

**RESPONSE TO OHIO EPA'S COMMENTS SOUTH
PLUME REMOVAL ACTION EE/CA**

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**DOE-FMPC, OEPA
18
REPORT
OU5**

RESPONSE TO OHIO EPA'S COMMENTS

SOUTH PLUME REMOVAL ACTION

EE/CA

General Comments

1. Comment:

Page ES-5, third paragraph: USEPA's Risk Assessment Guidance for Superfund requires the use of 70 years for exposure duration. The use by DOE of a 50-year exposure duration is not consistent with this guidance.

Response:

There appears to be some confusion as to the difference between a 50-year committed effective dose and a 70-year exposure period. A 50-year committed dose, as defined on page 10-2 of EPA's Risk Assessment Guidance for Superfund, 1989, is the "total dose equivalent (averaged over tissue T) deposited over the 50-year period following the intake of a nuclide."

The intake for each year has a 50-year committed dose associated with it. In accordance with EPA guidance, DOE applies this 50-year committed dose for each year in a 70-year exposure period.

Action:

No change to the EE/CA is necessary.

2. Comment:

Page ES-11, Table ES-1, Maximum Exposure (for the four surface water pathways): The values presented for the maximum exposure are somewhat misleading in that those for Alternatives 1 through 3 are rounded up from 0.67 mrem to 0.7 mrem while the value for Alternative 4 is rounded down to 0.7 mrem from values of 0.71, 0.75, 0.75, 0.79, 0.79 mrem over the five years of the action (Table C3-2). The average of these values is in excess of 0.75 and if a single rounded value is to be chosen to represent the exposure presented by Alternative 4 over the five years, this value should be 0.8 mrem.

Response:

Rounding discrepancies are noted, however, Alternative 4 (Pump & Discharge) has been modified to Pump & Treat. Therefore, this comment does not apply since calculations have changed for applications of new Alternative 4.

Action:

No change to the EE/CA is necessary.

3. Comment:

Page ES-11, Table ES-1, Maximum Exposure (Drinking water pathway only): Rounding discrepancies, similar to those noted in Comment #2, are presented in this part of Table ES-1. Actual values of 0.34 mrem are rounded to 0.3 mrem for Alternatives 1 through 3 while a value of 0.38 mrem is rounded to 0.3 mrem for Alternative 4. These rounded values are misleading to the reader who doesn't scrutinize Appendix C. The preferred solution to the rounding problems would be to either list the actual values, two places past the decimal in Table ES-1 or round figures according to convention. These types of discrepancies bring the reader to question the integrity of other values presented in the document.

Response:

Reference response to comment 2.

Action:

No change to the EE/CA is necessary.

4. Comment:

Page ES-13, Table ES-1, Aquatic Ecology: Although from an acute toxicity standpoint, Alternative 4 may have a marginal positive impact on the Great Miami River, in actuality the above background river water concentration of uranium will increase an additional 10%. This increase in uranium concentration in the river water will only increase any possible chronic effects on the aquatic community. The possibility for increased chronic effects from this alternative should be acknowledged in the text.

Response:

As stated in the EE/CA, the DOE is designing an Advanced Wastewater Treatment (AWWT) facility for the FMPC. The AWWT will treat existing FMPC wastewater discharges to remove radionuclides. The AWWT is projected to begin operation in December 1993. DOE has proposed to install a 150 gpm "Interim" Advanced Waste Water Treatment (IAWWT) unit as part of the South Groundwater Containment Plume Removal Action. This unit would remove uranium from a

portion of the FMPC wastewater currently being discharged to the Great Miami River (GMR). The IAWWT unit would operate until the AWWT becomes operational. The mass of uranium that will be removed from the FMPC waste water will exceed the amount that the various removal actions will be contributing to the GMR. Attached is a Figure 1 demonstrating this concept and how the implementation of the various removal actions & AWWT will occur. This figure quantifies the amounts of uranium that each removal action will contribute to the GMR and how the 150 gpm unit will remove a greater amount of uranium from the process waste water that is discharged to the GMR. This figure clearly demonstrates that the addition of the 150 gpm unit would prevent any increased risk to human health and/or the environment.

Action

Alternative 4 of the EE/CA is being revised to include the 150 gpm "Interim" Advanced Waste Water Treatment unit. All sections of the EE/CA which evaluate Alternative #4 will be changed accordingly.

