



Public Service®

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Public Service
Company of Colorado

April 22, 1997
Fort St. Vrain
P-97028

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

NL10
1/1

Attention: Mr. John W. Hickey, Chief
Decommissioning and Regulatory
Issues Branch

Docket No. 50-267

SUBJECT: Proposed Amendment to Fort St. Vrain NPDES Permit

Dear Mr. Hickey:

Attached for your information is a copy of a proposed amendment to the Fort St. Vrain (FSV) National Pollutant Discharge Elimination System (NPDES) Permit, Wastewater Discharge Permit No. CO-0001121. This amendment was requested from the Colorado Department of Public Health and Environment to support repowering activities, including operation of the cooling tower and boiler feedwater process systems and subsequent wastewater discharges.

The attached proposed change to the FSV NPDES Permit is provided to the NRC in accordance with Section 3.2.d of the FSV Non-Radiological Technical Specifications, Appendix B to Facility Operating License No. DPR-34. If you have any questions regarding this information, please contact Mr. M. H. Holmes at (303) 571-7633.

Sincerely,

Frederick J. Borst
Frederick J. Borst

Decommissioning Program Director

FJB/SWC

Attachment

9704290059 970422
PDR ADOCK 05000267
W PDR



P-97028
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cc: w/attachment

Regional Administrator, Region IV

Mr. Robert M. Quillin, Director
Radiation Control Division
Colorado Department of Public Health and Environment



Public Service
Company of Colorado
P.O. Box 840
Denver, CO 80201-0840

April 16, 1997

Mr. Don Holmer
Permits and Enforcement Section
Water Quality Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80222-1530

RE: Public Service Company of Colorado - Request for Amendment to the Fort St. Vrain Station
Wastewater Discharge Permit - CDPS Permit No. CO-0001121

Dear Don:

In a letter to the Colorado Water Quality Control Division (CWQCD), dated May 15, 1995, Public Service Company of Colorado (PSC) requested a wastewater discharge permit amendment to address changes to the Fort St. Vrain Generating Facility (FSV) as a result of decommissioning and Phase 1A of the repowering project. Phase 1A, the installation of the combustion turbine, was completed in the first quarter of 1996.

PSC began Phase 1B construction, the installation of a heat recovery steam generator (HRSG), in the first quarter of 1997. Construction of Phase 1B is expected to be completed by the end of 1997 with operation beginning in 1998. A result of HRSG installation and operation will be the startup and operation of the cooling towers and boiler feedwater systems. Operation of the cooling tower and boiler feedwater process systems and subsequent wastewater discharges require the FSV wastewater discharge permit to be amended to reflect projected operations.

PSC submits the following permit amendment requests for FSV's wastewater discharge permit:

Outfalls 001B and 002

FSV's wastewater discharge permit identifies outfall 001B as the industrial wastewater discharge at the Parshall Flume to the Goosequill Ditch Stub. Water in the Goosequill Ditch Stub flows to the Jay Thomas Ditch then to the Farm Pond before discharge to the South Platte River. Outfall 001A is identified as the discharge from the Farm Pond to the South Platte River. Outfall 001B does not include water in the Goosequill Ditch or the Jay Thomas Ditch.

Outfall 002 is identified as the alternate discharge point for outfall 001 when the Goosequill Ditch Stub is unavailable due to maintenance. Wastewater from outfall 002 flows through the Drainage Slough to the St. Vrain Creek. Outfall 002 is located at the Parshall Flume before the diversion box

Outfalls 001B and 002 have similar monitoring requirements. Differences in monitoring between 001B and 002 are the monitoring requirements for 002 for total recoverable iron and chronic whole effluent toxicity. PSC requests that all references to outfall 002 as the "alternate" discharge outfall when the Goosequill Ditch Stub is closed for maintenance be revised to indicate that FSV can discharge wastewater from outfall 001B and/or 002 in a manner that provides maximum benefit for facility operations.

This permit amendment will provide operational flexibility for FSV without impacting monitoring requirements and/or water quality.

Whole Effluent Toxicity

Whole effluent toxicity (WET) monitoring requirements were a provision of FSV's wastewater discharge permit when it was renewed in 1993. The CWQCD justified WET monitoring as a means to ensure that there are no discharges "in amounts", concentrations, or combinations which are harmful to the beneficial uses or toxic to humans, animal, plants, or aquatic life. Outfall 001B has quarterly acute WET monitoring requirements using Ceriodaphnia and fathead minnows. Outfall 002 has quarterly acute and semiannual chronic WET monitoring using Ceriodaphnia and fathead minnows.

The in-stream waste concentration (IWC) for outfall 001B in FSV's wastewater discharge permit is 6.1% which was based on a stream flow of 32.3 MGD and outfall flow of 2.08 MGD. The IWC for outfall 002 in FSV's wastewater discharge permit is 4.5% which was based on a stream flow of 44.0 MGD and outfall flow of 2.08 MGD. Average wastewater flows through outfall 001B and 002 are not expected to exceed those used in the IWC calculations in Phase 1B or Phase 2 of the FSV repowering project.

PSC requests that the WET monitoring requirements in FSV's wastewater discharge permit be revised to consider current CWQCD biomonitoring guidance and that discharges from outfall 001B and 002 are the same industrial wastewater discharged either to the South Platte River or the St. Vrain Creek. Since neither outfall 001B or 002 exceed the IWC of 9.1% used in the CWQCD's current biomonitoring guidance, PSC requests that all chronic WET monitoring requirements be removed from the FSV wastewater discharge permit. In addition since the industrial wastewater discharges from outfalls 001B and 002 are the same wastewater, PSC requests that the FSV wastewater discharge permit be amended to require only a single acute WET test per quarter regardless of whether outfall 001B, 002, or both 001B and 002 are used in a quarter.

This revision will change FSV's wastewater discharge permit to reflect the CWQCD's biomonitoring guidelines and amend the current situation of two quarterly acute WET tests being required (one for outfall 001B and one for outfall 002) when the industrial wastewater discharge point is changed within a quarter. The revision addresses the CWQCD's concern about biomonitoring while boiler feedwater and cooling water systems at FSV are being started but reduces PSC's potential economic impact of biomonitoring.

To support the CWQCD's review of the amendment request for revisions to the WET monitoring requirements, PSC has provided in ATTACHMENT I the Colorado - CDPS WET Report Forms for all of FSV's WET tests since 1993.

Total Residual Chlorine

FSV's wastewater discharge permit requires weekly monitoring for total residual chlorine for outfalls 001A, 001B, 002, and 007. The daily maximum and 30-day average permit limit for total residual chlorine at outfalls 001A, 001B, and 002 is 0.25 mg/l. The daily maximum total residual chlorine permit limit for outfall 007 is 2.0 mg/l. Outfall 007 is the internal discharge point from the domestic sewage treatment system.

PSC requests that the monitoring requirement for total residual chlorine for outfall 007 be removed from FSV wastewater discharge permit. Since outfalls 001B and 002 include wastewater from outfall 007, the weekly requirement to monitor total residual chlorine at both internal and external discharge points is redundant. Review of the 1995 and 1996 total residual chlorine test results for outfalls 001A, 001B, 002, and 007 show that there were only three months where total residual chlorine test results for outfall 007 were above 0.05 mg/l. The average/maximum total residual chlorine test results for April 1995, May 1995, and April 1996, were 0.78 mg/l / 1.85mg/l, 1.21 mg/l / 1.21 mg/l, and 0.37 mg/l / 1.97 mg/l, respectively. Total residual chlorine test results for outfalls 001A, 001B, and 002 were all <0.05 mg/l for these months. PSC believes that total residual chlorine monitoring can be removed from outfall 007 without any impacts to water quality.

By-pass Flows

Page 14 of FSV's wastewater discharge permit Rationale and page 1a of the permit indicate that as a best management practice the combined flow from the cooling towers and raw water storage ponds in the North Yard Drains shall be managed so as to minimize the exceedance of the 1100 to 2000 gpm flow necessary to maintain compliance with limits required by the Nuclear Regulatory Commission (NRC). The by-pass flows are used to control radionuclide concentrations in wastewater discharges. As a result of decommissioning, PSC expects the NRC to terminate PSC's radioactive materials license for FSV.

Even after PSC's radioactive materials license for FSV is terminated by the NRC, PSC expects that some by-pass flows will need to be continued. The reason for continued main-cooling tower by-pass flows to the North Yard Drains is to prevent the FSV Raw Water Pond from becoming septic and to support irrigation of crop land on PSC property.

FSV was built with two raw water ponds. Each pond has a capacity of approximately 13 million gallons. FSV has drained one of the raw water ponds. The remaining pond must be kept full to ensure the pond's integrity. Since FSV's operation of the combustion turbines and HRSGs will use small volumes of water when compared to its original nuclear design, the remaining raw water pond will have problems with low turnover. The low turnover will cause problems with algae growth and a resulting increase in pH. FSV could experience operational problems and have difficulty meeting its wastewater discharge permit requirements if the raw water ponds become septic.

PSC property surrounding FSV is cultivated to produce agricultural crops. Irrigation is dependent upon the by-pass flows which flow either to the Goosequill Ditch or Drainage Stub. PSC needs to keep some by-pass to support irrigation of the crop-land.

PSC is requesting that the permit Rationale be revised to reflect that by-pass flows will be maintained to ensure facility operation. However, Best Management Practices will be used to minimize the by-pass flows.

Chemical Cleaning

PSC expects startup and future chemical cleaning of the cooling water and boiler feedwater systems to result in large quantities of wastewater. FSV's wastewater discharge permit (page 1a) specifically prohibits discharge of metal cleaning wastes and cooling tower basin cleaning wastes. PSC plans to discharge both metal cleaning wastes and cooling tower basin cleaning wastes to the South Evaporation Pond. This pond has a synthetic liner which has recently been inspected and found to be in good condition.

PSC requests that the FSV wastewater discharge permit be amended to reflect that metal cleaning wastes and cooling tower basin cleaning wastes can be sent to the facility's evaporation ponds.

Water Treatment Chemicals

PSC has reviewed the chemical list in FSV's wastewater discharge permit. A revised chemical list is attached to include chemicals currently used and those that will be brought on site to support operations this fall. Material Safety Data Sheets for chemicals that are proposed for introduction to FSV are provided as ATTACHMENT II.

PSC requests that the chemical list in FSV's wastewater discharge permit be revised to reflect the chemicals that will be introduced to support repowering. A detailed discussion of using hydrazine as an oxygen scavenger was supplied to the CWQCD in PSC's Cherokee Station wastewater discharge permit amendment request dated March 18, 1997. Hydrazine information supporting reintroduction in Cherokee Station's amendment request is not duplicated in this request. If the CWQCD needs this information to be resubmitted, please call Eldon Lindt at 571-7440.

FSV Chemical List

Chemicals Currently Being Used			
Chemical Name	Manufacturer	Purpose	In Which Waste Stream?
Sodium Hydroxide	Various	pH Control	Turbine Building Sump/ Demineralizer Sump - Outfalls 001A and 001B and evaporation ponds
Sulfuric Acid	Various	pH Control	Demineralizer Sump and Cooling Tower Blowdown - Outfalls 001A and 001B and evaporation ponds
Calcium Hypochlorite	Various	Chlorination of Sewage Lagoon Effluent	Sewage Lagoon Effluent - Outfalls 001A and 001B
Chlorine/Bromine Powder	Various	Biocide in 42 System Cooling Tower	Cooling Tower Blowdown - Outfalls 001A and 001B
H-133A which contains N-Dodecylguanidine Hydrochloride or equivalent	Calgon or supplier with equivalent product	Microbicide	Cooling Tower Blowdown - Outfalls 001A and 001B
Calgon PCL-711 or equivalent	Calgon	Cooling Tower Scale and Corrosion Inhibitor	Cooling Tower Blowdown - Outfalls 001A and 001B
Mineral Oil and Kerosene	Various	Antifoam	Cooling Tower Blowdown and Turbine Building Sump - Outfalls 001A and 001B
Citric Acid	Various	Boiler Tube Cleaning and Emergency Response	Evaporation Pond
Soda Ash	Various	Emergency Spill Cleanup	Evaporation Ponds/ Offsite Waste Disposal
Summit Labs 756 Sodium Sulfite / Sodium Metabisulfite	Summit Labs	Oxygen Scavenger	Turbine Building Sump - Outfalls 001A and 001B
Potassium Hydroxide	Various	pH Control	Turbine Building Sump
Summit Labs 713 Sodium Polymethacrylate / Polyacrylic Copolymer	Summit Labs	Auxiliary Boiler Treatment	Turbine Building Sump - Outfalls 001A and 001B
Trisodium Phosphate		pH and Scale Control	Turbine Building Sump - Outfalls 001A and 001B
Disodium Phosphate		pH and Scale Control	Turbine Building Sump - Outfalls 001A and 001B

Chemical Name	Manufacturer	Purpose	In Which Waste Stream?
Calgon CL-361 or equivalent	Calgon or supplier with equivalent product	Penetrant - Biocide Assistance	Cooling Tower Blowdown - Outfalls 001A and 001B
Calgon CL-5	Calgon	Copper Corrosion Inhibitor	Cooling Tower Blowdown - Outfalls 001A and 001B
New Chemicals To Be Introduced			
Monosodium Phosphate		pH and Scale Control	Turbine Building Sump - Outfalls 001A and 001B
Chlorine		Biocide in 41 and 42 Cooling Water Systems	Cooling Tower Blowdown - Outfalls 001A and 001B
Hydrazine		Oxygen Scavenger	Turbine Building Sump - Outfalls 001A and 001B
Morpholine - Summit 782 or equivalent	Various	Condensate treatment	Turbine Building Sump - Outfalls 001A and 001B
Cyclohexylamine - Summit 782 or equivalent	Various	Condensate pH Control	Turbine Building Sump - Outfalls 001A and 001B

Facility/Legal Contacts

Amendment No. 6 to FSV's wastewater discharge permit identifies Alan Albrandt as the legal contact and a facility contact. Mary Fisher is identified as a facility contact. PSC is merging with Southwestern Public Service Company (SPS) to form New Century Energies. As a result of the merger, a staff reorganization is taking place. The legal contact has changed while the PSC/SPS reorganization is in progress. Further changes to the legal and facility contacts are expected. Following completion of the merger restaffing process, the CWQCD will be notified of all the revisions to legal and facility contacts for PSC's wastewater discharge permits.

The Facility Contact in the FSV wastewater discharge permit should be revised to the following:

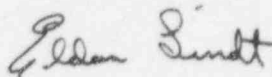
Marty Block
Manager, Fort St. Vrain
16805 Weld County Road
Platteville, CO 80651
(303) 620-1313

The interim legal contact for the FSV wastewater discharge permit is:

Charles H. Fuller
Acting VP Engineering and Operations Support
Public Service Company of Colorado
PO Box 840, Denver, CO 80201-0840
550 15th Street, Suite 700
Denver, CO 80202-4256
(303) 571-7221

If you have any questions concerning PSC's amendment request for FSV's wastewater discharge permit, please call Eldon Lindt at 571-7440.

Sincerely,



Eldon Lindt
Sr. Environmental Analyst

Attachments

cc: (with Attachments)

Marty Block
Sam Chestnutt

Jesse Brungardt

Dave Fetterolf

(without Attachments)

Alan Albrandt

Mark Fox

ATTACHMENT I

Outfall 001B - Acute Whole Effluent Toxicity Monitoring

1. Second Quarter 1993 Acute WET Test - May 1993
2. Third Quarter 1993 Acute WET Test - September 1993
3. Fourth Quarter 1993 Acute WET Test - October 1993
4. First Quarter 1994 Acute WET Test - March 1994
5. Second Quarter 1994 Acute WET Test - June 1994
6. Third Quarter 1994 Acute WET Test - September 1994
7. Fourth Quarter 1994 Acute WET Test - December 1994
8. First Quarter 1995 Acute WET Test - February 1995
9. Second Quarter 1995 Acute WET Test - May 1995
10. Third Quarter 1995 Acute WET Test - August 1995
11. Fourth Quarter 1995 Acute WET Test - November 1995
12. First Quarter 1996 Acute WET Test - March 1996
13. Second Quarter 1996 Acute WET Test - June 1996
14. Third Quarter 1996 Acute WET Test - July 1996

Outfall 002 - Acute Whole Effluent Toxicity Monitoring

1. Third Quarter 1993 Acute WET Test - November 1993
2. Second Quarter 1994 Acute WET Test - May 1994
3. Second Quarter 1995 Acute WET Test - June 1995
4. Third Quarter 1996 Acute WET Test - August 1996
5. Fourth Quarter 1996 Acute WET Test - October 1996
6. First Quarter 1997 Acute WET Test - February 1997

Outfall 002 - Chronic Whole Effluent Toxicity Monitoring

1. Chronic WET Test - November 1993
2. Chronic WET Test - May 1994
3. Chronic WET Test - June 1995
4. Chronic WET Test - August 1996
5. Chronic WET Test - April 1997

Outfall 001 B - Second Quarter 1993 Acute WET Test - May 1993

COLORADO - CDP'S WET TEST REPORT FORM - ACUTE

343192

PERMITTEE: Fort St. Vrain CDP'S NO. CO-00 OUTFALL: 001B ECCO 1111

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pseudophoxinus AGE: <24 hrs.

