

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

June 15, 1983
83-7405

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

Attention: AC/S Facilities

Subject: Analyses of Samples Received 5/31/83

Sample Identification: Purchase Order No. M67001-83-M-0181

37 Samples for Trihalomethane Analysis Identified as in "Results" Section.

CONSULTATION

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

RESULTS

<u>Sample</u>	<u>Chloroform</u>	<u>Bromodichloro- methane</u>	<u>Chlorodibromo- methane</u>	<u>Bromoform</u>	<u>Total Trihalo- methane</u>
363	<1	2	4	6	12
364	<1	1	3	5	9
365	<1	1	4	5	10
366	<1	1	3	4	8
367	<1	1	3	5	9
368	1	3	3	<1	7
369	1	2	2	<1	5
370	2	4	3	2	11
371	2	3	3	1	9
372	1	3	3	<1	7
373	2	6	15	25	48
374	NO SAMPLE SUBMITTED				
375	2	7	23	52	84
376	3	10	30	66	109
377	7	19	47	66	139



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RESULTS
(Continued)

<u>Sample</u>	<u>Chloroform</u>	<u>Bromodichloro- methane</u>	<u>Chlorodibromo- methane</u>	<u>Bromoform</u>	<u>Total Trihalo- methane</u>
378	10	6	3	<1	19
379	14	8	5	1	28
380	16	9	5	1	31
381	15	9	5	1	30
382	15	9	5	1	30
383	34	12	4	<1	50
384	37	13	4	<1	54
385	35	14	4	<1	53
386	46	17	5	<1	68
387	38	14	4	<1	56
388	16	9	4	<1	29
389	34	16	7	<1	57
390	17	9	4	<1	30
391	17	10	5	<1	32
392	21	12	6	<1	39
393	23	7	2	<1	32
394	NO SAMPLE SUBMITTED				
395	27	8	1	<1	36
396	42	12	2	<1	56
397	26	2	<1	<1	28

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RESULTS
(Continued)

Sample	Chloroform	Bromodichloro- methane	Chlorodibromo- methane	Bromoform	Total Trihalo- methane
398	19	15*	4	<1	38**
399	NO SAMPLE SUBMITTED				
400	24	15*	4	<1	43**
401	20	15*	4	<1	39**
402	22	15*	4	<1	41**

* Represents a probable upper limit on the Bromodichloromethane results. There is interference in this sample set.

** Represents a probable upper limit on the total Trihalomethane result.

NOTE: All results reported in micrograms per liter.
Analysis completed 6/10/83.



Bruce A. Babson
Laboratory Supervisor

BAB/ab
Customer #92400
cc: Elizabeth Betz

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TRIHALOMETHANE SAMPLING

MONTH: MAY
YEAR: 1983

SAMPLE # SAMPLE LOCATION
WTP: Tarawa Terrace Sampler: *LLP* Date: 27 May 1983 TIME

363	Bldg STT-39A, Water Plant @ 1st Pump	1402
364	Bldg TT-60, TT Elem School I, Main Hall Men's Head Sink	1406
365	Bldg TT-48, TT Elem School II, Men's Head across Office	1340
366	Bldg TT-2453, TT Exchange gas Station's Ladies Room	1356
367	Bldg TT-35, Sewage Plant's Office Sink	1347-

WTP: Sampler: Date:

NOT COLLECT Bldg E-23, Sewage Lift Station, Knox Trailer Park

WTP: Montford Point Sampler: Date:

368	Bldg M-178, Water Plant @ Sink faucet	1310
369	Bldg M-625, Steam Plant, Bathroom Sink	1329
370	Bldg M-128, Branch Clinic, Men's Head (IF CLOSE TO NEXT DOOR)	1314
371	Bldg M-136, Sewage Plant Sink	1324
372	Bldg M-231, BOQ, 1st floor Men's Head	1319

WTP: New River Sampler: Date:

373	Bldg AS-110, Water Plant @ Pump	1144
374	Bldg G-520, Career Planner, 2nd floor Men's Room	locked
375	Bldg AS-4025, Barracks Rec Room, Bathroom Sink	1154
376	Bldg 710, Officer's Club Gally Sink	1212
377	Bldg 2800, Boat Marina Men's Room	1204

