1998 02.12 SPDES Permit

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

REGION 4 HEADQUARTERS
1150 NORTH WESTCOTT ROAD
SCHENECTADY, NEW YORK 12306
(518) 357-2069
(518) 357-2460 (FAX)

John P. Cahill
Commissioner

February 12, 1998

William Morris
Norlite Corporation
628 South Saratoga Street
Cohoes, NY 12047

RE: DEC #4-0103-00016/00020
SPDES #NY-0004880
Norlite Corporation
Cohoes (City), Albany County

Dear Mr. Morris:

Enclosed is your modified SPDES Permit which is effective beginning March 1, 1998, and will expire on February 1, 2002.

Please read all permit conditions carefully. All permit documents must be available upon request by Department staff as well as distributed to and understood by your personnel responsible for proper operation of the facility and compliance with the discharge limits. Any violation of these permit conditions constitutes a violation of the Environmental Conservation Law.

If you have any questions regarding this permit, you may contact the Division of Compliance Services at the above address. Please refer to the above referenced numbers when you are corresponding with this office or when you are applying to renew or modify this permit.

Any questions regarding your annual pollutant discharge elimination fee should be directed to the Regulatory Fee Determination Unit at 1-800-225-2566.

Sincerely,

Jeffrey Gregg
Environmental Analyst 2
Region 4

Enclosure
CC: D. Lis, DOW
Albany County Health Department
R. Hanneford, BWFD
ECO Maloney/Lt. Wayman
File

91-20-2 (1/89)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

State Pollutant Discharge Elimination System (SPDES)
DISCHARGE PERMIT
Special Conditions (Part I)

Industrial Code: 1422
Discharge Class (CL): 01
Toxic Class (TX): T
Major Drainage Basin: 12
Sub Drainage Basin: 01
Water Index Number: H-240
Compact Area:

SPDES Number: NY-0004880
DEC Number: 4-0103-16/20-0
Effective Date (EDP): 02/01/97
Expiration Date (ExDP): 02/01/02
Modification Date(s): 03/01/98
Attachment(s): General Conditions (Part II) Date: 11/90

This SPDES permit is issued in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and in compliance with the Clean Water Act as amended, (33 U.S.C. Section 1251 et. seq.)(hereafter referred to as "the Act").

PERMITTEE NAME AND ADDRESS Attention: William Morris

Name: Norlite Corporation
Street: 628 South Saratoga Street
City: Cohoes State: NY Zip Code: 12047
is authorized to discharge from the facility described below:

FACILITY NAME AND ADDRESS

Name: Norlite Corporation
Location (C,T,V): Cohoes (C) County: Albany
Facility Address: 628 South Saratoga Street
City: Cohoes State: NY Zip Code: 12047
NYTM - E: . NYTM - N: 4 .
From Outfall No.: 003 at Latitude: 42° 45′ 14" & Longitude: 73° 40′ 20"
into receiving waters known as: Salt Kill Creek Class: D
and; (list other Outfalls, Receiving Waters & Water Classifications)

004 - Salt Kill Creek Class: D
006 - Mohawk River Class: C
007 - Salt Kill Creek Class: D

in accordance with the effluent limitations, monitoring requirements and other conditions set forth in Special Conditions (Part I) and General Conditions (Part II) of this permit.

DISCHARGE MONITORING REPORT (DMR) MAILING ADDRESS

Mailing Name: Norlite Corporation
Street: 628 South Saratoga Street
City: Cohoes State: NY Zip Code: 12047
Responsible Official or Agent: William Morris Phone: (518)235-0401

This permit and the authorization to discharge shall expire on midnight of the expiration date shown and the permittee shall not discharge after the expiration date unless this permit has been renewed, or extended pursuant to law. To be authorized to discharge beyond the expiration date, the permittee shall apply for a permit renewal no less than 180 days prior to the expiration date shown above.

DISTRIBUTION: Carol Lamb - Region 4
R. Hannaford - Room 318
Mark Wykes - ACHD
ECO Maloney/Lt. Wayman
File

Permit Administrator: (Deputy) Jeffrey Gregg
Address: 1150 North Westcott Road
Schenectady, New York 12306
Signature: Jeffrey Gregg Date: 2/12/98

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning EDM

and lasting until February 1, 2002

the discharges from the permitted facility shall be limited and monitored by the permittee as specified below:

Outfall Number & Effluent Parameter	Discharge Limitations Daily Avg.	Daily Max.	Units	Minimum Monitoring Requirements Measurement Frequency	Sample Type
Outfall 003 - Quarry Water					
Flow	Monitor	Monitor	gpd	Daily[2]	Instantaneous
Solids, Total Suspended	25	45	mg/l	Weekly[1]	Composite[3]
pH (Range)	6.0 - 9.0		SU	Daily[2]	Grab
Outfall 004 - Shale Fines Leachate & Storm Runoff from Landfill Area					
Flow	Monitor	Monitor	gpd	Daily[2]	Measured
Solids, Total Suspended	25	45	mg/l	Daily[2]	Composite[3]
pH (Range)	6.0 - 9.0		SU	Daily[2]	Grab
Temperature	NA	90	deg F	Daily[2]	Grab
Cadmium, Total	NA	0.004	mg/l	Daily[2]	Grab
Chromium, Total	NA	1.7	mg/l	Daily[2]	Grab
Chromium, Hexavalent	NA	0.016	mg/l	Daily[2]	Grab
Copper, Total	NA	0.018	mg/l	Daily[2]	Grab
Lead, Total	NA	0.08	mg/l	Daily[2]	Grab
Mercury, Total	NA	0.0002	mg/l	Daily[2]	Grab
Nickel, Total	NA	1.8	mg/l	Daily[2]	Grab
Zinc, Total	NA	0.3	mg/l	Daily[2]	Grab

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning EDM

and lasting until February 1, 2002

the discharges from the permitted facility shall be limited and monitored by the permitte

Outfall Number & Effluent Parameter	Discharge Limitations Daily Avg.	Daily Max.	Unit	...rements ...ample ...ype
Outfall 006 - Trunnion Cooling Water, Scrubber Blowdown & Boiler Blowdown				
Flow	NA	Monitor	gpd	Cont. Recorded
Arsenic, Total	NA	.11	lbs/day	Daily[2] Grab
Barium, Total	NA	2.88	lbs/day	Daily[2] Grab
Beryllium, Total	NA	1.44	lbs/day	Daily[2] Grab
Cadmium, Total	NA	.04	lbs/day	Daily[2] Grab
Chromium, Total	NA	.14	lbs/day	Daily[2] Grab
Copper, Total	NA	.66	lbs/day	Daily[2] Grab
Iron, Total	NA	2.88	lbs/day	Daily[2] Grab
Lead, Total	NA	.43	lbs/day	Daily[2] Grab
Mercury, Total	NA	.04	lbs/day	Daily[2] Grab
Nickel, Total	NA	.94	lbs/day	Daily[2] Grab
Selenium, Total	NA	.07	lbs/day	Daily[2] Grab
Zinc, Total	NA	.66	lbs/day	Daily[2] Grab
Solids, Total Suspended	NA	66	lbs/day	Daily Grab
Solids, Total Dissolved	NA	Monitor	g/l	Weekly[1] Grab
Total Chlorine Residual	NA	Monitor	mg/l	Footnote[5] Grab
Temperature	NA	115[4]	°F	Daily[2] Grab
pH (Range)	6.0 - 9.0		SU	Daily[2] Grab
NH_3 (As Ammonia)	NA	Monitor	mg/l	Monthly Grab
Chlorides	NA	Monitor	mg/l	Monthly Grab

Outfall 007 - Storm Runoff

No monitoring required.

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

During the period beginning EDM

and lasting until February 1, 2002

the discharges from the permitted facility shall be limited and monitored by the permittee as specified below:

Outfall Number & Effluent Parameter	Discharge Limitations Daily Avg.	Daily Max.	Units	Minimum Monitoring Requirements Measurement Frequency	Sample Type

FOOTNOTES

1 Samples shall be taken one day per week while discharging.

2 Samples shall be taken each day a discharge occurs.

3 Representative composite consisting of a minimum of three samples (one at the beginning, middle, and end of the day.

4 This temperature limit shall apply at the final discharge point from the wastewater treatment plant. A temperature of 90^{O} shall apply at the final discharge point of Norlite's property line, prior to the Mohawk River. Sampling the final discharge point shall consist of a quarterly grab.

5 The permittee shall collect a grab sample of the discharge following the addition of sodium hypochlorite for hydrogen sulfide control. Analysis shall be by the DPD colorimetric method (equivalent to EPA method 330.5). The addition of Sodium Hypochlorite shall be made whenever the ORP reading is unstable and falling below +100 toward zero or negative.

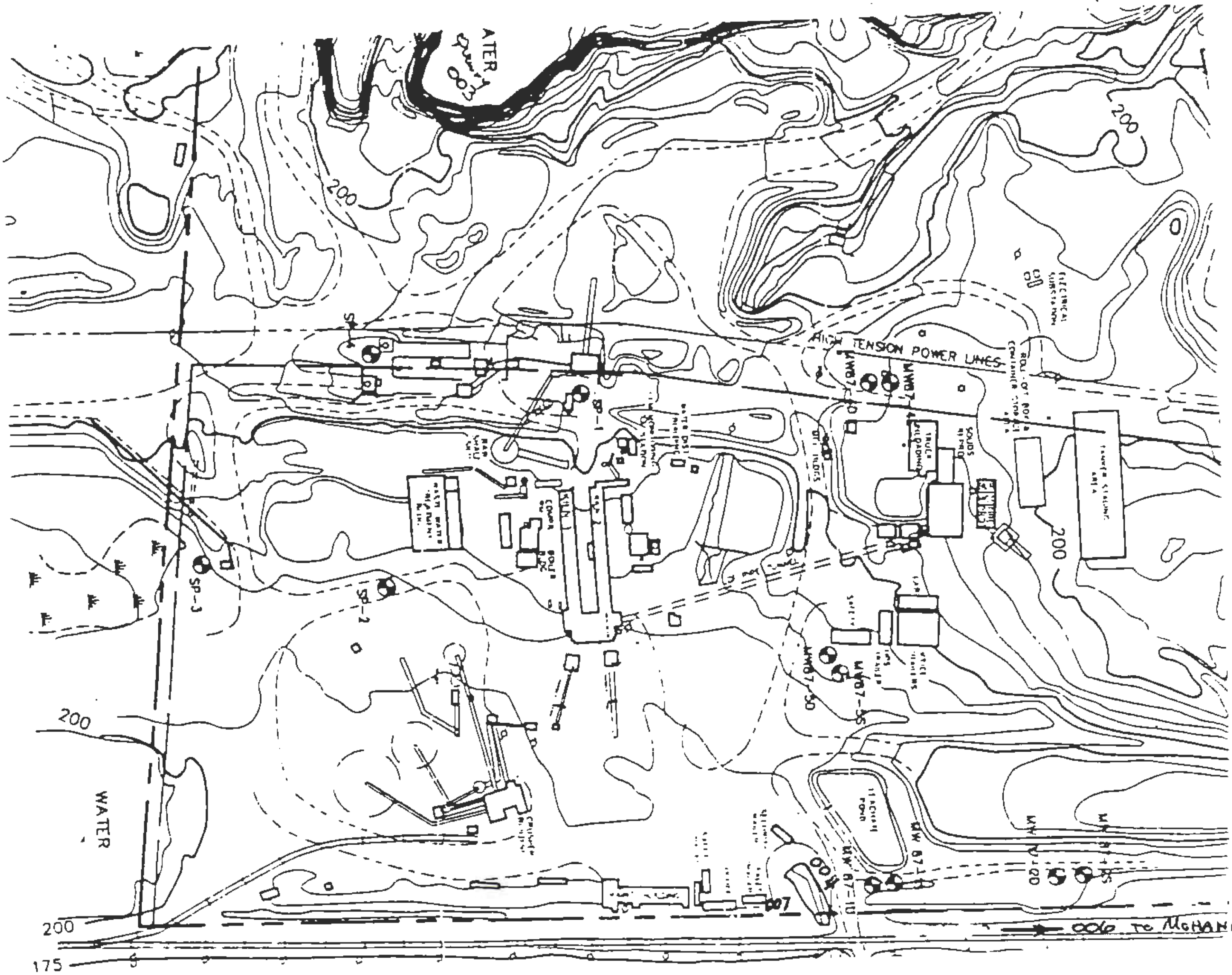
DEFINITIONS OF DAILY AVERAGE AND DAILY MAXIMUM

The daily average discharge is the total discharge by weight or in other appropriate units as specified herein, during a calendar month divided by the number of days in the month that the production or commercial facility was operating. Where less than daily sampling is required by this permit, the daily average discharge shall be determined by the summation of all the measured daily discharges in appropriate units as specified herein divided by the number of days during the calendar month when measurements were made.

