

NREAD/FAB/jc
11330
30 Apr 1984

Mr. Charles E. Rundgren
Water Supply Branch
Division of Health Services
Post Office Box 2091
Raleigh, North Carolina 27602/2091

Dear Mr. Rundgren:

This letter is in response to your letter dated 27 March 1984.

Enclosures (1), (2) and (3) provide inorganic, corrosivity and construction materials data previously submitted to your agency by our letter dated 1 June 1983 which is attached to Enclosure (4). Enclosure (5) provides additional requested water system information. Enclosure (6) provides Grainger Laboratory data sheets.

Questions regarding this matter should be forwarded to Ms. Elizabeth Betz, Supervisory Chemist, telephone (919)-451-5977.

Sincerely,

J. I. WOOTEN
Director

By direction of the Commanding General

Encl:

- (1) Inorganic Chemical Results
- (2) Corrosivity Results
- (3) Construction Materials System
- (4) Water Supply Branch letter dated 21 June 1983 w/encl
- (5) General System Information
- (6) Grainger Lab Sheets

CLW

0000004133

INORGANIC CHEMICAL RESULTS (mg/l) FOR SERIAL NO. 04-67-041 thru 048

<u>Parameter</u>	<u>Method</u>	<u>Containment Code</u>								
			<u>041</u>	<u>042</u>	<u>043</u>	<u>044</u>	<u>045</u>	<u>046</u>	<u>047</u>	<u>048</u>
Arsenic	123	1005	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Barium	101	1010	0.01	0.04	0.03	0.01	0.04	0.04	0.01	0.01
Cadmium	101	1015	0.0011	0.0005	0.0005	0.0005	0.0005	0.0005	0.0011	0.0005
Chromium	101	1020	0.003	0.003	0.003	0.003	0.017	0.004	0.003	0.003
Fluoride	107	1025	0.994	0.24	0.856	1.00	0.139	0.126	0.109	0.146
Lead	101	1030	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Mercury	103	1035	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Nitrate (N)	109	1040	0.17	0.05	0.11	0.05	0.05	0.05	0.11	0.05
Selenium	123	1045	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Silver	101	1050	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Iron	101	1028	0.045	0.338	0.037	0.020	0.673	0.544	0.536	0.556
Manganese	101	1032	0.002	0.004	0.002	0.006	0.015	0.030	0.011	0.025
Sodium	101	1052	20.7	79.8	24.4	19.8	81.9	88.7	81.5	66.4

All Samples Collected (Except Sodium): 29 September 1982

Sodium Samples Collected: 3 September 1982

All Results Run by Grainger Laboratories (ID# 37709)

CLW

0000004134

CORROSIVITY RESULTS FOR SERIAL NO. 04-67-041 thru 048

<u>PARAMETER</u>	<u>METHOD</u>	<u>CONTAMINANT CODE</u>	<u>041</u>	<u>042</u>	<u>043</u>	<u>044</u>	<u>045</u>	<u>046</u>	<u>047</u>	<u>048</u>
pH	135	1925	8.8	7.6	8.2	8.2	7.1	8.0	7.9	7.1
Temperature °C	130	1996	20.0	20.0	19.0	20.0	20.0	23.0	21.0	21.0
Total Alkalinity As CaCO ₃ mg/l	142	1927	51.9	136	82.3	76.4	166	151	164	155
Total Filterable Residue mg/l	139	1930	106	320	10	152	126	230	246	140
Calcium As CaCO ₃ mg/l	101	1919	40.9	48.0	56.1	101	41.9	44.3	50.0	111
Stability Index (Langelier)	140	1910	0.25	-0.59	0.03	0.19	-0.95	0.06	-0.12	-0.54

All samples collected: 3 September 1982

pH & temperature run by Quality Control Laboratory (ID #37807)

The rest of the results run by Grainger Lab (ID #37709)

CLW
0000004135

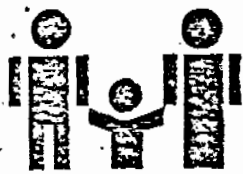
CONSTRUCTION MATERIALS SYSTEM SERIAL NO. 04-67-041 thru 048 (See Note 1)

