DUKE ENERGY®

Crystal River Nuclear Plant
15760 W. Power Line Street
Crystal River, FL 34428

Docket 50-302
Operating License No. DPR-72

Environmental Protection Plan
(Non-Radiological)
Technical Specifications
Appendix B – Part II

August 7, 2014
3F0814-03

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – Reporting Related to the National Pollutant Discharge Elimination System (NPDES) Permit ID# FL0000159-014-IW1S

Dear Sir:

Duke Energy Florida, Inc., hereby provides a copy to the Nuclear Regulatory Commission (NRC) of a revision to the NPDES Permit to include operation of the proposed Citrus County Combined Cycle Project and changing the pH monitoring and compliance point for existing Crystal River Unit 3 (CR-3) Outfall I-FG during times when pH water quality-based effluent limits are met in discharge from this internal outfall. This submittal is required by the CR-3 Facility Operating License, Appendix B – Part II, Environmental Protection Plan (Non-Radiological) Technical Specifications, Section 3.2, Reporting Related to the NPDES Permit.

Specifically, Section 3.2.4., states, "The NRC shall be notified of changes to the effective NPDES Permit proposed by the licensee by providing NRC with a copy of the proposed change at the same time it is submitted to the permitting agency."

This letter establishes no regulatory commitments.

If you have any questions regarding this report, please contact Mr. Doug Yowell, Lead Environmental Specialist at (727) 820-5228.

Sincerely,

Blair P. Wunderly
Plant Manager
Crystal River Nuclear Plant

BPW/ff

Attachment: Citrus County Combined Cycle Project – Application for Revision to the Crystal River Energy Complex NPDES Permit (Facility ID: FL0000159)

xc: NRR Project Manager
Regional Administrator, Region I

C001
NRR

DUKE ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50-302 / LICENSE NUMBER DPR-72

REPORTING RELATED TO THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT ID# FL0000159-014-IW1S

ATTACHMENT

CITRUS COUNTY COMBINED CYCLE PROJECT – APPLICATION FOR REVISION TO THE CRYSTAL RIVER ENERGY COMPLEX NPDES PERMIT (FACILITY ID: FL0000159)

AUGUST 2014

10.2.2 NPDES Application/Permits

The Crystal River Energy Complex (CREC) is currently authorized to operate under two National Pollutant Discharge Elimination System (NPDES) permits: No. FL0000159 was issued for Units 1, 2, and 3 (see Appendix 10.6.3), and No. FL0036366 for Units 4 and 5.

For the Citrus Combined Cycle (CCC) Project, Duke Energy Florida, Inc. (DEF), is seeking a revision of the existing NPDES industrial wastewater facility permit No. FL0000159 for CREC Units 1, 2, and 3 to include the CCC Project and associated changes in the facility water balance and wastewater discharge plans. The industrial wastewater facility or activity permit application (Florida Department of Environmental Protection [FDEP] Forms 1 and 2CS) and supporting information for the requested permit revision are provided in this appendix. The permit application has also been submitted separately to the FDEP Industrial Wastewater Section, Power Plant NPDES Permitting.

WASTEWATER FACILITY OR ACTIVITY PERMIT
APPLICATION FORM 1
GENERAL INFORMATION

I IDENTIFICATION NUMBER:

Facility ID FL0000159

II CHARACTERISTICS:

INSTRUCTIONS: Complete the questions below to determine whether you need to submit any permit application forms to the Department of Environmental Protection. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the blank in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements. See Section B of the instructions. See also, Section C of the instructions for definitions of the terms used here.

SPECIFIC QUESTIONS	YES	NO	FORM ATTACHED
A. Is this facility a domestic wastewater facility which results in a discharge to surface or ground waters?		X	
B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters?		X	
C. Does or will this facility (other than those describe in A. or B.) discharge process wastewater, or non-process wastewater regulated by effluent guidelines or new source performance standards, to surface waters?	X		2CS
D. Does or will this facility (other than those described in A. or B.) discharge process wastewater to ground waters?	X		(Separate COC)
E. Does or will this facility discharge non-process wastewater, not regulated by effluent guidelines or new source performance standards, to surface waters?		X	
F. Does or will this facility discharge non-process wastewater to ground waters?	X		(Separate COC)
G. Does or will this facility discharge stormwater associated with industrial activity to surface waters?	X		(Separate MSGP)
H. Is this facility a non-discharging/closed loop recycle system?		X	
I. Is this facility a public water system whose primary purpose is the production of potable water for public consumption and which discharges demineralization concentrate to surface water or groundwater?		X	

III NAME OF FACILITY: (40 characters and spaces)

Crystal River Units 1, 2, 3

Facility ID FL0000159

IV FACILITY CONTACT: (A. 30 characters and spaces)

A. Name and Title (Last, first, & title)	B. Phone (area code & no.)
Yowell, Douglas W.	727-820-5228

V FACILITY MAILING ADDRESS: (A. 30 characters and spaces; B. 25 characters and spaces)

A. Street or P.O. Box: P.O. Box 14042, PEF-903		
B. City or Town: St. Petersburg	State: FL	Zip Code: 33733

VI FACILITY LOCATION: (A. 30 characters and spaces; B. 24 characters and spaces; C. 3 spaces (if known); D. 25 characters and spaces; E. 2 spaces; F. 9 spaces)

A. Street, Route or Other Specific Identifier: 15760 West Power Line Street		
B. County Name: Citrus	C. County Code (if known): 017	
D. City or Town: Crystal River	E. State: FL	F. Zip Code: 34428

VII SIC CODES: (4-digit, in order of priority)

1. Code #: 4911	(Specify) Electric Svc.	2. Code #:	(Specify)
3. Code #:	(Specify)	4. Code #:	(Specify)

VIII OPERATOR INFORMATION: (A. 40 characters and spaces; B. 1 character; C. 1 character (if other, specify); D. 12 characters; E. 30 characters and spaces; F. 25 characters and spaces; G. 2 characters; H. 9 characters)

A. Name: Duke Energy Florida, Inc.		B. Is the name in VIII A. the owner? ☒Yes ☐No	
C. Status of Operator: F = Federal; S = State; P = Private; O = Other; M = Public (other than F or S)	(code) P	(specify) Utility	D. Phone No.: 352-501-5682
E. Street or P. O. Box: 15760 West Power Line Street			
F. City or Town: Crystal River		G. State: FL	H. Zip Code: 34428

IX INDIAN LAND: Is the facility located on Indian lands? ☐ Yes ☒ No

Facility ID FL0000159

X EXISTING ENVIRONMENTAL PERMITS:

A. NPDES Permit No.	B. UIC Permit No.	C. Other (specify)	D. Other (specify)
FL0000159; MSGP FLR05H479	N/A	COC PA 77-09P	FLA118753 - DWW

XI MAP: Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

See Form 2CS; See Narrative and Figures in Attachment I

XII NATURE OF BUSINESS (provide a brief description)

Crystal River Energy Complex is an electrical power generation plant.

The revision is to add the Citrus Combined Cycle (CCC) Project to the existing NPDES Permit FL0000159.

CCC is a two-unit natural gas-fired combined cycle generator.

XIII CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

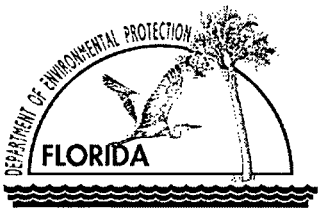
R. Alexander Glenn
A. Name (type or print)

B. Signature

State President Florida
Official Title (type or print)

July 30, 2014
C. Date Signed

FORM
2CS



WASTEWATER APPLICATION FOR PERMIT TO DISCHARGE PROCESS WASTEWATER FROM NEW OR EXISTING INDUSTRIAL WASTEWATER FACILITIES TO SURFACE WATERS

Facility I.D. Number: FL0000159

Please print or type information in the appropriate areas.

I OUTFALL LOCATION For each outfall, list the X,Y coordinates and the name of the receiving water.
(latitude/longitude to the nearest 15 seconds)

A. Outfall No. (List)	B. Latitude			C. Longitude			D. Name of Receiving Water
	Deg.	Min.	Sec.	Deg.	Min.	Sec.	
D-XXX	28	57	33.2	82	41	54.01	To the site discharge canal and thence to the Gulf of Mexico
I-XX1	28	58	7.1	82	40	24.92	Internal Outfall to D-XXX
I-XX2	28	58	7.1	82	40	19.07	Internal Outfall to D-XXX
NA	—	—	—	—	—	—	Intentionally left blank
NA	—	—	—	—	—	—	Intentionally left blank
NA	—	—	—	—	—	—	Intentionally left blank
NA	—	—	—	—	—	—	Intentionally left blank

II OUTFALL DESIGN

A. Outfall No. (List)	B. Design Configuration and Construction Materials	C. Distance from shore	D. Diameter	E. Elevation of Discharge Invert (MSL)	F. Receiving Water Depth at POD (MSL)
D-XXX	Concrete headwall, baffle, and overflow weir that discharges onto a concrete apron and riprap	0	NA	-11.29	-13.29
I-XX1	HDPE or equivalent	NA	30"		Internal Outfall
I-XX2	HDPE or equivalent	NA	30"		Internal Outfall
NA	—	—	—	—	—
NA	—	—	—	—	—
NA	—	—	—	—	—

III RECEIVING WATER INFORMATION

For each surface water that will receive effluent, supply the following information:

A. Name of Receiving Water	B. Check One		C. Classification (See Ch. 62-302, F.A.C.)	D. Type of Receiving Water (canal, river, lake, etc.)
	Fresh	Salt or Brackish		
Crystal Bay/Gulf of Mexico (WBID 8039)	☐	☒	Class II	Gulf
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		
	☐	☐		

E. Minimum 7-day 10-year low flow of the receiving water at each outfall (if appropriate).

NA – tidal waters

F. Identify and describe the flow of effluent from each outfall to a major body of water. A suitably marked map or aerial photograph may be used.

Cooling water will be withdrawn from the existing CREC intake canal, while cooling tower blowdown will be discharged via the existing discharge canal. See Attachment 1, Figures 1 and 2.

G. Do you request a mixing zone under Rule 62-4.244, F.A.C.? If yes, for what parameters or pollutants?

No

IV FLOWS, SOURCES OF POLLUTION, AND TREATMENT TECHNOLOGIES

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Item B. Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

See Attachment 1, Figures 3-5 and supporting narrative in Attachment 2.

B. For each outfall, provide a description of:

1. All operations contributing wastewater to the effluent; including process wastewater, sanitary wastewater, cooling water, and stormwater runoff;

2. The average flow contributed by each operation; and

3. The treatment received by the wastewater.

Use the space on the next page. Continue on additional sheets, if necessary.

(1) Outfall No. (List)	(2) Operation(s) Contributing Flow		(3) Treatment		
	(a) Operation (list)	(b) Avg. Flow & Units	(a) Description	(b) List Code from Table 2CS-1	
D-XXX	Cooling tower discharge	27.4 MGD	Mixing, discharge to surface water	1-O	4-A
	Flow augmentation to reduce chlorides concentrations	54.9 MGD	Flow augmentation to reduce chlorides concentrations	1-O	
I-XX1	Internal Outfall CCC Blowdown #1	13.7 MGD	Disinfection	2-F	
			Dechlorination	2-E	
I-XX2	Internal Outfall CCC Blowdown #2	13.7 MGD	Disinfection	2-F	
			Dechlorination	2-E	

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?
☐ Yes (complete the following table) ☒ No (go to D. below)

(1) Outfall No. (List)	(2)Operation(s) Contributing Flow(List)	(3) Frequency		(4) Flow				
		(a) Days per Week (specify avg.)	(b) Months per Yr. (specify avg.)	(a) Flow Rate (in mgd)		(b) Total Volume (specify with units)		(c) Duration (in days)
				Long Term Avg	Max Daily	Long Term Avg	Max Daily	

D. Describe practices to be followed to ensure adequate wastewater treatment during emergencies such as power loss and equipment failures causing shutdown of pollution abatement equipment of the proposed/permitted facilities.

Power generating facilities are interconnected to the electrical grid, and, therefore have a reliable backup power supply. However, in the unlikely event of complete power loss, the cooling tower circulating water pumps for internal Outfalls I-XX1 and I-XX2 would cease to operate, thereby preventing a discharge to Outfall D-XXX.

E. List the method(s) and location(s) of flow measurement.

Flow from Internal Outfalls I-XX1 and I-XX2 will be measured continuously via bubble-tube type flow meters, ultrasonic level indicator/weir, or equivalent at the blowdown flow point from each cooling tower.

V PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ Yes (complete Item V-B) ☐ No (go to Section VI)

B. Are the limitations in the applicable guideline expressed in terms of production (or other measure of operation)?

☐ Yes (complete Item V-C) ☒ No (go to Section VI)

C. If you answered "yes" to Item V-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. Affected Outfalls
a. Quantity per Day	b. Units of Measure	c. Operation, Product, Materials, Etc. (specify)	(list outfall nos.)
N/A			

VI IMPROVEMENTS

A. Are you now required by any Federal, State or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement order, enforcement compliance schedule letter, stipulations, court orders, and grant or loan conditions.

☒ Yes (complete the following table) ☐ No (go to Item VI-B)

1. Identification of Condition, Agreement, Etc	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	a. No.	b. Source of Discharge		a. Required	B. Projected
See Attachment 2					

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs (or other environmental projects which may affect your discharges) you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ Mark "X" if description of additional control programs is attached.

VII INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding--Complete one set of tables for each outfall -- Annotate the outfall number in the space provided. NOTE: Tables VII-A, VII-B, and VII-C are included on separate sheets number VII-1 through VII-9.

See Attachment 2 for narrative on intake and effluent characteristics and Attachment 3 for Antidegradation Demonstration.

D. Use the space below to list any of the pollutants listed in Table 2CS-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. Pollutant	2. Source	1. Pollutant	2. Source
N/A			

VIII POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item VII-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or by-product?

☐ YES (list all such pollutants below) ☒ NO (go to IX)

IX BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☒ YES (identify the test(s) and describe their purposes below) ☐ NO (go to Section X)

Acute and/or chronic WET testing performed in conjunction with treatment of the Unit 3 heat decay system using Betz CT 1300

Testing performed by Hydrosphere Research, 11842 Research Circle, Alachua, Florida 32615.

FL-NELAP Cert. # EE82295

In addition, chronic WET testing has been performed on cooling tower blowdown for Units 4 and 5 (NPDES No. FL0036366)

X CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item VII performed by a contract laboratory or consulting firm?

☒ YES (list the name, address, telephone number, and certification number of, and pollutants analyzed by each such laboratory or firm below) ☐ NO (go to Section XI)

A. Name	B. Address	C. Telephone (area code & no.)	D. Pollutants Analyzed (list)
Pace Analytical Services, Inc. FL DOH No E83079	8 East Tower Circle, Ormond Beach, FL 32174	(386) 672 5668	All parameters (excluding fecal coliform, low-level mercury, and rads.)
Pace Analytical Services, Inc. FL DOH No. E84973	1209 Tech Blvd., Suite 207 Tampa, FL 33619	(813) 627-0003	Fecal coliform
Pace Analytical Services, Inc. FL DOH No. E87683	1638 Roseytown Road, Suite 2-3-4 Greensburg, PA 15601	(724) 850-5600	Gross alpha, gross beta, Total Ra and Ra 226
Pace Analytical Services, Inc. FL DOH No. E87948	1241 Bellevue Street, Suite 9 Green Bay, WI 54302	(920) 469-2436	Low-level mercury

Facility I.D. Number: FL0000159

XI CONNECTION TO REGIONAL POTW

A. Indicate the relationship between this project and area regional planning for wastewater treatment. List steps to be taken for this industrial wastewater facility to become part of an area-wide wastewater treatment system.

N/A

XII-A CERTIFICATIONS FOR NEW OR MODIFIED FACILITIES

This is to certify the engineering features of this pollution control project have been designed by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned, if authorized by the owner, will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

IVAN B. CHOU LICENSE No. 30688 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signature

Ivan B. Chou

Name (please type)

Environmental Consulting & Technology, Inc.

Company Name

Address 3701 Northwest 98th Street

Gainesville, Florida 32606

Florida Registration No.: 30688

Telephone No:: (352) 332 - 0444

Date August 1, 2014

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

R. Alexander Glenn, State President Florida

Name & Official Title (Please type or print)

(727) 820 - 5587

Telephone No. (area code & No.)

Signature

July 30, 2014

Date Signed

XII-B CERTIFICATIONS FOR PERMIT RENEWALS

This is to certify the engineering features of this pollution control project have been examined by me and found to be in conformity with sound engineering principles, applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules of the Department.

Not applicable.

Signature	Company Name
	Address
Name (please type)	
(Affix Seal)	Florida Registration No.:
	Telephone No::
	Date

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name & Official Title (Please type or print)	Signature
Telephone No. (area code & No.)	Date Signed

Facility ID. Number: FL0000159 Outfall No. Intake

PLEASE PRINT OR TYPE ONLY: You may report some or all of this information on separate sheets instead of completing these pages. Use the same format. SEE INSTRUCTIONS.

VII. INTAKE AND EFFLUENT CHARACTERISTICS

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1 Pollutant	2 Effluent							3 Units		4 Intake (optional)		
	a Max Daily Value		b Max 30-day Value		c Annual Avg Value		d No of Analyses	a Concentration	b Mass	a Long Term Avg Value		b No of Analyses
	(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Carbonaceous Biochemical Oxygen Demand (CBOD)	< 2						1	mg/L				
b Chemical Oxygen Demand (COD)	1420						1	mg/L				
c Total Organic Carbon (TOC)	8 2						1	mg/L				
d Total Suspended Solids (TSS)	16 0						1	mg/L				
e Total Nitrogen (as N)	1 4				1 01		4	mg/L				
f Total Phosphorus (as P)	0 11				0 061		4	mg/L				
g Ammonia (as N)	< 0 02						1	mg/L				
h Flow - actual or projected	Value		Value		Value					Value		
i Flow - design	Value		Value		Value					Value		
j Specific Conductivity	Value 34,733		Value		Value		1	umhos/cm		Value		
k Temperature (winter)	Value		Value		Value			°C		Value		
l Temperature (summer)	Value		Value		Value			°C		Value		
m pH	Min 7 52	Max 8 50	Min	Max			49	STANDARD UNITS				

PART B - Mark "X" in column 2a for each pollutant you know or have reason to believe is present. Mark "X" in column 2b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge Complete one table for each outfall. See the instructions for additonal details and requirements

1 Pollutant and CAS No (if available)	2 Mark "X"		3 Effluent						4 Units		5 Intake (optional)		
	a believed present	b believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
			(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Bromide (24959-67-9)	☒	☐	37 4						1	mg/L				
b Chlorine, Total Residual	☒	☐	< 0.1						1	mg/L				
c Color	☒	☐	45 0						1	PCU				
d Fecal Coliform	☒	☐	< 2						1	CFU/100 mL				
e Fluoride (16984-48-8)	☒	☐	< 5 0						1	mg/L				
f Nitrate-Nitrite (as N)	☒	☐	0 900				0.313		4	mg/L				

: Item VII-B Contd. Facility ID. Number FL0000159 Outfall No. Intake

1 Pollutant and CAS No (if available)	2 Mark "X" a believed present	2 Mark "X" b believed absent	3 Effluent a Maximum Daily Value (1) Conc	3 Effluent a Maximum Daily Value (2) Mass	3 Effluent b Max 30-day Value (if available) (1) Conc	3 Effluent b Max 30-day Value (if available) (2) Mass	3 Effluent c Long Term Avg Value (if available) (1) Conc	3 Effluent c Long Term Avg Value (if available) (2) Mass	3 Effluent d No of Analyses	4 Units a Conc	4 Units b Mass	5 Intake (optional) a Long Term Avg Value (1) Conc	5 Intake (optional) a Long Term Avg Value (2) Mass	5 Intake (optional) b No of Analyses
g Nitrogen, Total Organic (as N)	☒	☐	0.74						1	mg/L				
h Oil and grease	☒	☐	< 1.3						1	mg/L				
i Phosphorus, Total (as P) (7723-14-0)	☒	☐	0.11				0.061		4	mg/L				
j Radioactivity														
(1) Alpha, Total	☒	☐	3.72 (+/- 1.84)						1	pCi/L				
(2) Beta, Total	☒	☐							1	pCi/L				
(3) Radium, Total	☒	☐	< 1.68 (+/- 0.985)						1	pCi/L				
(4) Radium 226, Total	☒	☐	< 0.95 (+/- 0.624)						1	pCi/L				
k Sulfate (as SO_4) (14808-79-8)	☒	☐	1,600						1	mg/L				
l Sulfide (as S)	☒	☐	< 1.0						1	mg/L				
m Sulfite (as SO_3) (14265-45-3)	☒	☐	< 10						1	mg/L				
n Surfactants	☒	☐	0.38						1	mg/L				
o Aluminum, Total (7429-90-5)	☒	☐	0.094 (I)						1	mg/L				
p Barium, Total (7440-39-3)	☒	☐	0.012						1	mg/L				
q Boron, Total (7440-42-8)	☒	☐	3.3						1	mg/L				
r Cobalt, Total (7440-48-4)	☒	☐	< 0.005						1	mg/L				
s Iron, Total (7439-89-6)	☒	☐	0.16						1	mg/L				
t Maagnesium, Total (7439-95-4)	☒	☐	898.0						1	mg/L				
u Molybdenum, Total (7439-98-7)	☒	☐	0.0074 (I)						1	mg/L				
v Manganese, Total (7439-96-5)	☒	☐	< 0.0125						1	mg/L				
w Tin, Total (7440-31-5)	☒	☐	< 0.025						1	mg/L				
x Titanium, Total (7440-32-6)	☒	☐	< 0.025						1	mg/L				

Facility ID. Number: FL0000159 Outfall No. Intake

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2a for all GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols If you are not required to mark column 2a (secondary industries, non-process wastewater outfalls, and non-required GC/MS fractions), mark "X" in column 2b for each pollutant you know or have reason to believe is present. Mark "X" in column 2c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one anlysis for that pollutnat if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4,dinitrophenol, or 2-methyl-4,6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M Antimony, Total (7440-36-0)	☒	☒	☐	< 5.0						1	ug/L				
2M Arsenic, Total (7723-14-0)	☒	☒	☐	< 5.0						1	ug/L				
3M Beryllium, Total (7440-41-7)	☒	☒	☐	< 0.25						1	ug/L				
4M Cadmium, Total (7440-43-9)	☒	☒	☐	< 0.50						1	ug/L				
5M Chromium, Total (7440-47-3)	☒	☒	☐	< 2.5						1	ug/L				
6M Copper, Total (7440-50-8)	☒	☒	☐	< 4 6						1	ug/L				
7M Lead, Total (7439-92-1)	☒	☒	☐	< 2.5						1	ug/L				
8M Mercury, Total (7439-97-6)	☒	☒	☐	0.000911						1	ug/L				
9M Nickel, Total (7440-02-0)	☒	☒	☐	< 2.5						1	ug/L				
10M Selenium, Total (7782-49-2)	☒	☒	☐	< 7.5						1	ug/L				
11M Silver, Total (7440-22-4)	☒	☒	☐	< 0.25						1	ug/L				
12M Thallium, Total (7440-28-0)	☒	☒	☐	< 2.5						1	ug/L				
13M Zinc, Total (7440-66-6)	☒	☒	☐	< 10.0						1	ug/L				
14M Cyanide, Total (57-12-5)	☒	☒	☐	< 5 0						1	ug/L				
15M Phenols, Total	☒	☒	☐	< 5 0						1	ug/L				
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☒												
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V Acrolein (107-02-8)	☒	☒	☐	< 10.0						1	ug/L				
2V Acrylonitrile (107-13-1)	☒	☒	☐	< 5.0						1	ug/L				

