



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
**PITTSBURGH DISTRICT, CORPS OF ENGINEERS**  
**WILLIAM S. MOORHEAD FEDERAL BUILDING**  
**1000 LIBERTY AVENUE**  
**PITTSBURGH, PA 15222-4186**

August 8, 2003

Operations and Readiness Division

Pennsylvania Department of Environmental Protection  
Water Management  
400 Waterfront Drive  
Pittsburgh, Pennsylvania 15222-4745

**SUBJECT: Waste Water Discharge Authorization for Lift Gate Chain Cleaning and Lubrication**

Dear Mr. Ron Schwartz:

Per our meeting and demonstration of lift gate chain cleaning at Emsworth Locks last August, the Pittsburgh District Corps of Engineers is requesting a Waste Water Discharge Authorization. The attached document (Guidelines For Environmental Pollution Controls, Lift Gate Chain Cleaning and Lubrication) provides a description of the process and the environmental controls that we have in place. We have implemented the recommendations that you and Mr. Homer Richey provided and we continue to strive for minimizing the environmental impact from our operations and maintenance activities.

If you have any questions with the above request, please contact Mr. Laurence L. Homich by email at [larry.l.homich@usace.army.mil](mailto:larry.l.homich@usace.army.mil) or by phone at (412)-395-7192.

Sincerely,

<signed>

James J. Edinger, P.E.  
Chief, Operations and Readiness Division



**US Army Corps  
of Engineers**  
Pittsburgh District

**July 2002**

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GUIDELINES FOR ENVIRONMENTAL POLLUTION CONTROLS  
LIFT GATE CHAIN CLEANING AND LUBRICATION

U.S. ARMY CORPS OF ENGINEERS  
Pittsburgh District

July 21, 2003

Operations and Readiness Division  
Technical Support Branch  
Natural Resources Section  
CELRP-OR-TR

## **Introduction**

The Pittsburgh District U.S. Army Corps of Engineers manages and operates twenty three Locks and Dams on the Allegheny, Monongahela and Ohio Rivers that are located in Pennsylvania, West Virginia, and Ohio. Within the Pittsburgh District there are two main types of dams, fixed crest and gated structures. There are eleven gated dams, five on the Ohio River (two in Pennsylvania and three between West Virginia and Ohio), and six on the Monongahela River (three in Pennsylvania and three in West Virginia). The gated structures control the water level in the navigation pool upriver of the dam. Machinery mounted on concrete piers move large chains that lift gates that are hinged into the body of the piers. The gates are raised or lowered to control the relative amount of water flowing past them to maintain the upstream pool at a relatively constant authorized depth of at least 9 feet throughout its length. The gated structures however are not operated to control flood flows. The following sections describe the method utilized in the Pittsburgh District to clean and lubricate the chains (called lift gate chains) that move the gates. Also described are the controls that are in place during the cleaning and lubrication procedure to protect the environment.

## **Cleaning Procedure**

- a. A bulkhead is placed upstream of the gate to be closed and the chains to be cleaned. The bulkhead diverts the flow of water to either side of the closed gate. This results in a eddy or pool behind (or downstream) the closed gate.
- b. An oil adsorbent boom is placed in the river and downstream from the closed gate. The ends of the boom are tied off to encircle from pier to pier of the closed gate.
- c. The work platform on the concrete pier where the chains will be cleaned in place are completely covered with adsorbent pads (walk way, railing, and pier walls). The pads are held in place with tape and/or plastic strap ties.
- d. A portable diesel fuel powered pressure washer set between 2.7 and 10.2 gallons per minute of withdrawn river water at 2000 psia is used to clean the chain. The chain is set to move at 1 foot per minute during the cleaning process, and is cleaned twice (once while being raised and lowered). The average chain length is 75 feet and there are two chains per gate. The chains are scheduled to be cleaned every other year.

## **Lubrication Procedure**

- a. The same steps as a thru c for the Cleaning Procedure are in place.
- b. Either a five gallon airless sprayer or an air siphon sprayer is utilized to apply the lubricant. The lubricant is a mixture of 25% by volume of diesel fuel and 75% by volume of Monolec 2001 lubricant (MSDS and Company Technical Information is attached). Approximately 2 gallons of lubricant mixture is applied per lift gate chain. The chains are scheduled to be lubricated once per year.

