



NALCO CHEMICAL COMPANY

P.O. BOX 249, DANFORTH BUILDING • CAMILLUS, N. Y. 13031 • AREA 315-672-3106

November 19, 1979

Niagara Mohawk Power Corporation
P O Box 32
Lycoming, New York 13043

Attention: Mr. Tom Perkins

Copies to: Mr. Jim Duell

Mr. Jack Toennies
Director Environmental Affairs
Niagara Mohawk
Syracuse, New York 13202

Subject: Condenser Water Treatment:
October 26th. - October 29th., 1979

Gentlemen:

The feed of the Nalco 7348/7388 chemical treatment program for the condenser was started on October 26th., and stopped on October 29th.

The 7348 which is designed to disperse microbio masses was fed via a chemical pump and timer through the drain opening for the containment spray pump drain pipes which were located directly above the secondary forebay. The 7388 was fed via a timer and gravity feed through a 3/4" line in the same location.

Both chemicals were slug fed at 24 minute intervals twice per day. The feed of the 7348 should have been .5 gpm or 1900 milliliters per minute and the feed of the 7388 should have been .46 gpm or 1740 milliliters per minute.

RESULTS:

The following data was noted by the plant personnel during the four day feed of chemicals:

1. The megawatt ratio remained constant.
2. The Δ T remained constant.

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3. The lake water temperature decreased.
4. The cleanliness factor on the condenser went from 68% down to 65%.
5. The back pressure decreased from 2.0 to 1.87.

The results of the Nalco laboratory analyses during the feed of the chemical on water and microbio are as follows:

WATER

<u>Date</u>	<u>Inlet</u>	<u>Discharge</u>
10/25	10 ppm <u>Total Suspended Solids</u> 6 ppm <u>Total Organic Carbon</u>	8 ppm <u>Total Suspended Solids</u> 6 ppm <u>Total Organic Carbon</u>
10/26	Non Detected TSS 6 ppm TOC	6 ppm TSS 6 ppm TOC
10/28	Non Detected TSS 6 ppm TOC	Non Detected TSS 6 ppm TOC
10/29	Non Detected TSS 7 ppm TOC	Non Detected TSS 9 ppm TOC

MICROBIO*

10/25	120,000 Total Count 9,000 Slime Forming	36,000 Total Count Negative Slime
10/26	370,000 Total Count 170,000 Slime Forming	880,000 Total Count 430,000 Slime Forming

*reported in organisms per milliliter

CONCLUSIONS:

1. The plant data indicated no significant change during the four day feed of the chemicals. The decrease in the cleanliness factor very often happens in this type of chemical treatment application in that we

-3-

can dislodge some of the foulants which would cause a temporary decrease in the cleanliness factor prior to seeing an improvement on the cleanliness of the condenser.

The decrease in backpressure may have been due to the chemical feed; however, the decrease in lake water temperature may have had a bearing on this portion of the data.

2. Analytical data: the samples of water and microbio were taken on the day prior to the chemical feed being initiated (Oct. 25th.). The difference between the water analyses on October 25th. and when the chemical treatment was started October 26th. are insignificant. However, the microbio results indicate a considerably higher total count and slime forming between the inlet and outlet which could indicate that some of the microbio masses were being moved from the condenser.

The remaining water analyses on October 28th. and October 29th. show insignificant results.

A slight amount of foaming was noted during the feed of the chemical in the discharge or hot well. This foaming was very slight and only temporary. Since we can expect to change the surface tension of the water during the chemical feed, slight foaming conditions are very often noted in this sort of application.

The water samples were collected on the inlet and discharge during the feed of the chemical and the total organic carbon levels between the inlet and discharge were the same except for October 29th. when there was only a 2 ppm pickup of TOC in the discharge. This would indicate that feed of the chemicals did not contribute a substantial increase in oil/grease to the plant effluent.

In summary: other than the difference in microbio count on October 26th., and possibly the improvement in the backpressure readings, the data collected shows little or no significant differences.

RECOMMENDATIONS:

1. In order to achieve a more meaningful evaluation, a two week trial on this chemical treatment should be attempted during the later part of July next year or when the lake water temperatures reach their peak.

