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**RESOLUTION TO THE SOUTH GROUNDWATER  
CONTAMINATION PLUME EE/CA COMMENTS**

**10/18/90**

**DOE-117-91  
DOE-FMPC/USEPA  
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LETTER  
OU5**

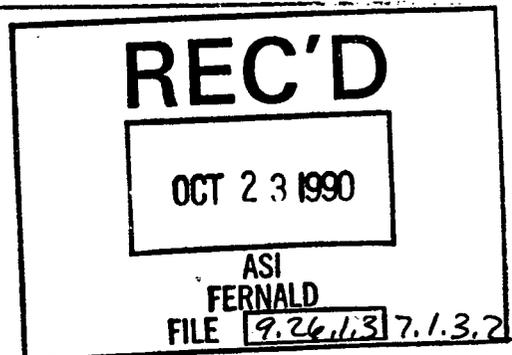
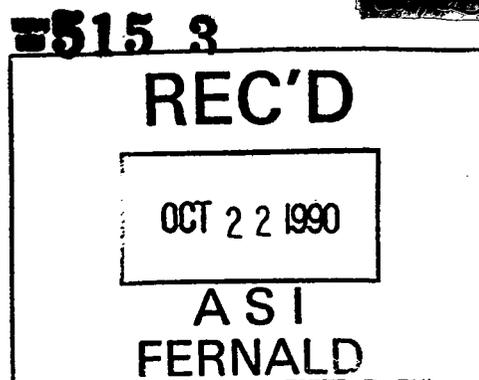


**Department of Energy**

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OCT 18 1990  
DOE-117-91

Mr. William E. Muno  
Associate Director, Waste Management Division  
U. S. Environmental Protection Agency  
Region V  
230 South Dearborn Street  
Chicago, IL 60604



**RESOLUTION TO THE SOUTH GROUNDWATER CONTAMINATION PLUME EE/CA  
COMMENTS**

- Reference:
- 1) DOE-2015-90, Andrew P. Avel to Catherine A. McCord, "Proposed Resolution to the South Groundwater Contamination Plume EE/CA," dated September 28, 1990
  - 2) Letter, Catherine A. McCord to Mr Bobby J. Davis, "Removal #3 Dispute Resolution South Plume EE/CA U. S. DOE - Fernald OH6 890 008 976," dated October 4, 1990

Dear Mr. Muno:

On September 25, 1990, the U.S. DOE presented a wastewater overview describing the short and long range wastewater treatment plans for the FMPC. One of the main purposes of the wastewater overview was to present to U. S. EPA what DOE feels is a logical, systematic, and fiscally responsible approach to reducing the release of uranium from the FMPC while at the same time integrating the South Plume Removal Action, the Waste Pit Area Run-off Control Removal Action, and the Contaminated Water Under FMPC Buildings (Perched Water) Removal Action into the FMPC wastewater system. The presentation concluded with a proposal for resolving the dispute over the Engineering Evaluation/Cost Analysis (EE/CA) concerning Removal #3 - South Groundwater Contamination Plume. DOE issued a letter (Reference 1) on September 28, 1990, which summarized this proposal.

On October 4, 1990, U.S. EPA comments were received (Reference 2) concerning the September 25, 1990, presentation and the follow-up correspondence. Enclosure 1 presents the DOE response to the

U.S. EPA October 4th comments. Enclosure 2 presents the gravel pack study and integrity testing on the 16" effluent pipeline entitled "FMPC Outfall Pipeline Investigation - Final Report."

If you should have any questions, please contact me at FTS 774-6319 or Andy Avel at FTS 774-6161.

Sincerely,



Gerald W. Westerbeck  
FMPC Site Manager

DP-84:Avel

Enclosures: as stated

cc w/encls:

C. A. McCord, USEPA-V

cc w/encl. 1:

- R. P. Whitfield, EM-40, FORS
- G. E. Mitchell, OEPA-Dayton
- P. Q. Andrews, USEPA-V
- D. A. Kee, USEPA-V
- K. J. Pierard, USEPA-V
- D. A. Ullrich, USEPA-V
- E. Schuessler, PRC
- R. E. Owens, ODH-Columbus

ENCLOSURE 1

RESPONSE TO U.S. EPA COMMENTS

DISPUTE RESOLUTION FOR THE SOUTH PLUME EE/CA

1. Comment:

Provid[e an "interim"] treatment system(s) that would treat up to 300 gallons per minute (GPM) instead of the 150 GPM [proposed].