WTP: Holcomb Blvd Sampler: Date:

378	Bldg 670, Water Plant @ Pump	1418
379	Bldg 4022, Fire Station, Bathroom Sink	1412
380	Bldg 1915, Golf Course, Men's Locker Room	1432
381	Bldg 5400, Berkeley Manor Elem School, Main Hall Bathroom	1403
382	Bldg 2615, PP Officer's Club, Gally Dishwashing Sink	1437

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RCRA

RESULTS

Sample	Chloroform	Bromodichloro- methane	Chlorodibromo- methane	Bromoform	Total Trihalo- methane
363	<1	2	4	6	12
364	<1	1	3	5	9
365	<1	1	4	5	10
366	<1	1	3	4	8
367	<1	1	3	5	9
368	1	3	3	<1	7
369	1	2	2	<1	5
370	2	4	3	2	11
371	2	3	3	1	9
372	1	3	3	<1	7
373	2	6	15	25	48
374	NO SAMPLE SUBMITTED				
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376	3	10	30	66	109
377	7	19	47	66	139

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Commanding General
GLI 83-7405
June 15, 1983
Page 2

RESULTS
(Continued)

Sample	Chloroform	Bromodichloro- methane	Chlorodibromo- methane	Bromoform	Total Trihalo- methane
378	10	6	3	<1	19
379	14	8	5	1	28
380	16	9	5	1	31
381	15	9	5	1	30
382	15	9	5	1	30
383	34	12	4	<1	50
384	37	13	4	<1	54
385	35	14	4	<1	53
386	46	17	5	<1	68
387	38	14	4	<1	56
388	16	9	4	<1	29
389	34	16	7	<1	57
390	17	9	4	<1	30
391	17	10	5	<1	32
392	21	12	6	<1	39
393	23	7	2	<1	32
394	NO SAMPLE SUBMITTED				
395	27	8	1	<1	36
396	42	12	2	<1	56
397	26	2	<1	<1	28

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Commanding General
GLI 83-7405
June 15, 1983
Page 3

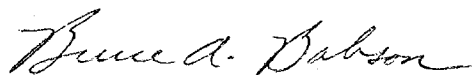
RESULTS
(Continued)

<u>Sample</u>	<u>Chloroform</u>	<u>Bromodichloro- methane</u>	<u>Chlorodibromo- methane</u>	<u>Bromoform</u>	<u>Total Trihalo- methane</u>
398	19	15*	4	<1	38**
399	NO SAMPLE SUBMITTED				
400	24	15*	4	<1	43**
401	20	15*	4	<1	39**
402	22	15*	4	<1	41**

* Represents a probable upper limit on the Bromodichloromethane results. There is interference in this sample set.

** Represents a probable upper limit on the total Trihalomethane result.

NOTE: All results reported in micrograms per liter.
Analysis completed 6/10/83.



Bruce A. Babson
Laboratory Supervisor

BAB/ab
Customer #92400
cc: Elizabeth Betz

CLW

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DD

THM Sampling Information

Sample #	WTP	Date	Time	Point of Contact
363 A&B	TT*	27 May 83	11:00	Elizabeth A. Betz (919)451-5977
364 A&B	TT	27 May 83	11:00	
365 A&B	TT	27 May 83	11:00	
366 A&B	TT	27 May 83	11:00	
367 A&B	TT	27 May 83	11:00	
368 A&B	CJ*	27 May 83	11:00	
369 A&B	CJ	27 May 83	11:00	
370 A&B	CJ	27 May 83	11:00	
371 A&B	CJ	27 May 83	11:00	
372 A&B	CJ	27 May 83	11:00	
373 A&B	NR*	27 May 83	11:00	
374 A&B	NR	27 May 83	11:00	
375 A&B	NR	27 May 83	11:00	
376 A&B	NR	27 May 83	11:00	
377 A&B	NR	27 May 83	11:00	
378 A&B	HB*	27 May 83	11:00	
379 A&B	HB	27 May 83	11:00	
380 A&B	HB8	27 May 83	11:00	
381 A&B	HB	27 May 83	11:00	
382 A&B	HB	27 May 83	11:00	
383 A&B	RR*	27 May 83	11:54	
384 A&B	RR	27 May 83	11:57	
385AA&B	RR	27 May 83	11:01	
386 A&B	RR	27 May 83	11:01	
387 A&B6	RR	27 May 83	11:01	
388 A&B	CHB*	27 May 83	11:02	
389 A&B	CHB	27 May 83	11:06	
390 A&B	CHB	27 May 83	11:06	
391 A&B	CHB	27 May 83	11:07	
392 A&B	CHB	27 May 83	11:13	
393 A&B	OB*	27 May 83	11:52	
394 A&B	OB	27 May 83	11:56	
395 A&B	OB	27 May 83	11:56	
396 A&B	OB	27 May 83	11:55	
397 A&B	OB	27 May 83	11:40	
398 A&B	HP*	27 May 83	11:50	
399 A&B	HP	27 May 83	11:50	
400 A&B	HP	27 May 83	11:55	
401 A&B	HP	27 May 83	11:14	
402 A&B	HP	27 May 83	11:25	

