

PHILADELPHIA ELECTRIC COMPANY

NUCLEAR GROUP HEADQUARTERS

955-65 CHESTERBROOK BLVD.

WAYNE, PA 19087-5691

(215) 640-6000

April 26, 1991

Docket Nos. 50-352
50-353

License Nos. NPF-39
NPF-85

NPDES Permit No. PA0051926

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

Subject: Limerick Generating Station, Units 1 and 2
Proposed Change to the National Pollutant
Discharge Elimination System Permit

Gentlemen:

The Limerick Generating Station (LGS), Units 1 and 2, Environmental Protection Plan (EPP), Section 3.2, stipulates that the NRC shall receive a copy of any proposed change to the LGS National Pollutant Discharge Elimination System (NPDES) permit at the same time the proposed change is submitted to the permitting agency.

By letter dated March 25, 1991 to the Pennsylvania Department of Environmental Resources (PA DER), Philadelphia Electric Company (PECo) requested a change to the LGS NPDES Permit No. PA0051926 to allow for the addition of new chemical additives for use in the secondary cooling water system at LGS to prevent corrosion. These new chemicals are essentially the same as chemicals currently in use and approved under the LGS NPDES permit.

9105030072 910426
PDR ADOCK 05000352
P PDR

CDD

Therefore, in accordance with the LGS EPP Section 3.2, a copy of the March 25, 1991 letter to the PA DER (including attachments) requesting the change to the LGS NFDES permit is enclosed.

If you have any questions, please do not hesitate to contact us.

Sincerely yours,

R M Knick for

G. J. Beck

Manager

Licensing Section

Nuclear Engineering and Services

Enclosure

cc: T. T. Martin, Administrator, Region I, USNRC (w/ enclosure)
T. J. Kenny, USNRC Senior Resident Inspector, LGS
(w/ enclosure)

PHILADELPHIA ELECTRIC COMPANY

2301 MARKET STREET

P.O. BOX 8699

PHILADELPHIA, PA. 19101

(215) 841-4000

RECEIVED
E.M. KRICH

MAR 27 1991

REF. TO

March 25, 1991

Mr. James Newbold
Chief, Permits Section
Bureau of Water Quality Management
Department of Environmental Resources
Lee Park, Suite 6010
555 North Lane
Conshohocken, PA 19428

RE: Limerick Generating Station
NPDES Permit PA0051926
Additional Cooling Water Treatment Chemicals

Dear Mr. Newbold:

In accordance with Chapter 92.7 "Reporting of New or Increased Discharges" of the Department's Rules and Regulations, and pursuant to Other Requirement "J" of the subject permit, we hereby request that the approved chemical list of Other Requirement "J" in the permit be changed to include Betz Chemicals PECO 4 (zinc/polymer) and PECO 5 (phosphate/HEDP/TTA), and Bromine Compounds LTD "Bromide Plus" (Generic Sodium Bromide).

The two Betz Chemicals, PECO 4 and PECO 5, were formulated by Betz to be equivalent to the presently-approved chemicals Nalco 1360 and 1372, and will be used to control corrosion in the cooling water systems at Limerick Generating Station.

Bromide Plus is a generic sodium bromide solution similar to the presently-approved chemical Nalco 1338 (Actibrom). Nalco 1338 is a sodium bromide solution with a small amount of surfactant added to increase penetration into biological growths. The surfactant is not included in Bromide Plus and is, therefore, less costly to use. As with Nalco 1338, Bromide Plus will be used in conjunction with our intermittent chlorine treatment program to control biofouling.

Since all three of these chemicals are basically the same as chemicals already approved in our NPDES permit, we believe that the monitoring and limitations specified in our NPDES are sufficient for the use of these three chemicals and that a formal permit amendment should not be required. We wish

James Newbold
March 25, 1991

Page 2

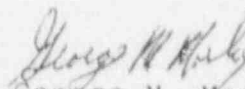
to retain our current approvals for chemicals already listed in the permit and add to that list the three aforementioned chemicals.