5. Comment:

Page ES-16, Reduction in Mobility, Toxicity, or Volume; Alternative 4: The result of this alternative will be to actually increase mobility of the contaminants by placing them into a more mobile environment (surface water) without truly capturing and treating the contaminants. Toxicity of the contaminants in the Great Miami River is actually increased since the above background river water concentration of uranium will be up to 10% higher with Alternative 4 (1.8-2.0 pCi/l) than will result from any of the other three alternatives (1.7 Pci/l). Volume will also be increased as less contaminated groundwater is drawn into the wells along the plume and then discharged into the Great Miami River. As the contaminants are continually diluted, the total volume of water in which the contaminant resides increases.

Response:

Reference response to comment 4.

Action:

No change to the EE/CA is necessary.

6. Comment:

Page 2-22, Section 2.2.6: The correct name for the A & W facility is Albright & Wilson Americas, Inc., not Albright & Wilson Chemical Company as stated in the text.

Response:

Discrepancy has been noted.

Actions:

Change will be incorporated into revised EE/CA to Albright & Wilson Americas, Inc.

7. Comment:

Page 2-26, third paragraph: The sentence starting "Uranium concentrations have been detected..." needs to be reworded. The sentence is confusing at present. Also, in the next sentence, the word "fare" should be changed to "far."

Response:

Discrepancies have been noted.

Actions:

Sentence will be reworded and incorporated into revised EE/CA.

8. Comment:

Page 2-29, Table 2-3, Well 2104: A "b" was used to explain the lack of sample results for Round 5. This is incorrect in that "b" denotes "well installation not completed". Since the well was sampled during Rounds 1 through 4, this appears to be an inappropriate symbol and changes should be made accordingly.

Response:

Discrepancy has been noted.

Actions:

Symbol "b" will be changed to "c".

9. Comment:

Page 2-32, Table 2-5, Well 4015: A "b" was used under the Round 5 column. Again, this is incorrect in that "b" denotes "well installation not completed." Since the well was sampled during Rounds 1 through 4, the well obviously had to have been completed for the fifth sampling round. This error should be corrected.

Response:

Discrepancy has been noted.

Actions:

Symbol "b" will be changed to "c".

10. Comment:

Page 2-41: The entire second paragraph is redundant with most of the first paragraph beginning with "It is not expected..." and ending with "...from other directions." Appropriate corrections to these paragraphs should be made.

Response:

Discrepancies has been noted.

Actions:

Redundant paragraph will be removed from revised EE/CA.

11. Comment:

Page 2-42, second paragraph: As previously stated, USEPA's Risk Assessment Guidance for Superfund requires the use of 70 years for exposure duration. The use by DOE of a 50-year exposure duration is not consistent with this guidance. In addition, although the CEDE of 4 mrem is used to establish MCLs for other radionuclides, MCLs are not merely health or risk-based since other factors such as economic impacts of water treatment are also considered when establishing MCLs.

Response:

There appears to be some confusion as to the difference between a 50-year committed effective dose and a 70-year exposure period. A 50-year committed dose, as defined on page 10-2 of EPA's Risk Assessment Guidance for Superfund, 1989, is the "total dose equivalent (averaged over tissue T) deposited over the 50-year period following the intake of a nuclide."

The intake for each year has a 50-year committed dose associated with it. In accordance with EPA guidance, DOE applies this 50-year committed dose for each year in a 70-year exposure period.

Action:

No action is necessary.

12. Comment:

Page 2-48, first paragraph: In this paragraph, it is stated that a 50 year CEDE limit of 4 mrem from an annual intake of radioactive materials in drinking water corresponds to an excess cancer risk of 0.5 to 2 cancers per year per one million people who drink this water at a rate of 730 liters per year. It is unclear how the risk compared to what determined. There also appears to be some inconsistency in the way DOE calculated its carcinogenic risk compared to what is contained in USEPA's Health Effects Assessment Summary Tables (First/Second Quarters FY-1990, OSWER document OS-230, January/April 1990). In the HEAST, to estimate risk-specific concentrations in drinking water, for example, a specified level of risk is divided by the unit risk for drinking water. Hence, the water concentration (in Pci/l) that correspond to a best estimate of the increased lifetime cancer risk of 1×10^{-6} is calculated as follows:

$$\text{Pci/l in water} = \frac{1 \times 10^{-6}}{\text{unit risk in (Pci/l)}^{-1}}$$