Facility ID. Number: FL0000159 Outfall No. Intake

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
3V Benzene (71-43-2)	☒	☒	☐	< 0.50						1	ug/L				
4V Bis (Chloromethyl) Ether (542-88-1)	☒	☒	☐												
5V Bromoform (75-25-2)	☒	☒	☐	< 0.50						1	ug/L				
6V Carbon Tetrachloride (56-23-5)	☒	☒	☐	< 0.50						1	ug/L				
7V Chlorobenzene (108-90-7)	☒	☒	☐	< 0.40						1	ug/L				
8V Chlorodi-bromomethane (124-8-1)	☒	☒	☐	< 0.25						1	ug/L				
9V Chloroethane (74-00-3)	☒	☒	☐	< 0 61						1	ug/L				
10V 2-Chloro-ethylvinyl Ether (110-75-8)	☒	☒	☐	< 5.0						1	ug/L				
11V Chloroform (67-86-3)	☒	☒	☐	< 0.50						1	ug/L				
12V Dichloro-bromomethane (75-24-4)	☒	☒	☐	< 0.30						1	ug/L				
13V Dichloro-difluoromethane (75-71-8)	☒	☒	☐	< 0.50						1	ug/L				
14V 1,1-Dichloroethane (75-34-3)	☒	☒	☐	< 0.50						1	ug/L				
15V 1,2-Dichloroethane (107-06-2)	☒	☒	☐	< 0.50						1	ug/L				
16V 1,1-Dichloroethylene (75-35-4)	☒	☒	☐	< 0.50						1	ug/L				
17V 1,2,-Dichloropropane (78-87-5)	☒	☒	☐	< 0.50						1	ug/L				
18V 1,3-Dichloropropylene (542-75-6)	☒	☒	☐	< 0.50						1	ug/L				
19V Ethylbenzene (100-41-4)	☒	☒	☐	< 0.50						1	ug/L				
20V Methyl Bromide (74-83-9)	☒	☒	☐	< 0.50						1	ug/L				
21V Methyl Chloride (74-87-3)	☒	☒	☐	< 0.50						1	ug/L				
22V Methylene Chloride (74-98-2)	☒	☒	☐	< 2.5						1	ug/L				
23V 1,1,2,2-Tetra-chloroethane (79-34-5)	☒	☒	☐	< 0.17						1	ug/L				
24V Tetrachloroethylene (127-18-4)	☒	☒	☐	< 0.50						1	ug/L				

Facility ID. Number: FL0000159 Outfall No. Intake

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
25V Toluene (108-88-3)	☒	☒	☐	< 0.50						1	ug/L				
26V 1,2-Trans-Dichloroethylene (156-60-5)	☒	☒	☐	< 0.50						1	ug/L				
27V 1,1,2-Trichloroethane (71-55-6)	☒	☒	☐	< 0.50						1	ug/L				
28V 1,1,2-Trichloroethane (7940-5)	☒	☒	☐	< 0.50						1	ug/L				
29V Trichloroethylene (79-01-6)	☒	☒	☐	< 0.50						1	ug/L				
30V Trichloro-fluoromethane (75-69-4)	☒	☒	☐	< 0.66						1	ug/L				
31V Vinyl Chloride (75-01-4)	☒	☒	☐	< 0.53						1	ug/L				
GC/MS FRACTION - ACID COMPOUNDS															
1A 2-Chlorophenol (95-57-8)	☒	☒	☐	< 0.78						1	ug/L				
2A 2,4-Dichlorophenol (120-83-2)	☒	☒	☐	< 0.64						1	ug/L				
3A 2,4-Dimethylphenol (105-67-9)	☒	☒	☐	< 1.8						1	ug/L				
4A 4,6-Dinitro-O-Cresol (534-53-1)	☒	☒	☐	< 1.5						1	ug/L				
5A 2,4-Dinitrophenol (51-28-5)	☒	☒	☐	< 1.8						1	ug/L				
6A 2-Nitrophenol (88-75-5)	☒	☒	☐	< 0.93						1	ug/L				
7A 4-Nitrophenol (100-02-7)	☒	☒	☐	< 1.2						1	ug/L				
8A P-Chloro-M-Cresol (59-50-7)	☒	☒	☐	< 0.71						1	ug/L				
9A Pentachlorophenol (87-86-5)	☒	☒	☐	< 0.76						1	ug/L				
10A Phenol (108-95-2)	☒	☒	☐	< 0.62						1	ug/L				
11A 2,4,5-Trichloro-phenol (88-06-2)	☒	☒	☐	< 0.79						1	ug/L				
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B Acenaphthene (63-32-9)	☒	☒	☐	< 0.018						1	ug/L				
2B Acenaphtylene (208-96-8)	☒	☒	☐	< 0.017						1	ug/L				
3B Anthracene (120-12-7)	☒	☒	☐	< 0.018						1	ug/L				
4B Benzidine (92-87-5)	☒	☒	☐	< 0.88						1	ug/L				

Facility ID. Number: FL0000159 Outfall No. Intake

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent						4 Units		5 Intake (optional)			
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
5B Benzo *(a)* Anthracene (56-55-3)	☒	☒	☐	< 0.013						1	ug/L				
6B Benzo *(a)* Pyrene (50-32-8)	☒	☒	☐	< 0.021						1	ug/L				
7B 3,4-Benzo-fluoranthene (205-99-2)	☒	☒	☐	< 0.016						1	ug/L				
8B Benzo *(ghi)* Perylene (191-24-2)	☒	☒	☐	< 0.016						1	ug/L				
9B Benzo *(k)* Fluoranthene (207-08-9)	☒	☒	☐	< 0.022						1	ug/L				
10B Bis *(2-Chloroethoxy)* Methane (111-91-1)	☒	☒	☐	< 3.4						1	ug/L				
11B Bis *(2-chloroethyl)* Ether (111-44-4)	☒	☒	☐	< 0.86						1	ug/L				
12B Bis *(2-Chloroisopropyl)* Ether (102-60-1)	☒	☒	☐	< 0.84						1	ug/L				
13B Bis *(2-Ethylhexyl)* Phthalate (117-81-7)	☒	☒	☐	< 0.92						1	ug/L				
14B 4-Bromophenyl Phenyl Ether (101-55-3)	☒	☒	☐	< 0.77						1	ug/L				
15B Butyl Benzyl Phthalate (84-68-7)	☒	☒	☐	< 0.83						1	ug/L				
16B 2-Chloronaphthalene (91-58-7)	☒	☒	☐	< 0.92						1	ug/L				
17B 4-Chlorophenyl Phenyl Ether (7005-72-3)	☒	☒	☐	< 0.72						1	ug/L				
18B Chrysene (218-01-9)	☒	☒	☐	< 0.015						1	ug/L				
19B Dibenzo *(a,h)* Anthracene (53-70-3)	☒	☒	☐	< 0.018						1	ug/L				
20B 1,2-Dichlorobenzene (95-50-1)	☒	☒	☐	< 0.78						1	ug/L				
21B 1,3-Dichlorobenzene (541-73-1)	☒	☒	☐	< 0.87						1	ug/L				
22B 1,4-Dichlorobenzene (106-46-7)	☒	☒	☐	< 0.88						1	ug/L				
23B 3,3'-Dichlorobenzidine (92-94-1)	☒	☒	☐	< 0.79						1	ug/L				
24B Diethyl Phthalate (84-66-2)	☒	☒	☐	< 0.59						1	ug/L				
25B Dimethyl Phthalate (131-11-3)	☒	☒	☐	< 0.73						1	ug/L				
26B Di-N-Butyl Phthalate (84-74-2)	☒	☒	☐	< 0.47						1	ug/L				
27B 2,4-Dinitrotoluene (121-14-2)	☒	☒	☐	< 0.61						1	ug/L				
28B 2,6-Dinitrotoluene (606-20-2)	☒	☒	☐	< 0.73						1	ug/L				

Facility ID. Number: FL0000159 Outfall No. Intake

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
29B Di-N-Octyl Phthalate (117-84-0)	☒	☒	☐	< 1 0						1	ug/L				
30B 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	☒	☒	☐	< 0 76						1	ug/L				
31B Fluoranthene (206-44-0)	☒	☒	☐	< 0.012						1	ug/L				
32B Fluorene (86-73-7)	☒	☒	☐	< 0 011						1	ug/L				
33B Hexachlorobenzene (118-74-1)	☒	☒	☐	< 0.92						1	ug/L				
34B Hexachlorobutadiene (87-68-3)	☒	☒	☐	< 1.2						1	ug/L				
35B Hexachlorocyclopentadiene (77-47-4)	☒	☒	☐	< 1.5						1	ug/L				
36B Hexachloroethane (67-72-1)	☒	☒	☐	< 0.82						1	ug/L				
37B Indeno (*1,2,3-cd*) Pyrene (193-39-5)	☒	☒	☐	< 0.018						1	ug/L				
38B Isophorone (78-59-1)	☒	☒	☐	< 0 84						1	ug/L				
39B Naphthalene (91-20-3)	☒	☒	☐	< 0.015						1	ug/L				
40B Nitrobenzene (98-95-9)	☒	☒	☐	< 1.3						1	ug/L				
41B N-Nitrosodimethylamine (62-75-9)	☒	☒	☐	< 1.1						1	ug/L				
42B N-Nitrosodi-N-Propylamine (621-64-7)	☒	☒	☐	< 1.1						1	ug/L				
43B N-Nitro-sodiphenylamine (86-30-6)	☒	☒	☐	< 0.57						1	ug/L				
44B Phenanthrene (85-01-8)	☒	☒	☐	< 0.016						1	ug/L				
45B Pyrene (129-00-0)	☒	☒	☐	0.0097						1	ug/L				
46B 1,2,4-Trichlorobenzene (120-82-1)	☒	☒	☐	< 0.95						1	ug/L				
GC/MS FRACTION - PESTICIDES															
1P Aldrin (309-00-2)	☐	☐	☒												
2P -BHC (319-84-6)	☐	☐	☒												
3P -BHC (319-85-7)	☐	☐	☒												
4P -BHC (58-89-9)	☐	☐	☒												
5P -BHC (319-86-8)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. Intake

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
6P Chlordane (57-74-9)	☐	☐	☒												
7P 4,4'-DDT (50-29-3)	☐	☐	☒												
8P 4,4'-DDE (72-55-9)	☐	☐	☒												
9P 4,4'-DDD (72-54-8)	☐	☐	☒												
10P Dieldrin (60-57-1)	☐	☐	☒												
11P -Endosulfan (115-29-7)	☐	☐	☒												
12P -Endosulfan (115-29-7)	☐	☐	☒												
13P Endosulfan Sulfate (1031-07-8)	☐	☐	☒												
14P Endrin (72-20-8)	☐	☐	☒												
15P Endrin Aldehyde (7421-92-4)	☐	☐	☒												
16P Heptachlor (76-44-8)	☐	☐	☒												
17P Heptachlor Epoxide (1024-57-3)	☐	☐	☒												
18P PCB-1242 (53469-21-9)	☐	☐	☒												
19P PCB-1254 (11097-69-1)	☐	☐	☒												
20P PCB-1221 (11104-28-2)	☐	☐	☒												
21P PCB-1232 (11141-16-5)	☐	☐	☒												
22P PCB-1248 (12672-29-6)	☐	☐	☒												
23P PCB-1260 (11096-82-5)	☐	☐	☒												
24P PCB-1016 (12674-11-2)	☐	☐	☒												
25P Toxaphene (8001-35-2)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. D-XXX

PLEASE PRINT OR TYPE ONLY: You may report some or all of this information on separate sheets instead of completing these pages. Use the same format.
SEE INSTRUCTIONS.

VII. INTAKE AND EFFLUENT CHARACTERISTICS

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1 Pollutant	2 Effluent							3 Units		4 Intake (optional)		
	a Max Daily Value		b Max 30-day Value		c Annual Avg Value		d No of Analyses	a Concentration	b Mass	a Long Term Avg Value		b No of Analyses
	(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Carbonaceous Biochemical Oxygen Demand (CBOD)	<2						1	mg/L				
b Chemical Oxygen Demand (COD)	1000 04						1	mg/L				
c Total Organic Carbon (TOC)	6 97						1	mg/L				
d Total Suspended Solids (TSS)	28 67						1	mg/L				
e Total Nitrogen (as N)	1 15						1	mg/L				
f Total Phosphorus (as P)	0 08						1	mg/L				
g Ammonia (as N)	0 02						1	mg/L				
h Flow - actual or projected	Value		Value 109 3 (Projected - see Narrative Fig 4)		Value 82 3 (Projected – see Narrative Fig 3)			MGD		Value		
i Flow - design	Value		Value		Value					Value		
j Specific Conductivity	Value 38088 31		Value		Value		1	umhos/cm		Value		
k Temperature (winter)	Value		Value		Value			°C		Value		
l Temperature (summer)	Value 35 3		Value		Value 25 2		calculated	°C		Value		
m pH	Min 8	Max 8	Min	Max				STANDARD UNITS				

PART B - Mark "X" in column 2a for each pollutant you know or have reason to believe is present. Mark "X" in column 2b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge Complete one table for each outfall See the instructions for additonal details and requirements.

1 Pollutant and CAS No (if available)	2 Mark "X"		3 Effluent							4 Units		5 Intake (optional)		
	a believed present	b believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
			(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Bromide (24959-67-9)	☒	☐	40.60						1	mg/L				
b Chlorine, Total Residual	☒	☐	0.07						1	mg/L				
c Color	☒	☐	31.67						1	PCU				
d Fecal Coliform	☒	☐	<1.67						1	CFU/100 mL				
e Fluoride (16984-48-8)	☒	☐	3.60						1	mg/L				
f Nitrate-Nitrite (as N)	☒	☐	0.32						1	mg/L				

: Item VII-B Contd.

Facility ID. Number FL0000159 Outfall No. D-XXX

1 Pollutant and CAS No (if available)	2 Mark "X"		3 Effluent							4 Units		5 Intake (optional)		
	a believed present	b believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
			(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
g Nitrogen, Total Organic (as N)	☒	☐	0.22						1	mg/L				
h Oil and grease	☒	☐	0.43						1	mg/L				
i Phosphorus, Total (as P) (7723-14-0)	☒	☐	0 05						1	mg/L				
j Radioactivity														
(1) Alpha, Total	☒	☐	3.51						1	pCi/L				
(2) Beta, Total	☒	☐	73.33						1	pCi/L				
(3) Radium, Total	☒	☐	1.45						1	pCi/L				
(4) Radium 226, Total	☒	☐	0.97						1	pCi/L				
k Sulfate (as SO_4) (14808-79-8)	☒	☐	1866 64						1	mg/L				
l Sulfide (as S)	☒	☐	<0.70						1	mg/L				
m Sulfite (as SO_3) (14265-45-3)	☒	☐	<7.33						1	mg/L				
n Surfactants	☒	☐	0.32						1	mg/L				
o Aluminum, Total (7429-90-5)	☒	☐	0.08						1	mg/L				
p Barium, Total (7440-39-3)	☒	☐	0 01						1	mg/L				
q Boron, Total (7440-42-8)	☒	☐	2 22						1	mg/L				
r Cobalt, Total (7440-48-4)	☒	☐	0.01						1	mg/L				
s Iron, Total (7439-89-6)	☒	☐	0 16						1	mg/L				
t Maagnesium, Total (7439-95-4)	☒	☐	1065.32						1	mg/L				
u Molybdenum, Total (7439-98-7)	☒	☐	0.03						1	mg/L				
v Manganese, Total (7439-96-5)	☒	☐	<0.01						1	mg/L				
w Tin, Total (7440-31-5)	☒	☐	0.58						1	mg/L				
x Titanium, Total (7440-32-6)	☒	☐	<0.02						1	mg/L				

Facility ID. Number: FL0000159 Outfall No. D-XXX

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2a for all GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2a (secondary industries, non-process wastewater outfalls, and non-required GC/MS fractions), mark "X" in column 2b for each pollutant you know or have reason to believe is present. Mark "X" in column 2c for each pollutant you believe is absent If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one anlysis for that pollutnat if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4,dinitrophenol, or 2-methyl-4,6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M Antimony, Total (7440-36-0)	☒	☒	☐	<3.33						1	µg/L				
2M Arsenic, Total (7723-14-0)	☒	☒	☐	<3.33						1	µg/L				
3M Beryllium, Total (7440-41-7)	☒	☒	☐	<0.17						1	µg/L				
4M Cadmium, Total (7440-43-9)	☒	☒	☐	<0.33						1	µg/L				
5M Chromium, Total (7440-47-3)	☒	☒	☐	<1.67						1	µg/L				
6M Copper, Total (7440-50-8)	☒	☒	☐	3.07						1	µg/L				
7M Lead, Total (7439-92-1)	☒	☒	☐	<1.67						1	µg/L				
8M Mercury, Total (7439-97-6)	☒	☒	☐	0.0012						1	µg/L				
9M Nickel, Total (7440-02-0)	☒	☒	☐	<1.67						1	µg/L				
10M Selenium, Total (7782-49-2)	☒	☒	☐	<5.00						1	µg/L				
11M Silver, Total (7440-22-4)	☒	☒	☐	<0.17						1	µg/L				
12M Thallium, Total (7440-28-0)	☒	☒	☐	<1.67						1	µg/L				
13M Zinc, Total (7440-66-6)	☒	☒	☐	<6.67						1	µg/L				
14M Cyanide, Total (57-12-5)	☒	☒	☐	<3.34						1	µg/L				
15M Phenols, Total	☒	☒	☐	<3.34						1	µg/L				
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☒												
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V Acrolein (107-02-8)	☒	☒	☐	<6.88						1	µg/L				
2V Acrylonitrile (107-13-1)	☒	☒	☐	<3.87						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. D-XXX

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
3V Benzene (71-43-2)	☒	☒	☐	<0.37						1	µg/L				
4V Bis (Chloromethyl) Ether (542-88-1)	☒	☒	☐												
5V Bromoform (75-25-2)	☒	☒	☐	<0.97						1	µg/L				
6V Carbon Tetrachloride (56-23-5)	☒	☒	☐	<0.41						1	µg/L				
7V Chlorobenzene (108-90-7)	☒	☒	☐	<0.28						1	µg/L				
8V Chlorodi-bromomethane (124-8-1)	☒	☒	☐	<0.22						1	µg/L				
9V Chloroethane (74-00-3)	☒	☒	☐	<0.54						1	µg/L				
10V 2-Chloro-ethylvinyl Ether (110-75-8)	☒	☒	☐	<3.46						1	µg/L				
11V Chloroform (67-86-3)	☒	☒	☐	<0.38						1	µg/L				
12V Dichloro-bromomethane (75-24-4)	☒	☒	☐	<0.24						1	µg/L				
13V Dichloro-difluoromethane (75-71-8)	☒	☒	☐	<0.58						1	µg/L				
14V 1,1-Dichloroethane (75-34-3)	☒	☒	☐	<0.37						1	µg/L				
15V 1,2-Dichloroethane (107-06-2)	☒	☒	☐	<0.37						1	µg/L				
16V 1,1-Dichloroethylene (75-35-4)	☒	☒	☐	<0.38						1	µg/L				
17V 1,2,-Dichloropropane (78-87-5)	☒	☒	☐	<0.35						1	µg/L				
18V 1,3-Dichloropropylene (542-75-6)	☒	☒	☐	<0.38						1	µg/L				
19V Ethylbenzene (100-41-4)	☒	☒	☐	<0.38						1	µg/L				
20V Methyl Bromide (74-83-9)	☒	☒	☐	<0.53						1	µg/L				
21V Methyl Chloride (74-87-3)	☒	☒	☐	<0.49						1	µg/L				
22V Methylene Chloride (74-98-2)	☒	☑	☐	<1.71						1	µg/L				
23V 1,1,2,2-Tetra-chloroethane (79-34-5)	☒	☒	☐	<0.15						1	µg/L				
24V Tetrachloroethylene (127-18-4)	☒	☒	☐	<0.39						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. D-XXX

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION : VOLATILE COMPOUNDS (continued)															
25V Toluene (108-88-3)	☒	☒	☐	<0.37						1	µg/L				
26V 1,2-Trans-Dichloroethylene (156-60-5)	☒	☒	☐	<0.43						1	µg/L				
27V 1,1,2-Trichloroethane (71-55-6)	☒	☒	☐	<0.36						1	µg/L				
28V 1,1,2-Trichloroethane (79-00-5)	☒	☒	☐	<0.41						1	µg/L				
29V Trichloroethylene (79-01-6)	☒	☒	☐	<0.37						1	µg/L				
30V Trichloro-fluoromethane (75-69-4)	☒	☒	☐	<0.51						1	µg/L				
31V Vinyl Chloride (75-01-4)	☒	☒	☐	<0.48						1	µg/L				
GC/MS FRACTION - ACID COMPOUNDS															
1A 2-Chlorophenol (95-57-8)	☒	☒	☐	<0.85						1	µg/L				
2A 2,4-Dichlorophenol (120-83-2)	☒	☒	☐	<0.76						1	µg/L				
3A 2,4-Dimethylphenol (105-67-9)	☒	☒	☐	<1.53						1	µg/L				
4A 4,6-Dinitro-O-Cresol (534-53-1)	☒	☒	☐	<2.00						1	µg/L				
5A 2,4-Dinitrophenol (51-28-5)	☒	☒	☐	<6.20						1	µg/L				
6A 2-Nitrophenol (88-75-5)	☒	☒	☐	<0.95						1	µg/L				
7A 4-Nitrophenol (100-02-7)	☒	☒	☐	<5.80						1	µg/L				
8A P-Chloro-M-Cresol (59-50-7)	☒	☒	☐	<0.81						1	µg/L				
9A Pentachlorophenol (87-86-5)	☒	☒	☐	<1.51						1	µg/L				
10A Phenol (108-95-2)	☒	☒	☐	<0.75						1	µg/L				
11A 2,4,5-Trichloro-phenol (88-06-2)	☒	☒	☐	<1.19						1	µg/L				
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B Acenaphthene (63-32-9)	☒	☒	☐	<0.35						1	µg/L				
2B Acenaphtylene (208-96-8)	☒	☒	☐	<0.34						1	µg/L				
3B Anthracene (120-12-7)	☒	☒	☐	<0.35						1	µg/L				
4B Benzidine (92-87-5)	☒	☒	☐	<33.92						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. D-XXX

