Doc. No. : CLEJ-00242-1.02-04/16/86

North Carolina Department of Human Resources
Eastern Regional Office • 404 Saint Andrews Drive • Greenville, N. C. 27834
James G. Martin, Governor Phillip J. Kirk, Jr., Secretary

April 16, 1986

Commanding General
US Marine Corps Base
Camp Lejeune, NC 28542

ATTN: Utilities Director
G. S. Johnson, Jr.

Dear Sir:

I visited the potable water treatment facilities aboard USMCB Camp Lejeune on 10 and 11 April 1986. I was accompanied during this visit by Mr. B. M. Frazelle, Jr. (Water Treatment Operator Foreman). The purpose of this visit was to update our files and records concerning the facility operations, treatment capacities, and construction work in progress as well as offer any suggestions for improvements in the process or daily operation and maintenance at the treatment facilities.

The routine plant operation and equipment maintenance are well organized and carried out. I was very pleased with the expansion and upgrading work recently completed or now in progress at several facilities.

We discussed several specific plant situations including: (1) A light film on the water surface at the filters in the Holcomb Boulevard facility may be from oil lubricated well pumps. (2) The maintenance level at the Tarawa Terrace and Camp Johnson facilities has dropped below the others. This is understandable, however, considering these are to be abandoned when the Holcomb Boulevard project is completed (estimated late 1986). (3) The water flow pattern at the Onslow Beach system is different from other facilities utilizing similar treatment. Normally, water is pumped from the wells through filters then through the ion exchange softeners, not divided. Additionally, filter backwash water is usually from the treated water system, not untreated well water.

We also discussed several items which may be applicable to more than one facility. These include: (1) The filters and softeners should be inspected annually for media loss and condition as well as any structural or operational abnormalities. (2) Covers for the brine (NaCl) day tanks will reduce some of the problems with surface corrosion. Installation and operation of dehumidifiers will also help this problem. (3) The existing treatment process consisting of aeration, lime addition, sedimentation, filtration (sand media), ion exchange (softening), chlorination, and phosphate (at three plants) may be altered to reduce chemical costs while maintaining acceptable quality. An in-plant or laboratory trial of the process may prove effective, depending on more detailed water quality analysis

DOC. NO.: CLEJ-00242-1.02-04/16/86

and study. (4) I noticed several open electrical service panels. A standing policy should be established to close or secure these at the end of the work or shift change, especially in the water plant areas. (5) Many water systems utilizing dry feeders for fluoride prefer sodium silicofluoride (due to its cost) instead of sodium fluoride (dissolves only to 4% solution). (6) Records of operations (including total water treated, filter and softener operations, chemical feed and dosage rates, etc.) should be reported monthly for each facility to our office in Raleigh.

I understand that planning is in progress for the development of private operations contracts for the water treatment facilities. Our office, in cooperation with the NC Attorney General's office, would like to review the final contract proposal to determine the operation's responsibilities as well as the system's liabilities.

As always, I appreciate the cooperation and attitude of the Base towards the State's Water Supply Branch and regulations.

If you have any questions or wish to discuss these comments further, please contact me.

Sincerely,

J. Fred Hill

J. Fred Hill
Water Plant Consultant
Water Supply Branch
Environmental Health Section

bgb

Enclosures

cc: C. E. Rundgren
M. P. Bell

DOC. NO.: CLEJ-00242-1.02-04/16/86

North Carolina Department of Human Resources
Eastern Regional Office • 404 Saint Andrews Drive • Greenville, N. C. 27834

James G. Martin, Governor Phillip J. Kirk, Jr., Secretary

April 16, 1986

MEMORANDUM

TO: Charles E. Rundgren, Chairman
N.C. Water Treatment Facility Operators Board of Certification

FROM: J. Fred Hill
Water Plant Consultant

SUBJECT: Water Treatment Plant Ratings
USMC Base Camp Lejeune

Attached are the classification rating forms with the modification for lime softening with spiractors that we discussed.

The eight systems surveyed are directed, managed, and operated through a common administration and responsible operator in charge (Byron M. Frazelle, "A" certification).