Response:

The 150 GPM "interim" treatment system proposed is considered to be a reasonable solution to addressing the additional uranium-bearing wastewaters resulting from implementation of the various removal actions until the Advanced Wastewater Treatment facility (AWWT) becomes operational.

The additional mass of uranium to the Great Miami River from the Removal Actions (denoted in parenthesis) is projected at approximately 320 lbs U/yr as follows:

Contaminated Water Under FMPC Buildings	(# 1) = 15 lbs U/yr
Waste Pit Area Run-off Control	(# 2) = 135 lbs U/yr
South Groundwater Contamination Plume	(# 3) = 170 lbs U/yr
<u>TOTAL</u>	<u>= 320 lbs U/yr</u>

Note that the estimate of uranium from the South Groundwater Contamination Plume is for the third year of the South Plume Removal Action operation which coincides with when the AWWT comes on-line. The third year projection represents the greatest uranium quantity that will be experienced during the "interim" period. The mass of uranium is estimated to increase annually at a rate of approximately 40 lbs U/yr during operation of the South Plume Removal Action as described in the EE/CA (see Figure 1). So that no additional uranium is discharged through the FMPC effluent line as a result of implementing the removal actions, the "interim" treatment system needs to be capable of removing a minimum of 320 lbs U/yr from the existing FMPC wastewater.

In determining the capacity of the "interim" treatment system, 1989 discharge data was used. The 1989 uranium discharge to the Great Miami River was 1862 lbs U/yr in a flow averaging 472 GPM. This equates to approximately 3.9 lbs U/yr/GPM (1862 lbs U/yr divided by 472 GPM equals 3.9 lbs U/yr/GPM). To remove a minimum of 320 lbs U/yr from the existing FMPC wastewater treatment system discharge, the "interim" treatment system

must have an 82 GPM capacity (320 lbs U/yr divided by 3.9 lbs U/yr/GPM equals 82 GPM). To provide for a factor of safety, an "interim" treatment system with a capacity of 150 GPM and the capability of reducing uranium concentrations in treated water to 20 parts per billion (ppb) was proposed. This 150 GPM treatment capacity will ensure no additional uranium mass will be discharged. Indeed, the 150 GPM system proposed will remove over 500 lbs U/yr resulting in a net decrease to the present FMPC uranium discharge level (see Figure 1).

2. Comment:

Installation of the "interim" treatment system for treatment of more highly contaminated water that is discharged to the Great Miami River [will] result in a significant overall reduction of contaminant loading to the river, even though an increased volume of water is being discharged.

Response:

The 150 GPM "interim" treatment system will provide, at minimum, the capability of contaminant removals in the FMPC wastewaters so that there is no increased uranium loading or risk experienced to the Great Miami River with the addition of the discharges from the planned removal actions.

3. Comment:

The "interim" treatment system proposed must be on-line by December 1991.

Response:

The DOE recognizes that implementation of the "interim" treatment system should, if at all possible, coincide with implementation of the first scheduled major removal action; the Waste Pit Area Run-off Control Removal Action. The design, installation, and operation of the "interim" treatment system will be made a high priority project and work on this effort will begin as soon as the Dispute Resolution is resolved. A detailed project schedule is being prepared. The best possible schedule will be presented in the Work Plan.

4A. Comment:

Stormwater collected from the proposed waste pit area stormwater collection system [should] be treated in the "interim" treatment system.

Response:

Stormwater Runoff collected by the Waste Pit Area Run-off Control Removal Action will be pumped to the Bionitrification Surge Lagoon (BSL) for the reasons described in the EE/CA for that project. From the BSL it will be processed through the Bionitrification System and the subsequent Effluent Treatment System (ETS). Discharges from the ETS are pumped to Manhole 175 for discharge to the Great Miami River. The flow from the BSL

will range from a low of 0 GPM to a high of 200 GPM as explained in the presentation of September 25, 1990, and as shown in Figure 2.

Obtaining the 150 GPM flow would require locating the "interim" treatment system downstream of the tie-in of the ETS discharge to the effluent force main. This is also physically located downstream of all flows except for the Sewage Treatment Plant discharge which occurs at Manhole 175 (see Figure 3). Therefore, the composition of wastewaters to the treatment system would vary depending on which batch discharges were being pumped. This could make the design of the treatment system more complex and delay the system from being on-line as soon as possible.