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
5B Benzo *(a)* Anthracene (56-55-3)	☒	☒	☐	<0 34						1	µg/L				
6B Benzo *(a)* Pyrene (50-32-8)	☒	☒	☐	<0 35						1	µg/L				
7B 3,4-Benzo-fluoranthene (205-99-2)	☒	☒	☐	<0 34						1	µg/L				
8B Benzo *(ghi)* Perylene (191-24-2)	☒	☒	☐	<0 34						1	µg/L				
9B Benzo *(k)* Fluoranthene (207-08-9)	☒	☒	☐	<0 35						1	µg/L				
10B Bis *(2-Chloroethoxy)* Methane (111-91-1)	☒	☒	☐	<2.60						1	µg/L				
11B Bis *(2-chloroethyl)* Ether (111-44-4)	☒	☒	☐	<1 57						1	µg/L				
12B Bis *(2-Chloroisopropyl)* Ether (102-60-1)	☒	☒	☐	<0.89						1	µg/L				
13B Bis *(2-Ethylhexyl)* Phthalate (117-81-7)	☒	☒	☐	<1.61						1	µg/L				
14B 4-Bromophenyl Phenyl Ether (101-55-3)	☒	☒	☐	<0.85						1	µg/L				
15B Butyl Benzyl Phthalate (84-68-7)	☒	☒	☐	<1 55						1	µg/L				
16B 2-Chloronaphthalene (91-58-7)	☒	☒	☐	<0 95						1	µg/L				
17B 4-Chlorophenyl Phenyl Ether (7005-72-3)	☒	☒	☐	<1 15						1	µg/L				
18B Chrysene (218-01-9)	☒	☒	☐	<0 34						1	µg/L				
19B Dibenzo *(a,h)* Anthracene (53-70-3)	☒	☒	☐	<0 35						1	µg/L				
20B 1,2-Dichlorobenzene (95-50-1)	☒	☒	☐	<0.85						1	µg/L				
21B 1,3-Dichlorobenzene (541-73-1)	☒	☒	☐	<0 91						1	µg/L				
22B 1,4-Dichlorobenzene (106-46-7)	☒	☒	☐	<0 92						1	µg/L				
23B 3,3'-Dichlorobenzidine (92-94-1)	☒	☒	☐	<13.86						1	µg/L				
24B Diethyl Phthalate (84-66-2)	☒	☒	☐	<0.73						1	µg/L				
25B Dimethyl Phthalate (131-11-3)	☒	☒	☐	<2 15						1	µg/L				
26B Di-N-Butyl Phthalate (84-74-2)	☒	☒	☐	<1 98						1	µg/L				
27B 2,4-Dinitrotoluene (121-14-2)	☒	☒	☐	<0.74						1	µg/L				
28B 2,6-Dinitrotoluene (606-20-2)	☒	☒	☐	<1 15						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. D-XXX

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
29B Di-N-Octyl Phthalate (117-84-0)	☒	☒	☐	<1.00						1	µg/L				
30B 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	☒	☒	☐	<1.17						1	µg/L				
31B Fluoranthene (206-44-0)	☒	☒	☐	<0.34						1	µg/L				
32B Fluorene (86-73-7)	☒	☒	☐	<0.34						1	µg/L				
33B Hexachlorobenzene (118-74-1)	☒	☒	☐	<0.95						1	µg/L				
34B Hexachlorobutadiene (87-68-3)	☒	☒	☐	<1.80						1	µg/L				
35B Hexachlorocyclopentadiene (77-47-4)	☒	☒	☐	<2.00						1	µg/L				
36B Hexachloroethane (67-72-1)	☒	☒	☐	<1.55						1	µg/L				
37B Indeno (1,2,3-cd) Pyrene (193-39-5)	☒	☒	☐	<0.35						1	µg/L				
38B Isophorone (78-59-1)	☒	☒	☐	<0.89						1	µg/L				
39B Naphthalene (91-20-3)	☒	☒	☐	<0.34						1	µg/L				
40B Nitrobenzene (98-95-9)	☒	☒	☐	<1.53						1	µg/L				
41B N-Nitrosodimethylamine (62-75-9)	☒	☒	☐	<1.73						1	µg/L				
42B N-Nitrosodi-N-Propylamine (621-64-7)	☒	☒	☐	<1.73						1	µg/L				
43B N-Nitrosodiphenylamine (86-30-6)	☒	☒	☐	<1.38						1	µg/L				
44B Phenanthrene (85-01-8)	☒	☒	☐	<0.34						1	µg/L				
45B Pyrene (129-00-0)	☒	☒	☐	<0.34						1	µg/L				
46B 1,2,4-Trichlorobenzene (120-82-1)	☒	☒	☐	<0.97						1	µg/L				
GC/MS FRACTION - PESTICIDES															
1P Aldrin (309-00-2)	☐	☐	☒												
2P -BHC (319-84-6)	☐	☐	☒												
3P -BHC (319-85-7)	☐	☐	☒												
4P -BHC (58-89-9)	☐	☐	☒												
5P -BHC (319-86-8)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. D-XXX

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
6P Chlordane (57-74-9)	☐	☐	☒												
7P 4,4'-DDT (50-29-3)	☐	☐	☒												
8P 4,4'-DDE (72-55-9)	☐	☐	☒												
9P 4,4'-DDD (72-54-8)	☐	☐	☒												
10P Dieldrin (60-57-1)	☐	☐	☒												
11P -Endosulfan (115-29-7)	☐	☐	☒												
12P -Endosulfan (115-29-7)	☐	☐	☒												
13P Endosulfan Sulfate (1031-07-8)	☐	☐	☒												
14P Endrin (72-20-8)	☐	☐	☒												
15P Endrin Aldehyde (7421-92-4)	☐	☐	☒												
16P Heptachlor (76-44-8)	☐	☐	☒												
17P Heptachlor Epoxide (1024-57-3)	☐	☐	☒												
18P PCB-1242 (53469-21-9)	☐	☐	☒												
19P PCB-1254 (11097-69-1)	☐	☐	☒												
20P PCB-1221 (11104-28-2)	☐	☐	☒												
21P PCB-1232 (11141-16-5)	☐	☐	☒												
22P PCB-1248 (12672-29-6)	☐	☐	☒												
23P PCB-1260 (11096-82-5)	☐	☐	☒												
24P PCB-1016 (12674-11-2)	☐	☐	☒												
25P Toxaphene (8001-35-2)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. I-XX1

PLEASE PRINT OR TYPE ONLY: You may report some or all of this information on separate sheets instead of completing these pages. Use the same format. SEE INSTRUCTIONS.

VII. INTAKE AND EFFLUENT CHARACTERISTICS

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1 Pollutant	2 Effluent							3 Units		4 Intake (optional)		
	a Max Daily Value		b Max 30-day Value		c Annual Avg Value		d No of Analyses	a Concentration	b Mass	a Long Term Avg Value		b No of Analyses
	(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Carbonaceous Biochemical Oxygen Demand (CBOD)	<2						1	mg/L				
b Chemical Oxygen Demand (COD)	160						1	mg/L				
c Total Organic Carbon (TOC)	4 5						1	mg/L				
d Total Suspended Solids (TSS)	54						1	mg/L				
e Total Nitrogen (as N)	0 66						1	mg/L				
f Total Phosphorus (as P)	0 018(J)						1	mg/L				
g Ammonia (as N)	<0 01						1	mg/L				
h Flow - actual or projected	Value 13 71		Value		Value			MGD		Value		
i Flow - design	Value		Value		Value					Value		
j Specific Conductivity	Value 44800		Value		Value		1	umhos/cm		Value		
k Temperature (winter)	Value		Value		Value			°C		Value		
l Temperature (summer)	Value 35 9		Value		Value 28 2		calculated	°C		Value		
m pH	Min 8	Max 8	Min	Max				STANDARD UNITS				

PART B - Mark "X" in column 2a for each pollutant you know or have reason to believe is present. Mark "X" in column 2b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall See the instructions for additonal details and requirements

1 Pollutant and CAS No (if available)	2 Mark "X"		3 Effluent							4 Units		5 Intake (optional)		
	a believed present	b believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
			(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Bromide (24959-67-9)	☒	☐	47						1	mg/L				
b Chlorine, Total Residual	☒	☐	<0.01						1	mg/L				
c Color	☒	☐	5						1	PCU				
d Fecal Coliform	☒	☐	<1						1	CFU/100 mL				
e Fluoride (16984-48-8)	☒	☐	0.8						1	mg/L				
f Nitrate-Nitrite (as N)	☒	☐	0.33 (J)						1	mg/L				

: Item VII-B Contd. Facility ID. Number FL0000159 Outfall No. I-XX1

1 Pollutant and CAS No (if available)	2 Mark "X"		3 Effluent							4 Units		5 Intake (optional)		
	a believed present	b believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
			(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
g Nitrogen, Total Organic (as N)	☒	☐	0.66						1	mg/L				
h Oil and grease	☒	☐	<1.3						1	mg/L				
i Phosphorus, Total (as P) (7723-14-0)	☒	☐	0.018 (I)						1	mg/L				
j Radioactivity														
(1) Alpha, Total	☒	☐	3.1						1	pCi/L				
(2) Beta, Total	☒	☐	220						1	pCi/L				
(3) Radium, Total	☒	☐	1						1	pCi/L				
(4) Radium 226, Total	☒	☐	1						1	pCi/L				
k Sulfate (as SO_4) (14808-79-8)	☒	☐	2400						1	mg/L				
l Sulfide (as S)	☒	☐	<0.1						1	mg/L				
m Sulfite (as SO_3) (14265-45-3)	☒	☐	<2						1	mg/L				
n Surfactants	☒	☐	0.209						1	mg/L				
o Aluminum, Total (7429-90-5)	☒	☐	<0.05						1	mg/L				
p Barium, Total (7440-39-3)	☒	☐	0.02						1	mg/L				
q Boron, Total (7440-42-8)	☒	☐	<0.05						1	mg/L				
r Cobalt, Total (7440-48-4)	☒	☐	0.019 (I)						1	mg/L				
s Iron, Total (7439-89-6)	☒	☐	0.15						1	mg/L				
t Magnesium, Total (7439-95-4)	☒	☐	1400						1	mg/L				
u Molybdenum, Total (7439-98-7)	☒	☐	0.071						1	mg/L				
v Manganese, Total (7439-96-5)	☒	☐	<0.001						1	mg/L				
w Tin, Total (7440-31-5)	☒	☐	1.7						1	mg/L				
x Titanium, Total (7440-32-6)	☒	☐	<0.01						1	mg/L				

Facility ID. Number: FL0000159 Outfall No. I-XX1

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2a for all GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2a (secondary industries, non-process wastewater outfalls, and non-required GC/MS fractions), mark "X" in column 2b for each pollutant you know or have reason to believe is present. Mark "X" in column 2c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one anlysis for that pollutnat if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4,dinitrophenol, or 2-methyl-4,6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements.

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M Antimony, Total (7440-36-0)	☒	☒	☐	0.0031 (I)						1	µg/L				
2M Arsenic, Total (7723-14-0)	☒	☒	☐	0.0021 (I)						1	µg/L				
3M Beryllium, Total (7440-41-7)	☒	☒	☐	<0.0001						1	µg/L				
4M Cadmium, Total (7440-43-9)	☒	☒	☐	<0.001						1	µg/L				
5M Chromium, Total (7440-47-3)	☒	☒	☐	<0.004						1	µg/L				
6M Copper, Total (7440-50-8)	☒	☒	☐	0.0025 (I)						1	µg/L				
7M Lead, Total (7439-92-1)	☒	☒	☐	<0.005						1	µg/L				
8M Mercury, Total (7439-97-6)	☒	☒	☐	0.0017						1	µg/L				
9M Nickel, Total (7440-02-0)	☒	☒	☐	0.0029 (I)						1	µg/L				
10M Selenium, Total (7782-49-2)	☒	☒	☐	0.014						1	µg/L				
11M Silver, Total (7440-22-4)	☒	☒	☐	0.013						1	µg/L				
12M Thallium, Total (7440-28-0)	☒	☒	☐	0.0016 (I)						1	µg/L				
13M Zinc, Total (7440-66-6)	☒	☒	☐	0.019						1	µg/L				
14M Cyanide, Total (57-12-5)	☒	☒	☐	<0.005						1	µg/L				
15M Phenols, Total	☒	☒	☐	0.006 (I)						1	µg/L				
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☒												
GC/MS FRACTION - VOLATILE COMPOUNDS															
1V Acrolein (107-02-8)	☒	☒	☐	<0.63						1	µg/L				
2V Acrylonitrile (107-13-1)	☒	☒	☐	<1.6						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. I-XX1

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
3V Benzene (71-43-2)	☒	☒	☐	<0.10						1	µg/L				
4V Bis (Chloromethyl) Ether (542-88-1)	☒	☒	☐												
5V Bromoform (75-25-2)	☒	☒	☐	1.9						1	µg/L				
6V Carbon Tetrachloride (56-23-5)	☒	☒	☐	<0.22						1	µg/L				
7V Chlorobenzene (108-90-7)	☒	☒	☐	<0.04						1	µg/L				
8V Chlorodi-bromomethane (124-8-1)	☒	☒	☐	<0.15						1	µg/L				
9V Chloroethane (74-00-3)	☒	☒	☐	<0.39						1	µg/L				
10V 2-Chloro-ethylvinyl Ether (110-75-8)	☒	☒	☐	<0.39						1	µg/L				
11V Chloroform (67-66-3)	☒	☒	☐	<0.14						1	µg/L				
12V Dichloro-bromomethane (75-24-4)	☒	☒	☐	<0.13						1	µg/L				
13V Dichloro-difluoromethane (75-71-8)	☒	☒	☐	<0.74						1	µg/L				
14V 1,1-Dichloroethane (75-34-3)	☒	☒	☐	<0.12						1	µg/L				
15V 1,2-Dichloroethane (107-06-2)	☒	☒	☐	<0.12						1	µg/L				
16V 1,1-Dichloroethylene (75-35-4)	☒	☒	☐	<0.14						1	µg/L				
17V 1,2,-Dichloropropane (78-87-5)	☒	☒	☐	<0.06						1	µg/L				
18V 1,3-Dichloropropylene (542-75-6)	☒	☒	☐	<0.14						1	µg/L				
19V Ethylbenzene (100-41-4)	☒	☒	☐	<0.13						1	µg/L				
20V Methyl Bromide (74-83-9)	☒	☒	☐	<0.58						1	µg/L				
21V Methyl Chloride (74-87-3)	☒	☒	☐	<0.47						1	µg/L				
22V Methylene Chloride (74-98-2)	☒	☒	☐	<0.13						1	µg/L				
23V 1,1,2,2-Tetra-chloroethane (79-34-5)	☒	☒	☐	<0.12						1	µg/L				
24V Tetrachloroethylene (127-18-4)	☒	☒	☐	<0.16						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. I-XX1

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
25V Toluene (108-88-3)	☒	☒	☐	<0.10						1	µg/L				
26V 1,2-Trans-Dichloroethylene (156-60-5)	☒	☒	☐	<0.30						1	µg/L				
27V 1,1,2-Trichloroethane (71-55-6)	☒	☒	☐	<0.09						1	µg/L				
28V 1,1,2-Trichloroethane (79-00-5)	☒	☒	☐	<0.23						1	µg/L				
29V Trichloroethylene (79-01-6)	☒	☒	☐	<0.12						1	µg/L				
30V Trichloro-fluoromethane (75-69-4)	☒	☒	☐	<0.21						1	µg/L				
31V Vinyl Chloride (75-01-4)	☒	☒	☐	<0.38						1	µg/L				
GC/MS FRACTION - ACID COMPOUNDS															
1A 2-Chlorophenol (95-57-8)	☒	☒	☐	<1						1	µg/L				
2A 2,4-Dichlorophenol (120-83-2)	☒	☒	☐	<1						1	µg/L				
3A 2,4-Dimethylphenol (105-67-9)	☒	☒	☐	<1						1	µg/L				
4A 4,6-Dinitro-O-Cresol (534-53-1)	☒	☒	☐	<3						1	µg/L				
5A 2,4-Dinitrophenol (51-28-5)	☒	☒	☐	<15						1	µg/L				
6A 2-Nitrophenol (88-75-5)	☒	☒	☐	<1						1	µg/L				
7A 4-Nitrophenol (100-02-7)	☒	☒	☐	<15						1	µg/L				
8A P-Chloro-M-Cresol (59-50-7)	☒	☒	☐	<1						1	µg/L				
9A Pentachlorophenol (87-86-5)	☒	☒	☐	<3						1	µg/L				
10A Phenol (108-95-2)	☒	☒	☐	<1						1	µg/L				
11A 2,4,5-Trichloro-phenol (88-06-2)	☒	☒	☐	<2						1	µg/L				
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B Acenaphthene (83-32-9)	☒	☒	☐	< 1						1	µg/L				
2B Acenaphtylene (208-96-8)	☒	☒	☐	< 1						1	µg/L				
3B Anthracene (120-12-7)	☒	☒	☐	< 1						1	µg/L				
4B Benzidine (92-87-5)	☒	☒	☐	< 100						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. 1-XX1

1. Pollutant and CAS No. (if available)	2. Mark "X"			3. Effluent							4. Units		5. Intake (optional)		
	a. testing required	b. believed present	c. believed absent	a. Maximum Daily Value		b. Max. 30-day Value (if available)		c. Long Term Avg. Value (if available)		d. No. of Analyses	a. Conc.	b. Mass	a. Long Term Avg. Value		b. No. of Analyses
				(1) Conc.	(2) Mass	(1) Conc.	(2) Mass	(1) Conc.	(2) Mass				(1) Conc.	(2) Mass	
5B Benzo *(a)* Anthracene (56-55-3)	☒	☒	☐	<1						1	µg/L				
6B Benzo *(a)* Pyrene (50-32-8)	☒	☒	☐	<1						1	µg/L				
7B 3,4-Benzo-fluoranthene (205-99-2)	☒	☒	☐	< 1						1	µg/L				
8B Benzo *(ghi)* Perylene (191-24-2)	☒	☒	☐	< 1						1	µg/L				
9B Benzo *(k)* Fluoranthene (207-08-9)	☒	☒	☐	<1						1	µg/L				
10B Bis *(2-Chloroethoxy)* Methane (111-91-1)	☒	☒	☐	< 1						1	µg/L				
11B Bis *(2-chloroethyl)* Ether (111-44-4)	☒	☒	☐	<3						1	µg/L				
12B Bis *(2-Chloroisopropyl)* Ether (102-60-1)	☒	☒	☐	< 1						1	µg/L				
13B Bis *(2-Ethylhexyl)* Phthalate (117-81-7)	☒	☒	☐	<3						1	µg/L				
14B 4-Bromophenyl Phenyl Ether (101-55-3)	☒	☒	☐	< 1						1	µg/L				
15B Butyl Benzyl Phthalate (84-68-7)	☒	☒	☐	<3						1	µg/L				
16B 2-Chloronaphthalene (91-58-7)	☒	☒	☐	< 1						1	µg/L				
17B 4-Chlorophenyl Phenyl Ether (7005-72-3)	☒	☒	☐	<2						1	µg/L				
18B Chrysene (218-01-9)	☒	☒	☐	< 1						1	µg/L				
19B Dibenzo *(a,h)* Anthracene (53-70-3)	☒	☒	☐	< 1						1	µg/L				
20B 1,2-Dichlorobenzene (95-50-1)	☒	☒	☐	< 1						1	µg/L				
21B 1,3-Dichlorobenzene (541-73-1)	☒	☒	☐	< 1						1	µg/L				
22B 1,4-Dichlorobenzene (106-46-7)	☒	☒	☐	< 1						1	µg/L				
23B 3,3'-Dichlorobenzidine (92-94-1)	☒	☒	☐	<40						1	µg/L				
24B Diethyl Phthalate (84-66-2)	☒	☒	☐	<1						1	µg/L				
25B Dimethyl Phthalate (131-11-3)	☒	☒	☐	<5						1	µg/L				
26B Di-N-Butyl Phthalate (84-74-2)	☒	☒	☐	<5						1	µg/L				
27B 2,4-Dinitrotoluene (121-14-2)	☒	☒	☐	< 1						1	µg/L				
28B 2,6-Dinitrotoluene (606-20-2)	☒	☒	☐	<2						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. I-XX1

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
29B Di-N-Octyl Phthalate (117-84-0)	☒	☒	☐	<1						1	µg/L				
30B 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	☒	☒	☐	<2						1	µg/L				
31B Fluoranthene (206-44-0)	☒	☒	☐	<1						1	µg/L				
32B Fluorene (86-73-7)	☒	☒	☐	<1						1	µg/L				
33B Hexachlorobenzene (118-74-1)	☒	☒	☐	<1						1	µg/L				
34B Hexachlorobutadiene (87-68-3)	☒	☒	☐	<3						1	µg/L				
35B Hexachlorocyclopentadiene (77-47-4)	☒	☒	☐	<3						1	µg/L				
36B Hexachloroethane (67-72-1)	☒	☒	☐	<3						1	µg/L				
37B Indeno (1,2,3-cd) Pyrene (193-39-5)	☒	☒	☐	<1						1	µg/L				
38B Isophorone (78-59-1)	☒	☒	☐	<1						1	µg/L				
39B Naphthalene (91-20-3)	☒	☒	☐	<1						1	µg/L				
40B Nitrobenzene (98-95-9)	☒	☒	☐	<2						1	µg/L				
41B N-Nitrosodimethylamine (62-75-9)	☒	☒	☐	<3						1	µg/L				
42B N-Nitrosodi-N-Propylamine (621-64-7)	☒	☒	☐	<3						1	µg/L				
43B N-Nitro-sodiphenylamine (86-30-6)	☒	☒	☐	<3						1	µg/L				
44B Phenanthrene (85-01-8)	☒	☒	☐	<1						1	µg/L				
45B Pyrene (129-00-0)	☒	☒	☐	<1						1	µg/L				
46B 1,2,4-Trichlorobenzene (120-82-1)	☒	☒	☐	<1						1	µg/L				
GC/MS FRACTION - PESTICIDES															
1P Aldrin (309-00-2)	☐	☐	☒												
2P -BHC (319-84-6)	☐	☐	☒												
3P -BHC (319-85-7)	☐	☐	☒												
4P -BHC (58-89-9)	☐	☐	☒												
5P -BHC (319-86-8)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. I-XX1

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
6P Chlordane (57-74-9)	☐	☐	☒												
7P 4,4'-DDT (50-29-3)	☐	☐	☒												
8P 4,4'-DDE (72-55-9)	☐	☐	☒												
9P 4,4'-DDD (72-54-8)	☐	☐	☒												
10P Dieldrin (60-57-1)	☐	☐	☒												
11P -Endosulfan (115-29-7)	☐	☐	☒												
12P -Endosulfan (115-29-7)	☐	☐	☒												
13P Endosulfan Sulfate (1031-07-8)	☐	☐	☒												
14P Endrin (72-20-8)	☐	☐	☒												
15P Endrin Aldehyde (7421-92-4)	☐	☐	☒												
16P Heptachlor (76-44-8)	☐	☐	☒												
17P Heptachlor Epoxide (1024-57-3)	☐	☐	☒												
18P PCB-1242 (53469-21-9)	☐	☐	☒												
19P PCB-1254 (11097-69-1)	☐	☐	☒												
20P PCB-1221 (11104-28-2)	☐	☐	☒												
21P PCB-1232 (11141-16-5)	☐	☐	☒												
22P PCB-1248 (12672-29-6)	☐	☐	☒												
23P PCB-1260 (11096-82-5)	☐	☐	☒												
24P PCB-1016 (12674-11-2)	☐	☐	☒												
25P Toxaphene (8001-35-2)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. I-XX2

PLEASE PRINT OR TYPE ONLY: You may report some or all of this information on separate sheets instead of completing these pages. Use the same format. SEE INSTRUCTIONS.