I recommend the system be classified to an "A" rating based on the management organization and the diversified treatment techniques involved.

If you have any questions, please let me know.

bgb

Attachments

DOC. NO.: CLEJ-00242-1.02-04/86/86

USMC BASE

CAMP LEJEUNE

MANAGEMENT

Operations

LtCol. W. M. Rice
Base Maintenance Officer

Fred Cone
Asst. BMO

G. S. Johnson, Jr.
Utilities Director

David Southerland
Util. General Foreman

Willard Price
General Foreman

B. M. Frazelle (Mac)
WTP Operator Foreman

Monitoring & Surveillance

Natural Resources and Environmental Affairs Division
Julian Wooten, Director
Danny Sharpe, Supervisory Ecologist
Elizabeth Metz, Supv. Chemist

US MARINE CORPS BASE

Camp Lejeune, NC

WTP Operators

Name	Title	Certification
Adkins, James M.	Water Treatment Plant Operator	C-Well
Barber, Elbert F.	Water Treatment Plant Operator	C
Brown, Leland R.	Industrial Equipment Repairer	C-Well
Campbell, Emery G.	Water Treatment Plant Operator	C
Cannon, Fred J.	Water Treatment Plant Operator	C
Huneycutt, Gaines B.	Water Plant Operator	C
Collins, Philip R.	Water Treatment Plant Operator	C
Duncan, Freddy	Water Treatment Plant Operator	B
Dunlap, James	Water Plant Operator	O
Ellis, Donald R.	Water Treatment Plant Operator Leader	C
Frazelle, Byron M.	Water Treatment Plant Operator Foreman	A
Hardison, Rufus C.	Water Treatment Plant Operator	C
Hartsoe, Joel R.	Water Treatment Plant Operator Leader	B-Well
Herring, L.	Water Plant Operator	O
Hill, Daniel E., Jr.	Water Treatment Plant Operator Leader	B-Well
Holland, Larry W.	Water Treatment Plant Operator Leader	B-Well
Phillips, Major	Water Treatment Plant Operator Helper	O
James, Nathaniel L.	Water Plant Operator	O
Kelly, Calvin D., Jr.	Water Treatment Plant Operator	C
Kolde, Sally	Clerk Typist	O
Lee, Jerry J.	Water Treatment Plant Operator	C
Marhelko, Michael J.	Water Treatment Plant Operator	C
Miller, Stanley L.	Water Treatment Plant Operator Leader	B
Milton, George D.	Water Treatment Plant Operator	C
Morton, Billie L.	Water Treatment Plant Operator	B
Mundt, Berton L.	Water Treatment Plant Operator	C
Odum, Cobrett G.	Water Treatment Plant Operator	C
Parker, Leon S.	Water Treatment Plant Operator	C-Well
Pehowic, Stanley A.	Water Treatment Plant Operator Leader	B
Petersen, Larry G.	Water Treatment Plant Operator	C-Well
Christensen, Nancy	Water Treatment Plant Operator Helper	O
Price, W. R.	Utilities Systems Plant General Foreman	B
Reiff, Howard F.	Water Treatment Plant Operator	C
Rich, Melvin P.	Industrial Equipment Mechanic	C
Riggs, Alvin T.	Water Treatment Plant Operator	C
Riggs, Joseph E.	Water Treatment Plant Operator	C
Smallwood, Scottie	Water Treatment Plant Operator	C
Stone, Tally	Water Treatment Plant Operator	C
Sumner, David W.	Industrial Equipment Repairer	C-Well
Sypnier, Richard A.	Water Treatment Plant Operator	C
Thomas, Tommie T.	Industrial Equipment Mechanic	C-Well
Vick, Ronnie C.	Instrument Mechanic	B-Well
Ward, William	Water Plant Operator	O
Wooten, Robert	Water Treatment Plant Operator	C-Well

DOC. NO.: CLET-00242-1.02-04/16/86

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY US MC Camp Lejeune - Holcomb Blvd.

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED B-W

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE 4 (Grade)

NAME B. M. Frazelle (Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY
See List.	

