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NALCO CHEMICAL COMPANY

Contains No CBI

ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198 □ AREA 708-305-1454

ORIGINAL

March 25, 1994

JOHN J. KASPER
DIRECTOR, PRODUCT SAFETY
MENTAL HEALTH & SAFETY

(A)



8EHQ-94-12958
INIT 04/01/94

REC'D
OFFICE OF POLLUTION
PREVENTION AND TOXICS
APR - 1 PM 2:26

CERTIFIED MAIL

TSCA Document Receipt Office (TS-790)
Attention: 8(e) Coordinator
Office of Pollution Prevention & Toxics
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

**SUBJECT: THIS NOTICE IS BEING SUBMITTED IN ACCORDANCE WITH SECTION 8(E)
(43FR1110, MARCH 16, 1978, STATEMENT OF INTERPRETATION)**

On March 15, 1994, our salesman was notified by a customer, Covenant Coal Company, in Cedar Bluff, Virginia, that our product was accidentally released from a storage tank. The valve was left open and approximately 200 gallons of polydadmec (CAS#26062-79-3) was spilled on the ground. The product ultimately entered their retention ponds. At that time, we recommended that our customer notify the state authorities of the incident, since the final retention pond entered Middle Creek in Tazewell County, Virginia. The customer was informed that the substance was acutely lethal to fish at very low levels < 1.0 ppm. An MSDS was available (Att.1). The customer cleaned up the affected area. We recommended that discharge into Middle Creek be prevented, and clay be added to the pond to absorb the polymer. No fish lethality was noticed. Water samples from their retention ponds were taken for analysis. A site diagram is enclosed (Att. 2).

On Thursday, March 17, 1994, we were notified by our sales force and customer that fish lethality was noted, and the state authorities, including the Department of Environmental Quality (DEQ), and the Fish, Game and Wildlife agency were on site. The initial response was that 1,000 minnows were dead, some suckers and sunfish were also reported as dead. The fishery department is assessing the incident.

Our salesman has continued to collect samples on March 17, 18, and 22. The analysis is enclosed (Att. 3). The customer has been adding solids, clay to the retention ponds and has pumped the fluids to a refuse coal pile.

It should be recognized that this was an accidental spill at our customer's site. Their storage tank containment, which is housed inside their preparation plant, was breached, and the product was released to the ground. Our customer suggested that the 1,000 gallons of product (80% water and 20% polymer) then entered the retention ponds which discharge to Middle Creek.

We will advise if any significant new information is identified.



88940000200

Sincerely,

John J. Kasper, M.Sc.

JJK045.02k

Encl.

5-11-94

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NALCO CHEMICAL COMPANY

ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198 □ AREA 708-305-1454

March 25, 1994

JOHN J. KASPER
DIRECTOR, PRODUCT SAFETY
ENVIRONMENTAL HEALTH & SAFETY

CERTIFIED MAIL

TSCA Document Receipt Office (TS-790)
Attention: 8(e) Coordinator
Office of Pollution Prevention & Toxics
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

REC'D
OFFICE OF POLLUTION
PREVENTION AND TOXICS
91 APR -1 PM 2:27

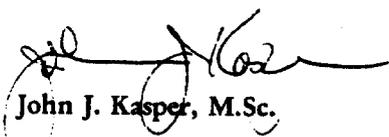
SUBJECT: NOTIFICATION SUBMITTED IN ACCORDANCE WITH SECTION 8(e)

The information below fulfills our reporting requirements. Enclosed is a summary of the circumstances, and actions taken.

- A. This notice has been sent by Certified Mail.
- B. This notice is being submitted in accordance with EPA's March 16, 1978, Statement of Interpretation for Notification of Substantial Risk: Section 8(e) of the Toxic Substance Control Act as published in 45 Federal Register 11110.
- C. John J. Kasper, M.Sc.
Director, Product Safety
One Nalco Center
Naperville, IL 60563-1198
(708) 305-1454

Nalco Chemical Company
One Nalco Center
Naperville, IL 60563-1198
(708) 305-1000
- D. Retention pond water and 2-Propen-1-aminium,N,N-dimethyl-N-2-propenyl-,chloride,homopolymer (CAS#26062-79-3).
- E. A fish kill of minnows and other larger fish occurred in Middle Creek, Tazewell County, Virginia. The risk from the polymer is expected to be an acute lethality effect.
- F. The Virginia Department of Environmental Quality (DEQ) Water Quality Control Board is investigating the fish kill.