At the present time, it appears more desirable to treat the flow from the combined Stormwater Retention Basin (SWRB) and Stormsewer Lift Station or the flow from one of these two streams. The treatment of either one of these two streams will also achieve the desired results. Therefore, until further testing of the wastestreams is completed (presently ongoing), DOE does not see the need to commit to treating of the waste pit area stormwater collection system flow.

4B. Comment:

U.S. DOE must submit the plans for the Advanced Wastewater Treatment (AWWT) system to U.S. EPA for review. This system will be treating water generated from several of the operable units and removal actions and U.S. EPA wants assurances that the system will be designed to accommodate these needs. This review of the AWWT plans now will allow the system to go on-line earlier than waiting for the completion of Operable Unit (OU) #5 work.

Response:

U.S. DOE will submit the plans for the 1100 GPM Phase I/II of the AWWT when they become available.

5. Comment:

All contaminated water generated from removal and remedial response action must be treated by the AWWT when it comes on-line in 1993.

Response:

As previously stated, the 150 GPM "interim" treatment system will remain in service until the AWWT becomes operational. The AWWT will consist of one subsystem (designated as Phase I) capable of treating 700 GPM of contaminated stormwater runoff and a second subsystem (designated as Phase II) capable of treating 400 GPM of "process" wastewater. The water discharged from the Waste Pit Area Run-off Control and the Contaminated Water Under FMPC Buildings Removal Actions are included in the "process" wastewater subsystem design. The AWWT will be capable of reducing the uranium level in the FMPC wastewater discharge from 1862 lbs U/yr to approximately 50 lbs U/yr (approximately 20 ppb discharge concentration).

The overall discharge of uranium during the first year of AWWT operation would be approximately 260 lbs U/yr (170 lbs from the South Plume plus 40 lbs anticipated annual increase in mass during South Plume Removal Action plus 50 lbs unremoved during AWWT treatment), see the attached Figure 1. This initial uranium level would increase by approximately 40 lbs U/yr thereafter until treatment of the South Plume is justified and implemented by the Record of Decision (ROD) for Operable Unit #5. The AWWT Phase I will have the flexibility to treat 700 GPM of the South Plume discharges in the absence of treating contaminated stormwater runoff during periods of dry weather (estimated at approximately 50% of the time). Otherwise, the extracted water will be discharged with the treated FMPC wastewaters through the effluent line to the Great Miami River.

As explained in the September 25 presentation, it is anticipated that sufficient capacity will be available in the initial Phase I/II AWWT to treat wastewaters generated from OUs #1, #2, #3, and #4. However, it will be necessary to expand the Phase I/II AWWT to handle treatment of groundwater as identified in the ROD for OU #5 and provide dedicated treatment to the South Groundwater Contamination Plume water. The layout of the Phase I/II AWWT will be designed to accommodate this future expansion.

6. Comment:

U.S. DOE assures that there is adequate long-term capacity in the effluent line.

Response:

The DOE does not understand why it is necessary to provide for long-term capacity in the effluent line at this time. The existing 16" effluent discharge line has the capacity to handle 3500 GPM from Manhole (MH) 175 to MH 176, 2500 GPM from MH 176 to MH 177, and 4400 GPM from MH 177 to the outfall at the Great Miami River. Expected flow to the effluent line with the implementation of the said removal actions (short-term capacity) is 3100 GPM (1100 GPM from the AWWT which includes the Waste Pit Area Run-off Control and the Contaminated Water Under FMPC Buildings Removal Action flows and 2000 GPM from the extraction wells intercepting the South Plume).

To provide for the 3100 GPM flow, several options are being investigated. Pipe sections from MH 176 to MH 177 or from MH 175 to MH 177 can be replaced at steeper slopes or the 2000 GPM flow resulting from the extraction well interception system can discharge directly into MH 177 instead of at MH 175 (this would require independent monitoring of the South Plume discharge flow as this point is downstream of the existing NPDES monitoring station). Either of these options can be provided at a nominal cost.

To provide for long-term capacity (i.e. for projected future and as yet unquantified additional OU #5 flows), a separate parallel effluent line

would need to be constructed next to the existing 16" line. Since the size of this line cannot be determined until the quantity of the future flow is determined (as part of OU #5), it is not reasonable to commit to the installation of a new line as part of the removal action.

7. Comment:

The effluent line must be repaired and its integrity periodically tested.