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	3
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	2
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	
Coagulation - Spectrum - Liq.	10	10
Sedimentation	5	
Filtration	10	10
Disinfection	10	10
Ion Exchange	5	
Adsorption	2	
Chemical Oxidation	2	
Softening	2	2
Stabilization	2	
Fluoridation	10	10
Raw Water Pumping	5	5
Receiving Basin	1	
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart (1.204 mg)	1-50	12
TOTAL POINTS		72

DATE 4-10-86

Form 2

DOC. NO.: CLET-00242-1.02-04/16/86

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY USMC-Lejeune Harnot Point

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED A

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE A (Grade)

NAME B. M. Frazelle (Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	3
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	2
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	
Coagulation - Spiractor - 6mg	10	10
Sedimentation	5	
Filtration	10	10
Disinfection	10	10
Ion Exchange	5	
Adsorption	2	
Chemical Oxidation	2	
Softening	2	2
Stabilization	2	
Fluoridation	10	10
Raw Water Pumping	5	5
Receiving Basin	1	1
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart (3.241 mgd)	1-50	24
TOTAL POINTS		85

DATE 4-10-86

Form 2

DOC. NO.: CLEJ-00242-1.02-04/16/86

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY USMC Camp Lejeune - Onslow Beach

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED B-W

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE - A - (Grade)

NAME B. M. Frazelle (Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY
See List	

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	3
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	2
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	2
Coagulation	10	
Sedimentation	5	
Filtration	10	10
Disinfection	10	10
Ion Exchange	5	5
Adsorption	2	
Chemical Oxidation	2	
Softening	2	2
Stabilization	2	
Fluoridation	10	
Raw Water Pumping	5	5
Receiving Basin	1	
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart	1-50	2
TOTAL POINTS (.137 mg)		49

DATE 4-10-86

Form 2

DOC. NO.: CLEJ-00242-1.02-04/16/86

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY USMC-Camp Lejeune - Courthouse Bay

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED B-W

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE A
Grade

NAME B.M. Frazelle
(Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY
See List	

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	3
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	2
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	2
Coagulation	10	
Sedimentation	5	
Filtration	10	10
Disinfection	10	10
Ion Exchange	5	5
Adsorption	2	
Chemical Oxidation	2	
Softening	2	
Stabilization	2	2
Fluoridation	10	
Raw Water Pumping	5	5
Receiving Basin	1	
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart (.452 mg)	1-50	5
TOTAL POINTS		52

DATE 4-10-86

Form 2

DOC. NO.: CLEJ-00242-1.02-04/16/96

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY USMC - Camp Lejeune - Rifle Range

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED B-W

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE 4
Grade

NAME B. M. FRAZELLE
(Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY
See List.	

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	3
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	2
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	2
Coagulation	10	
Sedimentation	5	
Filtration	10	10
Disinfection	10	10
Ion Exchange	5	5
Adsorption	2	
Chemical Oxidation	2	
Softening	2	
Stabilization	2	2
Fluoridation	10	
Raw Water Pumping	5	5
Receiving Basin	1	
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart (.262 MG)	1-50	3
TOTAL POINTS		50

DATE 4-10-96

Form 2

DOC. NO.: ELEG - 0242-1.02-04/16/86

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY [illegible] TAHOMA TERRACE

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED B-W

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE A
Grade

NAME B. M. Frazelle
(Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	3
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	2
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	
Coagulation - Lime - Spiractor	10	10
Sedimentation	5	
Filtration	10	10
Disinfection	10	10
Ion Exchange	5	
Adsorption	2	
Chemical Oxidation	2	
Softening	2	2
Stabilization	2	
Fluoridation	10	10
Raw Water Pumping	5	5
Receiving Basin	1	
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart	1-50	3
	(812 MSD)	
TOTAL POINTS		53

DATE 4-10-86

Form 2

DOC. NO.: CLEJ-00242-1.02-04/16/86

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY USMC Camp Lejeune Camp Johnson