TEST RESULTS: IWC: 6.1 CONTROL MORTALITY: 0 LC50: >100

50% MORTALITY LIMIT: PASS/FAIL CONC WITH STAT. SIGNIFICANT MORTALITY: 1600

SAMPLE TYPE: GRAB/COMPOSITE TIME & DATE: 1200 AM/PM 5-5-93

TEST TIME & DATE: BEGIN 1200 AM/PM 5/6/93 END 1250 AM/PM 5/8/93

DILUTIONS (3 EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12	6
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 72 HRS:						
AFTER 96 HRS:						

MAX/MIN VALUES

DISSOLVED OXYGEN, MG/L: 7.7/6.9 7.3/7.0 7.4/7.2 7.6/7.0 7.7/7.0 7.8/7.0

TEMPERATURE °C: 20.5/20.2 20.5/19.9 20.5/20.2 20.4/20.1 20.7/20.0 20.9/20.0

RECEIVING WATER USED FOR DILUTION? YES/NO SAMPLE AERATED? YES/NO

HARDNESS, MG/L: RECEIVING WATER 330 EFFLUENT 268 RECON/LAB WATER NA

ALKALINITY, MG/L: RECEIVING WATER 208 EFFLUENT 186 RECON/LAB WATER NA

PH: INITIAL - CONTROL 8.1 100% 8.9 FINAL - CONTROL 8.5 100% 8.6

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% ND

TOT. RESID. CHLORINE, MG/L: 100% ND SAMPLE DECHLORINATED BEFORE TEST? YES/NO

THE SEACREST GROUP

LABORATORY: _____ ANALYST: Karen Christensen

COMMENTS: Jelly X. Can 5/14/93 Fall 11/14/94

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

393192
001B
Goosewill

PERMITTEE: Public Service - Ft. St. Vrain CDPS NO. CO-00 _____ OUTFALL: _____

TYPE TEST: ROUTINE: ☒ ACCELERATED: _____ TEST SPECIES: Fathead Minnows AGE: 5 day

TEST RESULTS: IWC: 6.1 CONTROL MORTALITY: 0 LC50: 7100

50% MORTALITY LIMIT: PASS/FAIL CONC WITH STAT. SIGNIFICANT MORTALITY: None

SAMPLE TYPE: GRAB/COMPOSITE TIME & DATE: NOON AM/PM 5-5-93

TEST TIME & DATE: BEGIN 1505 AM/PM 5/5/93 END 1700 AM/PM 5/9/93

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12	6
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20
AFTER 72 HRS:	<u>19</u> <u>20</u> S/M/93	20	19	20	20	20
AFTER 96 HRS:	<u>19</u> <u>20</u> S/M/93	20	18	20	20	19

MAX/MIN VALUES

DISSOLVED OXYGEN, MG/L: 8.1 / 6.1 7.7 / 5.8 7.9 / 5.7 7.9 / 6.0 8.0 / 6.1 8.0 / 6.1

TEMPERATURE °C: 21.0 / 19.3 20.9 / 19.5 20.9 / 19.4 20.9 / 19.4 21.0 / 19.6 20.9 / 19.5

RECEIVING WATER USED FOR DILUTION? YES/NO SAMPLE AERATED? YES/NO

HARDNESS, MG/L: RECEIVING WATER 330 EFFLUENT 268 RECON/LAB WATER NA

ALKALINITY, MG/L: RECEIVING WATER 208 EFFLUENT 186 RECON/LAB WATER NA

PH: INITIAL - CONTROL 7.9 100% 8.8 FINAL - CONTROL 8.5 100% 8.6

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% ND

TOT. RESID. CHLORINE, MG/L: 100% ND SAMPLE DECHLORINATED BEFORE TEST? YES/NO

THE SEACREST GROUP

LABORATORY: _____ ANALYST: Dr. Darling, Michael Highsmith

COMMENTS: John A. Carr 5/14/93

Outfall 001B - Third Quarter 1993 Acute WET Test - September 1993

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC - Ft. St. Vrain CDPS NO. CO-00 01121 OUTFALL: FSV 001B IWC: 6.1
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1330 AM/PM 9/29/93 END 1415 AM/PM 10/1/93

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12	6
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	19	19	19
AFTER 48 HRS:	20	20	20	19	19	19
AFTER 72 HRS:						
AFTER 96 HRS:						

RECEIVING WATER USED FOR DILUTION? ☒ YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 348 EFFLUENT 362 RECON WATER ND

ALKALINITY, MG/L: RECEIVING WATER 213 EFFLUENT 196 RECON WATER ND

PH: INITIAL - CONTROL 8.2 100% 8.7 FINAL - CONTROL 8.6 100% 9.0

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% ND

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Bill Ratz, Tom Christensen

COMMENTS: Yell L. Pan 10/14/93

No statistically significant concentration.

7/1/93

COLORADO - COPS WET TEST REPORT FORM - AQUIC

PERMITTEE: P.C.C. Ft. St. Vrain COPS NO. CO-00 01121 COTIFALL: FSV 0018

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead minnow 9 days INC: 6.1%

TEST RESULTS: LC50: >100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1540 AM/PM 9/30/93 END 1600 AM/PM 10/4/93

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12	6
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20
AFTER 48 HRS:	20	20	19	20	20	20
AFTER 72 HRS:	20	20	19	20	20	20
AFTER 96 HRS:	20	19	19	18	20	20

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORIDE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 348 EFFLUENT 362 RECON WATER NA

ALKALINITY, MG/L: RECEIVING WATER 213 EFFLUENT 196 RECON WATER NA

PH: INITIAL - CONTROL 8.1 100% 8.8 FINAL - CONTROL 8.5 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% ND

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Don Fink

COMMENTS: John A. Carr 10/14/93

No statistically significant concentration.

7/1/93

Outfall 001B - Fourth Quarter 1993 Acute WET Test - October 1993

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC Ft. St. Vrain CDPS NO. CO-00 OUTFALL: 001B
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas
 TEST RESULTS: LC₅₀: 7100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1450 AM/PM 10/27/93 END 1710 AM/PM 10/31/93

MEASUREMENTS	DILUTIONS (% EFFLUENT)					
	CONTROL (0%)	6	12	25	50	100
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	19	20	20	19	20
AFTER 48 HRS:	20	19	20	20	19	20
AFTER 72 HRS:	20	19	20	20	19	20
AFTER 96 HRS:	20	19	20	20	19	20

RECEIVING WATER USED FOR DILUTION? ☒ YES/☐ NO TOT. RESID. CHLORINE, MG/L: 100% ND
 HARDNESS, MG/L: RECEIVING WATER 344 EFFLUENT 478 RECON WATER NA
 ALKALINITY, MG/L: RECEIVING WATER 188 EFFLUENT 228 RECON WATER NA
 PH: INITIAL - CONTROL ^{JB 7.7} 8.0 100% 8.7 FINAL - CONTROL 8.4 100% 8.7
 T. AMMONIA AS N, MG/L: INITIAL - 100% 0.16 ND FINAL - 100% ND

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: The Sea Crest Group ANALYST: Don Darling

COMMENTS: _____

[Signature] 11/12/93

7/1/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC Ft. St. Vrain CDPS NO. CO-00 OUTFALL: 001B

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: C. dubia

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1430 AM/PM 10/27/93 END 1500 AM/PM 10/29/93

	DILUTIONS (% EFFLUENT)					
MEASUREMENTS	CONTROL (0%)	6	12	25	50	100
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	19
AFTER 48 HRS:	20	20	20	20	20	19
AFTER 72 HRS:						
AFTER 96 HRS:						

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 344 EFFLUENT 478 RECON WATER NA

ALKALINITY, MG/L: RECEIVING WATER 188 EFFLUENT 228 RECON WATER NA

PH: INITIAL - CONTROL 8.1 100% 8.6 FINAL - CONTROL 8.6 100% 8.9

T. AMMONIA AS N, MG/L: INITIAL - 100% ND 0.16 KT FINAL - 100% ND

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: The Sea Crest Group ANALYST: Bill Lantz

COMMENTS: _____

11/12/93

7/1/93

Outfall 001B - First Quarter 1994 Acute WET Test - March 1994

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: WBC - Ft. St. Vrain CDPS NO. CO-00 01121 OUTFALL: 001B
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia INC: 6.1%
 TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1115 AM/PM 3/13/94 END 1120 AM/PM 3/15/94

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL(0%)	100	50	25	12.5	6.25	Rec'd Control
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>	<u>19</u>	<u>19</u>	<u>19</u>
AFTER 72 HRS:	<u>[Signature]</u>						
AFTER 96 HRS:	<u>[Signature]</u> <u>3/7/94</u>						

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 402 EFFLUENT 362 RECON WATER 110

ALKALINITY, MG/L: RECEIVING WATER 185 EFFLUENT 192 RECON WATER 73

PH: INITIAL - CONTROL 8.4 100% 8.2 FINAL - CONTROL 8.6 100% 8.4

T. AMMONIA AS N, MG/L: INITIAL - 100% 1.78 1.5 FINAL - 100% 1.9

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Loren Christensen, Lori Winkert
 COMMENTS: _____

[Signature] 3/7/94 7/1/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC - Ft. St. Vrain CDPS NO. CO-00 01/24 OUTFALL: 001 B

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead minnow INC: 6.1%

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Predict

TEST TIME & DATE: BEGIN 1510 AM/PM 3/2/94 END 1530 AM/PM 3/16/94

MEASUREMENTS	DILUTIONS (% EFFLUENT)						Rec'd Control
	CONTROL(0%)	100	50	25	12.5	6.25	
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:	20	20	20	20	20	20	20
AFTER 96 HRS:	20	20	19	20	20	20	20

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 402 EFFLUENT 362 RECON WATER 110

ALKALINITY, MG/L: RECEIVING WATER 185 EFFLUENT 192 RECON WATER 73

PH: INITIAL - CONTROL 8.6 100% 8.4 FINAL - CONTROL 8.4 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% 1.8 FINAL - 100% 1.9

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Don Darling, Chuck Bradley

COMMENTS: _____

John X. Cam 3/7/94

Outfall 001B - Second Quarter 1994 Acute WET Test - June 1994



COLORADO - CDEP WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC 74 St. Vrain CDEP NO. CO-00 01121 OUTFALL: 001B

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1045 AM/PM 10/21/94 END 1040 AM/PM 10/23/94

	DILUTIONS (% EFFLUENT)						
MEASUREMENTS	CONTROL(0%)	100	50	25	12.5	6.25	Recei wate
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	19	19	20	20
AFTER 48 HRS:	20	19	19	19	19	20	19
AFTER 72 HRS:							
AFTER 96 HRS:							

RECEIVING WATER USED FOR DILUTION? ☒ YES/☐ NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 314 EFFLUENT 246 RECON WATER 321

ALKALINITY, MG/L: RECEIVING WATER 154 EFFLUENT 184 RECON WATER 179

PH: INITIAL - CONTROL 8.1 100% 8.6 FINAL - CONTROL 8.6 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% ND

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Karen Christensen, Lori Winkler

COMMENTS: _____

Kelly A. Carr 10/24/94

COLORADO - COPE WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC 74 St. Vrain COPE NO. CO-00 01121 CONTAINER 001B

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fallhead minnows 8 d.o.

TEST RESULTS: LC50: >100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1725 AM/TH 6/20/94 END 1710 AM/TH 6/24/94

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL(01)	100	50	25	12.5	6.25	Recon water
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	19
AFTER 72 HRS:	20	20	20	20	20	20	19
AFTER 96 HRS:	20	20	20	20	20	20	19

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 314 EFFLUENT 266 RECON WATER 346

ALKALINITY, MG/L: RECEIVING WATER 154 EFFLUENT 184 RECON WATER 127

PH: INITIAL - CONTROL 8.1 100% 8.8 FINAL - CONTROL 8.3 100% 8.3

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% NA

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Don Darling, Chuck Badley

COMMENTS: _____

Kelly A. Carr 6/27/94

7/5/93

Outfall 001B - Third Quarter 1994 Acute WET Test - September 1994

COLORADO - CIPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC CIPS NO. CO-00 01121 OUTFALL: 74 St. Vrain

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia IWC 6.1%

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Prelut

TEST TIME & DATE: BEGIN 1220 AM/PM 9/15/94 END 1240 AM/PM 9/17/94

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL(0%)	100	50	25	12.5	6.25	Recon
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:							
AFTER 96 HRS:							

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 475 EFFLUENT 396 RECON WATER 296

ALKALINITY, MG/L: RECEIVING WATER 211 EFFLUENT 177 RECON WATER 146

PH: INITIAL - CONTROL 8.1 100% 8.3 FINAL - CONTROL 8.7 100% 8.6

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% 1.2A

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Stacie Razin, Lori Wentert

COMMENTS:

Kelly L. Carr 9/19/94 7/1/93

COLORADO - COPS WET TEST REPORT FORM - ACUTE

PERMITTEE: DSC COPS NO. CO-00 01121 OUTFALL: H. St. Vrain

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Forked minnow 7 d.o.

TEST RESULTS: LC50: > 100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1400 AM/PM 9/14/94 END 1405 AM/PM 9/18/94

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	6.25	Recon
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	19	20
AFTER 48 HRS:	20	20	20	20	20	19	20
AFTER 72 HRS:	20	20	20	20	20	19	20
AFTER 96 HRS:	20	20	20	20	20	19	20

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 475 EFFLUENT 396 RECON WATER 405

ALKALINITY, MG/L: RECEIVING WATER 211 EFFLUENT 177 RECON WATER 216

PH: INITIAL - CONTROL 7.8 100% 8.0 FINAL - CONTROL 8.6 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Chuck Bradley, Don Darling

COMMENTS: ✓

John A. M. 9/19/94

Outfall 001B - Fourth Quarter 1994 Acute WET Test - December 1994

PERMITTEE: FSC - 14 St. Vrain CIPS NO. CO-00 OUTFALL: 001 C

PERMITTEE: 700 - 450, 1960 (SFS NO. 0000)
TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubia

TEST RESULTS: LCO: > 100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1100 AM/PM 12/7/94 END 1515 AM/PM 12/9/94

DILUTIONS (3 ESTIMATES)

MEASUREMENTS	CONTROL (0%)	100 %	50 %	25 %	12.5 %	6.25 %	Reaction
NO. @ START OF TPST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:							
AFTER 96 HRS:							

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 270 EFFLUENT 442 RECON WATER 272

ALKALINITY, MG/L: RECEIVING WATER 180 EFFLUENT 230 RECON WATER 115

PH: INITIAL - CONTROL 7.8 100% 8.3 FINAL - CONTROL 8.3 100% 8.5

T. AMERICA AS N, HG/L: INITIAL - 100% 1.19 FINAL - 100%

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: **THE SEACREST GROUP** ANALYST: Stacie Razim, Lori Wenter

LABORATORY: _____

COMMENTS: ✓ Faren Christensen

Wm. A. Cross 12/12/96

7/1/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC 74 St. Vrain CDPS NO. CO-00 OUTFALL: 0018TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead minnow 7d.o.TEST RESULTS: LC50: >100 STATISTICAL METHOD: ProbitTEST TIME & DATE: BEGIN 1100 AM/PM 12/7/94 END 1105 AM/PM 12/11/94

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	6.25	3.125	Rea
NO. @ START OF TEST:	20	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20	20
AFTER 72 HRS:	20	20	20	19	20	20	20	19
AFTER 96 HRS:	20	18	20	19	20	20	20	19

RECEIVING WATER USED FOR DILUTION? ☒ YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01HARDNESS, MG/L: RECEIVING WATER 270 EFFLUENT 442 RECON WATER 279ALKALINITY, MG/L: RECEIVING WATER 180 EFFLUENT 230 RECON WATER 139PH: INITIAL - CONTROL 8.0 100% 8.5 FINAL - CONTROL 8.2 100% 8.5T. AMMONIA AS N, MG/L: INITIAL - 100% 1.19 FINAL - 100% WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NOIF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: LABORATORY: THE SEACREST GROUPANALYST: Mike Newkirk, Chuck Bradley,COMMENTS: Don Darling

7/1/93

Outfall 001 B - First Quarter 1995 Acute WET Test - February 1995

COLORADO - CIPS WET TEST REPORT FORM - ACUTE

PERMITTEE: WSC - 74.94.7mm CIPS NO. CO-00 01121 OUTFALL: 0013

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaornia dubia

TEST RESULTS: LC50: >100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1130 AM/PM 2/9/95 END 1115 AM/PM 2/11/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL(0%)	100	50	25	12.5	6.25	Re.
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 72 HRS:	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>
AFTER 96 HRS:	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>	<u>/</u>

RECEIVING WATER USED FOR DILUTION? ☒ YES ☐ NO TOT. RESID. CHLORINE, MG/L: 100% 40.91

HARDNESS, MG/L: RECEIVING WATER 340 EFFLUENT 421 RECON WATER 272

ALKALINITY, MG/L: RECEIVING WATER 186 EFFLUENT 202 RECON WATER 126

PH: INITIAL - CONTROL 8.2 100% 7.9 FINAL - CONTROL 8.2 100% 8.3

T. AMMONIA AS N, MG/L: INITIAL - 100% 2.88 FINAL - 100% 2.21

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: TEDE SEACREST GROUP ANALYST: Jim Case, Stacie Razin

COMMENTS: /

Mike L. Carr 2/10/95 7/1/93

COLORADO - COPE WET TEST REPORT FORM - AQUATIC

PERMITTEE: ESC - Ft. St. Vrain CIPS NO. CO-00 0112-1 OUTFALL: 001 B

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead minnows 10 d.o.