VII. INTAKE AND EFFLUENT CHARACTERISTICS

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1 Pollutant	2 Effluent							3 Units		4 Intake (optional)		
	a Max Daily Value		b Max 30-day Value		c Annual Avg Value		d No of Analyses	a Concentration	b Mass	a Long Term Avg Value		b No of Analyses
	(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Carbonaceous Biochemical Oxygen Demand (CBOD)	<2						1	mg/L				
b Chemical Oxygen Demand (COD)	160						1	mg/L				
c Total Organic Carbon (TOC)	4.5						1	mg/L				
d Total Suspended Solids (TSS)	54						1	mg/L				
e Total Nitrogen (as N)	0.66						1	mg/L				
f Total Phosphorus (as P)	0.018(I)						1	mg/L				
g Ammonia (as N)	<0.01						1	mg/L				
h Flow - actual or projected	Value 13.71		Value		Value					Value		mg/L
i Flow - design	Value		Value		Value					Value		mg/L
j Specific Conductivity	Value 44800		Value		Value		1	umhos/cm		Value		mg/L
k Temperature (winter)	Value		Value		Value			°C		Value		
l Temperature (summer)	Value 35.9		Value		Value 28.2		calculated	°C		Value		
m pH	Min 8	Max 8	Min	Max				STANDARD UNITS				

PART B - Mark "X" in column 2a for each pollutant you know or have reason to believe is present. Mark "X" in column 2b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitations guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1 Pollutant and CAS No (if available)	2 Mark "X"		3 Effluent							4 Units		5 Intake (optional)		
	a believed present	b believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
			(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
a Bromide (24959-67-9)	☒	☐	47						1	mg/L				
b Chlorine, Total Residual	☒	☐	<0.01						1	mg/L				
c Color	☒	☐	5						1	PCU				
d Fecal Coliform	☒	☐	<1						1	CFU/100 ml				
e Fluoride (16984-48-8)	☒	☐	0.8						1	mg/L				
f Nitrate-Nitrite (as N)	☒	☐	0.33 (I)						1	mg/L				

: Item VII-B Contd. Facility ID. Number FL0000159 Outfall No. I-XX2

1 Pollutant and CAS No (if available)	2 Mark "X"		3 Effluent							4 Units		5 Intake (optional)		
	a believed present	b believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
			(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
g Nitrogen, Total Organic (as N)	☒	☐	0.66						1	mg/L				
h Oil and grease	☒	☐	<1 3						1	mg/L				
i Phosphorus, Total (as P) (7723-14-0)	☒	☐	0.018 (1)						1	mg/L				
j Radioactivity														
(1) Alpha, Total	☒	☐	3.1						1	pCi/L				
(2) Beta, Total	☒	☐	220						1	pCi/L				
(3) Radium, Total	☒	☐	1						1	pCi/L				
(4) Radium 226, Total	☒	☐	1						1	pCi/L				
k Sulfate (as SO_4) (14808-79-8)	☒	☐	2400						1	mg/L				
l Sulfide (as S)	☒	☐	<0.1						1	mg/L				
m Sulfite (as SO_3) (14265-45-3)	☒	☐	<2						1	mg/L				
n Surfactants	☒	☐	0.209						1	mg/L				
o Aluminum, Total (7429-90-5)	☒	☐	<0.05						1	mg/L				
p Barium, Total (7440-39-3)	☒	☐	0.02						1	mg/L				
q Boron, Total (7440-42-8)	☒	☐	<0.05						1	mg/L				
r Cobalt, Total (7440-48-4)	☒	☐	0.019 (1)						1	mg/L				
s Iron, Total (7439-89-6)	☒	☐	0.15						1	mg/L				
t Maagnesium, Total (7439-95-4)	☒	☐	1400						1	mg/L				
u Molybdenum, Total (7439-98-7)	☒	☐	0.071						1	mg/L				
v Manganese, Total (7439-96-5)	☒	☐	<0.001						1	mg/L				
w Tin, Total (7440-31-5)	☒	☐	1.7						1	mg/L				
x Titanium, Total (7440-32-6)	☒	☐	<0.01						1	mg/L				

Facility ID. Number: FL0000159 Outfall No. I-XX2

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2a for all GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols If you are not required to mark column 2a (secondary industries, non-process wastewater outfalls, and non-required GC/MS fractions), mark "X" in column 2b for each pollutant you know or have reason to believe is present. Mark "X" in column 2c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one anlysis for that pollutnat if you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4,dinitrophenol, or 2-methyl-4,6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table (all 7 pages) for each outfall. See instructions for additional details and requirements

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
METALS, CYANIDE, AND TOTAL PHENOLS															
1M Antimony, Total (7440-36-0)	☒	☒	☐	0.0031 (I)						1	µg/L				
2M Arsenic, Total (7723-14-0)	☒	☒	☐	0 0021 (I)						1	µg/L				
3M Beryllium, Total (7440-41-7)	☒	☒	☐	<0.0001						1	µg/L				
4M Cadmium, Total (7440-43-9)	☒	☒	☐	<0.001						1	µg/L				
5M Chromium, Total (7440-47-3)	☒	☒	☐	<0 004						1	µg/L				
6M Copper, Total (7440-50-8)	☒	☒	☐	0.0025 (I)						1	µg/L				
7M Lead, Total (7439-92-1)	☒	☒	☐	<0.005						1	µg/L				
8M Mercury, Total (7439-97-6)	☒	☒	☐	0 0017						1	µg/L				
9M Nickel, Total (7440-02-0)	☒	☒	☐	0 0029 (I)						1	µg/L				
10M Selenium, Total (7782-49-2)	☒	☒	☐	0.014						1	µg/L				
11M Silver, Total (7440-22-4)	☒	☒	☐	0.013						1	µg/L				
12M Thallium, Total (7440-28-0)	☒	☒	☐	0 0016 (I)						1	µg/L				
13M Zinc, Total (7440-66-6)	☒	☒	☐	0 019						1	µg/L				
14M Cyanide, Total (57-12-5)	☒	☒	☐	<0.005						1	µg/L				
15M Phenols, Total	☒	☒	☐	0.006 (I)						1	µg/L				
DIOXIN															
2,3,7,8-Tetra-chlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☒												
GC/MS FRACTION-VOLATILE COMPOUNDS															
1V Acrolein (107-02-8)	☒	☒	☐	<0.63						1	µg/L				
2V Acrylonitrile (107-13-1)	☒	☒	☐	<1.6						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. I-XX2

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
3V Benzene (71-43-2)	☒	☒	☐	<0.10						1	µg/L				
4V Bis (Chloromethyl) Ether (542-88-1)	☒	☒	☐												
5V Bromoform (75-25-2)	☒	☒	☐	1.9						1	µg/L				
6V Carbon Tetrachloride (56-23-5)	☒	☒	☐	<0.22						1	µg/L				
7V Chlorobenzene (108-90-7)	☒	☒	☐	<0.04						1	µg/L				
8V Chlorodi-bromomethane (124-8-1)	☒	☒	☐	<0.15						1	µg/L				
9V Chloroethane (74-00-3)	☒	☒	☐	<0.39						1	µg/L				
10V 2-Chloro-ethylvinyl Ether (110-75-8)	☒	☒	☐	<0.39						1	µg/L				
11V Chloroform (67-86-3)	☒	☒	☐	<0.14						1	µg/L				
12V Dichloro-bromomethane (75-24-4)	☒	☒	☐	<0.13						1	µg/L				
13V Dichloro-difluoromethane (75-71-8)	☒	☒	☐	<0.74						1	µg/L				
14V 1,1-Dichloroethane (75-34-3)	☒	☒	☐	<0.12						1	µg/L				
15V 1,2-Dichloroethane (107-06-2)	☒	☒	☐	<0.12						1	µg/L				
16V 1,1-Dichloroethylene (75-35-4)	☒	☒	☐	<0.14						1	µg/L				
17V 1,2,-Dichloropropane (78-87-5)	☒	☒	☐	<0.06						1	µg/L				
18V 1,3-Dichloropropylene (542-75-6)	☒	☒	☐	<0.14						1	µg/L				
19V Ethylbenzene (100-41-4)	☒	☒	☐	<0.13						1	µg/L				
20V Methyl Bromide (74-83-9)	☒	☒	☐	<0.58						1	µg/L				
21V Methyl Chloride (74-87-3)	☒	☒	☐	<0.47						1	µg/L				
22V Methylene Chloride (74-98-2)	☒	☒	☐	<0.13						1	µg/L				
23V 1,1,2,2-Tetra-chloroethane (79-34-5)	☒	☒	☐	<0.12						1	µg/L				
24V Tetrachloroethylene (127-18-4)	☒	☒	☐	<0.16						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. I-XX2

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
GC/MS FRACTION - VOLATILE COMPOUNDS (continued)															
25V Toluene (108-88-3)	☒	☒	☐	<0.10						1	µg/L				
26V 1,2-Trans-Dichloroethylene (156-60-5)	☒	☒	☐	<0.30						1	µg/L				
27V 1,1,2-Trichloroethane (71-55-6)	☒	☒	☐	<0.09						1	µg/L				
28V 1,1,2-Trichloroethane (79400-5)	☒	☒	☐	<0.23						1	µg/L				
29V Trichloroethylene (79-01-6)	☒	☒	☐	<0.12						1	µg/L				
30V Trichloro-fluoromethane (75-69-4)	☒	☒	☐	<0.21						1	µg/L				
31V Vinyl Chloride (75-01-4)	☒	☒	☐	<0.38						1	µg/L				
GC/MS FRACTION - ACID COMPOUNDS															
1A 2-Chlorophenol (95-57-8)	☒	☒	☐	<1						1	µg/L				
2A 2,4-Dichlorophenol (120-83-2)	☒	☒	☐	<1						1	µg/L				
3A 2,4-Dimethylphenol (105-67-9)	☒	☒	☐	<1						1	µg/L				
4A 4,6-Dinitro-O-Cresol (534-53-1)	☒	☒	☐	<3						1	µg/L				
5A 2,4-Dinitrophenol (51-28-5)	☒	☒	☐	<15						1	µg/L				
6A 2-Nitrophenol (88-75-5)	☒	☒	☐	<1						1	µg/L				
7A 4-Nitrophenol (100-02-7)	☒	☒	☐	<15						1	µg/L				
8A P-Chloro-M-Cresol (59-50-7)	☒	☒	☐	<1						1	µg/L				
9A Pentachlorophenol (87-86-5)	☒	☒	☐	<3						1	µg/L				
10A Phenol (108-95-2)	☒	☒	☐	<1						1	µg/L				
11A 2,4,5-Trichloro-phenol (88-06-2)	☒	☒	☐	<2						1	µg/L				
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B Acenaphthene (63-32-9)	☒	☒	☐	< 1						1	µg/L				
2B Acenaphtylene (208-96-8)	☒	☒	☐	< 1						1	µg/L				
3B Anthracene (120-12-7)	☒	☒	☐	< 1						1	µg/L				
4B Benzidine (92-87-5)	☒	☒	☐	< 100						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. 1-XX2

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
5B Benzo *(a)* Anthracene (56-55-3)	☒	☒	☐	<1						1	µg/L				
6B Benzo *(a)* Pyrene (50-32-8)	☒	☒	☐	<1						1	µg/L				
7B 3,4-Benzo-fluoranthene (205-99-2)	☒	☒	☐	< 1						1	µg/L				
8B Benzo *(ghi)* Perylene (191-24-2)	☒	☒	☐	< 1						1	µg/L				
9B Benzo *(k)* Fluoranthene (207-18-9)	☒	☒	☐	<1						1	µg/L				
10B Bis *(2-Chloroethoxy)* Methane (111-91-1)	☒	☒	☐	< 1						1	µg/L				
11B Bis *(2-chloroethyl)* Ether (111-44-4)	☒	☒	☐	<3						1	µg/L				
12B Bis *(2-Chloroisopropyl)* Ether (102-60-1)	☒	☒	☐	< 1						1	µg/L				
13B Bis *(2-Ethylhexyl)* Phthalate (117-81-7)	☒	☒	☐	<3						1	µg/L				
14B 4-Bromophenyl Phenyl Ether (101-55-3)	☒	☒	☐	< 1						1	µg/L				
15B Butyl Benzyl Phthalate (84-68-7)	☒	☒	☐	<3						1	µg/L				
16B 2-Chloronaphthalene (91-58-7)	☒	☒	☐	< 1						1	µg/L				
17B 4-Chlorophenyl Phenyl Ether (7005-72-3)	☒	☒	☐	<2						1	µg/L				
18B Chrysene (218-01-9)	☒	☒	☐	< 1						1	µg/L				
19B Dibenzo *(a,h)* Anthracene (53-70-3)	☒	☒	☐	< 1						1	µg/L				
20B 1,2-Dichlorobenzene (95-50-1)	☒	☒	☐	< 1						1	µg/L				
21B 1,3-Dichlorobenzene (541-73-1)	☒	☒	☐	< 1						1	µg/L				
22B 1,4-Dichlorobenzene (106-46-7)	☒	☒	☐	< 1						1	µg/L				
23B 3,3'-Dichlorobenzidine (92-94-1)	☒	☒	☐	<40						1	µg/L				
24B Diethyl Phthalate (84-66-2)	☒	☒	☐	<1						1	µg/L				
25B Dimethyl Phthalate (131-11-3)	☒	☒	☐	<5						1	µg/L				
26B Di-N-Butyl Phthalate (84-74-2)	☒	☒	☐	<5						1	µg/L				
27B 2,4-Dinitrotoluene (121-14-2)	☒	☒	☐	< 1						1	µg/L				
28B 2,6-Dinitrotoluene (606-20-2)	☒	☒	☐	<2						1	µg/L				

Facility ID. Number: FL0000159 Outfall No. 1-XX2

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
29B Di-N-Octyl Phthalate (117-84-0)	☒	☒	☐	<1						1	µg/L				
30B 1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	☒	☒	☐	<2						1	µg/L				
31B Fluoranthene (206-44-0)	☒	☒	☐	<1						1	µg/L				
32B Fluorene (86-73-7)	☒	☒	☐	<1						1	µg/L				
33B Hexachlorobenzene (118-74-1)	☒	☒	☐	<1						1	µg/L				
34B Hexachlorobutadiene (87-68-3)	☒	☒	☐	<3						1	µg/L				
35B Hexachlorocyclopentadiene (77-47-4)	☒	☒	☐	<3						1	µg/L				
36B Hexachloroethane (67-72-1)	☒	☒	☐	<3						1	µg/L				
37B Indeno (1,2,3-cd) Pyrene (193-39-5)	☒	☒	☐	<1						1	µg/L				
38B Isophorone (78-59-1)	☒	☒	☐	<1						1	µg/L				
39B Naphthalene (91-20-3)	☒	☒	☐	<1						1	µg/L				
40B Nitrobenzene (98-95-9)	☒	☒	☐	<2						1	µg/L				
41B N-Nitrosodimethylamine (62-75-9)	☒	☒	☐	<3						1	µg/L				
42B N-Nitrosodi-N-Propylamine (621-64-7)	☒	☒	☐	<3						1	µg/L				
43B N-Nitrosodiphenylamine (86-30-6)	☒	☒	☐	<3						1	µg/L				
44B Phenanthrene (85-01-8)	☒	☒	☐	<1						1	µg/L				
45B Pyrene (129-00-0)	☒	☒	☐	<1						1	µg/L				
46B 1,2,4-Trichlorobenzene (120-82-1)	☒	☒	☐	<1						1	µg/L				
GC/MS FRACTION - PESTICIDES															
1P Aldrin (309-00-2)	☐	☐	☒												
2P -BHC (319-84-6)	☐	☐	☒												
3P -BHC (319-85-7)	☐	☐	☒												
4P -BHC (58-89-9)	☐	☐	☒												
5P -BHC (319-86-8)	☐	☐	☒												

Facility ID. Number: FL0000159 Outfall No. I-XX2

1 Pollutant and CAS No (if available)	2 Mark "X"			3 Effluent							4 Units		5 Intake (optional)		
	a testing required	b believed present	c believed absent	a Maximum Daily Value		b Max 30-day Value (if available)		c Long Term Avg Value (if available)		d No of Analyses	a Conc	b Mass	a Long Term Avg Value		b No of Analyses
				(1) Conc	(2) Mass	(1) Conc	(2) Mass	(1) Conc	(2) Mass				(1) Conc	(2) Mass	
6P Chlordane (57-74-9)	☐	☐	☒												
7P 4,4'-DDT (50-29-3)	☐	☐	☒												
8P 4,4'-DDE (72-55-9)	☐	☐	☒												
9P 4,4'-DDD (72-54-8)	☐	☐	☒												
10P Dieldrin (60-57-1)	☐	☐	☒												
11P -Endosulfan (115-29-7)	☐	☐	☒												
12P -Endosulfan (115-29-7)	☐	☐	☒												
13P Endosulfan Sulfate (1031-07-8)	☐	☐	☒												
14P Endrin (72-20-8)	☐	☐	☒												
15P Endrin Aldehyde (7421-92-4)	☐	☐	☒												
16P Heptachlor (76-44-8)	☐	☐	☒												
17P Heptachlor Epoxide (1024-57-3)	☐	☐	☒												
18P PCB-1242 (53469-21-9)	☐	☐	☒												
19P PCB-1254 (11097-69-1)	☐	☐	☒												
20P PCB-1221 (11104-28-2)	☐	☐	☒												
21P PCB-1232 (11141-16-5)	☐	☐	☒												
22P PCB-1248 (12672-29-6)	☐	☐	☒												
23P PCB-1260 (11096-82-5)	☐	☐	☒												
24P PCB-1016 (12674-11-2)	☐	☐	☒												
25P Toxaphene (8001-35-2)	☐	☐	☒												

Attachment 1 – Narrative Summary

This is an application to revise the National Pollutant Discharge Elimination System (NPDES) permit for Duke Energy Florida, Inc's (DEF's) Crystal River Units 1, 2, and 3 NPDES Permit No. FL0000159 (Figure 1) to include operation of the proposed Citrus Combined Cycle (CCC) Project. DEF is currently seeking certification of the CCC Project under the Florida Electrical Power Plant Siting Act (PPSA) (Sections 403.501 through 518, Florida Statutes [F.S.], and Chapter 62-17, Florida Administrative Code [F.A.C.]). The requested revisions to the existing NPDES permit are limited to:

- Using the existing cooling water intake system bays from the recently retired Crystal River Unit 3 (Figure 2) to serve the CCC Project.
- Adding two internal outfalls for cooling tower blowdown from the CCC's two cooling towers (located in Figure 2).
- Adding a new surface water outfall to the existing Crystal River Energy Complex (CREC) discharge canal (located in Figure 2) to discharge cooling tower blowdown in accordance with this application.
- Renaming existing Outfall D-093 to reflect that this screen washwater outfall is associated with the CCC intake flows.
- Changing the pH monitoring and compliance point for existing Crystal River Unit 3 Outfall I-FG during times when pH water quality-based effluent limits are met in discharge from this internal outfall.

No other changes to the existing NPDES permit relative to CREC Units 1, 2, and 3 are requested. Permitting of some other wastewater facilities associated with the CCC Project, including a proposed percolation pond system for disposal of contact stormwater, industrial wastewaters, and a septic tank or on-Site package plant for sanitary wastewaters, will be accomplished through a site certification application (SCA) under the PPSA. Construction stormwater permit coverage will be through an NPDES multisector general construction permit, with notices of intent filed under separate cover. This narrative will summarize the nature of surface water intake and wastewater discharges of the proposed CCC Project as they relate to relevant aspects of the NPDES permit.

OVERVIEW

Operation of the CCC Project will require the use of seawater withdrawn from the existing CREC intake canal. The primary uses of seawater will be for condenser cooling (i.e., for cooling tower makeup water) and for managing chlorides concentrations in the cooling tower blowdown. The commingled cooling tower blowdown will be discharged to surface waters via the existing discharge canal. The primary uses of groundwater will be for plant process/service water and potable water needs, with no wastewater discharges to surface waters. Information concerning groundwater use is included in this application to

provide a comprehensive water balance. In its application for site certification under the PPSA, DEF is seeking certification of inlet chiller systems to cool inlet air to the combustion turbine generators during periods of high temperature. At this time, DEF does not anticipate constructing the chiller system, but such a system may be included as the final design as the Project progresses or postconstruction, should a chiller system be determined to be be needed, effective, and practicable. This NPDES permit application presents information inclusive of construction and operation of such a system.

Figures 3 through 5 present process flow diagrams depicting the water flow through the proposed CCC facility. The quantities of water used in different plant systems will vary with plant operating conditions, as well as with ambient meteorological conditions (e.g., air temperature and relative humidity). The water balance diagrams in the three figures are presented to show the estimated annual average and peak water use under different operating conditions:

- Figure 3, annual average daily seawater/groundwater use.
- Figure 4, peak month daily seawater use.
- Figure 5, peak month daily groundwater use.

The annual average water balance depicted in Figure 3 is based on annual average ambient conditions and assumed annual average operating conditions of 1,830 hours without duct firing, 4,000 hours with duct firing, and 2,930 hours of summer direct firing with inlet air chillers. The peak monthly seawater use in Figure 4 is based on 100-percent load with duct firing under maximum ambient conditions (i.e., 98.5 degrees Fahrenheit [°F] dry bulb temperature). The peak month groundwater use in Figure 5 is based on 100-percent load with duct firing and 40°F ambient temperature. If the chiller system is not constructed, the chiller condensate supply used to augment service water shown in Figures 3 and 4 and Table 1 would be unavailable and would be replaced by groundwater. Table 1 provides a summary of the major flows for both power blocks combined in the three water balances.