Attached for your information are Material Safety Data Sheets and aquatic toxicity information for Betz PECO 4, Betz PECO 5, and Bromide Plus.

Specific chemical composition of the Betz products is available through Betz and may be obtained by calling Mr. Steve Jordan at (215) 524-6080 or (215) 752-3065.

If there are any other questions regarding this request, please call David W. Mobraaten at (215) 841-5679.

Very truly yours,


George M. Morley
Director
Environmental Affairs

DWM/lth
bcc: J. M. Madara, Jr. w/o attachment
G. M. Leitch " "
R. W. Dubiel w/ "
R. M. Krich w/ "
T. J. Jackson w/ "
G. J. Madsen w/ "
CCD w/ "

Betz Industrial

February 1, 1991

Lewis Luchie Jr.
Water Quality Manager
Bureau of Water Quality Management
1875 New Hope Street
Norristown, PA 19401

Dear Sir:

Enclosed is Human Health (MSDS) and Whole Product Bioassay data on water treatment chemicals that Philadelphia Electric would like to consider for use in the main recirculating cooling water systems at Limerick Generating Station. The proposed water treatment chemicals would be "replacements in kind" to those currently approved for use at Limerick. We are requesting that the following Betz Products be evaluated for addition to the approved cooling water treatment chemicals list.

Product designation, chemical composition, usage and use concentrations are as follows:

Betz Powerline PEC03:

Methyl-Benzotriazole, (TTA) sodium salt. 50 % sol'n
Used to supplement copper corrosion inhibitor levels.
Intended use concentration is 0 to 2 mg/l as product

Betz Powerline PEC04:

Blend of Zinc Sulfate and Acrylic Acid Copolymer
(allyl hydroxy propyl sulfonate ether and acrylic acid)
4.5 % as zinc and 13.5 % as active polymer
Used as carbon steel corrosion inhibitor and dispersant
Intended use concentration is 10 to 20 mg/l as product

Betz Powerline PEC05:

Blend of Phosphoric acid, HEDP, and TTA
Active constituents are 10% as PO4, 5% HEDP, and 5% TTA
Used as carbon steel and copper corrosion inhibitor and scale inhibitor
Intended use concentration is 10 to 20 mg/l as product

The use of the Betz Products is not expected to require any change in current NPDES permit limitations.

Betz Industrial

SECTION 2. SPECIFICATION RESPONSE

A. Two Product Chemical Treatment Program

Betz Industrial has custom formulated a "Two-Product" chemical treatment program in strict conformance to the requirements outlined in the bid specification. The program was designed to match the existing chemical blends in order to provide equivalent dosage flexibility with regard to zinc and orthophosphate. A review of the Limerick NPDES permit shows that Betz Industrial's proposed program is an environmental equivalent to the program currently in use.

Betz Industrial is pleased to offer Betz Powerline PECO4, a zinc/polymer blend, and Betz Powerline PECO5, a blend of phosphate/HEDP/TTA, for use at Limerick Generating Station.

A.1. Material Safety Data

From a material safety standpoint, there is a difference in the zinc blend being proposed. Betz PECO4 contains zinc sulfate whereas the current treatment uses zinc chloride. Betz PECO4 is less corrosive and does not have the noxious odor associated with the chloride content in the current blend. Material Safety Data Sheets are enclosed in Appendix A.

A.2. Aquatic Toxicity

Betz Industrial has reviewed the permit requirements of Limerick Generating Station with the PA Dept. of Environmental Resources. Environmentally equivalent chemical treatment programs can be added to the LGS NPDES permit by way of an addendum as opposed to a permit amendment. Chemical materials that are "replacements in kind" can be authorized for use in relatively short order. LGS will not have to request a permit amendment. The only requirement is a letter from LGS requesting that the new product names be added to the "authorized chemicals" list.

In accordance with the input provided by the PA DER, Betz Industrial has prepared an information package, as directed, for submittal. The package includes the human health (MSDS) and aquatic toxicity data (whole product bioassay results). Betz Industrial has also drafted a sample cover letter containing the appropriate language as described by the PA DER. This information package is enclosed in Appendix B.