TEST RESULTS: LC50: >100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1000 AM/PM 2/9/95 END 0915 AM/PM 2/13/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL(0%)	100	50	25	12.5	6.25	3.125
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	19	20	20	20	20	20	20
AFTER 48 HRS:	16	20	20	20	20	20	20
AFTER 72 HRS:	16	20	20	20	20	20	20
AFTER 96 HRS:	16	20	20	18	20	20	20

RECEIVING WATER USED FOR DILUTION? ☒ YES/NO ☐ TOT. RESID. CHLORINE, MG/L: 100% <.001

HARDNESS, MG/L: RECEIVING WATER 340 EFFLUENT 421 RECON WATER 305

ALKALINITY, MG/L: RECEIVING WATER 186 EFFLUENT 202 RECON WATER 132

PH: INITIAL - CONTROL 7.8 100% 8.3 FINAL - CONTROL 8.2 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% 2.58 FINAL - 100% 2.21

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NO ☐ 2/11/95

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

Over 10% mortality in the receiving water control, however the 100% effluent and the 12.5% effluent showed no mortality.

LABORATORY: THE SEACREST GROUP ANALYST: Tim Nickels, Mike Newkirk

COMMENTS: ✓

John X. Carr 2/14/95

7/1/93

Outfall 001 B - Second Quarter 1995 Acute WET Test - May 1995

TESTER: Fd. St. Vrain - ASC COPS NO. 00-00 01121 OUTFALL: 001 B
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Coriophoria

TEST RESULTS: LCO: >100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1345 MARCH 5/3/95 END 1445 MARCH 5/5/95

	DILUTIONS (% EFFLUENT)					
MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	6.25
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20
AFTER 72 HRS:						
AFTER 96 HRS:						

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 276 EFFLUENT 413 RECON WATER 281

ALKALINITY, MG/L: RECEIVING WATER 170 EFFLUENT 240 RECON WATER 150

PH: INITIAL - CONTROL 7.5 100% 7.7 FINAL - CONTROL 8.1 100% 8.4

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE GRACREST GROUP ANALYST: Stacie Razim

COMMENTS: _____

John A. Com 5/16/95 7/1/93

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead minnow 7 d.

TEST RESULTS: LCO: >100 STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1345 MARCH 5/3/95 END 1245 MARCH 5/7/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	6.25
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	19	20
AFTER 72 HRS:	20	20	20	20	19	19
AFTER 96 HRS:	20	20	20	20	19	19

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 276 EFFLUENT 413 RECEIVING WATER 2163

ALKALINITY, MG/L: RECEIVING WATER 170 EFFLUENT 240 RECEIVING WATER 52

PH: INITIAL - CONTROL 7.9 100% 8.1 FINAL - CONTROL 8.4 100% 8.6

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Tim Mickels, Mike Newkirk

COMMENTS: _____

John L. Brown 5/16/95

7/1/93

Outfall 001 B - Third Quarter 1995 Acute WET Test - August 1995

COLORADO - COPS WET TEST REPORT FORM - ACUTE

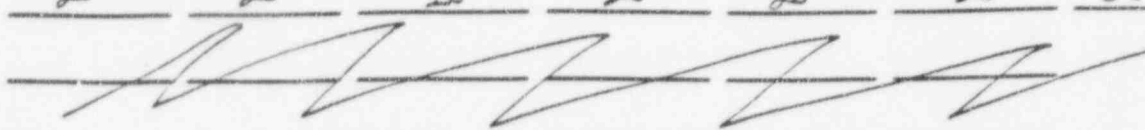
PERMITTEE: PSC 74 St Vrain COPS NO. CO-00 01121 OUTFALL: 01B

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubia

TEST RESULTS: L50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1200 AM MDT 7/17/95 END 1130 AM MDT 8/21/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100 %	50 %	25 %	12.5 %	6.25 %	Rec
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:							
AFTER 96 HRS:							

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 275 EFFLUENT 287 RECON WATER 279

ALKALINITY, MG/L: RECEIVING WATER 174 EFFLUENT 181 RECON WATER 161

PH: INITIAL - CONTROL 7.8 100% 7.7 FINAL - CONTROL 8.5 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Jim Case

COMMENTS: _____

John A. Case 8/23/95

COLORADO - COPS WET TEST REPORT FORM - ACUTE

PERMITTEE: BSC - Ft. St. Vrain COPS NO. CO-00 01121 OUTFALL: 0018

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas 12 d.

TEST RESULTS: L50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1200 AM (PM) 8/17/95 END 1100 AM (PM) 8/21/95

	DILUTIONS (1% EFFLUENT)						
WELLS/REMARKS	CONTROL (0%)	100 %	50 %	25 %	12.5 %	6.25 %	Recon
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	19	20	20	20	20	20
AFTER 72 HRS:	20	19	20	20	20	20	20
AFTER 96 HRS:	20	18	20	20	19	20	20

RECEIVING WATER USED FOR DILUTION? ☒ YES ☐ NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 275 EFFLUENT 282 RECON WATER 284

ALKALINITY, MG/L: RECEIVING WATER 174 EFFLUENT 181 RECON WATER 162

PH: INITIAL - CONTROL 7.8 100% 7.7 FINAL - CONTROL 8.5 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Tim Nickels, Mike Newkirk

COMMENTS: _____

Kelly L. Carr 7/12/93

Outfall 001 B - Fourth Quarter 1995 Acute WET Test - November 1995

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

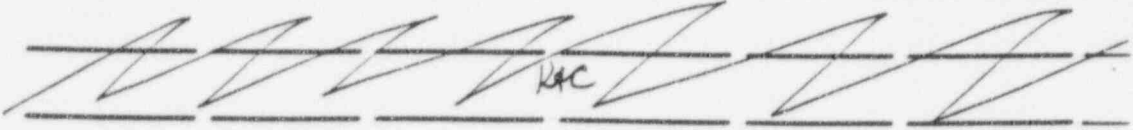
PERMITTEE: FCC - 14. St. Vrain CDPS NO. CO-00 01121 OUTFALL: 0013

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubia

TEST RESULTS: LCSO: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1410 AM (PM) 11/29/95 END 1320 AM (PM) 12/1/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	6.25	Rea
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:							
AFTER 96 HRS:							

RECEIVING WATER USED FOR DILUTION? ☒ YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 330 EFFLUENT 381 RECON WATER 279

ALKALINITY, MG/L: RECEIVING WATER 167 EFFLUENT 387 RECON WATER 150

PH: INITIAL - CONTROL 7.6 100% 7.7 FINAL - CONTROL 8.0 100% 8.3

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Shacie Pazim, Tim Case

COMMENTS: _____

Pelly & Pan 12/4/95

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC- 74.31 /min CDPS NO. CO-00 01121 OUTFALL: 001C

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas 141

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1400 AM/PM 11/29/95 END 1320 AM/PM 12/3/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	6.25	3.125
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 72 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 96 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 330 EFFLUENT 381 RECON WATER 388

ALKALINITY, MG/L: RECEIVING WATER 167 EFFLUENT 387 RECON WATER 276

PH: INITIAL - CONTROL 8.0 100% 8.0 FINAL - CONTROL 8.4 100% 8.7

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: —

LABORATORY: THE SEACREST GROUP ANALYST: Tim Nickels, Mike Nowbirk

COMMENTS: —

John A. Carr 12/4/95

Outfall 001B - First Quarter 1996 Acute WET Test - March 1996

COLORADO - CUPS WET TEST REPORT FORM - ACUTE

JAC 4/15/96
Wrong outfall named
002 001 BPERMITTEE: PSC 74. St. Vrain CUPS NO. 00-00 01/24 OUTFALL: 002 001 BTYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Aimophalar promelas 14d.TEST RESULTS: LC50: >100 % STATISTICAL METHOD: ProbitTEST TIME & DATE: BEGIN 1016 AM/PM 3/26/96 END 1022 AM/PM 3/30/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100 %	50 %	25 %	12.5 %	6.1 %	Recon
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	19	20	20	20	20	20	20
AFTER 72 HRS:	18	20	20	19	20	20	20
AFTER 96 HRS:	18	20	20	19	20	19	20

RECEIVING WATER USED FOR DILUTION? ☒ YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01HARDNESS, MG/L: RECEIVING WATER 327 EFFLUENT 346 RECON WATER 315ALKALINITY, MG/L: RECEIVING WATER 157 EFFLUENT 211 RECON WATER 196PH: INITIAL - CONTROL 8.1 100% 8.2 FINAL - CONTROL 8.1 100% 8.4T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: John Zastrow, Tim Nickels

COMMENTS: _____

Jelly H. Cam 4/1/96

7/1/93

396086

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

 PERMITTEE: PSC F.V. Vrain CDPS NO. CO-00 01121 ^{MAC 4/15/96} _{wrong outfall named} OUTFALL: 002 001B

 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubia

 TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

 TEST TIME & DATE: BEGIN 1345 AM (M) 3/26/96 END 1306 AM (M) 3/28/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	6.25	Recon
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 72 HRS:	<u>[Signature]</u>						
AFTER 96 HRS:	<u>[Signature]</u>						

 RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

 HARDNESS, MG/L: RECEIVING WATER 327 EFFLUENT 346 RECON WATER 250

 ALKALINITY, MG/L: RECEIVING WATER 157 EFFLUENT 211 RECON WATER 114

 PH: INITIAL - CONTROL 7.9 100% 8.0 FINAL - CONTROL 8.1 100% 8.3

 T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

 WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

 IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: —

 LABORATORY: THE SEACREST GROUP ANALYST: Stacie Duncan

 COMMENTS: —
[Signature] 4/1/96

7/1/93

Outfall 001B - Second Quarter 1996 Acute WET Test - June 1996

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC 74 St. Vrain CDPS NO. CO-00 01121 OUTFALL: 001BTYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubiaTEST RESULTS: LCSO: >100% STATISTICAL METHOD: ProbitTEST TIME & DATE: BEGIN 1045 AM/PM 6/4/96 END 1000 AM/PM 6/6/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100%	50%	25%	12.5%	6.25%	Recon
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>
AFTER 72 HRS:	<u>[Signature]</u>						
AFTER 96 HRS:	<u>[Signature]</u>						

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.0/HARDNESS, MG/L: RECEIVING WATER 259 EFFLUENT 435 RECON WATER 250ALKALINITY, MG/L: RECEIVING WATER 145 EFFLUENT 255 RECON WATER 131PH: INITIAL - CONTROL 7.8 100% 7.6 FINAL - CONTROL 8.2 100% 8.4T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Stacie Duncan, Jim Case

COMMENTS: _____

[Signature] 6/6/96

7/1/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: RSC Ft. St. Vrain CDPS NO. CO-00 01121 OUTFALL: 001 B
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: *Pimephales promelas* 14d.
 TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 0930 AM/PM 6/14/96 END 0927 AM/PM 6/18/96

	DILUTIONS (% EFFLUENT)						
MEASUREMENTS	CONTROL (0%)	100 %	50 %	25 %	12.5 %	6.25 %	Recon
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 72 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>
AFTER 96 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>19</u>	<u>19</u>	<u>20</u>	<u>20</u>

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 259 EFFLUENT 435 RECON WATER 257

ALKALINITY, MG/L: RECEIVING WATER 145 EFFLUENT 255 RECON WATER 167

PH: INITIAL - CONTROL 7.9 100% 7.6 FINAL - CONTROL 8.0 100% 8.1

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: John Zastrow, Tim Nickels

COMMENTS: _____

John A. Carr 6/10/96

7/1/93

Outfall 001B - Third Quarter 1996 Acute WET Test - July 1996

396239

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

001 Goosewill site

002 ES FAC
9/17/96PERMITTEE: RSC CDPS NO. CO-00 01121 OUTFALL: 7/1/96TYPE TEST: ROUTINE: ACCELERATED: TEST SPECIES: Acridaphnia dubiaTEST RESULTS: LCS0: >100 % STATISTICAL METHOD: ProbitTEST TIME & DATE: BEGIN 1540 AM/PM 7/24/96 END 1523 AM/PM 7/24/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	6.25 %	12.5 %	25 %	50 %	100 %	Recon
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:							
AFTER 96 HRS:							

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01HARDNESS, MG/L: RECEIVING WATER 458 EFFLUENT 359 RECON WATER 250ALKALINITY, MG/L: RECEIVING WATER 206 EFFLUENT 213 RECON WATER 128PH: INITIAL - CONTROL 7.9 100% 7.5 FINAL - CONTROL 8.4 100% 8.5T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NOIF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: LABORATORY: THE SEACREST GROUP ANALYST: Stacie DuncanCOMMENTS: John A. Carr 7/30/96

7/1/93

396239

001 Goosewill site

COLORADO - COPS WET TEST REPORT FORM - ACUTE

PERMITTEE: Public Service Corp. COPS NO. CO-00 01121 OUTFALL: 7.11.1996TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas 11 d.TEST RESULTS: LC50: >100 % STATISTICAL METHOD: ProbitTEST TIME & DATE: BEGIN 1530 AM/PM 7/24/96 END 1500 AM/PM 7/28/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	6.25 %	12.5 %	25 %	50 %	100 %	Recor
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	19
AFTER 48 HRS:	20	20	20	20	20	20	19
AFTER 72 HRS:	20	20	20	20	20	20	19
AFTER 96 HRS:	20	20	20	20	20	20	19

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01HARDNESS, MG/L: RECEIVING WATER 458 EFFLUENT 359 RECON WATER 404ALKALINITY, MG/L: RECEIVING WATER 206 EFFLUENT 213 RECON WATER 244PH: INITIAL - CONTROL 8.3 100% 8.1 FINAL - CONTROL 8.4 100% 8.4T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: John Zastron, Tim Nickels

COMMENTS: _____

Kelly A. Cam 7/30/96

7/1/93

Outfall 002 - Third Quarter 1993 Acute WET Test - November 1993

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: Fort St. Vrain - Public Src. CDPS NO. CO-00 01104 OUTFALL: 002TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: PseudophryniaTEST RESULTS: LCSO: 2/100 % STATISTICAL METHOD: LC50TEST TIME & DATE: BEGIN 1600 M/PM 11/23/93 END 1127 M/PM 11/25/93

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100 %	50 %	25 %	12 %	4.5 %
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>	<u>19</u>
AFTER 48 HRS:	<u>19</u>	<u>19</u>	<u>18</u>	<u>20</u>	<u>19</u>	<u>19</u>
AFTER 72 HRS:						
AFTER 96 HRS:						

RECEIVING WATER USED FOR DILUTION? ☒ YES ☐ NO TOT. RESID. CHLORINE, MG/L: 100% NDHARDNESS, MG/L: RECEIVING WATER 274 EFFLUENT 320 REFIN WATER NAALKALINITY, MG/L: RECEIVING WATER 186 EFFLUENT 194 REFIN WATER NAPH: INITIAL - CONTROL 7.8 100% 8.3 FINAL - CONTROL 8.4 100% 8.5T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% NDWERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: The Salsbery Group ANALYST: Bill Lantz

COMMENTS: _____

Jim [Signature] 12/15/93

7/1/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: Fort St. Vrain - Public Src. CDPS NO. CO-00 01104 OUTFALL: 002TYPE TEST: ROUTINE: ☒ AOCF DATED: TEST SPECIES: CeriodaphniaTEST RESULTS: LC50: 2100 % STATISTICAL METHOD: LC50TEST TIME & DATE: BEGIN 1600 AM (M) 11/23/93 END 1127 AM (M) 11/25/93

DILUTIONS (% EFFLUENT)