- c. Weekly inspection of chain links may reveal link binding, where two adjacent links may not move freely over the link roller/pin. To free the linkage a small amount of lubricant is sprayed using an ordinary pump garden sprayer.

**Lift Gate Chain Cleaning Worksheet Example** (Emsworth Locks, 0 Western Avenue, Allegheny County, Pittsburgh, Pa 15202) The gated structure at Emsworth has 8 main channel gates and 6 back channel gates for a total of 14 gates.

Pressure Washers	Every other year	
	Min	Max
gpm	2.7	10.2
75' chain, 1 foot/minute, 2x (gals)	405	1530
2 chains per gate (gals)	810	3060
total 14 gates (gals)	11340	42840

Once a year	Diesel Fuel	Lube	
Mix ratio, by volume	25%	75%	
1.5 lift gates, 6 gallons (gals)	1.5	4.5	
2 chains per gate			
14 gates, (total gallons)	14	42	56

**Pollution Potential**

Environmental concerns generated by the cleaning and lubrication procedure are:

- a. Suspended particulates in the water;
- b. Overspray of pressure washer and lubrication mixture;
- c. Debris/solid waste (adsorbent pads and boom);
- d. Leaks and spillage of diesel fuel or Monolec 2001 during storage and/or use;
- e. Aesthetics and noise (diesel powered spray washer).

**Environmental Controls**

Absorbent pads and river containment/adsorbent boom will be installed and in place before each work day.

The pads and river boom will be removed at the end of work day. Trash material collected on the pads and within the boom will be collected for disposal before the controls are removed or released.

Waste materials will be removed from the project site daily, at the end of the work day. The solid waste will be disposed of in accordance with applicable Federal, State, and local requirements.

**Environmental Controls** (cont)

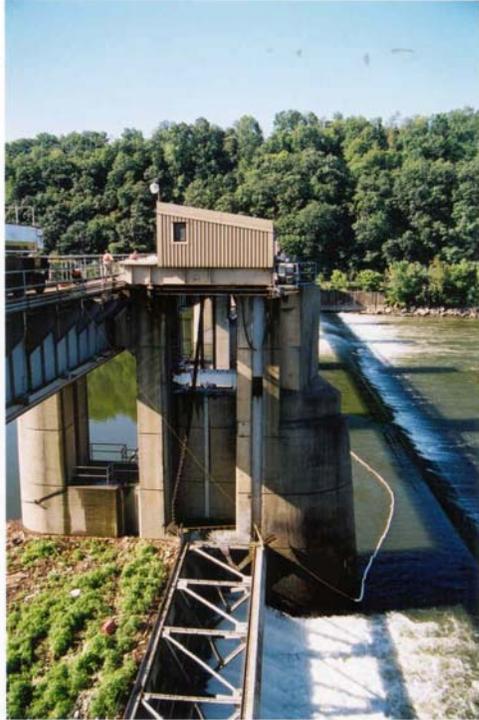
The diesel fuel and Monolec 2001 will be stored in an area so as to prohibit its accidental entry into any watercourse, water supply, drainage course or drainage system.