For Uranium 235 and 238, the pathway-specific unit risk given in Appendix C for exposure for a 70 year lifetime is $6.6 \times 10^{-6} \text{ (Pci/l)}^{-1}$. Using this value for the unit risk in the above equation, the concentration of uranium in ground water corresponding to a 10^{-6} excess lifetime cancer risk is 0.15 pCi/l (0.23 ug/l). For uranium 234, the concentration is slightly lower (about 0.21 ug/l). This means that the 30 ug/l concentration used by DOE as an action level in south plume EE/CA corresponds approximately to a lifetime cancer risk of 2×10^{-4} , which is outside the 10^{-6} to 10^{-4} acceptable risk range specified in the NCP and represents a risk that is at least 2 orders of magnitude higher than that given by DOE on Page 2-48.

Response:

From an evaluation of the HEAST reports, it appears as though U.S. EPA is using a risk factor of 5×10^{-7} mrem⁻¹ for uranium isotopes. Based on an ingestion rate of 2 liters per day for 365 days per year for 70 years, and a dose conversion factor (DCF) from Federal Guidance Report No. 11 for ingestion of uranium having natural isotopic ratios (DCF = 2.69×10^{-4} mrem/pCi), the lifetime risk due to drinking water with a uranium concentration of 20 pCi/l is approximately 1×10^{-4} . The proposed allowable concentration of uranium in groundwater (20 pCi/l) is based on an annual dose limit of 4 mrem and is not derived from an acceptable risk of 1E-06.

Action:

No action is necessary.

13. Comment:

Page 4-1, Section 4.1, last paragraph: DOE states that the design, construction, and implementation of a treatment facility for treatment of groundwater from the south plume would take approximately three years and would, therefore, not allow for a timely response under the removal action process. This seems contradictory with the Responsiveness Summary (page 100, response to Comment #20) which states that "the estimates time difference between Alternatives 4 and 5 is four months. Alternative 4 (Pump and Discharge) will be operational within 16 months and it is estimated that treatment can begin under Alternative 5 in 20 months." Based upon the Responsiveness Summary, the time difference between these two alternatives is not enough to eliminate Alternative 5 from further consideration.

Response:

Reference response to Comment 4.

Actions:

No change to the EE/CA is necessary.

14. Comment:

Figure 4-1: This figure needs to be clarified. Based upon this figure, it appears that DOE plans to install an alternate water supply well on Delta Steel property. This appears to be in error and should be clarified. If Albright & Wilson's wells are

shut down once the facility is connected to the alternate water supply, what will stop the south plume from being drawn into the Rutgers-Nease production well?

Response:

14A) This is not an error. A well will be installed on the Delta Steel property as explained in Section 4.2.3.

14B) Data acquired from Ruatgers-Nease shows that the Ruatgers-Nease production well pumps at low rate of approximately 2.5 gallons per minute. This well is drawing water from near the bottom of the aquifer, which is beneath the contamination. Additionally, this low pumping rate does not provide the capacity to draw the contamination downward in the aquifer.

Actions:

No change to the EE/CA is necessary.

15. Comment:

Page 4-10, Figure 4-3: The location of the proposed interceptor wells were left out of this figure.

Response:

Discrepancy has been noted.

Actions:

The proposed interceptor wells will be inserted into Figure 4-2 and incorporated into revised EE/CA.

16. Comment:

Page 4-12: It is stated on this page that six 2000-series and six 3000-series wells are proposed for monitoring the effectiveness of Alternative 4. Figure 4-3, however, shows only four monitoring well locations. This discrepancy should be corrected.

Response:

Discrepancy has been noted.

Actions:

Figure 4-2 was revised to reflect concern.

17. Comment:

Page 5-3, first paragraph: The reference dose for uranium should be expressed in units of ug/kg/day, not ug/l/kg/day.

Response:

The typographical error is noted.

Action:

"ug/l/kg/day" will be changed to "ug/kg/day" and incorporated into revised EE/CA.