MEASUREMENTS CONTROL(0%) 100 % 50 % 25 % 12 % 4.5 %NO. @ START OF TEST: 20 20 20 20 20 20NO. LIVE AFTER 24 HRS: AFTER 48 HRS: AFTER 72 HRS: AFTER 96 HRS: RECEIVING WATER USED FOR DILUTION? ☒ YES/NO TOT. RESID. CHLORINE, MG/L: 100% NDHARDNESS, MG/L: RECEIVING WATER 274 EFFLUENT 320 RECON WATER NAALKALINITY, MG/L: RECEIVING WATER 186 EFFLUENT 194 RECON WATER NAPH: INITIAL - CONTROL 7.8 100% 8.3 FINAL - CONTROL 8.4 100% 8.5T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% NDWERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NOIF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: LABORATORY: The SeaCrest Group ANALYST: Bill LantzCOMMENTS: 11/25/93

7/1/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: Ft. St. Vrain, Public Svc. CDPS NO. CO-00 01104 OUTFALL: 002TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead MinnowsTEST RESULTS: LC50: 2/100 % STATISTICAL METHOD: LC50TEST TIME & DATE: BEGIN 1630 AM/ED 11/23/93 END 1730 AM/ED 11/27/93

MEASUREMENTS	DILUTIONS (% EFFLUENT)					
	CONTROL (0%)	^{100%} 100%	^{25%} 250%	^{12.5%} 125%	12%	4.5%
NO. @ START OF TEST:	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	19	20	20	20	20
AFTER 48 HRS:	20	19	20	20	19	20
AFTER 72 HRS:	20	19	20	20	19	19
AFTER 96 HRS:	20	18	20	19	19	19

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% NDHARDNESS, MG/L: RECEIVING WATER 274 EFFLUENT 320 RECON WATER NAALKALINITY, MG/L: RECEIVING WATER 186 EFFLUENT 194 RECON WATER NAPH: INITIAL - CONTROL 7.7 100% 8.3 FINAL - CONTROL 8.3 100% 8.4T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% NDWERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: The Seacrest Group ANALYST: Don Darling, Chuck Bradley, & Dan Fink

COMMENTS: _____

11/15/93

7/1/93

Outfall 002 - Second Quarter 1994 Acute WET Test - May 1994

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC - 74 St. Virgin CDPS NO. CO-00 01121 OUTFALL: 002
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia 45% IWC
 TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1430 AM/PM 5/12/94 END 1340 AM/PM 5/14/94

	DILUTIONS (% EFFLUENT)						
MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	4.5	Recon made
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>19</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>18</u>	<u>19</u>	<u>20</u>	<u>20</u>	<u>19</u>	<u>20</u>	<u>19</u>
AFTER 72 HRS:	<u>[Signature]</u>						
AFTER 96 HRS:	<u>[Signature]</u> <u>5/18/94</u>						

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 234 EFFLUENT 216 RECON WATER 234

ALKALINITY, MG/L: RECEIVING WATER 122 EFFLUENT 116 RECON WATER 144

PH: INITIAL - CONTROL 8.0 100% 8.0 FINAL - CONTROL 8.3 100% 8.5

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% NA

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Jaren Christensen, Lori Wenker

COMMENTS: _____

[Signature] 5/19/94

7/2/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC - Ft. St. Vrain CDPS NO. CO-00 01121 ^{4.5% inc} OUTFALL: 002
TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead minnow 7 days
TEST RESULTS: LC50: > 100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 0900 AM/PM 5/12/94 END 0920 AM/PM 5/16/94

MEASUREMENT	DILUTIONS (% EFFLUENT)						Reo Quat
	CONTROL(0%)	100 %	50 %	25 %	12.5 %	4.5	
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:	19	20	20	20	20	20	20
AFTER 96 HRS:	19	20	20	20	19	20	20

RECEIVING WATER USED FOR DILUTION? YES/NO TOT. RESID. CHLORINE, MG/L: 100% ND

HARDNESS, MG/L: RECEIVING WATER 234 EFFLUENT 220 RECON WATER 242

ALKALINITY, MG/L: RECEIVING WATER 122 EFFLUENT 116 RECON WATER 119

PH: INITIAL - CONTROL 7.9 100% 8.1 FINAL - CONTROL 8.2 100% 8.4

T. AMMONIA AS N, MG/L: INITIAL - 100% ND FINAL - 100% NA

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Chuck Bradley, Don Dading

COMMENTS: _____

Kelly X. Com 5/19/94

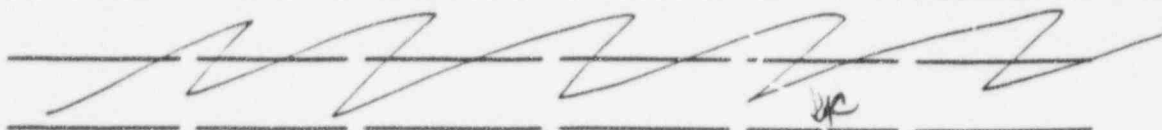
7/1/93

Outfall 002 - Second Quarter 1995 Acute WET Test - May 1995

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: ESC - Ft. St. Vrain CDPS NO. CO-00 01121 OUTFALL: 002TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubiaTEST RESULTS: LC50: >100 % STATISTICAL METHOD: ProbitTEST TIME & DATE: BEGIN 11:35 AM/PM 6/1/95 END 11:02 AM/PM 6/1/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	4.5	Recon
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS:	20	20	20	20	20	20	20
AFTER 48 HRS:	20	20	20	20	20	20	20
AFTER 72 HRS:							
AFTER 96 HRS:							

RECEIVING WATER USED FOR DILUTION? ☒ YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01HARDNESS, MG/L: RECEIVING WATER 139 EFFLUENT 334 RECON WATER 138ALKALINITY, MG/L: RECEIVING WATER 72 EFFLUENT 206 RECON WATER 74PH: INITIAL - CONTROL 7.3 100% 7.1 FINAL - CONTROL 7.7 100% 8.0T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: **THE SEACREST GROUP** ANALYST: Stacie Razin

COMMENTS: _____

File & Can 6/26/95

7/1/93

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: 74.24 Vrain CDPS NO. CD-00 01121 OUTFALL: 002TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas 11 d.TEST RESULTS: LCSO: >100 % STATISTICAL METHOD: ProbitTEST TIME & DATE: BEGIN 1100 AM/PM 7/20/95 END 1025 AM/PM 7/24/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100 %	50 %	25 %	12.5 %	4.5 %	Recon
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 48 HRS:	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 72 HRS:	<u>20</u>	<u>18</u>	<u>20</u>	<u>19</u>	<u>20</u>	<u>20</u>	<u>20</u>
AFTER 96 HRS:	<u>20</u>	<u>17</u>	<u>20</u>	<u>18</u>	<u>20</u>	<u>20</u>	<u>20</u>

RECEIVING WATER USED FOR DILUTION? ☒ YES/NO TOT. RESID. CHLORINE, MG/L: 100% <0.01HARDNESS, MG/L: RECEIVING WATER 139 EFFLUENT 334 RECON WATER 136ALKALINITY, MG/L: RECEIVING WATER 72 EFFLUENT 206 RECON WATER 70PH: INITIAL - CONTROL 7.5 100% 7.5 FINAL - CONTROL 7.9 100% 8.4T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Tim Nickels, Mike Newkirk

COMMENTS: _____

John D. Cam 4/24/95

7/1/93

Outfall 002 - Third Quarter 1996 Acute WET Test - August 1996

COLORADO - CDPS WET TEST REPORT FORM - ACUTE


PERMITTEE PSC - Ft. St. Vrain CDPS NO. CO-00 01121 OUTFALL 002

TYPE TEST. ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES Ceriodaphnia dubia

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1500 AM PM 8/13/96 END 1500 AM PM 8/15/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	6.25 %	12.5 %	25 %	50 %	100 %	Recon
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 48 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 72 HRS.:							
NO. LIVE AFTER 96 HRS.:							

RECEIVING WATER USED FOR DILUTION ☒ YES ☐ NO TOTAL RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 386 EFFLUENT 484 RECON WATER 250

ALKALINITY, MG/L: RECEIVING WATER 237 EFFLUENT 330 RECON WATER 120

PH: INITIAL - CONTROL 7.6 100% 7.2 FINAL - CONTROL 8.3 100% 8.4

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Stacie Duncan, Tim Case

COMMENTS: _____

[Handwritten signature] 5/19/96

396202

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE PSC - Ft. St. Vrain CDPS NO. CO-00 01121 OUTFALL 002

TYPE TEST: ROUTINE ☒ ACCELERATED ☐ TEST SPECIES Pimephales promelas 13d.

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE BEGIN 1530 AM 8/13/96 END AM/PM 8/17/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	1.25%	12.5%	25%	50%	100%	Recon
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 48 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 72 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 96 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>19</u>

RECEIVING WATER USED FOR DELUTION ☒ YES ☐ NO TOTAL RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 386 EFFLUENT 484 RECON WATER 395

ALKALINITY, MG/L: RECEIVING WATER 237 EFFLUENT 330 RECON WATER 250

PH: INITIAL - CONTROL 8.0 100% 7.5 FINAL - CONTROL 8.0 100% 8.2

T. AMMONIA AS N, MG/L: INITIAL - 100% <1.8 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS, _____

LABORATORY: THE SEACREST GROUP ANALYST: John Zastray, Tim Nickels

COMMENTS: _____

John X. Cam 8/19/96

Outfall 002 - Fourth Quarter 1996 Acute WET Test - October 1996

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

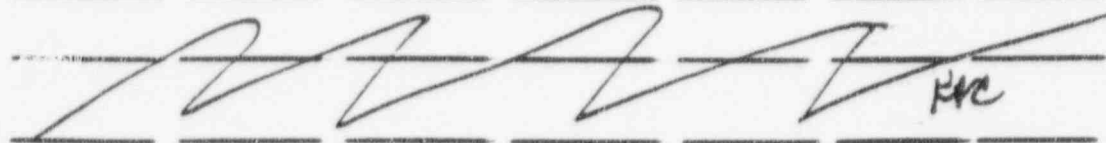
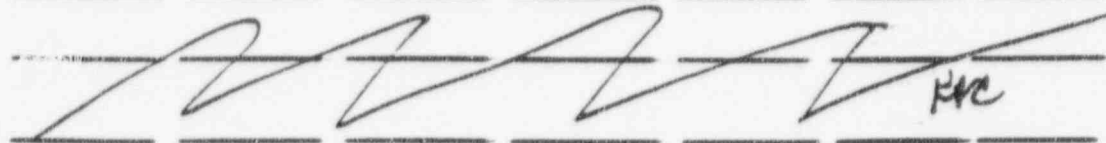
PERMITTEE: BC - H. S. Vrain CDPS NO. CO-00 01121 OUTFALL 002

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES Ceriodaphnia dubia

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 0935 AM 10/23/96 END 0925 AM 10/25/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	4.5 %	12.5 %	25 %	50 %	100 %	Res'd
NO. @ START OF TEST:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 48 HRS.:	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 72 HRS.:							
NO. LIVE AFTER 96 HRS.:	 KAC						

RECEIVING WATER USED FOR DELUTION ☒ YES ☐ NO TOTAL RESID. CHLORINE, MG/L: 100% <0.1

HARDNESS, MG/L: RECEIVING WATER 430 EFFLUENT 392 RECON WATER 80

ALKALINITY, MG/L: RECEIVING WATER 210 EFFLUENT 280 RECON WATER 77

PH: INITIAL - CONTROL 8.2 100% 7.4 FINAL - CONTROL 8.2 100% 8.4

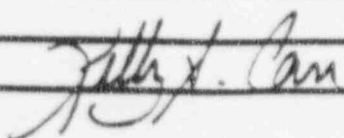
T. AMMONIA AS N, MG/L: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Tim Case, Jacie Duncan

COMMENTS: _____



COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: PSC Ft. St. Vrain CDPS NO. CO-00 01121 OUTFALL 002
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES Pimephales promelas 12d.

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 0930 AMPM 10/23/96 END 0900 AMPM 10/27/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	4.5 %	12.5 %	25 %	50 %	100 %	Resig
NO. @ START OF TEST :	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 24 HRS. :	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 48 HRS. :	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 72 HRS. :	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>
NO. LIVE AFTER 96 HRS. :	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>	<u>20</u>

RECEIVING WATER USED FOR DELUTION YES ☒ NO ☐ TOTAL RESID. CHLORINE, MGL: 100% <0.01

HARDNESS, MGL: RECEIVING WATER 730 EFFLUENT 392 RECON WATER: 705

ALKALINITY, MGL: RECEIVING WATER 240 EFFLUENT 280 RECON WATER: 225

PH: INITIAL - CONTROL 8.5 100% 7.5 FINAL - CONTROL 8.3 100% 8.4

T. AMMONIA AS N, MGL: INITIAL - 100% <1.0 FINAL - 100% —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: John Zarkey Mike Hawkins

COMMENTS: _____

[Signature]

Outfall 002 - First Quarter 1997 Acute WET Test - February 1997

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: RC 74 St. Vrain CDPS NO. C0-00 011/21 OUTFALL 2015 002

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES *Ceriodaphnia dubia*

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME: 1.17 BEGIN 1600 AMPM 2 12+ 1977 END 1605 AMPM 2 126 1977

DILUTIONS (% EFFLUENT)

MEASUREMENTS CONTROL (0%) 10.25% 12.5% 25% 50% 100% P2cor

NO. @ START OF TEST : 20 20 20 20 20 20 20

NO. LIVE AFTER 24 HRS. : 20 20 20 20 20 19 20

NO. LIVE AFTER 48 HRS. : 20 20 20 20 60 18 20

NO LIVE AFTER 72 HRS.: _____

NO LIVE AFTER 96 HRS.: 

RECEIVING WATER USED FOR DELUTION YES/NO TOTAL RESID. CHLORINE, MG/L: 100% 0.01

HARDNESS, MG/L: RECEIVING WATER 508 EFFLUENT 308 RECON WATER 252

ALKALINITY, MG/L: RECEIVING WATER 246 EFFLUENT 210 RECON WATER 132

PH: INITIAL - CONTROL 7.8 100% 7.9 FINAL - CONTROL 8.3 100% 8.3

T. AMMONIA AS N, MG/L; INITIAL - 100 % <1.0 FINAL - 100 % —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Tina Lee, Steve Hines

COMENTS: _____

7/96

COLORADO - CDPS WET TEST REPORT FORM - ACUTE

PERMITTEE: RSC 74 St. Vrain CDPS NO. CO-00 01121 OUTFALL 601-B 002 BE KAC 3/7/97

TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas 9 d

TEST RESULTS: LC50: >100 % STATISTICAL METHOD: Probit

TEST TIME & DATE: BEGIN 1430 AM PM 2/24/97 END 1500 AM PM 2/28/97

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	6.25 %	12.5 %	25 %	50 %	100 %	Recon
NO. @ START OF TEST:	20	20	20	20	20	20	20
NO. LIVE AFTER 24 HRS.:	20	20	20	20	20	20	20
NO. LIVE AFTER 48 HRS.:	20	20	20	20	20	20	20
NO. LIVE AFTER 72 HRS.:	20	20	20	20	20	20	20
NO. LIVE AFTER 96 HRS.:	20	20	20	20	20	20	20

RECEIVING WATER USED FOR DELUTION ☒ YES ☐ NO TOTAL RESID. CHLORINE, MG/L: 100% <0.01

HARDNESS, MG/L: RECEIVING WATER 508 EFFLUENT 308 RECON WATER 400

ALKALINITY, MG/L: RECEIVING WATER 206 EFFLUENT 210 RECON WATER 210

PH: INITIAL - CONTROL 8.0 100 % 8.0 FINAL - CONTROL 8.0 100 % 8.3

T. AMMONIA AS N, MG/L: INITIAL - 100 % <1.8 FINAL - 100 % —

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? ☒ YES ☐ NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Mike Newkirk, John Zestrow

COMMENTS: _____

John A. Zestrow 3/3/97

Outfall 002 - Chronic WET Test - November 1993

PERMITTEE: Public Service Co. CIPS NO. CO - OUTFALL: 002
TYPE TEST: ROUTINE: ✓ ACCELERATED: TEST SPECIES: P. promelas IWC: 4.5

RA PRODUCTION

STAT. METHOD USED: STATISTICAL DIFF.: Dunnets' test IC25: Bootstrap EPA program

MEASUREMENTS		DILUTIONS (10 ² - 10 ⁷)					
		CONTROL (0%)	4.5	12	25	50	100
% SURVIVAL FOR DAY:	1	100	100	100	100	100	100
	2	100	100	100	100	100	100
	3	100	100	100	100	100	100
	4	100	100	100	100	100	100
	5	100	100	100	100	100	100
	6	100	100	100	100	100	100
	7	100	100	98	100	100	100
MEAN 3 BROOD TOTAL:		N/A	N/A	N/A	N/A	N/A	N/A
7 DAY MEAN DRY WEIGHT:		0.48	0.49	0.51	0.49	0.44	0.52
PH	MAX/MIN:	8.3 / 7.8	8.3 / 7.9	8.4 / 7.9	8.4 / 7.9	8.4 / 8.0	8.9 / 8.0

