewater in the first reactor is adjusted to 9-10. The addition of acid or caustic soda is computer controlled. Then, coagulation material is added in the form of ferric chloride or ferric sulfate. The pH is also maintained at 9-10 as necessary, by addition of bases. The capacity of this system is 20 tons/hour.

b. Second RCRA Treatment Tank: flocculation

Polymeric flocculation material is added in the second reactor. The flocculation material acts as a binder to capture small particles formed by the previous process of coagulation. Once the particles form, they are difficult to capture since they are too small. The polymeric flocculent is a long chain of polymer material that captures the small particles to form much larger particles that are easier to filter. The capacity of this system is 20 tons/hour.

c. Third RCRA Treatment Tanks: settling in two phases

Water and particles are gravity separated into two phases in the settling tanks. In the lower phase the large, heavy particles formed through coagulation and flocculation settle to the bottom of the tank to form sludge. The water in the upper phase is clear of suspended matter. The two types of contaminants that remain in the wastewater after this phase separation are:

- Soluble organic matter, like solvents, and
- Soluble inorganic matter, like salts.

The clear water phase will be sent to a holding tank to be sent to the Flash Evaporator Distillation (FED) holding tank.

Sludge phase – 7% dry matter then goes to the 3,000-gallon sludge treating

reactors.

The tanks in this area are to be vented to a thermal oxidizer and then scrubber.

Step 2 – Unit 21 Chemical-Physical Treatment

This unit receives wastewater that contains salts and no VOCs. This unit contains batch reactors for neutralization and flocculation. Reagents are added to the reactors to facilitate neutralization and the settling of solids. After neutralization, the solids are removed by using a filter press. The treated wastewater contains only dissolved salts and is then sent to the FED (Flash Evaporation Distillation). The tanks are to be vented to a thermal oxidizer and then scrubber. Capacity of this system is approximately 3 tons/hour.

Step 2 – Unit 12 Chemical-Physical Treatment

This unit receives wastewater with a high acid content but does not contain VOCs or salts. The unit treats acid in several concentrations. This unit contains batch reactors for neutralization. Reagents and lime (pH ~9-10) is added to the reactors to facilitate neutralization and the settling of solids. After neutralization, the solids are removed by using a filter press or centrifuge. The waste acid does not contain any VOCs or salts so the resultant sludge is not hazardous. The tanks are to be vented to a thermal oxidizer and then scrubber.

Step 3 – Sludge Processing

a. Sludge Filtration and Dewatering

The sludge in the holding tank is RCRA hazardous pursuant to the "derived from rule". The sludge is filtered in a filter press to remove the water so the remaining solid sludge contains about 30% dry matter. The filtrate water from the filter press flows to the clear water holding tank and is sent to the FED holding tank to be further treated. From the filter press the dry sludge falls into a closed hopper that directs the sludge to the next process, the sludge dryer oven. Hoods shall be located over the sludge dewatering and drying area to vent all emissions to the thermal oxidizer and scrubber. The capacity of this process is 1 ton/hour of wet cake, 30% solids.

b. Sludge Dryer

The sludge dryer heat treatment oven is a completely closed process unit. The drying process is accomplished using a rotary dryer. The process is continuous and the sludge retention time and the temperature dictate the final moisture content of the product. The water from the sludge is vaporized. The emissions from the

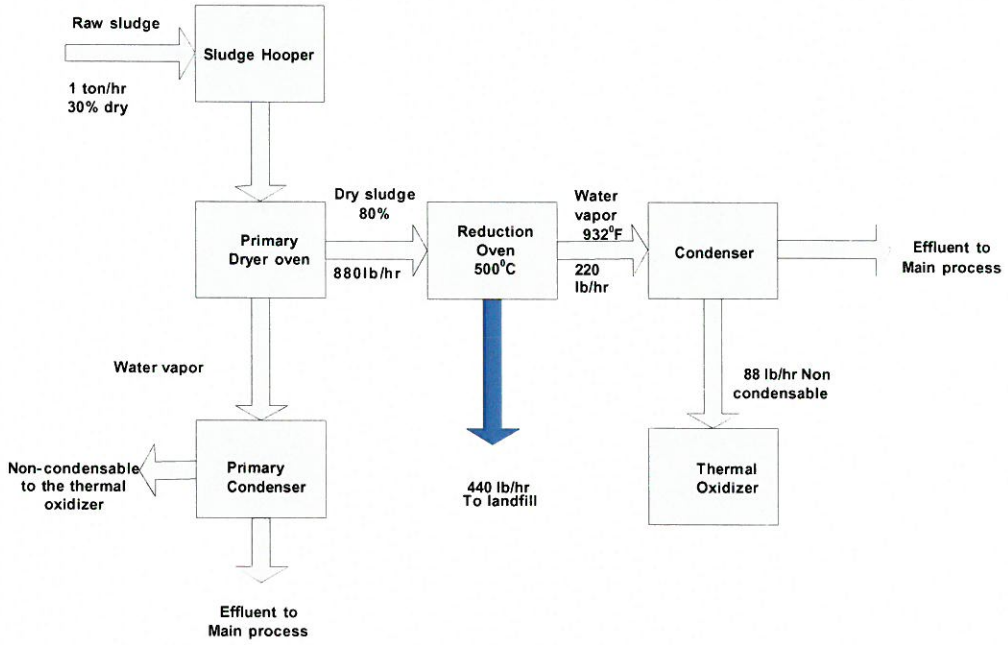
rotary oven contain particulate matter, which is removed by a cyclone. Downstream of the cyclone, the emissions are vented through the thermal oxidizer, and then a scrubber. The water which has been condensed flows back to the water holding tank where it is recycled to be treated in the plant.

The dry sludge then contains 70-85% dry matter and is ready for the next and final process of thermal treatment, where any remaining organics in the sludge are removed. The capacity of this section is approximately 1 ton/hour of wet cake, 30% solids at the inlet to the dryer, 880 lbs/hr of dry sludge (75% solids) at the outlet of the dryer.

c. Sludge Thermal Treatment

The sludge contains mainly oxides and other materials that need further treatment to separate the organic materials in the sludge. In the thermal process, the sludge is heated by a thermal screw to 550 °C (1,022 °F). As a result, all the residual organics are removed in gaseous form. The dried sludge will be collected in a closed silo. The RCRA hazardous sludge can then be transported and appropriately disposed or delisted. The dried sludge will still be hazardous pursuant to the "derived from rule". The organic vapor phase flows into a thermal oxidizer, where the organics are treated and the energy is captured and re-used. A bag filter will be located in the treatment area to collect any dust distribution in the air.

Schematic process diagram for the entire sludge process



Note: The projected flow rates, above, are approximate values

Step 4 – Unit 20 Flash Evaporation Distillation

The water, after settling and filtration, flows to the holding tank for the next process (FED holding tank). The water flows into the Flash Evaporation Distillation (FED) process to remove the entire organic load from the water by using steam as the organics extraction agent in the FED). The FED is comprised of an evaporator and flash chamber in which the wastewater is circulated. The wastewater enters the evaporator and is superheated with steam coming from the waste heat boiler to about 112 °C (233.6 °F). When the wastewater exits the evaporator and enters the flash chamber, the wastewater boils spontaneously (flashing), and the resultant steam which contains all the organics from the wastewater is pumped out of the flash chamber into the thermal oxidizer.

The FED combines complete organics extraction with distillation to achieve total organics destruction with evaporation distillation.

The FED is designed for 22 tons/hour with 100,000 COD and 4% total dissolved solids (TDS).

The FED conditions are important in order to achieve best performance, so all conditions are highly controlled: pH, steam flow, temperature, steam pressure, water temperature, circulation ratio, etc. The steam with the gaseous volatile organics rises from the top of the FED unit, and the VOC and steam mixture are sent to the thermal oxidizer.

The treatment of the VOCs is subject to Air Permitting, rather than RCRA, since the gaseous VOCs are neither solid nor liquid and therefore, not a hazardous waste. The water from the bottom of the FED unit flows into a holding tank, which acts as the hydraulic buffer between the FED process and the next process. Although still RCRA hazardous, the contaminants now left in the water are primarily the dissolved salts which must be distilled in order for the process to be complete and the water can be released. The wastewater is then biologically treated at a rate of 4 tons/hour.

Step 4 – Unit 23 Distillation

In case there is not enough VOCs in the main unit (Unit 20), it is possible to treat high concentrated organic waste (10-30% VOCs). The organic waste is distilled in a dedicated distillation column or in an evaporating vessel. The concentrated VOCs (about 70-80% VOCs) are then sent in a gaseous phase to the thermal oxidizer to be treated. The water is sent to the FED for further treatment along with the main unit's wastewater. The capacity of this system is approximately 10,000 tons/year.

Step 5 – Thermal Oxidation

In the proposed Elcon Recycling Facility, the thermal oxidizer is the main process to achieve destruction of the gaseous organics that were extracted from the wastewater in the FED unit.

The thermal oxidizer is regulated under the Air Program and operates at a minimum of 1,800 °F (approximately 1,000 °C). It is expected that at that temperature, 99.9% of the organics will be oxidized. The process is continuous and steady state.

The heat of combustion of the organics in the thermal oxidizer is captured using the waste heat boiler to generate steam. This steam is re-used in the FED unit for the next cycle. This technology allows for the process to be energy neutral when the feed wastewater contains more than 3% organics, which is expected for this facility.

All of the organic emission sources in the facility will be vented though the thermal oxidizer and then to a scrubber, before being vented to the atmosphere. The majority of the VOC emissions from the plant will be from the FED and distillation column. When the FED and thermal oxidizer are shut down due to process issues, the storage tanks and other vessels that emit negligible amounts VOCs shall be vented to a carbon filter.

The thermal oxidizer is designed for maximum of 1400 °C (2,552 °F) and will generate about 48 MM BTU/hr of energy that will be used for steam production. In the thermal oxidizer, the VOCs are oxidized to CO_2 and H_2O. The waste heat boiler is at the exit of the thermal oxidizer and will produce steam, which is then transmitted to the entire plant, where the steam is used in the FED process unit.

After passing through the waste heat boiler, the hot gases are cooled to 300 °C (572 °F) and flow through an air-air heat exchanger, which uses the residual heat in the hot air to heat up the incoming fresh air to the thermal oxidizer. This maximizes the recycling of the BTUs in the VOCs and minimizes external energy consumption. The flue gases shall be treated with urea for NOx reduction, when necessary, and then in a NaOH solution scrubber to treat any halogens at the outlet. The clean flue gases shall be vented to the atmosphere through a stack.

Step 6 – Water Distillation – Flash Evaporation Distillation (FED)

The separation distillation process is carried out using Flash Evaporation Distillation (FED) technology. The FED evaporation process combines distillation with evaporation and the organics extraction into the thermal oxidizer. It is more reliable than membrane reverse osmosis (RO), which frequently has plugging problems. The brine (salts) concentration can be approximately 25% TDS. This means that the FED process can deliver a concentration ratio of 1:5 when the incoming wastewater concentration is about 5% TDS.

In the FED process 60%-70% of the wastewater evaporates through the thermal oxidizer with the organic materials (the VOC) and passing through the scrubber.

The remaining 30%-40% of the wastewater which is now concentrated with salts is directed to a holding tank prior to the salt crystallization and drying process.

The thermal distillation has a nominal capacity of 22 tons/hour of wastewater. The concentrated brine at 15%-25% TDS, derived from hazardous waste after the FED process, flows to a holding tank from which it flows to crystallization, the next process.

Step 7 – Brine (Salts) Crystallization

The concentrated brine flows from the previous process (FED) to the brine holding tank where it is held for crystallization.

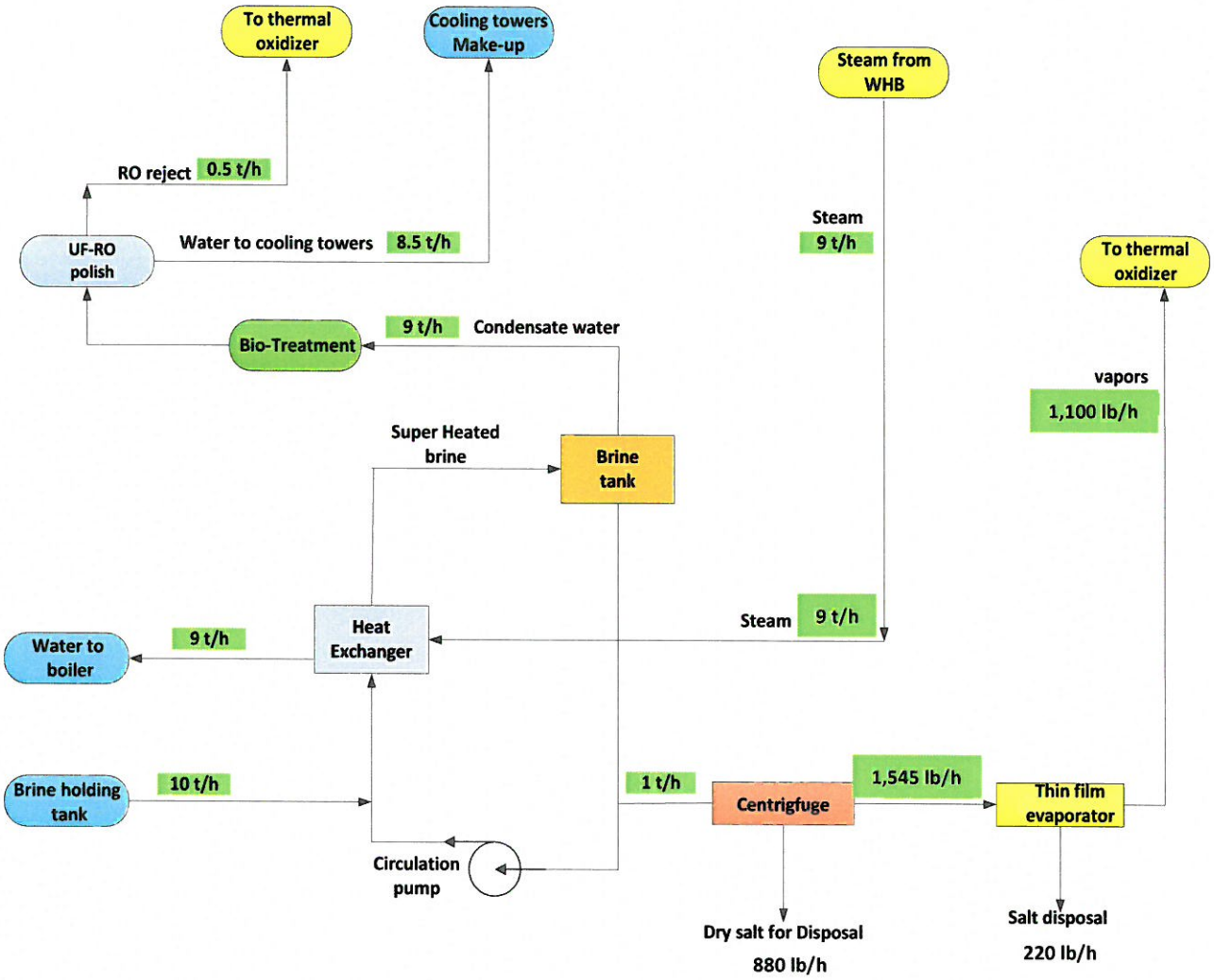
From the holding tank the concentrated wastewater (brine) containing 15%-20% salts flow through the heat exchanger where it is heated and enters the brine tank. In the brine tank the brine boils and the vapors are emitted from the top, collected, cooled and condensed into water that flows to the biological treatment unit.

The brine in the brine tank thus is further concentrated to achieve 75% salts concentration, by circulation using a circulation pump through a decanter-thin film evaporator unit. The salt crystals are removed with the decanter-thin film evaporator combination unit.

The steam to the heat exchanger is supplied from the waste heat boiler recovered from the waste. The crystallized salts flow to the centrifuge and then, into the brine dryer, in which the next process of drying takes place. The total capacity of this step is 10 tons/hour, with 15%-20% TDS at the inlet.

About 19 MM BTUs/hr of steam will be used to heat the crystallizer and about 1 ton/hour of salts 80-90% TDS will be removed.

Salts crystallization process diagram

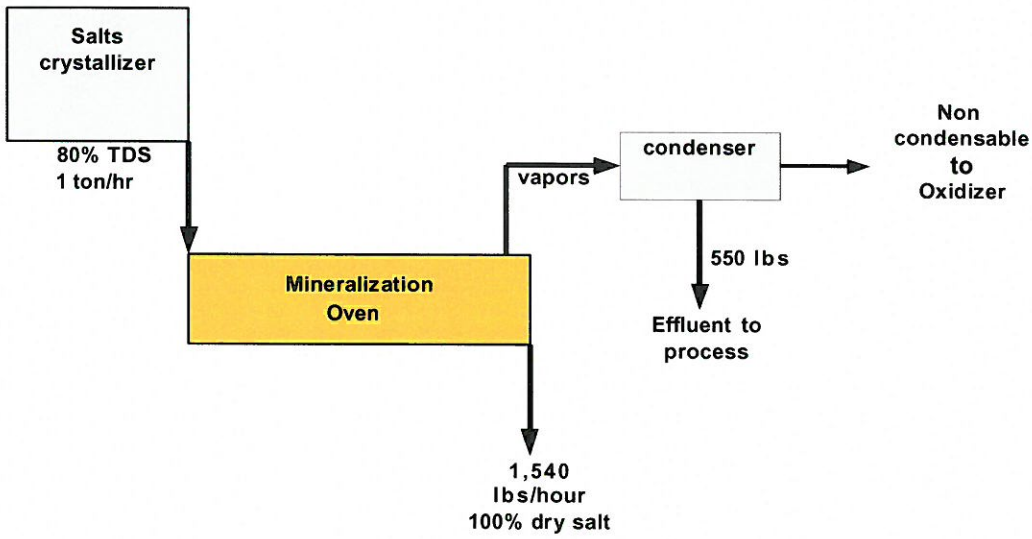


Note: The projected flow rates, above, are approximate values

Step 8 –Salt Drying

The salts, that are still hazardous pursuant to the "derived from" rule, are now in the form of liquid crystals. After crystallization at a temperature of 100 °C (212 °F), they flow to the drying salts oven, which is electrically heated and operates at max 240 °C (464 °F). The salts achieve 100% dry matter and the residual organic content of the salts is removed. The salts will be appropriately disposed as hazardous waste, or they can subsequently be delisted. The VOCs, in gaseous form, are oxidized in the thermal oxidizer, and then scrubber.

Schematic Salts Oven Drying Process Diagram



Note: The projected flow rates, above, are approximate values

Wastewater Discharge

The process has Zero Liquid Discharge

Air Emissions

The facility will be a minor air pollution emission source under the Clean Air Act and state regulations. The entire facility will utilize best available technology for air emissions control through the use of a thermal oxidizer as the main control device. When the process is not operating, emissions will be vented through activated carbon adsorption, as a backup.

The design will have the following:

1. **Tanks and Reactors**

   All tanks will be connected to a main blower that is directly vented to the thermal oxidizer unit, which will operate 24/7 to ensure compliance with Air Pollution requirements.

2. **Exhaust Air Treatment**

   The exhaust gases from the thermal oxidizer are vented as follows:

   - Rapid quenching of the air to cool from about 200 °C to 60 °C (392 °F to 140 °F)
   - Scrubber with caustic soda to eliminate all traces of acids such as HCl.

ATTACHMENT 3

EMISSION ESTIMATES AND SUPPORTING CALCULATIONS

ATTACHMENT 3
EMISSION ESTIMATES AND SUPPORTING CALCULATIONS

This attachment provides documentation for the emission estimates of all regulated pollutants, including Greenhouse Gas emissions.

Many of the emission estimates are based on operations of a nearly identical facility in Israel. The facility in Israel is slightly smaller than the proposed Falls Township facility, but the process unit operations that will be used and the types of waste streams that are processed will be similar to those proposed for the Falls Township facility. The other difference pertains to the use of the air pollution control systems for oxides of nitrogen (NO_x), which is used less frequently at the Israeli facility than is anticipated at the proposed for the Falls Township facility due to differences in regulatory requirements. Controlled emissions are then estimated using control efficiency of the control devices.

Some of the emission estimates are based on emission testing at the Israel facility, using U.S. EPA reference test methods. During the testing in Israel, the facility operated at approximately half the size of the proposed Falls Township facility; however, the process unit operations and the types of waste streams that were processed are similar to those proposed for the Falls Township facility. Copies of the summary pages from the testing reports from the Israeli facility are provided in Appendix 3-A of this attachment.

The following basic assumptions were used in the calculations:

- Annual emission rates, in tons per year (tpy), are based on the proposed maximum annual throughput rates.
- Due to the potentially fluctuations in waste streams, short-term emission rates (e.g., hourly mass emission rates or concentrations based limits) are based on peak hourly maximum throughput rates.
- The liquid waste throughput for the system is 194,558 tpy (176,470 metric tons per year (Mtpy)). Data from the Israeli facility (that is used to estimate uncontrolled emissions) is approximately 74% of the size of the proposed Falls Township facility, or 143,325 tpy (130,000 Mtpy).
- Operating hours for the processes are 8,400 hr/yr. Some time is assumed for shutdown and maintenance. The tanks were assumed to be in use for 8,760 hr/yr.
- The 9 MMBtu/hr boiler will not operate full time as it will only be used in the event of a process shutdown. Calculations were completed using an annual usage of natural gas of 36 MMcf.
- The emergency generator will burn up to 2.8 MMcf of natural gas per year.
- Each fire pump will burn up to 4,600 gal/yr of diesel fuel.
- The removal efficiency of the thermal oxidizer, which controls the organic emissions from the process, is 99.9 percent (by weight).

Table 3-1 provides a summary of the maximum hourly and annual material throughput rates. Tables 3-2 and 3-3 provide summaries of the controlled and controlled annual emission rates and maximum hourly controlled emission rates the proposed operations, respectively. Table 3-4 provides a summary of the annual uncontrolled emission rates. Details of the emission calculations are provided in the remaining portions of this document.

TABLE 3-1
SUMMARY OF MAXIMUM HOURLY AND ANNUAL MATERIAL THROUGHPUT RATES

Emission Source	Maximum Throughput (lb/hr)	Maximum Throughput (tpy)
101 – Storage Tanks and Pumping Systems	200 gpm	194,558 tpy
102 – Pretreatment	33.1 ton/hr	194,558 tpy
103 – Sludge Treatment	1.1 ton/hr	3,300 tpy
104 – Flash Evaporation Distillation	33.1 ton/hr	194,558 tpy
105 – Biological Treatment	11 ton/hr	75,600 tpy
106 – Distillation	3,150 lb/hr	10,000 tpy
107 – Salt Concentration and Crystallization	1.4 ton/hr	5,500 tpy
108 – Lime Silo	1.225 ton/hr	7,409 tpy
109 – Sludge Silo	1.1 ton/hr	3,300 tpy
110 – Cooling Towers	30 MMBtu/hr	N/A
111 – Equipment Leaks	N/A	N/A
112 – Emergency Generator	1,000 kW	2.8 MMcf/yr
113 – Fire Pumps (2)	300 HP (each)	9,180 gal/yr
013 – Boiler	9 MMBtu/hr	36 MMcf/yr

TABLE 3-2
CONTROLLED ANNUAL EMISSION RATES
(TPY)

Emission ID-Source	**VOCs**	**PM**	**SO_x**	**NO_x**	**CO**	**HCl**
S01 – Total Controlled to Main Stack	7.88	8.45	24	21	32.61	6.3
108 – Lime Silo		0.04				
110 – Cooling Tower		1.85				
111 – Equipment Leaks	1.57					
031 – Boiler	0.099	0.137	0.011	0.900	1.512	
112 – Emergency Generator	0.50	0.014	0.0008	1.00	1.99	
113 – Fire Pumps	0.05	0.03	0.18	0.54	0.52	
TOTAL	10.1	10.5	24.2	23.4	36.6	6.3

Notes:
1) VOCs includes organic HAPs
2) PM includes inorganic HAPs
3) Total Controlled to Main Stack includes Source IDs 101 to 107 and 109
4) Process operations are based on 8,400 hr/yr, except that tanks are in use 8,760 hr/yr

TABLE 3-3
CONTROLLED MAXIMUM SHORT-TERM EMISSION RATES
(LB/HR)

Emission ID-Source	**VOCs**	**PM**	**SO_x**	**NO_x**	**CO**	**HCl**
S01 – Total Controlled to Main Stack	4.4	2.01	23.4	6.5	7.77	2.0
108 – Lime Silo		0.014				
110 – Cooling Tower		0.44				
111 – Equipment Leaks	0.36					
031 – Boiler	0.050	0.068	0.005	0.450	0.756	
112 – Emergency Generator	3.32	0.0949	0.0056	6.64	13.28	
113 – Fire Pumps	0.36	0.20	1.23	3.61	3.44	
TOTAL	8.49	2.83	24.64	17.2	25.25	2.0

Notes:
1) VOCs includes organic HAPs
2) PM includes inorganic HAPs
3) Total Controlled to Main Stack includes Source IDs 101 to 107 and 109

TABLE 3-4
UNCONTROLLED ANNUAL EMISSION RATES
(TPY)

Emission ID-Source	**VOCs**	**PM**	**SO_x**	**NO_x**	**CO**	**HCl**
S01 – Total Uncontrolled to Main Stack	7,883	18.9	24	47	32.61	630
108 – Lime Silo		8.1				
110 – Cooling Tower		1.85				
111 – Equipment Leaks	2.06					
031 – Boiler	0.099	0.137	0.011	1.80	1.51	
112 – Emergency Generator	0.50	0.014	0.0008	1.00	1.99	
113 – Fire Pumps	0.05	0.03	0.18	0.54	0.52	
TOTAL	7,885.7	29.0	24.2	50.3	36.6	630

Notes:

1) VOCs includes organic HAPs
2) PM includes inorganic HAPs
3) Total Uncontrolled to Main Stack includes Source IDs 101 to 107 and 109
4) Process operations are based on 8,400 hr/yr, except that tanks are in use 8,760 hr/yr

VOLATILE ORGANIC COMPOUND EMISSIONS

Volatile organic compounds (VOCs), including organic hazardous air pollutants (HAPs), are potentially emitted from storage tanks, flash evaporation distillation, and distillation unit operations. There will be negligible VOC emissions from pretreatment and sludge treatment (drying ovens), reactor vents, salt treatment (crystallizer), and biological treatment. All of this equipment vents to the thermal oxidizers for VOC and organic HAP control. When the flash evaporation distillation and thermal oxidizer are shut down due to process issues, the storage tanks and other vessels will be vented to a carbon filter.

VOC and organic HAP emissions are controlled by a common control devices and vent through a common stack. Elcon estimates that the peak organic loading to the oxidizer is 4,400 lb/hr, which is one of the key pieces of information for the basis of design for the thermal oxidizers. At the proposed VOC control efficiency of 99.9 percent, the proposed maximum outlet VOC emission rate is 4.40 lb/hr.

For information purposes, Elcon estimated the contribution of the major VOC-emitting units to the maximum hourly emission rates based on the following breakdown:

Emission Source	**Fraction of Maximum Hourly Emissions**
Tanks	Negligible
Flash Evaporative Distillation	0.345
Distillation	0.621
Sludge Ovens	0.016
Reactors	0.016
Salt Crystallization	Negligible
Biological Treatment	Negligible

Elcon is not seeking individual emission limits for each individual emission source. VOC and HAP emissions are provided in this section for information only.

Storage Tanks –

Emissions from storage tanks were estimated using U.S. EPA's TANKS software (Version 4.0.9d). Since the incoming liquid waste stream is variable, several worst-case assumptions were made to calculate the potential emissions. These assumptions include:

1. The typical organic content of the incoming waste stream is in the range of 20 to 80 percent, with the remaining portion being water. For the purposes of the Tanks calculations, 100 percent inlet loading of the pollutant was assumed.

2. It was assumed that all the incoming waste streams contain organic materials and the facility operates at full capacity (194,558 tpy).

3. TANKS needs to use a specific compound to calculate emissions. The most common VOC/HAP in the waste stream is methanol. Another common solvent is isopropyl alcohol.

4. There will be multiple storage tanks associated with the operations. Some tanks will contain inorganic liquids only. However, to allow for operational flexibility in the use of the storage tanks and to show worst-case calculations, it was assumed that all of the tanks will process organic materials and all of the liquid waste streams coming into the facility will contain organic compounds. All of the tanks will vent to the thermal oxidizer.

5. For simplicity, it was assumed that all of the liquid waste streams are cycled through one 136,000-gallon tank. This is the most common size of tank at the facility.

6. The tanks are maintained under negative pressure so the emissions are all vented to the thermal oxidizer.

Multiple TANK runs were made using methanol and isopropyl alcohol. The highest uncontrolled emissions were from methanol, which is 1.5 lb/hr and 6.7 tons per year (tpy). The TANKS printouts follow the text of this attachment (Appendix 3-B). The control efficiency of the thermal oxidizer is 99.9 percent; therefore, the controlled emission rate is 0.0015 lb/hr and 0.007 tpy. To account for potential alternate blends of organics with differing vapor pressures and the use of multiple tanks, Elcon assumed an uncontrolled VOC emission rate of 4.4 lb/hr (19.3 tpy), which yields controlled emissions of 0.004 lb/hr (0.02 tpy) for emissions from the tanks. The TANKS printouts are provided in Appendix 3-B.

Flash Evaporation Distillation

Based on a mass and energy balance of the Israeli facility, the anticipated average VOC emissions from the flash evaporation process are 217.5 kilograms/hour (kg/hr) or 478.5 lb/hr. Scaling from the operations in Israel to the proposed operations in Falls Township, the uncontrolled annual emissions are:

478.5 lb/hr x 194,558 tpy/143,325 tpy x 8,400 hr/yr x ton/2,000 lb = 2,728.1 tpy

The controlled annual and maximum hourly emissions are:

2,728.1 tpy x (1-0.999) = 2.73 tpy
4.40 lb/hr x 0.345 = 1.52 lb/hr (maximum)

Distillation –

Based on a mass and energy balance of the Israeli facility, the anticipated average VOC emissions from the distillation process are 391.5 kg/hr or 861.3 lb/hr. Scaling from the operations in Israel to the proposed operations in Falls Township, the uncontrolled annual emissions are:

861.3 lb/hr x 194,558 tpy/143,325 tpy x 8,400 hr/yr x ton/2,000 lb = 4,910.6 tpy

The controlled annual and maximum hourly emissions are:

4,910.6 tpy x (1-0.999) = 4.91 tpy
4.40 lb/hr x 0.621 = 2.73 lb/hr (maximum)

Drying Ovens –

Based on a mass and energy balance of the Israeli facility, the anticipated average VOC emissions from the drying ovens is 8.7 kg/hr or 19.14 lb/hr. Scaling from the operations in Israel to the proposed operations in Falls Township, the uncontrolled annual emissions are:

19.14 lb/hr x 194,558 tpy/143,325 tpy x 8,400 hr/yr x ton/2,000 lb = 109.1 tpy

The controlled annual and maximum hourly emissions are:

109.1 tpy x (1-0.999) = 0.11 tpy
4.40 lb/hr x 0.016 = 0.07 lb/hr (maximum)

There is also a natural gas-fired burner associated with this drying oven. Combustion product emissions are addressed in a later section of this attachment.

Reactor Vents –

Based on a mass and energy balance of the Israeli facility, the anticipated worst-case VOC emissions from the reactor vents is 8.7 kg/hr or 19.14 lb/hr. Scaling from the operations in Israel to the proposed operations in Falls Township, the uncontrolled annual emissions are:

19.14 lb/hr x 194,558 tpy/143,325 tpy x 8,400 hr/yr x ton/2,000 lb = 109.1 tpy

The controlled annual and maximum hourly emissions are:

109.1 tpy x (1-0.999) = 0.11 tpy
4.40 lb/hr x 0.016 = 0.07 lb/hr (maximum)

Equipment Leaks –

VOC emissions are estimated from equipment subject to 40 CFR Subpart BB which includes pumps, pressure relief valves, sampling connection lines, open-ended valves or lines, valves in gas/vapor or in light liquid service, and flanges. Emissions are estimated using EPA document EPA-453/R-95-017 and are provided in Table 3-5. Control efficiency is estimated using the type of control associated with each equipment. Additionally, some of the emissions from the equipment located in the process building will be pulled into the thermal oxidizers. The impact of emissions captured and controlled by the thermal oxidizers was not considered. The total uncontrolled VOC emissions from equipment leaks are 0.47 lb/hr, equal to 2.06 tpy. The total controlled emissions are 0.36 lb/hr or 1.57 tpy.

Other Negligible VOC Sources –

Salt treatment (crystallizer) and biological treatment also vent to the thermal oxidizer. The crystallizer operations are crystallizing inorganic salts, so negligible VOC and organic HAP emissions are anticipated. Biological treatment is the final "polishing" step of the wastewater prior to final discharge. Since most, if not all, of the VOCs have been removed in previous steps of the operation, negligible VOC and organic HAP emissions are anticipated from this step in the operation.