<u>MATERIAL</u>	<u>041</u>	<u>042</u>	<u>043</u>	<u>044</u>	<u>045</u>	<u>046</u>	<u>047</u>	<u>048</u>
Lead from piping, solder, caulking, interior lining of distribution mains, alloys and home plumbing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Copper from piping and alloys, service lines and home plumbing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Galvanized piping, service lines and home plumbing	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ferrous piping materials such as cast iron and steel	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Asbestos cement pipe	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vinyl lined asbestos cement pipe	No	No	No	No	No	No	No	No
Coal tar lined pipes and tanks	No	No	No	No	No	No	No	No
Other: PVC	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes

CLW

0000004136

Information obtained from:
 Water Treatment Section,
 Utilities Branch
 and
 Outside Plumbing Section,
 General Trades,
 Maintenance & Repair Branch,
 Base Maintenance Division



Ronald H. Levine, M.D., M.P.H.
STATE HEALTH DIRECTOR

DIVISION OF HEALTH SERVICES
P.O. Box 2091
Raleigh, N.C. 27602-2091

June 21, 1983

Colonel J. T. Marshall
Assistant Chief of Staff, Facilities
United State Marine Corps
Camp Lejeune, North Carolina 28542

Re: Compliance Monitoring
Camp Lejeune
Onslow County

Dear Colonel Marshall:

Enclosed are the monitoring reports for trihalomethane, inorganic chemical, sodium and corrosivity. We appreciate the summary format in which you submitted the data; however, such a format does not contain all of necessary information required by this office.

According to the information you supplied, Grainger Laboratory conducted almost all the analyses. Please submit to this office the forms on which Grainger Laboratory submitted the analytical results to you. Grainger Laboratory should have submitted the results of these tests on a form which is similar to the enclosed blank forms.

If you have any questions about the enclosed forms, please do not hesitate to contact me at telephone (919) 733-2321.

Sincerely,

Wm. Larry Elmore
Environmental Engineer
Water Supply Branch
Environmental Health Section

WLE:spm

Enclosures

CLW

0000004137

ENCLOSURE (4)



UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

IN REPLY REFER TO
NREAD/DDS/th
11300
1 JUN 1983



Mr. Charles E. Rundgren, Head
Water Supply Branch
Division of Health Services
Post Office Box 2091
Raleigh, North Carolina 27602-2091

Dear Mr. Rundgren:

Enclosed are results of Inorganic Chemical and Corrosivity Analyses conducted during 1982 for all eight water treatment plants aboard Marine Corps Base, Camp Lejeune, as required by the Safe Drinking Water Act. Also enclosed is a table showing the construction materials used in each distribution system.

The laboratory analysis was run by Grainger Laboratories, Incorporated, Raleigh, North Carolina. The field analyses (temperature and pH) were run by personnel of the Quality Control Laboratory located in the Natural Resources and Environmental Affairs Division, Assistant Chief of Staff, Facilities. Ms. Elizabeth Betz, Quality Control Laboratory, telephone (919) 451-5977, is the point of contact in this matter.

Sincerely,

J. T. MARSHALL
Colonel, U. S. Marine Corps
Assistant Chief of Staff, Facilities
By direction of the Commanding General

Encl:

- (1) Inorganic Chemical Results
- (2) Corrosivity Results
- (3) Construction Materials System

Copy to:
CMDR, NAVFACENCOM (Code 114)

CLW

0000004138

INORGANIC CHEMICAL RESULTS (mg/l) FOR SERIAL NO. 04-67-041 thru 048

Parameter	Method	Containment Code								
			041	042	043	044	045	046	047	048
Arsenic	123	1005	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Barium	101	1010	0.01	0.04	0.03	0.01	0.04	0.04	0.01	0.01
Cadmium	101	1015	0.0011	0.0005	0.0005	0.0005	0.0005	0.0005	0.0011	0.0005
Chromium	101	1020	0.003	0.003	0.003	0.003	0.017	0.004	0.003	0.003
Fluoride	107	1025	0.994	0.24	0.856	1.00	0.139	0.126	0.109	0.146
Lead	101	1030	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
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Nitrate (N)	109	1040	0.17	0.05	0.11	0.05	0.05	0.05	0.11	0.05
Selenium	123	1045	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Silver	101	1050	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
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Sodium	101	1052	20.7	79.8	24.4	19.8	81.9	88.7	81.5	66.4

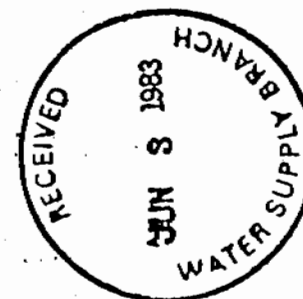
All Samples Collected (Except Sodium): 29 September 1982