The daily maximum discharge means the total discharge by weight or in other appropriate units as specified herein, during any calendar day.

MONITORING LOCATIONS

The permittee shall take samples and measurements, to comply with the monitoring requirements specified in this permit, at the location(s) indicated below: (Show sampling locations and outfalls with sketch or flow diagram as appropriate)



SPECIAL CONDITIONS - BEST MANAGEMENT PRACTICES

1. The permittee shall develop and implement a Best Management Practices (BMP) plan, within one year of EDM to prevent, or minimize the potential for, release of significant amounts of toxic or hazardous pollutants to the waters of the State through plant site runoff; spillage and leaks; sludge or waste disposal; and storm water discharges including, but not limited to, drainage from raw material storage. Completed BMP plans shall be submitted to the Regional Water Engineer within six months of EDM.

2. The permittee shall review all facility components or systems (including material storage areas; in-plant transfer, process and material handling areas; loading and unloading operations; storm water, erosion, and sediment control measures; process emergency control systems; and sludge and waste disposal areas) where toxic or hazardous pollutants are used, manufactured, stored or handled to evaluate the potential for the release of significant amounts of such pollutants to the waters of the State. In performing such an evaluation, the permittee shall consider such factors as the probability of equipment failure or improper operation, cross-contamination of storm water by process materials, settlement of facility air emissions, the effects of natural phenomena such as freezing temperatures and precipitation, fires, and the facility's history of spills and leaks. For hazardous pollutants, the list of reportable quantities as defined in 40 CFR, Part 117 may be used as a guide in determining significant amounts of releases. For toxic pollutants, the relative toxicity of the pollutant shall be considered in determining the significance of potential releases.

   The review shall address all substances present at the facility that are listed as toxic pollutants under Section 307(a)(1) of the Clean Water Act or as hazardous pollutants under Section 311 of the Act or that are identified as Chemicals of Concern by the Industrial Chemical Survey.

3. Whenever the potential for a significant release of toxic or hazardous pollutants to State waters is determined to be present, the permittee shall identify Best Management Practices that have been established to minimize such potential releases. Where BMPs are inadequate or absent, appropriate BMPs shall be established. In selecting appropriate BMPs, the permittee shall consider typical industry practices such as spill reporting procedures, risk identification and assessment, employee training, inspections and records, preventive maintenance, good housekeeping, materials compatibility and security. In addition, the permittee may consider structural measures (such as secondary containment and erosion/sediment control devices and practices) where appropriate.

4. Development of the BMP plan shall include sampling of waste stream segments for the purpose of toxic "hot spot"* identification. The economic achievability of technology-based end-of-pipe treatment will not be considered until plant site "hot spot" sources have been identified, contained, removed or minimized through the imposition of site specific BMPs or application of internal facility treatment technology.

5. The BMP plan shall be documented in narrative form and shall include any necessary plot plans, drawings or maps. Other documents already prepared for the facility such as a Safety Manual or a Spill Prevention, Control and Countermeasure (SPCC) plan may be used as part of the plan and may be incorporated by reference. USEPA guidance for development of stormwater elements of the BMP is available in the September 1992 manual "Storm Water Management for Industrial Activities," USEPA Office of Water Publication EPA 832-R-92-006 (available from NTIS, (703)487-4650, order number PB 92235969). A copy of the BMP plan shall be maintained at the facility and shall be available to authorized Department representatives upon request. As a minimum, the plan shall include the following BMP's:

   a. BMP Committee
   b. Reporting of BMP Incidents
   c. Risk Identification & Assessment
   d. Employee Training
   e. Inspections and Records
   f. Preventive Maintenance
   g. Good Housekeeping
   h. Materials Compatibility
   i. Security
   j. Spill prevention & response
   k. Erosion & sediment control
   l. Management of runoff

6. The BMP plan shall be modified whenever changes at the facility materially increase the potential for significant releases of toxic or hazardous pollutants or where actual releases indicate the plan is inadequate.

* A "hot spot" is a segment of an industrial facility; including but not limited to soil, equipment, material storage areas, sewer lines etc.; which contributes elevated levels of problem pollutants to the wastewater and/or storm water collection system of that facility. For the purposes of this definition, problem pollutants are substances for which end of pipe treatment to meet a water quality or technology requirement may, considering the results of wastestream segment sampling, be deemed unreasonable. For the purposes of this definition, an elevated level is a concentration or mass loading of the pollutant in question which is sufficiently higher than the end of pipe concentration of that same pollutant so as to allow for an economically justifiable removal and/or isolation of the segment and/or B.A.T. treatment of wastewaters emanating from the segment.

RECORDING, REPORTING AND ADDITIONAL MONITORING REQUIREMENTS

a) The permittee shall also refer to the General Conditions (Part II) of this permit for additional information concerning monitoring and reporting requirements and conditions.

b) The monitoring information required by this permit shall be summarized, signed and retained for a period of three years from the date of the sampling for subsequent inspection by the Department or its designated agent. **Also;**

[X] (if box is checked) monitoring information required by this permit shall be summarized and reported by submitting completed and signed Discharge Monitoring Report (DMR) forms for each 1 month reporting period to the locations specified below. Blank forms are available at the Department's Albany office listed below. The first reporting period begins on the effective date of this permit and the reports will be due no later than the 28th day of the month following the end of each reporting period.

Send the **original** (top sheet) of each DMR page to:

Department of Environmental Conservation
Division of Water
Bureau of Watershed Compliance Programs
50 Wolf Road
Albany, New York 12233-3506

Phone: (518) 457-3790

Send the **first copy** (second sheet) of each DMR page to:

Department of Environmental Conservation
Regional Water Engineer
Region 4
1150 North Westcott Road
Schenectady, New York 12306-2014

c) A monthly "Wastewater Facility Operation Report..." (form 92-15-7) shall be submitted (if box is checked) to the [ ] Regional Water Engineer and/or [ ] County Health Department or Environmental Control Agency listed above.

d) **Noncompliance** with the provisions of this permit shall be reported to the Department as prescribed in the attached General Conditions (Part II).

e) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit.

f) If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculations and recording on the Discharge Monitoring Reports.

g) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

h) Unless otherwise specified, all information recorded on the Discharge Monitoring Report shall be based upon measurements and sampling carried out during the most recently completed reporting period.

i) Any laboratory test or sample analysis required by this permit for which the State Commissioner of Health issues certificates of approval pursuant to section five hundred two of the Public Health Law shall be conducted by a laboratory which has been issued a certificate of approval. Inquiries regarding laboratory certification should be sent to the Environmental Laboratory Accreditation Program, New York State Health Department Center for Laboratories and Research, Division of Environmental Sciences, The Nelson A. Rockefeller State Plaza, Albany, New York 12201.

1996.11.12 SPDES permit W. Clarke

New York State Department of Environmental Conservation
Division of Compliance Services - Room 538
50 Wolf Road, Albany, New York 12233-1760
Phone: (518) 457-2224 FAX: (518) 457-5965

Michael D. Zagata
Commissioner

November 12, 1996

FACILITY INFORMATION

JAY DERMAN
NORLITE CORP.
628 SOUTH SARATOGA STREET
COHOES, NY 12047

NORLITE CORP
LOCATION : COHOES (C)
COUNTY : ALBANY
DEC NO : 4-0103-00016-00020-
SPDES NO : NY 000 4880

Dear SPDES Permittee:

Enclosed please find your renewed State Pollutant Discharge Elimination System (SPDES) permit which becomes effective on the date your current permit expires. This renewal permit together with the current valid permit constitute authorization to discharge wastewater in accordance with all terms, conditions and limitations specified in your current permit, including any valid modifications.

The instructions and other information that you received with the NOTICE/RENEWAL APPLICATION/PERMIT package fully described procedures for renewal and modification of you SPDES permit under the Environmental Benefit Permit Strategy (EBPS). As a reminder, SPDES permits are renewed at a central location in Albany in order to make the process more efficient. All other concerns with your permit such as applications for permit modifications, permit transfers to a new owner, name changes, and other questions should be directed to the Regional Permit Administrator at the following address:

William Clarke
NYSDEC REGION 4
1150 No Westcott Rd
Schenectady, NY 12306-2014
(518) 357-2069

If you have already filed an application for modification of your permit, it will be processed separately through our regional office. If you have questions concerning this permit renewal, please contact me at the above number.

Sincerely,

Debra A. Devine

Debra A. Devine
Environmental Analyst I

Enclosure

cc: RPA
RWE
BWFD

91-20-5 (1/95)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
State Pollutant Discharge Elimination System (SPDES)
NOTICE/RENEWAL APPLICATION/PERMIT

Please read **ALL** instructions on the back before completing this application form. Please **TYPE** or **PRINT** clearly in ink.

PART 1 - NOTICE Date: APR 19 1996

4-0103-00016/00020 APPL DUE BY 8/5/96

Permittee Contact Name, Title, Address

NPDES : NY 000 4880
NORLITE CORP.
JAY DERMAN
628 SOUTH SARATOGA STREET
COHOES NY 12047

Facility Information, DEC Number, SPDES Number, Expiration Date

NORLITE CORP
COUNTY : ALBANY
PERMIT NO : NY 000 4880
EXPIRE : 97/02/01
SIC: 1422 CEN DEC#: 4-0103-00016

Are these labels correct? If not, please write corrections on the labels.

The State Pollutant Discharge Elimination System Permit for the facility referenced above expires on the date indicated. You are required by law to file a complete renewal application **at least 180 days prior to expiration of your current permit. Note the "Application Due By" date above.**

CAUTION: This short application form and attached questionnaire are the only forms acceptable for permit renewal. Sign Part 2 below and mail only this form and the completed questionnaire using the enclosed envelope. *Effective April 1, 1994 the Department no longer assesses SPDES application fees.*

If there are changes to your discharge, or to operations affecting the discharge, then in addition to this renewal application, you must also submit a separate permit modification application to the Regional Permit Administrator for the DEC region in which the facility is located, as required by your current permit. See the reverse side of this page for instructions on filing a modification request.

PART 2 - RENEWAL APPLICATION

CERTIFICATION: I hereby affirm that under penalty of perjury that the information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief. False statements made herein are punishable as a Class A misdemeanor pursuant to section 210.45 of the Penal Law.

David Carabetta — President
Name of person signing application (see instructions on back) — Title

Signature — 8-2-96 Date

RECEIVED 96 AUG -8 AM 11:24 REGULATORY AFF...

PART 3 - PERMIT (Below this line - Official Use Only)

Effective Date: 2/1/97 Expiration Date: 2/1/02

Debra Devine
Permit Administrator

Address: NYSDEC - Regulatory Affairs
Permit and Registration services
50 Wolf Road, Albany, NY 12233-1760

Debra Devine — 11/12/96
Signature — Date

This permit together with the previous valid permit for this facility issued 1/27/92 and subsequent modifications constitute authorization to discharge wastewater in accordance with all terms, conditions and limitations specified in the previously issued valid permit, modifications thereof or issued as part of this permit, including any special or general conditions attached hereto. Nothing in this permit shall be deemed to waive the Department's authority to initiate a modification of this permit on the grounds specified in 6NYCRR §621.14, 6NYCRR §754.4 or 6NYCRR §757.1 existing at the time this permit is issued or which arise thereafter.

Attachments: General Conditions dated 11/90

91-20-5a (1/95)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Please enter the numbers from your current permit:

DEC Number: 4 - 0103 - 000 / 16/20 - 0

SPDES Number: NY 0004880

SPDES RENEWAL APPLICATION
QUESTIONNAIRE

THIS PAGE MUST BE COMPLETED AND RETURNED WITH YOUR COMPLETED APPLICATION

Please **TYPE** or **PRINT** neatly using adaquate pressure to make ALL copies legible. Keep the GOLD copy for your records.