Table 3-5
Elcon Recycling -- Falls Township, PA
VOC Emissions from Equipment Subject to 40 CFR Subpart BB

Type of Equipment	ID Numbers	Max. Organic Content (%)	Material State	Proposed Method of Compliance	Correlation Equation[1]	Emission Factor[2]		Number	Uncontrolled Emissions[6]		Control Effectiveness[7]	Controlled Emissions	
					kg/hr per source	kg/hr/source	lb/hr/source		lb/hr	tpy		lb/hr	tpy
Storage Tank T-20357 Unloading through Thermal Oxidizer													
Light liquid pumps	P-23102, P-20358	70%	liquid	Visual inspection/LDAR[3]	Leak Rate = 1.9E-5 x $(SV)^{0.824}$	0.0004772	0.0010	2	0.0015	0.01	45%	0.0008	0.00
Gas/vapor pressure relief devices	PSV for H-203XX	70%	gas/vapor	LDAR	Leak Rate = 1.9E-5 x $(SV)^{0.824}$	0.0004772	0.0010499	1	0.0007	0.00	44%	0.0004	0.00
Sampling connection systems	1	70%	liquid	LDAR	Average Emission Factor	0.015	0.033	1	0.023	0.10	0%	0.0231	0.10
Open-ended valves or lines[4]	21	70%	various	LDAR	Average Emission Factor	0.0017	0.0037	21	0.0550	0.24	0%	0.0550	0.24
Gas/vapor or light liquid valves[4]	71	70%	various	LDAR	Leak Rate = 6.41E-6 x $(SV)^{0.797}$	0.0001449	0.0003	71	0.0158	0.07	61%	0.0062	0.03
Flanges[5]		70%			Leak Rate = 3.05E-6 x $(SV)^{0.885}$	9.725E-05	0.0002139	1200	0.1797	0.79	33%	0.1204	0.53
Storage Tanks T-23100 and T-23101 Unloading through FED Unit													
Light liquid pumps	P-23102, P-20358, P-20111, P-20114, P-23202, P-23204, P-23205, P-23207, P-20207A, P-20207B, P-20247, P-20208, P-20219, P-20425, P-20412, P-20413, P-20405	30%	liquid	Visual inspection/LDAR	Leak Rate = 1.9E-5 x $(SV)^{0.824}$	0.0004772	0.0010499	17	0.0054	0.02	45%	0.0029	0.01
Gas/vapor pressure relief devices	PSV for H-203XX, PSV-233221, PSV-204146	30%	gas/vapor	LDAR	Leak Rate = 1.9E-5 x $(SV)^{0.824}$	0.0004772	0.0010499	3	0.0009	0.00	44%	0.0005	0.00
Sampling connection systems	2	30%	liquid	LDAR	Average Emission Factor	0.015	0.033	2	0.02	0.09	0%	0.0198	0.09
Open-ended valves or lines[4]	60	30%	various	LDAR	Average Emission Factor	0.0017	0.00374	60	0.0673	0.29	0%	0.0673	0.29
Gas/vapor or light liquid valves[4]	252	30%	various	LDAR	Leak Rate = 6.41E-6 x $(SV)^{0.797}$	0.0001449	0.0003187	252	0.0241	0.11	61%	0.0094	0.04
Light liquid pressure relief devices	PSV-233232, PSV-233233	30%	liquid	LDAR	Leak Rate = 1.9E-5 x $(SV)^{0.824}$	0.0004772	0.0010499	2	0.0006	0.00	0%	0.0006	0.00
Flanges[5]		30%			Leak Rate = 3.05E-6 x $(SV)^{0.885}$	9.725E-05	0.0002139	1200	0.0770	0.34	33%	0.0516	0.23
									Total	**2.06**		**Total**	**1.57**

Where:
Annual Hours of Operation 8760
Screening Value (SV): 50 ppm

Note:

[1]Correlation equations are from EPA document Volume II: Chapter 4; November, 1996; Page 4.4-5; Table 4.4-3. Average emission factors are from the same document; Page 4.5-2; Table 4.5-1.

[2]Emission factors are calculated based on correlation equations or taken from average emission factors. Emission factor for flanges is assumed to be same as connectors.

[3]LDAR – leak detection and repair program.

[4]Not including check valves and valves on lines containing non-organic materials (e.g., plant, water, ultrafiltration water), nitrogen, and plant air.

[5]All flanges will not be subject to Subpart BB requirements because of the low organic content of some of the treatment process (e.g., pH neutralization).

[6]Uncontrolled Emissions = (Applicable average emission factor for the equipment type) x (Avg. wt. fraction of the organic compound in stream) x (Number of pieces of equipment).

[7]Contro effectiveness are from EPA document Volume II: Chapter 4; November, 1996; Page 4.2-10; Table 4.2-2; Quarterly Monitoring. Control effectiveness data not available in the table 4.2-2 are assumed 0%.

Summary of Controlled VOC Emissions –

The following is a summary of the controlled VOC emissions from the operations venting to the thermal oxidizers:

Emission Source	**Main Stack VOC Emissions**	
	lb/hr (Maximum)	**tpy**
Storage Tanks	Negl.	0.02
Flash Evaporation Distillation	1.52	2.73
Distillation	2.73	4.91
Drying Ovens	0.07	0.11
Reactor Vents	0.07	0.11
Salt treatment (crystallizer)	Negl.	Negl.
Biological Treatment	Negl.	Negl.
TOTAL (VOC, including Organic HAPs)	4.4	7.88

Emission test data using U.S. EPA Reference Method 25A from the Israeli facility show that actual emissions from the facility's air pollution control devices are approximately 0.1 lb/hr and 0.4 tpy during normal operations. Elcon is proposing an allowable emission rate for VOC and organic HAPs of 4.40 lb/hr from the Main Stack. Therefore, even adjusting for the differences in the production rates, and assuming worst-case emission conditions, Elcon will be able to achieve the proposed emission limits for VOCs.

PARTICULATE MATTER EMISSIONS

There are potential particulate matter emissions from lime handling silo, sludge handling silo, material handling in the sludge area, the sludge ovens, salts handling, and the cooling towers. There may be trace amounts of metal HAPs with the particulate matter emissions from the process related emission units. Lime handling silo baghouse and the cooling tower will exhaust directly to the atmosphere; the remaining emission sources will exhaust through the thermal oxidizer stack.

Lime Handling Silo –

Lime handling will be controlled by a bin vent on the lime silo and will vent to the atmosphere after filtration as a standalone source. Emissions for total suspended particulate matter, PM_{10} and $PM_{2.5}$ were estimated using U.S. EPA emission factors in AP-42 (*Compilation of Air Pollutant Emission Factors*) on Table 11.17-4 for filterable particulate matter from uncontrolled lime transfer and conveying. There are no emissions factors for PM_{10} or $PM_{2.5}$ size fractions.

Emissions calculations are shown below:

Emission Factor:	2.2 lb/ton
Lime Throughput:	7,409 tpy
	1.225 ton/hr (maximum)
Operating Hours:	8,400 hr/yr

Uncontrolled emissions:

2.2 lb/ton x 7,409 ton/yr x 1 ton/2,000 lb = 8.1 tpy

2.2 lb/ton x 1.225 ton/hr = 2.7 lb/hr (maximum)

Baghouse Efficiency: 99.5%

Controlled Emissions:

8.1 ton/yr x (1-0.995) = 0.04 tpy

2.7 lb/hr x (1-0.995) = 0.014 lb/hr

Controlled Concentration:

0.014 lb/hr x hr/60 min x min/265 ft^3 x 7,000 gr/lb = 0.006 gr/dscf

Sludge Handling Silo –

Dried sludge handling will be controlled by a bin vent on the sludge silo, but this source will vent to main air pollution control system. Emissions for total suspended particulate matter were estimated using U.S. EPA emission factors in AP-42 (*Compilation of Air Pollutant Emission Factors*) on Table 11.17-4 for filterable particulate matter from uncontrolled lime transfer and conveying. Although this emission factor is not specifically for sludge handling, it should provide reasonable estimate of emissions from the sludge silo. There are no emissions factors for PM_{10} or $PM_{2.5}$ size fractions. Elcon is not seeking an individual emission limit for this source but is simply documenting compliance with the Department's applicable grain loading requirement of 0.04 gr/dscf.

Emissions calculations are shown below:

Emission Factor: 2.2 lb/ton
Sludge Throughput: 0.4 ton/hr
1.1 ton/hr (maximum)
Operating Hours: 8,400 hr/yr
Uncontrolled emissions:
2.2 lb/ton x 0.4 ton/hr x 8,400 hr/yr x ton/2,000 lb = 3.70 tpy
2.2 lb/ton x 1.1 ton/hr = 2.42 lb/hr (maximum)
Baghouse Efficiency: 99.5%
Controlled Emissions:
2.42 lb/hr x (1-0.995) = 0.01 lb/hr (maximum)
3.70 tpy x (1-0.995) = 0.02 tpy
Controlled Concentration:
0.01 lb/hr x hr/60 min x min/294 ft^3 x 7,000 gr/lb = 0.004 gr/dscf

Sludge Processing/Salts Handling –

There are two ovens (natural gas fired oven and electric heater) in the sludge processing area. Both ovens are controlled by cyclones, which are integral to the operation of the units followed, by a common venturi scrubber. The venturi scrubber then vents to the main air pollution control system. There will be some fugitive emissions from handling of materials in the sludge processing area, which will be controlled by a baghouse, primarily to reduce nuisance dust emissions for employees working in this area. This baghouse will also vent to the main air pollution control system. The salts handling operation will generate dust also from handling of materials. The emissions will be vented through the main air pollution control system. Elcon is not seeking an individual emission limit for these sources but is simply documenting compliance with the Department's applicable grain loading requirement of 0.04 gr/dscf.

Table 3-6 provides emission estimates for material handling calculated using AP-42 Section 13.2.4. These emissions are low and will be well below the proposed BAT of 0.01 gr/dscf as shown below:

Controlled Concentration – Sludge Processing:
2.13E-07 lb/hr x hr/60 min x min/647 ft^3 x 7,000 gr/lb = 3.8E-08 gr/dscf

Controlled Concentration – Salt Handling:
2.66E-07 lb/hr x hr/60 min x min/589 ft^3 x 7,000 gr/lb = 5.3E-08 gr/dscf

There are no published emission factors available for the actual drying operations, which is probably a larger source of emissions in these process areas. Based on emission testing at the oxidizer at the facility in Israel using U.S. EPA Reference Method 5, emissions during normal operations are estimated to be less than 0.25 lb/hr. Emissions from this source will exhaust through the main air pollution control train; an individual limit is not proposed.

Table 3-6
Estimated Particulate Matter Emissions from Processes Material Handling
Elcon Recycling, Falls Township, PA

	Sludge Processing				Salts Handling			
	Uncontrolled Emissions		Controlled Emissions		Uncontrolled Emissions		Controlled Emissions	
Parameter	**lb/hr (Max)**	**tpy**	**lb/hr (Max)**	**tpy**	**lb/hr (Max)**	**tpy**	**lb/hr (Max)**	**tpy**
Total Suspended Particulate Matter	4.25E-05	7.14E-05	2.13E-07	3.57E-07	5.33E-05	7.14E-05	2.66E-07	3.57E-07
PM_{10}	2.01E-05	3.38E-05	1.01E-07	1.69E-07	2.52E-05	3.38E-05	1.26E-07	1.69E-07
$PM_{2.5}$	3.05E-06	5.12E-06	1.52E-08	2.56E-08	3.81E-06	5.12E-06	1.91E-08	2.56E-08

Where:

Sludge processing throughput:	880	lb/hr (dry, average)
	2200	lb/hr (dry, maximum)
Salts handling throughput:	1,838	lb/hr (dry, average)
	2,756	lb/hr (dry, maximum)
Efficiency of sludge area baghouse:	99.5%	
Efficiency of salts handling system:	NA	uncontrolled
Operating hours:	8,400	hr/yr
For material handling (from AP-42 Section 13.2.4):		
Aerodynamic particle multiplier:	0.74	(for total suspended particulate matter)
	0.35	(for PM_{10})
	0.053	(for $PM_{2.5}$)
Windspeed:	0.1	mph (indoors)
Moisture:	1.00	%
Uncontrolled Emission Factor:	3.87E-05	lb/ton for total suspended particulate matter
	1.83E-05	lb/ton for PM_{10}
	2.77E-06	lb/ton for $PM_{2.5}$

Emission Factor Equation:

E = k x (0.0032) x (U/5)^1.3 /(M/2)^1.4

E = emission factor, lb/ton

k = particle multiplier, unitless, see above

U = mean wind speed, mile/hr

M = moisture content, %

Main Stack Emissions

Elcon is proposing an emission limit of 0.01 gr/dscf for PM emissions from the Main Stack. This will cover all of the PM emissions venting to this stack. Based on the operating air flow rate of 41,194 scfm and a moisture content of 43 percent, the mass emission rates are as follows:

0.01 gr/dscf x (41,194 scf x (1-0.43)) scf/min x 60 min/hr x lb/7,000 gr = 2.01 lb/hr
2.01 lb/hr x 8,400 hr/yr x ton/2,000 lb = 8.45 tpy

Testing for metal HAPs was also conducted at the Israeli facility using U.S. EPA Reference Method 29. The actual emissions are summarized on Table 3-7. This table also provides an estimate for the Falls Township facility. Effectively, the actual emissions from the Israeli facility were multiplied by a safety factor to account for possible variations in the liquid waste streams processed and production rates. These emission rates are provided for information purposes. Elcon is not seeking HAP limits other than to remain a minor source for HAPs.

Cooling Tower –

PM_{10} emissions from the cooling tower were estimated using an AP-42 emission factor Table 13.4-1. The airflow rate was calculated as shown on Table 3-8. The emission calculations are shown below (TDS is total dissolved solids):

Emission Factor:	0.019 lb/1,000 gal at TDS of 12,000 ppm
Estimated TDS:	1,000 ppm
Adjusted Emission Factor:	0.0016 lb/1,000 gal
Normal operating capacity:	2,300,000 lb/hr water flow
	4,596 gal/min
Operating Hours:	8,400 hr/yr

Estimated Emissions:

0.0016 lb/1,000 gal x 4,596 gal/min x 60 min/hr = 0.44 lb/hr
0.44 lb/hr x 8,400 hr/yr x ton/2,000 lb = 1.85 tpy

Table 3-7
Summary of Stack Test Data for Metals
Elcon, Israel

Pollutant	HAP?	Israeli Facility RTO Emission Rate			Falls Township Estimated Emission Rate	
		g/hr	lb/hr	tpy	lb/hr	tpy
Ag	No	< LOD	< LOD	< LOD	< LOD	< LOD
Al	No	1.983	0.0044	0.0183	0.0874	0.3669
As	Yes	< LOD	< LOD	< LOD	< LOD	< LOD
Be	Yes	< LOD	< LOD	< LOD	< LOD	< LOD
Cd	Yes	< LOD	< LOD	< LOD	< LOD	< LOD
Co	Yes	< LOD	< LOD	< LOD	< LOD	< LOD
Cr	Yes	0.972	0.0021	0.0090	0.0428	0.1798
Cu	No	0.994	0.0022	0.0092	0.0438	0.1839
Fe	No	1.049	0.0023	0.0097	0.0462	0.1941
Hg	Yes	0.092	0.0002	0.0009	0.0041	0.0170
Li	No	1.005	0.0022	0.0093	0.0443	0.1859
Mn	Yes	0.494	0.0011	0.0046	0.0218	0.0914
Mo	No	< LOD	< LOD	< LOD	< LOD	< LOD
Ni	Yes	0.967	0.0021	0.0089	0.0426	0.1789
Pb	Yes	< LOD	< LOD	< LOD	< LOD	< LOD
Sb	Yes	< LOD	< LOD	< LOD	< LOD	< LOD
Se	Yes	< LOD	< LOD	< LOD	< LOD	< LOD
Sn	No	0.994	0.0022	0.0092	0.0438	0.1839
Sr	No	0.967	0.0021	0.0089	0.0426	0.1789
Ti	No	< LOD	< LOD	< LOD	< LOD	< LOD
Te	No	< LOD	< LOD	< LOD	< LOD	< LOD
Tl	No	< LOD	< LOD	< LOD	< LOD	< LOD
V	No	0.961	0.0021	0.0089	0.0423	0.1778
Zn	No	2.032	0.0045	0.0188	0.0895	0.3760

Where:
< LOD = less than the Limit of Determination

Test Methods -

EPA Reference Method 29 for all metal HAPs except Mercury.
EPA Reference Method 101-a is used for Mercury.

Annual operating hours: 8,400 hr/yr
Israeli facility is half the size of the Falls Twp facility.
Emission factor is doubled and also safety factor is used.
"Safety" Factor for converting
Israeli rates to Falls Twp. : 10

TABLE 3-8

COOLING TOWER AIR FLOW RATE CALCUALTIONS

Heat balance for tower:		
Assumptions		
Air temperature	93	F
Relative humidity	46%	
Wet bulb temperature	76	F
Moisture content - specific humidity	0.0153	lb/lb dry air
Air specific volume	14.278	ft^3/lb dry air
Expected tower operations:		
Inlet water temperature	95	F
Discharge water temperature	85	F
Approach to wet bulb	9	F
Assumed air leaving temperature	95	F
Relative humidity	98%	
Moisture content - specific humidity	0.0358	lb/lb dry air
Air specific volume	14.791	ft^3/lb dry air
Added water per lb dry air	0.0205	lb/lb dry air
Sensible heat added	0.494	BTU/lb dry air
Heat of vaporization of water at 95 F	1,040	BTU/lb water
Cooling due to water vaporization	21.31	BTU/lb dry air
So total cooling per lb dry air is	21.81	BTU/lb dry air
To cool	23,000,000	BTU/hr
	1,054,727	lb dry air/hr
Exhaust volume	15,600,349	acfh
	260,006	acfm
Water flow rate	2,300,000	lb/hr
	4,596	gpm
Dry flow	234,384	dscfm

SULFUR OXIDES

Emissions of sulfur oxides (SO_x) may be emitted during the processing of the liquid waste streams as sulfur compounds may be present in some of the incoming liquid waste streams. As the sulfur-containing compounds are burned in the thermal oxidizer, the sulfur compounds can oxidize to SO_x.

Elcon is proposing an average SO_x limit of 5.7 lb/hr for the Falls Township facility to account for variations in liquid waste streams and production rate differences and a maximum emission concentration of 100 ppm, which is well below the Department's 500 ppm SO_2 limit,

Based on 8,400 hr/yr of operation, the annual SO_x emission rate is 24 tpy. The maximum hourly SO_x emission rate from the Main Stack is calculated as follows:

Airflow:	23,481 dscfm
Maximum concentration:	100 ppmvd
SO_x molecular weight:	64 lb/mole
Maximum emission rate:	

100 parts/1,000,000 parts x 60 min/hr x 23,491 dscfm x 64 lb/mole ÷ 385.3 cf/mole = 23.4 lb/hr

OXIDES OF NITROGEN

Emissions of NO_x may be emitted during the processing of the liquid waste streams as nitrogen compounds may be present in some of the incoming liquid waste streams. As the nitrogen-containing compounds are burned in the thermal oxidizers, the nitrogen compounds can oxidize to NO_x.

Based on a mass balance of the Israeli facility, the anticipated average NO_x emissions from the main stack exhaust are 5 lb/hr. At 8,400 hr/yr of operations, this is 21 tpy. To account for the potential variation in nitrogen loading, maximum hourly emissions could be up to 30 percent higher or 6.5 lb/hr.

Based on testing of the operations in Israel using U.S. EPA Reference Method 7D, nitrogen oxide emissions are less than 3.4 lb/hr. Elcon is proposing a maxium NO_x limit of 6.5 lb/hr for the Falls Township facility to account for variations in liquid waste streams and production rate differences. Elcon will use NO_x controls (urea injection), as needed, to meet the proposed emission limit.

ACID GASES

Elcon anticipates that acid gases (e.g., hydrochloric acid (HCl)) will form during the thermal oxidizer combustion process. A packed tower scrubber will be used to reduce HCl and other acid gas emissions. A small amount of acid gases will also be generated from the sludge drying ovens, which will also be controlled by the packed tower scrubber system.

Emission testing at the Israeli facility using U.S. EPA Reference Method 26A showed average controlled HCl emissions of approximately 0.16 lb/hr. To account for differences in the Israeli

operations and the proposed Falls Township operation and fluctuations in the waste streams, Elcon is proposing an maximum HCl controlled emission rate of 2.0 lb/hr and an annual limit of 6.3 tpy. The estimated control efficiency of the packed tower is 99 percent, yielding an estimated inlet loading to the packed tower scrubber of 200 lb/hr (maximum) and 630 tpy at 8,400 hr/yr.

Emission testing for hydrogen fluoride (HF) and hydrogen bromide (HBr) was also conducted at the Israeli facility using U.S. EPA Reference Method 26A. The test results were below the limit of determination (less than 0.02 lb/hr) for HF and typically below the limit of determination (0.02 lb/hr) for HBr. Since HF and HBr emissions are *de minimus*, Elcon proposes to use HCl as a surrogate for acid gas control for the proposed Falls Township facility.

AMMONIA

Ammonia emissions can also be formed during the treatment process due to ammonia-containing liquid waste or potential slips in the NO_x control system. Testing at the Israeli facility, which uses NO_x controls less frequently, shows emissions of 0.18 lb/hr during normal operations using U.S. EPA Conditional Test Method (CTM) CTM-027. Elcon is proposing an ammonia emission rate of 1 lb/hr (maximum), and an annual emission rate of 3.15 tpy (at 8,400 hr/yr) to account for the differences in production rate and the use of the NO_x control system.

Additionally, the estimated concentration of ammonia, including processing of ammonia–containing liquids, in the thermal oxidizer exhaust is low:

Airflow: 23,481 dscfm
Hourly emissions: 1 lb/hr (maximum)
NH_3 molecular weight: 17 lb/mole
Concentration:
1 lb/hr x 385.3 ft^3/mole ÷ 17 lb/mole ÷ 23,481 dscfm ÷ 60 min/hr x 1,000,000 = 16 ppm

EMISSIONS FROM COMBUSTION

There are natural gas-fired burners associated with the process equipment and a 9 MMBtu/hr natural gas-fired boiler. There are 70 MMBtu/hr burners on each of the thermal oxidizers, although, the maximum firing rate of the combined burners will 90 MMBtu/hr. There is also a 2.5 MMBtu/hr burner on sludge Oven No. 1. Since these emission sources vent through the main stack, emissions for pollutants, except for carbon monoxide, are already addressed above. However, for information purposes, the emissions from combustion of natural gas are provided in Table 3-9. Emissions were calculated using AP-42 emission factors.

There is a 1,000-KW natural gas-fired emergency generator to support the facility operations. The engine will be subject to the emission limits in Table 1 of NSPS Subpart JJJJ. Emissions are estimated using NSPS JJJJ limits and AP-42 emission factors and the details are provided in Table 3-10.

Finally, there are two 300-hp diesel fuel-fired fire pumps for emergency situations. The units will be subject to the emission limits on Table 4 of NSPS Subpart IIII. Emissions were estimated using the NSPS limits and AP-42 emission factors. The calculations are provided on Table 3-11.

GREENHOUSE GASES

Greenhouse Gas (GHG) emissions will occur during the combustion process in the thermal oxidizers, sludge oven, and 9 MMBtu/hr boiler. Table 3-12 shows GHG calculations for the facility. Emissions were estimated using factors and other information provided in 40 CFR Part 98, the Mandatory Greenhouse Gas Reporting Rule, although the facility will not be subject to this rule.

Table 3-9
Estimated Combustion Products Emissions
Elcon Recycling, Falls Township, PA

Pollutant	Emission Factor (lb/MMcf)	Sludge Oven No. 1		Thermal Oxidizer		Boiler		Total Oxidizer Stack	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
NO_x [2]	100	0.246	1.034	4.050	17.010	-	-	4.296	18.044
NO_x (for Boiler)	50	-	-	-	-	0.450	0.900		
CO	84	0.207	0.869	7.560	31.752	0.756	1.512	7.767	32.621
Total PM	7.6	0.019	0.079	0.684	2.873	0.068	0.137	0.703	2.951
SO_2	0.6	0.001	0.006	0.054	0.227	0.005	0.011	0.055	0.233
VOC	5.5	0.014	0.057	0.495	2.079	0.050	0.099	0.509	2.136

Where:

Sludge dryer burner size:	50	kg/hr natural gas
Density of natural gas:	0.717	kg/m3
Heat content of natural gas:	1000	Btu/ft3
Calculated size of sludge dryer burner:	2.5	MMBtu/hr
Size of thermal oxidizer burners (normal operations):	90.0	MMBtu/hr
Size of Boiler	9.0	MMBtu/hr
Oven & oxidizer operating hours per year:	8400	hr/yr
Boiler operating hours per year:	4000	hr/yr

Notes:

[1] Emission factors from AP-42 Tables 1.4-1 and 1.4-2, July 1998

[2] Average SNCR efficiency of 55% is used for estimating NO_x emissions from combustion of natural gas in thermal oxidizer.

Table 3-10
Estimated Emissions - 1000 KW Emergency Generator (Natural Gas)
Elcon Recycling, Falls Township, PA

Generator Output	1,000	KW
Engine Output	1,506	HP
Operating Hours Per Year	300	Hours
Natural Gas Input Rate	9300.65	ft^3/hr
Heating Value Natural Gas	1020	Btu/ft^3
Fuel Consumption Rate	9.487	MMBtu/hr
KW	1.34	HP
KW	56.92	Btu/min

	Emission Standards from NSPS Subpart JJJJ (g/hp-hr) (1)	lb/hr	ton/yr
NO_x	2	6.64	1.00
CO	4	13.28	1.99
VOC	1	3.32	0.50

	Emission Factor (lb/MMBtu) (2)	lb/hr	ton/yr
SO_2	5.88E-04	0.0056	0.0008
PM	1.00E-02	0.0949	0.0142
HAP (3)	0.077	0.7305	0.1096

Notes:

(1) Emission standards from NSPS Subpart JJJJ, Table 1.

(2) Emissions Factors are taken from AP-42 Table 3.2-2 Uncontrolled Emission Factors for 4-stroke Lean Burn Engines.

(3) Sum of all HAP compounds as specified in AP-42, Table 3.2-2.

(4) Efficiency is assumed as 36 % to estimate fuel consumption rate.

(5) Annual emissions are based on an operating schedule of 300 hr/yr.

Table 3-11
Estimated Emissions - Two 300 HP Fire Pump Engines (Diesel Fuel)
Elcon Recycling, Falls Township, PA

Engine Output (Each)	300	HP
Number of Engines	2	Number
Operating Hours Per Year[5]	300	Hours
Heating Value Diesel Fuel	137,000	Btu/gal
Fuel Consumption Rate[4]	2.121	MMBtu/hr
Diesel Fuel Input Rate	15.48	gal/hr
HP	42.42	Btu/min

	Emission Standards from NSPS Subpart IIII (g/hp-hr)[1]	lb/hr	ton/yr
NO_x	2.73	3.61	0.54
CO	2.6	3.44	0.52
PM	0.15	0.20	0.03
VOC	0.27	0.36	0.05

	Emission Factor lb/MMBtu[2]	lb/hr	ton/yr
SO_2	0.29	1.2302	0.1845
HAP[3]	3.79E-03	0.0161	0.0024

Notes:

[1] Emission standards from NSPS Subpart IIII, Table 4.

[2] Emissions Factors are taken from AP-42 Table 3.3-1 Emission Factor for Uncontrolled Diesel Industrial Engines.

[3] Sum of all HAP compounds as specified in AP-42, Table 3.3-2 Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines.

[4] Efficiency is assumed as 36 % to estimate fuel consumption rate.

[5] Annual emissions are based on an operating schedule of 300 hr/yr.

Table 3-12
Elcon Recycling -- Falls Township, PA
Potential Greenhouse Gas Calculations

Combustion Sources:	Burner Size	Annual Operating Hours	Natural Gas
Equipment	MMBtu/hr		scf/year
Thermal oxidizer burners (normal operations)	90	8400	736,842,105
Sludge dryer burner	2.5	8400	20,467,836
Boiler	9		36,000,000
Total Volume of Natural Gas combusted (scf)			**793,309,942**

Where:

Heat content natural gas (from 40 CFR Part 98) 1.026E-03 MMBtu/scf

* Emergency Generator do not count because it is used for emergency use, or testing/maintenance only as allowed under 40 CFR 98.30(b)(2).

Emissions Evaluation:

Methodology: The fuel usage was based the rated capacity of the unit and worst-case fuel.
CO_2e (CO_2 equivalent) calculations were made for emissions of CO_2, N_2O and CH_4 (see below)
CO_2e emissions were based on the formula provided in 40 CFR 98.2 and 98.33, Table A-1

CO_2e Emissions (metric tons) = (1 x 10-3 metric ton/kg x Fuel [mmBtu] x HHV x EF) X (GWP)
Where, HHV = Default high heat value of the fuel, from Table C-1 to Subpart C to Part 98 of the Rule, in MMBtu per scf
EF = Fuel-specific default CO_2 emission factor, from Table C-1 or C-2 to Subpart C to Part 98 of the Rule.
GWP = Global Warming Potential, gas-specific (Table A-1 to Subpart A of Part 98)
GWP of CO_2= 1
GWP of N_2O= 298
GWP of CH_4= 25

Natural Gas CO_2e Emissions:
Equation: CO_2 (metric tons) = 1 x 10-3 metric ton/kg x 793,309,942 scf x 1.026 x 10-3 mmBtu/scf x 53.06 kg CO2/mmBtu
Calculation: CO_2 (metric tons) = 43,187
Calculation: CO_2e CO_2 (metric tons) = 43,187

Equation: N_2O (metric tons) = 1 x 10-3 metric ton/kg x 793,309,942 scf x 1.026 x 10-3 mmBtu/scf x 1.0x10-4 kg N2O/mmBtu
Calculation: N_2O (metric tons) = 0.081
Calculation: CO_2e N_2O (metric tons) = 24.26

Equation: CH_4 (metric tons) = 1 x 10-3 metric ton/kg x 793,309,942 scf x 1.026 x 10-3 mmBtu/scf x 1.0x10-3 kg CH4/mmBtu
Calculation: CH_4 (metric tons) = 0.814
Calculation: CO_2e CH_4 (metric tons) = 20.3

Total CO_2e Emissions (metric tons): 43,232
47,655 short tons

APPENDIX 3-A

STACK SAMPLING REPORTS FROM ISRAELI FACILITY

מעבדות אקולוגיה אפ.בע"מ
החברה הארצית לבדיקות ושירותי איכות הסביבה
רח' הפרת 2, יבנה. ת.ד. 13337, מיקוד 81227.
טל: 08-9322115, פקס: 08-9322116, נייד:052-2333061,
E-mail :eco_lab2@yahoo.com

בדיקות פליטת מזהמים
ארובה. דו"ח תוצאות
R-330-1A-1116 .מס

מפעל: אלקון, מרכז מיחזור בע"מ

ישוב: אתר - נאות חובב.

אחראי במפעל: יוסי מטארסו

מחוז: חיפה

זיהוי הארובה: ארובת TO (ארובה מס. 1). בדיקות טכנולוגיות.
סט מס. 1a (ללא דיאוקסינים ופורנים).
מספר מזהה:

תאריך ביצוע הבדיקות: 28/11/2016

תאריך הדפסת הדו"ח: 26/12/2016

הבדיקות בוצעו ע"י: ולדימיר סבירידנקו

מיכאל מלניצ'נקו

סטניסלאב סובולב

עורך הדו"ח: אלכסיי סמירנוב

הדו"ח אושר ע"י: אלכסיי רטנר מנכ"ל

ISRAC הרשות הלאומית להסמכת מעבדות
ISO/IEC 17025
No. 093 מס
ilac-MRA

דו"ח הבדיקות.

המפעל.

שם המפעל:..... אלקון, מרכז מיחזור בע"מ
כתובת המפעל:..... אתר - נאות חובב.
איש הקשר במפעל:..... יוסי מטארסו
טלפון:.....
פקס:.....
מחוז:..... חיפה

הערות המפעל.

טבלת נתוני ארובה:

זיהוי הארובה	גובה הארובה מ'	סוג הדלק ותכולת גפרית	צריכת הדלק ק"ג שעה	מתקני טיפול	מתקני ניטור	הערות
TO ארובה סופית ארובה 1	כ- 30	גז		TO C-20370 סקרבר C-20390	גלאיי גזים	

החברה הבודקת:

שם החברה:..... מעבדות אקולוגיה א.פ. בע"מ.
כתובת:..... רח' הפרת 2, יבנה. ת.ד. 13337, מיקוד 81227.
טלפון:..... 08-9322115
פקס:..... 08-9322116
נייד:..... 052-2333061
שמות אנשי הצוות שבוצעו את הבדיקה:..... ולדימיר סבירידנקו
מיכאל מלניצ'נקו

הערות הבודק:

מטרת הבדיקות:..... קביעת פליטות מזהמים בארובה
הבדיקות בוצעו לפי:..... דרישת הלקוח
הבדיקות בוצעו בתאריך:..... 28/11/2016
תחילת הבדיקות בשעה:..... 08:33-10:35 10:49-11:28 11:50-12:40 08:25-08:55
08:57-09:27 09:30-10:00 10:01-10:31 10:45-11:15
מקום הבדיקה:..... ארובת TO (ארובה מס. 1). בדיקות טכנולוגיות.
סט מס. 1a (ללא דיאוקסינים ופורנים).
מספר מזהה:
הערות כלליות:..... 1. יש להתייחס למסמך זה במלואו ואין להשתמש בחלק ממנו ללא אישור המעבדה.
2. התוצאות המפורטות בדו"ח משקפות את פליטות הארובה בתאריך ובשעות הבדיקה שמצויינים בדו"ח זה בלבד.