Sodium Samples Collected: 3 September 1982

All Results Run by Grainger Laboratories (ID# 37709)

CLW

0000004139



CORROSIVITY RESULTS FOR SERIAL NO. 04-67-041 thru 048

<u>PARAMETER</u>	<u>METHOD</u>	<u>CONTAMINANT CODE</u>	<u>041</u>	<u>042</u>	<u>043</u>	<u>044</u>	<u>045</u>	<u>046</u>	<u>047</u>	<u>048</u>
pH	135	1925	8.8	7.6	8.2	8.2	7.1	8.0	7.9	7.1
Temperature °C	130	1996	20.0	20.0	19.0	20.0	20.0	23.0	21.0	21.0
Total Alkalinity As CaCO ₃ mg/l	142	1927	51.9	136	82.3	76.4	166	151	164	155
Total Filterable Residue mg/l	139	1930	106	320	10	152	126	230	246	140
Calcium As CaCO ₃ mg/l	101	1919	40.9	48.0	56.1	101	41.9	44.3	50.0	111
Stability Index (Langelier)	140	1910	0.25	-0.59	0.03	0.19	-0.95	0.06	-0.12	-0.54

All samples collected: 3 September 1982

pH & temperature run by Quality Control Laboratory (ID #37807)

The rest of the results run by Grainger Lab (ID #37709)

CLW
0000004140





UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

NREAD/DDS/th
11300

Mr. Charles E. Rundgren, Head
Water Supply Branch
Division of Health Services
Post Office Box 2091
Raleigh, North Carolina 27602-2091

Dear Mr. Rundgren:

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The laboratory analysis was run by Grainger Laboratories, Incorporated, Raleigh, North Carolina. The field analyses (temperature and pH) were run by personnel of the Quality Control Laboratory located in the Natural Resources and Environmental Affairs Division, Assistant Chief of Staff, Facilities. Ms. Elizabeth Betz, Quality Control Laboratory, telephone (919) 451-5977, is the point of contact in this matter.

Sincerely,

J. T. MARSHALL

Colonel, U. S. Marine Corps
Assistant Chief of Staff, Facilities
By direction of the Commanding General

Encl:

- (1) Inorganic Chemical Results
- (2) Corrosivity Results
- (3) Construction Materials System

Copy to:

CMDR, NAVFACENCOM (Code 114)



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0000004141



UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

IN REPLY REFER TO
NREAD/JTW/th
11330
1 JUN 1983



Mr. Charles E. Rundgren
Water Supply Branch
Division of Health Services
Post Office Box 2091
Raleigh, North Carolina 27602-2091

Dear Mr. Rundgren:

Enclosed is a table of results of Trihalomethane analysis conducted for the past year for all eight water treatment systems aboard Marine Corps Base, Camp Lejeune.

The sampling was done by personnel in the Quality Control Laboratory, state identification number 37807, located in the Natural Resources and Environmental Affairs Division, under the Assistant Chief of Staff, Facilities. The laboratory analysis, method code 215, was performed by Grainger Laboratories Incorporated, state identification number 37709, located in Raleigh, North Carolina.

Five sample points per system were collected each day. Four were the required distribution points and one was taken at the beginning of the distribution system. During your 5 May 1983 conversation with Ms. Elizabeth Betz, of this command, you stated that samples from the beginning of the distribution systems were to be calculated in the averages. In compliance with that conversation, the fifth sample point result has been added with the other results for averaging.

For further information of Trihalomethanes at Camp Lejeune, the point of contact is Ms. Elizabeth Betz, Supervisory Chemist, Quality Control Laboratory, telephone (919) 451-5977.

Sincerely,

J. T. MARSHALL
Colonel, U. S. Marine Corps
Assistant Chief of Staff, Facilities
By direction of the Commanding General

Encl:

(1) Total Trihalomethane Analysis Results

Copy to:

CMR, NAVFACENGCOM (Code 114)