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Don Dayling 7/1/93

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

PERMITTEE: Public Service Co. CDPS NO. 00 - OUTFALL: 002
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubia TWC: 4.5

TEST RESULTS: LETHALITY GROWTH REPRODUCTION

CHNC. WITH STAT. DIFFERENCE	<u>7 100</u>	<u>N/A</u>	<u>7 100</u>
	PASS/FAIL	PASS/FAIL	PASS/FAIL
IC25	<u>7 100</u>	<u>N/A</u>	<u>7 100</u>
	PASS/FAIL	PASS/FAIL	PASS/FAIL

STAT. METHOD USED: STATISTICAL DIFF.: Dunnetts IC25: Bootstrap EPA program

DATE: START 1200 AM/PM 11 / 1 / 93 END 1150 AM/PM 11 / 8 / 93

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL(0%)	<u>4.5</u>	<u>12</u>	<u>25</u>	<u>50</u>	<u>100</u>
% SURVIVAL FOR DAY: 1	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
2	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
3	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
4	<u>100</u>	<u>100</u>	<u>100</u>	<u>90</u>	<u>100</u>	<u>100</u>
5	<u>100</u>	<u>100</u>	<u>100</u>	<u>90</u>	<u>100</u>	<u>100</u>
6	<u>100</u>	<u>100</u>	<u>100</u>	<u>90</u>	<u>100</u>	<u>100</u>
7	<u>100</u>	<u>100</u>	<u>100</u>	<u>90</u>	<u>100</u>	<u>100</u>
MEAN 3 BROOD TOTAL:	<u>32</u>	<u>36</u>	<u>35</u>	<u>29</u>	<u>31</u>	<u>33</u>
7 DAY MEAN DRY WEIGHT:	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
PH MAX/MIN:	<u>8.7 / 7.7</u>	<u>8.7 / 7.7</u>	<u>8.6 / 8.1</u>	<u>8.6 / 8.1</u>	<u>8.6 / 8.1</u>	<u>8.7 / 8.1</u>

HARDNESS (\bar{x}) MG/L RECEIVING WATER: 405 EFFLUENT: 475 RECON WATER: _____

ALKALINITY (\bar{x}) MG/L RECEIVING WATER: 208 EFFLUENT: 234 RECON WATER: _____

T. AMMONIA as N (\bar{x}) MG/L INITIAL EFFLUENT: 2.01 FINAL EFFLUENT: 0.167

T. RESIDUAL CHLORINE, MG/L 100%: _____ RECEIVING WATER USED FOR DILUTION? YES/NO

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Bill Lawtz 7/1/93

Outfall 002 - Chronic WET Test - May 1994

394188

COLORADO - CUPS MET TEST REPORT FORM - CHRONIC

PERMITTEE: OSC - F.H. Vain CUPS NO. 00 - 0001121 OUTFALL: 002
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: fat Crustaceans INC: 4.5%

TEST RESULTS:

	LETHALITY	GROWTH	REPRODUCTION
CONC. WITH STAT. DIFFERENCE	>100	NA	>100
	PASS/FAIL	PASS/FAIL	PASS/FAIL
IC25	>100	NA	>100
	PASS/FAIL	PASS/FAIL	PASS/FAIL

STAT. METHOD USED: STATISTICAL DIFF.: _____ IC25: Bootstrap

DATE: START 1445 AM/PM 5 13 194 END 1200 AM/PM 5 19 194

		DILUTIONS (% EFFLUENT)						
MEASUREMENTS		CONTROL (0%)	100	50	25	12.5	4.5	Recon water
% SURVIVAL FOR DAY:	1	100	100	90	100	100	100	100
	2	100	100	90	100	100	100	90
	3	100	100	90	100	100	100	80
	4	100	100	90	100	100	100	80
	5	100	100	90	100	100	100	80
	6	100	100	90	100	100	100	80
	7			stopped at Day 6				
MEAN 3 BROOD TOTAL:		18.5	19.4	12.7	15.1	13.8	18.3	19.7
7 DAY MEAN DRY WEIGHT:		NA	NA	NA	NA	NA	NA	NA
PH	MAX/MIN:	8.4/7.8	8.4/7.9	8.4/7.8	8.4/7.8	8.4/7.7	8.4/7.7	8.7/8.4
HARDNESS (°) MG/L	RECEIVING WATER:	256						
	EFFLUENT:	274						
	RECON WATER:	286						
ALKALINITY (°) MG/L	RECEIVING WATER:	152						
	EFFLUENT:	170						
	RECON WATER:	165						
T. AMMONIA as N (°) MG/L	INITIAL EFFLUENT:	ND						
	FINAL EFFLUENT:	ND						
T. RESIDUAL CHLORINE, MG/L	100%:	NP						
	RECEIVING WATER USED FOR DILUTION?	YES/NO						
WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? <u>YES/NO</u>								
IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____								

LABORATORY: **THE SEACREST GROUP**ANALYST: Lori Werkert

7/1/93

Jelly A. Can 5/17/94

COLORADO - CIPS WET TEST REPORT FORM - CHRONIC

PERMITTEE: PSC - Ft. St. Vrain CIPS NO. CO - 0001121 OUTFALL: dr
TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Fathead minnow INC: 4.5%

TEST RESULTS:	LETHALITY	GROWTH	REPRODUCTION
CONC. WITH STAT. DIFFERENCE	<u>>100</u>	<u>>100</u>	<u>NA</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>
IC25	<u>>100</u>	<u>>100</u>	<u>NA</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>

STAT. METHOD USED: STATISTICAL DIFF.: Dunnnett's IC25: Backstop

DATE: START 1510 AM/PM 5/13/194 END 1100 AM/PM 5/16/194

MEASUREMENTS	CONTROL (0%)	DILUTIONS (% EFFLUENT)					Rec
		100	50	25	12.5	4.5	
% SURVIVAL FOR DAY:							
1	100	100	100	100	100	100	100
2	100	100	100	100	100	100	100
3	100	98	100	100	100	100	100
4	100	98	100	100	100	100	100
5	100	98	100	100	100	100	100
6	100	98	100	100	100	100	98
7	100	98	100	100	100	100	98
MEAN 3 BROOD TOTAL:	NA	NA	NA	NA	NA	NA	N:
7 DAY MEAN DRY WEIGHT:	0.36	0.38	0.37	0.37	0.36	0.36	0:
PH MAX/MIN:	8.1/7.8	8.4/8.0	8.3/7.9	8.2/7.9	8.1/7.9	8.1/7.9	8.1
HARDNESS (̄) MG/L		RECEIVING WATER: 256	EFFLUENT: 274	RECON WATER: 231			
ALKALINITY (̄) MG/L		RECEIVING WATER: 152	EFFLUENT: 170	RECON WATER: 128			
T. AMMONIA as N (̄) MG/L		INITIAL EFFLUENT: ND	FINAL EFFLUENT: ND				
T. RESIDUAL CHLORINE, MG/L	100%: ND	RECEIVING WATER USED FOR DILUTION? YES/NO					
WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? <u>YES/NO</u>							
IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____							

LABORATORY: THE SEACREST GROUP ANALYST: Don Darling, Chuck Bradley 7/12/93

Jelly A. Can 5/17/94

Outfall 002 - Chronic WET Test - June 1995

345267

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

PERMITTEE: PSC 24 St. Vrain CDPS NO. CD - 0001121 OUTFALL: _____
 TYPE TEST: ROUTINE: ☒ ACCELERATED: _____ TEST SPECIES: Ceriodaphnia dubia IWC: +5%

TEST RESULTS:	LETHALITY	GROWTH	REPRODUCTION
CONC. WITH STAT. DIFFERENCE	<u>>100</u>	<u>NA</u>	<u>>100</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>
IC25	<u>>100</u>	<u>NA</u>	<u>>100</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>

STAT. METHOD USED: STATISTICAL DIFF.: Dunnnett's IC25: Bootstrap

DATE: START 1045 AM/PM 6/14/95 END 1030 AM/PM 6/20/95

		DILUTIONS (% EFFLUENT)						
MEASUREMENTS		CONTROL (0%)	100	50	25	12.5	4.5	Recon
% SURVIVAL FOR DAY:	1	100	100	100	100	100	100	100
	2	100	100	100	100	100	100	100
	3	100	100	100	100	100	100	100
	4	100	100	100	100	100	100	100
	5	100	100	100	100	100	100	100
	6	100	100	100	100	100	100	100
	7	NA						
MEAN 3 BROOD TOTAL:		16.1	19.5	18.4	15.4	15.6	15.9	16.4
7 DAY MEAN DRY WEIGHT:		NA	NA	NA	NA	NA	NA	NA
PH	MAX/MIN:	8.6/7.5	8.6/7.4	8.8/7.6	8.8/7.6	8.8/7.6	8.8/7.6	8.3/7.3
HARDNESS (\bar{x}) MG/L	RECEIVING WATER:	151	EFFLUENT: 373		RECON WATER: 185			
ALKALINITY (\bar{x}) MG/L	RECEIVING WATER:	83	EFFLUENT: 219		RECON WATER: 99			
T. AMMONIA as N (\bar{x}) MG/L	INITIAL EFFLUENT:	<1.0		FINAL EFFLUENT: <1.0				
T. RESIDUAL CHLORINE, MG/L	100%:	<0.01		RECEIVING WATER USED FOR DILUTION? YES/NO				

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO
 IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Stacie Razim, Tim Case 7/1/93

Stacie Razim 6/20/95

1st Test - Invalid

395267

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

PERMITTEE: PSC - Ft. St. Vrain CDPS NO. 00 - 0001121 OUTFALL: _____
 TYPE TEST: ROUTINE: ☒ ACCELERATED: _____ TEST SPECIES: Pimephales promelas IWC: 4.5%

TEST RESULTS:

LETHALITY

GROWTH

REPRODUCTION

CONC. WITH STAT. DIFFERENCE	Day 6 - 25% only against Recon. control	NA	NA
Day 7 - all cores	PASS/FAIL	PASS/FAIL	PASS/FAIL
IC25	NA	NA	NA
	PASS/FAIL	PASS/FAIL	PASS/FAIL

STAT. METHOD USED: STATISTICAL DIFF.: Dunnnett's IC25: Bootstrap

DATE: START 0930 AM/PM 6/14/95 END 0930 AM/PM 6/21/95

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	100	50	25	12.5	4.5	Recon
% SURVIVAL FOR DAY: 1	98	100	100	100	100	100	100
2	95	100	98	100	100	100	100
3	90	95	90	95	95	88	100
4	90	95	88	93	90	85	100
5	88	95	85	85	85	85	98
6	75	65	68	58	65	65	90
7	43	50	53	50	43	50	85

MEAN 3 BROOD TOTAL: NA NA NA NA NA NA NA

7 DAY MEAN DRY WEIGHT: NA NA NA NA NA NA NA

PH MAX/MIN: 8.1/7.7 8.5/7.8 8.4/7.7 8.3/7.7 8.1/7.7 8.1/7.7 7.6/7

HARDNESS (\bar{x}) MG/L RECEIVING WATER: 151 EFFLUENT: 373 RECON WATER: 125

ALKALINITY (\bar{x}) MG/L RECEIVING WATER: 83 EFFLUENT: 219 RECON WATER: 83

T. AMMONIA as N (\bar{x}) MG/L INITIAL EFFLUENT: <1.0 FINAL EFFLUENT: <1.0

T. RESIDUAL CHLORINE, MG/L 100%: <0.01 RECEIVING WATER USED FOR DILUTION? YES/NO

WERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUP ANALYST: Jim Nickels, Mike Nunkirk 7/1/93

Jelly A. Can 6/20/95

2nd Test

375292

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

PERMITTEE: El Fort St. VrainCDPS NO. 00 - 05/24

OUTFALL: _____

TYPE TEST: ROUTINE: ☒

ACCELERATED: _____

TEST SPECIES: Pimephales promelasIWC: 45%

TEST RESULTS:

LETHALITY

GROWTH

REPRODUCTION

CONC. WITH STAT. DIFFERENCE	100	>100	NA
	PASS/FAIL	PASS/FAIL	PASS/FAIL
IC25	62.8	>100	NA
	PASS/FAIL	PASS/FAIL	PASS/FAIL

STAT. METHOD USED: STATISTICAL DIFF.: Kruskal-Wallis ANOVA IC25: BootstrapDATE: START 1000 AM/PM 6 127 195END 0955 AM/PM 7 14 195

MEASUREMENTS	CONTROL (0%)	DILUTIONS (% EFFLUENT)				
		100	75	25	12.5	6.25
% SURVIVAL FOR DAY: 1	100	95	100	95	98	98
2	100	95	100	95	98	88
3	100	90	98	95	98	88
4	100	78	98	93	93	85
5	100	65	95	83	90	85
6	100	63	90	83	88	85
7	100	60	88	78	85	83

MEAN 3 BROOD TOTAL: NA NA NA NA NA NA7 DAY MEAN DRY WEIGHT: 0.34 0.33 0.31 0.30 0.33 0.31PH MAX/MIN: 8.8/7.4 8.4/7.6 8.1/7.0 8.4/7.6 8.6/7.6 8.7/7.5HARDNESS (\bar{x}) MG/L RECEIVING WATER: 100 EFFLUENT: 250 RECON WATER: 97ALKALINITY (\bar{x}) MG/L RECEIVING WATER: 66 EFFLUENT: 163 RECON WATER: 48T. AMMONIA as N (\bar{x}) MG/L INITIAL EFFLUENT: <1.0 FINAL EFFLUENT: <1.0T. RESIDUAL CHLORINE, MG/L 100%: <0.01 RECEIVING WATER USED FOR DILUTION? YES/NOWERE ALL TEST CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

LABORATORY: THE SEACREST GROUPANALYST: Mike Newkirk Tim Nickels

7/1/93

Outfall 002 - Chronic WET Test - August 1996

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

PERMITTEE: PSC 74 St. Vrain CDPS NO. CO -00 01121 OUTFALL 002
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Ceriodaphnia dubia TWC: 4.5%

TEST RESULTS	LETHALITY	GROWTH	REPRODUCTION
CONC. WITH STAT. DIFFERENCE	<u>>100 %</u>	<u>NA %</u>	<u>>100 %</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>
IC25	<u>>100 %</u>	<u>NA %</u>	<u>>100 %</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>

STAT. METHOD USED: STATISTICAL DIFF.: IC25 Bootstrap

DATE: START 1435 AM (PM) 8/1/96 END 1400 AM (PM) 8/1/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	<u>4.5 %</u>	<u>12.5 %</u>	<u>25 %</u>	<u>50 %</u>	<u>100 %</u>	<u>Recy %</u>
% SURVIVAL FOR DAY 1	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
2.	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
3.	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
4.	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
5.	<u>100 %</u>	<u>90 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
6.	<u>100 %</u>	<u>90 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
7.	<u>100 %</u>	<u>90 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>

MEAN 3 BROOD TOTAL: 21.2 22.2 22.7 22.0 21.3 22.0 20.9

7 DAY MEAN DRY WEIGHT: NA NA NA NA NA NA NA

PH MAX/MIN 8.4/8.1 8.4/8.0 8.1/8.0 8.5/7.9 8.4/7.7 8.5/7.3 8.5/7.9

HARDNESS (X) MG/L RECEIVING WATER: 495 EFFLUENT: 434 RECON WATER: 250

ALKALINITY (X) MG/L RECEIVING WATER: 206 EFFLUENT: 252 RECON WATER: 120

T. AMMONIA as N (X) MG/L INITIAL EFFLUENT: <1.0 FINAL EFFLUENT: <1.0

T. RESIDUAL CHLORINE MG/L 100%: <0.01 RECEIVING WATER USED FOR DILUTION? YES/NO

WERE ALL TESTS CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

Laboratory: THE SEACREST GROUP ANALYST: Stacie Duncan, Tim Case

Keith X. Can 8/14/96

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

PERMITTEE: FSC 74 S.V. Train CDPS NO. CO-001121 OUTFALL 002
 TYPE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas TWC: ±5%

TEST RESULTS:	LETHALITY	GROWTH	REPRODUCTION
CONC. WITH STAT. DIFFERENCE	<u>>100 %</u>	<u>4.5 %</u>	<u>NA %</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>
IC25	<u>>100 %</u>	<u>>100 %</u>	<u>NA %</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>