A.3. Product Density

Betz Powerline PECO4 is 10.75 lbs/gal at 70 F

Betz Powerline PECO5 is 11.19 lbs/gal at 70 F

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19047

PRODUCT: POWERLINE PECO4

1/31/91

AQUATIC TOXICOLOGY

DAPHNIA MAGNA

48 HR. LC50: 20 MG/L

FATHEAD MINNOW

96 HR. LC50: 70 MG/L

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19047
BETZ MATERIAL SAFETY DATA SHEET
24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) 215/355-3300

PRODUCT : POWERLINE PEC04

(PAGE 1 OF 3)
EFFECTIVE DATE 11-30-90
PRINTED: 28-Jan-1991

REVISIONS TO SECTIONS: 1;EDIT:8

PRODUCT APPLICATION : WATER-BASED CORROSION INHIBITOR/DEPOSIT CONTROL AGENT.
-----SECTION 1-----HAZARDOUS INGREDIENTS-----
INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC
PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS
LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE
AND CHRONIC HAZARDS OF THIS FORMULATION.

ZINC SULFATE***CAS#7733-02-0;POTENTIAL REPRODUCTIVE TOXIN,SEVERE IRRITANT;
PEL/TLV:NONE.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: AS IS	(APPROX.) 3.0	ODOR: MILD
FL.PT.(DEG.F): >200	P-M(CC)	SP.GR.(70F)OR DENSITY: 1.295
VAPOR PRESSURE(mmHG): 18		VAPOR DENSITY(AIR=1): <1
VISC cps70F: 21		%SOLUBILITY(WATER): 100
EVAP.RATE: ND WATER=1		APPEARANCE: COLORLESS
PHYSICAL STATE: LIQUID		FREEZE POINT(DEG.F): 21

-----SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

BETZ MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: POWERLINE PEC04

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

MODERATELY IRRITATING TO SKIN.MAY CAUSE DERMATITIS.MAY BE ABSORBED.

TE EYE EFFECTS ***

SEVERE IRRITANT TO THE EYES

ACUTE RESPIRATORY EFFECTS ***

MISTS/AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED EXPOSURES MAY CAUSE LIVER AND KIDNEY TOXICITY;MAY

CAUSE BLOOD CELL DAMAGE OR IMPAIRMENT OF FUNCTION;AND MAY CAUSE

REPRODUCTIVE SYSTEM TOXICITY.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

MAY CAUSE REDNESS OR ITCHING OF SKIN.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CONTAMINATED CLOTHING.WASH EXPOSED AREA WITH A LARGE QUANTITY OF
SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES.IMMEDIATELY CONTACT A
PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR.APPLY APPROPRIATE
FIRST AID TREATMENT AS NECESSARY

ESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DILUTE CONTENTS OF STOMACH.INDUCE VOMITING BY ONE OF THE STANDARD
METHODS.IMMEDIATELY CONTACT A PHYSICIAN

-----SECTION 6-----SPILL,DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA,USE SPECIFIED PROTECTIVE EQUIPMENT.CONTAIN AND ABSORB
ON ABSORBENT MATERIAL.PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE
CHARACTERISTICS OF THE ABSORBED MATERIAL,OR ANY CONTAMINATED SOIL,
SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD
SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY
SEWER TREATMENT FACILITY,IN ACCORDANCE WITH ANY LOCAL AGREEMENT,A
PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT
PRODUCT(AS IS)-

INCINERATE OR BURY IN APPROVED LANDFILL.

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING
APPARATUS(FULL FACE-PIECE TYPE).PROPER FIRE EXTINGUISHING MEDIA:

DRY CHEMICAL,CARBON DIOXIDE,FOAM OR WATER

BETZ MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

PRODUCT: POWERLINE PEC04

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----
USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION

RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.