Table 1. Summary of Major Flows/Uses in the Water Balances

Water Flow/Use	Water Use (gpm) Annual Average (Figure 3)	Peak Seawater (Figure 4)	Peak Groundwater (Figure 5)
Seawater			
Cooling tower makeup	24,764	32,874	19,560
Augmentation water for cooling tower/ blowdown	38,106	50,616	30,094
Total withdrawal	62,870	83,490	49,654
Cooling tower evaporation	5,716	7,592	4,514
Total discharge	57,156	75,916	45,136
Groundwater			
Plant process/sanitary water	84	20	138
Potable water	1	1.1	1
Total withdrawal	85	21	138
Chiller condensate reuse (optional)	112	334	0
Total discharge to percolation pond	106	118	114

Sources: Burns & McDonnell, 2014. ECT, 2014.

WATER SUPPLY AND DISCHARGE

As shown in Table 1, use of seawater for cooling tower makeup and augmentation water for cooling tower blowdown, with a total peak combined flow of 83,490 gallons per minute (gpm) (120.2 million gallons per day [MGD]), are by far the largest plant water uses for the CCC Project. Cooling tower makeup water is required to replace water lost through evaporation in the cooling process and the discharge of blowdown to effectively manage water quality in the cooling towers. Seawater will also be used to manage the chlorides concentrations in the cooling tower blowdown (elevated due to evaporation) to meet applicable marine surface water quality standards.

The cooling tower makeup and augmentation water will be withdrawn from the existing CREC intake canal through the existing intake structure of the retired Crystal River Unit 3. Although not shown in the water balances, a small quantity of seawater will be periodically withdrawn from the intake structure bays as wash water for the traveling screens. Screen wash water will be returned to the intake canal after removal of debris.

The peak flow of combined cooling tower makeup and augmentation water flow (120.2 MGD) for the proposed CCC Project is significantly less than historical withdrawals when Crystal River Unit 3 was operational. Prior to its shutdown and ultimate permanent retirement, the once-through cooling water design withdrawal for Unit 3 was 979.2 MGD. Currently, Unit 3 is permitted to withdraw up to approximately 43.5 MGD of noncontact cooling water for utilization in the Unit 3 heat decay, spent fuel pool heat exchanger system. Actual flows have averaged approximately 16 to 18 MGD over the past several months. The current design withdrawals from the intake canal for once-through cooling water for Crystal Units 1 and 2 are 446.4 and 472.3 MGD, respectively.

DEF is currently planning on retiring Units 1 and 2 in coordination with the commercial operation of the CCC Project; therefore, these cooling water withdrawals will also cease in the future. The proposed CCC cooling water system will be compliant with the final Section 316(b) rule as described in the following paragraphs.

MINIMIZATION AND REUSE

DEF has evaluated the facility's water use in an integrated fashion and reduced its overall water withdrawals by employing a closed-cycle recirculating cooling system as well as combined cycle generation technology. The closed-cycle cooling system will consist of mechanical draft, evaporative cooling towers supplied with seawater for makeup to avoid use of freshwater as well as to take advantage of the existing intake canal and existing cooling water intake system associated with Crystal River Unit 3. Use of closed-cycle cooling and combined cycle generation, including consideration of the water used to manage chlorides concentrations, will reduce facility cooling water demand by 93 percent relative to an open-cycle facility of the same electrical output. Use of closed-cycle cooling is also a basis of compliance for new units[1] at existing facilities as defined in U.S. Environmental Protection Agency's (EPA's) 2014 316(b) existing facilities intake rule, which aims to reduce adverse environmental impacts associated with impingement and entrainment of aquatic organisms.

DEF has carefully considered opportunities for water reuse, either from inside the plant itself or from outside the plant, and water conservation to minimize the use of groundwater. In conjunction with the Southwest Florida Water Management District, DEF is currently implementing a project to use all reclaimed water available from the city of Crystal River to offset some groundwater use for Crystal River Units 4 and 5. No other practical sources of reclaimed water are available in the region. Similarly, potential storage and reuse of stormwater on the Site is impractical due to the size of the Site and constraints posed by wetlands and other land features. If an air chiller system is constructed, chiller condensate will be reused in the process/service water systems and as makeup water for the chiller cooling towers.

MINIMIZATION OF POTENTIAL WATER QUALITY IMPACTS

DEF has taken several measures to reduce the potential for impacts to water quality including:

- Use of closed-cycle cooling and combined cycle generation to reduce water demand for cooling. Together, surface water intake will be reduced by 93 percent relative to similar steam electric generating plants that use open-cycle cooling.

- Use of flow augmentation to limit the increase in chlorides concentration to 10 percent prior to discharge to surface waters to comply with Florida Surface Water Quality Standards. A co-benefit is that the augmentation water

[1] The CCC Project will be considered a new unit at an existing facility according to the definitions in the final 316(b) existing facilities rule.

will also reduce the concentrations of other cooling tower blowdown constituents, including those derived from concentration of seawater or from addition by the plant.

- Use of combined cycle generation and closed-cycle cooling substantially reduces the thermal loading to the environment. This reduction is manifested in reduced flows as well as reduced effluent temperatures. Use of augmentation water to manage chlorides concentrations will also reduce effluent temperature. DEF estimates that the maximum effluent temperature, conservatively estimated, will be well below the thermal limitation in the existing NPDES permit.

- The CCC Project will be operated in compliance with applicable state and federal regulations, including effluent limitation guidelines, water quality-based effluent limitations, and Florida's antidegradation policy.

- Chemical metal cleaning wastes will be containerized and disposed of off-Site consistent with local, state, and federal regulations.

- Industrial process wastewater will be disposed of to an appropriately sized and constructed percolation pond system, and treated sanitary wastewater will be disposed of to a subsurface treatment system or on-Site package plant under separate regulatory approvals.

SECTION 316 COMPLIANCE/THERMAL WATER QUALITY STANDARDS

Use of combined cycle generation and closed-cycle cooling substantially reduces the thermal loading to the environment. This reduction is manifested in reduced cooling water flows, as well as reduced effluent temperatures. Mixing cooling tower blowdown with ambient seawater to limit chloride concentrations in the blowdown will also reduce effluent temperature. DEF estimates that the maximum effluent temperature, conservatively estimated, will be well below the existing thermal limitation in the NPDES permit. The size of the thermal plume will not increase beyond existing conditions. Also, with the retirement of Unit 3, the thermal plume has been further reduced. DEF requests that the existing 316(a) variance and monitoring point for same remain applicable. As shown in the following Table 2, the thermal discharge will remain an existing heat source in accordance with Rule 62-302.520(1), (3)(d), F.A.C., and Section 403.08852, F.S.

Table 2. CREC Unit Operations—Effluent Thermal Loading

Unit	Generator Output* (MW electric)	Heat Rejection Rate (MW thermal)	Heat Load Added to Discharge Canal	
			Btu/hr	%
CREC 1	373.95	485.03	1.66E+09	16.80
CREC 2	520.82	674.06	2.30E+09	23.35
CREC 3	880.02	1,727.40	5.91E+09	59.84
Total CREC Units	1,774.79	2,886.49	9.87E+09	100.00
CCC 1	362	545.5	3.86E+07	0.39
CCC 2	362	545.5	3.86E+07	0.39
Total CCC	724	1,091.0	7.72E+07	0.78

*Generator output for CCC 1 and 2 are for steam cycle only.

Sources: DEF, 2014.
Burns & McDonnell, 2014.
ECT, 2014.

316(b) INFORMATION

DEF has evaluated the facility's water use in an integrated fashion and reduced its overall water withdrawals by employing a closed-cycle recirculating cooling system, as well as combined cycle generation technology. The closed-cycle cooling system will consist of mechanical draft, evaporative cooling towers supplied with seawater for makeup. Use of seawater is planned to avoid use of freshwater for cooling purposes as well as to take advantage of the existing intake canal and existing cooling water intake structure at Crystal River Unit 3. Use of closed-cycle cooling and combined cycle generation, including consideration of the chlorides flow augmentation water, will reduce facility cooling water demand by 93 percent relative to an open-cycle facility of the same electrical output and will result in a commensurate reduction in adverse environmental impacts associated with impingement and entrainment of aquatic organisms.

Use of closed-cycle cooling is deemed the best technology available (BTA) for compliance with both impingement and entrainment reduction requirements for new units at existing facilities as defined in EPA's 2014 final intake rule applicable to new units at existing facilities (40 CFR § 125.94(e)). As an added measure to reduce impingement, the intake structure will be configured to achieve an intake velocity of less than or equal to 0.5 foot per second (fps), considered the BTA for impingement for existing intakes in the final 316(b) rule for existing facilities.

ANTIDEGRADATION

Attachment 3 provides a demonstration that the proposed discharge is consistent with Florida's Antidegradation Policy set forth in Rule 62-302.300, F.A.C., as well as permitting requirements under Rule 62-4.242(1).

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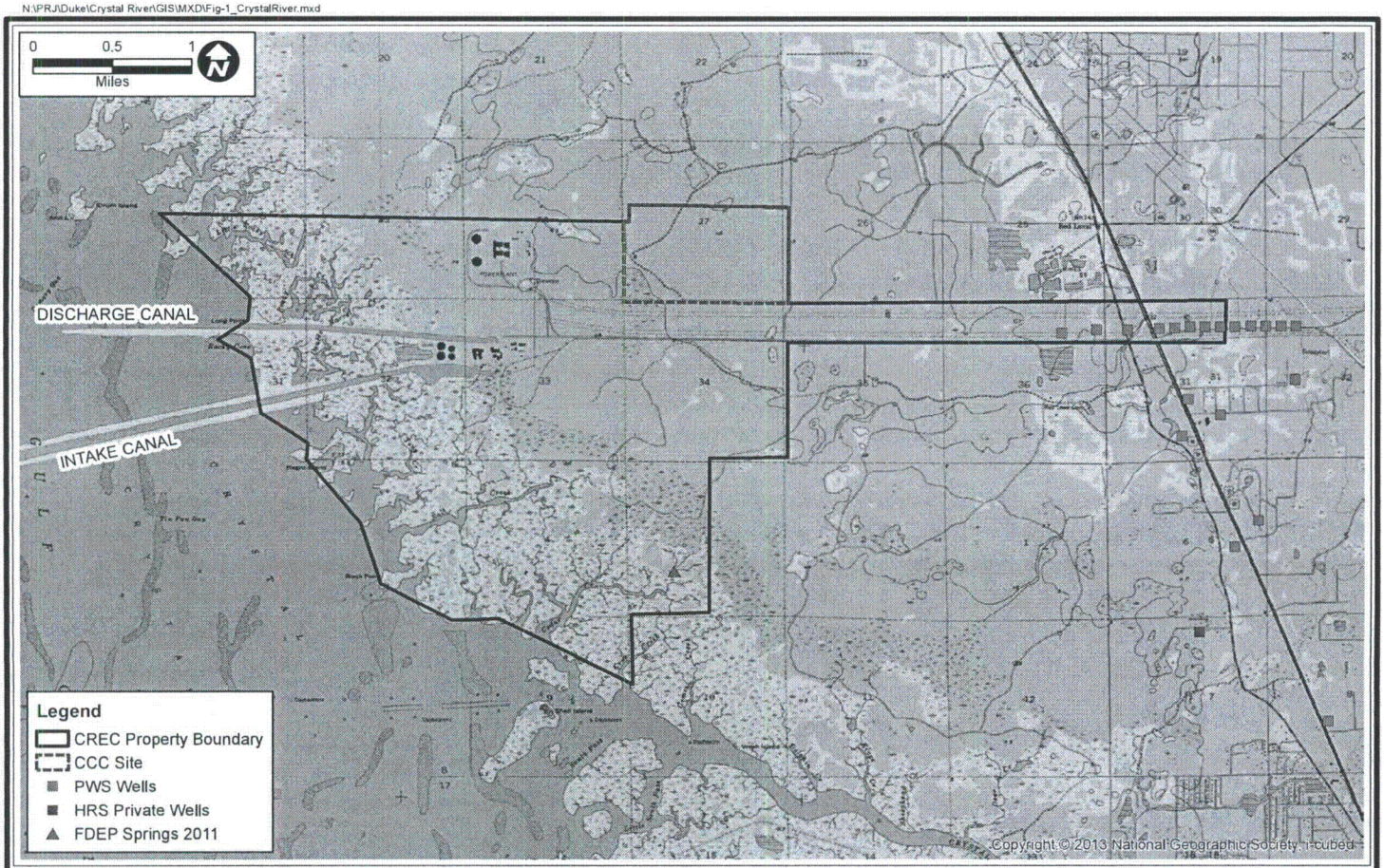

FIGURE 1.

SITE LOCATION

Sources: USGS Topographic Maps (Red Level and Crystal River - 1961); FDEP, 2011; Florida Health and Rehabilitative Services (HRS).

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N:\PRJ\Duke\Crystal River\GIS\MXD\Fig-2_CrystalRiver.mxd

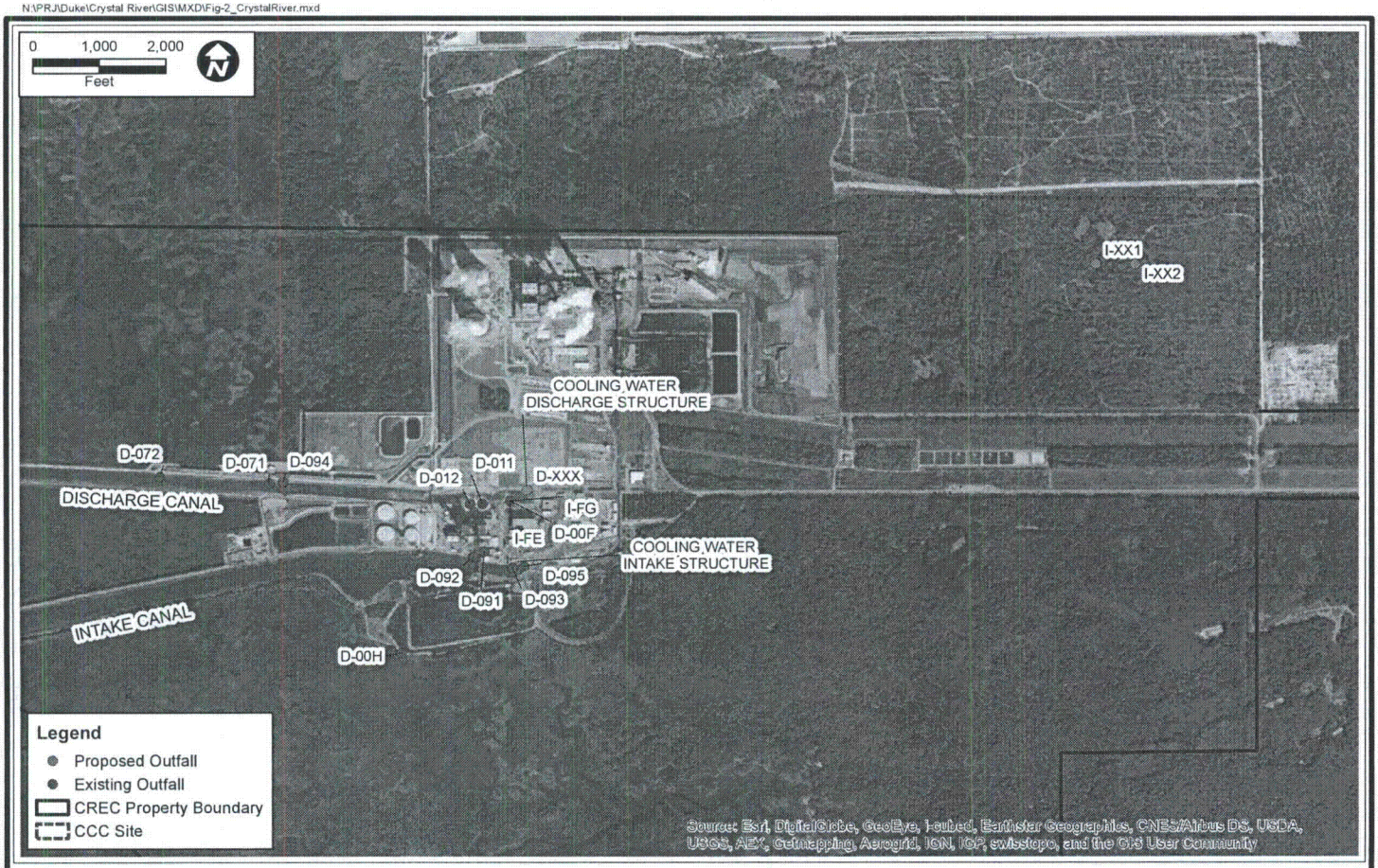

FIGURE 2.

EXISTING AND PROPOSED OUTFALLS

Sources: ESRI World Imagery.

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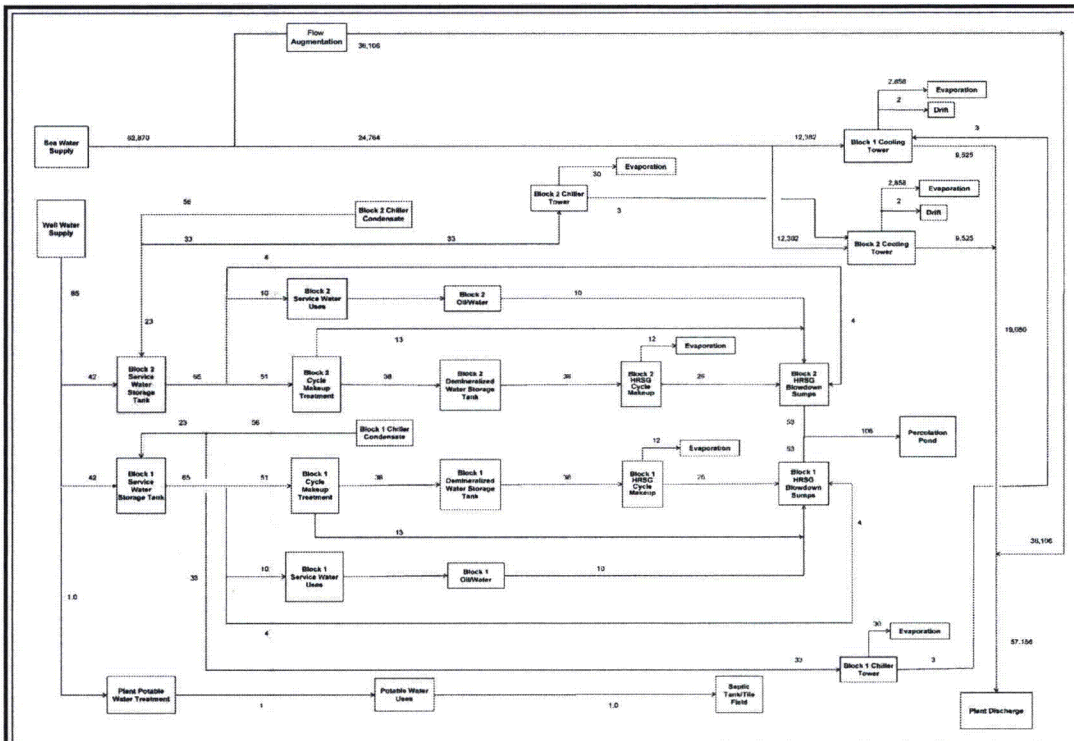

NOTES:

1. FLOWS ARE SHOWN IN GALLONS PER MINUTE ROUNDED TO THE NEAREST GPM.
2. TWO BLOCKS OF 2 x 1 CC (G Class Turbine).

DESIGN CRITERIA:

COOLING TOWER CYCLES	1.3
CHILLER TOWER CYCLES	10
DESIGN DRY BULB TEMPERATURE	72.0
MEAN RELATIVE HUMIDITY, %	73%

FIGURE 3

WATER BALANCE FOR ANNUAL AVERAGE SEAWATER AND GROUNDWATER USE CONDITIONS

Sources: Burns & McDonnell, 2014. ECT, 2014.

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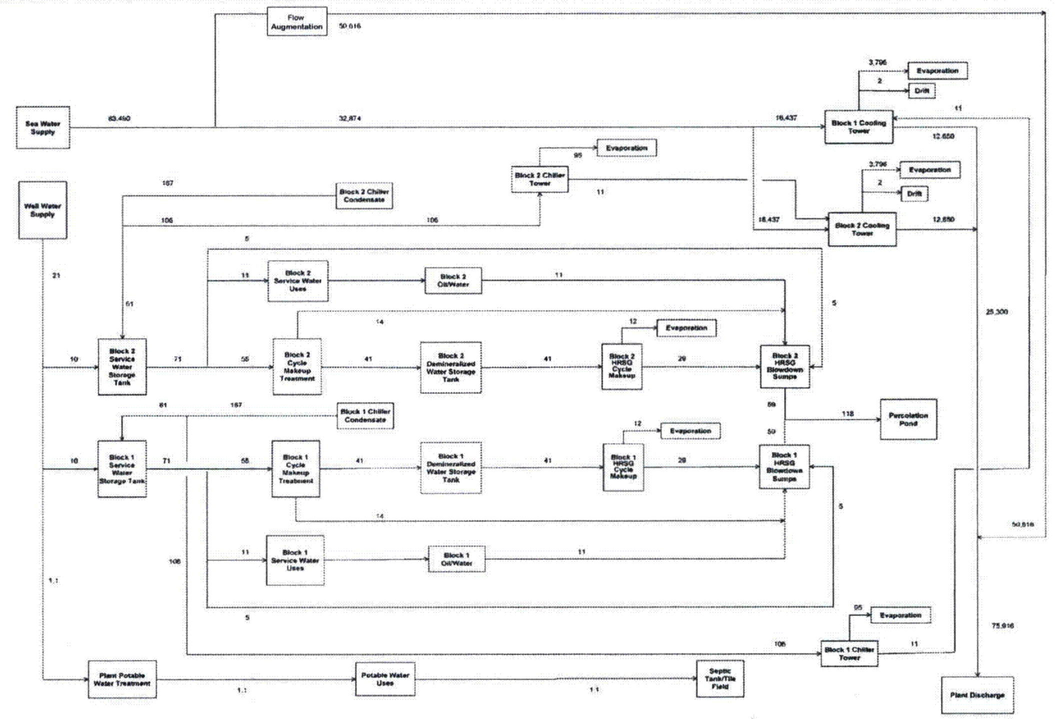

NOTES:

1. FLOWS ARE SHOWN IN GALLONS PER MINUTE ROUNDED TO THE NEAREST GPM.
2. TWO BLOCKS OF 2 x 1 CC (G Class Turbine).

DESIGN CRITERIA:

COOLING TOWER CYCLES	1.3
CHILLER TOWER CYCLES	0
DESIGN DRY BULB TEMPERATURE	98.5
MEAN RELATIVE HUMIDITY, %	60%

Preliminary - Not for Construction

FIGURE 4

WATER BALANCE FOR PEAK MONTH SEAWATER USE CONDITIONS

Sources: Burns & McDonnell, 2014. ECT, 2014.