STAT. METHOD USED: STATISTICAL DIFF: Student's t-Test ANOVA IC25 Bootstrap

DATE: START 1145 AM/PM 8/14/96 END 1100 AM/PM 8/13/96

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	<u>4.5 %</u>	<u>12.5 %</u>	<u>25 %</u>	<u>50 %</u>	<u>100 %</u>	<u>Rec'd %</u>
% SURVIVAL FOR DAY 1	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
2.	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
3.	<u>100 %</u>	<u>98 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>98 %</u>	<u>100 %</u>
4.	<u>100 %</u>	<u>98 %</u>	<u>98 %</u>	<u>100 %</u>	<u>95 %</u>	<u>93 %</u>	<u>95 %</u>
5.	<u>100 %</u>	<u>93 %</u>	<u>93 %</u>	<u>100 %</u>	<u>95 %</u>	<u>93 %</u>	<u>95 %</u>
6.	<u>100 %</u>	<u>90 %</u>	<u>90 %</u>	<u>100 %</u>	<u>93 %</u>	<u>93 %</u>	<u>93 %</u>
7.	<u>100 %</u>	<u>90 %</u>	<u>90 %</u>	<u>98 %</u>	<u>93 %</u>	<u>93 %</u>	<u>90 %</u>

MEAN 3 BROOD TOTAL: NA NA NA NA NA NA NA

DAY MEAN DRY WEIGHT: 0.43 0.32 0.33 0.37 0.39 0.36 0.39

H MAX/MIN: 8.9/8.1 8.9/8.2 8.8/8.3 8.7/8.2 8.7/8.1 8.7/7.8 8.6/8.1

HARDNESS (X) MG/L: RECEIVING WATER: 495 EFFLUENT: 484 RECON WATER: 395

ALKALINITY (X) MG/L: RECEIVING WATER: 206 EFFLUENT: 252 RECON WATER: 250

AMMONIA as N (X) MG/L: INITIAL EFFLUENT: <1.0 FINAL EFFLUENT: <1.0

RESIDUAL CHLORINE, MG/L: 100%: <0.01 RECEIVING WATER USED FOR DILUTION? YES/NO

WERE ALL TESTS CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

NO. LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

ANALYST: John Zarstrom, Tim Nichols

John X. Can 8/14/96

Outfall 002 - Chronic WET Test - April 1997

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

ATTREE: ASC 74. St. Vrain CDPS NO. CO -0001121 OUTFALL 002
 PE TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Pimephales promelas IWC: 4.5%

TEST RESULTS:	LETHALITY	GROWTH	REPRODUCTION
CONC. WITH STAT. DIFFERENCE	<u>>100%</u>	<u>>100%</u>	<u>NA</u> %
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	PASS/FAIL
IC25	<u>>100%</u>	<u>>100%</u>	<u>NA</u> %
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	PASS/FAIL

STAT. METHOD USED: STATISTICAL DIFF: ANOVA IC25 Backstrap

DATE: START 1045 AM/PM 4/11/97 END 1030 AM/PM 4/18/97

DILUTIONS (% EFFLUENT)

MEASUREMENTS	CONTROL (0%)	4.5%	12.5%	25%	50%	100%	Rec'd %
% SURVIVAL FOR DAY 1.	<u>98</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %
2.	<u>98</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %
3.	<u>98</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %	<u>100</u> %
4.	<u>98</u> %	<u>100</u> %	<u>100</u> %	<u>98</u> %	<u>100</u> %	<u>95</u> %	<u>100</u> %
5.	<u>98</u> %	<u>100</u> %	<u>98</u> %	<u>98</u> %	<u>100</u> %	<u>95</u> %	<u>100</u> %
6.	<u>98</u> %	<u>100</u> %	<u>98</u> %	<u>98</u> %	<u>98</u> %	<u>95</u> %	<u>98</u> %
7.	<u>98</u> %	<u>100</u> %	<u>98</u> %	<u>98</u> %	<u>98</u> %	<u>95</u> %	<u>98</u> %
MEAN 3 BROOD TOTAL:	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
7 DAY MEAN DRY WEIGHT:	<u>0.40</u>	<u>0.40</u>	<u>0.44</u>	<u>0.42</u>	<u>0.48</u>	<u>0.41</u>	<u>0.40</u>
PH MAX/MIN	<u>8.6, 7.9</u>	<u>8.6, 7.9</u>	<u>8.6, 8.0</u>	<u>8.6, 8.0</u>	<u>8.5, 7.9</u>	<u>8.5, 7.8</u>	<u>8.3, 7.4</u>
HARDNESS (x̄) MG/L							
RECEIVING WATER:	<u>348</u>						
EFFLUENT:	<u>338</u>						
RECON WATER:	<u>398</u>						
ALKALINITY (x̄) MG/L							
RECEIVING WATER:	<u>120</u>						
EFFLUENT:	<u>210</u>						
RECON WATER:	<u>198</u>						
T. AMMONIA as N (x̄) MG/L							
INITIAL EFFLUENT:	<u><1.0</u>						
FINAL EFFLUENT:	<u><1.0</u>						
T. RESIDUAL CHLORINE, MG/L							
100%:	<u><0.01</u>						
RECEIVING WATER USED FOR DILUTION?	<u>YES/NO</u>						
WERE ALL TESTS CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES?	<u>YES/NO</u>						
IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS:							

Laboratory: THE SEACREST GROUP ANALYST: Mike Hunkeler, John Zastrow

Kelly A. Carr 4/11/97

COLORADO - CDPS WET TEST REPORT FORM - CHRONIC

SITE: FSC - Ft. St. Vrain CDPS NO. CO - 000/12-1 OUTFALL 002
 TEST: ROUTINE: ☒ ACCELERATED: ☐ TEST SPECIES: Caridaphnia dubia TWC: 4.5%

TEST RESULTS:	LETHALITY	GROWTH	REPRODUCTION
CONC. WITH STAT. DIFFERENCE	<u>>100 %</u>	<u>NA %</u>	<u>>100 %</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>
IC25	<u>>100 %</u>	<u>NA %</u>	<u>>100 %</u>
	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>	<u>PASS/FAIL</u>

STAT. METHOD USED: STATISTICAL DIFF: Runnet's ANOVA IC25 Bootstrap

DATE: START 1430 AM/PM 3/31/97 END 1500 AM/PM 4/16/97

DILUTIONS (% EFFLUENT)							
MEASUREMENTS	CONTROL (0%)	<u>4.5%</u>	<u>12.5%</u>	<u>25%</u>	<u>50%</u>	<u>100%</u>	<u>Rec'd %</u>
% SURVIVAL FOR DAY 1	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
2.	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
3.	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
4.	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
5.	<u>100 %</u>	<u>90 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
6.	<u>100 %</u>	<u>90 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>
7.	<u>100 %</u>	<u>90 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>	<u>100 %</u>

MEAN 3 BROOD TOTAL: 20.6 21.6 15.6 21.0 18.2 21.8 18.2

7 DAY MEAN DRY WEIGHT: NA NA NA NA NA NA NA

PH MAX/MIN: 8.4/7.4 8.4/7.5 8.4/7.6 8.5/7.7 8.5/7.8 8.5/7.8 8.3/7.8

HARDNESS (X) MG/L: 348 EFFLUENT: 338 RECON WATER: 250

ALKALINITY (X) MG/L: 1160 EFFLUENT: 210 RECON WATER: 139

T. AMMONIA as N (X) MG/L: <1.0 FINAL EFFLUENT: <1.0

T. RESIDUAL CHLORINE, MG/L: 100%: <0.01 RECEIVING WATER USED FOR DILUTION? YES/NO

WERE ALL TESTS CONDITIONS IN CONFORMANCE WITH DIVISION GUIDELINES? YES/NO

IF NO, LIST DEVIATIONS FROM TEST SPECIFICATIONS: _____

Laboratory: THE SEACREST GROUP ANALYST: Jim Case, Stacie Duncan

Keith L. Cam 4/8/97

ATTACHMENT II

Material Safety Data Sheets

Monosodium Phosphate

Chlorine

Hydrazine

Summit 782

MSDS for Monosodium Phosphate

OHS15190 SODIUM PHOSPHATE, MONOBASIC

Page 1

OHS15190

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MDL INFORMATION SYSTEMS, INC.
14600 CATALINA STREET
SAN LEANDRO, CA 94577
1-800-635-0064 OR
1-510-895-1313

FOR EMERGENCY SOURCE INFORMATION
CONTACT: 1-615-366-2000 USA

CAS NUMBER: 7558-80-7
RTECS NUMBER: WA1900000
EU NUMBER (EINECS):
231-449-2

SUBSTANCE: SODIUM PHOSPHATE, MONOBASIC

TRADE NAMES/SYNONYMS:

MONOSODIUM PHOSPHATE; SODIUM DIHYDROGEN PHOSPHATE; MONOSODIUM DIHYDROGEN
PHOSPHATE; SODIUM BIPHOSPHATE; ACID SODIUM PHOSPHATE; MONOSODIUM
ORTHOPHOSPHATE; MSP; PHOSPHORIC ACID, MONOSODIUM SALT; DIHYDROGEN SODIUM
PHOSPHATE; MONOBASIC SODIUM PHOSPHATE; MONOSODIUM HYDROGEN PHOSPHATE; SODIUM
DIPHOSPHATE ANHYDROUS; SODIUM DIHYDROGEN, MONOPHOSPHATE; SODIUM DIHYDROGEN
ORTHOPHOSPHATE; SODIUM PHOSPHATE (NA(H₂PO₄)); SODIUM PRIMARY PHOSPHATE;
SODIUM PHOSPHATE; H₂NAO₄P; OHS15190

CHEMICAL FAMILY:

inorganic, salt

CREATION DATE: 11/20/84

REVISION DATE: 10/31/96

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: SODIUM PHOSPHATE, MONOBASIC
CAS NUMBER: 7558-80-7
PERCENTAGE: 100

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=0 FIRE=0 REACTIVITY=0

EMERGENCY OVERVIEW:

COLOR: white.

OHS15190

SODIUM PHOSPHATE, MONOBASIC

Page 2

PHYSICAL FORM: crystalline powder.

MAJOR HEALTH HAZARDS: No significant target effects reported.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: irritation.

LONG TERM EXPOSURE: no information is available.

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation.

LONG TERM EXPOSURE: same effects as short term exposure.

EYE CONTACT:

SHORT TERM EXPOSURE: mild irritation.

LONG TERM EXPOSURE: no information is available.

INGESTION:

SHORT TERM EXPOSURE: nausea, vomiting, diarrhea, stomach pain.

LONG TERM EXPOSURE: no information on significant adverse effects.

CARCINOGEN STATUS:

OSHA: N

NTP: N

IARC: N

SECTION 4 FIRST AID MEASURES

INHALATION: Remove from exposure immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention.

SKIN CONTACT: Remove contaminated clothing, jewelry, and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention, if needed.

EYE CONTACT: Wash eyes immediately with large amounts of water or normal saline, occasionally lifting upper and lower lids, until no evidence of chemical remains. Get medical attention immediately.

INGESTION: If vomiting occurs, keep head lower than hips to help prevent aspiration. Get medical attention, if needed.

ANTIDOTE: calcium gluconate, intravenous.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Negligible fire hazard.

OHS15190

SODIUM PHOSPHATE, MONOBASIC

Page 3

EXTINGUISHING MEDIA: Use extinguishing agents appropriate for surrounding fire..

FIREFIGHTING: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

FIREFIGHTING PROTECTIVE EQUIPMENT: Full firefighting turn-out gear (bunker gear). 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. Any self-contained breathing apparatus with a full facepiece.

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:

Large spills: Collect spilled material in appropriate container for disposal. Avoid generating dust. Clean up residue with a high-efficiency particulate filter vacuum.

SECTION 7 HANDLING AND STORAGE

Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

SODIUM PHOSPHATE, MONOBASIC:

No occupational exposure limits established by OSHA, ACGIH, or NIOSH.

VENTILATION: Provide local exhaust ventilation system. Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory

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SODIUM PHOSPHATE, MONOBASIC

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protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.

Any dust, mist, and fume respirator.

Any air-purifying respirator with a high-efficiency particulate filter.

Any powered, air-purifying respirator with a dust, mist, and fume filter.

Any powered, air-purifying respirator with a high-efficiency particulate filter.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

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.

Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: white

PHYSICAL FORM: crystalline powder

MOLECULAR WEIGHT: 119.98

MOLECULAR FORMULA: H₂-O₄-P.NA

MELTING POINT: No data available.

DECOMPOSITION POINT: 437 F (225 C)

VAPOR PRESSURE: negligible

VAPOR DENSITY: not applicable

SPECIFIC GRAVITY (water=1): 2 approximate

WATER SOLUBILITY: soluble

PH: 4.5 (0.1 M solution)

VOLATILITY: not applicable

ODOR THRESHOLD: No data available.

EVAPORATION RATE: not applicable

SOLVENT SOLUBILITY:

Very Slightly Soluble: ether, chloroform, toluene

Insoluble: alcohol

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid generating dust.

INCOMPATIBILITIES: metals.

SODIUM PHOSPHATE, MONOBASIC:

BRASS: May be corrosive in the presence of moisture.

METALS: Solutions may be corrosive.

STEEL: May be corrosive in the presence of moisture.

HAZARDOUS DECOMPOSITION: Thermal decomposition products: oxides of sodium,

OHS15190 SODIUM PHOSPHATE, MONOBASIC

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oxides of phosphorus.

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

SODIUM PHOSPHATE, MONOBASIC:

IRRITATION DATA:

50 mg eyes-human mild; 150 mg eyes-rabbit mild.

TOXICITY DATA:

8290 mg/kg oral-rat LD50; 250 mg/kg intramuscular-rat LD50.

CARCINOGEN STATUS: None.

ACUTE TOXICITY LEVEL:

Slightly Toxic: ingestion.

TARGET ORGANS: No data available.

HEALTH EFFECTS:

INHALATION:

ACUTE EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: May cause irritation.

CHRONIC EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: No data available.

SKIN CONTACT:

ACUTE EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: May cause irritation.

CHRONIC EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: Repeated and prolonged contact may cause dermatitis.

EYE CONTACT:

ACUTE EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: May cause transient irritation. Tested on rabbit eyes by continuous exposure for three hours at 0.1 M solution at pH 7.0 to 7.5 made up to 0.46 osmolar with sodium chloride or sucrose, caused no disturbance of the cornea.

CHRONIC EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: No data available.

INGESTION:

ACUTE EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: Ingestion may result in abdominal pain, nausea, vomiting, diarrhea, cramps, pain and burning in the mouth. Doses

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SODIUM PHOSPHATE, MONOBASIC

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of 250 gm/kg given orally to guinea pigs, rats and rabbits produced diarrhea. Generally, phosphates are slowly and incompletely absorbed, therefore systemic reactions are unlikely when these salts are given orally. Sodium phosphates are capable of seriously reducing the ionic serum calcium.

CHRONIC EXPOSURE:

SODIUM PHOSPHATE, MONOBASIC: Sodium phosphate, monobasic is used as a food additive. No adverse effects have been reported.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY DATA:

FISH TOXICITY: 186000 ug/L 96 hour LC50 (Mortality) Mosquitofish (*Gambusia affinis*).

INVERTEBRATE TOXICITY: <1560000 ug/L 48 month LTCN (Immobilization) Water flea (*Daphnia magna*).

ALGAL TOXICITY: 279 ug/L 10 month (Population Growth) Diatom (*Nitzschia sigma*).

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

No classification currently assigned.

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:

TSCA INVENTORY STATUS:

Y

TSCA 12(b) EXPORT NOTIFICATION:

Not listed.