טבלת תוצאות:

ספיקת הגז בארובה מק"ת / שעה	ריכוזים: קצב פליטה ק"ג / שעה	הערות	ריכוז מנורמל ** מ"ג / מק"ת	אחוז חמצן לנירמול אחוז נפחי	ריכוז תנאים תקניים (0 oC) מ"ג / מק"ת	ppm *	אחוז חמצן הנמדד אחוז נפחי	קבוצת סיווג ע"פ TA-LUFT 2002	דיגום ואנליזה: שיטת אנליזה	שיטת דגימה	המזהם	תנאים בארובה: תכולת מים בארובה אחוז נפחי	סמפרטורה בארובה o C	המתקנים המחוברים לארובה: עובדים בו זמנית	פרוס המתקנים	שם הארובה
13,999	Metals											43.7	79.0	1	TO	TO
	0.00051	< LOD	לא רלוונטי	לא רלוונטי	0.036	-----	6.87	C-I	ICP	EPA-29	As			סט	C-20370	ארובה
	0.00048	< LOD	לא רלוונטי		0.035	-----		C-I	ICP	EPA-29	Cd			1a	סקרבר	סופית
	0.00048	< LOD	לא רלוונטי		0.035	-----		IPM-II	ICP	EPA-29	Co				C-20390	ארובה 1
	0.00097		לא רלוונטי		0.069	-----		IPM-III	ICP	EPA-29	Cr					
	0.00099		לא רלוונטי		0.071	-----		IPM-III	ICP	EPA-29	Cu					
	0.00049		לא רלוונטי		0.035	-----		IPM-III	ICP	EPA-29	Mn					
	0.00097		לא רלוונטי		0.069	-----		IPM-II	ICP	EPA-29	Ni					
	0.00097	< LOD	לא רלוונטי		0.069	-----		IPM-II	ICP	EPA-29	Pb					
	0.00098	< LOD	לא רלוונטי		0.070	-----		IPM-III	ICP	EPA-29	Sb					
	0.00098	< LOD	לא רלוונטי		0.070	-----		IPM-II	ICP	EPA-29	Se					
	0.00099		לא רלוונטי		0.071	-----		IPM-III	ICP	EPA-29	Sn					
	0.00194	< LOD	לא רלוונטי		0.138	-----		IPM-II	ICP	EPA-29	Te					
	0.00098	< LOD	לא רלוונטי		0.070	-----		IPM-I	ICP	EPA-29	TL					
	0.00096		לא רלוונטי		0.069	-----		IPM-III	ICP	EPA-29	V					
15,267	Mercury											44.8	80.0			
	0.000092	< LOD	לא רלוונטי	לא רלוונטי	0.0060	-----	6.87	IPM-I	AACV	EPA-101a	Mercury					

טבלת תוצאות:

ספיקת הגז בארובה מק"ת / שעה	ריכוזים: קצב פליטה ק"ג / שעה	הערות	ריכוז מנורמל ** מ"ג / מק"ת	אחוז חמצן לנירמול אחוז נפחי	ריכוז תנאים תקניים (0 oC) מ"ג / מק"ת	ריכוז * ppm	אחוז חמצן הנמדד אחוז נפחי	קבוצת סיווג ע"פ TA-LUFT 2002	דיגום ואנליזה: שיטת אנליזה	שיטת דגימה	המזהם	תנאים בארובה: תכולת מים בארובה אחוז נפחי	סמפרטורה בארובה o C	המתקנים המחוברים לארובה: פרוט המתקנים	עובדים בו זמנית	שם הארובה
13,999	SO2, NOx, TOC, Benzene, CO											43.7	79.0	TO C-20370 סקרבר C-20390	1 טס 1a	TO ארובה סופית ארובה 1
	0.0213	< LOD	לא רלוונטי	לא רלוונטי	1.52	-----	6.87	IG-IV	Titration	EPA-6	SO2					
	0.5006	< LOD	לא רלוונטי		35.8	-----		IG-IV	IC	EPA-7d	NOx					
	0.3975	< LOD	לא רלוונטי		0.40	-----		CS-III	GC	EPA-18 (VOST)	Benzene					
	0.0481		לא רלוונטי		3.17	-----		OS-III	FID	EPA-25a	TOC as Carbon					
	0.1488		לא רלוונטי		9.8	-----		-----	Analyser	EPA-3a	CO					
	VOC Screening															
	0.0037		לא רלוונטי	לא רלוונטי	0.27	-----	6.87	-----	GC-MS	EPA-18 (VOST)	1,2-PropaneDiol					
	0.0037		לא רלוונטי		0.27	-----		-----	GC-MS	EPA-18 (VOST)	Total VOC					
15,196	PM, HCL, HBR, HF, NH3											45.0	80.7			
	0.0651		לא רלוונטי	לא רלוונטי	4.28	-----	6.87	-----	Grav.	EPA-5	Total Dust					
	0.0211		לא רלוונטי		1.39	-----		IG-III	IC	EPA-26a	HCl					
	0.0052	< LOQ	לא רלוונטי		0.34	-----		IG-II	IC	EPA-26a	HBr					
	0.0054	< LOQ	לא רלוונטי		0.36	-----		IG-II	IC	EPA-26a	HF					
	0.1179		לא רלוונטי		7.76	-----		IG-III	Sp-Ph	EPA-CTM-027	NH3					

<u>הערות:</u> 1. ריכוזים מחושבים בתנאים תקניים (גז יבש, לחץ אטמוספרי, 0 מעלות צלסיוס).
תוצאות TOC מחושבות כ- CARBON.
תוצאות VOC מחושבות כ- XYLENE.
2. "< LOD" = נמוך מסף הגילוי של האנליזה.
"< LOQ" = נמוך מסף הכימות של האנליזה.
3. * = במדידה באמצעות מכשיר ניטור
4. ** = במידה ויש צורך

נתוני הסביבה:

טמפרטורת סביבה (oC):..... ***14***

לחות יחסית (%):..... ***73***

לחץ ברומטרי (mm Hg):..... ***716***

נקודת הדגימה:

קוטר הארובה בחתך הדגימה, (m):..... **1.00**

מספר פתחי דגימה בחתך הדגימה..... **2 ("4, בניצב, שולחנות דגימה).**

מרחק מההפרעה האחרונה עד חתך הדגימה..... **יותר מ- 8 קוטרי ארובה**

מרחק מחתך הדגימה עד ההפרעה הבאה..... **יותר מ- 2 קוטרי ארובה**

עורך צינור דגימה, (m):..... **1.20**

הערות: הכנסת צנור דגימה לתוך הארובה בוצעה באופן ישיר.

ביצוע הדגימה:

פרופיל מהירויות בארובה:

קוטר הארובה בחתך הדגימה, (m):..... **1.00**

אורך הפלאנץ' (m):..... **0.21** **0.19**

תכולת המים המשוערת (%):..... **40.0**

לחץ סטטי בארובה מ"מ מים	שורש מרובע מ- d Pi	הפרש לחצים בצנור פיטו (d Pi) אינטש מים	טמפרטורה ^{o}C	מרחק מקצה הפלאנץ' ס"מ	נקודת דגימה מס.
פתח דגימה "A"					
	0.461	0.213	75	116.6	1
	0.486	0.236	76	106.4	2
	0.494	0.244	75	91.4	3
4.2	0.525	0.276	76	50.6	4
	0.517	0.268	76	35.6	5
	0.502	0.252	75	25.4	6
פתח דגימה "B"					
	0.444	0.197	74	114.6	7
	0.452	0.205	75	104.4	8
4.8	0.486	0.236	76	89.4	9
	0.494	0.244	77	48.6	10
	0.510	0.260	76	33.6	11
	0.486	0.236	77	23.4	12
4.50	***0.488***	***0.239***	***75.7***	***ממוצע:***	

קוטר נחיר הדגימה הנבחר (אינטש):..... ***ראה טבלת בחירת נחירי דגימה***

קבוע איזוקינטי (K) המחושב:..... ***ראה טבלת בחירת נחירי דגימה***

טבלת נתוני דגימה איזוקינטית: *Metals*

נקודת דגימה	מרחק מקצה הפלאנץ'	זמן הדגימה	קריאת מונה גז (DGM)	ואקום במערכת דגימה	טמפרטורה בארובה	d Pi	d H	טמפרטורה בצנור הדגימה	טמפרטורה הגז ב- DGM	טמפרטורה באזור הפילטר	טמפרטורת הגז היוצא מאימפינג'ר האחרון
מס.	ס"מ	דקות	מ"ק	מ"מ כספית	°C	מ"מ מים	מ"מ מים	°C	°C	°C	°C
פתח דגימה "A"											
1	116.6	----		----	----	----	----	----	----	----	----
2	106.4	----		----	----	----	----	----	----	----	----
3	91.4	----		----	----	----	----	----	----	----	----
4	50.6	----		----	----	----	----	----	----	----	----
5	35.6	----		----	----	----	----	----	----	----	----
6	25.4	----		----	----	----	----	----	----	----	----
פתח דגימה "B"											
7	114.6	20	**642.7060**	3.5	77	7.0	54	119	15	120	11
8	104.4	20		4.0	79	8.2	64	121	18	122	12
9	89.4	20		4.5	79	8.6	66	123	20	123	13
10	48.6	20		4.0	80	7.8	60	125	22	123	15
11	33.6	20		4.0	80	7.2	56	124	24	124	17
12	23.4	20	**645.6734**	4.0	79	7.0	54	125	25	123	19
		120	***2.9674***	***4.0***	***79.0***	***7.63***	***59.0***	***123***	***20.7***	***123***	***15***
		סה"כ	סה"כ	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע

איזוקינטיות (I) של הדגימה (%):..... ***100.5***

טבלת נתוני דגימה איזוקינטית: *Mercury*

נקודת דגימה	מרחק מקצה הפלאנץ'	זמן הדגימה	קריאת מונה גז (DGM)	ואקום במערכת דגימה	טמפרטורה בארובה	d Pi	d H	טמפרטורה בצנור הדגימה	טמפרטורת הגז ב- DGM	טמפרטורה באזור הפילטר	טמפרטורת הגז היוצא מאימפינג'ר האחרון
מס.	ס"מ	דקות	מ"ק	מ"מ כספית	°C	מ"מ מים	מ"מ מים	°C	°C	°C	°C
פתח דגימה "A"											
1	116.6	----		----	----	----	----	----	----	----	----
2	106.4	----		----	----	----	----	----	----	----	----
3	91.4	----		----	----	----	----	----	----	----	----
4	50.6	----		----	----	----	----	----	----	----	----
5	35.6	----		----	----	----	----	----	----	----	----
6	25.4	----		----	----	----	----	----	----	----	----
פתח דגימה "B"											
7	114.6	6	**645.6800**	2.5	79	8.8	68	----	27	----	16
8	104.4	6		3.0	79	9.0	70	----	28	----	13
9	89.4	6		3.0	80	9.6	74	----	28	----	14
10	48.6	6		3.0	81	10.0	76	----	29	----	14
11	33.6	6		3.0	79	10.2	78	----	31	----	15
12	23.4	6	**646.6744**	3.0	82	9.0	70	----	33	----	16
		36	***0.9944***	***2.9***	***80.0***	***9.43***	***72.7***	***-----***	***29.3***	***-----***	***15***
		סה"כ	סה"כ	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע	ממוצע

איזוקינטיות (I) של הדגימה (%):..... ***100.1***

טבלת נתוני דגימה איזוקינטית: PM, Hal.,NH3

נקודת דגימה מס.	מרחק מקצה הפלאנץ' ס"מ	זמן הדגימה דקות	קריאת מונה גז (DGM) מ"ק	ואקום במערכת דגימה אינטש כספית	טמפרטורה בארובה °C	d Pi מ"מ מים	d H מ"מ מים	טמפרטורה בצנור הדגימה °C	טמפרטורת הגז ב- DGM °C	טמפרטורה באזור הפילטר °C	טמפרטורת הגז היוצא מאימפינג'ר האחרון °C
פתח דגימה "A"											
1	116.6	----		----	----	----	----	----	----	----	----
2	106.4	----		----	----	----	----	----	----	----	----
3	91.4	----		----	----	----	----	----	----	----	----
4	50.6	----		----	----	----	----	----	----	----	----
5	35.6	----		----	----	----	----	----	----	----	----
6	25.4	----		----	----	----	----	----	----	----	----
פתח דגימה "B"											
7	114.6	8	**646.6900**	1.0	82	9.0	13.8	121	31	123	16
8	104.4	8		1.5	81	9.4	14.4	123	33	125	17
9	89.4	8		2.0	80	9.8	15.0	125	34	127	18
10	48.6	8		2.5	80	10.8	16.6	124	34	126	19
11	33.6	8		2.5	81	10.0	15.4	125	34	127	19
12	23.4	8	**647.3144**	2.5	80	8.8	13.4	125	34	127	20
		48 סה"כ	***0.6244*** סה"כ	***2.0*** ממוצע	***80.7*** ממוצע	***9.63*** ממוצע	***14.77*** ממוצע	***124*** ממוצע	***33.3*** ממוצע	***126*** ממוצע	***18*** ממוצע

איזוקינטיות (I) של הדגימה (%):..... ***103.7***

טבלת נתוני דגימה לא איזוקינטית: SO2

נקודת דגימה מס.	זמן הדגימה דקות	נפח הגז הנדגם מ"קת	טמפרטורה במד הגז °C	טמפרטורה מדיית הדגימה * °C	ספיקה במשאבת דגימה ** לפני הדגימה ליטר לדקה	ספיקה במשאבת דגימה ** אחרי הדגימה ליטר לדקה
התחלה	30	0.0000	15	10		
סוף		26.3510	17	12		
	30	***0.024827***	***16***	***11***		
	סה"כ	סה"כ	ממוצע	ממוצע	ממוצע	ממוצע

* - במידה ויש צורך.

** - כאשר אין DGM והדגימה מתבצעת בעזרת משאבות עם ספיקה מכויילת.

טבלת נתוני דגימה לא איזוקינטית: NOx

נקודת דגימה מס.	זמן הדגימה דקות	נפח הגז הנדגם מ"קת	טמפרטורה במד הגז °C	טמפרטורה מדיית הדגימה * °C	ספיקה במשאבת דגימה ** לפני הדגימה ליטר לדקה	ספיקה במשאבת דגימה ** אחרי הדגימה ליטר לדקה
התחלה	30	0.000000	17	12		
סוף		0.014530	18	14		
	30	***0.013605***	***17.5***	***13***		
	סה"כ	סה"כ	ממוצע	ממוצע	ממוצע	ממוצע

* - במידה ויש צורך.

** - כאשר אין DGM והדגימה מתבצעת בעזרת משאבות עם ספיקה מכויילת.

טבלת נתוני דגימה לא איזוקינטית: *Benzene*

נקודת דגימה מס.	זמן הדגימה דקות	נפח הגז הנדגם מ"קת	טמפרטורה במד הגז °C	טמפרטורה מדיית הדגימה * °C	ספיקה במשאבת דגימה ** לפני הדגימה ליטר לדקה	ספיקה במשאבת דגימה ** אחרי הדגימה ליטר לדקה
התחלה	30	0.000000	18	15		
סוף		0.005790	19	16		
	30	***0.005400***	***18.5***	***15.5***		
	סה"כ	סה"כ	ממוצע	ממוצע	ממוצע	ממוצע

* - במידה ויש צורך.

** - כאשר אין DGM והדגימה מתבצעת בעזרת משאבות עם ספיקה מכויילת.

טבלת נתוני דגימה לא איזוקינטית: *VOC Screening*

נקודת דגימה מס.	זמן הדגימה דקות	נפח הגז הנדגם מ"קת	טמפרטורה במד הגז °C	טמפרטורה מדיית הדגימה * °C	ספיקה במשאבת דגימה ** לפני הדגימה ליטר לדקה	ספיקה במשאבת דגימה ** אחרי הדגימה ליטר לדקה
התחלה	30	0.000000	19	16		
סוף		0.005634	19	17		
	30	***0.005245***	***19***	***16.5***		
	סה"כ	סה"כ	ממוצע	ממוצע	ממוצע	ממוצע

* - במידה ויש צורך.

** - כאשר אין DGM והדגימה מתבצעת בעזרת משאבות עם ספיקה מכויילת.

נספחים:

פרמטרים מחושבים לבדיקה איזוקינטית: *Metals*

משקל מולקולרי יבש של גזי הפליטה (g/Mole): **29.73**

משקל מולקולרי רטוב של גזי הפליטה (g/Mole): **24.61**

כמות המים שנאספו באימפינגרים (ml): **1,497**

כמות המים שנאספו בסיליקה ג'ל (g): **99**

נפח הגז הנדגם (גז יבש, תנאים תקניים, dscm, 20 oC): **2.7464**

תכולת המים בגזי הפליטה (%): **43.7**

מהירות הגז בארובה (ממוצעת, m/s): **11.5**

ספיקת הגז בארובה (תנאים תקניים, dscm/Hr, 0 oC): **13,999**

איזוקינטיות של הבדיקה (%): **100.5**

פרמטרים מחושבים לבדיקה איזוקינטית: *Mercury*

משקל מולקולרי יבש של גזי הפליטה (g/Mole): **29.73**

משקל מולקולרי רטוב של גזי הפליטה (g/Mole): **24.47**

כמות המים שנאספו באימפינגרים (ml): **526**

כמות המים שנאספו בסיליקה ג'ל (g): **20**

נפח הגז הנדגם (גז יבש, תנאים תקניים, dscm, 20 oC): **0.8952**

תכולת המים בגזי הפליטה (%): **12.8**

מהירות הגז בארובה (ממוצעת, m/s): **44.8**

ספיקת הגז בארובה (תנאים תקניים, dscm/Hr, 0 oC): **15,267**

איזוקינטיות של הבדיקה (%): **100.1**

פרמטרים מחושבים לבדיקה איזוקינטית: PM, Hal.,NH3

משקל מולקולרי יבש של גזי הפליטה (g/Mole):	29.73
משקל מולקולרי רטוב של גזי הפליטה (g/Mole):	24.44
כמות המים שנאספו באימפינגרים (ml):	328
כמות המים שנאספו בסיליקה ג'ל (g):	11
נפח הגז הנדגם (גז יבש, תנאים תקניים, dscm, 20 oC):	0.5515
תכולת המים בגזי הפליטה (%):	45.0
מהירות הגז בארובה (ממוצעת, m/s):	12.9
ספיקת הגז בארובה (תנאים תקניים, dscm/Hr, 0 oC):	15,196
איזוקינטיות של הבדיקה (%):	103.7

מעבדת דיגום: חברת מעבדות אקולוגיה א.פ. בע"מ מוסמכת לביצוע דיגום ע"פ כל השיטות המופיעות בטבלת התוצאות.

תעודות אנליטיות: תעודת אנליזה ל- SO2, NH3 ובנזן של מעבדות אקולוגיה המצורפות לדו"ח הינן תחת הסמכת ISO-17025 (של הרשות להסמכת מעבדות).
תעודת אנליזה לכספית של מעבדות אקולוגיה המצורפת לדו"ח אינה תחת הסמכת ISO-17025 (של הרשות להסמכת מעבדות).
תעודות אנליזה למתכות, HCL, HF, NOX של מעבדות אמינולאב המצורפות לדו"ח הינן תחת הסמכת ISO-17025 (של הרשות להסמכת מעבדות).
תעודות אנליזה לסריקת VOC ב- GCMS של מעבדות אמינולאב המצורפות לדו"ח אינן תחת הסמכת ISO-17025 (של הרשות להסמכת מעבדות).

מעבדות אנליטיות: חברת מעבדות אקולוגיה פועלת ע"פ מערכת איכות ISO-17025 מוסמכת לביצוע אנליזה ל- SO2, NH3, TOC ובנזן אך לא מוסמכת לביצוע אנליזות לכספית ע"י הרשות להסמכת מעבדות.
מעבדת אמינולאב פועלת ע"פ מערכת איכות ISO-17025 מוסמכת לתקן ISO-17025 לביצוע אנליזה למתכות (פרט לכספית) HCL, HF, NOX אך לא מוסמכת לביצוע אנליזות לסריקת VOC ב- GC-MS ע"י הרשות להסמכת מעבדות.

הערה כללית: הרשות הלאומית להסמכת מעבדות אינה אחראית על תוצאות הבדיקות.

Ecological Laboratories A.P. Ltd.
Environmental Services and Solutions
HaPrat Str. 2, POB 13337, Yavne 81227, Israel.
Tel.: 972-8-9322115, Fax: 972-8-9322116,
Mobile: +972-52-2333061. E-mail: eco_lab2@yahoo.com

Test Procedure.

Plant: ELCON Recycling Ltd
City: Neot Hovav Industrial Area.
Sampling Date: 28/11/2016
Stack Location: TO Final Stack (No. 1).
Hazard Tested:

Hazard	Sampling Method	Analytical Method	Analytical Lab	Remarks
Total Dust	EPA-5	Grav.	Ecolab	
Metals	EPA-29	ICP	Aminolab	
Mercury	EPA-29	AACV	Ecolab	
HCl	EPA-26a	IC	Aminolab	
HF	EPA-26a	IC	Aminolab	
HBr	EPA-26a	IC	Aminolab	
NH3	EPA-CTM-027	Sp-Ph	Ecolab	
SO2	EPA-6	Titration	Ecolab	
NOx	EPA-7d	IC	Aminolab	
Benzene	EPA-18	GC	Ecolab	VOST
VOC Screening	EPA-18	GC-MS	Aminolab	VOST, as Xylene
TOC as Carbon	EPA-25a	FID	Ecolab	
Burnt Gases	M-22	FTIR	Ecolab	
Gas Flowrate	EPA-1, 2, 4	-----	Ecolab	

Sampling Site:
1. 2 Sampling Ports (4", 90 degrees). Sampling Tables.
2. More than 8 Dst DownStream up to the Last Turbulence.
3. More than 2 Dst UpStream up to the Next Turbulence.
4. Existing Sampling Site is in Compiance with EPA-1 Requirements.

SamplingTrain:
1. "APEX" Complete Sampling Train (EPA-29/26a/CTM-027/5/6/7d/18-VOST Standard/Flexible Configurations).
   TOC Analyser (FID, EPA-25a Flexible Configuration).
2. Sampling Probe: 1.5 m Length.
3. BoroSilicate Glass Liner and Nozzle,

Series No.: 1a
Fuel: Gas
Filter No.: F-207t F-210q

Stack Diameter:	100 *cm*			Measured
Stack Cross Area:	0.785 *m2*	=	8.45 *ft2*	Calculated
Nipple "A" Length:	21 *cm*			Measured
Nipple "B" Length:	19 *cm*			Measured

STACK GAS VELOCITY PROFILE (according to EPA Methods 1 and 2).

Traverse Point No.	Fraction of Stack ID %/100	Traverse Point Location cm	InStack Tempe-rature oC	Delta Pi (measured) mm H2O	Delta Pi (calculated) in. H2O	Square Root of Delta Pi (in. H2O) $^{1/2}$	Instack Static Pressure mm H2O
Sampling Port "A"							
1	0.956	***116.6***	75	5.4	0.213	0.461	
2	0.854	***106.4***	76	6.0	0.236	0.486	
3	0.704	***91.4***	75	6.2	0.244	0.494	
4	0.296	***50.6***	76	7.0	0.276	0.525	4.2
5	0.146	***35.6***	76	6.8	0.268	0.517	
6	0.044	***25.4***	75	6.4	0.252	0.502	
Sampling Port "B"							
7	0.956	***114.6***	74	5.0	0.197	0.444	
8	0.854	***104.4***	75	5.2	0.205	0.452	
9	0.704	***89.4***	76	6.0	0.236	0.486	4.8
10	0.296	***48.6***	77	6.2	0.244	0.494	
11	0.146	***33.6***	76	6.6	0.260	0.510	
12	0.044	***23.4***	77	6.0	0.236	0.486	
Average	--------	--------	***75.7***	***6.07***	***0.239***	***0.488***	***4.50***

Remarks: 1. Traverse Points Locations were Measured from the Nipples Ends.
2. Instack Static Pressure was Measured in 2 Traverse Points.

PRELIMINARY CALCULATIONS.

Barometric Pressure (Pbar):.....	716	mm Hg	=	28.2 in. Hg	Measured
InStack Static Pressure (Pg):.....	0.33	mm Hg	=	0.013 in. Hg	Measured
InStack Absolute Pressure (Pso):.....	716.3	mm Hg	=	28.20 in. Hg	Calculated
Gas Temperature in the DGM (Tmo):.....	33	o C	=	550 o R	Assumed
InStack Gas Temperature (Tso):.....	75.7	o C	=	628 o R	Calculated
Dry Gas Molecular Weight (Md):.....	29.0	g/Mole			Assumed
Water Content in the Gas Stream (Bwso):.....	0.40	Mole Parts			Assumed
Wet Gas Molecular Weight (Mso):.....	24.60	g/Mole			Calculated
Optimal Nozzle Diameter (Dn Opt.):.....	0.379	in.	=	9.6 mm	Calculated
Stack Gas Velocity (Vso):.....	33.3	ft/sec	=	10.2 m/sec	Calculated
Stack Gas Flowrate (Stack Cond., Qao):.....	1,014,151	acf/Hr	=	28,718 acm/Hr	Calculated
Stack Gas Flowrate (St-d Cond., Qso):.....	449,592	dscf/Hr	=	12,731 dscm/Hr	Calculated

Sampling Nozzle Selection and "K" Calculations.

Sampling System No.	Hazard Sampled	Nozzle ID Number No.	Nozzle Diameter in.	Nozzle Diameter mm	Nozzle Cross Section Area ft^2	Nozzle Cross Section Area mm^2	Calculated K Factor
3	PM, Hal.,NH3	N-3-1/4G	0.2513	6.38	0.000344	32.0	1.56
3	Metals	N-5-3/8G	0.3753	9.53	0.000768	71.3	7.75
3	Mercury	N-5-3/8G	0.3753	9.53	0.000768	71.3	7.75

Sampling System No. : 3

Pito't Tube Calibration Factor (Cp):.....	0.84	Calibrated	at 06/11/16
DGM Calibration Factor (Y):.....	0.978	Calibrated	at 01/11/16
Orifice Calibration Factor (dHo):.....	1.758	Calibrated	at 01/11/16

Combustion Gases Measurements (Gas Analyser).

Beginning: **08:18**

Measure-Ment No.	O2 Conc-n % v	CO2 Conc-n % v	CO Conc-n ppm
1	6.9	9.0	10
2	7.1	8.9	5
3	6.6	9.2	8
4	6.8	9.1	12
5	6.8	9.1	5
6	7.0	9.0	7
Average	**6.87**	**9.06**	**7.8**
			mg/dscm
		0 oC -	**9.8**
		20 oC-	**9.1**
EMISSION RATE, g/Hour			**148.8**

Real Stack Gas Dry Molecular Weight, Calculated, According to EPA Method 3a:

Md real	=	**29.73**	*g/Mole*

IK Test: Metals

EPA Method 29 Field Test Data.

Sampling Time: 08:33-10:35

Sampling Point No	Sampling Point Location cm	Sampling Time min	Stack Gas Temp. Tst oC	Delta Pi mm H2O	Delta Pi in. H2O	Square Root of Delta Pi (in. H2O)$^{1/2}$	Delta H Calc-d mm H2O	Delta H Real mm H2O	Gas Vol. Sampled Vm acm	D.G.M. Temp. Tdgm oC	Vacuum In the S. Train in. Hg	Probe Temp. Tpr oC	Filter Temp. Tf oC	Last.Imp. Gas.Temp. Timp oC	Remarks
Sampling Port "A"															
1	116.6	----	----	----	----	----	----	----		----	----	----	----	----	
2	106.4	----	----	----	----	----	----	----		----	----	----	----	----	
3	91.4	----	----	----	----	----	----	----		----	----	----	----	----	
4	50.6	----	----	----	----	----	----	----		----	----	----	----	----	
5	35.6	----	----	----	----	----	----	----		----	----	----	----	----	
6	25.4	----	----	----	----	----	----	----		----	----	----	----	----	
Sampling Port "B"									642.7060	<--- Beginning					
7	114.6	20	77	7.0	0.276	0.525	54.2	54		15	3.5	119	120	11	LC1 - O'K
8	104.4	20	79	8.2	0.323	0.568	63.5	64		18	4.0	121	122	12	
9	89.4	20	79	8.6	0.339	0.582	66.6	66		20	4.5	123	123	13	
10	48.6	20	80	7.8	0.307	0.554	60.4	60		22	4.0	125	123	15	
11	33.6	20	80	7.2	0.283	0.532	55.8	56		24	4.0	124	124	17	
12	23.4	20	79	7.0	0.276	0.525	54.2	54	645.6734	25	4.0	125	123	19	LC2 - O'K
-----	-----	120	79.0	7.63	0.301	0.548	59.2	59.0	2.9674	20.7	4.0	123	123	15	-----
		Total	Average	Average	Average	Average	Average	Average	Total	Average	Average	Average	Average	Average	

Measurements in the Laboratory.

Impingers Initial Volume.....	**200**	*ml*
Impingers Final Volume:.....	**1697**	*ml*
Impingers Washing Volume:.....	**50**	*ml*
Silica Gel Initial Weight:.....	**600**	*g*
Silica Gel Final Weight:.....	**699**	*g*
Volume of Total Water Collected :.....	**1596**	*ml*

Necessary Calculations.

Average Pressure in Sampling Train (Pm):.....	**28.36**	*in. Hg*	=	**720.3**	*mm Hg*
Instack Pressure (Pst):.....	**28.20**	*in. Hg*	=	**716.3**	*mm Hg*
Average Stack Gas Temperature (Tst):.....	**79.0**	*oC*	=	**352.0**	*oK*
Actual Gas Volume Sampled (Vm):.....	**2.9674**	*acm*			
Gas Volume Sampled (St-d. Cond., 20 oC):.....	**2.7464**	*dscm*			
Water Vapours Volume (St-d Cond-s, 20 oC):.....	**2.1275**	*dscm*			
Gas Stream Water Content (Bws):.....	**43.7**	*%*			
Saturated Vapours Water Content (Bsat):.....	**40.9**	*%*			
Dry Gas Molecular Weight (Md):.....	**29.73**	*g/Mole*			
Wet Gas Molecular Weight (Ms):.....	**24.61**	*g/Mole*			

Stack Gas Velocity and Flowrate.

Average Stack Gas Velocity:.....	***11.5***	*m/sec*
Stack Gas Flowrate (Stack Conditions):.....	***32,375***	*acm/Hr*
Stack Gas Flowrate (St-d Cond-s, 0 oC):.....	***13,999***	*dscm/Hr*
ISOKINETICS of the Sampling:.....	***100.5***	*%*

EPA-29 Method Final Results.

Hazard Sampled	Hazard Content in the Filter + + Dig. Sol-ns (16-M-4486x) mcg	Hazard Conc-n in the Impinger's 1+2 Liquid (16-M-4486y) mcg/ml	Total Hazard Content in the Sample mcg	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate g/Hour	Remarks
Ag	2	0.1	176.7	0.069	0.967	< LOD
Al	13	0.2	362.4	0.142	1.983	
As	5	0.05	92.4	0.036	0.505	< LOD
Be	1	0.05	88.4	0.035	0.483	< LOD
Cd	1	0.05	88.4	0.035	0.483	< LOD
Co	1	0.05	88.4	0.035	0.483	< LOD
Cr	3	0.1	177.7	0.069	0.972	
Cu	7	0.1	181.7	0.071	0.994	
Fe	17	0.1	191.7	0.075	1.049	
Li	9	0.1	183.7	0.072	1.005	
Mn	3	0.05	90.4	0.035	0.494	
Mo	2	0.1	176.7	0.069	0.967	< LOD
Ni	2	0.1	176.7	0.069	0.967	
Pb	2	0.1	176.7	0.069	0.967	< LOD
Sb	5	0.1	179.7	0.070	0.983	< LOD
Se	5	0.1	179.7	0.070	0.983	< LOD
Sn	7	0.1	181.7	0.071	0.994	
Sr	2	0.1	176.7	0.069	0.967	
Ti	1	0.1	175.7	0.069	0.961	< LOD
Te	5	0.2	354.4	0.138	1.939	< LOD
TL	5	0.1	179.7	0.070	0.983	< LOD
V	1	0.1	175.7	0.069	0.961	
Zn	22	0.2	371.4	0.145	2.032	

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).
2. The Concentrations were Calculated as Elementary Metals (ICP Analysis).
3. "< LOD" = less than the Limit of Determination.
"< LOQ" = less than the Limit of Quantification.

IK Test: ***Mercury***

EPA Method 101a Field Test Data.

Sampling Time: 10:49-11:28

Sampling Point No.	Sampling Point Location cm	Sampling Time min	Stack Gas Temp. Tst oC	Delta Pi mm H2O	Delta Pi in. H2O	Square Root of Delta Pi (in. H2O)$^{1/2}$	Delta H Calc-d mm H2O	Delta H Real mm H2O	Gas Vol. Sampled Vm acm	D.G.M. Temp. Tdgm oC	Vacuum In the S. Train in. Hg	Probe Temp. Tpr oC	Filter Temp. Tf oC	Last.Imp. Gas.Temp. Timp oC	Remarks
Sampling Port "A"															
1	116.6	----	----	----	----	----	----	----		----	----	----	----	----	
2	106.4	----	----	----	----	----	----	----		----	----	----	----	----	
3	91.4	----	----	----	----	----	----	----		----	----	----	----	----	
4	50.6	----	----	----	----	----	----	----		----	----	----	----	----	
5	35.6	----	----	----	----	----	----	----		----	----	----	----	----	
6	25.4	----	----	----	----	----	----	----		----	----	----	----	----	
Sampling Port "B"									**645.6800**	**<---- Beginning**					
7	114.6	6	79	8.8	0.346	0.589	68.2	68		27	2.5	----	----	16	**LC1 - O'K**
8	104.4	6	79	9.0	0.354	0.595	69.7	70		28	3.0	----	----	13	
9	89.4	6	80	9.6	0.378	0.615	74.4	74		28	3.0	----	----	14	
10	48.6	6	81	10.0	0.394	0.627	77.5	76		29	3.0	----	----	14	
11	33.6	6	79	10.2	0.402	0.634	79.0	78		31	3.0	----	----	15	
12	23.4	6	82	9.0	0.354	0.595	69.7	70	**646.6744**	33	3.0	----	----	16	**LC2 - O'K**
----	----	***36***	***80.0***	***9.43***	***0.371***	***0.609***	***73.1***	***72.7***	***0.9944***	***29.3***	***2.9***	----	----	***15***	----
		Total	Average	Average	Average	Average	Average	Average	Total	Average	Average	Average	Average	Average	

Measurements in the Laboratory.

Impingers Initial Volume.....	**200** *ml*
Impingers Final Volume:.....	**726** *ml*
Impingers Washing Volume:.....	**274** *ml*
Silica Gel Initial Weight:.....	**200** *g*
Silica Gel Final Weight:.....	**220** *g*
Volume of Total Water Collected :.....	**546** *ml*

Necessary Calculations.

Average Pressure in Sampling Train (Pm):	**28.40** *in. Hg*	=	**721.3** *mm Hg*
Instack Pressure (Pst):	**28.20** *in. Hg*	=	**716.3** *mm Hg*
Average Stack Gas Temperature (Tst):.....	**80.0** *oC*	=	**353.0** *oK*
Actual Gas Volume Sampled (Vm):.....	**0.9944** *acm*		
Gas Volume Sampled (St-d. Cond., 20 oC):.....	**0.8952** *dscm*		
Water Vapours Volume (St-d Cond-s, 20 oC):.....	**0.7278** *dscm*		
Gas Stream Water Content (Bws):.....	**44.8** *%*		
Saturated Vapours Water Content (Bsat):.....	**42.1** *%*		
Dry Gas Molecular Weight (Md):.....	**29.73** *g/Mole*		
Wet Gas Molecular Weight (Ms):.....	**24.47** *g/Mole*		

Stack Gas Velocity and Flowrate.

Average Stack Gas Velocity:.....	***12.8*** *m/sec*
Stack Gas Flowrate (Stack Conditions):.....	***36,159*** *acm/Hr*
Stack Gas Flowrate (St-d Cond-s, 0 oC):.....	***15,267*** *dscm/Hr*
ISOKINETICS of the Sampling:.....	***100.1*** *%*

Determination of Mercury Instack Concentration, according to EPA No. 101-a Method.

Nesessary Data.

1. Final Impingers Volume:..... **726** *ml*
2. Gas Volume Sampled (St-d Cond-s, 20 oC):..... **0.8952** *dscm*
3. Stack Gas Flowrate (St-d Cond-s, 0 oC):..... **15,267** *dscm/Hr*

Hazard Sampled	Analytical Result	Hazard Content in the Sample	Hazard Instack Conc-ns (St-d Cond-s, 0 o C)	Hazard Emission Rate	Remarks
	mcg/ml	*mcg*	*mg/dscm*	*g/Hr*	
Sample Code: 16-G-4487					
Mercury	**0.005**	5.00	***0.0060***	***0.092***	< LOD

Remarks: 1. The Concentration was Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).

2. The Concentrations were Calculated as Elementary Mercury (AACV Analysis).

3. "< LOD" = less than the Limit of Determination.
"< LOQ" = less than the Limit of Quantification.

IK Test: PM, Hal.,NH3

EPA Method 5/26a/CTM-027 Field Test Data.