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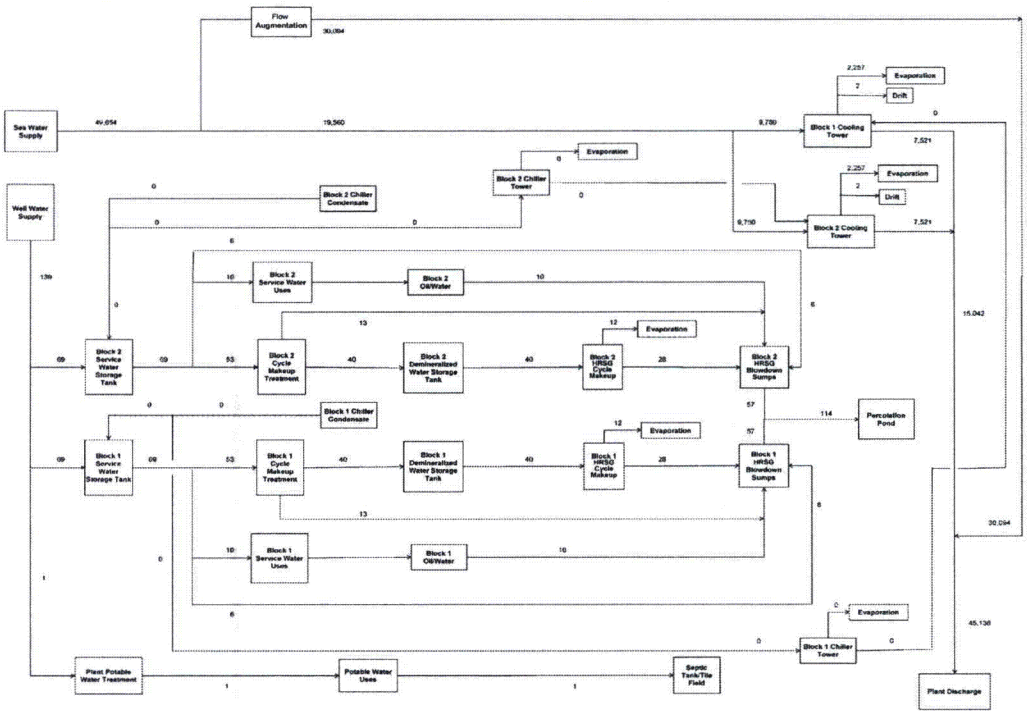

NOTES:

1. FLOWS ARE SHOWN IN GALLONS PER MINUTE ROUNDED TO THE NEAREST GPM.
2. TWO BLOCKS OF 2 x 1 CC (G Class Turbine)

DESIGN CRITERIA:

COOLING TOWER CYCLES	1.3
CHILLER TOWER CYCLES	0
DESIGN DRY BULB TEMPERATURE	40.0
MEAN RELATIVE HUMIDITY, %	60%

Preliminary - Not for Construction

FIGURE 5

WATER BALANCE FOR PEAK MONTH DAILY GROUNDWATER USE CONDITIONS

Sources: Burns & McDonnell, 2014. ECT, 2014.

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Attachment 2 – Form 2CS
Additional Information

FORM 2CS, SECTION IV—WASTEWATER DESCRIPTION

The following describes the contributory wastewater streams and wastewater treatment employed at the two CCC units. Refer to Figures 3 through 5 in Attachment 1 for the process flow diagram and water balances. Additional descriptions of chemical usage and chemicals that have the potential to be discharged via the permitted outfalls are also provided.

Internal Outfalls I-XX1 and I-XX2 consist of noncontact, closed-cycle cooling tower blowdown from the two CCC cooling tower basins. Water discharged from these cooling tower basins will be commingled with seawater from the intake while in transit to a new outfall, Outfall D-XXX, which, in turn, is discharged via the CREC discharge canal.

The two CCC units have the ability to inject oxidizing biocides to control biofouling within the mechanical draft cooling towers. In addition to sodium hypochlorite, various sodium bromide products (or a mixture of sodium hypochlorite and sodium bromide) may be used. To comply with limits for total residual oxidants, a dechlorination/debromination product, such as sodium bisulfite or sodium metabisulfite, is added at a stoichiometric ratio to ensure compliance with the total residual oxidants limits. Table 3 provides usage rates for these chemicals. Attachment 4 provides material safety data sheets.

Table 3. Projected Treatment Chemical Use in the Cooling Towers

Chemical	Daily Use (gallons)	
	Average	Maximum
Sodium hypochlorite (12.5%)		
Intake feed	2,174	2,415
Cooling tower feed	444	444
Sodium bromide (42.8%)		
Intake feed	157	245
Cooling tower feed	32	45
Surfactant	7.1	9.5
Sodium bisulfite	Variable*	Variable*

*Dosage rate will vary with oxidant demand in source water and flow rate

Sources: DEF, 2014.
ECT, 2014.

In addition to biocide treatment in the cooling towers, at times, a Florida Department of Environmental Protection (FDEP)-approved surfactant is used to increase the effectiveness of the biocide treatments and as a silt dispersant. Consistent with federal effluent guidelines for the steam electric sector, only one cooling tower is treated at any one time.

FORM 2CS, SECTION VI—IMPROVEMENTS

Revised Administrative Order No. AO-024-TL (revised Order) was issued with the current NPDES permit on April 7, 2014. Item III.29 of the revised Order requires that CREC prepare a feasibility study report to comply with the final regulations for Section 316(b) for operation of the existing units at CREC. EPA's final intake rule was signed by the EPA Administrator on May 19, 2014, and has been released in prepublication form. FDEP has stated its intent to modify the revised Order for consistency with the study requirements and schedule in the final rule once it is published.

Based on the prepublication version of the final rule, the new CCC generation units are defined as new units at an existing facility. As discussed in Attachment 1, the design of new CCC cooling water intake system will be compliant with the rule's requirements for such units as the use of closed-cycle recirculating cooling towers represents BTA for compliance with both impingement and entrainment reduction requirements (40 CFR § 125.94(e)(1)). Information submittals required under 40 CFR § 122.21(r) for operation of the proposed CCC Project must be submitted no later than 180 days prior to the commencement of cooling water withdrawals at the new units (40 CFR § 125.95(b)).

Item III.32 of the revised Order requires that CREC prepare a modified biological plan of study and schedule to study the protectiveness of the existing Section 316(a) thermal variance given the retirement of Unit 3. As stated in Attachment 1, the discharge from the CCC Project will achieve the existing thermal limits for the CREC permit and thus will be protective of the balanced indigenous population in the receiving water body. A thermal plan of study was submitted to FDEP on July 3, 2014, that included a phased approach for physical and biological sampling of the CREC thermal discharge.

FORM 2CS, SECTION VII—INTAKE AND EFFLUENT CHARACTERISTICS

Data provided in Part VII of the application were calculated using sampling data from the intake canal taken from DEF's NPDES permit renewal application for Units 1, 2 and 3 submitted to FDEP on February 28, 2013, and data for cooling tower blowdown from Units 4 and 5 taken from DEF's NPDES permit renewal application for Units 4 and 5 submitted to FDEP on January 25, 2010. Constituents in the tables for Section VII, Part B, marked as "believed present" are due to their presence in the ambient seawater at the point of intake, which are then passed through to the discharge.

The cooling tower blowdown from the CCC Project will be similar to that of Units 4 and 5, given that both sets of towers use the same source waters and similar water treatment chemicals (Table 3). Cooling tower blowdown from the CCC Project will also be subject to flow augmentation to manage chlorides concentration using seawater from the intake

canal. The intake and blowdown data described in the previous paragraphs were mathematically composited using the projected augmentation ratios from the water balance to predict the final effluent characterization for Outfall D-XXX.

When analytical results were below the method detection limit, the result was reported as less than the calculation result.

Estimation of effluent temperature (Table 4) is based on modeling of cooling tower blowdown temperature based on the operation of the CCC units and ambient meteorological conditions. The record of inlet temperature for CREC Units 1, 2, and 3 was used to assign a temperature for the augmentation water. The ratio of augmentation water to cooling tower blowdown was used to develop a flow-weighted temperature of the mixed streams under annual average conditions as well as maximum summertime temperatures.

Table 4. Projected Effluent Temperatures

Parameter	Average	Maximum
Inputs		
Intake canal temperature basis	Average	Maximum
Intake canal temperature (°F)	74.6	94.9
Cooling tower blowdown (°F)	82.8	96.6
Flow augmentation rate (gpm)	38,026	29,026
Cooling tower blowdown rate (gpm)	19,010	18,868
Estimate		
Effluent temperature to effluent canal (°F)	77.3	95.6

Sources: Burns & McDonnell, 2014.
ECT, 2014.

The summertime maximum temperature likely represents an overestimate, as the maximum observed inlet temperature (94.9°F) is only one of two observations made between July 2005 and March 2014 that exceeded 92°F. In addition, the cooling tower blowdown and mixed blowdown/augmentation water will be transported in subsurface pipes for several thousand feet prior to discharge. This will allow for heat transfer from the effluent to subsurface soils. This heat dissipation is not accounted for in the calculation of the maximum summer temperature. Furthermore, compliance with the thermal limits is at the point of discharge into Crystal Bay (monitoring location Eff-3D), which is approximately 1.5 miles downstream of the proposed outfall into the discharge canal. Additional heat dissipation into the atmosphere will occur during transit in the discharge canal. For these reasons, the calculated maximum effluent temperatures and the overall thermal loading into the receiving water body are conservative.

Attachment 3 – Antidegradation Demonstration

The discharge from the proposed CCC Project will not result in degradation of water quality or impairment in any of the designated uses in the receiving body of water. The operation of the CCC Project, in combination with the retirement of Crystal River Unit 3 in 2013 and the planned retirement of Crystal River Units 1 and 2 in conjunction with the CCC Project becoming operational, will result in a net benefit to aquatic resources through reductions in cooling water use and thermal loading.

An SCA has been submitted to the state that addresses the potential effects of the construction and operation of the CCC Project. The benefits of the Project are also described in the SCA. While the CCC Project is not expected to result in degradation of water quality, the following information is provided to demonstrate that the proposed discharge is consistent with the antidegradation policy set forth in Rule 62-302.300, F.A.C., and meets the antidegradation permitting requirements in Rules 62-4.242(1)(b) and (d), F.A.C.

ANTIDEGRADATION PROVISIONS

Section 403.088(2)(b), F.S. provides that if a proposed discharge does not reduce the quality of the receiving water below the classification established for it, FDEP "may issue an operation permit if it finds that such degradation is necessary or desirable under federal standards and under circumstances which are clearly in the public interest."

Rule 62-4.242(1), F.A.C. provides:

(b) In determining whether a proposed discharge which results in water quality degradation is necessary or desirable under federal standards and under circumstances which are clearly in the public interest, the department shall consider and balance the following factors:

1. Whether the proposed project is important to and is beneficial to the public health, safety, or welfare (taking into account the policies set forth in Rules 62-302.300, F.A.C., and, if applicable, 62-302.700, F.A.C.); and

2. Whether the proposed discharge will adversely affect conservation of fish and wildlife, including endangered or threatened species, or their habitats; and

3. Whether the proposed discharge will adversely affect the fishing or water-based recreational values or marine productivity in the vicinity of the proposed discharge; and

4. Whether the proposed discharge is consistent with any applicable Surface Water Improvement and Management Plan that has been adopted by a Water Management District and approved by the Department.

* * *

(d) For industrial wastewater facilities, proposing new or expanded surface water discharges, in addition to paragraph (b) above, in order for the new or expanded industrial wastewater discharge to be necessary or desirable under federal standards and under circumstances which are clearly in the public interest, the permit applicant:

1. Must demonstrate that use of other discharge locations, land application, or recycling at off-Site locations that would avoid the degradation of water quality is not economically and technologically reasonable; and

2. Shall submit a signed statement under penalty of law that a waste minimization and source reduction analysis was completed consistent with best management practices appropriate for the type of facility or discharge proposed as identified in paragraph 62-620.100(3)(m), F.A.C., 40 CFR 122.44(k), and Guidance Manual for Developing Best Management Practices (BMP), U.S. Environmental Protection Agency, Office of Water, Washington, DC, EPA 833-B-93-004, October 1993.

Rule 62-302.300(6), F.A.C., confirms that "private activities conducted for private purposes may...be in the public interest." These elements of the antidegradation rule are addressed in the following paragraphs.

RULE 62-4.242(1)(B), F.A.C.

1. The CCC Project is important and beneficial to the public health, safety, and welfare of the region by providing reliable and cost-effective electric power. DEF has an obligation to provide sufficient, adequate, and efficient electric service in its service territory (Section 366.03, F.S.). Through its integrated resource planning process, DEF has determined the need for additional generating capacity by 2018. The CCC Project is the most cost-effective option for customers and provides systemwide reliability, ensures regulatory compliance, and meets DEF's 2018 in-service construction timeline. On May 27, 2014, DEF filed a petition for a determination of need for the CCC Project with the Florida Public Service Commission (PSC). The PSC is the sole forum for a determination of the need for an electrical power plant (Section 403.519, F.S.).

2. The proposed discharge will not adversely affect conservation of fish and wildlife, including endangered or threatened species, or their habitats.

3. The proposed discharge will not adversely affect the fishing or water-based recreational values or marine productivity in the vicinity of the proposed discharge.

The conclusions articulated in previous Items 2 and 3 are supported by the following:

- The effects of the existing cooling water intakes and thermal discharges from CREC have been studied extensively over the several decades. In September 1988, EPA granted a Section 316(a) variance from thermal effluent limitations to CREC after a determination that the variance was adequately protective of a balanced indigenous population in the receiving body of water. At the same time, EPA determined that CREC's helper cooling towers, seasonal flow reductions, and mitigation efforts constituted BTA for protection of adverse environmental impacts under the Clean Water Act Section 316(b) requirements. The potential for adverse effects to federally-listed species also were carefully evaluated by the relevant agencies. Their determinations either concluded that there would not be substantial impacts or resulted in control plans approved by the agencies.

- The CCC Project's use of a closed-cycle recirculating cooling system will result in significant reductions in cooling water withdrawals, which will produce commensurate reductions in adverse environmental effects. As noted in the following paragraphs, the CCC Project will use seawater to manage chlorides concentrations in the cooling tower blowdown. The rate of cooling water withdrawn from the existing intake canal (including augmentation water for chlorides) will be reduced by approximately 93 percent compared to a facility with the same output that employs once-through cooling. When considered on the basis of electricity output (i.e., million gallons per day per megawatt [MGD/MW]), the generation provided by Units 1, 2, and 3 require 1.03 MGD/MW. In contrast, the proposed CCC Project will use cooling tower makeup and chloride dilution water at a rate of 0.07 MGD/MW, an overall 93-percent reduction relative to a facility of the same output that uses once-through cooling, thus producing a commensurate decrease in impingement and entrainment rates.

- The use of closed-cycle recirculating cooling systems is identified in the final Section 316(b) existing facilities rule as BTA for new units at existing facilities (40 CFR 125.94[e][1]). The existing Unit 3 intake bays will be retrofitted with intake screens with a design through-screen velocity of less than 0.5 fps, considered BTA for mitigation of impingement mortality effects from existing cooling water intakes (40 CFR § 125.94(c)(2)).

- The CCC Project will greatly reduce thermal loading to the aquatic environment relative to open-cycle systems. The current NPDES permit sets a maximum discharge temperature at the point of discharge into Crystal Bay of 96.5°F as a 3-hour average for compliance with the 316(a) thermal variance. The cooling tower design for the new CCC units will result in a cooling tower blowdown temperature that is lower than this final discharge limit,

conservatively estimated using the maximum seawater intake and ambient air temperatures to yield a maximum effluent temperature of 95.6°F. Further, heat dissipation will occur through the below-ground discharge pipe prior to entering the discharge canal and within the discharge canal prior to entering Crystal Bay at the temperature monitoring compliance point. The temperature of the proposed discharge will therefore easily meet thermal limits set by the current 316(a) thermal variance. Evaporative cooling towers operate by using the latent heat of water evaporation to cool recirculating water. The facility also uses the waste heat from the combustion process to generate steam and electricity, reducing the cooling demand. For these reasons, the thermal load associated with cooling tower blowdown is far lower than that of a similarly-sized plant that employs once-through cooling.

- The effluent from the CCC Project will comply with applicable ambient water quality standards. As described previously, the CCC Project will use ambient seawater from the existing intake canal to manage chlorides concentrations in the blowdown prior to discharge to ensure that the concentration of chlorides is not increased by more than 10 percent relative to the source water. This will have the additional beneficial effect of reducing the temperature of the cooling tower blowdown.

- The CCC Project will intermittently use sodium hypochlorite and/or sodium bromide to control biofouling in the cooling towers, consistent with the 40 CFR 423 effluent guidelines for the steam electric generating sector. Dechlorination will be performed during this procedure.

- No other toxic chemicals will be introduced into the cooling tower blowdown, which is expected to be similar in quality to the blowdown from the existing Units 4 and 5 cooling towers. Semiannual toxicity testing of the Unit 4 and 5 blowdown conducted under conditions of the current NPDES permit for those units has shown no issues with toxicity.

- There are no applicable surface water improvement and management (SWIM) plans adopted by a Water Management District and approved by FDEP that would be impacted by the project. The closest approved plan is for Crystal River/Kings Bay[2], located south of the Project. The Project boundary lies northwest of the SWIM plan's management boundary and lies outside both the surface watershed and groundwater recharge area.

RULE 62-4.242(1)(D), F.A.C.

1. Discharge of cooling tower blowdown via the existing CREC discharge canal is the most cost-effective and least environmentally disturbing discharge alternative due the presence of existing infrastructure and close proximity.

[2] Crystal River/Kings Bay Surface Water Improvement and Management (SWIM) Plan, Final Approved Plan July 10, 2000. Southwest Florida Water Management District, Resource Management Department, Surface Water Improvement and Management Section.

Land application and off-Site reuse of the cooling tower blowdown is not feasible due to the use of salt water cooling towers and the resulting high dissolved solids content of the cooling blowdown. Process wastewaters will be discharged to an on-Site percolation pond to limit the potential for water quality degradation. As noted in Attachment 1 to this application, every opportunity for flow reduction and reuse on-Site was incorporated into the Project design.

2. DEF certifies that a waste minimization and source reduction analysis was completed consistent with BMPs to control or abate the discharge of pollutants as identified in paragraph 62-620.100(3)(m), F.A.C., and 40 CFR § 122.44(k).

In summary, the proposed CCC Project is in the public interest, because it helps ensure that DEF can provide reliable and cost-effective electric service in its service territory. The Project will result in substantial reductions in cooling water withdrawals and thermal discharges, minimize adverse environmental impacts due to impingement and entrainment, and will result in additional protection to threatened and endangered species. The Project will not result in degradation of water quality or reduction in any of the designated uses in the receiving water body. Finally, the Project will be designed with waste minimization and source reduction features consistent with approved BMP guidance.[3]

DEF is providing the following statement in accordance with Rule 62-4.242(1)(d)2, Florida Administrative Code (F.A.C.):

> [A] waste minimization and source reduction analysis was completed consistent with best management practices appropriate for the type of facility or discharge proposed, as identified in paragraph 62-620.100(3)(m), F.A.C., 40 CFR 122.44(k), and Guidance Manual for Developing Best Management Practices, U.S. Environmental Protection Agency, Office of Water, Washington, DC, EPA 833-B-93-004, October 1993.

[3] Guidance Manual for Developing Best Management Practices, U.S. Environmental Protection Agency, Office of Water, Washington, DC, EPA 833-B-93-004, October 1993

Attachment 4 – Material Safety Data Sheets

Material Safety Data Sheet

Material Name: Sodium Metabisulphite or Sodium Metabisulfite ID: C1-143

* * * Section 1 - Chemical Product and Company Identification * * *

Chemical Name: Sodium Metabisulphite (Technical, Photo and Food Grades) or Sodium Metabisulfite
Product Use: For Commercial Use
Synonyms: Disulfurous acid, Disodium salt, Fertisilo; Pyrosulfurous acid, disodium salt; Sodium disulfite; Disodium pyrosulfite; Sodium pyrosulfite.
Supplier Information

Chem One Ltd.
8017 Pinemont Drive, Suite 100
Houston, Texas 77040-6519
Phone: (713) 896-9966
Fax: (713) 896-7540
Emergency # (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.
NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
7681-57-4	Sodium Metabisulfite	> 95%

Component Related Regulatory Information
This product may be regulated, have exposure limits or other information identified as the following: Sulfites.
Component Information/Information on Non-Hazardous Components
This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

* * * Section 3 - Hazards Identification * * *

Emergency Overview
Sodium Metabisulfite is a white crystal or white/yellow powder form. May cause severe allergic reaction in asthmatics and sulfite sensitive individuals. May be harmful if swallowed. May cause eye, skin and respiratory tract irritation. This product is not flammable. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g. sulfur dioxide), which may increase fire hazard due to the flammability of sulfur dioxide. Emergency responders should wear proper personal protective equipment for the releases to which they are responding.
Hazard Statements
WARNING! CAUSES SKIN AND EYE IRRITATION. HARMFUL IF INHALED. MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION. Keep from contact with clothing. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Avoid prolonged or repeated contact with skin. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. **WARNING! Contact with acids, water or ice releases sulfur dioxide gas which may be harmful or deadly if inhaled. Use of this product in confined spaces may cause suffocation leading to death. Do not use in unventilated areas such as in the holds of fishing boats, walk-in coolers or confined spaces. Use only in ventilated areas.**
Potential Health Effects: Eyes
Exposure to particulates or solution of this product may cause stinging, tearing and redness. Prolonged contact with solutions of this product may cause conjunctivitis, ulceration and corneal abnormalities.
Potential Health Effects: Skin
This product can cause irritation of the skin, especially after prolonged exposures. Repeated skin contact may lead to skin sensitization, an allergic reaction and dermatitis (red, cracked skin). Skin contact can cause allergic skin reaction in susceptible individuals, with symptoms including itching, rash and welts.
Potential Health Effects: Ingestion
Ingestion of this product can irritate the tissues of the mouth, esophagus, and other tissues of the digestive system. Symptoms of exposure can include central nervous system depression, gastrointestinal and cardiac abnormalities, and violent colic. Sulfite compounds, such as this product, can cause a severe allergic reaction in sensitive individuals and some asthmatics, which can be life-threatening.
Potential Health Effects: Inhalation
Breathing dusts or particulates generated by this product can lead to irritation of the nose, throat or respiratory system. Symptoms of such exposure could include coughing and sneezing. This product can cause an asthma-like allergy with symptoms such as shortness of breath, wheezing, coughing, urticaria, angioedema, nasal congestion, nasal polyp swelling and chest tightness. Severe general (anaphylactic) reactions can occur, which can be life-threatening in some cases.
HMIS Ratings: Health Hazard: 2* **Fire Hazard:** 0 **Physical Hazard:** 1
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, rinse immediately with plenty of water for at least 20 minutes. Seek immediate medical attention if any adverse effect occurs.