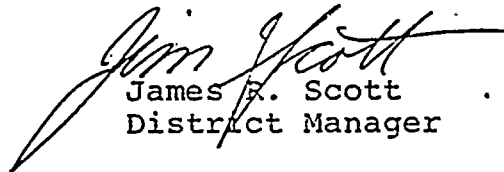
The decrease in condenser efficiency in regard to backpressure and cleanliness factor appears to occur during the summer months.

2. The chemical feeding apparatus which are currently in the plant will be left there for the evaluation next summer. In addition, Nalco will make the necessary arrangements to have a chemical pump for both the 7348 biodispersant and 7388 inorganic dispersant. By using a pump on each chemical along with a timer, we should gain more consistent feed of these chemicals during the two week trial.
3. Necessary arrangements should be made, if required, with the various regulatory agencies for this two week evaluation next July.

We would like to thank you for the many courtesies and cooperation extended to us during this evaluation and we look forward to working with you in the future.

If you should have any questions in regard to the above or the chemical treatment programs, please do not hesitate to contact us.

Very truly yours,


James E. Scott
District Manager

JRS/ksw

enc: Microbio and Water Analyses



ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:

NIAGARA MOHAWK
LYCOMING, NEW YORK

SAMPLE MARKED:
INLET

ANALYSIS NO. P 10541
DATE SAMPLED 10/25/79
DATE RECEIVED 11/ 5/79
DATE PRINTED 11/ 8/79

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	10.
TOTAL ORGANIC CARBON (C)	6.

A handwritten signature in cursive script that reads 'James J. Hickey'.

1927 NOLTE DR • PAULSBORO, NJ 08066

NALCO CHEMICAL COMPANY
REGIONAL ANALYTICAL LABORATORIES

Box 127
- Anaheim, CA 92805

1927 Nolte Dr.
Paulsboro, NJ 08066

Box 87
Sugar Land, TX 77478

CENTRAL LABORATORY
6216 W. 66th Place
Chicago, Illinois 60638



ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:
NIAGARA MOHAWK
LYCOMING, NEW YORK

ANALYSIS NO. P 10542
DATE SAMPLED 10/25/79
DATE RECEIVED 11/ 5/79
DATE PRINTED 11/ 8/79

SAMPLE MARKED:
DISCHARGE

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	8.
TOTAL ORGANIC CARBON (C)	6.

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NALCO CHEMICAL COMPANY
REGIONAL ANALYTICAL LABORATORIES

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Anaheim, CA 92805

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Paulsboro, NJ 08066

Box 87
Sugar Land, TX 77478

CENTRAL LABORATORY
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Chicago, Illinois 60638



ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:
NIAGARA MOHAWK
LYCOMING, NEW YORK

ANALYSIS NO. . . P 10543
DATE SAMPLED 10/26/79
DATE RECEIVED 11/ 5/79
DATE PRINTED 11/ 8/79

SAMPLE MARKED:
INLET

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	*ND (5.)
TOTAL ORGANIC CARBON (C)	6.
*NOT DETECTED (BELOW INDICATED LIMIT OF DETECTION)	

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ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:
NIAGARA MOHAWK
LYCOMING, NEW YORK

ANALYSIS NO. - P 10544
DATE SAMPLED 10/26/79
DATE RECEIVED 11/ 5/79
DATE PRINTED 11/ 8/79

SAMPLE MARKED:
DISCHARGE

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	6.
TOTAL ORGANIC CARBON (C)	6.