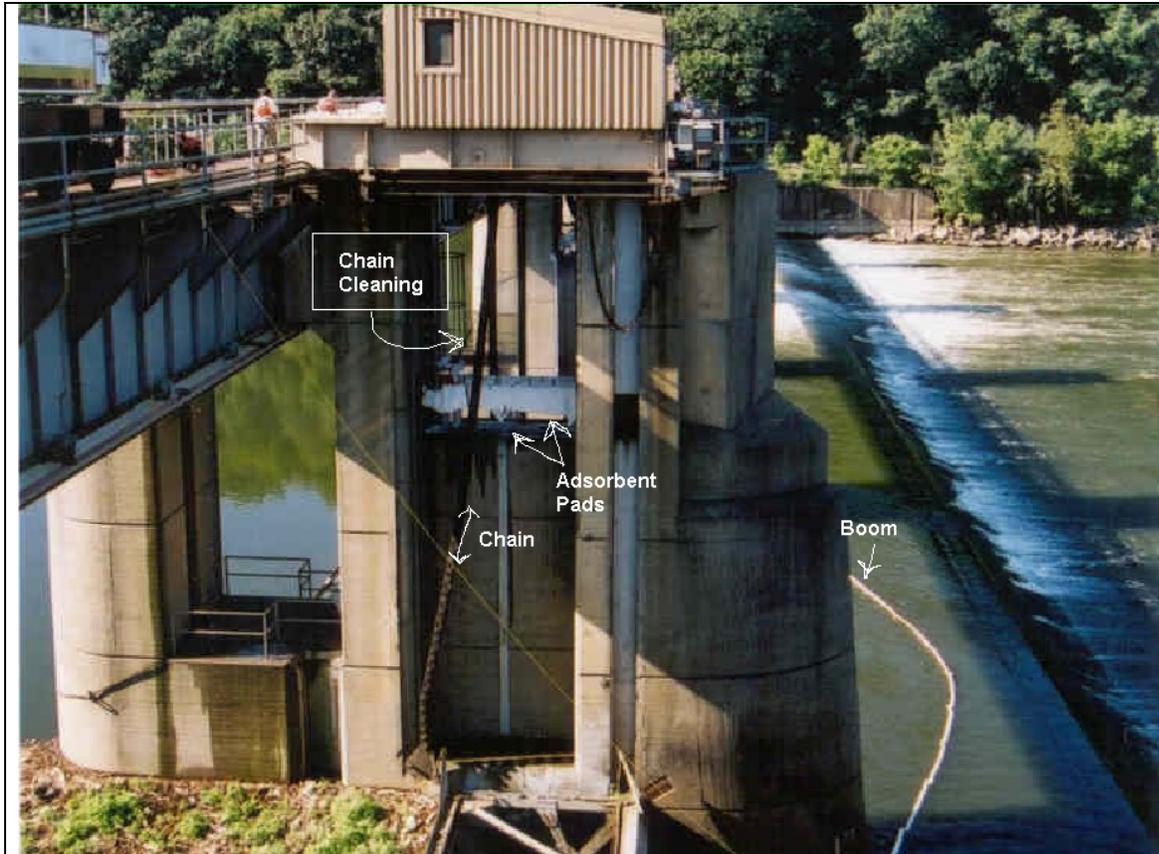
Remove or use only the quantity of diesel fuel or Monolec 2001 necessary to lubricate the chain planned to be lubricated that work day.

To minimize the overspray during the lubrication process, an airless sprayer or a conventional air siphon sprayer is used to increase the transfer efficiency.