RECOMMENDED SKIN PROTECTION***

RUBBER GLOVES

WASH OFF AFTER EACH USE.REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----

STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

PROTECT FROM FREEZING

HANDLING INSTRUCTIONS***

ACIDIC.DO NOT MIX WITH ALKALINE MATERIAL.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
ZINC SULFATE

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: NOT APPLICABLE

...DOT HAZARD/UN#/ER GUIDE# IS: NOT APPLICABLE

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: ZINC SULFATE(7733-02-0) , 21.0-30.0% ;

...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE) AND DELAYED(CHRONIC)

...MICHIGAN CRITICAL MATERIALS: ZINC SULFATE(7733-02-0) ;

NFPA/HMIS : HEALTH - 2 ; FIRE - 1 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOSE, PA. 19047

PRODUCT: POWERLINE PEC05

1/31/91

AQUATIC TOXICOLOGY

DAPHNIA MAGNA

48 HR. LC50: 761 MG/L

FATHEAD MINNOW

96 HR. LC50: 430 MG/L

BETZ LABORATORIES, INC.
4636 SOMERTON ROAD, TREVOST, PA. 19047
BETZ MATERIAL SAFETY DATA SHEET
24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) 215/355-3300

PRODUCT : BETZ PEC05

(PAGE 1 OF 3)
EFFECTIVE DATE 12-13-89
PRINTED: 28-Jan-1991

REVISIONS TO SECTIONS: APPENDIX

PRODUCT APPLICATION : WATER-BASED CORROSION INHIBITOR/DEPOSIT CONTROL AGENT.

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD IS LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

POTASSIUM HYDROXIDE(CAUSTIC POTASH)***CAS#1310-58-3;CORROSIVE;TOXIC IF ORALLY INGESTED;PEL/TLV:2.0MG/M3(CEILING).

1-H-BENZOTRIAZOLE,METHYL***(TOLYLTRIAZOLE;TTA);CAS#29385-43-1; IRRITANT(EYE);PEL:NONE;TLV:NONE.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: AS IS	(APPROX.) 12.5	ODOR: MILD
FL.PT.(DEG.F): >200	SETA(CC)	SP.GR.(70F)OR DENSITY: 1.348
VAPOR PRESSURE(mmHG): ND		VAPOR DENSITY(AIR=1): ND
VISC cps70F: 24		%SOLUBILITY(WATER): 100
EVAP.RATE: ND	WATER=1	APPEARANCE: YELLOW
PHYSICAL STATE: LIQUID		FREEZE POINT(DEG.F): 10

-----SECTION 3-----REACTIVITY DATA-----

STABLE.MAY REACT WITH STRONG OXIDIZERS.DO NOT CONTAMINATE.BETZ TANK
CLEAN-OUT CATEGORY 'B'

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

BETZ MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: BETZ PEC05

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

SEVERE IRRITANT TO THE SKIN

TE EYE EFFECTS ***

CORROSIVE TO THE EYES

ACUTE RESPIRATORY EFFECTS ***

MISTS/AEROSOLS CAUSE IRRITATION TO UPPER RESPIRATORY TRACT

CHRONIC EFFECTS OF OVEREXPOSURE***

PROLONGED OR REPEATED CONTACT MAY CAUSE PRIMARY IRRITANT DERMATITIS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

CAUSES SEVERE IRRITATION, BURNS OR TISSUE ULCERATION WITH SUBSEQUENT SCARRING.

PRECAUTIONARY STATEMENT BASED ON TESTING RESULTS ***

MAY BE TOXIC IF ORALLY INGESTED.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR. APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING. IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. CONTAIN AND ABSORB ON ABSORBENT MATERIAL. PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL, OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY, IN ACCORDANCE WITH ANY LOCAL AGREEMENT, A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT (AS IS) -

INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (FULL FACE-PIECE TYPE). PROPER FIRE EXTINGUISHING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER

BETZ MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

PRODUCT: BETZ PEC05

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----
USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.

VENTILATION PROTECTION***

ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
RECOMMENDED RESPIRATORY PROTECTION***

IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH DUST/MIST FILTERS.