First Aid: Skin

Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

First Aid: Ingestion

Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim rinse mouth thoroughly with water, if conscious. Contact a physician or poison control center immediately. Never give anything by mouth to a victim who is unconscious or having convulsions.

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician

Provide general supportive measures and treat symptomatically.

* * * Section 5 - Fire Fighting Measures * * *

Flash Point: Not flammable
Method Used: Not applicable
Upper Flammable Limit (UEL): Not applicable
Lower Flammable Limit (LEL): Not applicable
Auto Ignition: Not applicable
Flammability Classification: Not applicable
Rate of Burning: Not applicable

General Fire Hazards

When involved in a fire, this material may decompose and produce irritating vapors, acrid smoke and toxic gases (i.e. sulfur oxides and sodium oxides). Contact with acids, water and ice produces sulfur oxide, which presents a fire hazard due to its flammability. Sodium Metabisulfite is a reducing agent and reacts explosively with oxidizers.

Hazardous Combustion Products

Sodium sulfide and sulfur oxides.

Extinguishing Media

In case of fire, use water fog, dry chemical, carbon dioxide or regular foam.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self-contained breathing apparatus. If possible control runoff from fire control or dilution water to prevent environmental contamination.

NFPA Ratings: Health: 2 **Fire:** 0 **Reactivity:** 1 **Other:**
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

Clean-Up Procedures

Small releases can be cleaned-up wearing gloves, goggles and suitable body protection. In case of a large spill (in which excessive dusts can be generated), clear the affected area, protect people, and respond with trained personnel. Place all spill residues in an appropriate container and seal. Thoroughly wash the area after a spill or leak clean-up. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling. Avoid accumulation of dusts of this product. Remove contaminated clothing immediately. Keep in dust-tight containers. Keep away from all heat sources. **Individuals responsible for the procurement, use or application of Sodium Metabisulfite must familiarize themselves with the appropriate safety and handling precautions involved. Specifically, for the prevention of Black Spot on shrimp, Sodium Metabisulfite should only be used as a dilute (1.25%) solution and only in well-ventilated area. NEVER USE SODIUM METABISULFITE IN A DRY FORM DIRECTLY ON THE SHRIMP AND NEVER IN A CONFINED SPACE SUCH AS THE HOLD OF A SHRIMP BOAT OR A WALK-IN COOLER. DEADLY SULFUR DIOXIDE GAS CAN BE GENERATED AND ACCUMULATED IN CONFINED SPACES, CREATING AN EXTREMELY HAZARDOUS CONDITION WHICH CAN CAUSE SUFFOCATION LEADING TO DEATH.**

Storage Procedures

All employees who handle this material should be trained to handle it safely. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Empty containers may contain residual amounts of this product; therefore, empty containers should be handled with care. Keep this product in an airtight container. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep container tightly closed when not in use. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Do not store this material in open or unlabeled containers. Limit quantity of material stored.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines

A: General Product Information

Sulfur Dioxide, which is released slowly at ambient temperatures from this material, has established exposure limits as follows:

ACGIH: 5.2 mg/m^3 TWA
13 mg/m^3 STEL

OSHA: 13 mg/m^3 TWA; 5 mg/m^3(Vacated 1989 PEL)
13 mg/m^3 (Vacated 1989 PEL)

NIOSH: 5 mg/m^3 TWA
13 mg/m^3 STEL
100 ppm (IDLH)

DFG MAKs 5.3 mg/m^3 TWA (Inhalable fraction of the aerosol)
1•MAK 15 min., average value, 1-hr interval

B: Component Exposure Limits

The exposure limits given are for Sodium Metabisulfite (7681-57-4).

ACGIH: 5 mg/m^3 TWA

NIOSH: 5 mg/m^3 TWA

Engineering Controls

Use mechanical ventilation such as dilution and local exhaust, necessary for use in enclosed or confined spaces due to the slow release of sulfur dioxide. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Treatment of exhaust gases may be required to prevent environmental contamination. Supply ample air replacement.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear safety glasses (or goggles). If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Wear impervious gloves, boots and coveralls to avoid skin contact. Gloves should be tested to determine their suitability for prolonged contact with this material. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

* * * Section 8 - Exposure Controls / Personal Protection (Continued) * * *

Personal Protective Equipment: Respiratory

If airborne concentration is high, use an appropriate respirator or dust mask. If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General

Wash hands thoroughly after handling material. Do not eat, drink or smoke in work areas. Have a safety shower or eyewash fountain available. Use good hygiene practices when handling this material, including changing and laundering work clothes after use. Discard contaminated shoes and leather goods.

* * * Section 9 - Physical & Chemical Properties * * *

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	White to yellowish crystalline powder	**Odor:**	Mild odor of rotten eggs (sulfurous)
Physical State:	Solid	**pH:**	4.5-5 (10% solution)
Vapor Pressure:	Not applicable	**Vapor Density:**	Not applicable
Boiling Point:	Not applicable	**Freezing/Melting Point:**	302 deg F (150 deg C)
Solubility (H2O):	40% @ 20 deg C	**Specific Gravity:**	1.4 (H2O = 1)
Softening Point:	Decomposes upon heating	**Particle Size:**	Not determined
Molecular Weight:	190.13	**Bulk Density:**	1.48 g/cc
		Chemical Formula:	Na2S2O5

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Product is normally stable. Sodium Metabisulfite is air and moisture sensitive and releases sulfur dioxide slowly at ambient temperatures. Sodium Metabisulfite will decompose on heating to form sodium sulfate.

Chemical Stability: Conditions to Avoid

Avoid moisture, high temperatures, exposure to air and incompatible materials.

Incompatibility

This material is incompatible with strong oxidizers, sodium nitrite and alkalis. Sodium Metabisulfite may produce sulfur dioxide gas when in contact with acids and/or water and ice. Large-scale addition of solid sodium disulfite to an unstirred and too-concentrated solution of sodium nitrite may cause a vigorous exothermic reaction.

Hazardous Decomposition

Products of thermal decomposition include sodium sulfate, sulfur oxides, and sodium oxide. Products of hydrolysis include sodium dioxide.

Hazardous Polymerization

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute and Chronic Toxicity

A: General Product Information

May cause eye, skin, nose, throat and respiratory tract irritation. May be harmful if swallowed.

Chronic: Long term skin overexposure to this product may lead to dermatitis (red, itchy skin). Prolonged or repeated contact may cause allergic respiratory and skin reactions in sensitive individuals. Respiratory sensitization can be life-threatening in some cases.

B: Component Analysis - LD50/LC50

Sodium Metabisulfite (7681-57-4):

LD_{50}-Intravenous-rat: 115 mg/kg; LD_{50}-Parenteral-mouse: 910 mg/kg; LD_{50}-Oral-mouse: 5989 mg/kg; LDLo-Intravenous-mouse: 1220 mg/kg; LD_{50}-Intravenous-rabbit: 1220 mg/kg

* * * Section 11 - Toxicological Information (Continued) * * *

Acute and Chronic Toxicity (continued):

B: Component Analysis - TDLo/LDLo

Sodium Metabisulfite (7681-57-4):

LDLo-Intravenous-rabbit: 192 mg/kg; TDLo-Oral-rat: 75 mg/kg/15 days-continuous: Kidney, Urethra, Bladder: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, Enzyme inhibition, induction, or change in blood or tissue levels:- dehydrogenases; TDLo - Oral - pig: 562 gm/kg/48 weeks-continuous: Liver: changes in liver weight Kidney, Urethra, Bladder: changes in bladder weight Nutritional and Gross Metabolic - weight loss or decreased weight gain; TDLo-Oral-rat: 20 gm/kg: multigenerations: Reproductive: Effects on Newborn: stillbirth; TDLo-Oral-rat: 40 gm/kg: multigenerations: Reproductive: Effects on Newborn: weaning or lactation index (e.g., # alive at weaning per # alive at day 4); Cytogenetic analysis-hamster Ovary: 180 µg/L; Sister chromatid exchange: Rodent-hamster Ovary: 200 µg/L; TDLo-Subcutaneous-mouse: 806 mg/kg/26 weeks-intermittent: Tumorigenic: equivocal tumorigenic agent by RTECS criteria Skin and Appendages: tumors; TDLo-Oral-mouse: 14 gm/kg: female 8-12 day(s) after conception: Reproductive: Effects on Newborn: other neonatal measures or effects; TDLo-Parenteral-mouse: 60 mg/kg: female 8 day(s) after conception: Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), Specific Developmental Abnormalities: musculoskeletal system

Carcinogenicity

A: General Product Information

No information available.

B: Component Carcinogenicity

Sodium Metabisulfite (7681-57-4)

ACGIH: TLV-A4 - Not classifiable as a Human Carcinogen

Sulfur Dioxide (decomposition product)

ACGIH: TLV-A4 - Not classifiable as a Human Carcinogen

IARC: Group 3 - Not classifiable as to carcinogenicity in humans.

Epidemiology

Sodium metabisulfite has caused severe allergic reactions in asthmatics and sulfite sensitive individuals.

Neurotoxicity

Has not been identified.

Mutagenicity

Human mutation data are available for Sodium Metabisulfite, these data were obtained during clinical studies on specific human tissues exposed to high doses of this compound.

Teratogenicity

Clinical studies on test animals exposed to relatively high doses of Sodium Metabisulfite provided teratogenic data.

Other Toxicological Information

No information available.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

This product is expected to be harmful to aquatic life in low concentration.

B: Ecotoxicity

No information available.

Environmental Fate

Sodium Metabisulfite:

Water Solubility = 470 g/L (20°C).

Chemical Oxygen Demand (COD) = 165 mg oxygen/g compound

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

Sodium Metabisulfite is considered hazardous to the environment in aqueous solutions. EPA waste number for reactivity (D003) may be applicable to wastes of this product.

* * * Section 13 - Disposal Considerations (Continued) * * *

US EPA Waste Number & Descriptions (continued):

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

All wastes must be handled in accordance with local, state and federal regulations or with regulations of Canada and its Provinces. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

* * * Section 14 - Transportation Information * * *

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information

Shipping Name: Not Regulated
Hazard Class: Not Classified
UN/NA #: Not Classified
Packing Group: None
Required Label(s): None

International Air Transport Association (IATA)

For Shipments by Air transport: We classify this product as hazardous (Class 9) when shipped by air because 49 CFR 173.140 (a). "For the purposes of this subchapter, miscellaneous hazardous material (Class 9) means a material which presents a hazard during transportation, but which does not meet the definition of any other hazard class. This class includes: (a) Any material which has an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties."

UN: UN 3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (sodium metabisulfite)
Hazard Class: 9
Packing Group: III
Passenger & Cargo Aircraft Packing Instruction: 911
Passenger & Cargo Aircraft Maximum Net Quantity: 400 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg
Special Provisions: A97 A 149
ERG Code: 9L

International Maritime Organization (I.M.O.) Classification

Sodium Metabisulfite is not regulated under I.M.O.

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

No additional information.

B: Component Analysis

This material does not contain any chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Sodium Metabisulfite. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Sodium Metabisulfite	7681-57-4	No	Yes	No	Yes	Yes

* * * Section 15 - Regulatory Information (Continued) * * *

US Federal Regulations (continued)

U.S. State Regulations

A: General Product Information

California Proposition 65

Sodium Metabisulfite is not on the California Proposition 65 chemical lists.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substance lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Sodium Metabisulfite	7681-57-4	Yes	Yes	Yes	Yes	Yes	No

Other Regulations

A: General Product Information

No other information available.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Sodium Metabisulfite	7681-57-4	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Sodium Metabisulfite	7681-57-4	1 percent

ANSI LABELING (Z129.1):

WARNING! MAY BE FATAL IF SWALLOWED. CAUSES SKIN AND EYE IRRITATION. HARMFUL IF INHALED. MAY CAUSE ALLERGIC SKIN AND SEVERE RESPIRATORY REACTION. RESPIRATORY REACTIONS MAY BE LIFE-THREATENING. Keep from contact with clothing. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Avoid prolonged or repeated contact with skin. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO_2, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

* * * Section 16 - Other Information * * *

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration

Contact: Sue Palmer-Koleman, PhD **Contact Phone:** (713) 896-9966

Revision Log

08/28/00 4:23 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
06/02/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.
08/20/01 3:20 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.
02/18/02 11:13 AM HDF Up-date of SARA Hazard Ratings.
11/20/03 11:50 AM HDF General review and up-date of entire MSDS. Up-graded Section 10 Reactivity Information. Up-date of HMIS categories. Up-date of Section 8. Up-date of Section 14.
06/22/05 1:18 pm SEP Updated IATA Section 14
10/22/07 4:23 PM SEP Updated IATA Section 14

This is the end of MSDS # C1-143

NALCO

MATERIAL SAFETY DATA SHEET

PRODUCT

Nalco 73551

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **Nalco 73551**

APPLICATION : DEPOSIT PENETRANT

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

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

2. COMPOSITION/INFORMATION ON INGREDIENTS

Based on our hazard evaluation, none of the substances in this product are hazardous.

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Wear suitable protective clothing. Keep container tightly closed. Flush affected area with water.
May evolve oxides of carbon (COx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact.

INGESTION :
Not a likely route of exposure. No adverse effects expected.

INHALATION :
Not a likely route of exposure. No adverse effects expected.

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

4. FIRST AID MEASURES

EYE CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

SKIN CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. If symptoms develop, seek medical advice.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

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

5. FIRE FIGHTING MEASURES

FLASH POINT : > 400 °F / > 200 °C (COC)

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Do not touch spilled material. Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Avoid eye and skin contact. Do not take internally. Ensure all containers are labelled. Keep the containers closed when not in use.

STORAGE CONDITIONS :
Store the containers tightly closed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Respiratory protection is not normally needed.

HAND PROTECTION :
Neoprene gloves, Nitrile gloves, Butyl gloves, PVC gloves

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE Liquid

APPEARANCE	Clear Colorless
ODOR	None
SPECIFIC GRAVITY	0.99 - 1.03 @ 77 °F / 25 °C
SOLUBILITY IN WATER	Complete
pH (100 %)	6.6 - 7.0

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
None known

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon

11. TOXICOLOGICAL INFORMATION

The following results are for the polymer.

ACUTE ORAL TOXICITY :

Species	LD50	Test Descriptor
Rat	2,300 - 16,000 mg/kg	The following results are for the polymer.

Rating : Non-Hazardous

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Rainbow Trout	96 hrs	> 1,000 mg/l	Product
Bluegill Sunfish	96 hrs	> 1,000 mg/l	Product
Fathead Minnow	96 hrs	996 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs		> 1,000 mg/l	Product
Ceriodaphnia dubia	48 hrs	1,320 mg/l		Product

CHRONIC FISH RESULTS :

Species	Exposure	NOEC / LOEC	End Point	Test Descriptor
Fathead Minnow	7 Days	250 mg/l / 500 mg/l	Reproduction	Product

CHRONIC INVERTEBRATE RESULTS :

Species	Test Type	NOEC / LOEC	End Point	Test Descriptor
Ceriodaphnia dubia	3 Brood	125 mg/l / 250 mg/l	Reproduction	Product

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 85,000 mg/l

Chemical Oxygen Demand (COD) : 250,000 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	4 mg/l	Product

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by 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 waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, none of the substances in this product are hazardous.

CERCLA/SUPERFUND, 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 substances 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.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

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

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 173.340 Defoaming Agents, 21 CFR 175.105 Adhesives, 21 CFR 176.200 Defoaming Agents used in coatings, 21 CFR 176.210 Defoaming agents used in the manufacture of paper and paperboard, 21 CFR 177.1200 Cellophane, 21 CFR 177.1400 Hydroxyethyl cellulose film, water-insoluble, 21 CFR 176.300 Slimicides, 21 CFR 178.3120 - Animal glue

Limitations: no more than required to produce intended technical effect.

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :
NSF Registration number for this product is : 137540
This product is acceptable for treatment of cooling and retort water (G5) in and around food processing areas.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
None of the substances are specifically listed in the regulation.

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

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
The following substances are disclosed for compliance with State Right to Know Laws:

Water	7732-18-5
Polyalkylene glycol	Proprietary

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :
Not considered a WHMIS controlled product.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substances in this preparation are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

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 insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 05/08/2006
Version Number : 1.12

NALCO

MATERIAL SAFETY DATA SHEET

PRODUCT

3D TRASAR 3DT195

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **3D TRASAR 3DT195**

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

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

2. COMPOSITION/INFORMATION ON INGREDIENTS

Based on our hazard evaluation, none of the substances in this product are hazardous.

Hazardous Substance(s)	CAS NO	% (w/w)

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water.
Wear suitable protective clothing.
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of sulfur (SOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
No adverse effects expected.

SKIN CONTACT :
No adverse effects expected.

INGESTION :
Not a likely route of exposure. No adverse effects expected.

INHALATION :
Not a likely route of exposure. No adverse effects expected.

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

4. FIRST AID MEASURES

EYE CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

SKIN CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

INGESTION :
Get medical attention. Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

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

5. FIRE FIGHTING MEASURES

FLASH POINT : Not applicable

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of sulfur (SOx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Stop or reduce any leaks if it is safe to do so. Ventilate spill area if possible.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Clean contaminated surfaces with water or aqueous cleaning agents. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Do not breathe vapors/gases/dust. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled.

STORAGE CONDITIONS :
Store in suitable labeled containers. Store the containers tightly closed.

SUITABLE CONSTRUCTION MATERIAL :
Neoprene, EPDM, Epoxy phenolic resin, Buna-N, Polyurethane, Hypalon, Polyethylene, HDPE (high density polyethylene), Viton, Compatibility with Plastic Materials can vary; we therefore recommend that compatibility is tested prior to use., PVC

UNSUITABLE CONSTRUCTION MATERIAL :
Brass, Stainless Steel 304, Stainless Steel 316L, 100% phenolic resin liner

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Respiratory protection is not normally needed.

HAND PROTECTION :
When handling this product, the use of chemical gloves is recommended., The choice of work glove depends on work conditions and what chemicals are handled, but we have positive experience under light handling conditions using gloves made from, PVC, Gloves should be replaced immediately if signs of degradation are observed., Breakthrough time not determined as preparation, consult PPE manufacturers.

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear safety glasses with side-shields.

HYGIENE RECOMMENDATIONS :
Use good work and personal hygiene practices to avoid exposure. Consider the provision in the work area of a safety shower and eyewash. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Clear Orange
ODOR	Mild
SPECIFIC GRAVITY	1.25 @ 60 °F / 15.6 °C
DENSITY	10.39 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	4.7
VISCOSITY	84 cps @ 77 °F / 25 °C
VAPOR PRESSURE	16 mm Hg @ 100 °F / 38 °C

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Extremes of temperature

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of sulfur

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Fathead Minnow	96 hrs	4,000 mg/l	Product
Rainbow Trout	96 hrs	2,222 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs		921 mg/l	Product

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 120,000 mg/l

Chemical Oxygen Demand (COD) : 310,000 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Test Descriptor
5 d	7,320 mg/l	Product

The organic portion of this preparation is expected to be poorly biodegradable.

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM , provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models. If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	10 - 30%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by 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 waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, none of the substances in this product are hazardous.

CERCLA/SUPERFUND, 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 substances 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.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

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

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
This product may contain trace levels (<0.1% for carcinogens, <1% all other substances) of the following substance(s) listed under the regulation:

Substance(s)	Citations
• Methanol	Sec. 111, Sec. 112

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

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
None of the substances are specifically listed in the regulation.

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :
D2A - Materials Causing Other Toxic Effects - Very Toxic Material

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

INTERNATIONAL CHEMICAL CONTROL LAWS

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

EUROPE
The substances in this preparation have been reviewed for compliance with the EINECS or ELINCS inventories.

16. OTHER INFORMATION

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 insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Prepared By : Product Safety Department
Date issued : 03/21/2007
Version Number : 1.4

ODYSSEY
MANUFACTURING CO.

MATERIAL SAFETY DATA SHEET

REVISED 7/2/00

SECTION I CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

ODYSSEY MANUFACTURING CO.
1484 Massaro Boulevard
Tampa, Florida 33619
1-813-635-0339

EMERGENCY RESPONSE NUMBER:
1-800-ODYSSEY (FLORIDA)
1-813-635-0339 (24 hours)

SUBSTANCE: SODIUM HYPOCHLORITE
TRADE NAME: Ultra-CHLOR
CHEMICAL NAME/SYNONYMS: Sodium Hypochlorite Solution, Bleach Solution, Bleach Liquor, Hypo-solution, Bleach, and Liquid Bleach.
CAS NUMBER: 7681-52-9
CHEMICAL FAMILY: Alkali
FORMULA: NaOCl
DOT PROPER SHIPPING NAME: Hypochlorite Solution
DOT HAZARD CLASS: 8 (Corrosive) PG III; PG II (For solutions greater than 16% available chlorine)
DOT IDENTIFICATION NO: UN1791
RQ: 100 pounds
DOT EMERGENCY GUIDE NO: 154

SECTION II COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT(S):	
Sodium Hypochlorite (NaOCl)	10.0 - 20.0% wt
Sodium Hydroxide (NaOH)	0.1 - 0.4% wt
Water (H_2O)	79.7 - 89.9% wt

SECTION III HAZARDS IDENTIFICATION

NFPA CLASSIFICATION (SCALE 0-4): Health=2 Fire=0 Reactivity=1
EC CLASSIFICATION (ASSIGNED): C (Corrosive)

EMERGENCY OVERVIEW
COLOR: Yellow
PHYSICAL FORM: Liquid
ODOR: Chlorine Odor
MAJOR HEALTH HAZARDS: Respiratory Tract Burns, Skin Burns, Mucous Membrane Burns, and Eye Irritation
HAZARDOUS MIXTURES WITH OTHER LIQUIDS, SOLIDS, OR GASES: Reacts violently with acids liberating chlorine gas. Also reacts with organic substance. When heated, gives off oxygen that may increase fire hazard.

POTENTIAL HEALTH EFFECTS

INHALATION:

- SHORT TERM EXPOSURE: Irritation to respiratory tract. May have same as effects reported in other routes of exposure, burns, blisters, nausea, difficulty breathing, and lung congestion.
- LONG TERM EXPOSURE: Same as effects reported in short term exposure.