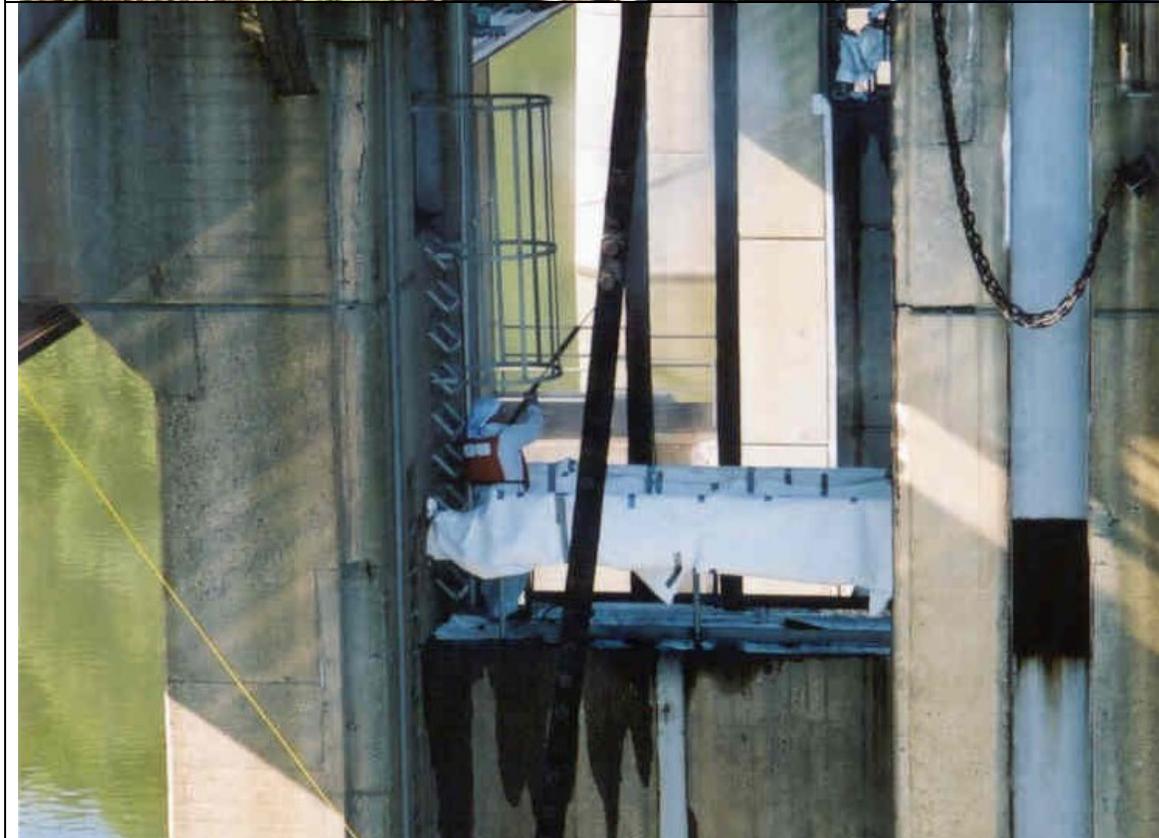
If spill occurs, contain the spill and follow the applicable procedures in the spill response plan.

CELRP-OR-TR  
Guidelines For Environmental Pollution Controls For Lift Gate Chain Cleaning and Lubrication

 A portable diesel-powered pressure washer is shown on a concrete platform. The machine is black with a yellow fuel tank and a red engine cover. It is emitting a spray of water. In the background, there is a body of water and a forested hillside.	Portable Diesel Powered Pressure Washer
 An extended oil adsorbent boom is shown downstream from a closed gate. The boom is a long, narrow structure with a metal frame and a brown cover. It is positioned in the water. In the background, there is a concrete structure and a forested hillside.	Extended oil adsorbent boom, downstream from the closed gate



Work Layout, showing the length of chain, the adsorbent pads, and the boom placement



Chain Cleaning/ Spray Lubrication, also showing the adsorbent pads on the work surfaces



Close Up, Looking from above, the spray washer is in the left hand and is spraying lubricant mixture (note that the spray washer is no longer used to apply the mixture).

101-076-0

LUBRICATION ENGINEERS, INC.  
P. O. BOX 7128 FORT WORTH, TX 76111

MATERIAL SAFETY DATA SHEET

\*\*\*\*\* SECTION I \*\*\*\*\*

PRODUCT IDENTIFICATION

SUPPLIER:	Lubrication Engineers, Inc. 3851 Airport Freeway Fort Worth, TX 76111	EMERGENCY TELEPHONE NO.:	(817) 834-6321
CHEMICAL NAME AND SYNONYMS:	Not Applicable	TRADE NAME AND SYNONYMS:	2001 Monolec Wire Rope Lubricant
CHEMICAL FAMILY:	Petroleum-Hydrocarbon	FORMULA:	Not Applicable

\*\*\*\*\* SECTION II \*\*\*\*\*

TYPICAL CHEMICAL AND PHYSICAL PROPERTIES

APPEARANCE:	Purple Lubricant	VISCOSITY:	At <u>210</u> F, SUS Not Applicable	At <u>100</u> C, CS Not Applicable
ODOR:	Solvent Odor	VISCOSITY:	At <u>100</u> F, SUS <u>175</u>	At <u>40</u> C, CS <u>37.5</u>
RELATIVE DENSITY: (Air=1)	>1	SOLUBILITY IN WATER:	Negligible	
RELATIVE DENSITY: (Air=1)	>1	PH:	6-8	
MELTING POINT:	Not Applicable	POUR POINT:	-40 F	
BOILING POINT: F	367-405	FLASH POINT: F (Method)	140 (C.O.C.)	
VAPOR PRESSURE: (MM HG 60F)	<5	SPECIFIC GRAVITY: (H2O=1)	0.91	