*--Not Required by SDWA

CLW

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THM Sampling Information

Sample #	WTP	Date	Time	Point of Contact
363 A&B	TT*	27 May 83		Elizabeth A. Betz (919)451-5977
364 A&B	TT	27 May 83		
365 A&B	TT	27 May 83		
366 A&B	TT	27 May 83		
367 A&B	TT	27 May 83		
368 A&B	CJ*	27 May 83		
369 A&B	CJ	27 May 83		
370 A&B	CJ	27 May 83		
371 A&B	CJ	27 May 83		
372 A&B	CJ	27 May 83		
373 A&B	NR*	27 May 83		
374 A&B	NR	27 May 83		
375 A&B	NR	27 May 83		
376 A&B	NR	27 May 83		
377 A&B	NR	27 May 83		
378 A&B	HB*	27 May 83		
379 A&B	HB	27 May 83		
380 A&B	HB8	27 May 83		
381 A&B	HB	27 May 83		
382 A&B	HB	27 May 83		
383 A&B	RR*	27 May 83		
384 A&B	RR	27 May 83		
385 AA&B	RR	27 May 83		
386 A&B	RR	27 May 83		
387 A&B6	RR	27 May 83		
388 A&B	CHB*	27 May 83		
389 A&B	CHB	27 May 83		
390 A&B	CHB	27 May 83		
391 A&B	CHB	27 May 83		
392 A&B	CHB	27 May 83		
393 A&B	OB*	27 May 83		
394 A&B	OB	27 May 83		
395 A&B	OB	27 May 83		
396 A&B	OB	27 May 83		
397 A&B	OB	27 May 83		
398 A&B	HP*	27 May 83		
399 A&B	HP	27 May 83		
400 A&B	HP	27 May 83		
401 A&B	HP	27 May 83		
402 A&B	HP	27 May 83		

*-Not Required by SDWA

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Memorandum

0000006389

DATE: 31 May 1983

FROM: Supervisory Chemist, Quality Control Lab, Environmental Branch, NREAB

TO: Director, NREAD

SUBJ: Inorganic Chemicals, Corrosivity, and Trihalomethane Analysis Information

Ref: (a) Rules Governing Public Water Supplies Sections .0600-.2500 of NCAG Title 10, Chapter 10, Subchapter 10D.

1. The Safe Drinking Water Act and Reference (a) requires that certain inorganic (anything not containing Carbon) Chemicals be monitored. Analysis is required every three years for ground water systems. The chemicals that are required are listed below with their respective maximum allowable level.

Arsenic	0.05ppm	Chromium	0.05ppm	Nitrate(as N)	10ppm
Barium	1.0ppm	Lead	0.05ppm	Selenium	0.01ppm
Cadmium	0.010ppm	Mercury	0.002ppm	Silver	0.05ppm

Fluoride is also required but its maximum allowable level is based on the annual average of the maximum daily air temperature.