1. Has the SPDES permit for your facility been modified in the past 5 years ☒ YES ☐ NO

2. Dischargers who use, manufacture, store, handle or discharge toxic or hazardous pollutants are subject to Industrial Best Management Practices (BMP) plan requirements for toxic or hazardous substances. A BMP plan prevents or minimizes the potential for release of pollutants to receiving waters from such ancillary industrial activities, including material storage areas; plant site runoff; in-plant transfer; process and material storage areas; loading and unloading operations, and sludge and waste disposal areas.

   Does your facility conduct ancillary activities as described above, which are not covered by BMP requirements in your current permit? ☐ YES ☒ NO

Please indicate which of the following best describes the situation at your facility:

☐ None of the concerns on the "Self Evaluation List" seem to apply to my facility at this time and I will not be applying for a modification of the SPDES permit in the foreseeable future.

☒ Yes, some of the items on the "Self Evaluation List" have led me to believe my permit needs to be modified. I already have a complete modification application pending with the Department.

☐ Yes, some of the items on the "Self Evaluation List" have led me to believe that the SPDES permit for this facility may need to be Modified. I have requested the appropriate forms by phone OR I have completed and attached the "Request For SPDES Application Forms" (included in this renewal package) to allow me to submit a permittee-initiated Modification application. See The "Request For SPDES Application Forms" page for a toll free 800 number.

☐ The items on the "Self Evaluation List" have left me unable to conclude whether my permit needs to be modified at this time. I am reporting the following general concerns about my permit:

_____

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DISTRIBUTION: Regional Water Engineer -- WHITE
Central Office (BWFD) -- YELLOW
Regional Permit Administrator -- PINK
Applicant -- GOLD

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
REGION 4 HEADQUARTERS
1150 NORTH WESTCOTT ROAD
SCHENECTADY, NEW YORK 12306
Tel: (518) 357-2045 Fax: (518) 357-2398

Michael D. Zagata
Commissioner

April 23, 1996

Mr. Bill Morris
Norlite Corporation
628 South Saratoga Street
P.O. Box 694
Cohoes, NY 12047

Re: Inspection

Dear Mr. Morris:

It has come to my attention that there is some confusion regarding the inspection letter dated April 3, 1996. In that letter, I stated that the facility is being operated in a satisfactory manner. This statement was based solely on the observations noted during the inspection and was intended to indicate that no major deficiencies were found.

In order for this office to confirm that the treatment system is functioning as designed, the analytical results must demonstrate that the effluent is in compliance with the permit limits. The discharge monitoring reports continue to show noncompliance with the effluent limits contained in the draft SPDES permit. Although these exceedances have been attributed to the initial start up and are expected to be eliminated by the end of March, we cannot sign off on the project until the analyses demonstrate consistent compliance with the effluent limits.

I apologize for any confusion I may have caused. If you have any questions or comments regarding this issue, please contact me.

Sincerely,

Carol Lamb-LaFay, P.E.
Environmental Engineer I
Region IV

CAL/ml-8CL1

cc: Bill Clarke
Ed Toomer

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
REGION 4 HEADQUARTERS
1150 NORTH WESTCOTT ROAD
SCHENECTADY, NEW YORK 12306
Tel: (518) 357-2045 Fax: (518) 357-2398

Michael D. Zagata
Commissioner

October 29, 1996

Mr. Tim Lachell
Norlite Corporation
628 South Saratoga Street
P.O. Box 694
Cohoes, NY 12047

Re: Wastewater Treatment Plant
SPDES Permit #NY 000 4880

Dear Mr. Lachell:

I have reviewed the interim report, submitted by letter dated October 21, 1996, concerning Norlite's Waste Water Treatment Operations. Although it appears that you have solved the optimization problems associated with the addition of Iron Sulfate Solution at the equalization tank, I would like to see additional data demonstrating compliance prior to signing off on this issue. Therefore, I am extending the deadline for submission of the Engineering Report until November 22, 1996. At that time, it is hoped that continuous compliance with the effluent limits can be demonstrated.

If you have any questions concerning this matter, please contact me at the above number.

Sincerely,

Carol Lamb-LaFay, P.E.
Environmental Engineer I
Region IV

cc: Jim Harrington, BWP
Rich Ostrov, Regional Attorney
Bob Warland, DAR
Bill Clarke, DRS

Norlite Corporation

628 SO. SARATOGA ST.
P.O. BOX 694
COHOES, N.Y. 12047
TEL.: (518) 235-0401
FAX.: (518) 235-0233

April 19, 1996

Mr. William Clarke
Regional Permit Administrator
New York State DEC - Region IV
1150 N. Westcott Rd.
Schenectady, NY 12306

Dear Mr. Clarke:

Please find enclosed a copy of a report from Carol Lamb-LaFay of your Department regarding the new wastewater treatment plant at our facility. We believe this should satisfy the requirements referenced in the HW/APC permit regarding completion and operation of the permanent WWTP. These are addressed in the footnotes of Module VII.D.3 and Module V.A. With this approval, Norlite Corporation has completed the requirements of Module VII.D.3, footnote 8. We request your written authorization for the increase in liquid LGF feed rate and the use of solid LGF.

Norlite will inform you of further upgrade completions as they occur to satisfy other footnote requirements in the permit such as the additional bays in the truck unloading area and the upgrading of the solid LGF staging area by Kiln #1 (formerly, the temporary WWTP).

We would also like to move forward with the modification of the SPDES permit so that the Order on Consent may be closed such as we did with the HW/APC permit in November 1995. We shall resolve the technical issues of the high temperature at Outfall 006 and monitoring frequency at Outfall 003 with Ms. Lamb-LaFay as discussed in her inspection report.

If you have any questions regarding this request, please feel free to call me at (518) 235-0401. Thank you for your attention in this matter.

Sincerely,

William Morris
Environmental Director
NORLITE CORPORATION

New York State Department of Environmental Conservation
REGION 4
1150 North Westcott Road, Schenectady, New York 12306
Telephone: (518) 357-2045
Facsimile: (518) 357-2398

Michael D. Zagata
Commissioner

April 3, 1996

CERTIFIED - RETURN RECEIPT REQUESTED
Z 191 716 311

Mr. Ed Burgher
Director of Compliance
Norlite Corporation
628 South Saratoga Street
P.O. Box 694
Cohoes, NY 12047

Re: SPDES Permit #NY 000 4880

Dear Mr. Burgher:

On March 28, 1996, Ed Toomer, Pete Empie and I visited the Norlite facility. The purpose of our visit was to inspect the new wastewater treatment plant and different areas referenced in the BMP plan. During the inspection, the following was noted:

1] The effluent from the wastewater treatment plant was drawn from the discharge pipe within the treatment plant. Although the effluent initially appeared brownish, it became clear within a few minutes. The brownish color was attributed to the water sitting n the pipe.

2] the high temperature alarm was activated. The alarm is currently set at the permit limit of 90F. Although the temperature of the effluent exceeded the permit limit, this is not necessarily a violation as the permit limit applies at the point of discharge to the Mohawk River. However, the location of the discharge to the Mohawk is not easily accessible making it difficult to verify compliance with the temperature limit. It is recommended that you determine the correlation between the temperature at the plant and the temperature at the outfall. This would be helpful in determining a meaningful setpoint for the high temperature alarm.

3] Upon completion of our review of the revision to the Best Management Plan, comments will be forwarded to your attention.

4] The draft permit modification for the discharge to the Mohawk River is in the process of being modified to reflect recent changes at the facility. If you wish to modify the monitoring frequency for Outfall 003, please submit a written request with the proposed changes within two weeks of receipt of this letter.

Based on observations noted during this inspection, it appears that the facility is being operated in a satisfactory manner. A copy of the inspection form is attached for your records. If you have any questions, please contact me at the above number.

Sincerely,

Carol Lamb-LaFay

Carol Lamb-LaFay, P.E.
Environmental Engineer
Region IV

CL/ml-7CL50

cc: Ed Toomer, DAR
Jim Harrington, BWFD

Form Approved
OMB No. 158-R0073

NPDES COMPLIANCE INSPECTION REPORT *(Coding Instructions on back of last page)*

TRANSACTION CODE	NPDES	YR MO DA	TYPE	INSPECTOR	FAC TYPE	TIME
[ ]	[5] NY0104180	96 03 28	2C	5	2	10:00 a.m. p.m.
1 2	3 11	12 17	18	19	20	

REMARKS

21 64

ADDITIONAL

65 70

SECTION A - Permit Summary

NAME AND ADDRESS OF FACILITY *(Include County, State and ZIP code)*
NORLITE CORPORATION
628 South Saratoga St
Cohoes NY 123

EXPIRATION DATE: 2/1/97
ISSUANCE DATE: 2/1/92

RESPONSIBLE OFFICIAL	TITLE	PHONE

FACILITY REPRESENTATIVE	TITLE	PHONE
ED BURGHER	DIRECTOR OF COMP.	235-0901

SECTION B - Effluent Characteristics *(Additional sheets attached _____)*

PARAMETER/ DUTFALL		MINIMUM	AVERAGE	MAXIMUM	ADDITIONAL
001	SAMPLE MEASUREMENT				NO Samples.
	PERMIT REQUIREMENT				Clear
	SAMPLE MEASUREMENT				High Temp Alarm ON Low Level Alarm ON.
	PERMIT REQUIREMENT				
	SAMPLE MEASUREMENT				
	PERMIT REQUIREMENT				
	SAMPLE MEASUREMENT				
	PERMIT REQUIREMENT				
	SAMPLE MEASUREMENT				
	PERMIT REQUIREMENT				

SECTION C - Facility Evaluation *(S = Satisfactory, U = Unsatisfactory, N/A = Not applicable)*

	EFFLUENT WITHIN PERMIT REQUIREMENTS		OPERATION AND MAINTENANCE		SAMPLING PROCEDURES
	RECORDS AND REPORTS		COMPLIANCE SCHEDULE		LABORATORY PRACTICES
	PERMIT VERIFICATION		FLOW MEASUREMENTS		OTHER:

SECTION D - Comments

SECTION E - Inspection/Review

SIGNATURES	AGENCY	DATE
INSPECTED BY Carol Lamb-LaTray	NYSDEC	3/28/96.
INSPECTED BY		
REVIEWED BY		

ENFORCEMENT DIVISION USE ONLY
COMPLIANCE STATUS:
☐ COMPLIANCE
☐ NON-COMPLIANCE

Mr. Ed Burgher
Director of Compliance
Norlite Corporation
628 South Saratoga Street
P.O. Box 694
Cohoes, NY 12047

RE: NY 000 4880

Dear Mr. Burgher:

On March 28, 1996, Ed Toomer, Pete Empie and I visited the Norlite facility. The purpose of our visit was to inspect the new wastewater treatment plant and different areas referenced in the BMP plan. During the inspection, the following was noted:

1] The effluent from the wastewater treatment plant was drawn from the discharge pipe within the treatment plant. Although the effluent initially appeared brownish, it became clear within a few minutes. The brownish color was attributed to the water sitting in the pipe.

2] The high temperature alarm was activated. The alarm is currently set at the permit limit of 90F. Although the temperature of the effluent exceeded the permit limit, this is not necessarily a violation as the permit limit applies at the point of discharge to the Mohawk River. However, the location of the discharge to the Mohawk is not easily accessible making it difficult to verify compliance with the temperature limit. It is recommended that you determine the correlation between the temperature at the plant and the temperature at the outfall. This would be helpful in determining a meaningful setpoint for the high temperature alarm.

3] Upon completion of our review of the revision to the Best Management Plan, comments will be forwarded to your attention.

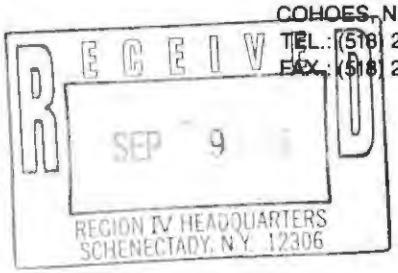
4] The draft permit modification for the discharge to the Mohawk River is in the process of being modified to reflect recent changes at the facility. If you wish to modify the monitoring frequency for Outfall 003, please submit a written request with the proposed changes within two weeks of receipt of this letter.

Based on observations noted during this inspection, it appears that the facility is being operated in a satisfactory manner. A copy of the inspection form is attached for your records. If you have any questions, please contact me at the above number.