Sincerely,


John J. Kasper, M.Sc.

JJK042.02k

Encl.



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 9851 COAGULANT

Emergency Telephone Number

Medical (800) 462-5378 (24 hours)

(800) I-M-ALERT

SECTION 11 SPILL AND DISPOSAL INFORMATION

(CONTINUED)

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be incinerated in accordance with local, state and federal regulations.

SECTION 12 ENVIRONMENTAL INFORMATION

AQUATIC DATA: Results below based on a similar product.

96 hour static acute LC50 to Bluegill Sunfish = 0.90 ppm

96 hour no observed effect concentration is 0.56 ppm based on no mortality or abnormal effects.

96 hour static acute LC50 to Rainbow Trout = 0.47 ppm

96 hour no observed effect concentration is 0.18 ppm based on no mortality or abnormal effects.

96 hour static acute LC50 to Sheepshead Minnow = Greater than 1000 ppm

96 hour no observed effect concentration is 100 ppm based on no mortality or abnormal effects.

If released into the environment, see CERCLA in Section 14.

SECTION 13 TRANSPORTATION INFORMATION

PROPER SHIPPING NAME/HAZARD CODE -
(DEPENDENT UPON MODE, PACKAGE)

PRODUCT IS NOT REGULATED
DURING TRANSPORTATION

SECTION 14 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:



MATERIAL SAFETY DATA SHEET

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SECTION 9 REACTIVITY INFORMATION

INCOMPATIBILITY: Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO₂, NO_x may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 10 PERSONAL PROTECTION EQUIPMENT

RESPIRATORY PROTECTION: Respiratory protection is not normally needed.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles when attaching feeding equipment, doing maintenance or handling product. Examples of impermeable gloves available on the market are neoprene, nitrile, PVC, natural rubber, viton and butyl (compatibility studies have not been performed).

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

SECTION 11 SPILL AND DISPOSAL INFORMATION

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (800) I-M-ALERT or (800) 462-5378.

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 14.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 14.

This product is toxic to fish. It should not be directly discharged into lakes, ponds, streams, waterways or public water supplies.

MATERIAL SAFETY DATA SHEET

PRODUCT

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SECTION 1 PRODUCT IDENTIFICATION

TRADE NAME: NALCO 9851 COAGULANT

DESCRIPTION: An aqueous solution of a polyquaternary amine

NFPA 704M/HMIS RATING: 0/0 HEALTH 1/1 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
 0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 2 HAZARDOUS INGREDIENTS

Our hazard evaluation of the ingredient(s) under OSHA's Hazard Communication Rule, 29 CFR 1910.1200 has found none of the ingredient(s) hazardous.

SECTION 3 PRECAUTIONARY LABEL INFORMATION

CAUTION: May cause irritation to skin and eyes. Avoid contact with skin, eyes and clothing. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

SECTION 4 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes. Call a physician.
SKIN: Flush with water for 15 minutes.
INGESTION: Do not induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

SECTION 5 HEALTH EFFECTS INFORMATION

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin

EYE CONTACT: May cause irritation with prolonged contact.
SKIN CONTACT: May cause irritation with prolonged contact.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

PAGE 1 OF 7



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 9851 COAGULANT

Emergency Telephone Number

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SECTION 6 TOXICOLOGY INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have not been conducted on this product, but toxicity studies have been conducted on a similar product. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = 4,699 mg/kg

95% Confidence Limit = 3,772 - 5,854 mg/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS): LD50 = Greater than 2,000 mg/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):
SKIN IRRITATION INDEX DRAIZE RATING:
0.84/8.0 Mildly Irritating

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):
EYE IRRITATION INDEX DRAIZE RATING:
1.0/110.0 Practically Non-Irritating

SECTION 7 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Clear to slightly hazy amber	FORM: Liquid	ODOR: None
DENSITY: 9.0-9.2 lbs/gal.		
SOLUBILITY IN WATER: Completely		
SPECIFIC GRAVITY: 1.08-1.10 @ 77 Degrees F		ASIM D-1298
pH (NEAT) = 7.7		ASIM E-70
VISCOSITY: 1075 cps @ 44 Degrees F/ 700 cps @ 69 Degrees F/ 730 cps @ 72 Degrees F/ 425 cps @ 110 Degrees F		ASIM D-2983
FLASH POINT: None (PMOC)		ASIM D-93

NOTE: These physical properties are typical values for this product.