RECOMMENDED SKIN PROTECTION***

RUBBER GLOVES

WASH OFF AFTER EACH USE. REPLACE AS NECESSARY

RECOMMENDED EYE PROTECTION***

SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----
STORAGE INSTRUCTIONS***

KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.

PROTECT FROM FREEZING

HANDLING INSTRUCTIONS***

ALKALINE. CORROSIVE (EYES). DO NOT MIX WITH ACIDIC MATERIAL.

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIRONMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION

THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
REPORTABLE QUANTITY (RQ) FOR UNDILUTED PRODUCT:
.96 GALLONS DUE TO POTASSIUM HYDROXIDE

...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE, THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: D002=CORROSIVE (PH)

...DOT HAZARD/UN#/ER GUIDE# IS: ORM-B (WHEN CONTAINER > RQ) NA1760/#60

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

...SARA SECTION 312 HAZARD CLASS: IMMEDIATE (ACUTE) AND DELAYED (CHRON. C)

...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS

NFPA/HMIS : HEALTH - 3 ; FIRE - 1 ; REACTIVITY - 0 ; SPECIAL - ALK ; PE - B

JNB Laboratories

P.O. Box 191
Pennington, N.J. 08534
(609) 924-6274

RECEIVED

JAN 16 1991

D. W. MOBRAATEN

December 28, 1990

Mr. Steven Diech
Limerick Generating Station
Philadelphia Electric Company
P.O. Box A, Sanatoga Branch
Pottstown, Pa. 19464

Re: Toxicity Data - Sodium Bromide

Dear Steve,

The following is the toxicity data as requested. Please note that the studies are performed using technical grade sodium bromide in drinking water. The reason for this is that BROMIDE PLUS is made in this way. BROMIDE PLUS is a 40% solution of technical grade sodium bromide solid in a drinking water solution. Since this is different from the other suppliers since they start with a solution and then concentrate it. Therefore, low level organic impurities are present this type of product.

The following is the toxicity data for BROMIDE PLUS:

Bluegill Sunfish

96-hour LC50 1000 mg/l, highest conc. tested
96-hour NOEL = 1000 mg/l

Rainbow Trout

96-hour LC50 1000 mg/l, highest conc. tested
96-hour NOEL = 320 mg/l

Daphnia Magna

48-hour LC50 1000 mg/l, highest conc. tested
48-hour NOEL = 1000 mg/l

We hope that the above data is sufficient.

Sincerely yours,

Nelson Brown

BROMINE COMPOUNDS LTD

Registered Office, P.O. Box 100, Beer Sheva 84100 Israel
Telephone 052-667222 Fax 052-667222
Telex 5221 2335 5741 Cable BROMINE



תדכוכות ברומין בע"מ

מיקום: תל אביב * מס' ת"ד: 9720
ד"ר: 52444 * ד"ר: 52444 * ד"ר: 52444 * ד"ר: 52444
ד"ר: 52444 * ד"ר: 52444 * ד"ר: 52444 * ד"ר: 52444

MATERIAL SAFETY DATA SHEET

90

BROMIDE PLUS (sodium bromide solution)

I. CHEMICAL DATA (of the active ingredient)

1. Synonyms: Sodium bromide
2. Chemical family: Alkali metal halide (solution)
3. Formula: NaBr
4. Molecular weight: 102.9
5. CAS RN: 7647-15-6

II. INGREDIENTS (typical value - not a specification)

Sodium bromide - 30 - 42.0%
Water - 67 - 58.0%

III. PHYSICAL DATA

1. Boiling point: 112°C
2. Freezing point: Not applicable for a solution
3. Vapour pressure: 10 mm Hg at 25°C
4. Vapour density: None
5. Solubility:
 - in water: 94.6 g/100 ml at 25°C
 - in other solvents:
 - ethanol: 7 g/100 ml at 25°C
 - methanol: 14.4 g/100 ml at 25°C
6. Specific gravity: 1.3462 for 35% w/w solution
1.4138 for 40% w/w solution (1)
7. Evaporation rate: Of water
8. Decomposition: The active ingredient decomposes from ca. 800°C
9. Appearance & Odour: Colourless liquid; odourless

