ER ID 03853

LOS ALAMOS SCIENTIFIC LABORATORY
UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO 87544

(20)

OFFICE MEMORANDUM

TO : C. Christenson, H-7

VIA : C. A. Reynolds

FROM : E. L. Miller

DATE: July 30, 1971.

SUBJECT: EFFLUENT FROM PLANT COOLING TOWERS

SYMBOL : ENG-4

LASL Facility cooling towers receive chemical treatment as described herein. Certain of these towers discharge to various canyons for blowdown. In compliance with Harry Schulte's memo of April 12, 1971, samples of representative blowdown water are submitted to your group for analysis.

A description of the various chemicals added to all cooling towers is included herein for your convenience. Our supplier does ask that we treat this information as commercial confidential, as it is proprietary in nature.

A. Scale and Corrosion Control:

1. Chemicals now used to treat the water for corrosion and scale control are combinations of amino acids, aminocarbokylic acids, polyacrylates and organic inhibitors. Specific chemicals used are sodium salts of the following acids:

Citric Acid
Malic Acid
Acetic Acid
Ethylenediaminetetraacetic Acid (EDTA)
N-hydroxyethylethylenediaminetriacetic Acid (HEEDTA)
Nitrilotriacetic Acid (NTA)
Diethylenetriaminetpentaacetic Acid (DTPA)
Nitrilotri (Methylene Phosphonic) Acid
1-Hydroxyethylidene 1, 1-Diphosphonic Acid
Polyacrylates

Dosage of chemicals in the blowdown to sewer or canyon is 10 ppm. Sodium salts of the above acids are all biodegradable. pH of blowdown varies from 7.2 to 8.0.

B. Microbiological growth, algae and slime control:

1. Chemicals used are in combination of the following:

Sodium Pentachlorophenate
Sodium salt of a slow chlorine release material
Alkyl Dimethyl Benzyl Ammonium Chloride
Amine based material

Materials are added biweekly for a maximum period of two days in system treated.

C. Chemical Cleaning:

1. Chemical cleaning and removal of calcium and magnesium scale in systems is accomplished with a mixture of the following organic acids:

   Phosphoric Acid - Food grade
   Lactic Acid
   Citric Acid
   Malic Acid
   Nitrilotri (Methylene Phosphonic) Acid

   Dosage varies with scale to be removed--generally 5 to 10 per cent by weight. Metallic ion complexes formed are easily broken and materials are generally very biodegradable.

   Chemical cleaning of old scale in cooling units which is approximately 80 per cent SiO_2 is accomplished using a Diethylthiourea based corrosion inhibitor, ammonium bifluoride and a mineral acid activator.

   Dosage of ammonium bifluoride is 5 per cent by weight. Circulation in the unit varies from two to four hours. Material is discharged to sewer or canyon and 1 per cent sodium hydroxide solution is circulated in the system for four to eight hours and then discharged.

2. Cleaning of any one system is usually necessary only once, to remove deposits accumulated over the years before our present treatment started.

E. L. Miller
Electrical-Mechanical Section Leader
Maintenance and Construction

ELM:jt

ence: 1. Effluent Report
2. 10 bottles of blowdown water

cc : H. Schulte, H-5 (without enclosures)
C. A. Reynolds (without enclosures)
H. P. Foyt (without enclosures)
File

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 3 Building BM-127

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Sandia Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 372,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space.

Group ENG-4 Tech Area 3 Building SM-184

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Pajarito Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 165,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 3 Building SM-187

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Sandia Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 169,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space.

Group ENG-4 Tech Area 3 Building SM-285

Accounting Number(s) CT-1 and -2

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Bandia Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 1,560,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 15 Building 202

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Potrillo Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 360,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space.

Group CNC-4 Tech Area 21 Building 143

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Cholate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 325,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space.

Group ENG-4 Tech Area 21 Building 152

Accounting Number(s) EWC-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 16,700 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 21 Building 166

Accounting Number(s) ENC-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 42,600 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 21 Building 166

Accounting Number(s) AW-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 20,600 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 21 Building 167

Accounting Number(s) AW-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 36,500 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space.

Group ENG-4 Tech Area 21 Building 220

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 910,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 46 Building 1

Accounting Number(s) ENC-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Canyon Del Buey

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 10,500 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 46 Building 67

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Canyon Del Buey

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 453,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space.

Group ENG-4 Tech Area 48 Building 1

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Mortandad Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 208,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 48 Building 1

Accounting Number(s) CT-2

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Mortandad Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 150,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 53 Building 2

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Sandia Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 395,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Do not write in this space

Group ENG-4 Tech Area 53 Building 60

Accounting Number(s) CT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Cholate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 462,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.

LOS ALAMOS SCIENTIFIC LABORATORY

Survey of Effluent Streams

Group ENG-4 Tech Area 53 Building 62

Do not write in this space

Accounting Number(s) GT-1

Nature of Effluent Streams: Gas ____ Liquid X Solid ____ Other ____

(Fill out one sheet for each effluent stream)

Effluent Treatment: Type: Organo Chelate

Discharge Point: (Identify and show sketch on reverse if more than one per building)

Stack ____ Industrial Sewer ____

Sanitary Sewer ____ Storm Sewer ____

Trash Container Type: ____

Other: Los Alamos Canyon

Disposal Method: Atmospheric Dispersal ____ Sewage Plant ____

Waste Process Plant ____ Chemical Dump ____

Sewage Lagoon ____ Surface of Ground X

Contaminated Burial Area ____ Septic Tank ____

Community Landfill ____ Other ____

Volume of Effluent: Known 1,940,000 GPY Estimated ____

Contaminants (see list)	Estimated Discharge

Monitoring Equipment on Effluent Stream: No X Yes ____

Describe ____

Remarks Chemical description disclosed in cover letter. Considered biodegradable and nontoxic.