2. Iron is required by paragraph .1619 of Reference (a). Paragraph .1619 states that any community system with iron concentrations in excess of 0.30 mg/l shall provide approved treatment.
3. Manganese is required by paragraph .1620 of Reference (a). Paragraph .1620 states that any community system with manganese concentrations in excess of 0.05 mg/l shall provide approved treatment.
4. In February 1982, EPA and the State of North Carolina added Sodium to the list of inorganic chemicals for monitoring, however, no limit has been accepted. It was proposed, at one point, to set the limit at 20ppm.
5. Also in February 1982, EPA and the State of North Carolina added a regulation covering corrosion control. The regulation(paragraph .1621 of Reference (a)) requires all systems to analyze for corrosivity characteristics by February 1983. The Langelier Stability Index is a mathematical determination of the corrosivity of the water. A positive value indicates a tendency to form scale in the distribution system. A negative value indicates a tendency to dissolve scale and become corrosive. Along with the results, the regulations state that a summary of construction materials used in each distribution system must be provided.
6. Trihalomethanes are required to be analyzed quarterly for systems serving greater than 10,000(Hadnot Point & MCAS-New River) by paragraph .1635 of Reference (a). The maximum allowable level of total trihalomethanes is 0.10ppm or 100ppbs as a running annual average.
7. In summary, the only level exceeding limits is iron in five systems. If the 20 ppm limit is ever accepted all but one system would be in non-compliance. We have four systems showing a slight tendency to be corrosive. As for Trihalomethanes, we have one system that is very close to the limit.

Elizabeth A. Bets
Elizabeth A. Bets, Supvy. Chem.

Charles E. Rundgren, Head
Water Supply Branch
Division of Health Services
P. O. Box 2091
Raleigh, NC 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 ID#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 Inc., State ID#37709, located in Raleigh, NC.

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 conversation, on 5 May 1983, 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)451-5988.

Enclosure

Copy to:
LANTDIV (Code 114)
BMD, UTIL DIR
SUPVY CHEM

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TOTAL TRIHALOMETHANE ANALYSIS RESULTS

System	ID#	Quarterly Averages units=ppb				Annual Average
		1982 1982 Apr-Jun	1982 Jul-Sep	1982 Oct-Dec	1983 Jan-Mar	
Hadnot Point ¹	04-67-041	29.7	43.7	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	14.1	19.	13.	19.	16
Camp Johnson ²	04-67-045	7.20	5.8	8866	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	38	37	44 ⁴	42

Notes

1. Hadnot Point and Marine Corps Air Station-New River systems serve populations 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

 27 May 1982
 24 June 1982
 25 June 1982

 28 July 1982
 29 July 1982

 17 August 1982
 21 September 1982
 26 November 1982
 29 November 1982

 29 December 1982
 26 January 1983
 24 February 1983
 25 February 1983

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

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Enclosure

TRIHALOMETHANE SAMPLING

MONTH:
YEAR:

SAMPLE##	SAMPLE LOCATION	TIME
WTP: Rifle Range Sampler: Date:		
383	Bldg RR-85, Water Plant @ Finish Tap	1054
384	Bldg RR-6, Fire House Sink	1057
385	Bldg RR-10, Snack Bar Sink	1117
386	Bldg RR-200, Across from Target Shed	1141
387	Bldg RR-92, Sewage Plant Sink	1103
WTP: Courthouse Bay Sampler: Date:		
388	Bldg BB-190, Water Plant @ Faucet	1032
389	Bldg BB-7, Mess Hall Sink	1026
390	Bldg BB-54, Service Club	1030
391	Bldg SBB-204, Sewage Plant Sink	1019
392	Bldg BB-46, Marina Bathroom Sink	1013
WTP: Onslow Beach Sampler: <i>N4F</i> Date: 5/27/83		
393	Bldg BA-138, Water Plant	0952
394	Bldg BA-103, Mess Hall	<i>closed for renovation</i>
395	Campsite #2, Spigot 10(Mainland)	1056
396	Campsite #1, Spigot 2(Beachside)	0925
397	Bldg SBA-142, Spigot at bottom of Pier	0940
WTP: Hadnot Point Sampler: Date:		
398	Bldg20, Water Plant @ Pump	1450
399	Bldg NH-1, Emergency Room Sink	<i>locked</i>
400	Bldg 1202, Men's Room Sink	1505
401	Bldg 65, Quality Control Lab, Room 220 Sink	1514
402	Bldg FC-530, Laundry Room Sink, 1st floor	1458

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