IV. FIRE AND EXPLOSION HAZARD DATA

1. Flash point: None
2. Flammable (explosive) limits: Not flammable
3. Autoignition point: Not applicable
4. Extinguishing media: Material is not combustible. If involved in fire use extinguishing media appropriate to surrounding conditions.
5. Special fire fighting procedures: Cool containers with water spray. In closed stores, provide fire-fighters with self-contained breathing apparatus in positive pressure mode.
6. Unusual fire and explosion hazards: Will decompose from ca. 800°C releasing poisonous and corrosive fumes of bromine and sodium oxide.

V. HEALTH HAZARD DATA (of the active ingredient)

1. Toxicity:
 - LD₅₀ (oral, rat) - 4200 mg/kg
 - LD₅₀ (dermal, rabbit) > 2000 mg/kg
2. Threshold limit value: Not established
3. Effects of overexposure
 - Acute
 - Eye contact: Mild irritant
 - Skin contact: Nonirritant to intact skin. Slight irritant, on prolonged contact, to abraded skin.
 - Skin absorption: None via intact skin

Ingestion:

May produce depression, sedation and confusion. After prolonged exposure, may produce non-persistent acne-like skin rash.

Chronic:

Repeated ingestion may cause bromism: emaciation, depression, mental deterioration, with acne- or furunculosis-like skin rash.

4. Mutagenicity:

Not mutagenic

5. Emergency and first aid procedures

Eye contact:

Holding the eyelids apart, flush eyes promptly with copious flowing water for at least 15 minutes. Get medical attention if irritation persists.

Skin contact:

Remove contaminated clothing. Wash skin thoroughly with mild soap and plenty of water for at least 15 minutes. Wash clothing before re-use. Get medical attention if irritation occurs.

Inhalation:

In case of inhalation remove person to fresh air. Keep him quiet and warm. Apply artificial respiration if necessary and get medical attention immediately.

Ingestion:

If swallowed, wash mouth thoroughly with plenty of water and give water or milk to drink. Get medical attention immediately.
Note: Do not give liquids to an unconscious person

VI. REACTIVITY DATA

- | | |
|--------------------------------------|---|
| 1. Stability: | Stable under normal conditions |
| Conditions to avoid | Heating above 800°C |
| 2. Incompatibility: | Acids and heavy metal salts;
Reacts violently with bromine trifluoride |
| 3. Hazardous decomposition products: | Bromine and sodium oxide |
| 4. Hazardous polymerization: | Will not occur |

VII. SPILL OR LEAK PROCEDURES

- | | |
|---|--|
| 1. Steps to be taken in case material is released or spilled: | Wear respirator safety goggles with side shields, rubber gloves and boots.
Absorb with sawdust, clay or filter-aid.
Place in a suitable container and dispose of as waste. |
| 2. Waste disposal method: | Remove to approved incinerator or landfill
observe all federal, state or local regulations when disposing of this substance. |

VIII. SPECIAL PROTECTION INFORMATION

- | | |
|------------------------------|--|
| 1. Ventilation requirements: | Adequate ventilation must be provided. Use local exhaust fans as necessary, especially under misting conditions. |
| 2. Protective equipment: | |
| Eyes: | Chemical safety goggles with side-shield |
| Gloves: | Protective gloves |
| Other protective equipment: | Body-covering clothes, and rubber boots |

IX. SPECIAL PRECAUTIONS

1. Precautions to be taken in handling and storage: Keep containers well closed. Store in cool, dry locations, away from BrF₃, acids, incompatible materials (see VI 2).
2. Other precautions: Safety shower and eyes bath should be provided. Do not eat, drink or smoke until after work abluion.

X. REGULATION INFORMATION

1. Transportation: UN, IMD, RID/ADR, UK, US: Not regulated
2. Status: Reported in EPA ISCA Inventory
Reported in EINECS
Not listed in NTP, 1989.

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