Sincerely,
Carol Lamb-LaFay
Environmental Engineer

Norlite Corporation

628 SO. SARATOGA ST.
P.O. BOX 694
COHOES, N.Y. 12047
TEL.: (518) 235-0401
FAX.: (518) 235-0233



September 6, 1996

Ms. Carol Lamb-LaFay
New York State Department of Environmental Conservation
Region IV Headquarters
1150 North Westcott Road
Schenectady, NY 12306

Dear Ms. Lamb-LaFay:

I have enclosed Norlite's discussion and proposal for Waste Water Treatment Plant changes that would bring Norlite's effluent into compliance with Arsenic, Selenium, and Total Suspended Solids with the current consent order and the proposed SPDES permit modification. Additional discussion is presented on Ammonia in the effluent.

I appreciate your technical assistance in this matter. The information you supplied in mid-August was very helpful in developing solutions to the issue at hand.

Norlite is very confident the proposed solutions will have a significant positive impact on our waste water effluent. Norlite is prepared to move forward with our proposals immediately.

If you have any questions concerning the attached report, please contact Bill Morris or myself.

Sincerely,

Timothy F. Lachell

Timothy F. Lachell
Plant Manager

cc: Bill Morris--Norlite
Bill Clarke--NYSDEC
Jim Herrington--NYSDEC

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September 6,1996

BACKGROUND

Norlite Corporation (Norlite) has built and is operating a waste water treatment plant (WWTP) for the treatment of water generated from wet scrubbers used on two lightweight aggregate kilns. This WWTP was built based on the document, "Engineering Report for Norlite, Inc. Proposed Wastewater Treatment Process to comply with Proposed Mohawk River SPDES Limitations, RE: SPDES Permit No. NY-0004880, Order on Consent No. R-1680-94-05". The treatment system includes an equalization tank, flocculation tank, clarifier, clarifier overflow collection tank, fabric solids filter (sock filters), carbon adsorption filters and discharge collection tanks. Dissolved metals are removed from the water stream by chemical precipitation using Sodium Hydroxide (NaOH) and a polymeric flocculant. Solids are settled in the clarifier, transferred to a sludge thickening tank and dewatered using a filter press.

Norlite has monitored increasing concentrations of Arsenic and Selenium over the past five months. Removal of these contaminants has been marginal using the current chemical precipitation procedures. The more persistent contaminant has been arsenic and Norlite has focused its attention on its removal. It was assumed that the treatment scheme that removes arsenic would be successful for the removal of selenium since they are both semiconductor elements. The treatment plant removes arsenic that is already precipitated and exists in the form of suspended solids. Any soluble arsenic passes through the treatment system untouched. Norlite has also experienced minor problems in removing suspended solids. There is a dissolved concentration of ammonia in the effluent as well at a concentration of about 30 to 90 ppm .

In order to remove these contaminants to acceptable levels, Norlite Corporation intends to make the modifications to the treatment plant to achieve compliance with the current consent order and the proposed SPDES permit modification.

DISCUSSION

Arsenic and Selenium Removal

Arsenic and Selenium removal has been marginal at best. These two semiconductor elements, when soluble as ions in the water, have not been removed using the existing metals precipitation system. During the original engineering study for this treatment plant, the Arsenic and Selenium concentrations were not high enough to warrant concern over the method for metals removal. Norlite has seen an increase over the last four months in the dissolved arsenic concentrations and now the selenium concentrations. NYSDEC provided Norlite with literature describing arsenic removal using coprecipitants, sulfide precipitation and oxidation in response to a Norlite proposal to air strip ammonia from the water before discharge. NYSDEC had a concern that the air stripping may precipitate arsenic based on oxidation of As^{2+} to As^{3+}. NYSDEC would support air stripping for ammonia after arsenic was removed. The literature provided by NYSDEC provided useful insight to a slight modification to the metals precipitation system that would provide removal of arsenic.

Over the last two weeks, Norlite has performed a number of laboratory tests involving ferrous

sulfate ($FeSO_4$) used as a coprecipitant at the metals removal step. The existing treatment system has relied on pH adjustment and polymeric flocculation for metals removal with good success for other metals. The flocculate that forms is relatively small in size and the water retains a fair amount of pin flocculate that passes through the clarifier to be removed by the sock filters. The addition of $FeSO_4$ has provided a better environment for the flocculate to form. Particles are much larger and heavier. The resulting water stream is clearer and appears to have considerably less suspended solids. Laboratory analysis shows the arsenic and selenium being effected by the $FeSO_4$ coprecipitant. Norlite has determined that an induced Fe^{2+} concentration of 300 to 400 ppm and a precipitating pH of 10.5 to 11.0 have an effect on the removal of these two metals without adversely affecting other metal removal efficiencies. Removal efficiencies in the concentration range of 50 to 500 ppb Arsenic and Selenium are fair to good as shown below.

See Tables 1-1 through 1-10

Analysis of Arsenic removal by coprecipitation with $FeSO_4$ indicates that the same removal occurs with and without an oxidation step. According to the literature provided by NYSDEC, solubilized arsenic with a 2+ valence is less prone to precipitation than arsenic with a 3+ valence. The coprecipitation was simulated using scrubber blowdown water. Samples were treated with bleach to ensure full oxidation of the arsenic ion species while others were not. There was no difference in the arsenic removal efficiency for either scenario. The likely conclusion is that dissolved arsenic in the scrubber blowdown exists at a 3+ valence.

See Table 2

Norlite did not explore the use of Sodium Sulfide (Na_2S) beyond the original research described in the paper. While metal sulfide salts are mostly insoluble in water, the introduction of reduced sulfur could resurrect Norlite's Hydrogen Sulfide issues of November 1995. This option would have been explored in more detail had the $FeSO_4$ addition failed.

Ammonia Removal

Ammonia exists in the effluent in a concentration range of 30 to 90 ppm dissolved (See Table 3). The ammonia is allegedly coming out of solution as a gas in the discharge line, thus causing an odor problem when downstream entities open the sewer line. Norlite has monitored the air space above the clarifier in the WWTP in an effort to determine the airborne concentrations. The threshold limiting value of ammonia in air is 25 ppm. Concentrations above the clarifier have been typically 0 to 15 ppm with a maximum reading of 25 ppm.

In order to remove dissolved ammonia from the effluent stream, Norlite has proposed the use of air stripper after the suspended solids removal step in the process. Norlite made this proposal on July 16, 1996 in a letter to Carol Lamb-LaFay. Norlite still proposes to use this technology pending effective removal of the arsenic as described above.

Total Suspended Solids Removal

Norlite proposes to add to the fabric or "sock" filters with a sandfilter as described in the July 16, 1996 letter to Carol Lamb-LaFay. The sand filter will provide easier removal of the residual solids left from the clarifier. The proposed addition of $FeSO_4$ will greatly enhance suspended solids removal due to better flocculation as described above. The sand filter is easier technology to maintain than the sock filters and will provide optimal suspended solids removal. The filter is cleaned by backwashing with the backwash being discharged to the head of the water treatment system.

CONCLUSIONS AND PROPOSAL

Norlite proposes to begin $FeSO_4$ addition in the "EQ" tank that receives the scrubber blowdown. A dosage that delivers 300 to 400 ppm Fe^{2+} will be administered to this tank. The water will pass through the "floc" tank as it does now where the pH will be adjusted to between 10.5 and 11.0 and flocculant is added. The mixture will flow into the clarifier for settling. The two differences here are the addition of $FeSO_4$ and a higher pH range. The remaining treatment remains the same. The treatment will become more effective in solids removal due to better flocculation conditions and Arsenic and Selenium concentrations will be reduced to below permit limitations.

A sand filter will be installed for enhanced solids removal after the overflow collection tank in combination with the existing fabric or "sock" filters.

A pilot test shall be performed using an air stripper to determine ammonia removal from the effluent stream. This test would be performed after successful removal of the arsenic in the metals removal process. Data and conclusions would be shared with NYSDEC when available as described in our July 16, 1996 letter.

Norlite believes these minor changes to the treatment system will bring the treatment system into compliance with the proposed SPDES permit limitations for Arsenic, Selenium and Total Suspended Solids without compromising other contaminant removal performance.

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TABLE 1-1

Variable Iron dose at variable pH

Date	Sample ID	Filtered(F) Unfiltered(U)	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] (PQL ppm) As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
08/27/96	EQ Tank	U	3-a	9.10	25120	0.450	O/R	0.135	Unfiltered Influent Material from the EQ Tank
08/27/96	EQ Tank	F	3-b			0.363	0.367	0.089	Filtered Influent Material from the EQ Tank
08/27/96	TL-EQ-01-1	F	z	10.30		0.053	0.000	0.050	700 ppm Fe addition
08/27/96	TL-EQ-01-2	F	z	10.40		0.000	0.263	0.062	700 ppm Fe addition
08/27/96	TL-EQ-01-3	F	z	11.80		0.000	0.422	0.078	1000 ppm Fe addition
08/27/96	TL-EQ-01-4	F	z	10.20		0.000	0.101	0.032	1000 ppm Fe addition
08/27/96	TL-EQ-01-5	F	z	13.10		0.332	0.111	0.107	1500 ppm Fe addition
08/27/96	TL-EQ-01-6	F	z	12.10		0.148	0.435	0.119	1500 ppm Fe addition
08/27/96	TL-EQ-01-7	F	z	12.10		0.031	0.332	0.103	3000 ppm Fe addition
08/27/96	TL-EQ-01-8	F	z	12.40		0.037	0.265	0.061	3000 ppm Fe addition

NOTE: O/R indicates out of instrument range

TABLE 1-2

Variable iron dose at variable pH

Date	Sample ID	Filtered(F) Unfiltered(U)	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] (PQL ppm) As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
08/28/96	EQ Tank	U	3-a	9.13	24180	0.712	O/R	0.110	Unfiltered Influent Material from the EQ Tank
08/28/96	EQ Tank	F	3-b	9.35		0.413	0.659	0.090	Filtered Influent Material from the EQ Tank
08/28/96	TL-EQ-02-1	F	z	10.50		0.375	0.360	0.073	1 ppm Fe addition
08/28/96	TL-EQ-02-2	F	z	10.50		0.356	0.701	0.105	10 ppm Fe addition
08/28/96	TL-EQ-02-3	F	z	10.50		0.285	0.145	0.104	100 ppm Fe addition
08/28/96	TL-EQ-02-4	F	z	11.00		0.355	0.166	0.114	1 ppm Fe addition
08/28/96	TL-EQ-02-5	F	z	11.00		0.372	0.161	0.105	10 ppm Fe addition
08/28/96	TL-EQ-02-6	F	z	11.00		0.283	0.069	0.068	100 ppm Fe addition
08/28/96	TL-EQ-02-7	F	z	11.50		0.383	0.921	0.104	1 ppm Fe addition
08/28/96	TL-EQ-02-8	F	z	11.50		0.363	0.112	0.130	10 ppm Fe addition
08/28/96	TL-EQ-02-9	F	z	11.50		0.178	0.051	0.043	100 ppm Fe addition

NOTE: O/R indicates out of instrument range

TABLE 1-3
Variable iron dose at variable pH

Date	Sample ID	Filtered{F} Unfiltered{U}	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] {PQL ppm} As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
08/29/96	EQ Tank	U	3-a	8.93	31440	0.730	O/R	0.130	Unfiltered Influent Material from the EQ Tank
08/29/96	EQ Tank	F	3-b	9.05		0.303	0.500	0.146	Filtered Influent Material from the EQ Tank
08/29/96	TL-EQ-03-1	F	z	10.50		0.123	0.393	0.070	200 ppm Fe addition
08/29/96	TL-EQ-03-2	F	z	10.50		0.151	0.267	0.129	300 ppm Fe addition
08/29/96	TL-EQ-03-3	F	z	10.50		0.084	0.233	0.120	400 ppm Fe addition
08/29/96	TL-EQ-03-4	F	z	11.00		0.067	0.171	0.107	200 ppm Fe addition
08/29/96	TL-EQ-03-5	F	z	11.00		0.051	0.232	0.104	300 ppm Fe addition
08/29/96	TL-EQ-03-6	F	z	11.00		0.054	0.461	0.127	400 ppm Fe addition
08/29/96	TL-EQ-03-7	F	z	11.50		0.120	0.131	0.105	200 ppm Fe addition
08/29/96	TL-EQ-03-8	F	z	11.50		0.109	0.354	0.114	300 ppm Fe addition
08/29/96	TL-EQ-03-9	F	z	11.50		0.078	0.228	0.105	400 ppm Fe addition