\*\*\*\*\* SECTION III \*\*\*\*\*

INGREDIENTS

	WT PCT (APPROX)	TLV	ORAL LD50	DERMAL LD50
<b>HAZARDOUS INGREDIENTS:</b>				
Oil Mist (Mineral)	50-70	5mg/m3 TWA	Unknown	Unknown
Mineral Spirits	10-20	Unknown	Unknown	Unknown

**NON-HAZARDOUS INGREDIENTS:**

Additives and/or other ingredients. This product is a mixture. The specific chemical identity of hazardous ingredients and non-hazardous ingredients, their C.A.S. numbers and their exact percent of composition are proprietary to Lubrication Engineers, Inc. and are being withheld as Trade Secrets. The above listing of hazardous ingredients discloses the properties, approximate concentration and known toxicological effects of the hazardous ingredients. This material is an automotive/industrial lubricant with a low order of toxicity and irritancy.

\*\*\*\*\* SECTION IV \*\*\*\*\*

FIRE AND EXPLOSION HAZARD DATA

**FLASH POINT:** F (Method Used)      **FLAMMABLE LIMITS:**      **LEL**      **UEL**  
 140 (C.O.C.)      Unknown

**EXTINGUISHING MEDIA:**

Foam, dry chemical, water fog, or carbon dioxide.

**SPECIAL FIRE FIGHTING PROCEDURES:**

Do not direct a solid stream of water into fire. Treat as a petroleum oil fire. Respiratory protection required for fire fighting personnel.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

None

\*\*\*\*\* SECTION V \*\*\*\*\*

HEALTH HAZARD DATA

**THRESHOLD LIMIT VALUE: (If Established)**

Not established. Oil mist = 5mg/m3

**EFFECTS OF OVEREXPOSURE:**

Although there are no consistent primary routes of entry, the product may cause mild dermatitis upon prolonged contact and is expected to an eye and lung irritant. Any existing skin, eye, or lung irritati

may be aggravated by direct contact. Testing of oils similar to mineral spirits by I.A.R.C. has produced skin tumors in experimental animals.

\*\*\*\*\* SECTION VI \*\*\*\*\*

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT:

Flush immediately with water until irritation subsides.

SKIN CONTACT:

Wash affected skin area with mild soap and water.

INGESTION:

Do not induce vomiting. Contact a physician.

INHALATION:

Remove to fresh air. If not breathing, give artificial respiration. Contact a physician.

\*\*\*\*\* SECTION VII \*\*\*\*\*

REACTIVITY DATA

STABILITY: (Thermal, Light, Etc.)  
Stable

CONDITIONS TO AVOID:  
Contact with nuclear radiation and strong oxidizing materials.

INCOMPATIBILITY: (Materials to avoid)  
Strong oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS:  
Dense smoke and oxides of C, N, Ca and S: hydrogen sulfide.

HAZARDOUS POLYMERIZATION:  
Will not occur.

\*\*\*\*\* SECTION VIII \*\*\*\*\*

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:  
Remove all sources of ignition. Treat as a petroleum oil spill.

WASTE DISPOSAL METHOD:  
Incinerate where permitted under federal, state, and local laws. Used petroleum products may be recycled through re-refining processes.

\*\*\*\*\* SECTION IX \*\*\*\*\*

SPECIAL PROTECTION INFORMATION

EYE PROTECTION:

Sufficient to avoid direct contact

SKIN PROTECTION:

Protective neoprene or plastic gloves may be desired.

RESPIRATORY PROTECTION:

Usually not needed.

VENTILITATION:

Usually not needed in open, unconfined areas.

OTHER:

Not needed.

\*\*\*\*\* SECTION X \*\*\*\*\*

SPECIAL PRECAUTIONS

Close containers when not in use. Keep away from heat, open flames, and strong oxidants. Avoid eye contact and prolonged skin contact. Avoid breathing oil mists. Wash thoroughly after handling.