SECTION 8 FIRE AND EXPLOSION INFORMATION

FLASH POINT: None (PMOC) ASIM D-93

EXTINGUISHING MEDIA: This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use water to cool containers exposed to fire.

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx under fire conditions.



MATERIAL SAFETY DATA SHEET

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

STATE RIGHT TO KNOW LAWS:

This product does not contain ingredients listed by State Right To Know Laws.

INTERNATIONAL REGULATIONS:

This is not a WHMIS controlled product under The House of Commons of Canada Bill C-70.

SECTION 15 ADDITIONAL INFORMATION

None

SECTION 16 USER'S RESPONSIBILITY

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to ensure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 17 BIBLIOGRAPHY

ANNUAL REPORT ON CARCINOGENS, U.S. Department of Health and Human Services, Public Health Service, PB 33-135855, 1983.

CASARETT AND DOULL'S TOXICOLOGY, THE BASIC SCIENCE OF POISONS, Doull, J., Klaassen, C. D., and Admur, M. O., eds., Macmillian Publishing Company, Inc., N. Y., 2nd edition, 1980.

CHEMICAL HAZARDS OF THE WORKPLACE, Proctor, N. H., and Hughes, J. P., eds., J. P. Lipincott Company, N.Y., 1981.

DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, Sax, N. Irving, ed., Van Nostrand Reinhold Company, N.Y., 6th edition, 1984.

IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Geneva: World Health Organization, International Agency for Research on Cancer, 1972-1977.

PATTY'S INDUSTRIAL HYGIENE AND TOXICOLOGY, Clayton, G. D., Clayton, F. E.,



MATERIAL SAFETY DATA SHEET

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SECTION 14 REGULATORY INFORMATION

(CONTINUED)

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:
Based on our hazard evaluation, this product is not hazardous.

CERCLA, 40 CFR 117, 302:
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986
(TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
This product does not contain ingredients listed in Appendix A and B as an
Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found that this product is not hazardous under
29 CFR 1910.1200.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):
This product does not contain ingredients on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):
The chemical ingredients in this product are on the 8(b) Inventory List
(40 CFR 710).

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
Consult Section 11 for RCRA classification.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15
(formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, Sec. 111 (40 CFR 60), Sec. 112 (40 CFR 61, 1990 Amendments),
Sec. 611 (40 CFR 82, CLASS I and II Ozone depleting substances):
This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:
This product does not contain any chemicals which require warning under
California Proposition 65.

MICHIGAN CRITICAL MATERIALS:
This product does not contain ingredients listed on the Michigan Critical
Materials Register.

PAGE 5 OF 7



MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 9851 COAGULANT

Emergency Telephone Number

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SECTION 17 BIBLIOGRAPHY

(CONTINUED)

eds., John Wiley and Sons, N. Y., 3rd edition, Vol. 2 A-C, 1981.

REGISTRY OF TOXIC EFFECTS ON CHEMICAL SUBSTANCES, U.S. Department of Health and Human Services, Public Health Service, Center for Disease Control, National Institute for Occupational Safety and Health, 1983 supplement of 1981-1982 edition, Vol. 1-3, OH, 1984.

Title 29 Code of Federal Regulations Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES AND PHYSICAL AGENTS IN THE WORKROOM ENVIRONMENT WITH INTENDED CHANGES, American Conference of Governmental Industrial Hygienists, OH.