Sampling Time: 11:50-12:40

Sampling Point No.	Sampling Point Location cm	Sampling Time min	Stack Gas Temp. Tst oC	Delta Pi mm H2O	Delta Pi in. H2O	Square Root of Delta Pi (in. H2O)$^{1/2}$	Delta H Calc-d mm H2O	Delta H Real mm H2O	Gas Vol. Sampled Vm acm	D.G.Meter Temp. Tdgm oC	Vacuum In the S. Train in. Hg	Probe Temp. Tpr oC	Filter Temp. Tf oC	Last.Imp. Gas.Temp. Timp oC	Remarks
Sampling Port "A"															
1	116.6	—	—	—	—	—	—	—		—	—	—	—	—	
2	106.4	—	—	—	—	—	—	—		—	—	—	—	—	
3	91.4	—	—	—	—	—	—	—		—	—	—	—	—	
4	50.6	—	—	—	—	—	—	—		—	—	—	—	—	
5	35.6	—	—	—	—	—	—	—		—	—	—	—	—	
6	25.4	—	—	—	—	—	—	—		—	—	—	—	—	
Sampling Port "B"									646.6900	<— Beginning					
7	114.6	8	82	9.0	0.354	0.595	14.0	13.8		31	1.0	121	123	16	LC1 - O'K
8	104.4	8	81	9.4	0.370	0.608	14.6	14.4		33	1.5	123	125	17	
9	89.4	8	80	9.8	0.386	0.621	15.3	15.0		34	2.0	125	127	18	
10	48.6	8	80	10.8	0.425	0.652	16.8	16.6		34	2.5	124	126	19	
11	33.6	8	81	10.0	0.394	0.627	15.6	15.4		34	2.5	125	127	19	
12	23.4	8	80	8.8	0.346	0.589	13.7	13.4	647.3144	34	2.5	125	127	20	LC2 - O'K
-----	-----	*48* Total	*80.7* Average	*9.63* Average	*0.379* Average	*0.615* Average	*15.0* Average	*14.8* Average	*0.6244* Total	*33.3* Average	*2.0* Average	*124* Average	*126* Average	*18* Average	-----

Measurements in the Laboratory.

Impingers Initial Volume.....	**200**	*ml*
Impingers Final Volume:.....	**528**	*ml*
Washing Volume:.....	**50**	*ml*
Silica Gel Initial Weight:.....	**200**	*g*
Silica Gel Final Weight:.....	**211**	*g*
Dust Collected in the Probe and Cyclone:.....	**0.0003**	*g*
Filter Tare Weight:.....	**0.3508**	*g*
Filter Gross Weight.....	**0.3527**	*g*
Volume of Total Water Collected :.....	**339**	*ml*
Weight of Total Dust Collected:.....	**0.0022**	*g*

Necessary Calculations.

Average Pressure in Sampling Train (Pm):.....	**28.23**	*in. Hg*	=	**717.1**	*mm Hg*
Instack Pressure (Pst):.....	**28.20**	*in. Hg*	=	**716.3**	*mm Hg*
Average Stack Gas Temperature (Tst):.....	**80.7**	*oC*	=	**353.7**	*oK*
Actual Gas Volume Sampled (Vm):.....	**0.6244**	*acm*			
Gas Volume Sampled (St-d. Cond., 20 oC):.....	**0.5515**	*dscm*			
Water Vapours Volume (St-d Cond-s, 20 oC):....	**0.4519**	*dscm*			
Gas Stream Water Content (Bws):.....	**45.0**	*%*			
Saturated Vapours Water Content (Bsat):.....	**42.9**	*%*			
Dry Gas Molecular Weight (Md):.....	**29.73**	*g/Mole*			
Wet Gas Molecular Weight (Ms):.....	**24.44**	*g/Mole*			

Stack Gas Velocity and Flowrate.

Average Stack Gas Velocity:.....	***12.9***	*m/sec*
Stack Gas Flowrate (Stack Conditions):.....	***36,585***	*acm/Hr*
Stack Gas Flowrate (St-d Cond-s, 0 oC):.....	***15,196***	*dscm/Hr*
ISOKINETICS of the Sampling:.....	***103.7***	*%*

Determination of PM, HCl, HBr, HF and NH3 Instack Concentrations, according to EPA No. 5/26a/CTM-027 Methods.

Nesessary Data.

1. Impingers Final Volume:..... **528** *ml*
2. Gas Volume Sampled (St-d Cond-s, 20 oC):..... **0.5515** *dscm*
3. Stack Gas Flowrate (St-d Cond-s, 0 oC):..... **15,196** *dscm/Hr*

Hazard Sampled	Analytical Result *mcg/ml*	Hazard Cont-t in the Sample *mcg*	Hazard Instack Conc-n (St-d Cond-s 0 oC) *mg/dscm*	Hazard Emission Rate *g/Hr*	Remarks
Sample Code: 16-F-4490					
Total Dust	----	2,200	**4.28**	**65.1**	
Sample Code: 16-H-4488					
HCl	1.2	713.1	**1.39**	**21.1**	
HBr	0.3	175.6	**0.34**	**5.19**	< LOQ
HF	0.3	182.5	**0.36**	**5.40**	< LOQ
Sample Code: 16-A-4489					
NH3	6.9	3,988	**7.76**	**117.9**	

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure)

2. HCl HBr, and HF Concentrations were Calculated as an Acids.
3. Analytical Methods: Ion Chromatography for Acids, SpectroPhotoMetric for Ammonia, Gravimetric for Total Dust
4. "< LOD" = less than the Limit of Determination.
   "< LOQ" = less than the Limit of Quantification.

Determination of SO2 Instack Concentration according to EPA No. 6 Method.

Nesessary Data.

1. Initial DGM Reading:.....	0.000	L
2. Final DGM Reading:.....	26.351	L
3. Sampling Time:.....	08:25-08:55	
4. Sampling Time:.....	30	min
5. Average Sampling Flowrate:.....	878.4	ml/min
6. Gas Volume Sampled (DGM Conditions):.....	0.026351	acm
7. Gas Volume Sampled (St-d Cond-s, 20 oC):.....	0.024827	dscm
8. Stack Gas Flowrate (St-d Cond-s, 0 oC):.....	13,999	dscm/Hr
9. Probe Initial Temperature:.....	120	oC
10. Probe Final Temperature:.....	126	oC
11. Gas Leaving the Last Sampler Initial Temp.:.....	10	oC
12. Gas Leaving the Last Sampler Final Temp.:.....	12	oC
13. Sampling Average Delta H:.....	24	mm H2O
14. DGM Initial Temperature:.....	15	oC
15. DGM Final Temperature:.....	17	oC
16. Sample System No.:.....	3	
17. DGM Calibration Factor (cal. Date - 11/11/16):.....	0.984	
18. Impingers Final Volume:.....	44	ml

Final Results.

1. Sample Volume (for titration).....	20.0	ml
2. Volume of the titrant used for Sample Titration:.....	0.2	ml
3. Blanc Volume (for titration).....	20.0	ml
4. Volume of the titrant used for BlancTitration:.....	0.20	ml
5. Normality of titrant Solution:.....	0.0100	N
6. SO2 Instack Conc-n (St-d Cond-s, 0 oC):.....	1.52	mg/dscm
7. SO2 Emission Rate:.....	21.32	g/Hour
8. Sample Code:.....	16-S-4491	

Remarks: 1. The Concentration was Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).

2. The Concentration was Calculated as SO2.
3. Analytical Method: Barium-Thorine Titration.
4. "< LOD" = less than the Limit of Determination.
   "< LOQ" = less than the Limit of Quantification.

Determination of NOx Instack Concentration according to EPA No. 7-d Method.

Nesessary Data.

1. Initial DGM Reading:..... **0.000** L
2. Final DGM Reading:..... **14.530** L
3. Sampling Time:..... **08:57-09:27**
4. Sampling Time:..... **30** min
5. Average Sampling Flowrate:..... **484.3** ml/min
6. Gas Volume Sampled (DGM Conditions):..... **0.014530** acm
7. Gas Volume Sampled (St-d Cond-s, 20 oC):..... **0.013605** dscm
8. Stack Gas Flowrate (St-d Cond-s, 0 oC):..... **13,999** dscm/Hr
9. Probe Initial Temperature:..... **123** oC
10. Probe Final Temperature:..... **126** oC
11. Gas Leaving the Last Sampler Initial Temp.:..... **12** oC
12. Gas Leaving the Last Sampler Final Temp.:..... **14** oC
13. Sampling Average Delta H:..... **14** mm H2O
14. DGM Initial Temperature:..... **17** oC
15. DGM Final Temperature:..... **18** oC
16. Sample System No.:..... **3**
17. DGM Calibration Factor (cal. Date - 11/11/16):..... **0.984**
18. Sample Code :..... **16-N-4492**
19. Sample Final Volume :..... **611** ml

Hazard Sampled	Nitrate ion Conc-n in the Sample mcg/ml	NOx Instack Conc-n (Stand-d Cond-s, 0 oC) mg/dscm	NOx Emission Rate g/Hr	Remarks
NOx	1.0	35.8	500.6	< LOD

Remarks: 1. The Concentration was Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure)
2. The Concentration was Calculated as NO2.
3. Analytical Method - IC.
4. "< LOD" = less than the Limit of Determination.
"< LOQ" = less than the Limit of Quantification.

Field Sampling Data (Benzene), according to EPA No. 18 (VOST) Method.

Nesessary Data.

1. Initial DGM Reading:..... **0.000** L
2. Final DGM Reading:..... **5.790** L
3. Sampling Time:..... **09:30-10:00**
4. Sampling Time:..... **30** min
5. Average Sampling Flowrate:..... **193.0** ml/min
6. Gas Volume Sampled (DGM Conditions):..... **0.005790** acm
7. Gas Volume Sampled (St-d Cond-s, 20 oC):..... **0.005400** dscm
8. Stack Gas Flowrate (St-d Cond-s, 0 oC):..... **13,999** dscm/Hr
9. Probe Initial Temperature:..... **121** oC
10. Probe Final Temperature:..... **125** oC
11. Gas Leaving the Last Sampler Initial Temp.:..... **15** oC
12. Gas Leaving the Last Sampler Final Temp.:..... **16** oC
13. Sampling Average Delta H:..... **8** mm H2O
14. DGM Initial Temperature:..... **18** oC
15. DGM Final Temperature:..... **19** oC
16. Sample System No.:..... **3**
17. DGM Calibration Factor (cal. Date - 11/11/16):..... **0.984**
18. Sample Code :..... **16-V-4494x,y**

Hazard Sampled	Hazard Content in the "X" Tube mcg	Hazard Content in the "Y" Tube mcg	Hazard Instack Conc-n (Stand-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate g/Hr	Remarks
Benzene	1.0	1.0	**0.40**	**5.57**	< LOD

Remarks: 1. The Concentration was Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure)
2. Analytical Method - GC.
3. Field Blank Result - see 16-V-4495 Sample.
4. "< LOD" = less than the Limit of Determination.
"< LOQ" = less than the Limit of Quantification.

Field Sampling Data (VOC Screening), according to EPA No. 18 (VOST) Method.

Nesessary Data.

1. Initial DGM Reading:.....	0.000	L
2. Final DGM Reading:.....	5.634	L
3. Sampling Time:.....	10:01-10:31	
4. Sampling Time:.....	30	min
5. Average Sampling Flowrate:.....	187.8	ml/min
6. Gas Volume Sampled (DGM Conditions):.....	0.005634	acm
7. Gas Volume Sampled (St-d Cond-s, 20 oC):.....	0.005245	dscm
8. Stack Gas Flowrate (St-d Cond-s, 0 oC):.....	13,999	dscm/Hr
9. Probe Initial Temperature:.....	125	oC
10. Probe Final Temperature:.....	126	oC
11. Gas Leaving the Last Sampler Initial Temp.:.....	16	oC
12. Gas Leaving the Last Sampler Final Temp.:.....	17	oC
13. Sampling Average Delta H:.....	8	mm H2O
14. DGM Initial Temperature:.....	19	oC
15. DGM Final Temperature:.....	19	oC
16. Sample System No.:.....	3	
17. DGM Calibration Factor (cal. Date - 11/11/16):.....	0.984	
18. Sample Code :.....	16-V-4493x,y	

Hazard Sampled	Hazard Content in the Sample mcg	Hazard Instack Conc-n (Stand-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate g/Hr	Remarks
VOC Screening (GC-MS)				
1,2-PropaneDiol	1.3	0.27	3.72	
Total VOC	1.3	0.27	3.72	

Remarks:
1. The Concentrations were Calculated at Stan-d Cond-s (Dry Gas, 0 oC, Atmospheric Pressure).
2. Analytical Method - GC-MS. VOC Conc-s were Calculates as Benzene
3. Field Blank Result - see Blank Sample.
4. "< LOD" = less than the Limit of Determination. "< LOQ" = less than the Limit of Quantification.

TOC (Total Organic Carbon) Determination. according to EPA Method No. 25a.

Meaure-ment No.	Time HH:mm	FID Reading as Propane ppm	TOC Conc-n (calculated, as Carbon) ppm	TOC Conc-n (calculated, as Carbon, St-d Cond-s, 0 oC) mg/dscm	TOC Emission Rate (as Carbon) g/Hour	Remarks
1	10:45	0.99	2.97	2.8	42.9	
2	10:53	1.14	3.42	3.3	49.4	
3	11:01	1.05	3.15	3.0	45.5	
4	11:08	1.21	3.63	3.5	52.4	
5	11:15	1.16	3.48	3.3	50.3	
Average		**1.11**	**3.33**	**3.17**	**48.11**	

Remarks: 1. The Concentration was Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).

2. Analytical Method: FID TOC Analyser.
Flame Ionization Detector (FID) was Calibrated before theTest with 3 Propane Calibration Gases (EPA Protocol Quality)

3. Measuring Time: **10:45-11:15**

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קרית ויצמן , פנחס ספיר 1 ,ת.ד . 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

21/12/2016
דו"ח מס': a/a+b-113094.16

ISRAC
הרשות הלאומית
להסמכת מעבדות
ISO/IEC 17025
No. 005 מס

לכבוד
מר אלכסיי ריטנר
מעבדות אקולוגיה א.פ. בע"מ
ת.ד 13337, הפרת 2
יבנה

טל: 08-9322115, 052-2333061
פקס: 08-9322116
דוא"ל: eco_lab2@yahoo.com

הנדון: **תעודה לתוצאות בדיקה**

מס' אמינולאב: 90100.16-C - 90102.16-C
תאריך קבלה: 06/12/2016
נדגם ע"י: תלקוח
מס' הזמנה: 16-772-1
סוג הדיגום: --

תוצאות הבדיקה:

מס. אמינולאב		90100.16-C	90102.16-C	הערות
תאור הדוגמה		תמיסה + פילטר בלאנק HNO3 0.1N	תמיסה + פילטר 16-M-4486X	
הבדיקה	יח' מידה			
סריקת מתכות מלאה ב-ICP				1
כסף - Ag	µg/sample	<2	<2	
אלומיניום - Al	µg/sample	7	20	
ארסן - As	µg/sample	<5	<5	
בורון - B	µg/sample	<5	<5	
בריום - Ba	µg/sample	1	4	
בריליום - Be	µg/sample	<1	<1	
סידן - Ca	µg/sample	67	320	
קדמיום - Cd	µg/sample	<1	<1	
קובלט - Co	µg/sample	<1	<1	
כרום - Cr	µg/sample	<1	3	
נחושת - Cu	µg/sample	<1	7	
ברזל - Fe	µg/sample	3	20	
אשלגן - K	µg/sample	<5	73	
ליתיום - Li	µg/sample	<1	9	
מגנזיום - Mg	µg/sample	4	69	
מנגן - Mn	µg/sample	<1	3	
מוליבדן - Mo	µg/sample	<2	<2	
נתרן - Na	µg/sample	5	557	

נבדק ע"י: מרינה רוכמן
אושר ע"י: דר' שירה רוזנצוייג
מנהלת המחלקה

Shira

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים. דף 1 מתוך 2
הנתונים המפורטים משקפים במדויק את תוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של אמינולאב בעיים או במוניטין שלה, בהקשר לנתונים או הממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קרית ויצמן , פנחס ספיר 1 ,ת.ד. 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

ISRAC
הרשות הלאומית
להסמכת מעבדות
ISO/IEC 17025
No. 005 מס.

הערות	90102.16-C	90100.16-C	מס. אמינולאב	
	16-M-4486X תמיסה + פילטר	HNO3 0.1N תמיסה + פילטר בלאנק	תאור חדוגמה	
			יח' מידה	הבדיקה
	2	<1	µg/sample	ניקל - Ni
	35	<5	µg/sample	זרחן - P
	<2	<2	µg/sample	עופרת - Pb
	170	9	µg/sample	גופרית - S
	<5	<5	µg/sample	אנטימון - Sb
	<5	<5	µg/sample	סלן - Se
	7	<5	µg/sample	בדיל - Sn
	2	<1	µg/sample	סטרונציום - Sr
	<1	<1	µg/sample	טיטניום - Ti
	<5	<5	µg/sample	טלוריום - Te
	<5	<5	µg/sample	טליום - Tl
	1	<1	µg/sample	וונדיום - V
	30	8	µg/sample	אבץ - Zn

הערות לבדיקה:

(-) = אין הערות

1. סריקת מתכות: ICP scan - results including "<" = Below detection limits

אבטחת איכות:

הסמכה/ הכרה	שיטה / תקן	הבדיקה
א	Based on EPA 29. Accredited for all the metals included in EPA 29, except for Hg.	סריקת מתכות מלאה ב- ICP

הסמכות / הכרות:

למעבדה מערכת איכות מוסמכת לפי ISO/IEC 17025 והיא פועלת בהתאם לנהלי עבודה מסודרים.

א. המעבדה מוסמכת לביצוע הבדיקה לפי ISO/IEC 17025 מטעם הרשות הלאומית להסמכת מעבדות.

נבדק ע"י: מרינה רוכמן

אושר ע"י: דר' שירה רוזנצוייג
מנהלת המחלקה

Shira

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים. אין לעשות שימוש בשמה של אמינולאב בעיתון או במוניטין שלה, בהקשר לנתונים או הממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

* סוף תעודת הבדיקה *

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קריית ויצמן , פרחס ספיר 1 ,ת.ד. 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

21/12/2016
דו"ח מס': b/a+b-113094.16

ISRAC
הרשות הלאומית
להסמכת מעבדות
ISO/IEC 17025
No. 005 מס

לכבוד
מר אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
ת.ד 13337, הפרת 2
יבנה

טל: 08-9322115, 052-2333061
פקס: 08-9322116
דוא"ל: eco_lab2@yahoo.com

הנדון: **תעודה לתוצאות בדיקה**

מס' אמינולאב: 90101.16-C - 90103.16-C
תאריך קבלה: 06/12/2016
נדגם ע"י: הלקוח
מס' הזמנה: 16-772-1
סוג הדיגום: --

תוצאות הבדיקה:

מס. אמינולאב		90101.16-C	90103.16-C	הערות
תאור הדוגמה		H2O2/HNO3 תמיסת בלאנק	16-M-4486Y תמיסה	
הבדיקה	יח' מידה			
סריקת מתכות מלאח ב-ICP				1
כסף - Ag	mg/L	<0.1	<0.1	
אלומיניום - Al	mg/L	<0.2	<0.2	
ארסן - As	mg/L	<0.1	<0.1	
בורון - B	mg/L	<0.2	<0.2	
בריום - Ba	mg/L	<0.05	<0.05	
בריליום - Be	mg/L	<0.05	<0.05	
סידן - Ca	mg/L	<1	1	
קדמיום - Cd	mg/L	<0.05	<0.05	
קובלט - Co	mg/L	<0.05	<0.05	
כרום - Cr	mg/L	<0.1	<0.1	
נחושת - Cu	mg/L	<0.1	<0.1	
ברזל - Fe	mg/L	<0.1	<0.1	
אשלגן - K	mg/L	<0.5	<0.5	
ליתיום - Li	mg/L	<0.1	<0.1	
מגנזיום - Mg	mg/L	<0.1	<0.1	
מנגן - Mn	mg/L	<0.05	0.1	
מוליבדן - Mo	mg/L	<0.1	<0.1	
נתרן - Na	mg/L	<0.5	<0.5	

נבדק ע"י: מרינה רוכמן
אושר ע"י: דר' שירה רוזנצוייג
מנהלת המחלקה

Shira

מעבדות אמינולאב בע"מ AMINOLAB Analytical Laboratory Services

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את התוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של אמינולאב בע"מ או במוניטין שלה, בהקשר לנתונים או הממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קרית ויצמן , פנחס ספיר 1 ,ת.ד . 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

ISRAC
הרשות הלאומית להסמכת מעבדות
ISO/IEC 17025
No. 005 מס.

מס. אמינולאב		90101.16-C	90103.16-C	הערות
תאור הדוגמה		תמיסת בלאנק H2O2/HNO3	תמיסה 16-M-4486Y	
הבדיקה	יח' מידה			
ניקל - Ni	mg/L	<0.1	<0.1	
זרחן - P	mg/L	<0.5	<0.5	
עופרת - Pb	mg/L	<0.1	<0.1	
גופרית - S	mg/L	<0.5	<0.5	
אנטימון - Sb	mg/L	<0.1	<0.1	
סלן - Se	mg/L	<0.1	<0.1	
בדיל - Sn	mg/L	<0.1	<0.1	
סטרונציום - Sr	mg/L	<0.1	<0.1	
טיטניום - Ti	mg/L	<0.1	<0.1	
טלוריום - Te	mg/L	<0.2	<0.2	
טליום - Tl	mg/L	<0.1	<0.1	
וונדיום - V	mg/L	<0.1	<0.1	
אבץ - Zn	mg/L	<0.2	<0.2	

הערות לבדיקה:

(-) = אין הערות

1. סריקת מתכות: ICP scan - results including "<" = Below detection limits

אבטחת איכות:

הבדיקה	שיטה / תקן	הסמכה/ הכרה
סריקת מתכות מלאה ב- ICP	Based on EPA 29. Accredited for all the metals included in EPA 29, except for Hg.	א

הסמכות / הכרות:

למעבדה מערכת איכות מוסמכת לפי ISO/IEC 17025 והיא פועלת בהתאם לנהלי עבודה מסודרים.

א. המעבדה מוסמכת לביצוע הבדיקה לפי ISO/IEC 17025 מטעם הרשות הלאומית להסמכת מעבדות.

נבדק ע"י: מרינה רוכמן

אושר ע"י: דר' שירה רוזנצוייג
מנהלת המחלקה

Shira

מעבדת אמינולאב בע"מ AMINOLAB Analytical Laboratory Services

יש לחתייחס לנתונים המופיעים במסמך זה במלואם ואין לחעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את חתוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדח אין לעשות שימוש בשמה של אמינולאב בע"מ או במוניטין שלה, בהקשר לנתונים או הממצאים המצוינים במסמך זח אלא ובכפוף לאישורה המוקדם בכתב.

*** סוף תעודת הבדיקה ***

מעבדות אקולוגיה א.פ. בע"מ
החברה הארצית לבדיקות ושירותי איכות הסביבה
רח' הפרת 2, יבנה, ת.ד. 13337, מיקוד 81227.
טל: 08-9322115, פקס: 08-9322116, נייד: 052-2333061,
E-mail :eco_lab2@yahoo.com

פרטי לקוח:

אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
רח' הפרת 2 ת.ד. 13337,יבנה
טל.:08-9322115
פקס.:08-9322116

תאריך הדפסה: 18/12/2016

דיווח תוצאות בדיקה מס' 16-1408/12

קידוד Ecolab: 16-M-7175/7176
סוג הדיגום: ארובות
תאריך דיגום: 28/11/2016
נדגם ע"י: הלקוח
תאור הדוגמא: תמיסה

תאריך ביצוע : 15/12/2016
תאריך קבלה : 02/12/2016
מס' הזמנה : פנימי
תנאי שינוע וקבלה : קירור
איחסון במעבדה : מקרר

תוצאות הבדיקה:

קידוד דוגמה Ecolab פנימי	קידוד דוגמה לפי יומן ניהול	קידוד רישומי שדה / או לפי טופס משמורת	שם חומר הנבדק / אנליזה נדרשת	תוצאת הבדיקה	יחידות
16-M-7175	KMnO4/H2SO4 BLANK	---	כספית-Hg	< 0.005	µg/ml
16-M-7176	16-G-4487	G-1	כספית-Hg	< 0.005	µg/ml

הערות בדיקה: 1. (+) = האנליזה הינה תחת הסמכה ISO/IEC 17025
2. (-) = האנליזה אינה תחת הסמכה ISO/IEC 17025

סוג הבדיקה	שיטת הבדיקה / תקן	הערות בדיקה	איכות
ICP-HG	b.o. EPA 101A	-	מ-1 עד 2

הערות אבטחת איכות , הסמכות/הכרות:

1. המעבדה פועלת ע"פ מערכת איכות ISO/IEC 17025 בהתאם לנהלי עבודה מסודרים.
2. הרשות הלאומית להסמכת מעבדות אינה אחראית על תוצאות הבדיקה.

בוצע ע"י: מריה ניפודוב, אלכסיי חתימה:

אושר ע"י: סמירנוב ילנה חתימה:

מעבדות אקולוגיה א.פ. בע"מ מחלקת אנליטית

סוף דווח

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את התוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של מעבדות אקולוגיה א.פ בע"מ או במוניטין שלה, בהקשר לנתונים או ממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קרית ויצמן , פנחס ספיר 1 ,ת.ד . 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

20/12/2016
דו"ח מס': 112957.16

ISRAC
הרשות הלאומית להסמכת מעבדות
ISO/IEC 17025
No. 005 מס.

לכבוד
מר אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
ת.ד 13337, הפרת 2
יבנה
טל: 08-9322115, 052-2333061
פקס: 08-9322116
דוא"ל: eco_lab2@yahoo.com

הנדון: **תעודה לתוצאות בדיקה**

מס' אמינולאב: **89589.16-C - 89592.16-C** **תאריך קבלה:** 04/12/2016
נדגם ע"י: הלקוח **מס' הזמנה:** 16-765-1
סוג הדיגום: --

תוצאות הבדיקה:

מס. אמינולאב	תאור הדגימה	כלורידים Cl	פלואוריד F	ברומידים Br
		mg/L	mg/L	mg/L
89589.16-C	תמיסת בלאנק H2SO4 0.1N	ND	ND	ND
89592.16-C	תמיסה 16-H-4488	1.2	ND	ND
הערות לבדיקות:		1,2	1,2	1,2

מתחת לסף הגילוי, Not Detected = ND

הערות לבדיקה:
(-) = אין הערות
1. סף הכימות – 1 מג"ל, סף הגילוי – 0.3 מג"ל
2. תוצאות הבדיקה נתונות ללא הפחתת בלנק

אבטחת איכות:

הבדיקה	שיטה / תקן	הסמכה/ הכרה
סריקה בין כרומטוגרף	EPA 26	א

הסמכות / הכרות:
למעבדה מערכת איכות מוסמכת לפי ISO/IEC 17025 והיא פועלת בהתאם לנהלי עבודה מסודרים.
א. המעבדה מוסמכת לביצוע הבדיקה לפי ISO/IEC 17025 מטעם הרשות הלאומית להסמכת מעבדות.

נבדק ע"י: מיכל איזנמן
אושר ע"י: מרינה רוכמן, מנהלת טכנית

מעבדות אמינולאב בע"מ AMINOLAB Analytical Laboratory Services

יש לחתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים. הנתונים המפורטים משקפים במדויק את התוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה אין לעשות שימוש בשמה של אמינולאב בע"מ או במוניטין שלה, בהקשר לנתונים או הממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

*** סוף תעודת הבדיקה ***

מעבדות אקולוגיה א.פ. בע"מ
החברה הארצית לבדיקות ושירותי איכות הסביבה
רח' הפרת 2, יבנה. ת.ד. 13337, מיקוד 81227.
טל: 08-9322115, פקס: 08-9322116, נייד: 052-2333061.
E-mail :eco_lab2@yahoo.com

פרטי לקוח:
אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
רח' הפרת 2 ת.ד. 13337,יבנה
טל.:08-9322115
פקס.:08-9322116

תאריך הדפסה : 06/12/2016

דיווח תוצאות בדיקה מס' 16-1325/12

קידוד Ecolab: 16-A-7055; 16-A-7059
סוג הדיגום: לא ידוע
תאריך דיגום: 28/11/2016
נדגם ע"י: הלקוח
תאור הדוגמא: תמיסה

תאריך ביצוע : 05/12/2016
תאריך קבלה : 28/11/2016
מס' הזמנה : פנימי
תנאי שינוע וקבלה : קרור
איחסון במעבדה : מקרר

תוצאות הבדיקה:

קידוד דוגמה Ecolab פנימי	קידוד דוגמה לפי יומן ניהול	קידוד רישומי שדה/ לפי טופס משמורת	שם חומר הנבדק / אנליזה נדרשת	תוצאת בדיקה	יחידות
16-A-7055	בלאנק 0.1N H2SO4	---	Ammonia	< 0.2	µg/ml
16-A-7059	16-A-4489	A-1	Ammonia	6.9	µg/ml

הערות בדיקה:
1. (+) = האנליזה הינה תחת הסמכה ISO/IEC 17025
2. (-) = האנליזה אינה תחת הסמכה ISO/IEC 17025

סוג הבדיקה	שיטת הבדיקה / תקן	הערות בדיקה	הערות אבטחת איכות
אמוניה ב-SPh	NIOSH P&CAM 205/SPh	+	מ-1 עד 2

הערות אבטחת איכות , הסמכות/הכרות:
1. המעבדה פועלת ע"פ מערכת איכות ISO/IEC 17025 בהתאם לנהלי עבודה מסודרים.
2. הרשות הלאומית להסמכת מעבדות אינה אחראית על תוצאות הבדיקה.

נבדק או בוצע ע"י: נפיודוב מריה — חתימה:
אושר ע"י: סמירנוב ילנה — חתימה:

מעבדות אקולוגיה א.פ. בע"מ מעבדה אנליטית

סוף דוח

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורסים משקפים במדויק את התוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של מעבדות אקולוגיה א.פ בע"מ או במוניטין שלה, בהקשר לנתונים או ממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

מעבדות אקולוגיה א.פ. בע"מ
החברה הארצית לבדיקות ושירותי איכות הסביבה
רח' הפרת 2, יבנה. ת.ד. 13337, מיקוד 81227.
טל: 08-9322115, פקס: 08-9322116, נייד: 052-2333061,
E-mail :eco_lab2@yahoo.com

פרטי לקוח:
אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
רח' הפרת 2 ת.ד. 13337,יבנה
טל.:08-9322115
פקס.:08-9322116

תאריך הדפסה : 11/12/2016

תעודה לתוצאות בדיקה מס' 16-1364/12 תאריך ביצוע: 08/12/2016

מס' ECOLAB: 16-S-7049; 16-S-7051
סוג הדיגום: ארובות
תאריך דיגום: 28/11/2016
נדגם ע"י: הלקוח
תאור הדוגמא: תמיסה
סוג האנליזה: טיטרציה

תאריך קבלה: 28/11/2016
מס' הזמנה: פנימי
תנאי הובלה והגעה: קרור
איחסון במעבדה: מקרר

תוצאות הבדיקה: SOx בטיטרציה

קידוד הדוגמא פנימי	קידוד הדוגמא	Vt ml	N BaCl2 meq/ml	Vsoln ml	Va ml	הערות
16-S-7049	תמיסת בלאנק 3% H2O2	< 0.2*	0.01	100	20	+
16-S-7051	16-S-4491	< 0.2*	0.01	100	20	+

הערות: 1.(-) = האנליזה אינה תחת הסמכה ISO/IEC 17025
הערות:2.(+) = האנליזה הינה תחת הסמכה ISO/IEC 17025
(*)= על פי תוכנית הבטחת איכות פנימית של מעבדה אנליטית

אבטחת איכות:
הסמכות/הכרות: המעבדה פועלת ע"פ מערכת איכות ISO/IEC 17025 בהתאם לנהלי עבודה מסודרים
הרשות הלאומית להסמכת מעבדות אינה אחראית על תוצאות הבדיקה

בוצע ע"י: מריה נפיודוב חתימה:
אושר ע"י: ילנה סמירנוב חתימה:

מעבדות אקולוגיה א.פ. בע"מ מעבדה אנליטית

ilac-MRA ISRAC הרשות הלאומית להסמכת מעבדות ISO/IEC 17025 No 073

סוף דווח

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את התוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של מעבדות אקולוגיה א.פ בע"מ או במוניטין שלה, בהקשר לנתונים או ממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קרית ויצמן , פנחס ספיר 1 ,ת.ד . 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

20/12/2016
דו"ח מס': 112969.16

ISRAC
הרשות הלאומית
להסמכת מעבדות
ISO/IEC 17025
No. 005 מס.

לכבוד
מר אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
ת.ד 13337, הפרת 2
יבנה
טל: 08-9322115, 052-2333061
פקס: 08-9322116
דוא"ל: eco_lab2@yahoo.com

הנדון: **תעודה לתוצאות בדיקה**

מס' אמינולאב: **89607.16-C - 89619.16-C** **תאריך קבלה:** 04/12/2016
נדגם ע"י: הלקוח **מס' הזמנה:** 16-755-1
סוג הדיגום: --

תוצאות הבדיקה:

מס. אמינולאב	תאור הדגימה	ניטראטים NO_3
		mg/L
89607.16-C	תמיסת בלאנק KMnO4/NaOH	ND
89619.16-C	תמיסה 16-N-4492	ND
הערות לבדיקות:		1,2

מתחת לסף הגילוי, Not Detected = ND

הערות לבדיקה:
(-) = אין הערות
1. סף הכימות – 1 מג"ל, סף הגילוי – 0.3 מג"ל
2. תוצאות הבדיקה נתונות ללא הפחתת בלנק

אבטחת איכות:

הבדיקה	שיטה / תקן	הסמכה/ הכרה
ניטראטים - EPA 7D	EPA 7D	א

הסמכות / הכרות:
למעבדה מערכת איכות מוסמכת לפי ISO/IEC 17025 והיא פועלת בהתאם לנהלי עבודה מסודרים.
א. המעבדה מוסמכת לביצוע הבדיקה לפי ISO/IEC 17025 מטעם הרשות הלאומית להסמכת מעבדות.