Response:

The FMPC conducted a study of the gravel backfill surrounding the existing 16" effluent pipeline along with pipeline integrity testing in July 1990 (Enclosure 2). Contaminant concentrations in the surrounding bedding material along this pipe section were found to be far lower than the proposed cleanup criteria of 35 pCi/g total uranium. The results from the pipe integrity testing indicate that the effluent pipe has the potential for unacceptable leakage (i.e. exceeding industry accepted standards) in the pipe section between MH 179 to MH 180. Two methods of repair for this section, involving either the "sliplining" method or the epoxy resin lining method, are currently being investigated. The DOE will repair the section of pipe between MH 179 and MH 180 using one of these two methods. The proposed plan will be submitted to U.S. EPA and Ohio EPA before proceeding.

An integrity testing program will be implemented to monitor the effluent discharge pipeline. This program will include visual inspection of the manhole covers and pipeline cover soil to be performed once a year and pneumatic testing to be performed every five years. A work plan for the integrity testing program will be prepared in conjunction with the plan for repair of the section between MH 179 to MH 180.

# EFFLUENT STREAMS

## FEED MATERIALS PRODUCTION CENTER WESTINGHOUSE MATERIALS CO. OF OHIO

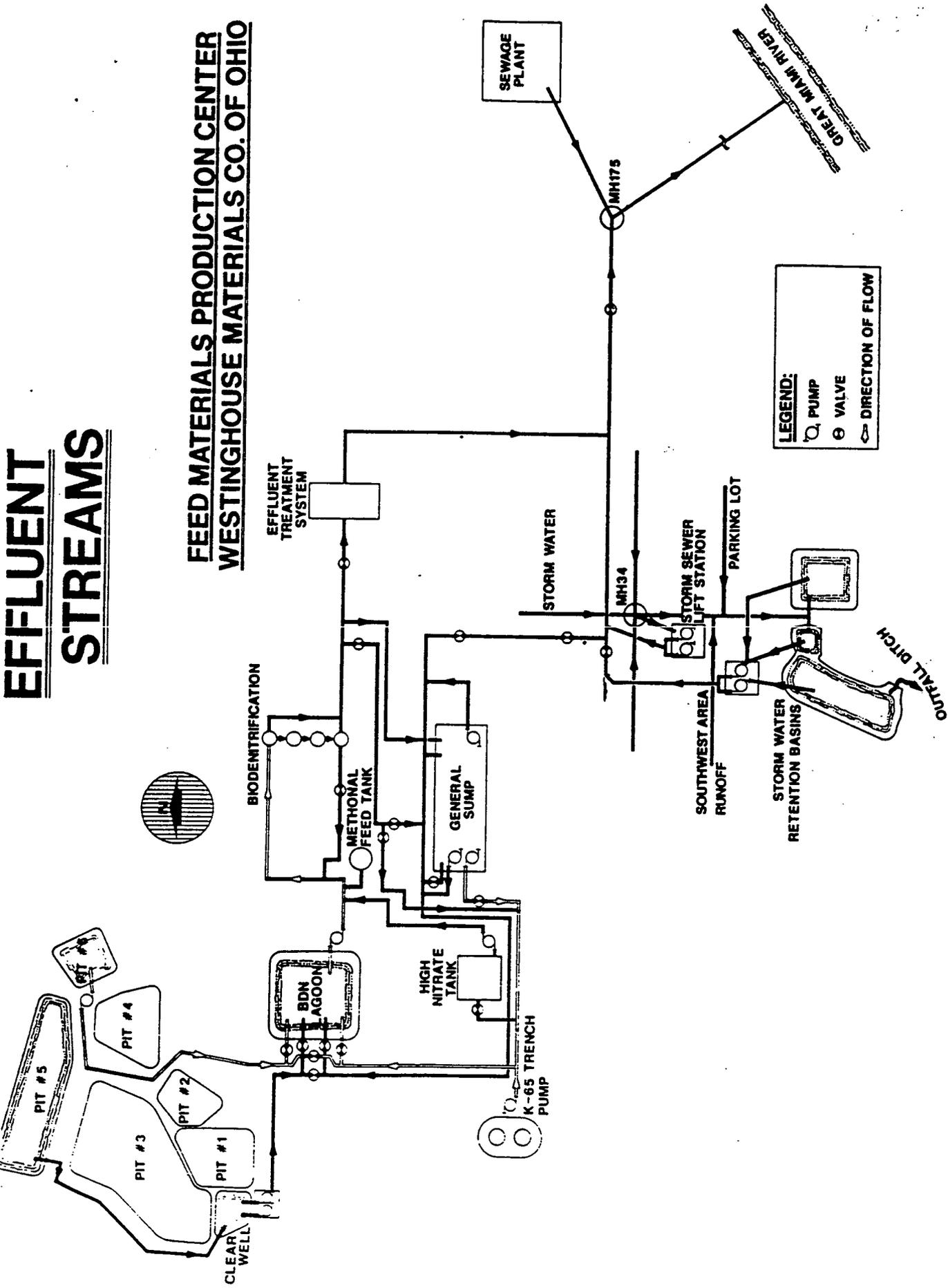
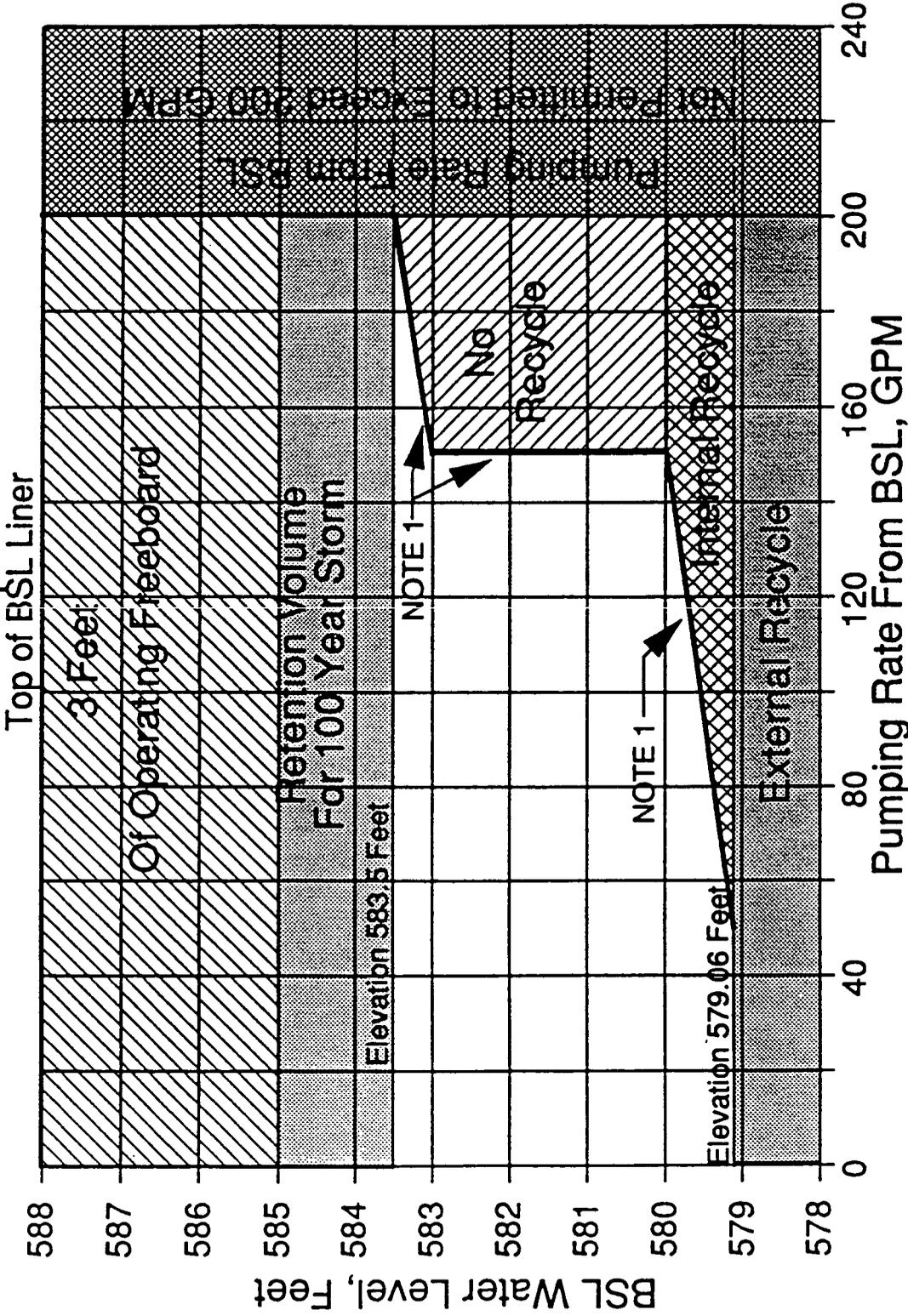