James J. Hickey

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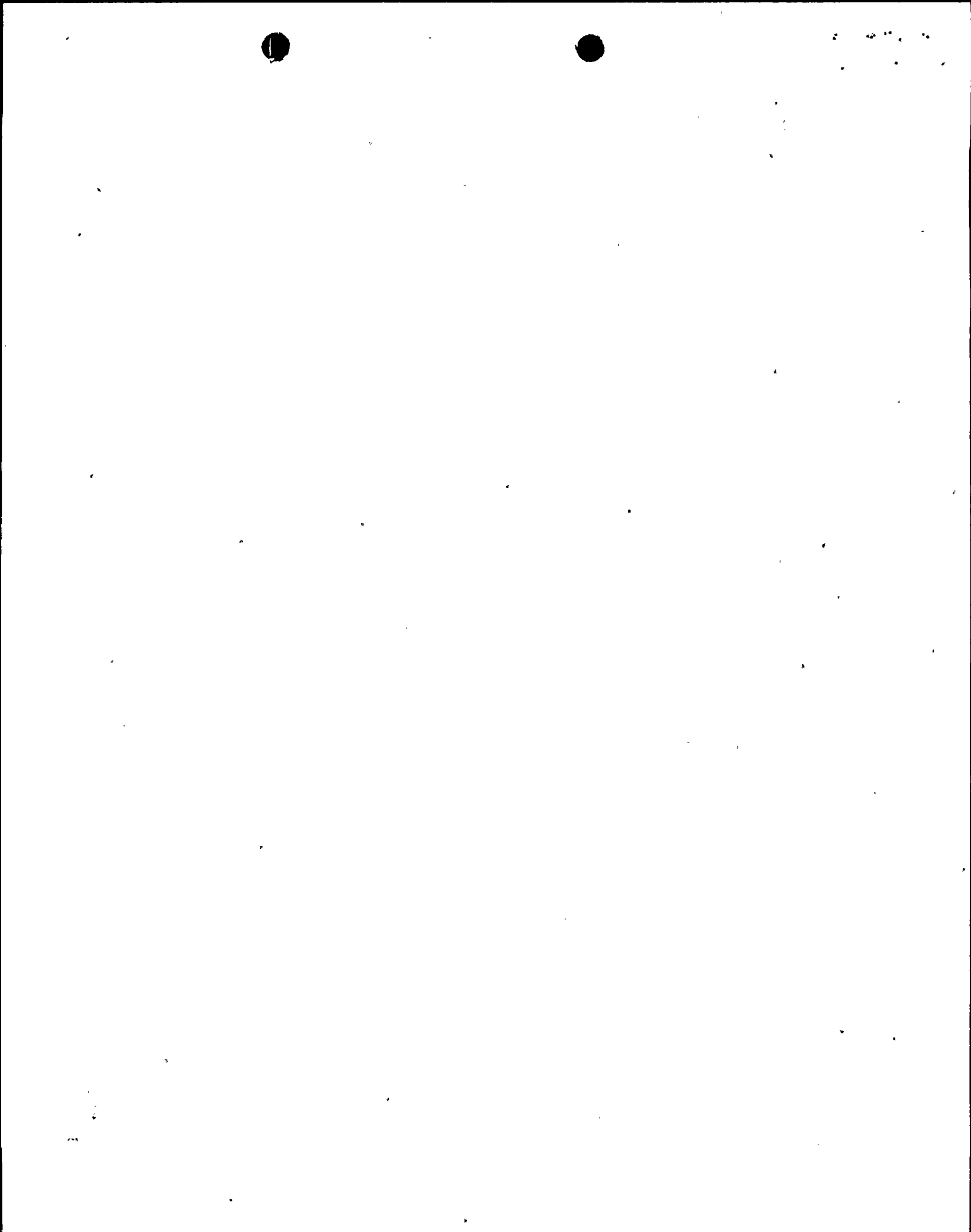
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REGIONAL ANALYTICAL LABORATORIES

Box 127
Anaheim, CA 92805

1927 Nolte Dr.
Paulsboro, NJ 08066

Box 87
Sugar Land, TX 77478

CENTRAL LABORATORY
6216 W. 66th Place
Chicago, Illinois 60638





ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:
NIAGARA MOHAWK
LYCOMING, NEW YORK

ANALYSIS NO. P 10545
DATE SAMPLED 10/28/79
DATE RECEIVED 11/ 5/79
DATE PRINTED 11/ 8/79

SAMPLE MARKED:
INLET

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	*ND (5.)
TOTAL ORGANIC CARBON (C)	6.

*NOT DETECTED (BELOW INDICATED LIMIT OF DETECTION)

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REGIONAL ANALYTICAL LABORATORIES

Box 127
Anaheim, CA 92805

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Paulsboro, NJ 08066

Box 87
Sugar Land, TX 77478

CENTRAL LABORATORY
6216 W. 66th Place
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ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:
NIAGARA MOHAWK
LYCOMING, NEW YORK

ANALYSIS NO. P 10546
DATE SAMPLED 10/28/79
DATE RECEIVED 11/ 5/79
DATE PRINTED 11/ 8/79

SAMPLE MARKED:
DISCHARGE

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	*ND (5.)
TOTAL ORGANIC CARBON (C)	6.