נבדק ע"י: מיכל איזנמן
אושר ע"י: מרינה רוכמן
מנהלת טכנית

מעבדות אמינולאב בע"מ AMINOLAB Every Particle Counts Analytical Laboratory Services

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את תוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של אמינולאב בע"מ או במוניטין שלה, בהקשר לנתונים או הממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

*** סוף תעודת הבדיקה ***

מעבדות אקולוגיה א.פ. בע"מ
החברה הארצית לבדיקות ושירותי איכות הסביבה
רח' הפרת 2 יבנה ת.ד. 13337, מיקוד 81227
טל: 08-9322115, נייד: 052-2333061, פקס: 08-9322116,
E-mail:eco_lab2@yahoo.com

פרטי לקוח:
אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
רח' הפרת 2 ת.ד. 13337,יבנה
טל.:08-9322115
פקס.:08-9322116

תאריך הדפסה: 08/12/2016

דיווח תוצאות בדיקה מס' 16-1395/12

קידוד Ecolab: 16-V-7031-7035
סוג הדיגום: ארובות
תאריך דיגום: 28/11/2016
נדגם ע"י: הלקוח
תאור הדוגמה: שפופרת

תאריך ביצוע: 05/12/2016
תאריך קבלה: 28/11/2016
מס' הזמנה: פנימי
תנאי שינוע וקבלה: קירור
איחסון במעבדה: מקרר

תוצאות הבדיקה:

קידוד דוגמה Ecolab פנימי	קידוד דוגמה לפי יומן ניהול	קידוד רישומי שדה / או לפי טופס משמורת	שם חומר הנבדק / אנליזה נדרשת	תוצאת הבדיקה	יחידות
16-V-7031	Blank	---	Benzene	< 1.0	µg/sample
16-V-7032	SPIKE	---	Benzene	87.8	%
16-V-7033	16-V-4494X	V-1	Benzene	< 1.0	µg/sample
16-V-7034	16-V-4494Y	V-11	Benzene	< 1.0	µg/sample
16-V-7035	16-V-4495	V-FB	Benzene	< 1.0	µg/sample

הערות בדיקה:
1. (+) = האנליזה הינה תחת הסמכה ISO/IEC 17025
2. (-) = האנליזה אינה תחת הסמכה ISO/IEC 17025

סוג הבדיקה	שיטת הבדיקה / תקן	הערות בדיקה	הערות אבטחת איכות
GC	b.o. NIOSH 1501	+	מ-1 עד 2

הערות אבטחת איכות , הסמכות/הכרות:

1. המעבדה פועלת ע"פ מערכת איכות ISO/IEC 17025 בהתאם לנהלי עבודה מסודרים.
2. הרשות הלאומית להסמכת מעבדות אינה אחראית על תוצאות הבדיקה.

בוצע ע"י: אלינה פלץ **חתימה:**

אושר ע"י: סמירנוב ילנה **חתימה:**

מעבדות אקולוגיה א.פ. בע"מ מעבדה אנליטית

סוף דוח

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את התוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של מעבדות אקולוגיה א.פ בע"מ או במוניטין שלה, בהקשר לנתונים או ממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קרית ויצמן , פנחס ספיר 1 ,ת.ד. 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

18/12/2016
דו"ח מס': 112418.16

לכבוד
מר אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
ת.ד 13337, הפרת 2
יבנה
טל: 08-9322115, 052-2333061
פקס: 08-9322116
דוא"ל: eco_lab2@yahoo.com

הנדון: **תעודה לתוצאות בדיקה**

מס' אמינולאב: **90153.16-C** **תאריך קבלה:** 06/12/2016
תאור הדוגמה: שפופרת 16-V-4493X,Y
נדגם ע"י: הלקוח
סוג הדיגום: --

סריקה חצי כמותית במכשיר GC-MS - נדיפים

סריקת החומרים האורגניים הנדיפים בוצעה ב- GC-MS מול ספרית Wiley 7 המכילה 350,000 ספקטרא וזוהו בה התומרים הבאים:

Compound	CAS No.	Results	Library Search Quality
1,2-Propanediol	57-55-6	1.30	64

אבטחת איכות:

הבדיקה	שיטה / תקן	הסמכה/ הכרה
סריקה חצי כמותית במכשיר GC-MS - נדיפים	GC-MS	(-)

הסמכות / הכרות:
למעבדה מערכת איכות מוסמכת לפי ISO/IEC 17025 והיא פועלת בהתאם לנהלי עבודה מסודרים.
(-) = אין הסמכה ואין הכרה.

נבדק ע"י: דר' אלכסנדר אנוחין
אושר ע"י: דר' שירה רוזנצוייג, מנהלת המחלקה

חתימה:
חתימה:

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את תוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה. אין לעשות שימוש בשמה של אמינולאב בע"מ או במוניטין שלה, בהקשר לנתונים או הממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

*** סוף תעודת הבדיקה ***

אמינולאב בע"מ שרותי מעבדה אנליטיים
T +972.8.930.3333 F +972.8.930.3300
קרית ויצמן , פנחס ספיר 1 ,ת.ד 4074 , נס ציונה 70400

AMINOLAB
Every Particle Counts

18/12/2016
דו"ח מס' :112418.16

לכבוד
מר אלכסיי רטנר
מעבדות אקולוגיה א.פ. בע"מ
ת.ד 13337, הפרת 2
יבנה
טל: 08-9322115, 052-2333061
פקס: 08-9322116
דוא"ל: eco_lab2@yahoo.com

הנדון: **תעודה לתוצאות בדיקה**

מס' אמינולאב: **90149.16-C** **תאריך קבלה:** 06/12/2016
תאור הדוגמה: שפופרת בלאנק SKC 226-09
נדגם ע"י: הלקוח
סוג הדיגום: --

סריקה חצי כמותית במכשיר GC-MS - נדיפים

סריקת החומרים האורגניים הנדיפים בוצעה ב- GC-MS מול ספרית Wiley 7 המכילה 350,000 ספקטרא ולא זוהו בה חומרים

אבטחת איכות:

הבדיקה	שיטה / תקן	הסמכה/ הכרה
סריקה חצי כמותית במכשיר GC-MS - נדיפים	GC-MS	(-)

הסמכות / הכרות:
למעבדה מערכת איכות מוסמכת לפי ISO/IEC 17025 והיא פועלת בהתאם לנהלי עבודה מסודרים.
(-) = אין הסמכה ואין הכרה.

נבדק ע"י: דר' אלכסנדר אנוחין
אושר ע"י: דר' שירה רוזנצוייג
מנהלת המחלקה

חתימה:
חתימה:

יש להתייחס לנתונים המופיעים במסמך זה במלואם ואין להעתיק או לצטט, את כולם או חלקם, למסמכים אחרים.
הנתונים המפורטים משקפים במדויק את התוצאות של הדוגמה שנמסרה לבדיקה, כפי שהתקבלו במעבדה אין לעשות שימוש בשמה של אמינולאב בע"מ או במוניטין שלה, בחקשר לנתונים או הממצאים המצוינים במסמך זה אלא ובכפוף לאישורה המוקדם בכתב.

*** END OF THE REPORT ***

ELCON - Neot Hovav. TO Stack. PCDD/F's. 13/06/2017.

Stack No.	Average Stack Gas Temp o C	Stack Gas Water Content % vol	Average Stack Gas Flowrate (St-d Cond-s, 0 oC) dscm/Hr	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) ng I-TEQ/dscm	Hazard Emission Rate ng I-TEQ/Hr	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) ng I-TEQ/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
TO Stack Set 1d	66.0	18.3	9,491	10:25-14:32	2,3,7,8-TCDD	0.000928	8.81	< LOQ	-----	-----
					1,2,3,7,8-PeCDD	0.000757	7.18		-----	-----
					1,2,3,4,7,8-HxCDD	0.000121	1.15		-----	-----
					1,2,3,6,7,8-HxCDD	0.000364	3.46		-----	-----
					1,2,3,7,8,9-HxCDD	0.000239	2.27		-----	-----
					1,2,3,4,6,7,8-HpCDD	0.000204	1.94		-----	-----
					OCDD	0.000019	0.18		-----	-----
					Total PCDD's	0.002633	24.99		-----	-----
					2,3,7,8-TCDF	0.000323	3.06		-----	-----
					1,2,3,7,8-PeCDF	0.000219	2.08		-----	-----
					2,3,4,7,8-PeCDF	0.002077	19.71		-----	-----
					1,2,3,4,7,8-HxCDF	0.000536	5.09		-----	-----
					1,2,3,6,7,8-HxCDF	0.000476	4.52		-----	-----
					1,2,3,7,8,9-HxCDF	0.000070	0.66	< LOQ	-----	-----
					2,3,4,6,7,8-HxCDF	0.000374	3.55		-----	-----
					1,2,3,4,6,7,8-HpCDF	0.000265	2.51		-----	-----
					1,2,3,4,7,8,9-HpCDF	0.000035	0.33	< LOQ	-----	-----
					OCDF	0.000074	0.70		-----	-----
					Total PCDF's	0.004447	42.21		-----	-----
					PCDD's + PCDF's	0.007080	67.20		0.1	-----
					PCDD's + PCDF's	0.006057	57.49	Min. Concentration		

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure)

2. "< LOD" = less than the Limit of Determination. "< LOQ" = less than the Limit of Quantification.

ELCON - Neot Hovav. TO Stack. No PCDD/F's. 13/06/2017.

Stack No.	Average Stack Gas Temp o C	Stack Gas Water Content % vol	Average Stack Gas Flowrate (St-d Cond-s, 0 oC) dscm/Hr	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
TO Stack Set 1a	62.8	18.1	9,714	10:30-11:44	Metals					
					As	0.037	0.00036	< LOD	0.05	-----
					Cd	0.018	0.00017	< LOD	0.05	-----
					Co	0.018	0.00017	< LOD	0.5	-----
					Cr	0.038	0.00037		1.0	-----
					Cu	0.039	0.00038		1.0	-----
					Mn	0.036	0.00035		0.05	-----
					Ni	0.039	0.00038		1.0	-----
					Pb	0.043	0.00042		0.5	-----
					Sb	0.037	0.00036	< LOD	0.5	-----
					Se	0.037	0.00036		1.0	-----
					Sn	0.041	0.00040		0.5	-----
					Te	0.071	0.00069	< LOD	0.5	-----
					TL	0.037	0.00036	< LOD	0.05	-----
					V	0.034	0.00033		1.0	-----
					SO2, NOx, TOC, Benzene, CO					
				10:36-11:06	SO2	1.32	0.0128	< LOD	35	-----
				10:36-11:36	NOx	165.6	1.608		150	-----
				11:10-11:40	Benzene	0.39	0.0038	< LOD	1.0	-----
				10:56-11:26	TOC as Carbon	2.67	0.0258		20/15	-----
					CO	4.83	0.0074		100	-----

ELCON - Neot Hovav. TO Stack. No PCDD/F's. 13/06/2017.

Stack No.	Average Stack Gas Temp o C	Stack Gas Water Content % vol	Average Stack Gas Flowrate (St-d Cond-s, 0 oC) dscm/Hr	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
TO Stack Set 1a	62.8	18.1	9,714	11:44-12:14	VOC Screening					
					Total VOC	0.21	0.0020	< LOD	-----	-----
	63.7	18.2	9,720	12:00-12:38	Mercury					
					Mercury	0.0074	0.000071	< LOD	0.05	-----
	68.8	18.8	9,650	12:50-13:28	PM, HCL, HBr, HF, NH3					
					Total Dust	3.94	0.0383		10	-----
					HCl	0.18	0.0018	< LOD	30/10	-----
					HBr	0.18	0.0017	< LOD	3	-----
					HF	0.19	0.0018	< LOD	1	-----
					NH3	8.63	0.0838		10	-----
	64.3	18.3	9,589	13:40-14:18	Cyanides					
					Cyanides	0.032	0.00030	< LOD	1.0	TA-Luft
					O2 (Measured)	7.91	% vol		-----	-----
					O2 (for Norm-n)	N.R.	% vol		-----	-----

ELCON - Neot Hovav. TO Stack. No PCDD/F's. 13/06/2017.

Stack No.	Average Stack Gas Temp o C	Stack Gas Water Content % vol	Average Stack Gas Flowrate (St-d Cond-s, 0 oC) dscm/Hr	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
TO Stack Set 1a	66.0	18.3	9,491	10:25-14:32	PAH's					
					Naphtalene	0.0013623	0.00001293		20	-----
					AceNaphtylene	0.0000046	0.00000004	< LOQ	-----	-----
					AceNaphtene	0.0000071	0.00000007		-----	-----
					Fluorene	0.0000313	0.00000030		-----	-----
					PhenAntrene	0.0000185	0.00000018		-----	-----
					Anthracene	0.0000046	0.000000044	< LOQ	-----	-----
					Pyrene	0.0000309	0.00000029		-----	-----
					Benzo(a)Anthracene	0.0000129	0.00000012		-----	-----
					Chryzene	0.0000070	0.000000066		-----	-----
					Benzo(b)Fluoranthene	0.0000212	0.000000201		-----	-----
					Benzo(k)Fluoranthene	0.0000446	0.000000423		-----	-----
					Benzo(a)Pyrene	0.0000090	0.000000086		0.05	-----
					Indeno(1,2,3-cd)Pyrene	0.0000046	0.000000044	< LOQ	-----	-----
					DiBenz(a,h)Anthracene	0.0000046	0.000000044	< LOQ	-----	-----
					Benzo(ghi)Perylene	0.0000046	0.000000044	< LOQ	-----	-----

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure)

2. "< LOD" = less than the Limit of Determination. "< LOQ" = less than the Limit of Quantification.

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1d (DOX). 03/01/2018.

Stack No.	Stack Gas Parameters Measured	Value	Units	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) ng I-TEQ/dscm	Hazard Emission Rate ng I-TEQ/Hr	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) ng I-TEQ/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1d	Temp.	60.8	o C	10:10-14:13	2,3,7,8-TCDD	0.00115	14.3	< LOQ	-----	-----
	Water Cont-t	17.6	% vol		1,2,3,7,8-PeCDD	0.00160	19.9		-----	-----
	Gas Velocity	6.9	m/sec		1,2,3,4,7,8-HxCDD	0.00031	3.8		-----	-----
	Act. Gas Flow	19,464	acm/Hr		1,2,3,6,7,8-HxCDD	0.00076	9.4		-----	-----
	St-d. Gas Flow	12,398	dscm/Hr		1,2,3,7,8,9-HxCDD	0.00052	6.5		-----	-----
	O2 Conc-n	11.14	%		1,2,3,4,6,7,8-HpCDD	0.00041	5.1		-----	-----
					OCDD	0.00008	1.01		-----	-----
					Total PCDD's	0.00483	59.9		-----	-----
					2,3,7,8-TCDF	0.00071	8.8		-----	-----
					1,2,3,7,8-PeCDF	0.00085	10.6		-----	-----
					2,3,4,7,8-PeCDF	0.00737	91.4		-----	-----
					1,2,3,4,7,8-HxCDF	0.00479	59.4		-----	-----
					1,2,3,6,7,8-HxCDF	0.00442	54.8		-----	-----
					1,2,3,7,8,9-HxCDF	0.00094	11.6		-----	-----
					2,3,4,6,7,8-HxCDF	0.00359	44.6		-----	-----
					1,2,3,4,6,7,8-HpCDF	0.00304	37.7		-----	-----
					1,2,3,4,7,8,9-HpCDF	0.00062	7.7		-----	-----
					OCDF	0.00035	4.4		-----	-----
					Total PCDF's	0.02670	331.0		-----	-----
					PCDD's + PCDF's	0.03153	390.9		0.1	
					PCDD's + PCDF's	0.03041	377.1	Min. Concentration		

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1d (DOX). 03/01/2018.

Stack No.	Average Stack Gas Temp o C	Stack Gas Water Content % vol	Average Stack Gas Flowrate (St-d Cond-s, 0 oC) dscm/Hr	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1d	Temp.	60.8	o C	10:10-14:13	Naphtalene	0.000230	0.00000286		20	TA-Luft
	Water Cont-t	17.6	% vol		AceNaphtylene	0.000005	0.00000006		-----	-----
	Gas Velocity	6.9	m/sec		AceNaphtene	0.000005	0.00000006		-----	-----
	Act. Gas Flow	19,464	acm/Hr		Fluorene	0.000005	0.00000006		-----	-----
	St-d. Gas Flow	12,398	dscm/Hr		PhenAntrene	0.000013	0.00000016		-----	-----
	O2 Conc-n	11.14	%		Anthracene	0.000014	0.00000018		-----	-----
					Fluoranthene	0.000016	0.00000020		-----	-----
					Pyrene	0.000010	0.00000012		-----	-----
					Benzo(a)Anthracene	0.000005	0.00000006		-----	-----
					Chryzene	0.000005	0.00000006		-----	-----
					Benzo(b)Fluoranthene	0.000005	0.00000006		-----	-----
					Benzo(k)Fluoranthene	0.000005	0.00000006		-----	-----
					Benzo(a)Pyrene	0.000005	0.00000006		0.05	TA-Luft
					DiBenz(a,h)Anthracene	0.000005	0.00000006		-----	-----
					Benzo(ghi)Perylene	0.000005	0.00000006		-----	-----
					Indeno(1,2,3-cd)Pyrene	0.000005	0.00000006		-----	-----

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).

2. "< LOD" = less than the Limit of Determination. "< LOQ" = less than the Limit of Quantification.

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1a (no DOX). 03/01/2018.

Stack No.	Stack Gas Parameters Measured	Value	Units	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1a	Temp.	60.5	o C	10:25-11:27	Metals					
	Water Cont-t	17.5	% vol		As	0.031	0.000391	< LOD	0.05	TA-Luft
	Gas Velocity	7.0	m/sec		Cd	0.014	0.000183	< LOD	0.05	TA-Luft
	Act. Gas Flow	19,809	acm/Hr		Co	0.014	0.000183	< LOD	0.5	TA-Luft
	St-d. Gas Flow	12,650	dscm/Hr		Cr	0.031	0.000391		1.0	TA-Luft
	O2 Conc-n	11.14	%		Cu	0.029	0.000367		1.0	TA-Luft
					Mn	0.029	0.000367		1.0	TA-Luft
					Ni	0.030	0.000383		0.5	TA-Luft
					Pb	0.029	0.000367	< LOD	0.5	TA-Luft
					Sb	0.031	0.000391	< LOD	1.0	TA-Luft
					Se	0.031	0.000391	< LOD	0.5	TA-Luft
					Sn	0.031	0.000391	< LOD	1.0	TA-Luft
					Te	0.059	0.000741	< LOD	0.5	TA-Luft
					TL	0.031	0.000391	< LOD	0.05	TA-Luft
					V	0.028	0.000358	< LOD	1.0	TA-Luft
					SO2, NOx, TOC, Benzene, CO					
				10:41-11:11	SO2	1.51	0.0191	< LOD	150/40	-----
				11:20-12:20	NOx	120.3	1.522		350/180	-----
				12:23-12:53	Benzene	0.41	0.0052	< LOD	1.0	TA-Luft
				13:21-13:51	TOC as Carbon	2.88	0.0370		20/10	-----
				11:25-11:40	CO	9.31	0.1178		100/30	-----
				13:00-13:30	VOC Screening					
					Total VOC	0.20	0.0026	< LOD	-----	-----

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1a (no DOX). 03/01/2018.

Stack No.	Stack Gas Parameters Measured	Value	Units	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1a	Temp.	62.0	o C	12:50-13:28	Mercury					
	Water Cont-t	17.8	% vol		Mercury	0.014	0.00018		0.05	TA-Luft
	Gas Velocity	7.0	m/sec							
	Act. Gas Flow	19,872	acm/Hr							
	St-d. Gas Flow	12,577	dscm/Hr							
	Temp.	61.0	o C	11:40-12:18	PM, HCL, HF, HBr, NH3					
	Water Cont-t	17.6	% vol		Total Dust	3.80	0.0487		20/5	-----
	Gas Velocity	7.1	m/sec		HCl	5.42	0.0695		50/8	-----
	Act. Gas Flow	20,142	acm/Hr		HBr	1.07	0.0137		6.0/3.0	-----
	St-d. Gas Flow	12,824	dscm/Hr		HF	0.65	0.0084	< LOQ	1.0/2.0	-----
					NH3	2.98	0.0382		10	-----
	Temp.	60.7	o C	13:46-14:20	Cyanides					
	Water Cont-t	17.6	% vol		Cyanides	0.022	0.00029	< LOD	1.0	TA-Luft
	Gas Velocity	7.1	m/sec							
	Act. Gas Flow	20,022	acm/Hr							
	St-d. Gas Flow	12,760	dscm/Hr							

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).

2. "< LOD" = less than the Limit of Determination. "< LOQ" = less than the Limit of Quantification.

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1d (DOX). 20/08/2018.

Stack No.	Stack Gas Parameters Measured	Value	Units	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) ng I-TEQ/dscm	Hazard Emission Rate ng I-TEQ/Hr	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) ng I-TEQ/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1d	Temp.	76.8	o C	08:52-13:00	2,3,7,8-TCDD	0.00089	15.1	< LOQ	-----	-----
	Water Cont-t	35.7	% vol		1,2,3,7,8-PeCDD	0.00090	15.2		-----	-----
	Gas Velocity	12.6	m/sec		1,2,3,4,7,8-HxCDD	0.00016	2.8		-----	-----
	Act. Gas Flow	35,615	acm/Hr		1,2,3,6,7,8-HxCDD	0.00050	8.5		-----	-----
	St-d. Gas Flow	16,983	dscm/Hr		1,2,3,7,8,9-HxCDD	0.00029	5.0		-----	-----
	O2 Conc-n	10.52	%		1,2,3,4,6,7,8-HpCDD	0.00021	3.6		-----	-----
					OCDD	0.00002	0.34		-----	-----
					Total PCDD's	0.00297	50.5		-----	-----
					2,3,7,8-TCDF	0.00044	7.5		-----	-----
					1,2,3,7,8-PeCDF	0.00046	7.8		-----	-----
					2,3,4,7,8-PeCDF	0.00300	51.0		-----	-----
					1,2,3,4,7,8-HxCDF	0.00231	39.2		-----	-----
					1,2,3,6,7,8-HxCDF	0.00112	19.1		-----	-----
					1,2,3,7,8,9-HxCDF	0.00017	2.9		-----	-----
					2,3,4,6,7,8-HxCDF	0.00062	10.5		-----	-----
					1,2,3,4,6,7,8-HpCDF	0.00043	7.2		-----	-----
					1,2,3,4,7,8,9-HpCDF	0.00006	1.0		-----	-----
					OCDF	0.00004	0.7		-----	-----
					Total PCDF's	0.00866	147.0		-----	-----
					PCDD's + PCDF's	0.01163	197.5		0.1	
					PCDD's + PCDF's	0.01073	182.3	Min. Concentration		

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1d (DOX). 20/08/2018.

Stack No.	Average Stack Gas Temp o C	Stack Gas Water Content % vol	Average Stack Gas Flowrate (St-d Cond-s, 0 oC) dscm/Hr	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1d	Temp.	76.8	o C	08:52-13:00	Naphtalene	0.000222	0.00000377	< LOQ	20	TA-Luft
	Water Cont-t	38.0	% vol		AceNaphtylene	0.0000237	0.00000040		-----	-----
	Gas Velocity	12.6	m/sec		AceNaphtene	0.0000044	0.00000008	< LOQ	-----	-----
	Act. Gas Flow	35,615	acm/Hr		Fluorene	0.0000154	0.00000026		-----	-----
	St-d. Gas Flow	16,983	dscm/Hr		PhenAntrene	0.0001468	0.00000249		-----	-----
	O2 Conc-n	10.52	%		Anthracene	0.0000044	0.00000008	< LOQ	-----	-----
					Fluoranthene	0.0001182	0.00000201		-----	-----
					Pyrene	0.0000927	0.00000157		-----	-----
					Benzo(a)Anthracene	0.0000242	0.00000041		-----	-----
					Chryzene	0.0001127	0.00000191		-----	-----
					Benzo(b)Fluoranthene	0.0000231	0.00000039		-----	-----
					Benzo(k)Fluoranthene	0.0000051	0.00000009		-----	-----
					Benzo(a)Pyrene	0.0000044	0.00000008	< LOQ	0.05	TA-Luft
					DiBenz(a,h)Anthracene	0.0000044	0.00000008	< LOQ	-----	-----
					Benzo(ghi)Perylene	0.0000044	0.00000008	< LOQ	-----	-----
					Indeno(1,2,3-cd)Pyrene	0.0000044	0.00000008	< LOQ	-----	-----

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).

2. "< LOD" = less than the Limit of Determination. "< LOQ" = less than the Limit of Quantification.

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1a (no DOX). 20/08/2018.

Stack No.	Stack Gas Parameters Measured	Value	Units	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1a	Temp.	77.8	o C	09:10-10:12	Metals					
	Water Cont-t	35.1	% vol		As	0.068	0.001054	< LOD	0.05	TA-Luft
	Gas Velocity	11.4	m/sec		Cd	0.033	0.000505		0.05	TA-Luft
	Act. Gas Flow	32,173	acm/Hr		Co	0.033	0.000505		0.5	TA-Luft
	St-d. Gas Flow	15,448	dscm/Hr		Cr	0.079	0.001217		1.0	TA-Luft
	O2 Conc-n	10.52	%		Cu	0.068	0.001054		1.0	TA-Luft
					Mn	0.064	0.000993		1.0	TA-Luft
					Ni	0.072	0.001113		0.5	TA-Luft
					Pb	0.068	0.001054		0.5	TA-Luft
					Sb	0.068	0.001054	< LOD	1.0	TA-Luft
					Se	0.068	0.001054	< LOD	0.5	TA-Luft
					Sn	0.068	0.001054		1.0	TA-Luft
					Te	0.132	0.002035	< LOD	0.5	TA-Luft
					TL	0.068	0.001054	< LOD	0.05	TA-Luft
					V	0.066	0.001025		1.0	TA-Luft
					SO2, NOx, TOC, Benzene, CO					
				10:10-10:40	SO2	10.5	0.1623		150/40	-----
				11:51-12:51	NOx	31.3	0.4836		350/180	-----
				11:50-11:20	Benzene	0.43	0.0066	< LOD	1.0	TA-Luft
				09:07-09:37	TOC as Carbon	8.79	0.1535		20/10	-----
				09:30-09:45	CO	4.88	0.0753		100/30	-----
					CO2	6.70	2,034.5		-----	-----
				09:36-10:06	VOC Screening					
					Total VOC	0.20	0.0030	< LOD	-----	-----

ELCON - Neot Hovav. TO Stack Test Results. Set No. 1a (no DOX). 20/08/2018.

Stack No.	Stack Gas Parameters Measured	Value	Units	Sampling Time HH:mm	Hazard Sampled	Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Hazard Emission Rate Kg/Hour	Remarks	Emission Standard (Heiter Plitot) Hazard Instack Conc-n (St-d Cond-s, 0 oC) mg/dscm	Emission Standard (Heiter Plitot) Hazard Emission Rate Kg/Hour
Stack No. ST-1 Test No. 1a	Temp.	77.5	o C	13:54-14:31	Mercury					
	Water Cont-t	36.0	% vol		Mercury	0.011	0.00019	< LOD	0.05	TA-Luft
	Gas Velocity	13.3	m/sec							
	Act. Gas Flow	37,542	acm/Hr							
	St-d. Gas Flow	17,806	dscm/Hr							
	Temp.	77.7	o C	13:10-13:47	PM, HCL, HF, HBr, NH3					
	Water Cont-t	35.8	% vol		Total Dust	4.36	0.0762		20/5	-----
	Gas Velocity	13.0	m/sec		HCl	2.30	0.0401		50/8	-----
	Act. Gas Flow	36,769	acm/Hr		HBr	5.90	0.1030		6.0/3.0	-----
	St-d. Gas Flow	17,468	dscm/Hr		HF	0.31	0.0054	< LOD	1.0/2.0	-----
					NH3	7.96	0.1391		10	-----
	Temp.	77.3	o C	14:37-15:14	Cyanides					
	Water Cont-t	36.1	% vol		Cyanides	0.040	0.00072	< LOD	1.0	TA-Luft
	Gas Velocity	13.5	m/sec							
	Act. Gas Flow	38,014	acm/Hr							
	St-d. Gas Flow	17,985	dscm/Hr							

Remarks: 1. The Concentrations were Calculated at Standard Conditions (Dry Gas, 0 oC, Atmospheric Pressure).

2. "< LOD" = less than the Limit of Determination. "< LOQ" = less than the Limit of Quantification.

APPENDIX 3-B

TANKS PRINTOUTS

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T-20120A
City:	Philadelphia
State:	Pennsylvania
Company:	Elcon
Type of Tank:	Vertical Fixed Roof Tank
Description:	Storage Tank Unit 20

Tank Dimensions

Shell Height (ft):	50.00
Diameter (ft):	21.50
Liquid Height (ft) :	45.00
Avg. Liquid Height (ft):	40.00
Volume (gallons):	122,211.62
Turnovers:	485.00
Net Throughput(gal/yr):	59,272,637.10
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.00
Slope (ft/ft) (Cone Roof)	0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Philadelphia, Pennsylvania (Avg Atmospheric Pressure = 14.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-20120A - Vertical Fixed Roof Tank
Philadelphia, Pennsylvania

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Methyl alcohol	All	55.99	51.19	60.78	54.30	1.2694	1.0867	1.4779	32.0400			32.04	Option 2: A=7.897, B=1474.08, C=229.13

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-20120A - Vertical Fixed Roof Tank
Philadelphia, Pennsylvania

Annual Emission Calcaulations	
Standing Losses (lb):	359.7344
Vapor Space Volume (cu ft):	3,630.5030
Vapor Density (lb/cu ft):	0.0074
Vapor Space Expansion Factor:	0.0618
Vented Vapor Saturation Factor:	0.5978
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	3,630.5030
Tank Diameter (ft):	21.5000
Vapor Space Outage (ft):	10.0000
Tank Shell Height (ft):	50.0000
Average Liquid Height (ft):	40.0000
Roof Outage (ft):	0.0000
Roof Outage (Cone Roof):	
Roof Outage (ft):	0.0000
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0000
Shell Radius (ft):	10.7500
Vapor Density:	
Vapor Density (lb/cu ft):	0.0074
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.2694
Daily Avg. Liquid Surface Temp. (deg. R):	515.6569
Daily Average Ambient Temp. (deg. F):	54.2792
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	513.9892
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,263.2634
Vapor Space Expansion Factor:	
Vapor Space Expansion Factor:	0.0618
Daily Vapor Temperature Range (deg. R):	19.1711
Daily Vapor Pressure Range (psia):	0.3912
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.2694
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	1.0867
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	1.4779
Daily Avg. Liquid Surface Temp. (deg R):	515.6569
Daily Min. Liquid Surface Temp. (deg R):	510.8641
Daily Max. Liquid Surface Temp. (deg R):	520.4497
Daily Ambient Temp. Range (deg. R):	18.2750
Vented Vapor Saturation Factor:	
Vented Vapor Saturation Factor:	0.5978
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.2694
Vapor Space Outage (ft):	10.0000
Working Losses (lb):	13,116.6614
Vapor Molecular Weight (lb/lb-mole):	32.0400
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	1.2694
Annual Net Throughput (gal/yr.):	59,272,637.0978
Annual Turnovers:	465.0000
Turnover Factor:	0.2285
Maximum Liquid Volume (gal):	122,211.6229
Maximum Liquid Height (ft):	45.0000
Tank Diameter (ft):	21.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	13,476.5957

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

T-20120A - Vertical Fixed Roof Tank
Philadelphia, Pennsylvania

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Methyl alcohol	13,116.86	359.73	13,476.60

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	T-20120A
City:	Philadelphia
State:	Pennsylvania
Company:	Elcon
Type of Tank:	Vertical Fixed Roof Tank
Description:	Storage Tank Unit 20

Tank Dimensions

Shell Height (ft):		50.00
Diameter (ft):		21.50
Liquid Height (ft) :		45.00
Avg. Liquid Height (ft):		40.00
Volume (gallons):		122,211.62
Turnovers:		485.00
Net Throughput(gal/yr):		59,272,637.10
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition:	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Philadelphia, Pennsylvania (Avg Atmosphenc Pressure = 14.73 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

T-20120A - Vertical Fixed Roof Tank
Philadelphia, Pennsylvania

Mixture/Component	Month	Daily Liquid Surf Temperature (deg F) Avg.	Min.	Max	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Isopropyl alcohol	All	55.99	51.19	60.78	54.30	0.4142	0.3457	0.4942	60.0900			60.09	Option 2: A=8.1177, B=1580.92, C=219.61

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

T-20120A - Vertical Fixed Roof Tank
Philadelphia, Pennsylvania

Annual Emission Calcaulations	
Standing Losses (lb):	211.8834
Vapor Space Volume (cu ft):	3,630.5030
Vapor Density (lb/cu ft):	0.0045
Vapor Space Expansion Factor:	0.0434
Vented Vapor Saturation Factor:	0.8200
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	3,630.5030
Tank Diameter (ft):	21.5000
Vapor Space Outage (ft):	10.0000
Tank Shell Height (ft):	50.0000
Average Liquid Height (ft):	40.0000
Roof Outage (ft):	0.0000
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.0000
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0000
Shell Radius (ft):	10.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0045
Vapor Molecular Weight (lb/lb-mole):	60.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4142
Daily Avg. Liquid Surface Temp. (deg. R):	515.6569
Daily Average Ambient Temp. (deg. F):	54.2792
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	513.9692
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,263.2634
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0434
Daily Vapor Temperature Range (deg. R):	19.1711
Daily Vapor Pressure Range (psia):	0.1485
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4142
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.3457
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.4942
Daily Avg. Liquid Surface Temp. (deg R):	515.6569
Daily Min. Liquid Surface Temp. (deg R):	510.8641
Daily Max. Liquid Surface Temp. (deg R):	520.4497
Daily Ambient Temp. Range (deg. R):	18.2750
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.8200
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4142
Vapor Space Outage (ft):	10.0000
Working Losses (lb)	8,025.9207
Vapor Molecular Weight (lb/lb-mole):	60.0900
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.4142
Annual Net Throughput (gal/yr.):	59,272,637.0978
Annual Turnovers:	485.0000
Turnover Factor:	0.2285
Maximum Liquid Volume (gal):	122,211.6229
Maximum Liquid Height (ft):	45.0000
Tank Diameter (ft):	21.5000
Working Loss Product Factor:	1.0000
Total Losses (lb):	8,237.8041

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

T-20120A - Vertical Fixed Roof Tank
Philadelphia, Pennsylvania

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Isopropyl alcohol	8,025.92	211.88	8,237.80

ATTACHMENT 4

REGULATORY REVIEW AND APPLICABLE REQUIREMENTS

ATTACHMENT 4
REGULATORY REVIEW AND APPLICABLE REQUIREMENTS

The proposed source is required to comply with regulations promulgated by the U.S. Environmental Protection Agency (EPA) and the Pennsylvania Department of Environmental Protection (Department) with respect to emissions of air contaminants. This section identifies the applicable federal and state regulations for the proposed project:

4.1 U.S. ENVIRONMENTAL PROTECTION AGENCY REGULATIONS

EPA currently regulates new and modified sources of air contaminants through four programs:

1) New Source Performance Standards (NSPS)
2) National Emission Standards for Hazardous Air Pollutants (NESHAP)
3) Maximum Achievable Control Technology (MACT) for Source Categories
4) Prevention of Significant Deterioration (PSD)/Nonattainment New Source Review (NNSR)

4.1.1 New Source Performance Standards (NSPS)

The NSPS currently apply to approximately 80 categories of sources. These standards list emission limitations and operating requirements specific to each source category for new or modified sources.

Storage Tanks

There is currently one standard (40 CFR Part 60 Subpart Kb) that may be applicable to the tanks at proposed Elcon facility. Subpart Kb applies to each storage vessel with a capacity greater than or equal to 75 cubic meters (m^3) that is used to store volatile organic liquids (VOLs) for which construction, reconstruction, or modification is commenced after July 23, 1984. This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa. This subpart does not apply to process tanks.