NOTE: O/R indicates out of instrument range

TABLE 1-4

Variable iron dose at variable pH

Date	Sample ID	Filtered{F} Unfiltered{U}	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] {PQL ppm} As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
08/30/96	EQ Tank	U	3-a	7.80	28780	0.321	O/R	0.019	Unfiltered Influent Material from the EQ Tank
08/30/96	EQ Tank	F	3-b	8.44		0.083	0.102	0.007	Filtered Influent Material from the EQ Tank
08/30/96	TL-EQ-04-1	F	z	10.50		0.113	0.305	0.033	200 ppm Fe addition
08/30/96	TL-EQ-04-2	F	z	10.50		0.100	0.372	0.018	300 ppm Fe addition
08/30/96	TL-EQ-04-3	F	z	10.50		0.059	0.342	0.018	400 ppm Fe addition
08/30/96	TL-EQ-04-4	F	z	11.00		0.073	0.312	0.038	200 ppm Fe addition
08/30/96	TL-EQ-04-5	F	z	11.00		0.084	0.189	0.019	300 ppm Fe addition
08/30/96	TL-EQ-04-6	F	z	11.00		0.088	0.314	0.011	400 ppm Fe addition
08/30/96	TL-EQ-04-7	F	z	11.50		0.149	0.411	0.029	200 ppm Fe addition
08/30/96	TL-EQ-04-8	F	z	11.50		0.101	0.245	0.027	300 ppm Fe addition
08/30/96	TL-EQ-04-9	F	z	11.50		0.122	0.427	0.019	400 ppm Fe addition

NOTE: O/R indicates out of instrument range

TABLE 1-5
Variable iron dose at variable pH

Date	Sample ID	Filtered(F) Unfiltered(U)	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] (PQL ppm) As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
08/31/96	EQ Tank	U	3-a		20580	0.810	O/R	0.007	Unfiltered Influent Material from the EQ Tank
08/31/96	EQ Tank	F	3-b			0.250	0.532	0.033	Filtered Influent Material from the EQ Tank
08/31/96	TL-EQ-05-1	F	z	10.50		0.028	0.569	0.025	200 ppm Fe addition
08/31/96	TL-EQ-05-2	F	z	10.50		0.000	0.655	0.013	300 ppm Fe addition
08/31/96	TL-EQ-05-3	F	z	10.50		0.000	0.743	0.008	400 ppm Fe addition
08/31/96	TL-EQ-05-4	F	z	11.00		0.031	0.204	0.006	200 ppm Fe addition
08/31/96	TL-EQ-05-5	F	z	11.00		0.036	0.349	0.009	300 ppm Fe addition
08/31/96	TL-EQ-05-6	F	z	11.00		0.050	NA	0.005	400 ppm Fe addition
08/31/96	TL-EQ-05-7	F	z	11.50		0.098	0.199	0.008	200 ppm Fe addition
08/31/96	TL-EQ-05-8	F	z	11.50		0.016	0.358	0.006	300 ppm Fe addition
08/31/96	TL-EQ-05-9	F	z	11.50		0.059	0.911	0.000	400 ppm Fe addition

NOTE: O/R indicates out of instrument range
NOTE: NA indicates not available

TABLE 1-6

Variable iron dose at variable pH

Date	Sample ID	Filtered{F} Unfiltered{U}	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] {PQL ppm} As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
09/01/96	EQ Tank	U	3-a		21790	0.629	O/R	0.013	Unfiltered Influent Material from the EQ Tank
09/01/96	EQ Tank	F	3-b			0.241	0.214	0.047	Filtered Influent Material from the EQ Tank
09/01/96	TL-EQ-06-1	F	z	10.50		0.000	0.329	0.024	200 ppm Fe addition
09/01/96	TL-EQ-06-2	F	z	10.50		0.042	0.357	0.000	300 ppm Fe addition
09/01/96	TL-EQ-06-3	F	z	10.50		0.000	0.224	0.000	400 ppm Fe addition
09/01/96	TL-EQ-06-4	F	z	11.00		0.078	0.267	0.038	200 ppm Fe addition
09/01/96	TL-EQ-06-5	F	z	11.00		0.086	0.234	0.083	300 ppm Fe addition
09/01/96	TL-EQ-06-6	F	z	11.00		0.000	0.075	0.000	400 ppm Fe addition
09/01/96	TL-EQ-06-7	F	z	11.50		0.128	0.329	0.038	200 ppm Fe addition
09/01/96	TL-EQ-06-8	F	z	11.50		0.088	0.171	0.034	300 ppm Fe addition
09/01/96	TL-EQ-06-9	F	z	11.50		0.000	0.410	0.000	400 ppm Fe addition

NOTE: O/R indicates out of instrument range

TABLE 1-7

Variable iron dose at variable pH

Date	Sample ID	Filtered(F) Unfiltered(U)	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] (PQL ppm) As [0.150] (0.100)	Fe [4.000] (0.100)	Se [0.100] (0.050)	
09/02/96	EQ Tank	U	3-a		22195	0.431	62.708	0.045	Unfiltered Influent Material from the EQ Tank
09/02/96	EQ Tank	F	3-b			0.377	0.835	0.008	Filtered Influent Material from the EQ Tank
09/02/96	TL-EQ-07-1	F	z	10.50		0.052	0.483	0.062	200 ppm Fe addition
09/02/96	TL-EQ-07-2	F	z	10.50		0.075	0.963	0.070	300 ppm Fe addition
09/02/96	TL-EQ-07-3	F	z	10.50		0.000	1.134	0.057	400 ppm Fe addition
09/02/96	TL-EQ-07-4	F	z	11.00		0.110	0.565	0.059	200 ppm Fe addition
09/02/96	TL-EQ-07-5	F	z	11.00		0.070	0.369	0.027	300 ppm Fe addition
09/02/96	TL-EQ-07-6	F	z	11.00		0.019	0.607	0.058	400 ppm Fe addition
09/02/96	TL-EQ-07-7	F	z	11.50		0.120	0.382	0.041	200 ppm Fe addition
09/02/96	TL-EQ-07-8	F	z	11.50		0.108	0.260	0.035	300 ppm Fe addition
09/02/96	TL-EQ-07-9	F	z	11.50		0.035	0.506	0.043	400 ppm Fe addition

TABLE 1-6
Variable iron dose at variable pH

Date	Sample ID	Filtered{F} Unfiltered{U}	Process ID #	pH	TSS	Norlite Limits Discharge [ppm] {PQL ppm} As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
09/03/96	EQ Tank	U	3-a	9.00	22120	0.769	O/R	0.002	Unfiltered Influent Material from the EQ Tank
09/03/96	EQ Tank	F	3-b			0.247	0.549	0.026	Filtered Influent Material from the EQ Tank
09/03/96	TL-EQ-08-1	F	z	10.50		0.000	0.132	0.031	200 ppm Fe addition
09/03/96	TL-EQ-08-2	F	z	10.50		0.056	0.139	0.000	300 ppm Fe addition
09/03/96	TL-EQ-08-3	F	z	10.50		0.029	0.848	0.003	400 ppm Fe addition
09/03/96	TL-EQ-08-4	F	z	11.00		0.024	1.092	0.001	200 ppm Fe addition
09/03/96	TL-EQ-08-5	F	z	11.00		0.043	0.817	0.026	300 ppm Fe addition
09/03/96	TL-EQ-08-6	F	z	11.00		0.000	0.435	0.001	400 ppm Fe addition
09/03/96	TL-EQ-08-7	F	z	11.50		0.024	0.386	0.000	200 ppm Fe addition
09/03/96	TL-EQ-08-8	F	z	11.50		0.013	0.701	0.012	300 ppm Fe addition
09/03/96	TL-EQ-08-9	F	z	11.50		0.066	0.283	0.023	400 ppm Fe addition

TABLE 1-9

Variable iron dose at variable pH

Date	Sample ID	Filtered(F) Unfiltered(U)	Process ID #	pH	TSS	As	Fe	Se	
						Norlite Limits Discharge [ppm] (PQL ppm)			
						[0.150] (0.100)	[4.000] (0.100)	[0.100] (0.050)	
09/04/96	EQ Tank	U	3-a	9.10	21450	0.791	O/R	0.049	Unfiltered Influent Material from the EQ Tank
09/04/96	EQ Tank	F	3-b	9.27		0.305	0.255	0.092	Filtered Influent Material from the EQ Tank
09/04/96	TL-EQ-09-1	F	z	10.50		0.062	0.801	0.083	200 ppm Fe addition
09/04/96	TL-EQ-09-2	F	z	10.50		0.066	0.410	0.077	300 ppm Fe addition
09/04/96	TL-EQ-09-3	F	z	10.50		0.068	0.576	0.058	400 ppm Fe addition
09/04/96	TL-EQ-09-4	F	z	11.00		0.055	0.705	0.085	200 ppm Fe addition
09/04/96	TL-EQ-09-5	F	z	11.00		0.043	0.817	0.026	300 ppm Fe addition
09/04/96	TL-EQ-09-6	F	z	11.00		0.066	0.097	0.037	400 ppm Fe addition
09/04/96	TL-EQ-09-7	F	z	11.50		0.123	0.521	0.092	200 ppm Fe addition
09/04/96	TL-EQ-09-8	F	z	11.50		0.065	0.417	0.070	300 ppm Fe addition
09/04/96	TL-EQ-09-9	F	z	11.50		0.064	0.029	0.028	400 ppm Fe addition

NOTE: O/R indicates out of instrument range

TABLE 1-10
Variable iron dose at variable pH

Date	Sample ID	Filtered(F) Unfiltered(U)	Process ID #	pH	TSS	As [0.150] (0.100)	Fe [4.000] (0.100)	Se [0.100] (0.050)	
						Norlite Limits Discharge [ppm] (PQL ppm)			
09/05/96	EQ Tank	U	3-a	8.78		0.706	O/R	0.029	Unfiltered Influent Material from the EQ Tank
09/05/96	EQ Tank	F	3-b			0.317	0.120	0.067	Filtered Influent Material from the EQ Tank
09/05/96	TL-EQ-10-1	F	z	10.50		0.069	0.563	0.052	200 ppm Fe addition
09/05/96	TL-EQ-10-2	F	z	10.50		0.104	0.560	0.049	300 ppm Fe addition
09/05/96	TL-EQ-10-3	F	z	10.50		0.068	0.367	0.038	400 ppm Fe addition
09/05/96	TL-EQ-10-4	F	z	11.00		0.079	0.428	0.033	200 ppm Fe addition
09/05/96	TL-EQ-10-5	F	z	11.00		0.116	0.569	0.009	300 ppm Fe addition
09/05/96	TL-EQ-10-6	F	z	11.00		0.100	0.310	0.066	400 ppm Fe addition
09/05/96	TL-EQ-10-7	F	z	11.50		0.135	0.336	0.068	200 ppm Fe addition
09/05/96	TL-EQ-10-8	F	z	11.50		0.117	0.464	0.019	300 ppm Fe addition
09/05/96	TL-EQ-10-9	F	z	11.50		0.139	0.557	0.012	400 ppm Fe addition

NOTE: O/R indicates out of instrument range

TABLE 2

Date	Sample ID	Filtered(F) Unfiltered(U)	Process ID #	pH	TSS	Norite Limits Discharge [ppm] (PQL ppm) As [0.150] {0.100}	Fe [4.000] {0.100}	Se [0.100] {0.050}	
08/21/96	BM-EQ-01	U	z	9.05	19770	0.559	O/R	0.023	Unfiltered Influent Material from the EQ Tank
08/21/96	BM-EQ-01	F	z	9.05		0.286	0.260	0.205	Filtered Influent Material from the EQ Tank
08/21/96	BM-EQ-01-1	F	z	10.50		0.242	0.592	0.119	Polymer addition only
08/21/96	BM-EQ-01-2	F	z	10.50		0.248	1.117	0.117	200 ppm Fe, Ploymer additon
08/21/96	BM-EQ-01-3	F	z	11.00		0.170	1.307	0.114	700 ppm Fe, Polymer addition
08/21/96	BM-EQ-01-4	F	z	10.90		0.169	0.310	0.125	Bleach addition, 700 ppm Fe
08/21/96	BM-EQ-01-5	F	z	10.60		0.000	0.341	0.036	Clarified liquor, 700 ppm Fe, Polymer addition
08/21/96	BM-EQ-01-6	F	z	10.50		0.021	0.231	0.091	Clarified liquor, Bleach addition, 700 ppm Fe, Polymer addition