*NOT DETECTED (BELOW INDICATED LIMIT OF DETECTION)

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Box 127
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Paulsboro, NJ 08066

Box 87
Sugar Land, TX 77478

CENTRAL LABORATORY
6216 W. 66th Place
Chicago, Illinois 60638



ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:
NIAGARA MOHAWK
LYCOMING, NEW YORK

SAMPLE MARKED:
INLET

ANALYSIS NO. . P 10538
DATE SAMPLED 10/29/79
DATE RECEIVED 11/ 2/79
DATE PRINTED 11/ 8/79

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	*ND (5.)
TOTAL ORGANIC CARBON (C)	7.

*NOT DETECTED (BELOW INDICATED LIMIT OF DETECTION)

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Box 127
Anaheim, CA 92805

1927 Nolte Dr.
Paulsboro, NJ 08066

Box 87
Sugar Land, TX 77478

CENTRAL LABORATORY
6216 W. 66th Place
Chicago, Illinois 60638



ANALYTICAL SERVICE LABORATORY REPORT

WATER ANALYSIS

FROM:
NIAGARA MOHAWK
LYCOMING, NEW YORK

SAMPLE MARKED:
DISCHARGE

ANALYSIS NO. P 10537
DATE SAMPLED 10/29/79
DATE RECEIVED 11/ 2/79
DATE PRINTED 11/ .8/79

	PPM
TOTAL SUSPENDED SOLIDS AT 105 C	*ND (5.)
TOTAL ORGANIC CARBON (C)	9.

*NOT DETECTED (BELOW INDICATED LIMIT OF DETECTION)

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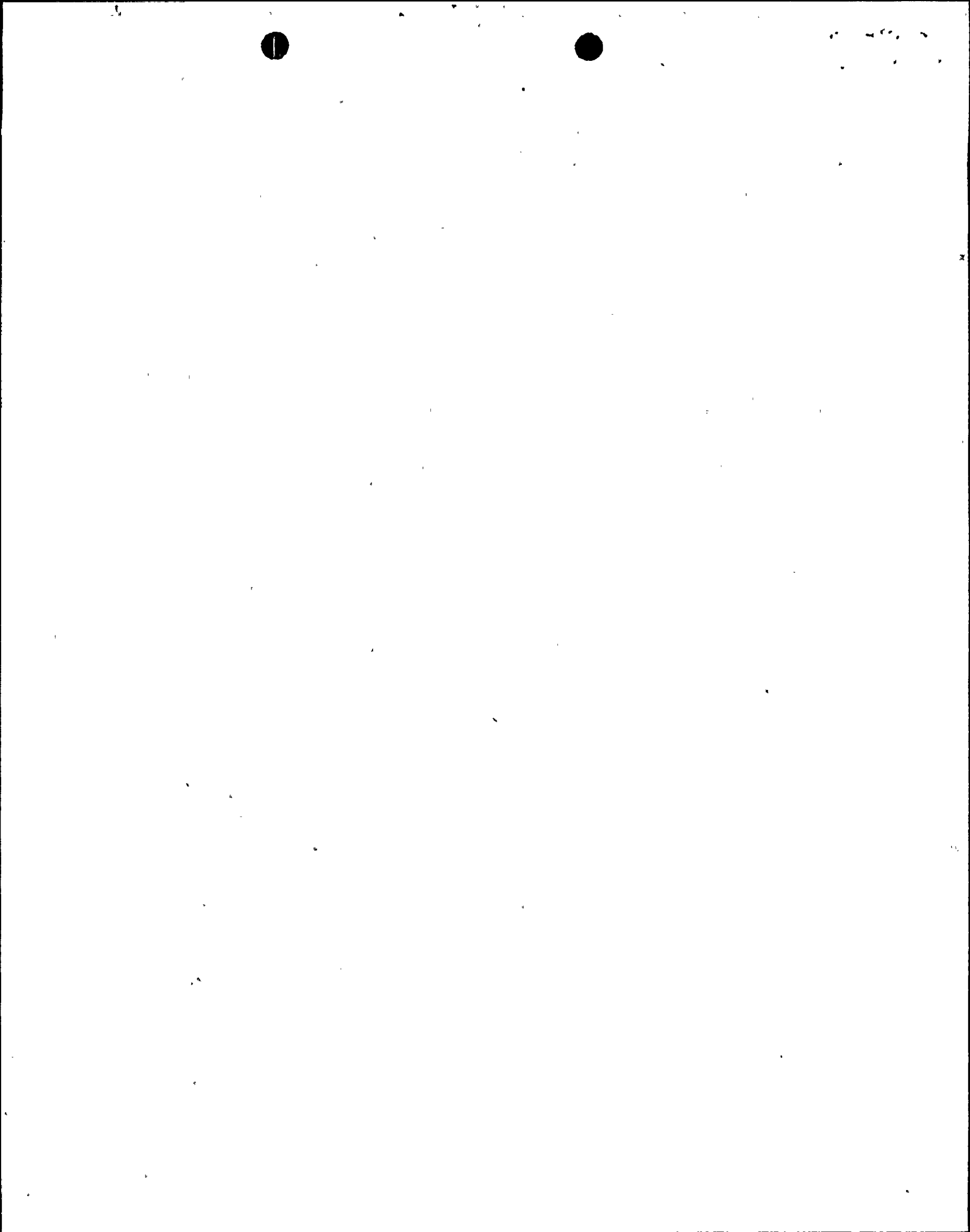
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REGIONAL ANALYTICAL LABORATORIES