The following tanks at Elcon can potentially contain volatile organic liquids and are greater than 75 m^3:

Source ID	Tank ID	Contents
101	T-20120A	Liquid waste
101	T-20120B	Liquid waste
101	T-20121A	Liquid waste
101	T-20121B	Liquid waste
101	T-20122A	Liquid waste

Source ID	Tank ID	Contents
101	T-20122B	Liquid waste
101	T-12101	Liquid waste
101	T-12102	Liquid waste
101	T-21100A	Liquid waste
101	T-21100B	Liquid waste
101	T-21101A	Liquid waste
101	T-21101B	Liquid waste
101	T-Future	Liquid waste

Because of the variations in the inlet streams, Elcon assumes that all of the tanks listed above will contain VOLs. There are additional storage tanks that contain caustic or acids, which will most likely not contain VOLs. However, in order to allow for maximum operational flexibility, Elcon would like the ability to store VOLs in any of these tanks. All of the tanks containing VOLs will vent to the thermal oxidizer system.

Elcon will comply with Subpart Kb by using a closed vent system and control device (thermal oxidizer) designed to reduce VOC emissions by at least 95 percent. The combustion chamber on the thermal oxidizer has a residence time greater than 0.75 seconds and will operate above 816 °C.

1,000-kW EGEN

The proposed EGEN engine is subject to the Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (40 CFR 60, Subpart JJJJ), and is classified as a new, emergency, 4-stroke, lean-burn engine. The specific requirements of this standard applicable to the proposed engine are as follows:

Emission Limits, §60.4233(e) and Table 1:

NOx 2.0 gm/hp-hr or 160 ppmvd @ 15% O_2
CO 4.0 gm/hp-hr or 540 ppmvd @ 15% O_2
VOC 1.0 gm/hp-hr or 86 ppmvd @ 15% O_2 (excluding formaldehyde)

Monitoring Requirements, *§60.4237(a):*

None, unless the engine does not meet the emission limits for a non-emergency engine, in which case a non-resettable hour meter must be installed.

Compliance Requirements, §60.4243(b):

Elcon will comply with this require by purchasing a certified engine.

Recordkeeping Requirements, §§60.4245(a) and (b):

Keep records of all notifications submitted and maintenance conducted on the engine. Since this will be a certified engine, Elcon will keep records of documentation from the manufacturer that the engine is certified to meet the emission standards. In addition, Elcon will document how many

hours are spent for emergency operation, including what classified the operation as emergency, and how many hours are spent for non-emergency operation.

Notification Requirements, §60.4245(c):

Elcon will comply with this require by purchasing a certified engine.

Performance Testing, §§60.8(a) and 60.4245(d):

Elcon will comply with this require by purchasing a certified engine.

300-hp Fire Pump Engine

The two fire pump engines are subject to the Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII), and is classified as a new, emergency engine. The specific requirements of this standard applicable to the proposed engine are as follows:

Emission Limits, §60.4205(c) and Table 4:

NOx + NMHC	4.0 gm/hp-hr
CO	3.5 gm/hp-hr
PM	0.2 gm/hp-hr

Fuel Requirements, §§60.4205(B) and 60.510(b)

Diesel fuel must meet a sulfur content limit of 15 ppm and either a minimum cetane index of 40 or a maximum aromatic content of 35 volume percent.

Monitoring Requirements, §60.4209

If the engine does not meet the standards applicable to non-emergency engines, install a non-resettable hour meter prior to startup of the engine. If the engine is equipped with a diesel particulate filter to comply with the PM emission standards, the diesel particulate filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

Compliance Requirements, §60.4211

1. Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;
2. Change only those emission-related settings that are permitted by the manufacturer.
3. Purchase an engine certified to meet the applicable emission limits.
4. Limit operation for maintenance checks and readiness testing to 100 hours per year.
5. The engine may be operated for certain non-emergency purposes up to 50 hours per year, which are counted as part of the 100 hour/year allotment for maintenance checks and readiness testing.

6. If the engine is not installed, configured, operated, and maintained according to the manufacturer's emission-related written instructions, or if the emission-related settings are changed in a way that is not permitted by the manufacturer, compliance must be demonstrated by keeping a maintenance plan and records of conducted maintenance and, to the extent practicable, maintaining and operating the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, an initial performance test must be conducted to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after the settings are changed.

Notification, Recordkeeping, and Reporting Requirements, 60.4214

No initial notifications are required for emergency engines. If the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, records must be kept of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The time of operation of the engine and the reason the engine was in operation during that time must also be recorded. If the engine is equipped with a diesel particulate filter, records must be kept of any corrective action taken after the backpressure monitor has notified that the high backpressure limit of the engine is approached.

4.1.2 National Emission Standards for Hazardous Air Pollutants (NESHAP), including Maximum Achievable Control Technology (MACT)

National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61

The NESHAP regulations, 40 CFR Part 61, apply to the following compounds listed as hazardous air pollutants (HAPs) prior to the passage of the Clean Air Act Amendments of 1990 (CAAA): asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride. The regulation lists emission limits and operating parameters that must be followed for specifically listed sources that emit these compounds.

40 CFR Part 61 Subpart E applies to sources that dry wastewater treatment plant sludge. A sludge dryer is a device used to reduce the moisture content of sludge by heating temperatures above 65 °C directly with combustion gases. Oven No. 1 (part of Source ID 103) meets this requirement. Some of the waste streams that Elcon may process can contain mercury. The emission limit for sludge dryers under Subpart E is 3.2 kilograms of mercury per 24-hour period. Based on testing of a similar operation in Israel, mercury emissions using EPA Reference Method 101-a and adjusting for differences in production rates and variations in waste streams, the predicted mercury emission rate from the Elcon facility is significantly below the Subpart E emission limit.

40 CFR Part 61 Subpart J applies to facilities that contain equipment operating in benzene service or facilities that treat benzene-containing hazardous waste, respectively. Elcon does not believe it will be subject to this rule since the process fluids will contain less than 10 percent benzene by weight.

40 CFR Part 61 Subpart V lists standards for equipment leaks (fugitive emission sources) in VHAP service. In VHAP service means a piece of equipment that contains or contacts a fluid that is at least 10 percent by weight of a volatile hazardous air pollutant (VHAP). VHAP only includes substances regulated for equipment leaks under 40 CFR Part 61; this includes benzene and vinyl chloride. Elcon does not expect to have any VHAP in excess of 10 percent.

Maximum Achievable Control Technology Standards, 40 CFR Part 63

MACT standards (40 CFR Part 63) have been promulgated for numerous categories of major HAP sources (those with potential emissions of 10 or more tons per year of any individual HAP or 25 tons per year of combined HAPs). These standards impose emission limitations and operating requirements specific to each source type. Elcon is a minor source for HAPs. Individual emissions of hydrochloric acid and metal HAPs will be less than 10 tpy and total HAP emissions will be below 25 tpy. The facility is not subject to any of the MACT standards that are applicable to major source. There is a MACT standard (40 CFR 63 Subpart DD - National Emission Standards for Hazardous Air Pollutants from Off-Site Waste and Recovery Operations) that is applicable to a major HAP source. As Elcon site is not a major source for HAPs, Subpart DD is not applicable to Elcon.

Area source MACT standards apply to the generator and fire pumps and are discussed below. The boiler fires natural gas only and hence it is not subject to the area source boiler MACT (40 CFR 63 Subpart JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources).

There is also an area source MACT standard (40 CFR 63 Subpart EEE) that applies to hazardous waste combustors. Hazardous waste combustors include: hazardous waste incinerators, hazardous waste cement kilns, hazardous waste lightweight aggregate kilns, hazardous waste solid fuel boilers, hazardous waste liquid fuel boilers, and hazardous waste hydrochloric acid production furnaces. Under Subpart EEE:

> "*Hazardous waste incinerator* means a device defined as an incinerator in §260.10 of this chapter and that burns hazardous waste at any time. For purposes of this subpart, the hazardous waste incinerator includes all associated firing systems and air pollution control devices, as well as the combustion chamber equipment."

40 CFR §260.10 is part of the Resource Conservation and Recovery Act (RCRA) requirements. Per EPA, the RCRA standards do not apply to "fume incinerators" because the fume is not identifiable as a solid waste. (On www.epa.gov/rcraonline-memorandums, see PPC 9441.1984(15)). In order for a waste stream to be classified as a hazardous waste, it first must be considered a solid waste. Since the thermal oxidizers are not burning hazardous waste, the thermal oxidizers do not meet the definition of a hazardous waste incinerator. Furthermore, EPA has clarified that the use of control devices used to meet the RCRA organic air emissions requirements for process vents and equipment leaks under 40 CFR part 264, Subparts AA and BB, are subject to the air pollution control requirements under the RCRA rules, which require a 95 percent control efficiency and are not subject to the RCRA incinerator standards under 40 CFR Part 265 Subpart O, which require a destruction or removal efficiency of 99.99 percent. (On

www.epa.gov/rcraonline-memorandums, see PPC 9534.1991(01)). Elcon is using the thermal oxidizer to achieve compliance with the RCRA organic air emission requirements; Elcon's proposed control efficiency of 99.9 percent far exceeds the RCRA requirements of 95 percent.

The thermal oxidizers proposed by Elcon for air pollution control are being used to comply the Department's air quality requirements as well as the air quality requirements under the Resource Conservation and Recovery Act (RCRA), specifically 40 CFR Part 264, Subparts AA, CC, and X.

40 CFR Part 264, Subpart AA pertains to specific types of process vents. For applicable process vents, which in Elcon's case includes the Flash Evaporative Distillation unit, the distillation column, and the thin film evaporators, VOC emissions are required to be reduced by a minimum of 95 percent. The thermal oxidizers proposed by Elcon significantly exceeds this value.

40 CFR Part 264, Subpart CC addresses the RCRA requirements for the tanks proposed by Elcon. Elcon is complying with the Subpart CC requirements for the tanks by venting the tanks to the thermal oxidizers. Similar to Subpart AA, the thermal oxidizer is only required to have a control efficiency of 95 percent, which is significantly exceeded by the proposed thermal oxidizer system.

Finally, 40 CFR Part 264 Subpart X, pertains to miscellaneous units used to treat, store, or dispose of hazardous waste. Miscellaneous units are defined as follows:

> "*Miscellaneous unit* means a hazardous waste management unit where hazardous waste is treated, stored, or disposed of and that is not a container, tank, surface impoundment, pile, land treatment unit, landfill, incinerator, boiler, industrial furnace, underground injection well with appropriate technical standards under part 146 of this chapter, containment building, corrective action management unit, unit eligible for a research, development, and demonstration permit under 40 CFR 270.65, or staging pile."

In Elcon's case, the miscellaneous units used to treat hazardous waste include various types of equipment, such as filter presses, sludge dryers, settlers, or centrifuges. The air pollution control devices (e.g., thermal oxidizers) are not hazardous waste treatment units simply because they are not treating hazardous waste per EPA. (See the discussion above regarding the applicability of the 40 CFR Subpart 63, Subpart EEE.) Subpart X requires that appropriate techniques be used for "Prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air …" (40 CFR 264.601(c)). Elcon is proposing to meet the Subpart X requirements by using the thermal oxidizers and other efficient systems (such as particulate control devices) to meet the Subpart X requirements as they pertain to air quality.

Generator and Fire Pumps

The emergency generator and fire pump are subject to the requirements of 40 CFR Part 63, Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines). This rule applies to owners and operators of all stationary reciprocating internal combustion engines (RICE) irrespective of the date the engine was constructed. Under Subpart ZZZZ [§ 63.6590(a)(2)(iii)], the emergency generator and fire pump are considered as "new engines at an area source" since their construction commenced after June 12, 2006. The generator meets the requirements of Subpart ZZZZ by meeting the requirements of

the New Source Performance Standard (NSPS) for Spark Ignition Engines (40 CFR 60, Subpart JJJJ). The pump meets the requirements of Subpart ZZZZ by complying with the requirements of the NSPS for Compression Ignition Engines (40 CFR 60, Subpart IIII). There are no further requirements for the generator or fire pump under Subpart ZZZZ [§ 63.6590(c)(1)].

40 CFR Part 60, Subpart JJJJ applies to owners and operators of stationary spark ignition engines for which construction commenced after June 12, 2006, and which were manufactured after January 1, 2009. The new generator is natural gas-fired, commenced construction after June 12, 2006, and is manufactured after January 1, 2009. Hence, this engine is subject to the requirements of NSPS Subpart JJJJ. Elcon will purchase a certified engine complying with requirements of NSPS Subpart JJJJ.

40 CFR Part 60, Subpart IIII applies to owners and operators of stationary compression ignition engines for which construction commenced after July 11, 2005, and which were manufactured after July 1, 2006 as a certified National Fire Protection Association (NFPA) fire pump engine. The fire pump engines are diesel-fired, commenced construction after July 11, 2005, and is manufactured after July 1, 2006. Hence, this pump is subject to the requirements of NSPS Subpart IIII.

Cooling Tower

40 CFR Part 63 Subpart Q applies to hazardous air pollutants for industrial process cooling towers operated with chromium-based water treatment chemicals and are located at a major source. Elcon's cooling towers will not use chromium-based chemicals and Elcon will be a minor source for HAPs.

4.1.3 40 CFR 68: Chemical Accident Prevention Provisions

The Chemical Accident Prevention Provisions apply to facilities that have at least one regulated compound in a process in an amount greater than its threshold quantity. Elcon has reviewed the list of regulated compounds and does not believe that this rule will apply to its operations. However, it will review applicability at start-up to verify this determination.

4.1.4 40 CFR 64: Compliance Assurance Monitoring

The proposed construction of the facility will not be subject to the CAM Plan requirements because the facility is not a major source.

4.1.5 Nonattainment New Source Review

The Prevention of Significant Deterioration (PSD) and Non-attainment New Source Review (NSR) programs will not apply as this is a minor facility as shown in the following table.

	NOx (tpy)	CO (tpy)	SO_X (tpy)	VOC (tpy)	PM (tpy)	HCl (tpy)
Total Plant	23.4 [1]	36.6	24.2	10.1	10.5	6.3 [2]

[1] Elcon is seeking a facility-wide limitation of 25 tpy for this pollutant.

[2] Elcon is seeking a facility-wide limitation of 10 tpy for this pollutant.

4.1.6 Greenhouse Gas Tailoring Rule

On June 3, 2010, EPA promulgated its final rule addressing the applicability criteria of greenhouse gas (GHG) emissions and major air quality operating permit programs. EPA is tailoring the applicability criteria of the Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs to avoid applicability of these complex programs to relatively small GHG emission sources. Without this rule, facilities that emit GHG at levels as low as 100 tons per year (tpy) would otherwise be subject to these programs that are intended for major emission sources.

EPA began implementing these requirements on January 2, 2011. In EPA's initial implementation of the rule (Step 1), the requirements apply to a source's GHG emissions only if the PSD or Title V requirements would apply anyway; i.e., if a source is already major for a non- GHG pollutant. For the Title V program, only existing sources with, or new sources obtaining, Title V permits for non-GHG pollutants will be required to address GHGs. Existing Title V sources need to address GHG emissions when they apply for, renew, or revise their permits, irrespective of their GHG emission rates. In Step 2 of EPA's implementation of the rule (July 1, 2011 through June 30, 2013), facilities that emit more than 100,000 tpy of carbon dioxide equivalent (CO_2e) will be required to apply for a Title V operating permit. However, the Courts have vacated EPA's step 2 provisions.

Potential GHG emissions for the facility are located in Attachment 3 and are below 75,000 metric tons of CO_2e. No further requirements apply related to GHG emissions.

4.2 PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS

State air quality regulations are contained in PA Title 25, Article III, the Rules and Regulations of the Pennsylvania Department of Environmental Protection (Department). The key sections of the Department's regulations as applicable to this Plan Approval application are summarized below:

Chapter 122 - New Source Performance Standards

Chapter 122 adopts the federal New Source Performance Standards. See the regulatory review for NSPS in Section 2.1.1.

Section 123.1 – Prohibition of Certain Fugitive Emissions and Section 123.2 – Fugitive Particulate Matter

Section 123.1 prohibits fugitive emissions into the outdoor atmosphere except for nine identified types of fugitive emission sources, such as construction, grading, roads or streets, or material stockpiles, unless reasonable actions are taken to keep particulate matter from becoming airborne. Section 123.2 prohibits emissions of fugitive particulate matter from the nine identified emission

sources to be visible outside of the property line. No fugitive emissions into the outdoor atmosphere are anticipated. There may be fugitive particulate emissions from roadways on site; however, the emissions will comply with the Department's requirement to take reasonable precautions to reduce emissions. For example, plant roads will be paved.

Section 123.11 – Combustion Units (Particulate Emissions)

Particulate matter emissions from the boiler are subject to §123.11. A person may not permit the emission into the outdoor atmosphere of particulate matter from a combustion unit in excess of 0.4 pounds per million Btu of heat input. Elcon will be well below this standard using natural gas as the fuel.

Section 123.13 – Processes (Particulate Emissions)

The sources of particulate matter emissions are subject to §123.13. The limitation varies based on the type of operation (i.e., is the operation listed on the table in the regulation) or the air flow rate.

The processing of solid and liquid hazardous or residual waste operations at Elcon are subject to the requirements of Section 123.13(c) as they are not listed on the table in the regulation. Since the air flow rate for the thermal oxidizers below 150,000 dscfm, the allowable particulate concentration is 0.04 gr/dscf. The operations will generate nominal amounts of particulate emissions due to the nature of the operations. The particulate matter emissions from the operations will be well below 0.04 gr/dscf.

The fire pumps and generator will fire clean fuels (natural gas or low sulfur diesel) and will be in compliance with the particulate limit of 0.04 gr/dscf.

Section 123.21 – Sulfur Compound Emissions (General)

This section applies to non-combustion units and limits emissions of sulfur oxides, expressed as sulfur dioxide, to 500 ppmvd.

There will be some sulfur compounds in the waste streams processed. Estimated emissions are well below the 500 ppmvd limit. The fire pumps and generator fire clean fuels (natural gas and low sulfur diesel) and will be in compliance with this standard.

Section 123.22 – Sulfur Compound Emissions (Boiler)

As started in Section §123.22(e) for the southeast Pennsylvania air basin inner zone, a person may not permit the emission of sulfur oxides from a combustion unit in excess of 1.0 lb/MMBtu. The sulfur emissions from the boiler will to be well below 1.0 lb/MMBtu burning natural gas fuel.

Section 123.31 – Odor Emissions

A person may not permit emissions into the outdoor atmosphere of any malodorous air contaminant such that the malodors are detectable outside the property line of the facility on which

the source is being operated. No malodors are expected to be detectable outside the property line of the facility based on prior experience in Israel. Best Available Technologies will be used to reduce emissions of organic compounds, which will maximize odor control.

Section 123.41 – Visible Emissions

Emissions may not equal or exceed 20 percent opacity for more than three minutes in any hour, and may not equal or exceed 60 percent opacity at any time. These operations will be equipped with scrubbers and dust collectors to reduce emissions. Based on the use of the air pollution control devices, no visible emissions above the allowable opacity limits are anticipated.

Chapter 124 – National Emission Standards for Hazardous Air Pollutants

Chapter 124 adopts the federal National Emission Standards for Hazardous Air Pollutants. See the regulatory review for NESHAP in Section 2.1.2.

Chapter 127, Subchapter B – Plan Approval Requirements

Section 127.11 prohibits facility owners from constructing new or modifying existing air pollution sources or air cleaning devices without first receiving plan approval and an operating permit from the Department. Section 127.12a requires that a compliance review form be submitted with the application or on a periodic basis as authorized in the section. This plan approval application submitted for the manufacturing operations demonstrates Elcon's compliance with these requirements. Elcon does not submit its compliance review form on a periodic basis; therefore, the compliance review information form is included with this application.

Chapter 127.43a – Public Notification

Applicants for plan approval are required to notify the municipality and county in which the facility will be located that such an application is being made. Municipal notifications have been sent to the Bucks County and Falls Township Planning Commissions. See Attachment 7 for copies of the notification letters and return receipts.

Chapter 127, Subchapter D – Prevention of Significant Deterioration of Air Quality

Chapter 127 adopts the federal Prevention of Significant Deterioration (PSD) requirements promulgated in 40 CFR 52. Elcon will be a minor source under this program; therefore, it is not applicable.

Chapter 127, Subchapter E – New Source Review

Major modifications to major existing sources and major new sources located in nonattainment areas are required to incorporate Lowest Achievable Emission Rate (LAER) control technology and offset the new emissions. Elcon will not be triggering New Source Review (NSR) based on projected emissions estimates. Emissions are below major source thresholds for NO_x and VOCs.

Section 129.56 – Storage tanks greater than 40,000 gallons capacity containing VOCs.

The provisions of this section apply to aboveground stationary storage tanks with a capacity greater than 40,000 gallons that contain volatile organic compounds with a vapor pressure greater than 1.5 psia (10.5 kilopascals) under actual storage conditions. Elcon is proposing to vent the storage tanks through a thermal oxidizer thus controlling VOC emissions. Similar to the requirements discussed above for NSPS Subpart Kb, Elcon will vent all of its tanks containing volatile organic compounds to the thermal oxidizers to allow for maximum operational flexibility at the facility.

Section 129.57 – Storage tanks less than or equal to 40,000 gallons capacity containing VOCs.

The provisions of this section apply to aboveground stationary storage tanks with a capacity equal to or greater than 2,000 gallons that contain volatile organic compounds with a vapor pressure greater than 1.5 psia (10.5 kilopascals) under actual storage conditions. Elcon is proposing to vent the storage tanks through thermal oxidizers thus controlling VOC emissions. Similar to the requirements discussed above for NSPS Subpart Kb, Elcon will vent all of its tanks containing volatile organic compounds to the thermal oxidizers to allow for maximum operational flexibility at the facility.

Section 129.91 – Control of major sources of NO_x and VOCs.

This section applies to major NO_x or VOC emitting sources for which no RACT requirement has been established in §§129.51, 129.52, 129.54–129.72, 129.81, and 129.82. Elcon is a minor source under this program and is not subject to these requirements.

Section 131.2 – National Ambient Air Quality Standards

With the use of air pollution control devices and the low quantity of emitted pollutants, Elcon will not exceed these standards.

Section 135.21 – Emission Statements

Major sources of pollution and sources in ozone nonattainment areas must submit annual emission statements by March 1 of each year, reporting emissions of those air contaminants for the previous year. Elcon is a minor source but will submit emission statements if requested by the Department.

Section 137.4 – Air Pollution Episode Plans

Certain sources designated by the Department under 137.4(a) and located in counties designated in 137.4(b) must submit a standby plan to be implemented in case of an air pollution episode. Elcon's operations are not one of the specific classes of sources listed under 137.4(a); and no counties have been designated by the Department under 137.4(b) since its adoption in 1972. Pennsylvania has never exceeded the pollutant levels that would require the implementation of "standby plans." An Air Pollution Episode Plan for this facility will be prepared and submitted upon request by the Department.

Section 139 – Sampling and Testing

The Department requires testing facilities to be installed in all sources and may require testing of the emissions source. Section 139 includes this requirement as well as the testing methods and monitoring requirements. Elcon will be complying with this requirement by using methods approved by the Department and will install sampling ports appropriately.

4.3 PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION

Under the Implementation of the Pennsylvania State History Code: Policy and Procedure for Applicants for DEP Permits and Plan Approvals, the Department will cooperate with the Pennsylvania Historical and Museum Commission (PHMC) in the protection of significant archaeological resources and historic structures. The policy provides a list of exemptions to which the Department and PHMC have agreed to exempt from these procedures. The exemption list includes air quality projects that disturb less than 10 acres.

Elcon estimates that 11.5 acres of earth will be disturbed as part of the installation of the liquid hazardous and residual waste storage and treatment operations. Elcon has submitted a project review form to the PHMC included in Attachment 10. The PHMC indicated that the project will have no effect on historic properties.

ATTACHMENT 5

BEST AVAILABLE TECHNOLOGY ANALYSIS

ATTACHMENT 5
BEST AVAILABLE TECHNOLOGY ANALYSIS

The Pennsylvania Department of Environmental Protection (Department) requires that air contaminant emissions be controlled to the maximum extent consistent with Best Available Technology (BAT). BAT is defined by the Department as the "equipment, devices, methods, or techniques as determined by the Department which will prevent, reduce, or control emissions of air contaminants to the maximum degree possible and which is available or may be made available." (25 Pa Code §121.1) A BAT analysis was conducted for pollutants emitted from the proposed Elcon operations.

The BAT evaluation was based on the following information sources:

- engineering experience
- vendor information
- EPA's RACT/BACT/LAER Clearinghouse database search
- EPA's Air Pollution Technology Fact Sheets
- EPA's, OAQPS Cost Control Manual, Sixth Edition, January 2002

The RACT/BACT/LAER Clearinghouse (RBLC) database contains information from early notification submittals and air permits received from various state and local air pollution control programs in the United States. The data is used to assist companies in determining what types of controls and pollution prevention measures have been applied to and/or are required for various sources and the effectiveness of these technologies. Any available data is presented with the write-up for the pollutant and emission source presented in the sections that follow.

5.1 BAT FOR ELCON PROCESS OPERATIONS

BAT analyses were conducted for all the pollutants that are potentially emitted from the proposed Elcon operations. The following sub-sections detail the BAT evaluation for emissions of particulate matter (PM), oxides of nitrogen (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO), volatile organic compounds (VOC), acid gases, ammonia, and Greenhouse Gases (GHGs). Hazardous air pollutants (HAPs) are addressed under the particulate matter section for metal HAPs and under the VOC section for organic HAPs.

5.1.1 PARTICULATE MATTER (PM) EMISSIONS

PM emissions are potentially emitted by the sludge ovens, lime silo, sludge silo, material handling, and cooling towers.

Table 5-1-1 lists the technologies identified as possible PM reduction technologies for the proposed facility along with their expected percent reduction.

Table 5-1-1
Possible Control Technologies for PM Emissions

Control Technology	Theoretical PM Reduction
Baghouses	~99%
Electrostatic Precipitators	95-99%
Scrubbers	95-99%
Cyclones	50-80%

Fabric Filter/Baghouse

In a fabric filter, the exhaust is passed through a tightly woven or felted fabric, causing PM to be collected on the fabric. Bags are the most common type of fabric filter. Groups of bags are placed in compartments to allow for cleaning the bags or replacement of some of the bags without shutting down the entire control device.

The dust cake that forms on the filter from the collected PM can significantly increase collection efficiency. Practical application of fabric filters requires the use of a large fabric area to avoid an unacceptable pressure drop across the fabric. Baghouse size of a particular unit is determined by the air-to-cloth-ratio, i.e., the ratio of the volumetric airflow to cloth area.

Operating conditions are important to determine the fabric to be used. Above 300 ^{0}F, thermally stable fabrics such as fiberglass, Teflon, or Nomex must be used. Temperatures above 550 ^{0}F require special refractory minerals or metallic fabrics, which can be expensive.

The use of a baghouse is a technically feasible method for PM removal for lime and sludge silos and sludge oven area fugitive operations. No further technologies were evaluated for these operations as the baghouse has the highest removal efficiency for this application. This is not a technically feasible option for the exhaust from the sludge ovens due to the anticipated high moisture content in the exhaust gas. The high moisture content could cause problems with the bags.

Electrostatic Precipitator

An electrostatic precipitator (ESP) is a particulate control device that uses electrical forces to move particles onto collection surfaces. The entrained particles are given an electrical charge when they pass through a corona, a region where gaseous ions flow. Electrodes in the center of the flow lane are maintained at high voltage and generate an electrical field that forces the particles to the collector walls. There are two basic types of ESPs: dry and wet.

Dry ESP
In dry ESPs, the collectors are mechanically cleaned and the particulates slides downward into a hopper where they are collected. The hopper is emptied periodically.

The major factor impacting the performance of a dry ESP is the resistivity of the collected material. Particles with high resistivity are not easily charged, and thus are not easily collected. The particles form a continuous layer with high voltage gradients on the collecting electrodes. Electrical breakdowns in these ash layers lead to injection of positively charged ions into the space between the discharge and collecting electrodes, thus reducing the charge on the particles and lowering the collecting efficiency.

A dry ESP is not technically feasible for the sludge ovens as the exhaust stream will be moist, which will disrupt the resistivity of the particles and significantly impact collection efficiency.

Wet ESP
In a wet ESP, the collectors are either intermittently or continuously washed by a spray of liquid, usually water. The collection hoppers used by dry ESPs are replaced with a drainage system. The wet effluent is collected and often reused or treated on site.

Wet ESPs can collect sticky particles and mists, as well as highly resistive dusts. The use of a wet ESP is a technically feasible method at the sludge ovens.

Scrubbers

Various types of scrubbers are available to remove particulate matter from air streams. Elcon proposes a venture scrubber for the sludge ovens as it would also like to remove some acid gases with the same unit. Elcon anticipates approximately 95 percent particulate removal with the scrubber that would be used locally to control emissions from the sludge ovens. Additionally, a similar packed tower is proposed in the main air pollution control system exhaust train. Between these two scrubbers in series, Elcon anticipates approximately 99 percent particulate removal (as well as acid gas removal). Scrubbers are a technical feasible control technology for controlling particulate matter from the drying ovens.

Cyclones

There are many different styles and designs of cyclones, but each operates using the same basic principles. In all cyclones, PM is separated from the gas stream by centrifugal force. PM is thrown toward the outside of a spinning column of gas, while the relatively clean gas exhausts from the center of the spinning vortex. The two main factors affecting the performance of any cyclone include: the velocity at which a given particle is moving toward the wall of the cyclone and the residence time, the length of time available to move the particle into a region where it will be collected before the gas exits the device.

Cyclones alone are not usually sufficient to meet stringent emission standards, but they serve well in removing larger particles from the gas stream or as a primary control device upstream of a more efficient secondary control device. The use of a cyclone is technically feasible for control of particulate emissions from the proposed sludge ovens.

Mist/Drift Eliminators

Drift droplets from cooling towers can potentially carry entrained particulate matter. The use of a mist/drift eliminator can be used to minimize particulate matter from droplet drift. The units use inertial separation caused by direction changes. This is a technically feasible alternative for reducing particulate matter from the cooling tower.

RBLC Database Review

Several searches of the RBLC database were conducted to identify PM control technologies in use at material handling silos (e.g., lime silos) and sludge ovens.

Table 5-1-2 presents a summary of available data for lime silos. Most of the silos use baghouses or fabric filters to control PM emissions.

There are no entries in the RBLC database for sludge ovens processing materials similar to Elcon. However, there are entries shown for resource recovery facility and a paint shop. There is also an entry shown for sludge conveyors (i.e., fugitive emissions) at a coal handling facility. Table 5-1-3 provides a summary of available PM control technologies for sludge ovens.

There is one entry in the RBLC database for a cooling tower. The unit is located at a power generating station and uses a mist eliminator to reduce particulate matter emissions. The unit is significantly larger than Elcon's proposed cooling tower.

Proposed PM BAT

BAT for the lime silo, sludge silo, and material handling operations in the sludge processing area is the use of a baghouse. This is consistent with information in the RBLC database. Elcon is proposing the use of cyclone and scrubbers in series to control particulate emissions from the sludge drying operations. It is anticipated that this control approach for the sludge drying oven/dryer will achieve approximately 99 percent particulate removal rates. The proposed outlet concentration for these particulate sources is 0.01 gr/dscf using EPA Reference Method 5. The proposed BAT for the cooling tower is the use of drift/mist eliminators.

Table 5-1-2
Summary of RBLC Database Information:
PM Controls for Lime Silos

RBLC ID	Name	Description	Control Device	Level of Control	Emission Limit
IA-0095	Tate & Lyle Ingredients Americas. Inc.	Lime silo	Dust collector	BACT	0.005 gr/dscf PM/PM_{10}
KY-0100	J.K. Smith Generating Station	Lime silo/Limestone silos	Fabric filter	BACT	0.005 gr/dscf PM/PM_{10}
LA-0223	Big Cajun I Power Plant	Limestone storage dome	Fabric filter	BACT	0.01 lb/hr PM/PM_{10}
LA-0223	Big Cajun I Power Plant	Lime silo and crusher	Fabric filter	BACT	0.02 lb/hr PM/PM_{10}
LA-0223	Big Cajun I Power Plant	Lime silo	Fabric filter	BACT	0.22 lb/hr PM/PM_{10}
TX-0485	Inland Paperboard and Packaging	Lime silo	Best management practices	LAER	3.4 lb/hr PM/PM_{10}
TX-0485	Inland Paperboard and Packaging	Lime silo	Not specified	LAER	0.01 lb/hr PM/PM_{10}
TX-0508	NRG Coal Handling	Lime Silos	Baghouse	BACT	0.61 lb/hr PM/PM_{10}
AL-0269	Georgia Pacific LLC	Lime Silo	Baghouse	BACT	0.005 gr/dscf 3-hr avg. 0.04 lb/hr 3-h avg.

Where:
BACT – Best Available Control Technology
LAER – Lowest Achievable Emission Rate

Table 5-1-3
Summary of RBLC Database Information:
PM Controls for Sludge Drying Operations

RBLC ID	Name	Description	Control Device	Level of Control	Emission Limit
FL-0273	North County Resource Recovery Facility	Sludge Dryers 1 and 2	Venturi scrubber and tray condenser scrubber	BACT	2.42 lb/hr PM/PM_{10}
OH-0309	Toledo Supplier Park Paint Shop	Paint Sludge Dryer	Not specified	BACT	98% control, 1.72 lb/hr
TX-0508	NRG Coal Handling	Sludge conveyor	Not specified	BACT	0.03 lb/hr PM
TX-0508	NRG Coal Handling	Sludge conveyor	Not specified	BACT	0.02b/hr PM_{10}

5.1.2 NITROGEN OXIDE (NO_X) EMISSIONS

NO_x will potentially be emitted from combustion of fuel in the thermal oxidizer and sludge oven No. 1. Emissions of NO_x may also be emitted during the processing of the liquid waste streams as nitrogen compounds may be present in some of the incoming liquid waste streams. As the nitrogen-containing compounds are burned in the thermal oxidizer, the nitrogen compounds can oxidize to NO_x.

All of the burners fire natural gas. Natural gas has a low fuel-bound nitrogen level. Given the relatively small size of the sludge dryer (2MMBtu/hr) burner and the low-NO_x nature of the natural gas fuel, Elcon proposes that BAT for NO_x from fuel combustion in sludge dryer is the use of natural gas burner.

Since some of the waste streams being processed can contain nitrogen compounds, Elcon also evaluated the use of add-on NO_x control technologies for the main process exhaust.