\*\*\*\*\* SECTION XI \*\*\*\*\*

HAZARD RATINGS

There are several recognized and accepted systems that assign hazard ratings to materials. Although this product has not been evaluated specifically against these systems, the ratings for the National Fire Protection Association (NFPA) and the National Paint and Coatings Association's Hazardous Material Identification System (HMIS) are:

	<u>NFPA</u>	<u>HMIS</u>
Health	2	1
Flammability	2	2
Reactivity	1	1

Jul 21, 2003



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**Additional Products**

### 2001 MONOLEC® Wire Rope Lubricant

-- Select a Product --

*For stationary or moving wire ropes or cables under heavy loads, chain drives on paving rollers and hot plants, chains on sand and gravel jaw crushers, wire rope on cranes*

- A penetrating lubricant that provides superior load carrying capacity and corrosion resistance
- Contains petroleum solvent to enhance penetration to the core. When solvent evaporates a thin film of heavy-bodied oil remains to protect and lubricate each strand.



#### Benefits:

- High load carrying capacity
- Increased wire rope life
- Excellent corrosion resistance
- Superior lubrication
- Preserves metal
- Penetrates better
- Self-cleaning
- Excellent rust preventative

### 2002 ALMASOL® WIRE ROPE LUBRICANT

*For wire ropes, cables, steel parts, and marine environments.*

- A coating lubricant that provides a self-healing film to reduce wear and fretting corrosion
- Resistant to fresh and salt water wash-off and excellent rust preventative for steel parts.

#### Benefits:

- Non-tacky coating resists abrasive contaminants
- Protects sheaves, drums, pins, and rollers

from excessive wear

- Self-healing coating
- High load carrying capacity
- Superior lubrication performance
- Resists corrosion

Customer Challenge:
A gas meter manufacturer sends parts through a parts washer that degreases, steam cleans, phosphates and rustproofs them. The conveyor that carries the parts uses a "zig zag" power chain which is exposed to an overspray of steam and chemicals eight hours a day, five days a week. The previous lubricant failed to prevent rust on the chain, and was slinging off and dropping to the floor, creating a safety hazard.
LE's Solution:
<a href="#">LE's 2001</a>  Lubricant consumption has been reduced from 15 drops per minute to two to three drops per minute. The maintenance superintendent says, " <i>the chains are running the best they ever have in 18 years experience with them.</i> " There is no rust showing after 10 months' service, while the previous lubricant showed rust in the first two to three hours after application.

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**Lubrication Engineers, Inc.**  
3851 Airport Freeway P. O. Box 7128  
Fort Worth, Texas 76111  
Phone (817) 834-6321  
Toll Free (800) 537-7683

Web site designed by [NVision Design, Inc.](#)



Pennsylvania Department of Environmental Protection

400 Waterfront Drive  
Pittsburgh, PA 15222-4745  
March 3, 2004

Southwest Regional Office

412-442-4000  
Fax 412-442-4328

James J. Edinger   
Chief, Operations and Readiness Division  
US Army Corps of Engineers  
Pittsburgh District  
William S. Moorehead Building  
1000 Liberty Avenue  
Pittsburgh, PA 15222-4745

Re: Guidelines for Environmental Pollution Controls  
Lift Gate Chain Cleaning and Lubrication  
City of Pittsburgh  
Allegheny County

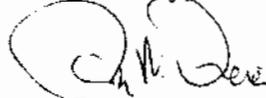
Dear Mr. Edinger:

The Department of Environmental Protection (Department) has reviewed your "GUIDELINES FOR ENVIRONMENTAL POLLUTION CONTROLS LIFT GATE CHAIN CLEANING AND LUBRICATION" to be utilized at all your gated dams. Representatives of the Department also observed a demonstration of the procedures. It appears the procedures will be adequate to protect the water quality of our local rivers.

If any adverse environmental impacts develop during the cleaning and lubrication process the U.S. Army Corps of Engineers should revise the guidelines to address those impacts. The Corps remains responsible for any related water quality problems.

The Department appreciates the Corps sharing the guidelines with the Department to help assure adverse environmental impacts are minimized. The Department regrets the delay in responding to your request.

Sincerely,



Tim V. Dreier  
Regional Manager  
Water Management