FIGURE 3

# Biodenitrification Surge Lagoon (BSL) Method of Operation



NOTE 1 - Flow rate to BDN from BSL will increase at maximum of 10 gpm/day

FIGURE 2

# Effect of Removal Actions and AWWT On Uranium Discharges to the Great Miami River

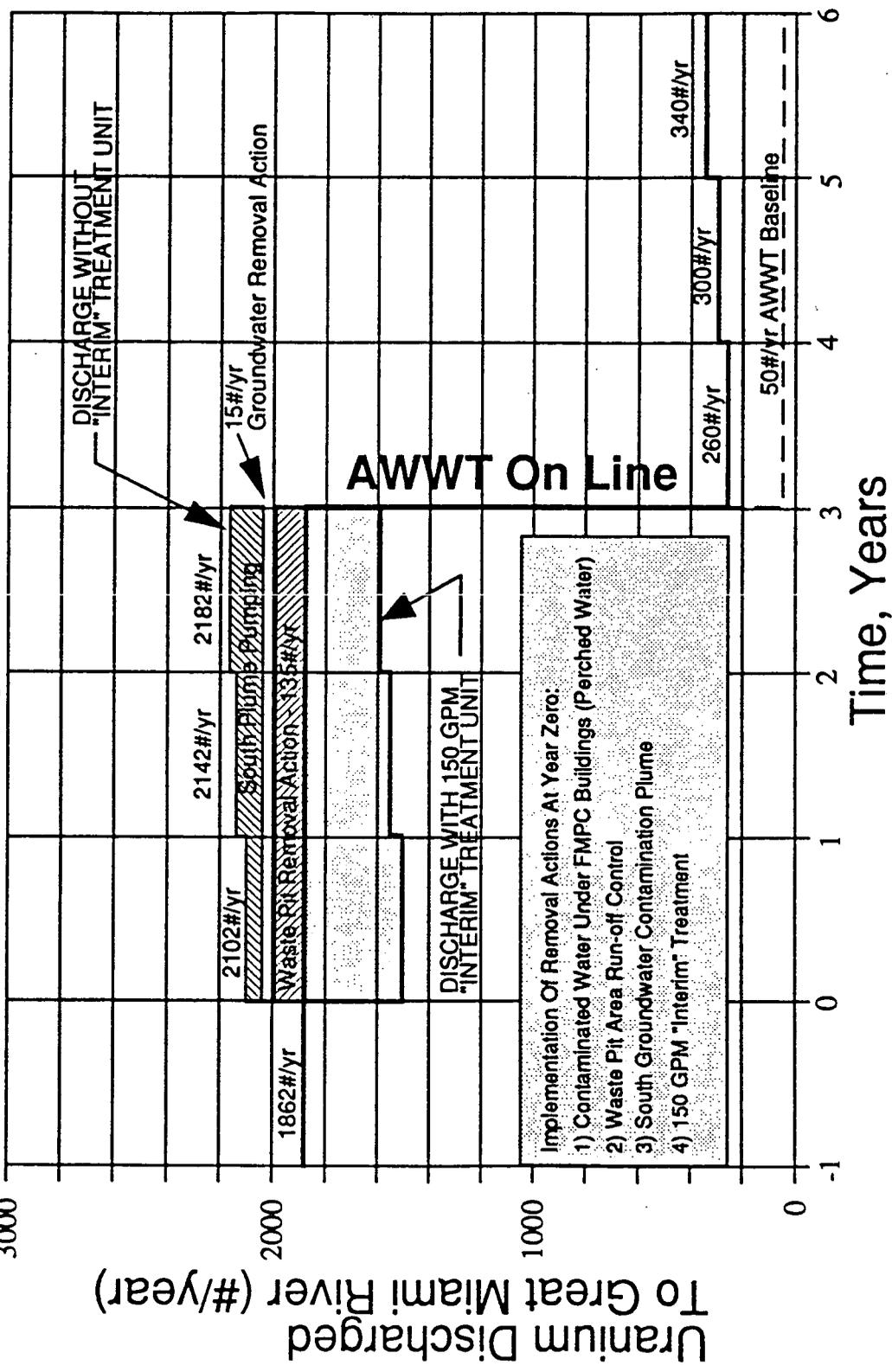


FIGURE 1