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED B-II

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE 4
Grade

NAME B.M. TRIPLETT
(Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	2
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	2
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	
Coagulation	10	
Sedimentation	5	
Filtration	10	
Disinfection	10	10
Ion Exchange	5	5
Adsorption	2	
Chemical Oxidation	2	
Softening	2	2
Stabilization	2	2
Fluoridation	10	
Raw Water Pumping	5	5
Receiving Basin	1	1
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart	1-50	2
TOTAL POINTS	(340 MG)	31

DATE 4-10-86

Form 2

DOC. NO.: CLET-00242-1.02-04/14/86

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES
WATER TREATMENT FACILITY OPERATORS BOARD OF CERTIFICATION
RATING VALUES FOR CLASSIFICATION OF WATER SUPPLY WORKS

NAME OF WATER TREATMENT FACILITY USMC-Camp Lejeune - New River Air Station

CLASSIFICATION ASSIGNED FACILITY AND LEVEL OF CERTIFICATE REQUIRED B,W

GRADE CERTIFICATE HELD BY OPERATOR IN RESPONSIBLE CHARGE A (Grade)

NAME B.M. Frazelle (Operator)

OTHER OPERATORS

NAME	GRADE CERTIFICATE HELD IF ANY
SEE LIST	

UNIT	RATING VALUE	ASSIGNED VALUE
Ground	3	
Surface	5	
Surface with Reservoir	6	
Coliform Bacteria less than 1.0 per 100 ml	2	
Coliform Bacteria 1.0 - 100 per 100 ml	4	
Coliform Bacteria 100 - 1000 per 100 ml	6	
Coliform Bacteria 1000 - 5000 per 100 ml	8	
Coliform Bacteria 5000 - 20000 per 100 ml	12	
Aeration	2	
Coagulation - SPIRACTOR - LIME	10	10
Sedimentation	5	
Filtration	10	10
Disinfection	10	10
Ion Exchange	5	
Adsorption	2	
Chemical Oxidation	2	
Softening	2	(-)
Stabilization - RECARBONATION	2	2
Fluoridation	10	
Raw Water Pumping	5	5
Receiving Basin	1	
Finished Water Pumping	5	5
Storage at Plant	1	1
Storage - System	2	2
Pumpage - from attached chart	1-50	5
TOTAL POINTS		47 (B)

DATE 4-10-86

Form 2

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
WELL INFORMATION

DOC. No.: CLEJ-00242-1.02-04/16/86

WELL NO. _____ ID NO. _____

1) WELL SITE: Owned or controlled (100' radius)? OK - all wells

Sources of pollution/distance controlled by USMC

Adequate slope? _____ Flooding? _____

2) WELL HOUSE: Free of stored materials? yes

Properly drained? _____ Freeze protection? _____

Condition of house OK Locked? yes

3) WELL: Diameter VARIES Type const. GRAVEL Yield (GPM) VARIES Storage at well NO

Properly sealed? ~~Properly vented~~ TOTAL - 7224 gpm

35 wells Casing depth _____ Well depth _____ Meter Available? @ WTP

Concrete slab adequate? ~~Yes~~ Mix @ 18 wells

Size of blow-off _____ Sample tap available _____

4) PUMP: Capacity MAX 450 MIN gpm 105 AVG gpm 350 Type pump VERT TURB (service pumps 1@3000 gpm 3@1500 gpm (2 w/aux pwr)

Height above floor (pump/casing) _____ Is pump leaking? _____

TREATMENT: Is this a central treatment facility? yes (one of eight)

Chlorinator: Type WET GAS Capacity 50/200 ppd In Service? yes

Spare parts or unit? Spare unit (200 #) Proper ventilation? yes Gas Mask? AIRPK' Repair Kit Cl2 ALERT

Recarbonation ~~injection~~ Type PROPANE GAS - SUBMERGED BURNER Condition NEW - 85

Filter(s): Type GRAVITY No. 5 Media SAND - ANTHRACITE

Size 350 ft² ea Rate (gpm/ft²) 2.0 Head loss B/W @ 5 ft.