Several technologies are available to potentially reduce NO_x emissions from the process operations. The feasibility of these options is discussed below:

<u>Selective Catalytic Reduction (SCR)</u>

In the SCR process, ammonia or urea is used as a reducing agent to convert NO_x to nitrogen. Ammonia or urea is injected into the exhaust gas stream before it enters the catalytic reactor. For safety reasons, urea is the preferred chemical. The catalyst is usually a mixture of titanium dioxide and vanadium pentoxide. The temperature of the exhaust gas stream must be in the range of 600 to 800 °F before entering the catalytic reactor to initiate the reaction. At higher temperatures,

ammonia is oxidized to NO_x, which compounds the problem. Below 600 °F, ammonium nitrate is formed, which is a salt that can plug the catalyst bed. Therefore, temperature control is very important. The temperatures of the various points in the proposed exhaust stream are either well outside the required temperature zone for use of this technology. Therefore, this technology is not technically feasible for controlling NO_x emissions generated from processing the waste streams.

Non-selective Catalytic Reduction (NSCR)

In NSCR, sufficient reactant must be supplied to consume excess oxygen in the exhaust gas stream before the NO_x can be converted to nitrogen. The typical reactant used in NSCR is either methane or hydrogen. The NSCR system is effectively and widely used to control NO_x emissions from exhaust gas streams containing less than 0.5 percent oxygen content, such as those in gasoline or natural gas-fired engines. Since the process exhaust stream will contain approximately 20 percent oxygen, this technology is not technically viable. Hence, no further analysis of this technology was conducted.

Selective Non-Catalyst Reduction System (SNCR)

SNCR reduces NO_x emissions through a reaction with ammonia in a temperature range of 1,500 to 2,000 F. The technology is similar to SCR except it does not utilize a catalyst bed. The ammonia may be supplied as anhydrous ammonia, aqueous ammonia, or urea. Since the exhaust gas temperature is within the appropriate temperature range at the thermal oxidizer, this is a technically feasible method of reducing NO_x emissions from processes containing nitrogen.

RBLC Database Review

There is no information in the RBLC database related to NO_x control technologies to control treatment operations similar to Elcon's proposed facility.

There was one entry for a sludge dryer that uses a low NO_x burner; however, this burner appears to be significantly larger than either of Elcon's proposed sludge dryer burner.

Proposed NO_x BAT

The proposed BAT for the combustion of fuel in sludge oven is the use of natural gas fuel. The burner on the sludge oven is small (approximately 2.5 MMBtu/hr).

The proposed BAT for combustion of natural gas in the thermal oxidizer is the use of SNCR. The burners on the thermal oxidizers will be used primarily at start-up; the organic constituents in the exhaust should provide the necessary heat input once the unit is at operating temperature.

The proposed BAT for process operations is the use of SNCR, as needed. Elcon proposes to monitor NO_x emissions. The system will turn on automatically to maintain NO_x emissions at or below 5.0 lb/hr.

5.1.3 SULFUR DIOXIDE (SO_2) EMISSIONS

SO_2 will potentially be emitted from combustion of fuel in the thermal oxidizer and sludge oven burner. Emissions of SO_2 may be also be emitted during the processing of the liquid waste streams as sulfur compounds may be present in some of the incoming liquid waste streams. As the sulfur compounds are burned in the thermal oxidizer, the sulfur compounds can oxidize to SO_2.

All of the burners fire natural gas. Natural gas has an inherently low sulfur level. Given the low sulfur nature of the natural gas fuel, Elcon proposes that BAT for SO_2 from fuel combustion is the use of natural gas burners.

Some of the waste streams being processed can contain sulfur compounds; however, the sulfur emissions are low, approximately 100 ppm, including emissions from combustion. The packed tower scrubber that will be installed for acid gas control will also reduce SO_2 emissions. Add-on controls would not be able to effectively reduce SO_2 emissions further.

RBLC Database Review

There is no information in the RBLC database related to SO_2 control technologies to control treatment operations similar to Elcon's proposed facility.

There was one entry for two sludge dryers at a resource recovery facility with a permit limit of 190 ppmv and 4.45 lb/hr. No control technology is identified.

Proposed SO_2 BAT

The proposed BAT for the combustion of fuel in burners is the use of natural gas fuel. The burner on the sludge oven is small (2.5 MMBtu/hr). The burners on the thermal oxidizesr will be used primarily at start-up; the organic constituents in the exhaust should provide the necessary heat input once the unit is at operating temperature.

The packed tower scrubber installed for acid gas will also reduce SO_2 emissions. Since the SO_2 emissions from the proposed process operations are already low, there are no viable add-on control technologies to further reduce SO_2 emissions. Elcon proposes to monitor SO_2 emissions.

5.1.4 CARBON MONOXIDE (CO) EMISSIONS

CO emissions result from incomplete combustion of fuel and is a function of the air-to-fuel ratio. The burners associated with the thermal oxidizer and sludge oven will emit CO. Based on the size of the burners for the proposed operations, the following technologies are potentially feasible for controlling CO emissions from these combustion sources:

- Combustion control
- Use of natural gas fuel

Excess oxygen or air promotes CO oxidation to CO_2. Excess air and properly adjusted burners can provide lower CO emissions from the combustion equipment. By maintaining good combustion practices and burning natural gas, Elcon expects to minimize its CO emissions.

The use of natural gas as a fuel also minimizes CO emissions relative to the use of other fuels. The use of natural gas is technically feasible for the thermal oxidizers and sludge oven.

RBLC Database Review

There was one entry in the RBLC database for two sludge dryers at a resource recovery facility with a permit limit of 3.37 lb/hr. No control technology is identified.

Proposed CO BAT

Since combustion controls and the use of natural gas as a fuel are technically and economically feasible options to reduce CO emissions from the proposed burners, Elcon proposes combustion controls and the use of natural gas as BAT for the natural gas-fired burners.

5.1.5 VOLATILE ORGANIC COMPOUND (VOC) EMISSIONS

VOC emissions, including organic hazardous air pollutants (HAPs), are potentially emitted from storage tanks, flash evaporation distillation, and distillation unit operations. There will be negligible VOC emissions from pretreatment and sludge treatment (drying ovens), reactor vents, salt treatment (crystallizer), biological treatment, and natural gas-fired burners.

VOC emissions from firing natural gas are *de minimus*. No further evaluation is made on VOC emissions from natural gas combustion.

The possible control options for VOC emissions from the process sources are summarized in Table 5-1-4 below.

Table 5-1-4
Possible Control Technologies for VOC Emissions

Control Technology	Theoretical VOC Reduction
Thermal Oxidation	95%+
Biofiltration	75-95%
Carbon Adsorption	50-95%
Absorption	25 – 50%
Condensation	50%

Thermal Oxidation

Thermal oxidation to oxidize organic vapors in the air stream to carbon dioxide, water, and other products of combustion is an effective VOC control technique. The oxidation efficiency of a thermal oxidizer is dependent on residence time, combustion temperature, and turbulence in the system. Operating temperatures typically range from 1,400 °F to 1,800 °F, except for a catalytic oxidizer, which uses a lower temperature range, with a minimum retention time between 0.5 and 2.0 seconds. Because of the high fuel requirements of thermal oxidation, heat recovery equipment is often employed to recover the heat generated.

There are three main types of thermal oxidizers. The first is regenerative oxidizer that uses a medium to recover the heat and increase turbulence in the unit, the second is a recuperative oxidizer that recovers the heat by using a heat exchanger, and the third is a catalytic oxidizer, utilizing a catalyst to react the VOCs at lower temperature.

The different types of oxidizers have similar removal efficiencies and are technically feasible for Econ's proposed operations. Other VOC control technologies have equal or lower removal efficiencies; therefore, additional technologies were not evaluated. Elcon is electing to use a straight thermal oxidizer system with waste heat boilers to recover some of the heat. Elcon is proposing to vent all of the process sources at the facility to the thermal oxidizers.

In the event of a shutdown of the thermal oxidizer, such as for routine maintenance, Elcon is proposing to use a carbon adsorption system to control the *de minimus* amount of VOC emissions from breathing loses from the storage tanks and other emission units that may contain organic liquids.

RBLC Database Review

There was no information in the RBLC database that was the same as Elcon's proposed process; however, there are several database entries for other types of wastewater treatment plants (WWTPs), such as those at petroleum refineries or ethanol plants. The relevant information from the RBLC database is summarized on Table 5-1-5.

Most of the facilities identified in the RBLC database do not include specific emission limits or air pollution control devices. However, three facilities identified include add-on air pollution controls to meet federal Best Available Control Technology (BACT) requirements as follows:

- One WWTP at a refinery uses a thermal oxidizer to reduce VOC emissions by 99.9 percent or less than 20 ppmv.
- One facility, a WWTP at an ethanol plant, use a flare to reduce VOC emissions to 5.4 tpy.
- A second WWTP at an ethanol plant uses a flare or a dryer to reduce VOC emissions to 78.4 lb/hr.

Table 5-1-5
Summary of RBLC Database Information:
VOC Controls for Wastewater Treatment Plants

RBLC ID	Name	Description	Control Device	Level of Control	Emission Limit
AZ-0046	Arizona Clean Fuels	WWTP at oil refinery	Thermal oxidizer	BACT	99.9% destruction efficiency; < 20 ppmv at low inlet concentrations; oxidizer temperature minimum 1,600 °F
FL-0318	Verenium	WWTP at ethanol facility	Flare	BACT	5.4 tpy
IL-0318	Conoco Phillips	WWTP at oil refinery	Good pollution control practices	LAER	None specified
LA-0211	Marathon Petroleum	Petroleum refinery collection and WWTP	None specified	BACT	Comply with NESHAP, MACT, and NSPS
LA-0213	Valero Refining	Petroleum Refinery collection and WWTP	None specified	BACT	Comply with MACT and NESHAP
NE-0029	Abengoa Bioenergy Corp.	WWTP at ethanol facility	Combust off-gases in flare or dryer	BACT	None specified
OH-0308	Sunoco	Petroleum refinery wastewater streams	Comply with MACT, NESHAP, and NSPS	MACT	91.19 tpy
WI-0229	Stora Enso North America	WWTP for paper mills	None specified	BACT	78.4 lb/hr
LA-0301	Lake Charles Chemical Complex Ethylene 2 Unit	Process Wastewater Treatment Plant (FUG 18)	Compliance with 40 CFR 63 Subpart G and 40 CFR 61 Subpart FF	BACT	40.01 tpy
LA-0312	St. James Methanol Plant	WWTF-13 - Wastewater Treatment Fugitives (FUG0001)	Compliance with NESHAP Subpart F and NESHAP Subpart G. LDAR Monitoring.	BACT	0.29 lb/hr

Table 5-1-5
Summary of RBLC Database Information:
VOC Controls for Wastewater Treatment Plants

RBLC ID	Name	Description	Control Device	Level of Control	Emission Limit
LA-0314	Indorama Lake Charles Facility	Wastewater Treatment System	Complying with 40 CFR 63 Subpart XX	BACT	None specified
TX-0756	CCI Corpus Christi Condensate Splitter Facility	Wastewater Treatment Plant	Overall system to achieve 90% of VOC from treated wastewater. Oil/water separator is enclosed and routed to a carbon adsorption system (CAS). Process drains to be equipped with a water seal. Wastewater sewers will be enclosed. Aerobic digesters will be enclosed and directed to a CAS.	BACT	4.56 lb/hr 9.04 tpy

Proposed VOC BAT

The proposed BAT for the process operations is the use of thermal oxidation to reduce VOC emissions. The efficiency of the thermal oxidizer for VOC control is expected to be 99.9 percent or less than 20 ppmvd as propane. During plant shut down periods, a carbon adsorption system will be used to control the *de minimus* amount of VOCs from tank breathing losses and other vessels than contain organic liquids. Elcon proposes to monitor VOC emissions.

The proposed BAT is consistent with the limited information that is available in the RBLC database.

5.1.6 ACID GASES

Elcon anticipates that acid gases (e.g., hydrochloric acid (HCl)) will form during the thermal oxidizer combustion process.

Absorption is the standard control technology for reducing HCl and other acid gas emissions. This technology can typically achieve removal efficiencies of 98 percent or greater. The proposed air pollution control device train will include a packed tower scrubber for acid gas control following the thermal oxidizer and SNCR.

An alternative to the absorption technology is dry lime injection to neutralize the HCl followed by removal of the lime by a fabric filter. Due to the high anticipated removal efficiencies by absorption, Elcon believes that the use of absorption is the appropriate control technology for reducing acid gases.

RBLC Database Review

There was no data for acid gases for operations similar to Elcon's in the RBLC database.

Proposed Acid Gases BAT

The proposed BAT for the process operations is the use of a packed tower scrubber. Elcon anticipates a 99 percent removal efficiency from this technology.

5.1.7 AMMONIA

Elcon anticipates a small amount of ammonia emissions to be formed during the treatment process due to ammonia-containing liquid waste or potential slips in the NO_x control system. Anticipated emissions are low, approximately 3.15 tpy and approximately 10 ppm. Add-on controls would not be able to effectively further reduce ammonia emissions.

RBLC Database Review

There was no data for ammonia emissions for operations similar to Elcon's in the RBLC database.

Proposed Ammonia BAT

Since the ammonia emissions from the proposed process operations are already low, there are no viable add-on control technologies to further reduce ammonia emissions.

5.1.8 CONCLUSIONS

BAT for the proposed operations at Elcon are summarized on Table 5-1-6:

5.2 BAT FOR FACILITY BOILER

The following sub-sections provide a BAT analysis for emissions from the natural gas fired boiler.

The boiler will emit the following air contaminants:

- Oxides of nitrogen (NOx)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Particulate matter (PM)
- Volatile organic compounds (VOCs)
- Greenhouse Gases (GHGs)

The boiler will fire natural gas only. NO_x is the primary pollutant of concern for the boiler because Bucks County is regulated as a severe ozone nonattainment area. CO is a pollutant of secondary concern. The other pollutants (PM, SO_2, and VOCs) are of lesser significance.

5.2.1 NO_x BAT

NO_x will potentially be emitted from combustion of fuel in the boiler. The boiler fires natural gas only. Natural gas has a low fuel-bound nitrogen level. Given the small size of the burner (9.9 MMBtu/hr) and the low-NO_x nature of the natural gas fuel, Elcon proposes that BAT for NO_x for the boiler is the use of natural gas and a Low NO_x burner with flue gas recirculation.

Table 5-1-6
BAT for Process Operations
Elcon, Falls Township, Pennsylvania

Emission Source	Pollutant	Proposed BAT	Proposed Limit
Lime Silo	PM	Baghouse	0.01 gr/dscf determined using Method 5
Treatment Processes	PM, including metal HAPs	Cyclones and venturi Scrubber on sludge oven/dryer. Baghouses on sludge handling and nuisance dust. Packed tower scrubber on all process	0.01 gr/dscf determined using Method 5
Thermal Oxidizer Burner	Combustion Products (PM, SO_2, CO, VOCs)	Natural gas, good combustion controls	NA
Sludge Oven Burner	Combustion Products (PM, NO_x, SO_2, CO, VOCs)	Natural gas, good combustion controls	NA
All Treatment Processes	VOCs, including organic HAPs	Thermal oxidizer	99.9% removal or 20 ppmvd as propane, 4.40 lb/hr (maximum)
All Treatment Processes and thermal oxidizer burner	NO_x	SNCR (as needed)	6.5 lb/hr (maximum)
All Treatment Processes	Acid Gases, SO_x	Packed tower scrubber	2.0 lb/hr HCl (maximum) 100 ppm SO_x (maximum)
Cooling Tower	PM	Drift/Mist eliminator	NA

5.2.2 CO BAT

Carbon monoxide (CO) results from incomplete combustion of fuel and is a function of the air-to-fuel ratio. The burner associated with the boiler will emit CO. Based on the size of the burner, combustion control is potentially feasible for controlling CO emissions from the boiler.

Excess oxygen or air promotes CO oxidation to CO_2. Excess air and properly adjusted burner can provide lower CO emissions from the boiler. By maintaining good combustion practices, Elcon expects to minimize CO emissions. Elcon proposes combustion control as BAT for the boiler.

5.2.3 OTHER AIR CONTAMINANTS

The boiler will emit minor quantities of SO_2, VOC, and PM emissions. BAT for SO_2 and PM emissions is the use of a low-sulfur fuel (natural gas). BAT for VOC is the use of finely tuned combustion controls. In addition, GHG emissions will be minimized by the same practices.

5.2.4 RBLC DATABASE REVIEW

There were a several entries in the RBLC Database for natural gas fired boilers in the size range proposed by Elcon. The following summarizes a review of the database for this emission source:

- GHG – Use of natural gas or good combustion controls or practices.
- CO – Use of good combustion controls or practices is the primary practice identified. There are also several entries for the use of natural gas fuel.
- NO_x – The primary reduction identified is low NO_x burners or low NO_x burners with flue gas recirculation. There are also several entries for good combustion controls or practices. There is one entry for a LAER determination for SCR with low NO_x burners and an annual operating hour restriction.
- PM – Use of good combustion controls or practices or following the manufacturer's specifications is the primary technique identified. Limiting the fuel to natural gas is also identified.
- SO_2 – Use of natural gas is the primary technique identified. There are also several boilers that use good combustion controls or practices.
- VOC – Use of good combustion controls or practices or following the manufacturer's specifications is the primary technique identified. Limiting the fuel to natural gas is also identified.

5.2.5 CONCLUSIONS

BAT for the boiler will be use of Low NO_x burner with flue gas recirculation, combustion controls, and firing of natural gas only.

5.3 BAT FOR EMERGENCY GENERATOR

The following sub-sections provide a BAT analysis for emissions from the emergency generator.

The engine will emit the following air contaminants:

- Oxides of nitrogen (NO_x)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Particulate matter (PM)
- Volatile organic compounds (VOC)
- Greenhouse Gases (GHGs)

The engine will fire natural gas and will comply with the requirements of NSPS for Stationary Spark Ignition Internal Combustion Engines (40 CFR 60, Subpart JJJJ). Elcon will purchase certified engine from the manufacturer. The engine will be installed and configured according to the manufacturer's emissions related specifications. The applicable NSPS JJJJ emission limits for the engine are as follows:

VOC = 1.00 grams/hp-hr
NO_x = 2.00 grams/hp-hr
CO = 4.00 grams/hp-hr

NO_x is the primary pollutant of concern in this project because Bucks County is regulated as a severe ozone nonattainment area. CO is a pollutant of secondary concern. The other pollutants (PM, SO_2, and HC) are of minor significance.

5.3.1 NO_x BAT

The following technologies are generally available for reducing NO_x emissions from internal combustion engines:

1. Lean-burn Engine – This technology is suitable for natural gas-fired stand-by generators. Lean-burn engines use a significant amount of excess air-up to twice the stoichiometric air quantity. This additional air reduces the peak combustion temperature in the engine cylinders, resulting in sufficiently low NO_x emissions to avoid the need for add-on NO_x controls. This is a lean-burn engine.

2. Selective catalytic reduction (SCR) – In the SCR process, ammonia or urea is used as a reducing agent to convert NO_x to nitrogen. Ammonia or urea is injected into the exhaust gas stream before it enters the catalytic reactor. For safety reasons, urea is the preferred chemical. This technology is technically feasible for this engine. A budgetary estimate for this technology was calculated for the purchase and installation of this technology. A detailed spreadsheet showing the cost-effectiveness calculations is provided in Attachment 4-1. The cost effectiveness for this technology is in excess of $50,000 per ton of NO_x removed; therefore, SCR is not economically feasible for the proposed generator.

3. Non-selective catalytic reduction (NSCR) – In the NSCR process, sufficient reactant must be supplied to consume excess oxygen in the exhaust gas stream before the NO_x can be converted to nitrogen. The typical reactant used in NSCR is either methane or hydrogen. The NSCR system is effectively and widely used to control NO_x emissions from exhaust gas streams containing less than 0.5 percent oxygen content, such as those in gasoline or natural gas-fired engines. This proposed engine is a lean-burn engine; therefore, this technology is not technically feasible.

4. Selective Non-Catalyst Reduction System (SNCR) – In this technology, ammonia or urea is added to the hot gas stream without using a catalyst bed. The temperature of the hot gas stream must be in the range of 1,500 to 2,000 °F for the reaction to take place. Since the exhaust gas temperature of the existing engine is below 1,000 °F, this technology is not viable for the removal of NO_x from this engine. Burning additional fuel to heat the air stream is counter-productive as NO_x emissions are only 1.66 tpy.

5. Turbocharger with aftercooler – The lower the temperature, the lower the formation of NO_x emissions. The proposed engine is equipped with turbochargers and aftercoolers to reduce the charge and peak cylinder temperatures. The aftercooler is liquid-cooled, resulting in a substantially reduced temperature compared to older engines, thus minimizing NO_x emissions.

6. Timing retard greater than or equal to 4 degrees – This technology is applicable to engines in older generators; newer engines are electronically optimized. This generator is electronically optimized.

7. Combustion controls – The proposed generator incorporates the following state-of-the-art combustion controls: electronic fuel injection, computer-controlled air supply, NO_x sensor, and controlled engine timing to optimize the combustion process.

8. Exhaust gas recirculation – Exhaust gas recirculation may be used to reduce peak combustion chamber temperatures, thus reducing NO_x emissions. However, this engine achieves the same impacts with other technologies already in place on the unit. Therefore, this technology is not practical or necessary for this unit.

NO_x BAT Summary –

The proposed engine features, computerized combustion controls, a turbocharger, an aftercooler, NO_x sensor, and lean-burn technology. Collectively, these measures represent BAT for the proposed engine. Additionally, the unit will conform with the stringent NSPS requirements.

5.3.2 CO BAT

The only feasible add-on technology for reducing CO emissions from the proposed engine would be an oxidation catalyst. Installing an oxidation catalyst on this engine is not necessary in view of their limited operating hours (500 hours per year), intermittent operation, and combustion controls. The engine will meet the NSPS emission limit for CO.

5.3.3 OTHER AIR CONTAMINANTS

The engine will emit minor quantities of SO_2, VOC, and PM emissions. BAT for SO_2 emissions is the use of a low-sulfur fuel (natural gas). BAT for VOC and PM is the purchase of EGEN certified to meet the NSPS requirements and the use of finely tuned combustion controls. In addition, GHG emissions will be minimized by the same practices.

5.3.4 RBLC DATABASE REVIEW

There were a several entries in the RBLC Database for natural gas-fired emergency generators in the size range proposed by Elcon. The following summarizes a review of the database for this emission source:

- GHG – Use of natural gas or good combustion controls or practices.
- CO – There are four entries in the database. Two are for the use of an oxidation catalyst and good combustion controls. One uses an oxidation catalyst to meet NSPS JJJJ. The fourth uses good combustion controls.
- NO_x – There are 11 entries in the database. Five use good combustion controls. Two use turbocharger and an aftercooler. One uses SCR along with a 50 hr/yr operating limits. Three do not identify any air pollution controls.
- PM – Use of natural gas as a fuel and/or good combustion controls.
- SO_2 – Use of natural gas.
- VOC – Use of oxidation catalyst or good combustion controls.

5.3.5 CONCLUSIONS

The engine will be equipped with turbochargers, lean burn, and low-temperature aftercoolers; therefore, NO_x emissions are minimized by the engine design. The engine is also certified to meet EPA's emission standards to demonstrate compliance with the NSPS requirements. The combustion controls minimize emissions of CO, PM, and VOCs from the engine.

Table 5-3-1
BAT for Emergency Generator
Elcon, Falls Township, Pennsylvania

Air Contaminant	Best Available Technology
NO_x	EPA NSPS certified engine (new EGEN), turbocharged and low-temperature aftercooler, and combustion controls[a].
CO	Meets NSPS / Combustion controls[a].
SO_2	Low-sulfur fuel (natural gas).
PM	Combustion controls[a].
VOC	Meets NSPS / Combustion controls[a].
HAPs/HCHO	Meets NSPS / Combustion controls[a].

[a] Electronic fuel injection, optimized timing of fuel injection system, controlled timing, and lean-burn.

Additionally, Elcon will monitor and record the fuel use and operating hours of the emergency generator.

5.4 BAT FOR FIRE PUMP ENGINES

The following sub-sections provide a BAT analysis for emissions from the fire pump engines.

The engine will emit the following air contaminants:

- Oxides of nitrogen (NO_x)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Particulate matter (PM)
- Volatile organic compounds (VOC)
- Greenhouse Gases (GHGs)

The engines will fire diesel fuel and will comply with the requirements of NSPS for Stationary Compression Ignition Engines (40 CFR 60, Subpart IIII). Elcon will purchase certified engine from the manufacturer. The engine will be installed and configured according to the manufacturer's emissions related specifications. The applicable NSPS IIII emission limits for the engine are as follows:

NMHC + NO_x = 3.00 grams/hp-hr
PM = 0.15 grams/hp-hr

NO_x is the primary pollutant of concern in this project because Bucks County is regulated as a severe ozone nonattainment area. The other pollutants (PM, CO, SO_2, and HC) are of minor significance.

5.4.1 NO_x BAT

The following technologies are generally available for reducing NO_x emissions from internal combustion engines:

The following technologies are generally available for reducing NO_x emissions from internal combustion engines:

4. Lean-burn Engines – This technology is suitable for natural gas-fired engines. Since these are diesel-fired engines, this technology is not applicable.

5. Selective catalytic reduction (SCR) – In the SCR process, ammonia or urea is used as a reducing agent to convert NO_x to nitrogen. Ammonia or urea is injected into the exhaust gas stream before it enters the catalytic reactor. For safety reasons, urea is the preferred chemical. SCR has been applied with varying degrees of success to diesel engines in the past and may be applicable to these engines. Additional information on SCR systems was provided previously.

6. Non-selective catalytic reduction (NSCR) – In the NSCR process, sufficient reactant must be supplied to consume excess oxygen in the exhaust gas stream before the NO_x can be converted to nitrogen. The typical reactant used in NSCR is either methane or hydrogen. The NSCR system is effectively and widely used to control NO_x emissions from exhaust gas streams containing less than 0.5 percent oxygen content, such as those in gasoline or natural gas-fired engines. The engine are diesel fired, which results in an oxygen-rich exhaust stream. Therefore, NSCR is not a technically feasible control option for these engines.

4. Selective Non-Catalyst Reduction System (SNCR) – In this technology, ammonia or urea is added to the hot gas stream without using a catalyst bed. The temperature of the hot gas stream must be in the range of 1,500 to 2,000 °F for the reaction to take place. Since the exhaust gas temperature of the engines is in the range of 750-950 °F, this technology is not viable for the removal of NO_x from these engines.

5. Turbocharger with aftercooler – The lower the temperature, the lower the formation of NO_x emissions. The engines will be equipped with turbochargers and aftercoolers to reduce the charge and peak cylinder temperatures. The aftercooler is liquid-cooled, resulting in a substantially reduced temperature compared to older engines, thus minimizing NO_x emissions.

6. Timing retard greater than or equal to 4 degrees – This technology is applicable to engines in older engines; newer engines are electronically optimized, so timing retard would not have any beneficial effect on emissions from these engines. In addition, retarding injection timing will tend to reduce power output, which is undesirable in a fire pump engine without a compensatory increase in motor size.

7. Combustion controls – The engines incorporate the following state-of-the-art combustion controls: electronic fuel injection, computer-controlled air supply, and controlled engine timing to optimize the combustion process.

8. Exhaust gas recirculation – Exhaust gas recirculation may be used to reduce peak combustion chamber temperatures, thus reducing NO_x emissions. However, this is difficult to implement on an existing engine, and manufacturers do not provide exhaust gas recirculation systems for EGENs of this size. Therefore, exhaust gas recirculation is not a technically feasible control option for this engine.

Of the NO_x control technologies listed above that are not already applied to the unit, only SCR could potentially be used on the proposed fire pump engines. The SCR system would consist of the following components:

- SCR catalyst with sufficient volume to provide needed NO_x removal and ammonia slip in a housing of material suitable for the operating temperatures and pressures
- Air atomized spray nozzle to deliver urea solution to upstream of the catalyst
- Urea supply system with tote storage of urea solution

- Pumps for delivery of the urea solution to the spray nozzle
- Air compressor to provide atomizing air and purge air to purge the nozzle at shutdown, and maintain nozzle flow when urea solution is not flowing
- City water to provide cleaning and flushing
- A heated building to house the urea storage system
- Urea flow control and system monitoring, with open end (flow set based on EGEN load) operation

There are a several drawbacks to an SCR system when applied to a diesel-fired engine in emergency use service only. They include:

1. Nozzle clogging can be a significant problem due to the periodic and limited nature of the operation. Minor evaporation, leaks, etc. can allow contaminants to build up in feed lines. Nozzle clogging would decrease or even eliminate the NO_x emission reductions, and require operator intervention at a time during a power failure when operators may be busy elsewhere.
2. Pumps and compressors that sit for long periods of time are subject to more failures due to non-operation, as in the case of an SCR system on an emergency generator. Effects on systems may include bearing flattening, aging of seals, corrosion, etc., that would not occur if the system was running continuously.
3. Since use of the urea solution is sporadic, a relatively small container of urea lasts a long time, leading to greater potential for aging, evaporation, and salt-out.
4. The urea solution is not effective for NO_x reduction at temperatures below 600 °F, and the water and urea can cause problems if they are sprayed into a cold exhaust stream. Therefore, the system would not be in operation (zero control) during the heat-up phase of the EGEN and its exhaust system. This is a significant portion of the overall run time of an emergency generator, given the short annual run time in emergency service, and the frequent short-duration system tests.
5. Increased exhaust pressure loss reduces the efficiency of the engine.
6. The potential for fouling or masking of the catalyst due to minor impurities in the fuel can substantially shorten catalyst life.
7. The potential for de-activation of catalyst due to sulfur compounds in the fuel can shorten catalyst life.

Due to the numerous drawbacks to the application of SCR technology to diesel-fired engines, particularly those in emergency generator service, an SCR system is not feasible for NO_x control on the relatively small fire pump engines.

NO_x BAT Summary –

The proposed engine features, computerized combustion controls, a turbocharger, and an aftercooler. Collectively, these measures represent BAT for the proposed engine. Additionally, the unit will conform with the stringent NSPS requirements.

5.4.2 CO BAT

The only feasible add-on technology for reducing CO emissions from the proposed engine would be an oxidation catalyst. Installing an oxidation catalyst on this engine is not necessary in view of their limited operating hours (less than 500 hours per year), intermittent operation, and combustion controls.

5.4.3 OTHER AIR CONTAMINANTS

The engine will emit minor quantities of SO_2, VOC, and PM emissions. BAT for SO_2 emissions is the use of a low-sulfur diesel fuel. BAT for VOC and PM is the purchase of engines certified to meet the NSPS requirements and the use of finely tuned combustion controls. In addition, GHG emissions will be minimized by the same practices.

5.4.4 RBLC DATABASE REVIEW

There were a number of entries in the RBLC Database for diesel-fired fire pumps of approximately the same size as the engines proposed by Elcon. The following summarizes a review of the database for this emission source:

- GHG – Good combustion controls or practices.
- CO – Primarily good combustion controls or practices or compliance with the NSPS Subpart IIII requirements. Others included hourly restrictions, use of certified engines, use of Tier 3 or 4 engines, and one facility indicated turbocharger and intercooler/aftercooler.
- NO_x – Primarily good combustion controls or practices or compliance with the NSPS Subpart IIII requirements. Others included hourly restrictions or the use of Tier 3 or 4 engines.
- PM – Primarily good combustion controls or practices or compliance with the NSPS Subpart IIII requirements. Others included hourly restrictions, use of certified engines, or use of Tier 3 or 4 engines.
- SO_2 – Primarily the use of low sulfur fuel or good combustion controls or practices.
- VOC – Primarily good combustion controls or practices or compliance with the NSPS Subpart IIII requirements.

5.4.5 CONCLUSIONS

The engines will be equipped with turbochargers and low-temperature aftercoolers; therefore, NO_x emissions are minimized by the engine design. The engine is also certified to meet EPA's emission standards, to demonstrate compliance with the NSPS requirements. The combustion controls minimize emissions of CO, PM, and VOCs from the engine.

Table 5-4-1
BAT for Fire Pump Engines
Elcon, Falls Township, Pennsylvania

Air Contaminant	Best Available Technology
NO_x	EPA NSPS certified engine, turbocharged and low-temperature aftercooler, and combustion controls[a]
CO	Combustion controls.
SO_2	Low-sulfur fuel (low sulfur diesel).
PM	Combustion controls[a].
VOC	Meets NSPS / Combustion controls[a].
HAPs/HCHO	Meets NSPS / Combustion controls[a].
[a] Electronic fuel injection, optimized timing of fuel injection system, and controlled timing.	

Additionally, Elcon will monitor and record the fuel use and operating hours of the fire pump engines.

ATTACHMENT 5-1

CONTROL COST SPREADSHEET

Potential Control Technologies Cost Summary
ELCON
Selective Catalytic Reduction

ECONOMIC FACTORS FOR COST ANALYSIS

The following economic factors and rates were used to determine
the cost-effectiveness of a Selective Catalytic Reduction for NOx Control
for the emergency generator

$$CRF = \frac{i(1+i)^a}{[(1+i)^a - 1]}$$

Where:

Capital Recovery Factor (CRF) for a 10 Year Equipment Life	0.1627
Interest Rate (i)	10%
Average Equipment Life (a) (years)	10

DIRECT OPERATING FACTORS

Air Flowrate (Q)		scfm
Operating Schedule (hr/yr)	500	hr/yr
Number of Operators per Shift	1	
Hours per Shift	8	hr/shift
Operator's Hour per Shift	1.0	hr/shift

Operating schedule assumes:
500 hr/yr

Calculations are based on EPA Air Pollution Control Cost Manual, 6th Edition, U.S. EPA.
Purchased equipment costs are based on a vendor quote. Labor and utility rates are based on estimated Elcon costs.