SKIN CONTACT:

- SHORT TERM EXPOSURE: Irritant, reddening of the skin. May have burns, blisters, and itching
- LONG TERM EXPOSURE: Same as effects reported in short term exposure.

EYE CONTACT:

- SHORT TERM EXPOSURE: Irritation (possibly severe), possible eye damage
- LONG TERM EXPOSURE: Same as effects reported in short term exposure.

INGESTION:

- SHORT TERM EXPOSURE: Burns, vomiting stomach pain, disorientation, bluish skin color, convulsions, coma
- LONG TERM EXPOSURE: Same as effects reported in short term exposure.

CARCINOGEN STATUS

OSHA: N
NTP: N
IARC: N

SECTION IV FIRST AID MEASURES

INHALATION: Remove from exposure and get fresh air. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Keep warm and at rest. Get medical attention immediately if artificial respiration is required.

SKIN CONTACT: Remove contaminated clothing, jewelry, and shoes immediately. Flush affected area with large amounts of water, preferably a safety shower. Use soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). For burns, cover affected area securely with sterile, dry, loose fitting dressing. If skin is burned, get medical attention immediately.

EYE CONTACT: Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15 minutes). Continue irrigating with a normal saline solution until ready to transport to physician. Cover with sterile bandages. Get medical attention immediately.

INGESTION: Rinse mouth with water. Drink large quantities of milk (water if no milk is available). Milk of magnesia may be helpful. **DO NOT USE ACIDIC ANTIDOTES SUCH AS SODIUM BICARBONATE.** When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, do not induce vomiting and turn their head to the side. Never make an unconscious person vomit or drink fluids. Get medical attention.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. For ingestion, avoid gastric lavage, emesis, sodium bicarbonate and acid solutions. Consider the use of antacids.

SECTION V FIRE FIGHTING MEASURES

FLASH POINT: Non-flammable

FLAMMABLE LIMITS: Non-flammable

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard. Oxidizer. This material will react with some metals and cause liberation of oxygen. May ignite or explode on contact with combustible materials. Toxic fumes can be liberated by contact with acid or heat.

EXTINGUISHING MEDIA: Regular dry chemical, carbon dioxide, water, or foam suitable for surrounding fire. For large fires, use regular foam or flood with fine water spray.

FIRE FIGHTING: Wear self-contained breathing apparatus and full protective clothing. Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Use extinguishing agents appropriate for surrounding fire. Do not get water directly on material. For large fires, flood with fine water spray. Reduce vapors with water spray. Apply water from a protected location or from a safe distance. Avoid body contact or inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

SECTION VI ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE: Do not touch spilled material. Stop leak if possible without personal risk. For small spills, collect spilled material in appropriate container for disposal and consider absorbing with sand or other non-combustible material (e.g., do not use sawdust or other combustible material). Be advised, however, that the use of absorbing material is creating hazardous waste and this absorbing material must now be disposed of properly. Collect spilled material in appropriate container for disposal. For small dry spills, move containers away from spill to a safe area. For large spills, dike for later disposal. If possible, do not allow material to enter sewers, streams, ponds or storm conduits as concentrated solutions will seriously injure aquatic life. Keep unnecessary people away, isolate hazard area and deny entry. Contain in as small an area as possible, such as a holding area for dilution and neutralization. Contain spill in plastic drums when available. Dispose of in accordance with Federal, State, and local regulations. Personnel engaged in cleanup operations must be equipped with NIOSH approved respirator protection, rubber boots, gloves, and clothing to avoid body contact. Reportable Quantity (RQ): 100 pounds. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section103, notify the National Response Center at (800) 424-8802 (USA) or (202) 426-2675 (USA).

ADVANCE PLANNING: Plan in advance for an occupational release and have necessary equipment and neutralization agents on-site. Contact Odyssey Manufacturing for assistance.

SECTION VII HANDLING AND STORAGE

Store in vented, closed containers that provide protection from direct sunlight. Keep separated from incompatible substances and do not store near acids, heat, or oxidizable materials or organics. When handling, do not mix with other cleaning agents that may liberate chlorine gas vapors (e.g., acidic agents).

Store and handle in accordance with all current regulations and standards including NFPA 430 Code for the Storage of Liquid and Oxidizing Materials.

SECTION VIII EXPOSURE CONTROLS AND PERSONNEL PROTECTION

EXPOSURE LIMITS: 2 mg/m3 AIHA recommended STEL 15 minute(s) for Sodium Hypochlorite
VENTILATION: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.
EYE PROTECTION: Splash goggles are preferred to a faceshield. Another option is to wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
CLOTHING: It is recommended to wear appropriate chemical resistant clothing to avoid body contact such as a rubber apron or rain suit. Boots are preferred for footwear.
GLOVES: Wear appropriate chemical resistant gloves.
RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

- Any chemical cartridge respirator with organic vapor cartridge(s).
- Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
- Any air-purifying respirator with a full facepiece and an organic vapor canister
- Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply (Use for Unknown Concentrations or those that may be Immediately Dangerous to Life or Health)
- Any self-contained breathing apparatus with a full facepiece (Use for High Concentrations or those which are immediately Dangerous to Life or Health)

SECTION IX PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL APPEARANCE: Liquid
APPEARANCE AND ODOR: Clear - Chlorine odor like household bleach.
COLOR: Greenish –Yellowish cast
MOLECULAR WEIGHT: 74.44
MOLECULAR FORMULA: Na-O-Cl

BOILING POINT: Degrades at 230 Degrees Fahrenheit
FREEZING POINT: 7 Degrees Fahrenheit
SPECIFIC GRAVITY: 1.15 - 1.17 at 60 Degrees Fahrenheit
PH: Approximately 11 - 13
VAPOR PRESSURE (mm HG): Vapor Pressure of water + decomposition product Vapor Pressure
VAPOR DENSITY: Not Available
SOLUBILITY IN WATER: Complete
VOLATILITY: Not Available
EVAPORATION RATE: >1
COEFFICIENT OF WATER /OIL DISTRIBUTION: Not Available

SECTION X STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.
CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Dangerous gases may accumulate in confined spaces. May ignite or explode on contact with combustible materials.
INCOMPATIBLES: Acids, metals, amines, combustible materials, reducing agents. Specific reactions with sodium hypochlorite include the following:
ACIDS: Violent reaction.
ALUMINUM: Corrosive action.
AMINES: Form explosive chloramines.
AMMONIA: Form explosive chloramines.
AMMONIUM SALTS: May form explosive product.
BENZYL CYANIDE (ACIDIFIED): Explosive reaction.
CELLOLOSE: Violent reaction
ETHYLENEIMINE: Forms explosive 1-chloroethyleneimine.
FORMIC ACID: Explosive mixture.
METHANOL: May form explosive compound.
NITROGEN COMPOUNDS: Forms explosive N-chloro compounds.
ORGANIC AND COMBUSTIBLE MATERIALS: Fire and explosion hazard.
OXALIC ACID: Intense reaction
REDUCING AGENTS: Fire and explosion hazard
ZINC: Corrosive
HAZARDOUS DECOMPOSITION:
Thermal decomposition products – Chlorine and Hydrochloric Acid Vapors
Decomposition Products – Hypochlorous Acid Vapors
POLYMERIZATION: Will not polymerize.

SECTION XI SODIUM HYPOCHLORITE TOXILOGICAL INFORMATION

IRRITATION DATA: 10 mg eyes – rabbit moderate
TOXICITY DATA:
1gm/ kg oral-woman; TDLo; 45mg/kg intravenous-man TDLo; 5800 mg/ kg oral-mouse LD5O; 140 mg/ kq/9 week(s) continuous oral-rat TDLo
CARCINOGEN STATUS: According to the IARC, animal inadequate evidence, human no adequate data, Group 3 (Hypochlorite salts)
LOCAL EFFECTS:
Corrosive: inhalation, skin contact, eye, ingestion hazards
ACUTE TOXICITYLEVEL:
Slightly Toxic if ingested
MUTAGENIC DATA:
Mutation in micro organisms – Salmonella typhimurium 1mg / plate (-S9); DNA repair – Escherichiacoli 20ug/ disc; DNA damage – Esoherichiacoli 420 umol/L; phage inhibition capacity – Esoherichiacoli 103 ug/ well; micronucleus test - non-mammalian species multiple 200 ppb; cytogenetic analysis - non-mammalian species multiple 120 ug/ L; cytogenetic analysis – human lymphocyte 100 ppm 24hour(s); sister chromatid exchange – human embryo 149 mg/ L; cytogenetic analysis – hamster lung 100 mg/ L
HEALTH EFFECTS:
INHALATION
ACUTE EXPOSURE: May cause severe bronchial irritation, sore throat with possible blistering, coughing,

stomatitis, nausea, labored breathing, shortness of breath and pulmonary epedema. 10-20 mg/m3 causes burning of the nose and throat; 40-60 mg/m3 may be fatal. If sufficient amounts are absorbed, may cause effects as detailed in acute ingestion.

CHRONIC EXPOSURE: No data available.

SKIN CONTACT

ACUTE EXPOSURE: Extent of damage depends on concentration, pH, volume of solution and duration of contact. May cause redness, pain, blistering, itchy eczema and chemical burns. Sensitization reactions are possible in previously exposed persons.

CHRONIC EXPOSURE: Effects depend on concentration and duration of exposure. Repeated or prolonged contact with corrosive substances may result in dermatitis or effects similar to acute exposure. Allergic dermatitis has also been reported.

EYE CONTACT

ACUTE EXPOSURE: May cause redness, pain, and blurred vision. Solutions of 5% splashed in human eyes have caused a burning sensation and later only slight superficial disturbance of the corneal epithelium which cleared completely in the next day or two without special treatment. However, one animal study reports a 5% solution causing only moderate irritation with clearing within 7 days. A higher concentration of 15% tested on rabbit eyes caused immediate severe pain, hemorrhages, rapid onset of ground-glass appearance of the corneal epithelium, moderate bluish edema of the whole cornea, chemosis and discharge for several days. Such eyes have sometimes healed in 2-3 weeks with slight or no residual corneal damage but they had neovascularization of the conjunctiva and distortion of the nictitating membrane by scarring.

CHRONIC EXPOSURE: Depending on concentration and duration of exposure, symptoms may be as those of acute exposure.

INGESTION

ACUTE EXPOSURE: May cause irritation and erosion of the mucous membranes, vomiting (possibly bloody) and abdominal pain and spasms. A drop in blood pressure, shallow respiration, edema (possibly severe) of pharynx, larynx, and glottis, confusion, convulsions, delirium and coma may occur. Cyanosis and circulatory collapse are possible. Esophageal or gastric perforation and strictures are rare. Death may occur, usually due to complications of severe local injury such as toxemia, shock, perforations, hemorrhage, infection and obstruction. Massive ingestions may produce fatal hyperchloremic metabolic acidosis or aspiration pneumonitis.

CHRONIC EXPOSURE: Sensitization reactions are reported in individuals who are exposed in small amounts through their water supply. High doses have caused sperm abnormality in mice.

SECTION XII ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 94.0 ug/L 96h hour(s) LC5O (Mortality) Cutthroat trout (Oncorhynchus clarki)
INVERTEBRATE TOXICITY: 31.6 ug/L 7 hour(s) 1C50 (Species Diversity) Protozoan phylum (Protozoa)
ALGAL TOXICITY: 90 ug/L 96 hour(s) LC5O (Mortality) Algae, phytoplankton, algai mat (Algae)
PHYTOTOXICITY: 230 ug/L 35 hour(s) (Biomass) Curled pondweed (Potamogeton crispus)
OTHER TOXICITY: 2.1 ug/L 28 day(s) (Chlorophyll) Aquatic community (Aquatic community)

ENVIRONMENTAL SUMMARY: Highly toxic to aquatic life.

SECTION XIII DISPOSAL CONSIDERATIONS

Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001. Dispose in accordance with all applicable regulations.

SECTION XIV TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101 SHIPPING NAME-UN NUMBER: Sodium Hypochlorite) - UN1791
U.S. DOT 49 CER 172.101 HAZARD CLASS OR DIVISION: 8
U.S. DOT 49 CFR 172 .101 PACKING GROUP: III (less than 16% available chlorine) / II (16% or more available chlorine)
U.S. DOT 49 CFR 172.101 AND SUBPART E LABELING REQUIREMENTS: Corrosive
U.S. DOT 49 CFR 172.101 PACKAGING AUTHORIZATIONS:
EXCEPTIONS: 49 CFR 173.154

NON- BULK PACKAGING: 49 CFR 173.203 (less than 16% available chlorine) / 49 CFR 173.202 (16% or more available chlorine)
BULK PACKAGING: 49 CFR 173.241 (less than 16% available chlorine) / : 49 CFR 173.242 (16% or more available chlorine)
U.S. DOT 49 CFR 172.101 QUANTITY LIMITATIONS:
PASSENGER AIRCRAFT OR RAILCAR: 5 LITERS / (less than 16% available chlorine) / 1 LITERS (16% or more available chlorine)
CARGO AIRCRAFT ONLY: 60 LITERS / (less than 16% available chlorine) / 30 LITERS (16% or more available chlorine)

SECTION XV REGULATORY INFORMATION

U.S. REGULATIONS
TSCA INVENTORY STATUS: Y

TSCA 12(b) EXPORT NOTIFICATION: Not listed.
CERCLA SECTION 103 (40CFR302.4): Y
SODIUM HYPOCHLORITE: 100 LBS RQ
SARA SECTION 302 (40CFR355.30) : N
SARA SECTION 304 (40CFR355.40) : N
SARA SECTION 313 (40CFR372.65) : N
SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40CFR370.21):
ACUTE: Y
CHRONIC: N
FIRE: N
REACTIVE: N
SUDDEN RELEASE: N
OSHA PROCESS SAFETY (29CFR1S1O.119): N
STATE REGULATIONS:
California Proposition 65: N EUROPEAN REGULATIONS:
EC NUMBER (BINECS) : 231-668-3

EC RISK AND SAFETY PHRASES:

R 31	Contact with acids liberates toxic gas.
R 34	Causes burns.
S ½	Keep locked-up and out of reach of children.
S 28b	After contact with skin, wash immediately with plenty of soap and water.
S 45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
S 50	Do not mix with incompatible materials.

CONCENTRATION LIMITS:

C>10%	C	R 31-34
5%<=C<=l0%	Xi	R 31-36/38

GERMAN REGULATIONS:
WATER HAZARD CLASS (WGK) : 2 (Official German Classification)

SECTION XVI OTHER INFORMATION

For additional information, contact our technical service department.

Information contained in this MSDS refers only to the specific material designated and does not relate to any process or use involving other materials. This information is based on data believed to be reliable, and the Product is intended to be used in a manner that is customary and reasonably foreseeable. Since actual use and handling are beyond our control, no warranty, express or implied, is made and no liability is assumed by Odyssey Manufacturing in connection with the use of this information.

NALCO

SAFETY DATA SHEET

PRODUCT

ACTI-BROM® 1338

EMERGENCY TELEPHONE NUMBER(S)

(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **ACTI-BROM® 1338**

APPLICATION : CHLORINE ENHANCER, BIODISPERSANT

COMPANY IDENTIFICATION : Nalco Company
1601 W. Diehl Road
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER(S) : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 1 / 1 FLAMMABILITY : 0 / 0 INSTABILITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme * = Chronic Health Hazard

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Refer to Section 15 for more information.

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Bromide	7647-15-6	30 - 60

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

WARNING
HARMFUL IF SWALLOWED. HARMFUL IF ABSORBED THROUGH SKIN. CAUSES MODERATE EYE IRRITATION.
Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse.
Wear suitable protective clothing, gloves and eye/face protection.
Not flammable or combustible. May evolve hydrogen bromide and bromine under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
Can cause mild to moderate irritation.

SKIN CONTACT :
May cause irritation with prolonged contact. Harmful if absorbed through skin.

INGESTION :
Not a likely route of exposure. May be harmful if swallowed.

INHALATION :
Not a likely route of exposure. Repeated or prolonged exposure may irritate the respiratory tract.

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

HUMAN HEALTH HAZARDS - CHRONIC :
No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

IF SWALLOWED: Call a poison control center or a doctor immediately for treatment advice. DO NOT INDUCE VOMITING. Do not give anything to drink.

IF IN EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. After at least 15 minutes of rinsing or after it is judged that nearly all of the contamination has been removed. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing. Call a poison control center or a doctor immediately for treatment advice.

IF ON SKIN OR CLOTHING: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

IF INHALED: Move person to fresh air. If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for treatment advice.

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

5. FIRE FIGHTING MEASURES

FLASH POINT : None

EXTINGUISHING MEDIA :
Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
Not flammable or combustible. May evolve hydrogen bromide and bromine under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Stop or reduce any leaks if it is safe to do so. Do not touch spilled material. Ventilate spill area if possible. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection).

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters, unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Do not breathe vapors/gases/dust. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Do not mix with acids.

STORAGE CONDITIONS :
Store the containers tightly closed. Store in a cool well ventilated area away from direct sunlight.

UNSUITABLE CONSTRUCTION MATERIAL :
Shipping and long term storage compatibility with construction materials can vary; we therefore recommend that compatibility is tested prior to use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Respiratory protection is not normally needed. Where concentrations in air may exceed the limits given in this section or when significant mists, vapors, aerosols, or dusts are generated, an approved air purifying respirator equipped with

suitable filter cartridges is recommended. Consult the respirator / cartridge manufacturer data to verify the suitability of specific devices. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
Neoprene gloves Nitrile gloves Butyl gloves PVC gloves

SKIN PROTECTION :
Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Use good work and personal hygiene practices to avoid exposure. Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Always wash thoroughly after handling chemicals. When handling this product never eat, drink or smoke.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Moderate

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Colorless
ODOR	None

SPECIFIC GRAVITY	1.43 - 1.49 @ 77 °F / 25 °C
DENSITY	12.0 - 12.4 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	4.0 - 9.0
VISCOSITY	5 cps @ 72 °F / 22 °C
FREEZING POINT	-13 °F / -25 °C
BOILING POINT	230 °F / 110 °C
VAPOR PRESSURE	7.6 mm Hg @ 68 °F / 20 °C
VOC CONTENT	0.00 %

Note: These physical properties are typical values for this product and are subject to change.

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Reducing agents

HAZARDOUS DECOMPOSITION PRODUCTS :
Under acidic conditions: Hydrogen bromide

11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

ACUTE ORAL TOXICITY :

Species:	Rat
LD50:	> 5,000 mg/kg
Test Descriptor:	Similar Product

ACUTE DERMAL TOXICITY :

Species:	Rabbit
LD50:	> 2,000 mg/kg
Test Descriptor:	Similar Product

PRIMARY SKIN IRRITATION :

Species:	Rabbit
Draize Score:	0.4 /8.0
Test Descriptor:	Similar Product
Remarks:	Not irritating

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Test Descriptor
Bluegill Sunfish	96 hrs	> 1,000 mg/l	Product
Rainbow Trout	96 hrs	> 1,000 mg/l	Product
Guppy	96 hrs	538 mg/l	Product
Fathead Minnow	96 hrs	> 1,000 mg/l	Product
Inland Silverside	96.00 hrs	> 5,000.000 mg/l	Product

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Test Descriptor
Daphnia magna	48 hrs	> 1,000 mg/l		Product
Mysid Shrimp (Mysidopsis bahia)	96.00 hrs	1,827.000 mg/l		Product

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 2,000 mg/l

Chemical Oxygen Demand (COD) : 53,000 mg/l

Biological Oxygen Demand (BOD) : This material is an oxidizing biocide and is not expected to persist in the environment.

Greater than 95% of this product consists of inorganic substances for which a biodegradation value is not applicable.

MOBILITY :
The environmental fate was estimated using a level III fugacity model embedded in the EPI (estimation program interface) Suite TM, provided by the US EPA. The model assumes a steady state condition between the total input and output. The level III model does not require equilibrium between the defined media. The information provided is intended to give the user a general estimate of the environmental fate of this product under the defined conditions of the models.
If released into the environment this material is expected to distribute to the air, water and soil/sediment in the approximate respective percentages;

Air	Water	Soil/Sediment
<5%	30 - 50%	50 - 70%

The portion in water is expected to be soluble or dispersible.

BIOACCUMULATION POTENTIAL
This preparation or material is not expected to bioaccumulate.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: High
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Moderate

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by 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 waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are as follows.

LAND TRANSPORT :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

This section contains additional information that may have relevance to regulatory compliance. The information in this section is for reference only. It is not exhaustive, and should not be relied upon to take the place of an individualized compliance or hazard assessment. Nalco accepts no liability for the use of this information.

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Sodium Bromide : Non-Hazardous

CERCLA/SUPERFUND, 40 CFR 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 substances 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 this product to be hazardous. The product should be reported under the following indicated EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

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

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The substances in this preparation are included on or exempted from the TSCA 8(b) Inventory (40 CFR 710)

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : the following use conditions.

This product may be used to treat pulp and papermill water systems in situations requiring FDA sanction provided the bromide concentration in the water is kept below 22 ppm. The product must be used in conjunction with an oxidant such as bleach or gaseous chlorine. Follow instructions for use in pulp and papermill on the product label.

NSF NON-FOOD COMPOUNDS REGISTRATION PROGRAM (former USDA List of Proprietary Substances & Non-Food Compounds) :
NSF Registration number for this product is : 142570
This product is acceptable for treatment of cooling and retort water (G5) in and around food processing areas. This product is acceptable for treating boilers, steam lines, and/or cooling systems (G7) where neither the treated water nor the steam produced may contact edible products in and around food processing areas.

FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA) :
EPA Reg. No. 1706-168

In all cases follow instructions on the product label.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR 116.4 / formerly Sec. 311 :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CLEAN AIR ACT, Sec. 112 (Hazardous Air Pollutants, as amended by 40 CFR 63), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

CALIFORNIA PROPOSITION 65 :
Substances listed under California Proposition 65 are not intentionally added or expected to be present in this product.

MICHIGAN CRITICAL MATERIALS :
Substances listed under this regulation are not intentionally added or expected to be present in this product. Listed components may be present at trace levels.

STATE RIGHT TO KNOW LAWS :
This product is a registered biocide and is exempt from State Right to Know Labelling Laws.

INTERNATIONAL CHEMICAL CONTROL LAWS :

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
The substance(s) in this preparation are included in or exempted from the Domestic Substance List (DSL).

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS).

CHINA
All substances in this product comply with the Provisions on the Environmental Administration of New Chemical Substances and are listed on the Inventory of Existing Chemical Substances China (IECSC).

EUROPE
The substance(s) in this preparation are included in or exempted from the EINECS or ELINCS inventories

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Existing and New Chemical Substances list (ENCS).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)

NEW ZEALAND
All substances in this product comply with the Hazardous Substances and New Organisms (HSNO) Act 1996,and are listed on or are exempt from the New Zealand Inventory of Chemicals.

PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippines Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Moderate

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

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 insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version),
Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH,
(TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

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