Type controls NEW Condition GOOD

Comments SURFACE WASH ea. filter

Softeners: Type SPIRACTORS No. 5 Media SAND - catalyst

Size HYDRATED Lime SLOT Rate (~~gpm/ft²~~) 1.0 MGD ea ~~Head loss~~

6 feed pumps

Type controls 1000 # Lime / MG H2O Condition _____

Comments _____

Other treatment (Describe): WET NaF - GRAVIMETRIC (NEW '85)

Process Wastewater treatment (Describe): NEW - B/W to holding basin ① - sludge to SAN SEWER ② Supnat. to RAW WATER

6) REMARKS AND RECOMMENDATIONS

Maintains pH @ 8.8 for STABILITY

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
WELL INFORMATION

WELL NO. _____ ID NO. _____

1) WELL SITE: Owned or controlled (100' radius)? OK - All wells

Sources of pollution/distance None - controlled by USMC

Adequate slope? _____ Flooding? _____

2) WELL HOUSE: Free of stored materials? yes

Properly drained? yes Freeze protection? yes

Condition of house OK Locked? yes

3) WELL: Diameter Varies Type const. gravel Yield (GPM) Varies Storage at well no

Properly sealed? _____ Properly vented? Total 1800 gpm

8 wells

Casing depth _____ Well depth _____ Meter Available? @ WTP

Concrete slab adequate? _____ Size Aux eng. @ 4 wells

Size of blow-off _____ Sample tap available _____

4) PUMP: Capacity Min 133 Max 350 Avg 225 gpm Type pump Vert Turbine (usual)

Height above floor (pump/casing) _____ ~~Is pump leaking~~? High serv. pumps 2@700 gpm 2@1500 gpm (Aux available each)

5) TREATMENT: Is this a central treatment facility? yes (one of eight)

Chlorinator: Type Wt gas Capacity 1@50 2@100 operated @ 35 ppd In Service? yes

Spare parts or unit? 3 units Proper ventilation? yes Gas Mask? yes; Repair kit & alert system

Aerator: Type None Condition _____

Filter(s): Type gravity No. 2 Media Rapid sand

Size 18 x 20' Rate (gpm/ft^2) 2.0 usual Head loss —

Type controls Roberts - Condition good

Comments all controls & meters OK; surface sweeps in each

Softeners: Type Spiractor No. 2 Media catalyst (sand)

Size 700 gpm (ea) Rate (gpm/ft^2) — Head loss —

Type ~~controls~~ Hydrated lime - Bulk Condition good

Comments _____

Other treatment (Describe): NaF with gravimetric feeder - calibrated ea shift

Process wastewater treatment (Describe): Settling pond - disch to San. Swr.

6) REMARKS AND RECOMMENDATIONS ① Oil films on filters may be from oil lubricated pumps - S/B careful. ② Be careful with NaF (most use Na_2SiF_6)

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
WELL INFORMATION

DOC. NO.: CLEJ-00242-1.02-04/16/86

WELL NO. ______ ID NO. ______

1) WELL SITE: Owned or controlled (100' radius)? OK - ALL WELLS

Sources of pollution/distance controlled by USMC

Adequate slope? ______ Flooding? ______

2) WELL HOUSE: Free of stored materials? yes

Properly drained? ______ Freeze protection? ______

Condition of house OK Locked? yes

3) WELL: Diameter varied Type const. ______ Yield (GPM) varies Storage at well ______

Properly sealed? ______ Properly vented? ______

26 wells

Casing depth ______ Well depth ______ Meter Available? @ WTP

Concrete slab adequate? ______ Aux Eng @ 7 wells

Size of blow-off ______ Sample tap available yes

4) PUMP: Max Capacity 400 Min gpm 50 Avg 164 Type pump VERT TURB (High Service 2@1000 gpm, 1@500 gpm)

Height above floor (pump/casing) ______ Is pump leaking? ______ BOOSTERS 2@125 gpm, 2@750 gpm, 3@700 gpm

5) TREATMENT: Is this a central treatment facility? yes (one of eight)

Chlorinator: Type W&T gas (T-CONT) Capacity 1@/200 ppd In Service? yes

Spare parts or unit? SPARE w/200 ppd Proper ventilation? yes Gas Mask? AIR PACK; REPAIR KIT; ALARMS.