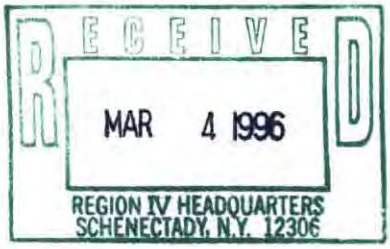
TABLE 3
Ammonia In Effluent

Date	Sample ID	Filt(F) Unfilt(U)	Process ID #	Ammonia by "TKN" as ppm
08/09/96	EFF-006	U	a	74
08/10/96	EFF-006	U	a	
08/11/96	EFF-006	U	a	
08/12/96	EFF-006	U	a	
08/13/96	EFF-006	U	a	69
08/14/96	EFF-006	U	a	46
08/15/96	EFF-006	U	a	35
08/16/96	EFF-006	U	a	49
08/17/96	EFF-006	U	a	36
08/18/96	EFF-006	U	a	33
08/19/96	EFF-008	U	a	38
08/20/96	EFF-006	U	a	41
08/21/96	EFF-006	U	a	79
08/22/96	EFF-006	U	a	62
08/23/96	EFF-006	U	a	62
08/24/96	EFF-006	U	a	76
08/25/96	EFF-006	U	a	60
08/26/96	EFF-006	U	a	63
08/27/96	EFF-006	U	a	55
08/28/96	EFF-006	U	a	57
08/29/96	EFF-006	U	a	84
08/30/96	EFF-006	U	a	69
08/31/96	EFF-006	U	a	50
09/01/96	EFF-006	U	a	59
09/02/96	EFF-006	U	a	87
09/03/96	EFF-006	U	a	79
09/04/96	EFF-006	U	a	73
09/05/96	EFF-006	U	a	55

Norlite Corporation

628 So. Saratoga Street
P.O. Box 694
Cohoes, New York 12047
tel. (518) 235-0401
fax. (518) 235-0233

February 29, 1996



Mr. William Clarke
Regional Permits Administrator
New York State Department of
Environmental Conservation
Region 4
1150 North Westcott Road
Schenectady, New York 12306

Re: Request for Modification of Norlite Corporation SPDES Permit No. NY 0004880.

Dear Mr. Clarke:

In December 1995, Norlite requested that Order on Consent No. R4-1680-94-05, effective date 1/2/96, be modified to allow Norlite to install and operate certain equipment in order to control the formation of hydrogen sulfide. That consent order required Norlite to submit a request for modification of the SPDES Permit No. NY 000 488 if Norlite continues beyond 60 days after the effective date of the Order. Therefore, Norlite is submitting this letter request to modify the subject SPDES permit to allow Norlite to operate the hydrogen sulfide control system on an as needed basis.

Attached to this letter is the Addendum to Engineering Report for Norlite Corporation Proposed Waste Water Treatment Process To Comply with Proposed Mohawk River SPDES Limitations. This addendum describes the measures that have been implemented to prevent the formation of hydrogen sulfide in Norlite's wastewater discharge. Norlite is presently modifying the Engineering Report Piping and Instrumentation Drawing No. NY029-D1002 and NY029-D1001 to show the added equipment for the effluent holding tanks recirculation, air sparging and sodium hypochlorite systems and will supply them shortly.

Norlite continues to routinely monitor hydrogen sulfide concentrations in the wastewater effluent to allow for prompt initiation of appropriate control measures if hydrogen sulfide is detected. Furthermore, Norlite continues to perform other measurements (oxidation/reduction potential and residual chlorine) that proactively assures that conditions promoting the growth of hydrogen sulfide forming bacteria can not develop in our wastewater. This routine monitoring and the corrective measures described in the Addendum have proven to be effective through several months of treatment plant operations since the problem was first identified and corrective measures were implemented.

If you have any questions concerning this modification request, please call me.

Sincerely,

Norlite Corporation

Edward C. Burgher
Director of Compliance

cc: F. Sievers
C. Lamb-Lafay
D. Carabetta
W. Morris
T. Lachell
S. Milos
K. Young
W. Ziegler

file: nco96021.ltr

Addendum to Engineering Report for Norlite Corporation Proposed Waste Water Treatment Process to Comply with Proposed Mohawk River SPDES Limitations

RE: SPDES Permit No. NY 0004880

1. PURPOSE

The purpose of this addendum is to describe the additional systems installed in the new permanent Waste Water Treatment plant to prevent the formation of hydrogen sulfide in the discharge to the sewer.

2. BACKGROUND

The Norlite waste water discharge was suspected in a number of odor complaints during the period October to November 1995. Norlite's subsequent investigations determined that the odor was most likely due to the biological generation of hydrogen sulfide in Norlite's wastewater discharge. Several modifications to the temporary waste water treatment system were made in an attempt to rectify the problem. These modifications were detailed to Mr. Peter Mack in the report "Measures That Have Been Taken to Eliminate Hydrogen Sulfide In Norlite's Effluent Discharge" dated November 28, 1995. Several months of operation since the corrective action measures were instituted demonstrate that the actions taken are successful in controlling the generation of hydrogen sulfide. No detectable levels were found dissolved in the waste water or in the vapor from November 28, 1995 to the start of the new permanent Waste Water Treatment system on February 12, 1996. With the success of this program, several of the features were installed in the new permanent plant.

This addendum describes these new features that are installed is provided as an addendum to the original engineering reported dated March, May 1994.

3. CAUSE OF HYDROGEN SULFIDE GENERATION

Hydrogen sulfide formation in water can occur by the biological reduction of sulfate to sulfide by a type of bacteria commonly known as "Sulfate Reducers". Sulfate reducers are an anaerobic bacteria meaning that they only grow in the absence or near absence

of oxygen. They prefer a near neutral to slightly alkaline pH, water temperatures of 50-100 degrees F and stagnant conditions. They will grow best in sludge pockets and are generally extremely sensitive to changes in their environment . Sudden changes in pH, temperature or oxygen concentration will limit or reduce bacterial population growth and hence sulfide generation.

Dissolved sulfate ions are reduced to the sulfide by these bacteria as part of their metabolic process. As the dissolved sulfide concentration in the water increases through this biological activity, hydrogen sulfide gas is evolved in concentrations proportional to the dissolved concentration. Gaseous phase sulfide concentrations increase with decreasing pH. Agitation of wastewater that has concentrations of dissolved sulfides will also promote increased evolution of the gaseous hydrogen sulfide.

Sulfate reduction to hydrogen sulfide by these anaerobic bacteria is a common problem in sewerage and storm water collection systems. To avoid the occurrence, pipelines are designed to avoid low flow or stagnant points in the lines. If a stagnant zone develops, sulfide reduction can occur within as little as 2 hours with the resulting evolution of hydrogen sulfide gas. Flushing of the lines will serve to flush out the accumulated bacterial population and eliminate (for a time) the generation of sulfide.

4. MODIFICATIONS TO THE NEW WASTE WATER TREATMENT PLANT

The following modifications were successful in controlling the reduction of sulfates in the temporary system and are incorporated into the new permanent treatment plant.

4.1. Recirculation of Wastewater in Effluent Holding Tank

Recirculation of the discharge water in the effluent tank has been implemented to provided for added agitation and increase air / wastewater contact. The piping has been modified to allow continuous recirculation (as required) by the effluent discharge pump.

4.2. Effluent Holding Tank Bottom Discharge

The discharge piping from the effluent holding tanks are installed on the bottom to minimize residence time and the formation of stagnant zones within the tanks.

4.3. Effluent Discharge Flowrate Matched to WWTP Influent Rate

Effluent discharge procedures have been written and implemented to maintain as continuous a discharge as possible to the storm drain system. A city water flush has been installed to maintain continuous flow through the system in the event that wastewater discharge flow is interrupted.

4.4. Air Sparging

An air sparging system has been installed in the effluent discharge tanks. The air sparger can be used as needed to increase agitation and aeration of wastewater in the effluent tanks.

4.5. Sodium Hypochlorite Addition

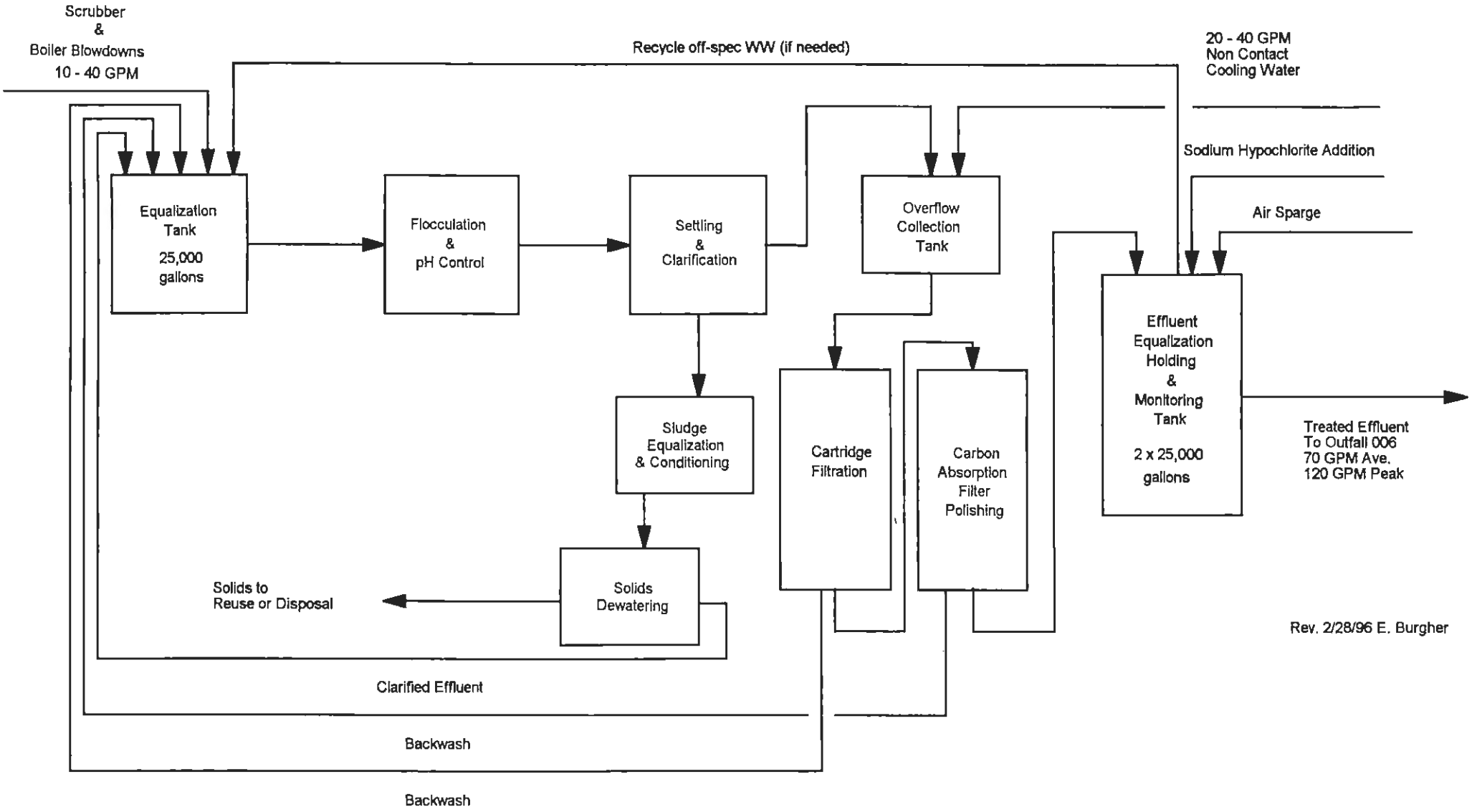
A system to add sodium hypochlorite has been installed as an additional precaution. This system may be activated if the Oxidation Reduction Potential (ORP) in the discharge water indicates a reducing state (negative values) exists or if hydrogen sulfide is detected in the effluent holding tank vapor space or if hydrogen sulfide is detected in the water. When needed, the amount of hypochlorite is adjusted to bring the ORP back to a positive value. As a back up to the ORP testing conducted by the operators, and to ensure that residual chlorine levels in the wastewater do not exceed 2 - 3 ppm, a residual chlorine test is also run. An indication of residual chlorine usually means an ORP value of greater than +200 millivolts.