Box 127
Anaheim, CA 92805

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Box 87
Sugar Land, TX 77478

CENTRAL LABORATORY
6216 W. 66th Place
Chicago, Illinois 60638





REPORT OF MICROBIOLOGICAL ANALYSIS

Company **NIAGARA MOHAWK**
 Address **LYCOMING, NEW YORK
INLET**
 Sample Marked

Analysis No. **055583**
 Sampling Date **10/25/79**
 Date Rec'd by NALCO **10/30/79**

Physical Appearance

CLEAR LIQUID

(All counts express quantity of organisms per ML of sample)

BACTERIA

AEROBIC SLIME FORMING

Non-Sporeforming

Flavobacterium.....(S) **NEG IN 1/1000**
 Mucoids **NEG IN 1/1000**
 Aerobacter **NEG IN 1/1000**
 Pseudomonas **9,000**

Sporeforming

B. subtilis
 B. cereus
 B. megatherium
 B. mycoides

ANAEROBIC CORROSIVE

Desulfovibrio **NEG IN 1/10**
 Clostridia

IRON DEPOSITING

Sphaerotilus **NONE**
 Gallionella

OTHER BACTERIA

NONE

TOTAL COUNT

120,000

REMARKS:

FUNGI

MOLDS

Aspergillus **NEG IN 1/10**
 Penicillium
 Trichoderma
 Alternaria

YEASTS