Recarbonation: Type Natural Gas (Submerged Burner) Condition OK

Filter(s): Type gravity (No Rate Controls) 3 ea Media SAND & ANTHRACITE

Size 17'x23' Rate (gpm/ft^2) ______ Head loss B/W @ 2.5-3.0 OR 48 hrs

Type controls B/W controls only Condition OK w/surface wash

Comments filter rate changes based on C.O.H. filter overflow thru recarb. unit

Softeners: Type SPIRACTORS No. 2 Media SAND - CATALYST

Size — Rate (gpm/ft^2) 1200 gpm ea Head loss —

Type controls Uses Hydrated lime Condition ok (Bulk STORAGE)

Comments Lime slaker - spare UNIT

Other treatment (Describe): ______

Process Wastewater treatment (Describe): To SAN. SWR

6) REMARKS AND RECOMMENDATIONS Aux generator @ WTP

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
WELL INFORMATION

WELL NO. ______ ID NO. ______

1) WELL SITE: Owned or controlled (100' radius)? OK - ALL Wells

Sources of pollution/distance CONTROLLED by USMC

Adequate slope? ______ Flooding? ______

2) WELL HOUSE: Free of stored materials? yes

Properly drained? ______ Freeze protection? ______

Condition of house OK Locked? yes

3) WELL: Diameter VARIED Type const. GRAVEL Yield (GPM) VARIED Storage at well NO

Properly sealed? ______ Properly vented? ______

8 Wells → Casing depth ______ Well depth ______ Meter Available? @ WTP

Concrete slab adequate? ______ [illegible] All @ [illegible] wells

Size of blow-off ______ Sample tap available yes

4) PUMP: Capacity MIN 40 gpm MAX 200 AVG 115 Type pump VERT TURB. ([illegible] pumps - 1250 gpm (w/[illegible]) 1000 gpm 500 gpm

Height above floor (pump/casing) ______ Is pump leaking? ______

5) TREATMENT: Is this a central treatment facility? yes (one of eight)

Chlorinator: Type W&T gas (150#) Capacity 10/30 ppd In Service? yes

Spare parts or unit? spare unit (50 ppd) Proper ventilation? yes Gas Mask? AIR PACK, REPAIR KIT, Cl_2 alert.

Aerator: Type NONE Condition ______

Filter(s): Type NONE No. ______ Media ______

Size ______ Rate (gpm/ft^2) ______ Head loss ______

Type controls ______ Condition ______

Comments ______

Softeners: Type ION EXCHANGE No. 2 Media Na Zeolite

Size 72" Ø Rate (gpm/ft^2) 180 ea Head loss ± 10

Type controls — Condition fair (some leaks)

Comments Regen. @ .048 MG — Bulk salt tank w/ day tank inside WTP

Other treatment (Describe): Phosphate - B.I.F. feed pump (2 gal/50 gal H_2O) (ORTHO PO_4 1.0 mg/l)

Process wastewater treatment (Describe): discharge to san. sewer

6) REMARKS AND RECOMMENDATIONS: ① Valves leaking at [illegible] ② To be [illegible] [illegible] [illegible]

DEPARTMENT OF HUMAN RESOURCES DOC. NO.: CLEJ-00242-1.02-04/16/86
DIVISION OF HEALTH SERVICES
"WELL INFORMATION"

WELL NO. ______ ID NO. ______

1) WELL SITE: Owned or controlled (100' radius)? OK - ALL wells

Sources of pollution/distance SITES CONTROLLED by USMC

Adequate slope? ______ Flooding? ______

2) WELL HOUSE: Free of stored materials? yes

Properly drained? ______ Freeze protection? ______

Condition of house OK Locked? yes

3) WELL: Diameter VARIES Type const. gravel Yield (GPM) 111 → 236 Storage at well NO

Total 9 Properly sealed? yes Properly vented? ______

6 wells Casing depth ______ Well depth ______ Meter Available? ______

(3 wells EMER. ONLY) Concrete slab adequate? ______ Size ______

Size of blow-off ______ Sample tap available Aux opng @ 2 wells

4) PUMP: Capacity MIN 111 MAX gpm 236 AVG 141 Type pump VERT TURB.