Potential Control Technologies Cost Summary
ELCON
Selective Catalytic Reduction

TOTAL CAPITAL INVESTMENT (TCI)

Purchased Equipment Costs (PEC)

				Eq
Equipment cost (vendor quote)		EAC		$225,000
Instrumentation (included in equipment cost)	+	10% of EAC	+	$0
Sales Tax	+	3% of EAC	+	$6,800
Freight (included in equipment cost)	+	5% of EAC	+	
	=	PEC	=	$231,800

Direct Installation Costs (DIC)

Foundations and Supports (Included in equipment cost)		8% of PEC		$0
Handling and erection (included with purchased costs above)	+	14% of PEC	+	$0
Electrical (included with purchased costs above)	+	4% of PEC	+	$0
Piping (included with purchased costs above)	+	2% of PEC	+	$0
Painting (included with purchased costs above)	+	1% of PEC	+	$0
Insulation for ductwork (included with purchase costs above)	+	1% of PEC	+	$0
Ductwork (included with purchased costs above)	+	Estimated Cost	+	$0
	=	DIC	=	$0

Site Preparation (SP, water piping, demolition/rebuild, utility extension)				$0

Total Direct Investment (TDI)		PEC		$231,800
	+	DIC	+	$0
	+	SP	+	$0
	=	TDI	=	$231,800

Total Indirect Investment (TII)

Engineering		10% of PEC		$23,200
GMP Engineering Issues	+	Estimate	+	$0
Construction and field expenses	+	5% of PEC	+	$11,600
Contractor fees	+	10% of PEC	+	$23,200
Start-up	+	2% of PEC	+	$4,600
Performance test	+	Estimate	+	$21,000
Contingencies	+	3% of PEC	+	$7,000
	=	TII	=	$90,600

Total Capital Investment (TCI)		TDI		$231,800
	+	TII	+	$90,600
	=	TCI	=	$322,400

Potential Control Technologies Cost Summary
ELCON
Selective Catalytic Reduction

OPERATING COSTS (OC)

Direct Operating Cost (DOC)

Operating + Maintenance				$0
Operator + Maintenance	$75.00 /hr			$4,690
Materials	50% of O+M labor (assume O+M evenly divided)		+	$2,350
Supervisory Labor	15% of O+M labor		+	$700
Utilities				
Urea	550 gal/yr	$3.40 /gal	+	$1,870
Natural Gas	$0.00 /MMBtu	MMBtu/hr	+	$0
Electricity	$0.00 /$10^3$ kWh	0.0 kW	+	$0
			=	$9,610

Indirect Operating Cost (IOC)

Overhead		60% of (O+M)		$4,640
Administrative Charges	+	2% of TCI	+	$6,450
Property Tax	+	1% of TCI	+	$3,220
Insurance	+	1% of TCI	+	$3,220
	=	IOC	=	$17,530

Operating Cost (OC)

		DOC		$9,610
	+	IOC	+	$17,530
	=	OC	=	$27,140

TOTAL ANNUALIZED COST (TAC)

Operating Cost		OC		$27,140
Capital Recovery	+	CRF x TCI	+	$52,450
	=	TAC	=	$79,590

COST EFFECTIVENESS

Total Annualized Cost		TAC		$79,590
NOx Removal at 90% efficiency	/	RNOx	/	0.9 ton/yr
		CE		$88,430 /ton

Uncontrolled emissions:	1.00 ton/yr
Capture efficiency:	100%
Removal efficiency:	90%

ATTACHMENT 6

PROPOSED MONITORING APPROACH

ATTACHMENT 6
PROPOSED MONITORING APPROACH

Elcon will use a number of technologies to continuously monitor key control device and process parameters to ensure continued compliance. Critical monitor parameters will be displayed in a centralized control room. Proposed parameters related to the air pollution control devices and process equipment will be verified during the start-up and debugging period.

The proposed monitoring systems are described in this section.

6.1 FABRIC FILTERS

Fabric filters, including bin vents, will be used to control particulate matter emissions, including metals hazardous air pollutants (HAPs) from the lime silo, sludge silo, and material handing in the sludge oven area. This includes Control Devices C05 (lime silo), C07 (Fugitive emissions in sludge drying area), and C09 (sludge silo). Pressure drop gauges will be used to continuously monitor pressure drop across each fabric filter. Monitoring data will be recorded once per day.

6.2 PACKED TOWER

A packed tower (C02) will be used to control particulate and acid gas emissions from the treatment processes and is part of the main exhaust air pollution control train. Elcon proposes to continuously monitor and record (i.e., at least every 15 minutes) the following parameters on the packed tower:

- Scrubbing liquid flow rate
- pH of the scrubbing liquid
- Pressure drop across the scrubber
- Scrubber outlet gas temperature

6.3 THERMAL OXIDIZERS

Two thermal oxidizers in parallel (C01A and C01B) control VOC emissions, including organic HAPs, for processes within the facility. Elcon proposes to continuously monitor and record the following:

- Combustion chamber temperature
- Air flow rate (process or combustion)
- Flame detection
- Pressure drop
- Oxygen Concentration

An interlock system and alarm system will be in place to stop the process feed to the operations if the combustion chamber temperature falls below the temperature established during the most

recent compliance test. A continuous monitor will be used to monitor VOC emissions at the exhaust stack.

6.4 SNCR

Two SCNRs in parallel will be used to control emissions of oxides of nitrogen (NO_x), as needed, from processes with the facility. An SNCR will follow each thermal oxidizer. A continuous monitor will be used to monitor NO_x emissions at the main exhaust stack (S01). The SNCR system will activate, as needed, if the NO_x levels reach 4.0 lb/hr.

6.5 CARBON UNIT

A back-up carbon adsorption system (C04) will be used to control VOC emissions, including organic HAPs, from tank breathing losses when the thermal oxidizer system is down. When the carbon adsorption system is in use, Elcon will monitor:

- The time and dates the plant is in shut down mode
- The number of hours the plant is in shut down mode, on a monthly basis
- Pressure drop across the bed on a daily basis
- Bed temperature on a daily basis

6.6 VENTURI SCRUBBER

A venturi scrubber (C06) will be used to locally control particulate matter emissions from the sludge drying operations. The venturi exhausts to the main control device train and does not have an individual exhaust. Elcon will monitor the following:

- Pressure drop across the scrubber
- Water flow rate

6.7 CYCLONES

Cyclones (C10 and C11) are used as a pre-control devices prior to the venturi scrubber to remove larger particulate matter emitted from the sludge drying operations. Elcon will monitor the pressure drop across each cyclone on a daily basis.

6.8 MAIN STACK ATMOSPHERIC EXHAUST

The final atmospheric exhaust from the main air pollution control train will include the following monitoring systems to continuously monitor emissions and key parameters from the main stack (S01):

- NO_x continuous emission monitoring system (CEMS)
- SO_2 CEMS
- Total organic compounds CEMS
- CO CEMS

- Oxygen
- Airflow rate

6.9 PROCESS EQUIPMENT MONITORING

Elcon proposes to monitor the following general process-related parameters:

- Throughput for key unit operations on a daily basis
- Hours of operation for key unit operations on a daily basis
- Records (quantity and type) of incoming waste materials
- Records of outgoing waste materials (salt and sludge)

ATTACHMENT 7

MUNICIPAL NOTIFICATION LETTERS

- **Falls Township**
- **Bucks County**
- **Return Receipts**

ENGINEERS

1720 Walton Road Blue Bell, PA 19422 610·828·3078 Fax 610·828·7842

October 12, 2018

EXPRESS MAIL
FedEx No. 8139 2794 0034
Mr. Peter Gray
Township Manager
Falls Township
188 Lincoln Highway, Suite 100
Fairless Hills, PA. 19030

Subject: Elcon Recycling Services, LLC
Falls Township, Pennsylvania
Plan Approval Application
IES Project No. EV181065.01

Dear Mr. Gray:

On behalf of Elcon Recycling Services, LLC (Elcon), IES Engineers (IES) hereby provides notice that, on or about October 15, 2018, Elcon will be submitting an air quality permit application to the Pennsylvania Department of Environmental Protection (Department) to install a commercial facility for the treatment and storage of hazardous and residual liquid waste streams located in Falls Township, Bucks County, Pennsylvania. Best available air pollution control technologies are proposed for this project.

Pursuant to Section 1905-A of the Administrative Code of 1929 (71 P.S. §510-5) and 25 Pa. Code §127.462, Elcon is required to provide the Falls Township Planning Commission with formal notice of this application. The Department allows for a 30-day comment period from the date of receipt of this notice. The application may be reviewed at the Department's Southeast Regional Office located at 2 East Main Street, Norristown, Pennsylvania 19401. Comments on this application may be submitted to the Department's Air Quality Program Manager at that address and to Dr. Rengarajan Ramesh of Elcon 11 LeParc Drive, Princeton Junction, New Jersey 08550. If the Township has no comments, it may submit a written statement to the Department expressly waiving the 30-day comment period.

Sincerely,

Marjorie J. Fitzpatrick

Marjorie J. Fitzpatrick, QEP
Principal Project Manager

Attachment

cc: R. Ramesh, Elcon

October 15,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **813927940034**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	R.MOLLE	**Delivery location:**	PA
Service type:	FedEx Standard Overnight	**Delivery date:**	Oct 15, 2018 14:02
Special Handling:	Deliver Weekday		

Signature image is available. In order to view image and detailed information, the shipper or payor account number of the shipment must be provided.

Shipping Information:

Tracking number:	813927940034	**Ship date:**	Oct 12, 2018

Recipient:
PA US

Shipper:
BLUE BELL, PA US

Reference

EV181065 01

Thank you for choosing FedEx.

ENGINEERS

1720 Walton Road Blue Bell, PA 19422 610·828·3078 Fax 610·828·7842

October 12, 2018

EXPRESS MAIL
FedEx No. 8139 2794 0023
Mr. Evan J. Stone
Executive Director
Bucks County Planning Commission
The Almshouse, Neshaminy Manor Center
1260 Almshouse Road
Doylestown, Pennsylvania 18901

Subject: Elcon Recycling Services, LLC
Falls Township, Pennsylvania
Plan Approval Application
IES Project No. EV181065.01

Dear Mr. Stone:

On behalf of Elcon Recycling Services, LLC (Elcon), IES Engineers (IES) hereby provides notice that, on or about October 15, 2018, Elcon will be submitting an air quality permit application to the Pennsylvania Department of Environmental Protection (Department) to install a commercial facility for the treatment and storage of hazardous and residual liquid waste streams located in Falls Township, Bucks County, Pennsylvania. Best available air pollution control technologies are proposed for this project.

Pursuant to Section 1905-A of the Administrative Code of 1929 (71 P.S. §510-5) and 25 Pa. Code §127.462, Elcon is required to provide the Bucks County Planning Commission with formal notice of this application. The Department allows for a 30-day comment period from the date of receipt of this notice. The application may be reviewed at the Department's Southeast Regional Office located at 2 East Main Street, Norristown, Pennsylvania 19401. Comments on this application may be submitted to the Department's Air Quality Program Manager at that address and to Dr. Rengarajan Ramesh of Elcon 11 LeParc Drive, Princeton Junction, New Jersey 08550. If the Commission has no comments, it may submit a written statement to the Department expressly waiving the 30-day comment period.

Sincerely,

Marjorie J. Fitzpatrick

Marjorie J. Fitzpatrick, QEP
Principal Project Manager

Attachment

cc: R. Ramesh, Elcon

October 15,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **813927940023**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	R.LEACH	**Delivery location:**	PA
Service type:	FedEx Standard Overnight	**Delivery date:**	Oct 15, 2018 11:14
Special Handling:	Deliver Weekday		

Signature image is available. In order to view image and detailed information, the shipper or payor account number of the shipment must be provided.

Shipping Information:

Tracking number:	813927940023	**Ship date:**	Oct 12, 2018
		Weight:	1.0 lbs/0.5 kg

Recipient:
PA US

Shipper:
BLUE BELL, PA US

Reference EV181065 01

Thank you for choosing FedEx.

ATTACHMENT 8

AIR POLLUTION CONTROL ACT

COMPLIANCE REVIEW FORM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

☒ Original Filing
☐ Amended Filing

Date of Last Compliance Review Form Filing: 07/25/2014

Type of Submittal

☒ New Plan Approval
☐ Extension of Plan Approval
☐ Other: _____
☐ New Operating Permit
☐ Change of Ownership
☐ Renewal of Operating Permit
☐ Periodic Submission (@ 6 mos)

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)

Elcon Recycling Services, LLC

(See Attachment 1 for additional information)

Address Location: 100 Dean Sievers Place, Morrisville, PA 19067

Mailing: 11 LeParc Drive, Princeton, NJ 08550

Telephone USA Representative:
Dr. Rengarajan Ramesh
(267) 243-3144

Taxpayer ID# 46-2247013

Permit, Plan Approval or Application ID# Pending Plan Approval

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual
☐ Municipality
☐ Proprietorship
☐ Public Corporation
☐ Private Corporation
☐ Syndicate
☐ Municipal Authority
☐ Fictitious Name
☐ Partnership
☐ Limited Partnership
☐ Government Agency
☐ Joint Venture
☐ Association
☒ Other Type of Business, specify below: LLC

Describe below the type(s) of business activities performed.

Commercial facility for treatment and storage of hazardous and residual liquid waste streams.

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
Elcon Recycling Services, Inc. See Attachment 2 for additional information	Israel	Delaware	46-2257221	parent corporation

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
Elcon Recycling Services, LLC	100 Dean Sievers Place, c/o Dr.Rengarajan Ramesh, 11 LeParc Drive, Princeton, NJ 08550	Bucks County/Falls Township	(267) 243-3144	Applicant

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address
Elcon Recycling Center Ltd. Israel See Attachment 3 for additional information	P.O. Box 2049, Beer Sheva 8412316 Israel

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address
Dr. Zvi Elgat (CEO)	P.O. Box 2049, Beer Sheva 841236 Israel

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
None				

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
None						$
						$
						$
						$
						$
						$
						$
						$
						$
						$

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
None				

<u>CONTINUING OBLIGATION</u>. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT	
Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.	
Signature	9/26/2018 Date
Dr. Zvi Elgat Name (Print or Type)	
CEO Title	

NOTE: Elcon Recycling Services, LLC is certifying this document and attachments as the Operator of the site. Elcon intends to purchase the property prior to issuance of the permit.

ATTACHMENT 1 – TO COMPLIANCE REVIEW FORM

DOCUMENTATION RELATED TO NAME OF APPLICANT

IRS DEPARTMENT OF THE TREASURY
INTERNAL REVENUE SERVICE
CINCINNATI OH 45999-0023

Date of this notice: 03-13-2013

Employer Identification Number:
46-2257221

Form: SS-4

Number of this notice: CP 575 A

ELCON RECYCLING SERVICES LLC
ZVI ELGAT SOLE MBR
PO BOX 1428
TEL AVIV 31013
ISRAEL

For assistance you may call us at:
1-800-829-4933

IF YOU WRITE, ATTACH THE
STUB AT THE END OF THIS NOTICE.

WE ASSIGNED YOU AN EMPLOYER IDENTIFICATION NUMBER

Thank you for applying for an Employer Identification Number (EIN). We assigned you EIN 46-2257221. This EIN will identify you, your business accounts, tax returns, and documents, even if you have no employees. Please keep this notice in your permanent records.

When filing tax documents, payments, and related correspondence, it is very important that you use your EIN and complete name and address exactly as shown above. Any variation may cause a delay in processing, result in incorrect information in your account, or even cause you to be assigned more than one EIN. If the information is not correct as shown above, please make the correction using the attached tear off stub and return it to us.

Based on the information received from you or your representative, you must file the following form(s) by the date(s) shown.

Form 941	04/30/2013
Form 940	01/31/2014

If you have questions about the form(s) or the due date(s) shown, you can call us at the phone number or write to us at the address shown at the top of this notice. If you need help in determining your annual accounting period (tax year), see Publication 538, *Accounting Periods and Methods*.

We assigned you a tax classification based on information obtained from you or your representative. It is not a legal determination of your tax classification, and is not binding on the IRS. If you want a legal determination of your tax classification, you may request a private letter ruling from the IRS under the guidelines in Revenue Procedure 2004-1, 2004-1 I.R.B. 1 (or superseding Revenue Procedure for the year at issue). Note: Certain tax classification elections can be requested by filing Form 8832, *Entity Classification Election*. See Form 8832 and its instructions for additional information.

If you are required to deposit for employment taxes (Forms 941, 943, 940, 944, 945, CT-1, or 1042), excise taxes (Form 720), or income taxes (Form 1120), you will receive a Welcome Package shortly, which includes instructions for making your deposits electronically through the Electronic Federal Tax Payment System (EFTPS). A Personal Identification Number (PIN) for EFTPS will also be sent to you under separate cover. Please activate the PIN once you receive it, even if you have requested the services of a tax professional or representative. For more information about EFTPS, refer to Publication 966, *Electronic Choices to Pay All Your Federal Taxes*. If you need to make a deposit immediately, you will need to make arrangements with your Financial Institution to complete a wire transfer.

The IRS is committed to helping all taxpayers comply with their tax filing obligations. If you need help completing your returns or meeting your tax obligations, Authorized e-file Providers, such as Reporting Agents (payroll service providers) are available to assist you. Visit the IRS Web site at www.irs.gov for a list of companies that offer IRS e-file for business products and services. The list provides addresses, telephone numbers, and links to their Web sites.

To obtain tax forms and publications, including those referenced in this notice, visit our Web site at www.irs.gov. If you do not have access to the Internet, call 1-800-829-3676 (TTY/TDD 1-800-829-4059) or visit your local IRS office.

IMPORTANT REMINDERS:

* Keep a copy of this notice in your permanent records. **This notice is issued only one time and the IRS will not be able to generate a duplicate copy for you.** You may give a copy of this document to anyone asking for proof of your EIN.

* Use this EIN and your name exactly as they appear at the top of this notice on all your federal tax forms.

* Refer to this EIN on your tax-related correspondence and documents.

If you have questions about your EIN, you can call us at the phone number or write to us at the address shown at the top of this notice. If you write, please tear off the stub at the bottom of this notice and send it along with your letter. If you do not need to write us, do not complete and return the stub.

Your name control associated with this EIN is ELCO. You will need to provide this information, along with your EIN, if you file your returns electronically.

Thank you for your cooperation.

Keep this part for your records. CP 575 A (Rev. 7-2007)

Return this part with any correspondence so we may identify your account. Please correct any errors in your name or address.

CP 575 A

9999999999

Your Telephone Number ( ) -

Best Time to Call

DATE OF THIS NOTICE: 03-13-2013
EMPLOYER IDENTIFICATION NUMBER: 46-2257221
FORM: SS-4 NOBOD

INTERNAL REVENUE SERVICE
CINCINNATI OH 45999-0023

ELCON RECYCLING SERVICES LLC
ZVI ELGAT SOLE MBR
PO BOX 1428
TEL AVIV 31013
ISRAEL

Entity #: 4168142
Date Filed: 02/22/2013
Carol Aichele
Secretary of the Commonwealth

PENNSYLVANIA DEPARTMENT OF STATE
BUREAU OF CORPORATIONS AND CHARITABLE ORGANIZATIONS

Certificate of Organization
Domestic Limited Liability Company
(15 Pa.C.S. § 8913)

Name
543098-005 Ku
Corporation Service Company

Document will be returned to the name and address you enter to the left.
⇐

Commonwealth of Pennsylvania
CERTIFICATE OF ORGANIZATION 3 Page(s)

T1306058072

Fee: $125

In compliance with the requirements of 15 Pa.C.S. § 8913 (relating to certificate of organization), the undersigned desiring to organize a limited liability company, hereby certifies that:

1. The name of the limited liability company *(designator is required, i.e., "company", "limited" or "limited liability company" or abbreviation)*:
Elcon Recycling Services LLC

2. The (a) address of the limited liability company's initial registered office in this Commonwealth or (b) name of its commercial registered office provider and the county of venue is:

(a) Number and Street | City | State | Zip | County

(b) Name of Commercial Registered Office Provider | County
c/o: Corporation Service Company | Dauphin

3. The name and address, including street and number, if any, of each organizer is *(all organizers must sign on page 2)*:

Name	Address
Dodd S. Griffith	214 North Main Street, Concord, NH 03301

2013 FEB 22 PM 4: 25
PA DEPT OF STATE

DSCB:15-8913-2

4. *Strike out if inapplicable term*
~~A member's interest in the company is to be evidenced by a certificate of membership interest.~~

5. *Strike out if inapplicable:*
Management of the company is vested in a manager or managers.

6. The specified effective date, if any is N/A
month date year hour, if any

7. *Strike out if inapplicable:* ~~The company is a restricted professional company organized to render the following restricted professional service(s):~~

8. For additional provisions of the certificate, if any, attach an 8½ x 11 sheet

IN TESTIMONY WHEREOF, the organizer(s) has (have) signed this Certificate of Organization this

22 day of February, 2013

Elcon Recycling Services LLC
Signature

Signature

Mordechai Gorfung / Zvi Elgat
Signature

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF STATE

10/11/2017

TO ALL WHOM THESE PRESENTS SHALL COME, GREETING:

Elcon Recycling Services LLC

I, Robert Torres, Acting Secretary of the Commonwealth of Pennsylvania, do hereby certify that the foregoing and annexed is a true and correct copy of

Creation Filing filed on Feb 22, 2013 - Pages (2)

which appear of record in this department.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Seal of the Secretary's Office to be affixed, the day and year above written

Robert Torres

Acting Secretary of the Commonwealth

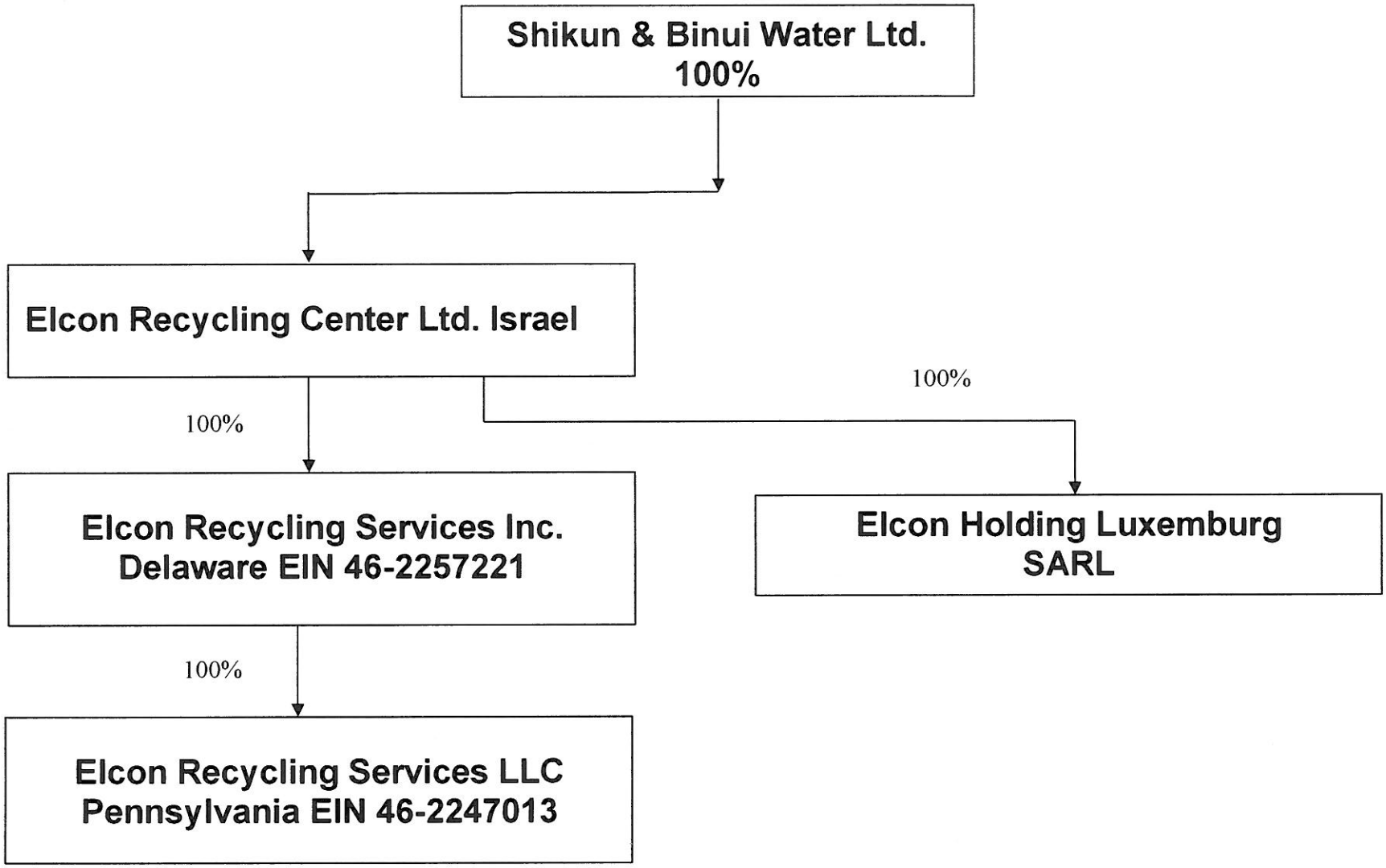
Certification Number: TSC171011100539-1

Verify this certificate online at http://www.corporations.pa.gov/orders/verify

ATTACHMENT 2 – TO COMPLIANCE REVIEW FORM

GENERAL INFORMATION REGARDING APPLICANT

Attachment 2
Principal Shareholders and Stockholders



Attachment 2

Domestic and Foreign Parent Corporations, Domestic and Foreign Subsidiary Corporations, and Subsidiary Corporations of the Ultimate Parent Corporation

Elcon Recycling Services LLC
2711 Centerville Road, Suite 400
Wilmington, DE 19808
Tax ID: 46-2247013

Elcon Recycling Services Inc.
2711 Centerville Road, Suite 400
Wilmington, DE 19808
Tax ID: 46-2257221

Elcon Recycling Center Ltd. Israel
P.O. Box 2049
Beer Sheva 8412316 Israel
Tax ID: NA

Elcon Holding Luxemburg
SARL
c/o: Elcon Recycling Center Ltd. Israel
P.O. Box 2049
Beer Sheva 8412316 Israel
Tax ID: NA

Shikun & Binui Water Ltd.
c/o: Elcon Recycling Center Ltd. Israel
P.O. Box 1428
Tel Aviv 31013 Israel
Tax ID: NA

ATTACHMENT 3 – TO COMPLIANCE REVIEW FORM

SPECIFIC INFORMATION REGARDING APPLICANT
AND RELATED PARTIES

Attachment 3

Principals, Corporate Officers, General and Limited Partners, Directors, Other Persons Performing Similar Functions

Officers of Elcon Recycling Center Ltd. Israel (Parent Corporation of Elcon Recycling Services):

Zvi Elgat, Ph.D., CEO

Adi Uzam, CFO

Avi Ben Menashe, CTO

Lazer Berdin, VP Business Development

Address for above: Elcon Recycling Center
P.O. Box 2049
Beer Sheva 8412316 Israel
Phone: (+972).8-6700930

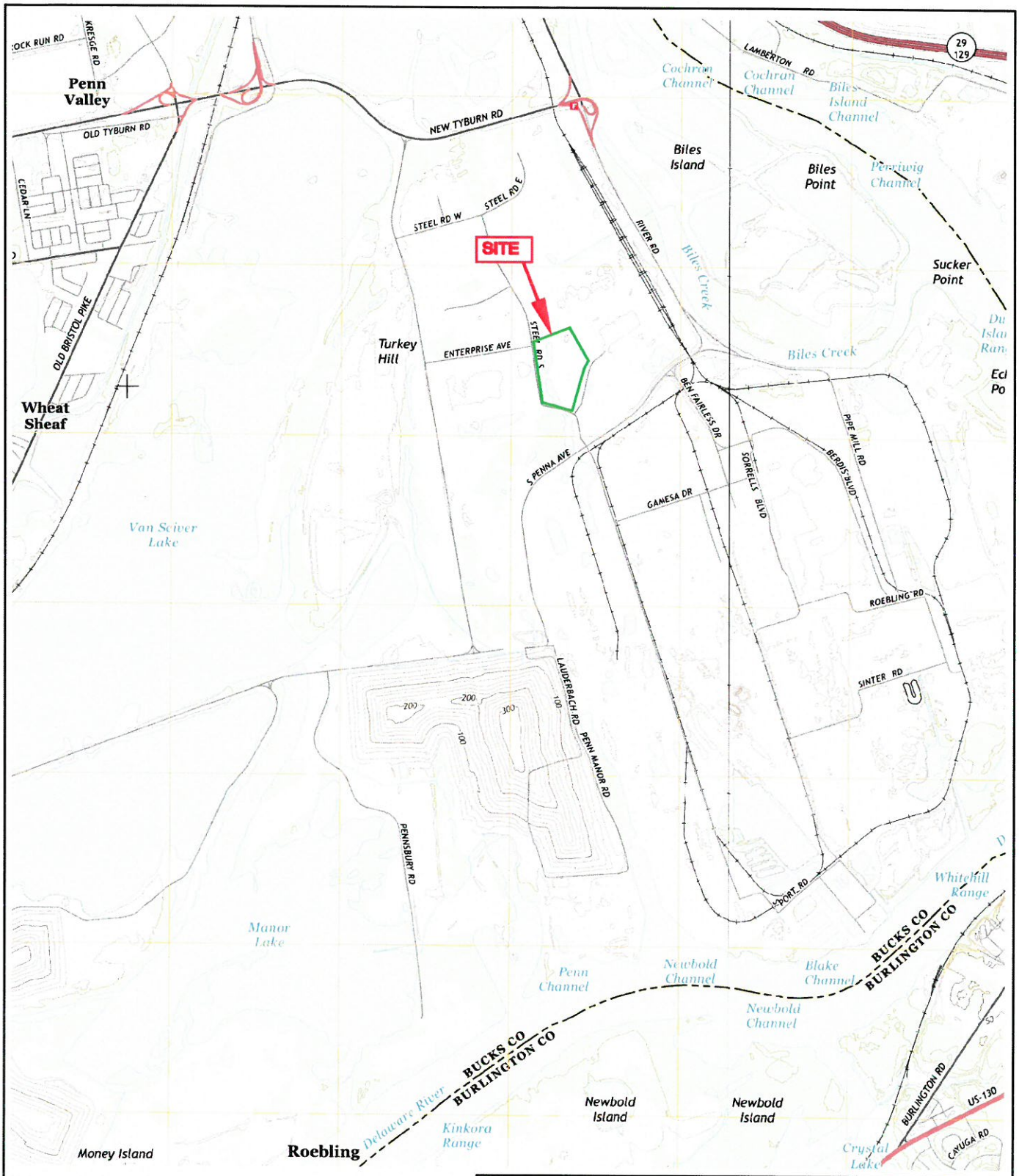
Directors of Elcon Recycling Center Ltd. Israel (Parent Corporation of Elcon Recycling Services):

Amit Segev
1A Ha'Yarden St.
Airport City 70151 Israel

Yuval Dagim
1A Ha'Yarden St.
Airport City 70151 Israel

ATTACHMENT 9

LOCATION MAP



1 0.5 0 MILES

1000 0 1000 2000 3000 4000 FEET

ENGINEERS

Date: 09-07-2016

PROJECT: EV161065.01

Figure 1

U.S.G.S. 7 1/2 MINUTE SERIES
TRENTON, NJ W. & E. QUADRANGLE

ELCON RECYCLING FACILITY
FALLS TOWNSHIP, BUCKS COUNTY, PA

ATTACHMENT 10

PROJECT REVIEW FORM AND RELATED INFORMATION

Attachment 16G-1 - PHMC Project Review Form

Pennsylvania Historical & Museum Commission

PROJECT REVIEW FORM

Request to Initiate SHPO Consultation on State and Federal Undertakings

OCT 10 '13 BUREAU FOR HISTORIC PRESERVATION

SHPO USE ONLY
DATE RECEIVED: 10/10/13
ER NUMBER: 14-0016D-017-A

REV: 1/2012

SECTION A: GENERAL PROJECT INFORMATION

Is this a new submittal? (●) YES ( ) NO OR ( ) This is additional information for ER Number:

Project Name	Elcon Recycling Facility			County	Bucks
Project Address	100 Dean Sievers Place				
City/State/ Zip	Falls Township	PA	19067	Municipality	Falls Township

SECTION B: PRIMARY CONTACT INFORMATION

Name	Barry Sutherland	Phone	(973) 564-6006
Company	TRC Engineers	Fax	(973) 564-6442
Street/P O Box	57 East Willow St	Email	bsutherland@trcsolutions.com
City/State/Zip	Millburn NJ 07041		

SECTION C: PROJECT DESCRIPTION

This project is located on: (check all that apply) [ ] Federal property [ ] State property [ ] Municipal property [✓] Private property

List all Federal and State agencies and programs (funding, permits, licenses) involved in this project

Agency Type	Agency/Program/Permit Name	Project/Permit/Tracking Number (if applicable)
State	PADEP - NPDES, Air Plan Approval, RCRA, and Industrial Wastewater permits	N/A (applications not submitted yet)

Proposed Work – Attach project description, scope of work, site plans, and/or drawings

Project includes (check all that apply): [✓] Construction [ ] Demolition [ ] Rehabilitation [ ] Disposition

Total acres of project area: 32 acres Total acres of earth disturbance: 11.5 acres

Are there any buildings or structures within the project area? ( ) Yes (●) No Approximate age: N/A

This project involves properties listed in or eligible for listing in the National Register of Historic Places, or designated as historic by a local government	Yes	No	Unsure	Name of historic property or historic districts	N/A
	( )	(●)	( )		

Please print and mail completed form and all attachments to:

PHMC
State Historic Preservation Office
400 North St.
Commonwealth Keystone Building, 2nd Floor
Harrisburg, PA 17120-0093

Attachments – Please include the following information with this form

- [✓] **Map** – 7.5' USGS quad showing project boundary and Area of Potential Effect
- [✓] **Description/Scope** – Describe the project, including any ground disturbance and previous land use
- [✓] **Site Plans/Drawings** – Indicate the location and age, if known, of all buildings in the project area
- [ ] **Photographs** – Attach prints or digital photographs showing the project site, including images of all buildings and structures keyed to a site plan

SHPO DETERMINATION (SHPO USE ONLY) SHPO REVIEWER: Mark Shaffer 10/16/13

- [ ] There are NO HISTORIC PROPERTIES in the Area of Potential Effect
- [X] The project will have NO EFFECT on historic properties
- [ ] The project will have NO ADVERSE EFFECTS on historic properties:
- [ ] The project will have NO ADVERSE EFFECTS WITH CONDITIONS (see attached)
- [ ] SHPO REQUESTS ADDITIONAL INFORMATION (see attached)

White, Christopher

From: Shaffer, Mark (PHMC) <mshaffer@pa.gov>
Sent: Friday, July 13, 2018 8:28 AM
To: White, Christopher
Subject: RE: Elcon plan approval project review form (EV181065.01)

Christopher - If nothing about the project has changed since 2013, then in my opinion, the 2013 submission is still valid.

Mark

From: White, Christopher <CWhite@iesengineers.com>
Sent: Wednesday, July 11, 2018 3:56 PM
To: Shaffer, Mark (PHMC) <mshaffer@pa.gov>
Cc: Fitzpatrick, Marjorie <mfitzpatrick@iesengineers.com>; Primus, Annalisa <aprimus@iesengineers.com>
Subject: Elcon plan approval project review form (EV181065.01)

Hi Mark,

We're working on the Elcon air plan approval application. As part of the application the PA Historical and Museum Commission requires submission of a cultural resource notice form for an area disturbance of greater than 10 acres; however, as of July 1, 2018, it seems this form is no longer in use. The PHMC now requires the submission of a *Project Review Form.* A project review form was submitted back in 2013 for the project (see attached). Is this 2013 submission still valid?

Thanks,

Christopher R. White | Project Engineer
1720 Walton Road | Blue Bell, Pennsylvania 19422
Office: 610-828-3078 | Fax: 610-828-7842
cwhite@iesengineers.com