Torula **NEG IN 1/10**
 Monilia
 Saccharomyces
 Rhodotorula

ALGAE

BLUE GREEN..... NONE

Oscillatoria

GREEN..... NONE

Chlorococcus

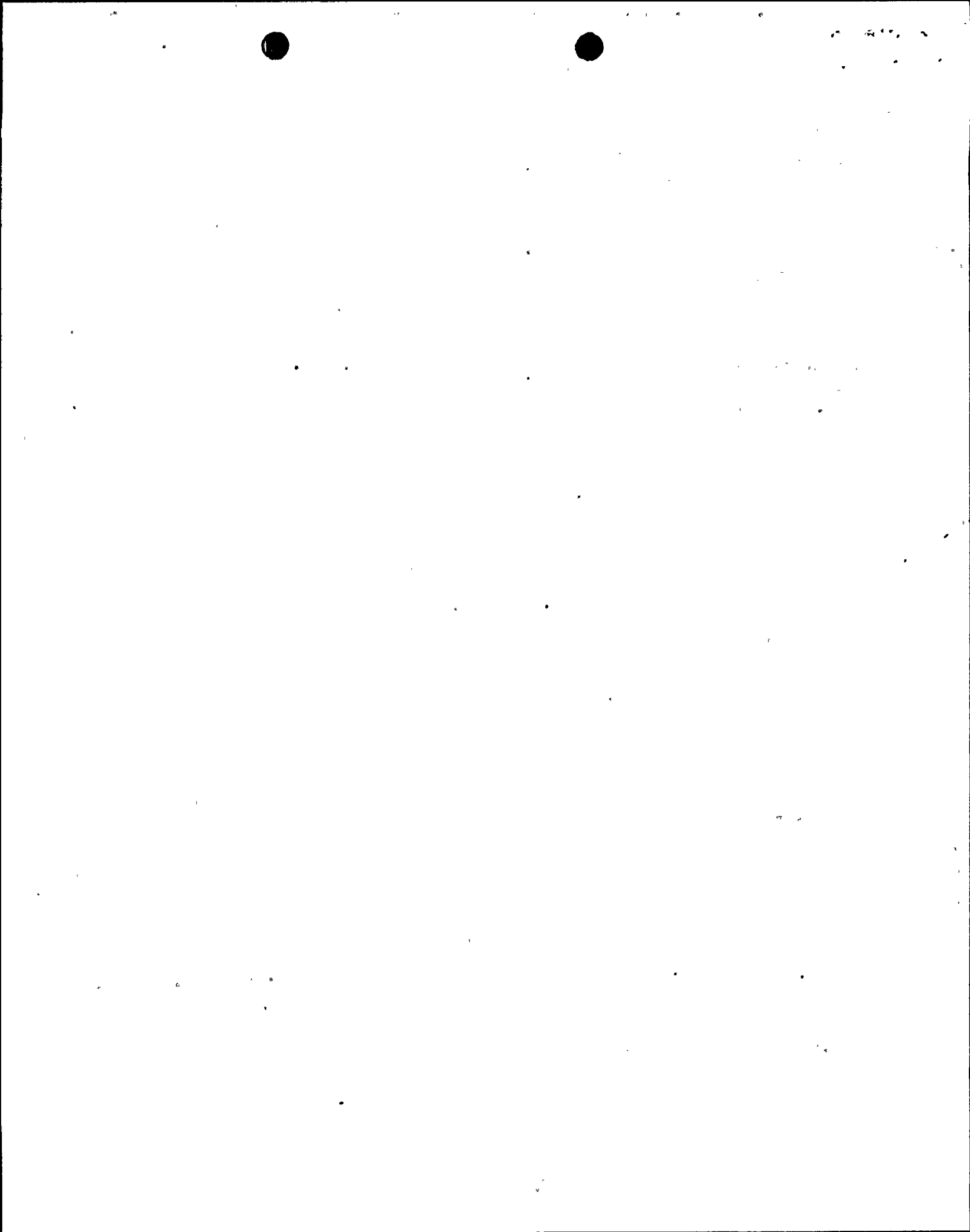
DIATOMS..... NONE

OTHER ORGANISMS

NONE

Henry J. Zitis

Head, Microbiological Laboratory





REPORT OF MICROBIOLOGICAL ANALYSIS

Company **NIAGARA MOHAWK**
 Address **LYCONING, NEW YORK**
DISCHARGE
 Sample Marked

Analysis No. **055584**
 Sampling Date **10/25/79**
 Date Rec'd by NALCO **10/30/79**

Physical Appearance

CLEAR LIQUID

(All counts express quantity of organisms per ML of sample)

BACTERIA

AEROBIC SLIME FORMING

Non-Sporeforming

Flavobacterium (S) **NEG IN 1/1000**
 Mucoids **NEG IN 1/1000**
 Aerobacter **NEG IN 1/1000**
 Pseudomonas **NEG IN 1/1000**

Sporeforming

B. subtilis
 B. cereus
 B. megatherium
 B. mycoides

ANAEROBIC CORROSIVE

Desulfovibrio **NEG IN 1/10**
 Clostridia

IRON DEPOSITING

Sphaerotilus **NONE**
 Gallionella

OTHER BACTERIA

NONE

TOTAL COUNT

36,000

REMARKS:

FUNGI

MOLDS

Aspergillus **NEG IN 1/10**
 Penicillium
 Trichoderma
 Alternaria

YEASTS

Torulula **NEG IN 1/10**
 Kluyveria
 Saccharomyces
 Rhodotorula

ALGAE

BLUE GREEN **NONE**

Oscillatoria **NONE**

GREEN **NONE**

Chlorococcus **NONE**

DIAZOTING **NONE**

OTHER ORGANISMS

NONE

Head, Microbiological Laboratory



REPORT OF MICROBIOLOGICAL ANALYSIS

Company **NIAGARA MOHAWK**
 Address **LYCOMING, NEW YORK
INLET**
 Sample Marked

Analysis No. **055536**
 Sampling Date **10/26/79**
 Date Rec'd by NALCO **10/29/79**

Physical Appearance

CLEAR LIQUID

(All counts express quantity of organisms per ML of sample)

BACTERIA

AEROBIC SLIME FORMING

Non-Sporeforming

Flavobacterium.....(S) **NEG IN 1/1000**
 Mucoids **NEG IN 1/1000**
 Aerobacter **NEG IN 1/1000**
 Pseudomonas **170,000**

Sporeforming

B. subtilis
 B. cereus
 B. megatherium
 B. mycoides

ANAEROBIC CORROSIVE

Desulfovibrio **NEG IN 1/10**
 Clostridia

IRON DEPOSITING

Sphaerotilus **NONE**
 Gallionella

OTHER BACTERIA

NONE

TOTAL COUNT

370,000

REMARKS:

FUNGI

MOLDS

Aspergillus
 Penicillium
 Trichoderma
 Alternaria

NEG IN 1/10

YEASTS

Torula
 Monilia
 Saccharomyces
 Rhodotorula

NEG IN 1/10

ALGAE

BLUE GREEN.....

Oscillatoria

NONE

GREEN

Chlorococcus

NONE

DIATOMS.....

NONE

OTHER ORGANISMS

NONE

Head, Microbiological Laboratory

100-100000-100000



REPORT OF MICROBIOLOGICAL ANALYSIS

Company **NIAGARA MOHAWK**
 Address **LYCOMING, NEW YORK
DISCHARGE**
 Sample Marked

Analysis No. **055537**
 Sampling Date **10/26/79**
 Date Rec'd by NALCO **10/29/79**

Physical Appearance

CLEAR LIQUID

(All counts express quantity of organisms per ^{ML} of sample)

BACTERIA

AEROBIC SLIME FORMING

Non-Sporeforming

Flavobacterium.....	(S)	NEG IN 1/1000
Mucoids		NEG IN 1/1000
Aerobacter		NEG IN 1/1000
Pseudomonas		430,000

Sporeforming

B. subtilis	
B. cereus	
B. megatherium	
B. mycoides	

ANAEROBIC CORROSIVE

Desulfovibrio	NEG IN 1/10
Clostridia	

IRON DEPOSITING

Sphaerotilus	NONE
Gallionella	

OTHER BACTERIA

NONE

TOTAL COUNT

880,000

REMARKS:

FUNGI

MOLDS

Aspergillus	
Penicillium	
Trichoderma	
Alternaria	

NEG IN 1/10

YEASTS

Torulula	
Monilia	
Saccharomyces	
Rhizobotryula	

NEG IN 1/10

ALGAE

BLUE GREEN

Oscillatoria	
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NONE

GREEN

Chlorococcus	
--------------------	--

NONE

DIATOMS

NONE

OTHER ORGANISMS

NONE

Henry J. Zintz

Head, Microbiological Laboratory

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233



Robert F. Flacke
~~Robert F. Flacke~~
Commissioner

November 29, 1979

Ms. Cheryl Blum
Associate Environmental Analyst
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Dear Ms. Blum:

We have reviewed the material submitted by you concerning the toxicity of Nalsperse 7348 and 7388 and hereby approve the use of these chemicals at Nine Mile Point Unit #1 in the method you have described.

Very truly yours,

A handwritten signature in cursive script that reads "Walter E. Loveridge".

Walter E. Loveridge, P.E.
Chief
Physical Systems Section

WL/ag/sr

cc: L. Skinner