CERCLA SECTION 103 (40CFR302.4):

N

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:

N

CHRONIC:

N

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FIRE:	N
REACTIVE:	N
SUDDEN RELEASE:	N
OSHA PROCESS SAFETY (29CFR1910.119):	N
STATE REGULATIONS:	
CALIFORNIA PROPOSITION 65:	N

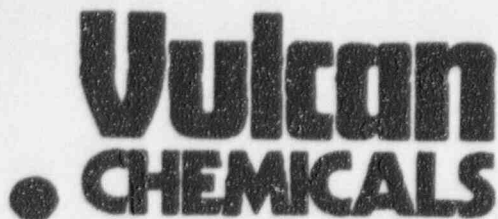
SECTION 16 OTHER INFORMATION

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MSDS for Chlorine



765-0913040

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MATERIAL SAFETY DATA SHEET

6594 24 Hour Emergency Phone (316) 524-5751

Division of Vulcan Materials Company / P. O. Box 530390 • Birmingham, AL 35253-0390

I - IDENTIFICATION

CHEMICAL NAME	CHEMICAL FORMULA	MOLECULAR WEIGHT
Chlorine	Cl ₂	70.90
TRADE NAME		
Chlorine		
SYNONYMS	DOT IDENTIFICATION NO.	
Liquid Chlorine	UN 1017	

II - PRODUCT AND COMPONENT DATA

COMPONENT(S) CHEMICAL NAME	CAS REGISTRY NO.	% (wt.) Approx.	OSHA PEL
* Chlorine	7782-50-5	100	0.5 ppm

* Denotes chemical subject to reporting requirements of Section 313 of Title III of the 1986 Superfund Amendments and Reauthorization Act (SARA) and 40 CFR Part 372

III - PHYSICAL DATA

APPEARANCE AND ODOR	SPECIFIC GRAVITY
Greenish-yellow gas, amber liquid; pungent odor	Liquid = 1.467 @ 0°C
BOILING POINT	VAPOR DENSITY IN AIR (Air = 1)
-29.3°F (-34.0°C.)	2.5
VAPOR PRESSURE	% VOLATILE, BY VOLUME
71 psig @ 60°F	100
EVAPORATION RATE	SOLUBILITY IN WATER
Not Applicable	Slight

IV - REACTIVITY DATA

STABILITY	CONDITIONS TO AVOID
Unstable	Dry chlorine is highly reactive with titanium and tin. Reacts with most metals at high temperatures. Reacts with water to produce hydrochloric and hydrochlorous acids, which are corrosive to most metals. (See Section VIII)
INCOMPATIBILITY (Materials to avoid)	
Amines, elemental metals, certain metal hydrides, carbides, nitrides, oxides, phosphides and sulfides, easily oxidized materials, organic materials (e.g. petrochemicals, oils, greases) and unstable and reactive compounds.	
HAZARDOUS DECOMPOSITION PRODUCTS	
Will not decompose.	
HAZARDOUS POLYMERIZATION	
Will not occur.	

V - FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT (Method used)	None	FLAMMABLE LIMITS IN AIR	Non-Flammable but does support combustion.
EXTINGUISHING AGENTS	None. Apply water to keep containers cool. Do not apply water to leaking containers. refer to Reactivity Data, Section IV. NFPA Hazard Ratings: Health 3; Flammability 0; Reactivity 0; OXY		
UNUSUAL FIRE AND EXPLOSION HAZARDS	Remove chlorine containers from fire zone if possible. Firefighters should wear self-contained, positive-pressure breathing apparatus, and a one piece, total-encapsulating suit of Butyl coated nylon or equivalent. Refer to Reactivity Data, Section IV.		

VI - TOXICITY AND FIRST AID

EXPOSURE LIMITS (When exposure to this product and other chemicals is concurrent, the exposure limit must be defined in the workplace.)

ACGIH: 0.5 ppm (8 hr) TWA, 1 ppm STEL OSHA: 0.5 ppm (8 hr) TWA, 1 ppm STEL

(Odor threshold approximately .3 ppm - highly variable especially with individuals routinely exposed)

Effects described in this section are believed not to occur if exposures are maintained at or below appropriate TLV.

Because of the wide variation in individual susceptibility, these exposure limits may not be applicable to all persons and those with medical conditions listed below.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Asthma, bronchitis, emphysema and other lung diseases, and chronic nose, sinus or throat conditions.

ACUTE TOXICITY

Primary route(s) of exposure:

☒ Inhalation

☐ Skin Absorption

☐ Ingestion

Inhalation: Major potential route of exposure. Chlorine is a respiratory irritant. Concentrations of 3-6 ppm can cause irritation of the nose and mucous membrane of the upper respiratory tract followed by headache and coughing. 10 ppm can cause severe irritation of respiratory tract with 15-20 ppm causing intense cough. Other symptoms of overexposure can include nausea, vomiting, dizziness, shortness of breath and chest pain. Pulmonary edema and chemical pneumonia can develop and may occur hours after exposure. Exposures to concentrations above 25 ppm can cause unconsciousness and death. Exposures to humans to .5 ppm for 8 hours and 1 ppm for 4 hours have caused transient decreased pulmonary capacity, as measured by pulmonary function tests. In persons exposed to acute, non-lethal levels, decreased pulmonary capacity is followed by a gradual return to normal. In some cases long lasting effects have been observed.

Skin: Liquid contact can cause local irritation and burns. Chlorine vapors can cause irritation, burning and blisters.

Eyes: Liquid contact can cause irritation and burns. Vapor concentrations of 1 ppm can cause redness, tearing and irritation of eyes.

Ingestion: Chlorine is gas at room temperature. Ingested liquid chlorine can cause severe burns of mouth, esophagus and stomach and nausea and vomiting are likely to occur.

FIRST AID

Inhalation: Remove to fresh air. If breathing has stopped, start artificial respiration.

Keep patient warm, at rest and comfortable. Call a physician.

Skin: Remove contaminated clothing and shoes. Wash exposed area thoroughly with large quantities of water, for at least 15 minutes. Wash contaminated clothing before reuse.

Eyes: Flush eyes immediately with water for at least 15 minutes. If irritation persists, call a physician.

Ingestion: Vomiting should be induced if conscious.

Notes to Physician: No known antidote. Treatment for inhalation is symptomatic and supportive.

Keep patient at rest until respiratory symptoms subside. Sedation for apprehension or restlessness may be considered, as well as diuretics and antibiotics to alleviate pulmonary edema and protect against secondary infection. Administer oxygen under endotracheal pressure not exceeding 4cm water for 15 minutes each hour until symptoms subside (except in presence of impending or existing cardiovascular failure).

Numerous studies have been conducted to determine the potential chlorine has to cause chronic effects. In rats exposed to concentrations up to 9 ppm for 6 hours a day, 5 days a week for 6 weeks, decreases in body weight and inflammation of the respiratory tract were observed. At exposures of 3 and 9 ppm, changes in the liver and kidneys were also noted. Rabbits and guinea pigs exposed to 1.7 ppm for 9 months showed weight loss and a decreased resistance to disease. No adverse effects were observed in rabbits and guinea pigs at levels of .7 ppm. Guinea pigs exposed to 1.6 ppm for 5 hours a day, for 47 days and injected with tuberculosis (bacteria) displayed shorter life cycles, than those exposed to just one of the agents. Rats with pulmonary disease showed an increased response to chlorine. Rhesus monkeys exposed to concentrations up to 2.3 ppm for 6 hours a day, 5 days a week for one year did not exhibit any signs of chronic toxicity, except for eye irritation.

A study of 600 diaphragm cell workers from 25 plants with an average duration of exposure of 11 years exposed to .006 to 1.42 ppm, showed no statistically significant increase in abnormal chest x-rays, ECGs or pulmonary function tests.

Carcinogenicity One study has been conducted to evaluate chlorine's ability to cause cancer in experimental animals. Seven generations of rats were exposed by ingestion to highly chlorinated water daily (100 mg/liter). No increased incidences of tumors were observed.

Chlorine is not listed on the IARC, NTP or OSHA carcinogen lists.

Reproductive Toxicity Two studies have been conducted to assess the ability of chlorine to cause reproductive effects. Rabbits exposed by inhalation to concentrations up to 1.5 ppm and rats exposed by ingestion to highly chlorinated drinking water daily for seven generations did not display any adverse reproductive effects.

VII - PERSONAL PROTECTION AND CONTROLS

RESPIRATORY PROTECTION

Where vapor concentration exceeds or is likely to exceed 0.5 ppm, a NIOSH/MSHA approved full face chlorine type respirator is acceptable. A NIOSH/MSHA approved self-contained breathing apparatus, with full facepiece, is required for vapor concentrations above 25 ppm and for leaks and/or emergencies. Follow any applicable respirator use standards and regulations.

VENTILATION

As necessary to maintain vapor concentrations below 1 ppm, at all times.

SKIN PROTECTION

Wear cotton, PVC or leather gloves during normal operations to avoid freeze burns.

EYE PROTECTION

Wear safety glasses. Contact lenses should not be worn. Chemical goggles should be worn when operating valves and connecting or disconnecting chlorine lines.

HYGIENE

Avoid contact with skin and avoid breathing vapors. Do not eat, drink, or smoke in work area. Wash hands prior to eating, drinking, or using restroom. Any clothing or shoes which become contaminated with chlorine should be removed immediately and thoroughly laundered before wearing again.

OTHER CONTROL MEASURES

To determine the exposure level(s), monitoring should be performed regularly. Wear respirator while operating valves and connecting or disconnecting lines. Safety shower and eye wash fountain should be available. NOTE: Protective equipment and clothing should be selected, used, and maintained according to applicable standards and regulations. For further information, contact the clothing or equipment manufacturer or the Vulcan Chemicals Technical Service Department.

VIII - STORAGE AND HANDLING PRECAUTIONS

Follow protective controls set forth in Section VII when handling this product. Do not attempt to handle, store, or use chlorine without complete review of The Chlorine Institute's Chlorine Manual. Any use as a pesticide must be in a manner consistent with the labeling. Store properly labeled containers in a cool, dry, well-ventilated area away from basements, pits, etc. Room vents should be located at floor level. Vapors are heavier than air and will collect in low areas. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276. Do not apply heat to a chlorine container. Do not remove or deface label or tags. Chlorine piping and equipment must be thoroughly cleaned of organics and moisture before use. Keep chlorine piping and handling equipment clean and dry. Liquid chlorine lines must have suitable expansion chambers between block valves due to the high coefficient of expansion. **ARA Title III Hazard Categories: Immediate Health, Fire, Sudden Release of Pressure.**

IX - SPILL, LEAK AND DISPOSAL PRACTICES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Move unprotected personnel upwind or crosswind out of danger area. Wear one-piece, total encapsulating suit of Butyl coated nylon or equivalent with self-contained breathing apparatus. Isolate leak to whatever extent possible. If a chlorine container is leaking, try to position it so that gas rather than liquid leaks; apply emergency kit device if possible. For other than minor leaks, immediately implement predetermined emergency plan. Report spills as required to appropriate government authorities. Call CHEMTREC or supplier when help is needed. Reportable Quantity (RQ) is 15 lbs. Notify National Response Center (800/424-8802) of uncontrolled spills in excess of RQ.

WASTE DISPOSAL METHOD

Chlorine gas will disperse to the atmosphere leaving no residue. Chlorine may be neutralized by introducing it in to caustic soda, soda ash, or hydrated lime. Liquid and/or solid residues from neutralization must be disposed of in a permitted waste management facility. Consult federal, state, or local disposal authorities for approved procedures.

X - TRANSPORTATION

DOT HAZARD CLASSIFICATION

Nonflammable gas

PLACARD REQUIRED

Chlorine 1017 or Nonflammable Gas 1017

LABEL REQUIRED

Nonflammable Gas and Poison. Label as required by OSHA Hazard Communication Standard, and any applicable state and local regulations.

Medical Emergencies

Call collect 24 hours a day
for emergency toxicological
information 415/821-5338

Other Emergency information

Call 316/524-5751 (24 hours)

For any other information contact:

Vulcan Chemicals
Technical Service Department
P.O. Box 530390
Birmingham, AL 35253-0390
800/873-4898
8 AM to 5 PM Central Time
Monday Through Friday

DATE OF PREPARATION

May 1, 1991

NOTICE: Vulcan Chemicals believes that the information contained on this Material Safety Data Sheet is accurate. The suggested procedures are based on experience as of the date of publication. They are not necessarily all-inclusive nor fully adequate in every circumstance. Also, the suggestions should not be confused with nor followed in violation of applicable state, federal, or insurance requirements.

NO WARRANTY EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS OR OTHERWISE IS MADE.

Phone 3239-310

MC-378 REV 7/90

MSDS for Hydrazine

MATERIAL SAFETY DATA SHEET

ELF ATOCHEM NORTH AMERICA
BASIC CHEMICALS
2000 MARKET ST.
PHILADELPHIA, PA 19103-3222

EMERGENCY PHONE NUMBERS
BUSINESS HRS.: 215-419-7695
BUSINESS HRS.: 215-419-7704
OTHER HOURS 800-424-9300
CHEMTREC: 800-424-9300

PRODUCT IDENTIFICATION

PRODUCT NAME: CAS NO.: NA
HYDRAZINE HYDRATE 55%
SYNONYMS:
NONE
CHEMICAL NAME:
HYDRAZINE, AQUEOUS SOLUTION
MOLECULAR FORMULA:
N2H4 (HYDRAZINE)
CHEMICAL FAMILY: DIAMINES

INGREDIENTS---HAZARD CLASSIFICATIONS

COMPONENTS-HAZARDOUS: CAS NO.: I COMMENTS:

HYDRAZINE	302-01-2	13	* LISTED SARA SECTION 313 AQUEOUS SOLUTIONS OF HYDRAZINE CONTAIN HYDRAZINE HYDRATE (CAS 7803-57-8)
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COMPONENTS-OTHER: CAS NO.: I COMMENTS:

WATER	7732-18-5	65
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SHIPPING INFORMATION

RQ HYDRAZINE, AQUEOUS SOLUTION, 6.1 TOXIC MATERIAL, UN3293, PGIII

NA - NOT APPLICABLE NE - NOT ESTABLISHED
(R) - INDICATES REGISTERED TRADEMARK OF ELF ATOCHEM NORTH AMERICA

PHYSICAL PROPERTIES

BOILING POINT/RANGE: 108 C (226 F)	MELTING POINT: NE	FREEZING POINT: -65 C (-54 F)
MOLECULAR WEIGHT: NA	SPECIFIC GRAVITY(H ₂ O=1): 1.02 @ 15 C	VAPOR PRESSURE(MM HG): 15 MM HG
VAPOR DENSITY(AIR=1): 0.64	SOLUBILITY IN H ₂ O: COMPLETE	% VOLATILES BY VOLUME: 100

APPEARANCE AND ODOR:
COLORLESS TO SLIGHTLY TINTED LIQUID WITH AMMONIA ODOR.

PH = 10.5 (1% SOLUTION)

WHEN IN AQUEOUS SOLUTION, HYDRAZINE FORMS A MONOHYDRATE FORM, ALSO CALLED HYDRAZINE HYDRATE, WHICH CONTAINS 64% HYDRAZINE AND 36% WATER. THE CONVERSION FACTOR BETWEEN PERCENT HYDRAZINE AND PERCENT HYDRAZINE HYDRATE IS 0.64. FOR EXAMPLE, A 55% HYDRAZINE HYDRATE SOLUTION CONTAINS 35% HYDRAZINE (55% x 0.64) AND 65% WATER.

FIRE AND EXPLOSION DATA

FLASH POINT: NONE	FLAMMABLE LIMITS: LOWER: NA UPPER: NA	AUTOIGNITION TEMP.: NE
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EXTINGUISHING MEDIA:

WATER SPRAY, CARBON DIOXIDE, FOAM, OR DRY CHEMICALS.

SPECIAL FIRE FIGHTING PROCEDURES:

FIRE FIGHTERS AND OTHERS WHO MAY BE EXPOSED TO PRODUCTS OF COMBUSTION SHOULD WEAR FULL FIRE FIGHTING TURN OUT GEAR (FULL BUNKER GEAR) AND SELF-CONTAINED BREATHING APPARATUS (PRESSURE DEMAND MSHA/NIOSH APPROVED OR EQUIVALENT). FIRE FIGHTING EQUIPMENT SHOULD BE THOROUGHLY DECONTAMINATED AFTER USE.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

MOVE CONTAINER FROM THE FIRE AREA, IF POSSIBLE. COOL FIRE EXPOSED CONTAINERS WITH WATER WELL AFTER THE FIRE IS OUT. FOR MASSIVE FIRE IN A STORAGE AREA USE AN UNMANNED ROSE HOLDER. FLOODING IS BEST TECHNIQUE.

REACTIVITY DATA

STABILITY: CONDITIONS CONTRIBUTING TO INSTABILITY:

NA - NOT APPLICABLE NE - NOT ESTABLISHED
(R) - INDICATES REGISTERED TRADEMARK OF ELF ATOCHEM NORTH AMERICA

REACTIVITY DATA - CONTINUED

THIS MATERIAL IS CHEMICALLY STABLE UNDER NORMAL AND ANTICIPATED STORAGE AND HANDLING CONDITIONS. HOWEVER, AVOID FLAMES, WELDING ARCS, POTENTIAL IGNITION SOURCES, OR OTHER HIGH TEMPERATURE SOURCES WHICH INDUCE THERMAL DECOMPOSITION.

INCOMPATIBILITY-AVOID CONTACT WITH:

STRONG STRONG
ACIDS OXIDIZERS

BARIUM OXIDE, CALCIUM OXIDE, CHROMATE SALTS, ALKALI METALS AND METAL SALTS.

HAZARDOUS DECOMPOSITION THERMAL AND OTHER:

NITROGEN PRODUCTS AND IN SOME CASES HYDROGEN, AN EXPLOSIVE GAS.

CONDITIONS TO AVOID:

AVOID DIRECT SUNLIGHT, HEAT, FLAME, PROLONGED STORAGE AT ELEVATED TEMPERATURES.