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TOTAL TRICHLOROMETHANE ANALYSIS RESULTS

System	ID#	Quarterly Average units=ppb				Annual Average
		1982 Apr-Jun	1982 Jul-Sep	1982 Oct-Dec	1983 Jan-Mar	
Hadnot Point ¹	04-67-041	29.7	43.4	48.4	44.8	41.57
MCAS-New River ¹	04-67-042	85.9	105.2	107.4	98.2	99.17
Holcomb Blvd ²	04-67-043	31.1	24.0	31.4	31.8	29.57
Tarawa Terrace ²	04-67-044	14.0	19.0	13.0	19.0	16.0
Camp Johnson ²	04-67-045	7.2	5.8	8.6	6.3 ³	6.97
Rifle Range ²	04-67-046	51.4	48.3	52.1	51.2	50.7
Courthouse Bay ²	04-67-047	45.0	42.6	45.4	40.4	43.35
Onslow Beach ²	04-67-048	51.0	38.0	37.0	44.0 ⁴	42.0

Notes

1. Hadnot Point and Marine Corps Air Station-New River systems serve population between 10,000-74,999.
2. These systems serve populations less than 10,000.
3. In February 1983, one of the distribution sample points at Camp Johnson was secured, so only four points were averaged instead of the usual five.
4. In February, the Onslow Beach distribution points were secured. Therefore, the only point collected was at the beginning of the distribution system.

Sample Dates

19 April 1982
 20 April 1982
 21 April 1982
 22 April 1982
 28 May 1982

Systems

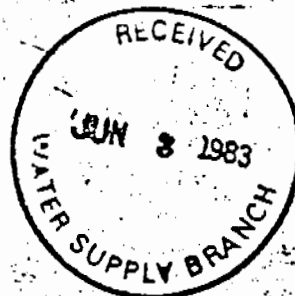
Tarawa Terrace, Camp Johnson
 MCAS-New River, Holcomb Blvd
 Rifle Range, Courthouse Bay, Onslow Beach
 Hadnot Point
 Tarawa Terrace, Camp Johnson, MCAS-New River, Rifle Range, Courthouse Bay
 Holcomb Blvd, Onslow Beach, Hadnot Point
 Tarawa Terrace, Camp Johnson
 MCAS-New River, Holcomb Blvd, Rifle Range, Courthouse Bay, Onslow Beach, Hadnot Point
 Tarawa Terrace, Hadnot Point
 Camp Johnson, MCAS-New River, Holcomb Blvd, Rifle Range, Courthouse Bay, Onslow Beach
 MCAS-New River, Rifle Range
 MCAS-New River, Rifle Range
 Holcomb Blvd, Hadnot Point
 Tarawa Terrace, Camp Johnson, MCAS-New River, Rifle Range, Courthouse Bay, Onslow Beach
 MCAS-New River, Rifle Range
 MCAS-New River, Rifle Range
 Tarawa Terrace, Camp Johnson
 MCAS-New River, Holcomb Blvd, Rifle Range, Courthouse Bay, Onslow Beach, Hadnot Point

CLW 000004143



UNITED STATES MARINE CORPS
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542

NREAD/JIW/th
11330



Mr. Charles E. Rundgren
Water Supply Branch
Division of Health Services
Post Office Box 2091
Raleigh, North Carolina 27602-2091

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Sincerely,

J. T. MARSHALL
Colonel, U. S. Marine Corps
Assistant Chief of Staff, Facilities
By direction of the Commanding General

Encl:

(1) Total Trihalomethane Analysis Results

Copy to:

CMDR, NAVFACENGCOM (Code 114)

CLW

0000004144

GENERAL SYSTEM INFORMATION FOR INORGANIC CHEMICAL - CORROSIVITY
MONITORING ABOARD MARINE CORPS BASE, CAMP LEJEUNE

All system types are: Community

All sources of water are: Ground

All sample sources are: Plant Tap

All sample types are: D-Regular

TYPE OF TREATMENTS

<u>SYSTEM #</u>	<u>CHLORINATED</u>	<u>FLUORIDATED</u>	<u>FILTERED</u>	<u>LIME</u>	<u>WATER SOFTENER</u>
04-67-041	X	X	X	X	X
04-67-042	X		X	X	X
04-67-043	X	X	X	X	X
04-67-044	X	X	X	X	X
04-67-045	X				X
04-67-046	X		X	X*	X
04-67-047	X		X	X*	X
04-67-048	X		X		X

* For pH Control

CLW

0000004145

ENCLOSURE (5)

GRAINER LABORATORIES

INCORPORATED

ANALYTICAL AND CONSULTING CHEMISTS

709 West Johnson Street

Raleigh, North Carolina 27603

(919) 828-3360

ANALYTICAL LABORATORY

Environment Analysis
Construction Materials
Identification of Unknowns
Agriculture
Fuels
Textiles
Chemicals
Hazardous Waste