4.6. Routine Monitoring

In addition to measurement of Oxidation Reduction Potential and residual chlorine, the wastewater treatment plant operators also routinely perform testing for dissolved sulfides and sulfates (if deemed necessary based upon sulfide results). Routine testing for hydrogen sulfide is per the Hach Hydrogen Sulfide Test (Model HS-C) or equivalent, which consists of a simple spot test. The test will indicates part per million concentrations of hydrogen sulfide greater than about 0.1 ppm. Levels of less than 1.0 ppm dissolved hydrogen sulfide have not shown any evolution of hydrogen sulfide gas. This test, therefore, is a good indicator that conditions do not exist for the detection of hydrogen sulfide odors.

The piping and equipment modifications necessary to effect the aforementioned air sparging and sodium hypochlorite systems are shown in the attached updated Figure 2.1, which was originally supplied with the March 14, 1994 Request for Permit Modification submitted to Mr. William Clarke by Mr. Richard Schlauch.

Norlite Corp. Figure 2.1: Waste Water Treatment Plant General Process Flow Diagram



Norlite Corporation

ThermalKEM New York

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November 28, 1995

Mr. Peter Mack, P.E.
Regional Engineer
New York State Department of
Environmental Conservation
Region 4
1150 North Westcott Road
Schenectady, New York 12306

RE: Norlite Corporation Wastewater Discharge and Correspondence of November 13, 1995

Dear Mr. Mack:

On November 13, 1995 Norlite Corporation submitted to DEC a request to modify the Order on Consent No. R4-1680-94-05, to allow a modification to the wastewater treatment plant to prevent the formation of hydrogen sulfide. The modifications have been made as described in this correspondence, per your approval given in our telephone discussion of November 14, 1995. In this phone discussion, you requested that Norlite submit a more detailed report on the nature of the problem, and corrective measures taken. The attached report provides a comprehensive review of the cause of hydrogen sulfide formation in the waste water, and the corrective actions that will prevent the formation of sulfide.

If you have any questions on the attached report, please contact Ed Burgher at Norlite.

Sincerely,

William J. Ziegler
Vice President of Health, Safety,
and Environmental Affairs

cc. William Clarke, NYSDEC Region IV
Kevin Young
Ed Burgher
Chuck Vannoy
Don Seauvageau
Dennis Venters
Richard Schlauch
Bill Morris, United Industrial Services

MEASURES THAT HAVE BEEN TAKEN TO ELIMINATE HYDROGEN SULFIDE IN NORLITE'S EFFLUENT DISCHARGE

1.0 BACKGROUND

On October 2, 1995, Norlite received a complaint from Mohawk Paper Company (which is located near the point where Norlite's effluent force main discharges into a storm sewer under Saratoga Street) that they have periodically experienced odors, apparently due to hydrogen sulfide, coming from the storm sewer since July 1995. At the time of the complaint, a representative of Norlite went to the site of the reported odor problem but the odor was not present at that time.

Suspecting that the source of the odor problem could be due to possible anaerobic conditions in a recently installed effluent holding tank, Norlite responded to the complaint by cleaning out the holding tank. The tank was treated with a solution of sodium hypochlorite (bleach) to remove any anaerobic bacteria that may have started to grow due to possible anaerobic conditions. However, on November 13, 1995, complaints were again received from Mohawk Paper company that hydrogen sulfide appeared to be coming from Norlite's effluent discharge where it empties into the storm sewer.

Norlite sampled the wastewater force main effluent and the storm sewer on November 13, 1995. The result show that although the force main sample contained less than 0.1 mg/l of sulfide (dissolved) at this time, the storm sewer sample collected from the manhole on Saratoga St. (at the connection with the force main) contained 5.6 mg/l of dissolved sulfide.

On this basis, Norlite has taken additional measures to ensure that hydrogen sulfide will not be generated in the effluent holding tank or the force main system discharging to the storm sewer. These measures include effluent holding tank system changes that will be described in the following discussion:

2.0 CAUSE OF HYDROGEN SULFIDE GENERATION

The wastewater treatment discharge pipeline became operational on November 18, 1994. At this time the treated effluent from the WWT plant was pumped to a 25,000 gallon tank located near the fuel farm for hold up prior to pumped discharge to the new force main pipeline. This tank had a bottom discharge with partial circulation of the discharge back into the tank (See Figure 1). In addition, the flow rate of discharge was operator adjusted to provide a relatively constant flow of treated effluent from the tank to the discharge pipeline.

In March-April 1995, this WWT effluent storage tank was taken out of WWT service and a 20,000 gallon bottom discharge "frac" tank was rented to take its place. When placed in service, this "frac" tank was not provided with discharge recirculation (See Figure 2). Further, the water level was allowed to alternate

between high and low level settings which resulted in flow and no flow conditions in the pipeline. In late May-June 1995, the WWT plant had been experiencing difficulties in maintaining required levels of suspended solids. In an attempt to prevent discharge of these suspended solids the bottom discharge pump suction was changed to a point located approximately 2-4 feet above the bottom of the tank. At about the same time (in June 1995), an acid feed system was installed in the WWT process to control effluent pH levels to below 9.0. This pH control system also provided more consistent pH levels in the effluent than previously maintained by the process.

The Norlite wastewater has varying concentrations of dissolved sulfates ranging from hundreds to thousands mg/l depending on the fuel sulfur concentration and the feed rate of shale to the kilns. In this respect, the process is not unlike a coal fired boiler with a wet scrubbing system.

Hydrogen sulfide formation in water can occur by the biological reduction of sulfate to sulfide by a type of bacteria commonly known as "Sulfate Reducers". Sulfate Reducers are an anaerobic bacteria meaning that they only grow in the total or near absence of oxygen. They prefer a near neutral to slightly alkaline pH, water temperatures of 50-100 F and stagnant conditions. They will grow best in sludge pockets and are generally extremely sensitive to changes in their environment. Sudden changes in pH, temperature or oxygen concentration will limit or reduce bacterial population growth and hence sulfide generation.

Dissolved sulfate ions are reduced to the sulfide by these bacteria as part of their metabolic process. As the dissolved sulfide concentration in the water increases through this biological activity, hydrogen sulfide gas is evolved in concentrations proportional to the dissolved sulfide concentration. Gaseous phase sulfide concentrations increase with decreasing pH. Agitation of wastewater that has concentrations of dissolved sulfides will also promote increased evolution of the gaseous hydrogen sulfide.

Sulfate reduction to hydrogen sulfide by these anaerobic bacteria is a common problem in sewerage and stormwater collection systems. To avoid the occurrence, pipelines are designed to avoid low flow or stagnant points in the lines. If a stagnant zone develops, sulfide reduction can occur within as little as 2 hours with the resulting evolution of hydrogen sulfide gas. Flushing of the lines will serve to flush out the accumulated bacterial population and eliminate (for a time) the generation of sulfide.

In the Norlite WWT process, the changes made to the effluent holding tank mode of operation in the spring of 1995 have all been conducive to the growth of sulfate reducing bacteria. The wastewater has always had a low dissolved oxygen level. It has always operated at a temperature of 95-100 F. However, initial operation after installation of the pipeline provided a

continuous discharge of wastewater (equivalent to continual line flushing) and eliminated stagnant conditions within the effluent tank via internal recirculation and bottom discharge. The mode of tank operation was then changed in ways that provided more stagnant conditions within the tank that could result in the population growth of the sulfate reducing bacteria. A more constant pH (no sudden environmental changes), an elevated discharge point producing a stagnant zone (especially so without internal recirculation), and an intermittent discharge flow (allowing time for bacterial growth) have all apparently combined to promote sulfate reduction in the tank. Also, an open transfer tank (T-6), used to repump treated effluent from the carbon adsorbers (which remove dissolved oxygen from the wastewater) to the effluent holding tank, was removed from the system. This tank was no longer needed when the effluent holding tank was relocated next to the WWT operation. This open transfer tank provided a degree of aeration that was lost when these system changes were made. (See attached WWT process flow diagrams comparing before April 1994 to after June 1995).

Corrective Action

Reverting to internal recirculation and a bottom discharge point on the effluent holding tank will virtually eliminate stagnant zones within the tank. Addition of compressed air agitation will further enhance internal turbulence. Returning to a continuous mode of discharge of bacteria free wastewater will provide a continuous flush of the downstream discharge pipelines and prevent potential bacterial growth. This will result in virtually no potential for hydrogen sulfide generation as was previously the case before April 1995.

The following chronology illustrates the impact of Norlite's WWT system changes on the occurrence of hydrogen sulfide odor problems at the force main discharge point.

NORLITE WWT DISCHARGE CHRONOLOGY
FOR PROCESS WASTEWATER TO OUTFALL 006

November 18, 1994	Norlite initiated the discharge of WWT effluent through a new force main to the storm sewer system discharging to the Mohawk River.
April 1995	Norlite changed from an effluent transfer tank/pump discharging to the recirculated 25,000 gallon holding tank to a system discharging directly from carbon adsorbers into a new effluent holding tank. (No internal recirculation).
May 1995	Effluent holding tank discharge relocated from bottom to side.

June 8, 1995	Norlite instituted effluent pH control system with new effluent holding tank system.
July 1995	Mohawk Paper Company started detecting odor problems due to hydrogen sulfide vapors in the storm sewer receiving Norlite's wastewater discharge. (Norlite not informed by Mohawk at this time).
October 2, 1995	First hydrogen sulfide odor complaint received by Norlite.

3. REMEDIAL MEASURES TO ELIMINATE HYDROGEN SULFIDE

Since the wastewater discharge from Norlite's existing wastewater treatment process did not create hydrogen sulfide problems in the storm sewer during the period between November 1994 and April 1995, it is apparent that the effluent discharge system modifications made during April, May and June are the probable cause. Because these modifications eliminated repumping and recirculation and bottom discharge in the effluent holding tank, anaerobic conditions (which are essential for bacterial hydrogen sulfide generation) were inadvertently promoted.

The remedy is not difficult. Agitation, aeration and recirculation will restore the effluent holding tank to an aerobic condition and eliminate this tank as a source of hydrogen sulfide generation. These process conditions are being implemented through the following system modifications; (See Figure 3).

3.1 A recirculation flow from the effluent discharge pump is being installed to provide agitation and increased air contact.

3.2 A bottom discharge from the effluent holding tank has been installed to minimize residence time and stagnant zones within the vessel.

3.3 A more continuous effluent discharge has been initiated by adjusting the level control systems and effluent discharge rate to more closely follow the tank influent rate.

3.4 An air agitation system has been installed to keep the tank contents well agitated and well aerated.

3.5 To expedite the return to aerobic conditions in the effluent holding tank (i.e., frac tank) and effluent discharge line, Norlite has begun a program of sodium hypochlorite (i.e., bleach) addition on November 14, 1995. This program will be in effect until aerobic conditions are maintained and hydrogen sulfide is not detected without use of sodium hypochlorite.

In addition, Norlite personnel have instituted additional process control tests to the Wastewater Technician's work schedule. These include routine checks for sulfide evaluation at the effluent holding tank and tests for oxidation-reduction potential or chlorine residual in the effluent.

All of these modifications were implemented by November 21, 1995.

The above system modifications will eliminate the stagnant effluent holding periods, experienced between April 1994 and November 1994, which tend to cause anaerobic conditions and consequential hydrogen sulfide generation to develop. They will also keep the effluent force main line and storm sewer system from developing stagnant conditions by providing a more continuous movement of water through these pipe lines.