Height above floor (pump/casing) — High Service Pumps 1200 gpm (w/aux pwr) 750 gpm; 850 gpm; 500 gpm

5) TREATMENT: Is this a central treatment facility? yes (1 of 8)

Chlorinator: Type W&T gas Capacity OPERATING 18 / 50 ppd In Service? yes

Spare parts or unit? SPARE UNIT Proper ventilation? yes Gas Mask? AIR pack; Repair kit & Alert.

Aerator: Type NONE Condition ______

Filter(s): Type PRESSURE No. 6 Media SAND

Size 84" Ø Rate (~~gpm/ft²~~) 127 gpm ea Head loss ±5-10 lbs

Type controls ______ Condition ______

Comments BACKWASHED daily - Access openings in filter sides

Softeners: Type SPIRACTOR No. 1 Media SAND-catalyst

Size 1.0 MGD Rate (gpm/ft²) — Head loss —

Type ~~controls~~ Hydrated lime - BAGS Condition MIXER MOTOR NOISY

Comments ______

Other treatment (Describe): NaF - in line softener before SATURATOR - METER ON fill line W&T 747 pump

Process Wastewater treatment (Describe): disch. to SAN. SWR

5) REMARKS AND RECOMMENDATIONS [illegible]

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
WELL INFORMATION

WELL NO. _____ ID NO. _____

1) WELL SITE: Owned or controlled (100' radius)? OK - ALL Wells

Sources of pollution/distance none - controlled by USMC

Adequate slope? _____ Flooding? _____

2) WELL HOUSE: Free of stored materials? yes

Properly drained? _____ Freeze protection? yes

Condition of house OK Locked? yes

3) WELL: Diameter varies Type const. gravel Yield (GPM) varies Storage at well _____

Properly sealed? _____ ~~Properly vented~~ → TOTAL 756 gpm

4 wells Casing depth _____ Well depth _____ Meter Available? yes

Concrete slab adequate? _____ Hwy drive @ 2 wells

Size of blow-off _____ Sample tap available yes

4) PUMP: Capacity Min 104 Max gpm 300 Avg HP 189 Type pump VERT TURB (high service in WTP)

Height above floor (pump/casing) _____ Is pump leaking? _____

5) TREATMENT: Is this a central treatment facility? yes (one of eight)

Chlorinator: Type WT gas (150# cyl) Capacity 18/100 ppd In Service? yes (manifold system)

Spare parts or unit? spare @ 30 ppd Proper ventilation? yes Gas Mask? AIR PACK; alert; Repair Kit

Aerator: Type Permutit forced draft Condition fan OK - detention tank @ unit

Filter(s): Type Pressure (Permutit No. 3 Media SAND

Size 96" Ø Rate (gpm/ft²) 134 gpm ea Head loss 5 #

Type controls Multiports Condition OK - all controls NOT AUTOMATIC

Comments B/W - ea 3rd day

Softeners: Type Permutit No. 2 Media Na Zeolite

Size 60" Ø Rate (gpm/ft²) 128 gpm ea Head loss 5-8 #

Type controls multiport Condition OK

Comments Regenerate @ 1100 hrs, BRINE day TANK INSIDE WTP

Other treatment (Describe): Lime feed for pH control & Fe reduction

Process wastewater treatment (Describe): disch. to SAN. SWR

6) REMARKS AND RECOMMENDATIONS _____

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
DOC. NO.: ELET-00242-1.02-04/16/86

WELL NO. _____ *WELL INFORMATION* ID NO. _____

1) WELL SITE: Owned or controlled (100' radius)? OK - ALL WELLS

Sources of pollution/distance CONTROLLED by USMC

Adequate slope? _____ Flooding? _____

2) WELL HOUSE: Free of stored materials? yes

Properly drained? _____ Freeze protection? yes

Condition of house _____ Locked? yes

3) WELL: Diameter VARIES Type const. _____ Yield (GPM) VARIES Storage at well _____