Commanding General
Marine Corps Base
Camp Lejeune, N.C. 28542

October 13, 1982
82-5049

CONSULTATION

Metallurgical Services
Pollution Abatement
Process Development
Quality Control
Methods Development
Special Investigation
Pesticides
RCRA

CORRECTED COPY

Attention: AC/S Facilities

Subject: Analyses of samples received 10/1/82

Sample Identification: Purchase Order# M67001-82-M-9318

1. A, Hadnot Point, 9/29/82, 0908 hr
2. B, Holcomb Blvd., 9/29/82, 0927
3. C, Tarawa Terrace, 9/29/82, 0940
4. D, Camp Johnson, 9/29/82, 1000
5. E, New River, 9/29/82, 1017
6. F, Rifle Range, 9/29/82, 1045
7. G, Courthouse Bay, 9/29/82, 1105
8. H, Onslow Beach, 9/29/82, 1120

For results see attached page.

William R. Cottrell
William R. Cottrell
Laboratory Supervisor

WRC/ab
Customer #92400
cc: Elizabeth Betz

CLW

0000004146

ENCLOSURE (6)



RESULTS

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
pH	8.9	8.8	8.7	7.3	8.0	8.3	8.1	7.4
Arsenic, total as As, mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Barium, total as Ba, mg/l	0.01	0.03	<0.01	0.04	0.04	0.04	<0.01	0.01
Cadmium, total as Cd, mg/l	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	0.0011	<0.0005
Chromium, total as Cr, mg/l	<0.003	<0.003	<0.003	0.017	<0.003	0.004	<0.003	<0.003
Lead, total as Pb, mg/l	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01
Manganese, total as Mn, mg/l	<0.002	<0.002	0.006	0.015	0.004	0.030	0.011	0.025
Mercury, total as Hg, mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, total as Fe, mg/l	0.045	0.037	0.020	0.673	0.338	0.544	0.536	0.556
Selenium, total as Se, mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007
Silver, total as Ag, mg/l	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
Fluoride, total as F, mg/l	0.994	0.856	1.00	0.139	0.924	0.126	0.109	0.146
Nitrate-Nitrite Nitrogen, mg/l	0.17	<0.05	0.11	<0.05	<0.05	<0.05	0.11	<0.05

CLW

000004147

GRAINGER LABORATORIES

INCORPORATED

ANALYTICAL AND CONSULTING CHEMISTS

709 West Johnson Street

Raleigh, North Carolina 27603

(919) 828-3360

ANALYTICAL LABORATORY

Environment Analysis
Construction Materials
Identification of Unknowns
Agriculture
Fuels
Textiles
Chemicals
Hazardous Waste

Septmeber 23, 1982
82-4805

Elizabeth Betz
Supey Chem., Q.C. Lab
NREAB, B Maintance Division
MCB Camp Lejuene, NC 28542

CONSULTATION

Metallurgical Services
Pollution Abatement
Process Development
Quality Control
Methods Development
Special Investigation
Pesticides
RCRA

Subject: Analyses of samples received 9/7/82


Sample Identification: Purchase Order M93182-2242-0001

1. HB, 0930, 8.2, 19
2. TT, 0945, 8.2, 20
3. MP, 1005, 7.1, 20
4. NR, 1035, 7.6, 20
5. RR, 1100, 8.0, 23
6. CHB, 1125, 7.9, 21
7. OB, 1145, 7.1, 21
8. HP, 1210, 8.8, 20

For results see attached page.

CLW

0000004148


William R. Cottrell
Laboratory Supervisor

WRC/ab



ENCLOSURE (6)

RESULTS

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
pH	8.20	8.20	7.10	7.6	8.00	7.90	7.1	8.80
Temperature, °C	19.0	20.0	20.0	20.0	23.0	21.0	21.0	20.0
Total Alkalinity, as CaCO ₃ , mg/l	82.3	76.4	166	136	151	164	155	51.9
Total Filterable Residue, mg/l	10	152	126	320	230	246	140	106
Calcium, as CaCO ₃ , mg/l	56.1	101	41.9	48.0	44.3	50.0	111	40.9
Stability Index (Langelier)	0.03	0.19	-0.95	-0.59	0.06	-0.12	-0.54	0.25
Sodium, as Na, mg/l	24.4	19.8	81.9	79.8	88.7	81.5	66.4	20.7

CLW
 000004149