TOXICITY

ROUTE:	ANIMAL:	DATA:
ORAL	NA	NE
DERMAL	NA	NE
INHALATION	NA	NE

TOXIC EFFECTS/ROUTES OF ENTRY

EYE EFFECTS: CORROSIVE

CAUSES EYE BURNS. MAY CAUSE BLINDNESS.

SKIN EFFECTS: IRRITANT

MAY CAUSE IRRITATION.

OTHER TOXIC EFFECTS:

HYDRAZINE HYDRATE IS CONSIDERED A SUSPECT CARCINOGEN AND AN ALLERGIC SKIN SENSITIZER.
INGESTION OF HYDRAZINE SOLUTIONS HAS PRODUCED VOMITING, WEAKNESS, UNCONSCIOUSNESS, IRREGULAR BREATHING, LIVER AND KIDNEY DAMAGE AND NERVOUS SYSTEM EFFECTS INCLUDING LOSS OF MUSCLE COORDINATION AND TINGLING IN THE ARMS AND LEGS.
INHALATION OF VAPORS HAS ALSO PRODUCED PNEUMONIA, LIVER DAMAGE, AND

NA - NOT APPLICABLE

NE - NOT ESTABLISHED

(R) - INDICATES REGISTERED TRADEMARK OF ELF ATOCHEM NORTH AMERICA

TOXICITY - CONTINUED

IRRITATION AND INFLAMMATION OF THE UPPER RESPIRATORY TRACT.
HYDRAZINE HYDRATE HAS PRODUCED TUMORS IN LABORATORY ANIMALS.
IT IS CONSIDERED ON THE BASIS OF SINGLE EXPOSURE ANIMAL STUDIES TO BE
MODERATELY TOXIC ORALLY, AND HIGHLY TOXIC AFTER SKIN CONTACT.

TARGET ORGAN TOXIN:

HYDRAZINE IS A POISON AND CARCINOGEN AFFECTING THE LUNGS (TUMORIGEN),
NERVOUS SYSTEM, LIVER, KIDNEYS AND SUBCUTANEOUS TISSUE.
ADDITIONAL SITES HAVE INCLUDED TUMORS OF BLOOD CELLS AND THE THYROID.

TOXICITY COMMENTS:

HYDRAZINE IS LISTED AS A SUBSTANCE THAT MAY REASONABLY BE ANTICIPATED
TO BE A CARCINOGEN BY THE NATIONAL TOXICOLOGY PROGRAM (NTP) AND IS
CLASSIFIED AS "POSSIBLY CARCINOGENIC TO HUMANS" BY THE INTERNATIONAL
AGENCY FOR RESEARCH ON CANCER (IARC).

HEALTH HAZARD INFORMATION

PERMISSIBLE EXPOSURE LIMITS:

EXPOSURE LIMITS FOR HYDRAZINE MONOHYDRATE HAVE NOT BEEN ESTABLISHED.

EXPOSURE LIMITS FOR PURE HYDRAZINE ARE:

OSHA TWA (SKIN) = 0.1 PPM, 0.1 MG/M3

ACGIH (TLV SKIN) TWA = 0.01 PPM, 0.013 MG/M3

SKIN ABSORPTION CAN ADD TO OVERALL EXPOSURE.

EMERGENCY FIRST AID

INGESTION:

IF SWALLOWED, INDUCE VOMITING IMMEDIATELY AS DIRECTED BY MEDICAL
PERSONNEL. GET EMERGENCY MEDICAL ATTENTION. CALL A POISON CONTROL
CENTER. IF THE PERSON IS CONSCIOUS, GIVE LARGE AMOUNTS OF WATER TO
DRINK. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

DERMAL:

IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE
REMOVING CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE REUSE.
DESTROY CONTAMINATED SHOES.

EYE CONTACT:

IF IN EYES, IMMEDIATELY FLUSH WITH PLENTY OF WATER. GET MEDICAL
ATTENTION IF IRRITATION PERSISTS.

INHALATION:

IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL

NA - NOT APPLICABLE

NE - NOT ESTABLISHED

(R) - INDICATES REGISTERED TRADEMARK OF ELF ATOCHEM NORTH AMERICA

HEALTH HAZARD INFORMATION - CONTINUED

RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION. CONTACT A POISON CONTROL CENTER.

SPECIAL PROTECTION INFORMATION

VENTILATION REQUIREMENTS:

INVESTIGATE ENGINEERING TECHNIQUES TO REDUCE EXPOSURES. PROVIDE VENTILATION IF NECESSARY TO MINIMIZE EXPOSURE. DILUTION VENTILATION ACCEPTABLE, BUT LOCAL MECHANICAL EXHAUST VENTILATION PREFERRED, IF PRACTICAL, AT SOURCES OF AIR CONTAMINATION SUCH AS OPEN PROCESS EQUIPMENT.

EYE:

WHERE THERE IS A POTENTIAL FOR EYE CONTACT, WEAR CHEMICAL GOGGLES AND HAVE EYE FLUSHING EQUIPMENT IMMEDIATELY AVAILABLE.

HAND(GLOVE TYPE):

WEAR APPROPRIATE CHEMICAL RESISTANT PROTECTIVE CLOTHING AND CHEMICAL RESISTANT GLOVES TO PREVENT SKIN CONTACT. SYNTHETIC GLOVES SHOULD BE WORN WHEN HANDLING THIS MATERIAL. WEAR CHEMICAL GOGGLES, FACE SHIELD, AND CHEMICAL RESISTANT CLOTHING SUCH AS RUBBER APRON WHEN SPLASHING MAY OCCUR. RINSE IMMEDIATELY IF SKIN IS CONTAMINATED. REMOVE CONTAMINATED CLOTHING PROMPTLY AND WASH BEFORE REUSE. CLEAN PROTECTIVE EQUIPMENT BEFORE REUSE. PROVIDE A SAFETY SHOWER AT ANY LOCATION WHERE SKIN CONTACT CAN OCCUR. WASH SKIN THOROUGHLY AFTER HANDLING.

RESPIRATOR TYPE:

AVOID BREATHING VAPOR OR MIST. USE NIOSH APPROVED RESPIRATORY PROTECTION EQUIPMENT APPROPRIATE TO THE MATERIAL AND/OR ITS COMPONENTS WHERE AIRBORNE EXPOSURE IS LIKELY. FULL FACEPIECE EQUIPMENT IS RECOMMENDED AND, IF USED, REPLACES NEED FOR CHEMICAL GOGGLES. IF EXPOSURES CANNOT BE KEPT AT A MINIMUM WITH ENGINEERING CONTROLS, CONSULT RESPIRATOR MANUFACTURER TO DETERMINE APPROPRIATE TYPE EQUIPMENT FOR GIVEN APPLICATION. OBSERVE RESPIRATOR USE LIMITATIONS SPECIFIED BY NIOSH OR THE MANUFACTURER. FOR EMERGENCY AND OTHER CONDITIONS WHERE THERE MAY BE A POTENTIAL FOR SIGNIFICANT EXPOSURE, USE AN APPROVED FULL FACE POSITIVE-PRESSURE, SELF-CONTAINED BREATHING APPARATUS OR POSITIVE-PRESSURE AIRLINE WITH AUXILIARY SELF-CONTAINED AIR SUPPLY. RESPIRATORY PROTECTION PROGRAMS MUST COMPLY WITH 29 CFR SECTION 1910.134.

OTHER PROTECTIVE EQUIPMENT: RUBBER BOOTS

APRON

WEAR CLOTHING TO PREVENT SKIN CONTACT.

NA - NOT APPLICABLE

NE - NOT ESTABLISHED

(R) - INDICATES REGISTERED TRADEMARK OF ELF ATOCHEM NORTH AMERICA

SPECIAL HANDLING AND STORAGE CONDITIONS

THIS MATERIAL IS NOT HAZARDOUS UNDER NORMAL STORAGE CONDITIONS; HOWEVER, MATERIAL SHOULD BE STORED IN CLOSED CONTAINERS, IN A SECURE AREA TO PREVENT CONTAINER DAMAGE AND SUBSEQUENT SPILLAGE.

SPILL MANAGEMENT

OBSERVE ALL SAFETY PRECAUTIONS STATED ABOVE. VENTILATE THE AREA AND REMOVE ALL IGNITION SOURCES. CONTAIN THE SPILL BY BUILDING A DIKE USING ABSORBENT MATERIAL. NEUTRALIZE THE SPILL BY SLOWLY ADDING SODIUM HYPOCHLORITE. COLLECT THE REMAINDER OF THE SPILL WITH ABSORBENT MATERIAL AND PLACE INTO A DRUM APPROVED FOR DISPOSAL.

DISPOSAL PROCEDURES

CONSULT FEDERAL, STATE, OR LOCAL AUTHORITIES FOR PROPER DISPOSAL PROCEDURES.

ADDITIONAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: HYDRAZINE IS HIGHLY TO MODERATELY TOXIC TO INVERTEBRATES, VERY HIGHLY TOXIC TO ALGAE, AND MODERATELY TOXIC TO SEVERAL SPECIES OF FISH. REPRESENTATIVE VALUES ARE PROVIDED BELOW:
48-HR EC50 WATER FLEA (DAPHNIA PULEX): 0.18 MG/L, HIGHLY TOXIC
96-HR EC50 WATER FLEA (DAPHNIA MAGNA): 2.3 MG/L, MODERATELY TOXIC
96-HR EC50 ALGAE (SELENASTRUM CAPRICORNUTUM): 6 MICROGRAMS/L, HIGHLY TOXIC

96-HR LC50 BLUEGILL SUNFISH: 1.3 MG/L, MODERATELY TOXIC
96-HR LC50 FATHEAD MINNOW: 5.98 MG/L, MODERATELY TOXIC
96-HR LC50 GUPPY: 3.85 MG/L, MODERATELY TOXIC

CHEMICAL FATE INFORMATION: HYDRAZINE IS RAPIDLY DEGRADED IN AIR, WATER AND SOIL. BIOACCUMULATION IS NOT EXPECTED TO BE SIGNIFICANT DUE TO THE NEGATIVE VALUE OF THE OCTANOL-WATER COEFFICIENT (POW = -3.8)

* WARNING: HYDRAZINE IS LISTED UNDER PROPOSITION 65 AND IS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

* THIS PRODUCT CONTAINS HYDRAZINE, WHICH IS DEFINED AS TOXIC CHEMICAL UNDER, AND IS SUBJECT TO THE REPORTING REQUIREMENTS OF, SECTION 313 OF TITLE III OF THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372. SEE 'INGREDIENTS-HAZARD CLASSIFICATIONS' SECTION FOR CAS NUMBERS AND PERCENT BY WEIGHT INFORMATION.

MSDS PREPARED BY PRODUCT SAFETY DEPT.

NA - NOT APPLICABLE NE - NOT ESTABLISHED
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MSDS

PRODUCT CODE: 30155-003
DATE: 08/31/95 PAGE: 7

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MSDS for Summit 782

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MATERIAL SAFETY DATA SHEET

SUMMIT LABORATORIES, INC.
1771 EAST 58TH AVENUE UNIT E
DENVER, CO 80216

PHONE: (303) 293-9862
CHEMICAL EMERGENCIES ONLY: CHEM-TEL
1-800-255-3924

SECTION 1 - IDENTITY INFORMATION

TRADENAME: B-702 BOILER TREATMENT

DESCRIPTION: STEAM AND RETURN LINE TREATMENT

PRODUCT TYPE: STEAM BOILER TREATMENT

HAZARD STATEMENT:

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL
OSHA HAZARD COMMUNICATION STANDARD 29 CFR 1910.1200.

HAZARDOUS INGREDIENTS:

INGREDIENTS	CAS #	%	TLV UNITS
CYCLOHEXYLAMINE	108-91-8	20	10 PPM
MORPHOLINE	110-91-8	20	20 PPM

SECTION 2 - PHYSICAL DATA

APPEARANCE:

COLORLESS LIQUID

ODOR:

AMINE

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BOILING POINT:

NOT LESS THAN 212 F

FREEZING POINT:

N.E.

DECOMPOSITION TEMPERATURE:

N.E.

EVAPORATION RATE:

N.E.

PERCENT VOLATILE:

40 PERCENT

VAPOR DENSITY:

ESTIMATED AT 3.0

VAPOR PRESSURE:

ESTIMATED AT 26 MM Hg AT 20 C

SOLUBILITY IN WATER:

COMPLETE

pH:

11 - 12

SPECIFIC GRAVITY:

1.0

POUNDS PER GALLON:

8.3

SECTION 3 - FIRE AND EXPLOSION HAZARD DATA**FLASH POINT:**

NOT LESS THAN 98 F

FLAMMABLE LIMITS IN AIR-LOWER:

ESTIMATED AT 1.8%

FLAMMABLE LIMITS IN AIR-UPPER:

ESTIMATED AT 10.8%

NFPA CODE:

HEALTH 2, FLAMABILITY 2, REACTIVITY 1

EXTINGUISHING MEDIA:

WATER FOG, CARBON DIOXIDE, FOAM, DRY CHEMICAL.

FIRE FIGHTING PROCEDURES-SPECIAL:

KEEP VAPORS AWAY FROM POSSIBLE IGNITION SOURCES

UNUSUAL FIRE AND EXPLOSION HAZARDS:

WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS

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SECTION 4 - REACTIVITY DATA**STABILITY:**

WILL AUTOIGNITE IN AIR AT 255 F

INCOMPATIBILITY:

STRONG ACIDS AND STRONG OXIDIZERS

HAZARDOUS DECOMPOSITION PRODUCTS:

CO, CO2, AND NOX

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

SECTION 5 - HEALTH HAZARD DATA**EFFECTS OF OVEREXPOSURE:****EMERGENCY AND FIRST AID PROCEDURES:**

EYES: FLUSH WITH COOL CLEAN WATER FOR AT LEAST 30 MINUTES. PROMPT MEDICAL CONSULTATION IS ESSENTIAL.

SKIN: WASH WITH WATER FOR AT LEAST 15 MIN. SEE A PHYSICIAN IF IRRITATION OCCURS. WASH CONTAMINATED CLOTHING. DESTROY CONTAMINATED LEATHER SHOES AND ARTICLES.

INHALATION: REMOVE TO FRESH AIR, AID IN BREATHING IF NECESSARY.

INGESTION: DO NOT INDUCE VOMITING. GIVE LARGE AMOUNT OF WATER OR MILK IF AVAILABLE AND TRANSPORT TO MEDICAL FACILITY. NEVER GIVE FLUIDS TO AN UNCONSCIOUS OR CONVULSING PERSON.

SECTION 6 - SPILL OR LEAK PROCEDURES**SPILL PROCEDURES:**

LARGE SPILL: DAM AREA TO PREVENT SPILL FROM SPREADING. USE ABSORBENT OR SAND.

SMALL SPILL: USE ABSORBENT MATERIAL OR SAND. BURN IN INCINERATOR.

WASTE DISPOSAL METHODS: DISPOSE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

SECTION 7 - SPECIAL PROTECTION INFORMATION**VENTILATION:**

GOOD GENERAL MECHANICAL VENTILATION RECOMMENDED:

PROTECTIVE CLOTHING:

WEAR IMPERVIOUS GLOVES, COVERALLS APRON, BOOTS AS NECESSARY TO PREVENT CONTACT.

EYE PROTECTION:

CHEMICAL GOGGLES, AND FACE SHIELD IS SPLASHING HAZARD EXISTS.

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RESPIRATORY PROTECTION:

IF VAPORS OR MISTS ARE GENERATED, WEAR A NIOSH/MSHA APPROVED ORGANIC VAPOR/MIST RESPIRATOR.

SECTION 8 - REGULATORY INFORMATION

THIS MATERIAL IS RCRA HAZARDOUS DUE TO ITS PROPERTIES.

HAZARDOUS SUBSTANCE SUPERFUND: NO **RQ (LBS):**

HAZARDOUS WASTE 40CFR261: YES **HAZARDOUS WASTE NUMBER:** D001,2

HAZARDOUS SUBSTANCE (49CFR CERCLA LIST): NO **(RQ):** NA

DOT PROPER SHIPPING DESCRIPTION: CORROSIVE LIQUIDS, n.s.s., 8,
UN 1760, III (CONTAINS MORPHOLINE,
CYCLOHEXYLAMINE)

HANDLING PRECAUTIONS:

DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. DO NOT INHALE MISTS. USE ONLY WITH ADEQUATE VENTILATION.

FOR INDUSTRIAL USE ONLY.

SHIPPING AND STORING PRECAUTIONS:

KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE AND DURING TRANSPORT.

PERSONAL HYGIENE:

WASH THOROUGHLY AFTER HANDLING.

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND EXPRESSED OR IMPLIED IS MADE WITH RESPECT TO THE CONTAINED HEREIN.

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