FIGURE 1

NORLITE WWT PROCESS FLOW SCHEMATIC PRIOR TO APRIL 1995

2/13/95
R. SCHLAUCH

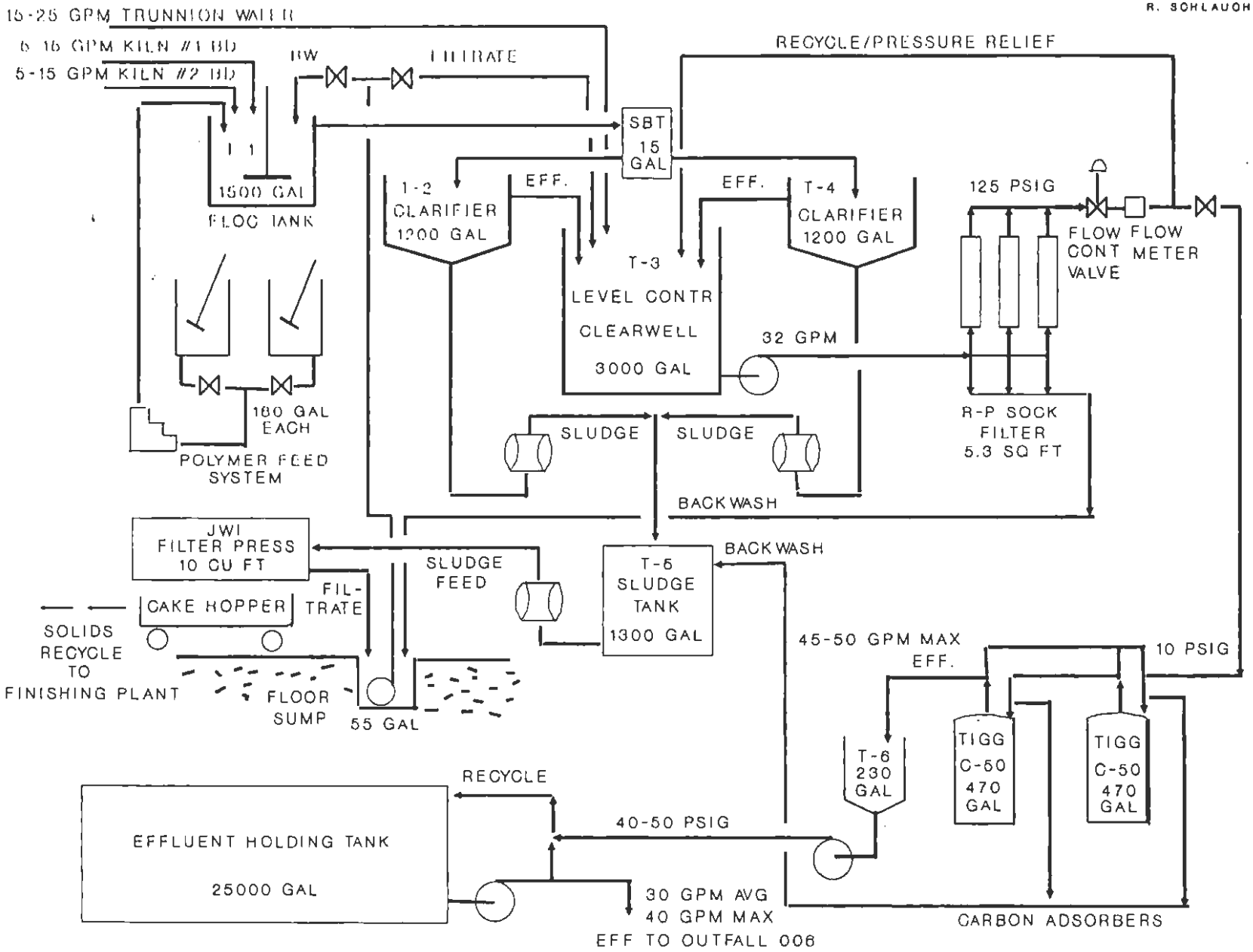


FIGURE 2

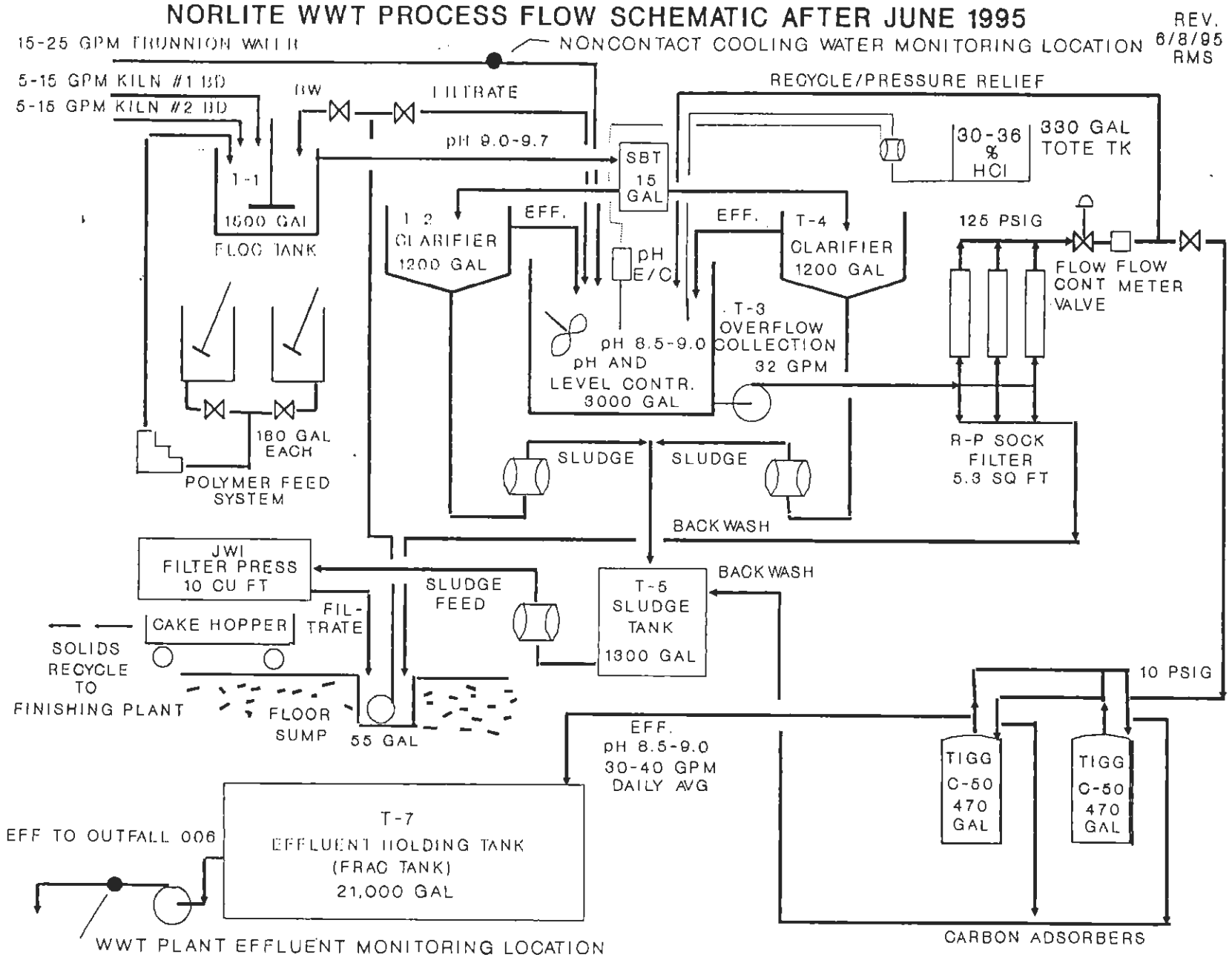
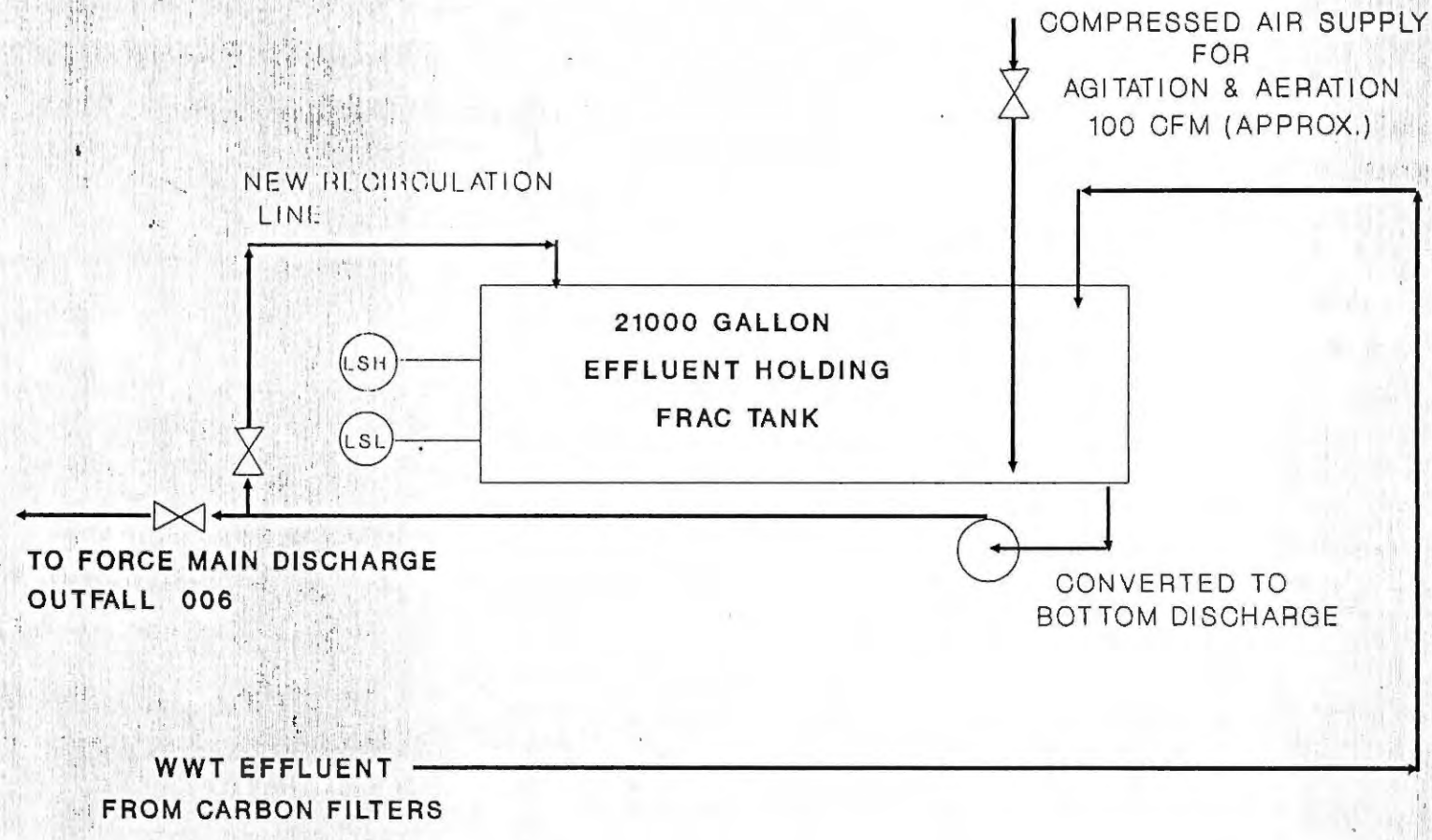

NORLITE WWT PROCESS FLOW SCHEMATIC AFTER JUNE 1995
REV. 6/8/95 RMS
15-25 GPM TRUNNION WATER
NONCONTACT COOLING WATER MONITORING LOCATION
5-15 GPM KILN #1 BD
5-15 GPM KILN #2 BD
BW
FILTRATE
pH 9.0-9.7
RECYCLE/PRESSURE RELIEF
30-36 % HCl
330 GAL TOTE TK
SBT 15 GAL
T-1
1500 GAL
FLOC TANK
T-2 CLARIFIER 1200 GAL
EFF.
pH E/C
EFF.
T-4 CLARIFIER 1200 GAL
125 PSIG
FLOW CONT VALVE
METER FLOW
T-3 OVERFLOW COLLECTION 32 GPM
pH 8.5-9.0
pH AND LEVEL CONTR. 3000 GAL
160 GAL EACH
POLYMER FEED SYSTEM
SLUDGE
SLUDGE
R-P SOCK FILTER 5.3 SQ FT
BACKWASH
JWI FILTER PRESS 10 CU FT
SLUDGE FEED
BACKWASH
T-5 SLUDGE TANK 1300 GAL
CAKE HOPPER
FIL-TRATE
SOLIDS RECYCLE TO FINISHING PLANT
FLOOR SUMP
55 GAL
10 PSIG
EFF. pH 8.5-9.0 30-40 GPM DAILY AVG
TIGG C-50 470 GAL
TIGG C-50 470 GAL
EFF TO OUTFALL 006
T-7 EFFLUENT HOLDING TANK (FRAC TANK) 21,000 GAL
WWT PLANT EFFLUENT MONITORING LOCATION
CARBON ADSORBERS

FIGURE 3

NORLITE WWT PROCESS EFFLUENT HOLDING TANK SYSTEM MODIFICATIONS MADE IN NOVEMBER 1995



J. REC

NOV.21, 1995