Properly sealed? _____ ~~Property, correct~~ TOTAL 777 gpm

5 wells Casing depth _____ Well depth _____ Meter Available? @ WTP

Concrete slab adequate? _____ Size _____

Size of blow-off _____ Sample tap available yes

4) PUMP: MIN Capacity 104 MAX gpm 260 AVG 155 Type pump VERT TURB

Height above floor (pump/casing) _____ ~~Is pump leaking?~~ hi service pumps 2@500 gpm 1@750 w/aux. drive

TREATMENT: Is this a central treatment facility? yes (one of eight)

Chlorinator: Type W&T Capacity 15/100 ppd In Service? yes

Spare parts or unit? SPARE 100 ppd Proper ventilation? yes Gas Mask? AIR PACK, AKRT, RESPIR RCT

Aerator: Type Permutit forced draft Condition fan OK - detention tank

Filter(s): Type Permutit - Pressure No. 6 Media _____

Size 96" ∅ Rate (gpm/ft²) 94 gpm ea Head loss ±5 #

Type controls Multiport Condition OK

Comments BACKWASHED daily

Softeners: Type Permutit No. 4 Media Na Zeolite

Size 72" ∅ Rate (gpm/ft²) 102 gpm ea Head loss 5 #

Type controls multiport Condition OK

Comments REGENERATED @ 1100 MG

Other treatment (Describe): Lime (Hydrated to slurry & pump-pH control for Fe Reduction)

Process Wastewater treatment (Describe): Phosphate NOT in service
↳ settling pond - discharge to ditch

6) REMARKS AND RECOMMENDATIONS

(1) Brine day tank inside Bldg. should have cover
(2) Lime & POL NOT necessary together (Should perform in plant trials to determine if lime may be discontinued)

DEPARTMENT OF HUMAN RESOURCES
DIVISION OF HEALTH SERVICES
WELL INFORMATION

WELL NO. ____________ ID NO. ____________

1) WELL SITE: Owned or controlled (100' radius)? OK - ALL wells

Sources of pollution/distance CONTROLLED by USMC

Adequate slope? ____________ Flooding? ____________

2) WELL HOUSE: Free of stored materials? yes

Properly drained? ____________ Freeze protection? ____________

Condition of house OK Locked? yes

3) WELL: Diameter VARIES Type const. gRAVEL Yield (GPM) VARIES Storage at well ____________

Properly sealed? ____________ ~~Properly vented?~~ TOTAL 369 gpm

2 wells Casing depth ____________ Well depth ____________ Meter Available? yes

Concrete slab adequate? ____________ ~~Sea~~ Aux @ 1 well

Size of blow-off ____________ Sample tap available yes

4) PUMP: Capacity MAX 210 gpm MIN 159 AVG 185 Type pump VERT TURB

Height above floor (pump/casing) ____________ ~~Is pump sealed?~~ service pumps 1 @ 1000 gpm (w/ Aux drive) 1 @ 750 1 @ 300

5) TREATMENT: Is this a central treatment facility? yes (one of eight)

Chlorinator: Type W&T gas (150#) Capacity 10/30 ppd In Service? yes

Spare parts or unit? spare 1 @ 50 ppd Proper ventilation? yes Gas Mask? AIR PACK; Alert; Repair KIT

Aerator: Type PRESSURIZED - in line unit Condition OK - uses AIR COMPRESSOR

Filter(s): Type Calgon (PRESSURE units) No. 2 Media SAND

Size 48" Ø Rate (gpm/ft²) 37 gpm ea Head loss ± 5#

Type controls Manual cycle Condition OK

Comments Backwashed at .030 MG - Uses Raw water for B/W

Softeners: Type Calgon No. 2 Media Na Zeolite

Size 42" Ø Rate (gpm/ft²) 75 gpm ea Head loss ± 5#

Type controls Manual cycle Condition OK - New Resin in 1977

Comments Regenerated @ .080 MG

Other treatment (Describe): ____________

Process wastewater treatment (Describe): Settling pond - pumped to ditch

6) REMARKS AND RECOMMENDATIONS ① Should use TRTD. WATER for B/W ② Flow pattern s/b changed - now split thru filters & softeners - Should All be thru filters then softener (① extend resin life ② Reduce iron in dist. system)