PREPARED BY: Ricky A. Stackhouse Ph.D., Toxicologist

DATE CHANGED: 11/03/92

DATE PRINTED: 03/25/94

PAGE 7 OF 7



MATERIAL SAFETY DATA SHEET

PRODUCT

Emergency Telephone Number

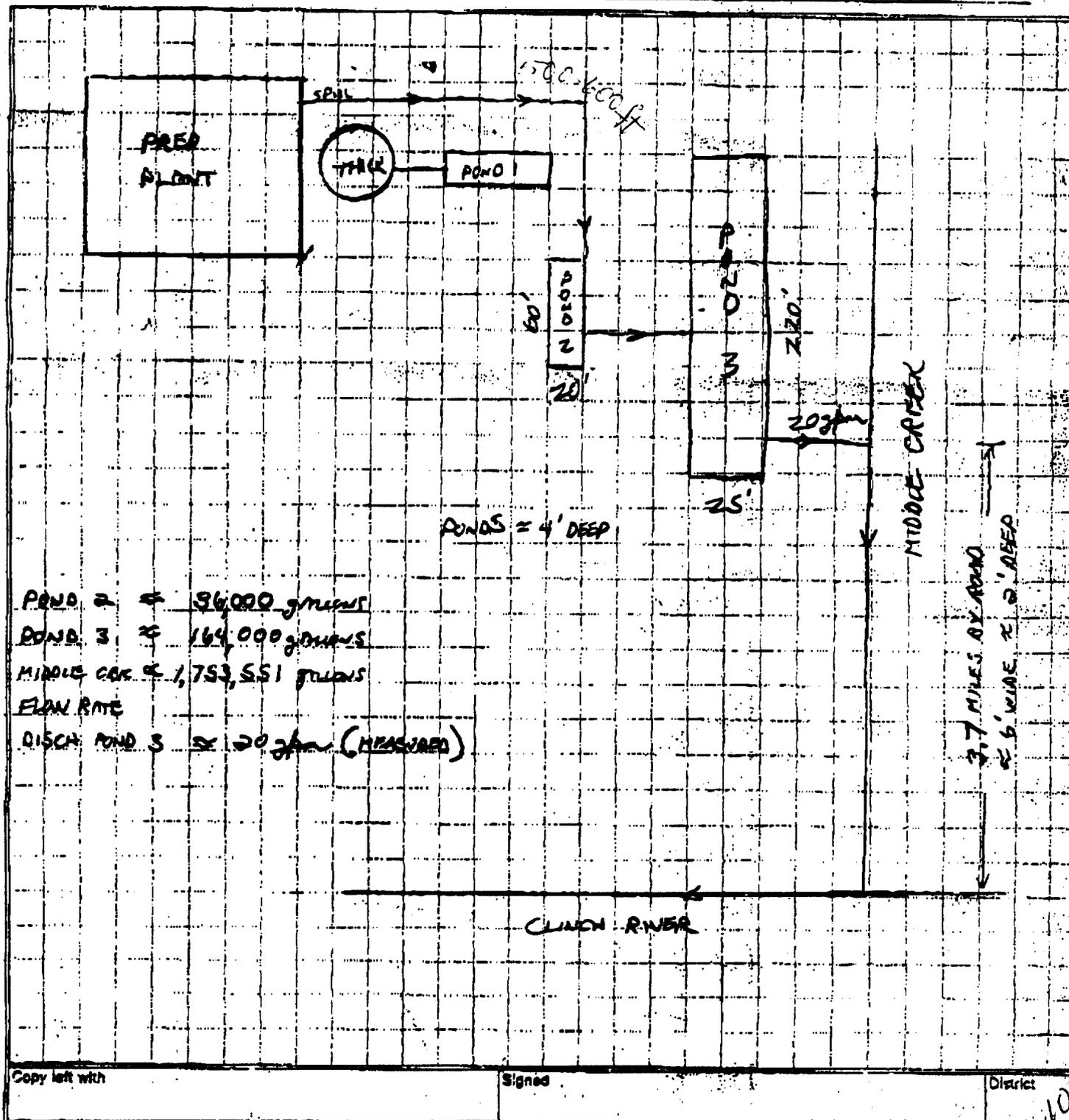
Medical (800) 462-5378 (24 hours)

(800) I-M-ALERT



PERSONAL SERVICE REPORT

Company _____ Date _____
 Address _____ Plant No. _____
 City _____ State _____ Zip + 4 _____
 Attention _____
 Copy to: _____
 Copy to: _____
 Nalco Copies to: _____



Copy left with

Signed

District



ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Unknown

Sample Marked:
Pond A

Analysis No. CS 385892
Date Sampled 3/16/94
Date Received 3/18/94
Date Completed 3/18/94
Date Printed 3/18/94

>>> ANALYTICAL RESULTS <<<

Analysis of Dried Sample

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 89 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present in the sample which interfere with the recovery of the spikes.

Analytical Laboratory Locations:

NALCO CHEMICAL COMPANY
ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198
POST OFFICE BOX 87 □ SUGAR LAND, TEXAS 77487-0087





ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Unknown

Sample Marked:
Pond B

Analysis No. CS 385893
Date Sampled 3/16/94
Date Received 3/18/94
Date Completed 3/18/94
Date Printed 3/18/94

>>> ANALYTICAL RESULTS <<<

Analysis of Dried Sample

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 1230 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present in the sample which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

NALCO CHEMICAL COMPANY
ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198
POST OFFICE BOX 87 □ SUGAR LAND, TEXAS 77487-0087



12



ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Cedar Bluff, VA

Analysis No. CS 386202
Date Sampled 3/17/94
Date Received 3/21/94
Date Completed 3/22/94
Date Printed 3/22/94

Sample Marked:
Pond 3 Discharge Into Middle Creek

>>> ANALYTICAL RESULTS <<<

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 650 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

NALCO CHEMICAL COMPANY
ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198
POST OFFICE BOX 87 □ SUGAR LAND, TEXAS 77487-0087



13



ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Cedar Bluff, VA

Sample Marked:
Middle Creek Near Guard Shack

Analysis No. CS 386225
Date Sampled 3/17/94
Date Received 3/22/94
Date Completed 3/22/94
Date Printed 3/22/94

>>> ANALYTICAL RESULTS <<<

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 8.2 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

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ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Cedar Bluff, VA

Analysis No. CS 386226
Date Sampled 3/17/94
Date Received 3/22/94
Date Completed 3/22/94
Date Printed 3/22/94

Sample Marked:
Middle Creek Prior To Discharge To Clinch River

>>> ANALYTICAL RESULTS <<<

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 5.6 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

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ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198
POST OFFICE BOX 67 □ SUGAR LAND, TEXAS 77487-0087



15



ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Cedar Bluff, VA

Analysis No. CS 386200
Date Sampled 3/18/94
Date Received 3/21/94
Date Completed 3/22/94
Date Printed 3/22/94

Sample Marked:
Pond 3 Discharge To Middle Creek

>>> ANALYTICAL RESULTS <<<

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 560 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

NALCO CHEMICAL COMPANY
ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1188
POST OFFICE BOX 87 □ SUGAR LAND, TEXAS 77487-0087





ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Cedar Bluff, VA

Sample Marked:
Pond 2 Discharge

Analysis No. CS 386201
Date Sampled 3/18/94
Date Received 3/21/94
Date Completed 3/22/94
Date Printed 3/22/94

>>> ANALYTICAL RESULTS <<<

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 18.7 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

NALCO CHEMICAL COMPANY
ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198
POST OFFICE BOX 87 □ SUGAR LAND, TEXAS 77487-0087



17



ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Cedar Bluff, VA

Analysis No. CS 386430
Date Sampled 3/22/94
Date Received 3/24/94
Date Completed 3/24/94
Date Printed 3/25/94

Sample Marked:
Pond 2 Discharge To Pond 3

>>> ANALYTICAL RESULTS <<<

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 7.4 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

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ONE NALCO CENTER □ NAPERVILLE, ILLINOIS 60563-1198
POST OFFICE BOX 87 □ SUGAR LAND, TEXAS 77487-0087



18



ANALYTICAL LABORATORY REPORT

From:
Covenant Coal Co.
Cedar Bluff, VA

Analysis No. CS 386429
Date Sampled 3/22/94
Date Received 3/24/94
Date Completed 3/24/94
Date Printed 3/25/94

Sample Marked:
Pond 3 Discharge To Middle Creek

>>> ANALYTICAL RESULTS <<<

Lab Comments:

Request was made to analyze this sample for residual cationic polymer. The analysis was performed using our standard colloid titration with polyvinylsulfonate as the titrant and toluidine blue as the indicator. The method used is a modification of a procedure published in "Water and Sewerage Works" (1966). This method is not specific for any specific individual cationic polymer. Therefore, the resulting value obtained is the total polymeric cationic material in solution.

Titration of the sample yielded a result of 103 ppm N-9851 as product. Known quantities of N-9851 were added to aliquots of the sample. Recovery of the spikes was 100 percent. This indicates that there are no chemical components present which interfere with the recovery of the spikes.

Form 738 (8-89)

Analytical Laboratory Locations:

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