18. Comment:

Page 5-8, third paragraph: The HI value of 6.0 for the maximally exposed off-site adult and 3.1 for the average exposed off-site adult indicate that the daily intakes of uranium are six and three times the acceptable intakes for the maximally exposed and average exposed off-site adult, respectively. Contrary to what is stated in the text, this is well above the acceptable intake level for uranium.

Response:

The typographical error is noted.

Action:

The following change will be made in the revised EE/CA:

"The HI calculated for the no-action alternative is 6.0 for the hypothetical maximally exposed off-site adult and 3.1 for the average exposed off-site adult. These values indicate that the daily intakes of uranium for the exposure pathways considered exceed the acceptable intake level of 3.0 ug/kg/day for uranium."

19. Comment:

Page 5-15, last paragraph: This paragraph discusses the cost and maintenance of "the interceptor wells." The alternative being analyzed does not involve interceptor wells but rather production wells for the alternate water supply. The sentence should be reworded to reflect this.

Response:

Discrepancy has been noted.

Actions:

Paragraph will be modified to address the alternate water supply wells and distribution system and changes will be incorporated into revised EE/CA.

20. Comment:

Page 5-16, Section 5.5.1, third paragraph: In addition to decreasing the effluent uranium concentration, Alternative 3 will also result in raising the above background uranium concentration in the Great Miami River by up to 10% above the level based on current discharges. The discharge of larger volumes of water with lower concentrations, which are still above background levels for the river, produces increased river concentrations of uranium. The fact that river concentrations will increase as a result of Alternative 4 should be incorporated into this discussion.

Response:

Reference response to Comment 4.

Actions:

No change to the EE/CA is necessary.

21. Comment:

Page 5-17, Section 5.5.2, first paragraph: Alternative 4 fails to meet the objective of reducing mobility and volume. In actuality, the alternative works against these objectives by increasing the volume in which the contaminant of concern resides and by increasing the mobility of the contaminant by removing it from a relatively immobile medium and discharging it into a medium with relatively high mobility.

Response:

Reference response to Comment 4.

Actions:

No change to the EE/CA is necessary.

22. Comment:

Page 5-17, last paragraph: Although acute toxicity may decrease as stated in the paragraph, chronic affects may increase as a result of increased uranium concentrations in the river (see Comment #20).

Response:

Reference response to Comment 4.

Actions:

No change to the EE/CA is necessary.

23. Comment:

Page 5-18, first paragraph: The EE/CA should discuss what would happen if one or more of the interceptor well pumps fail. Will the remaining wells be able to control plume migration or will they allow portions of the plume to get by and continue to migrate downgradient?

Response:

The design of the South Groundwater Contamination Plume Recovery Well System will include provisions for alarming when a pump fails. This will be accomplished by having a flow switch or similar device at each pump. A spare pump will be purchased and kept in standby mode. Since the FMPC has its own maintenance personnel, it is reasonable to assure that a failed pump can be replaced within 72 hours. A single pump stoppage of 72 hours is not expected to allow portions of the plume to get by and continue to migrate downgradient.

Actions:

No change to the EE/CA is necessary.

24. Comment:

Page 5-21, first two paragraphs: A discussion of treatment processes should not be included here since treatment is not incorporated into any of the alternatives presented in this revised EE/CA.

Response:

Alternative 4 (Pump & Discharge) has been modified to Pump & Treat. Therefore, this discussion of treatment processes is now valid.

Actions:

No change to the EE/CA is necessary.

25. Comment:

Page 6-2, Section 6.3, third paragraph: As previously stated, only Alternative 4 has the negative environmental impact of increasing the uranium contamination of the Great Miami River. This should be included in the evaluation discussed in this paragraph.

Response:

Reference response to Comment 4.

Actions:

No change to the EE/CA is necessary.

26. Comment:

Page 6-3, first full paragraph: It is Ohio EPA's position that treatment of the South Plume, if not conducted as part of this removal action, will be necessary for the final site remedy to fully comply with the treatment provisions of the NCP.

Response:

Reference response to Comment 4.

Actions:

No change to the EE/CA is necessary.

27. Comment:

Appendix A, page A-6, sixth paragraph: When referring to Collector Wells #1 and #2, the text should cite Figure A-1 so that the reader may more easily locate them.

Response:

Discrepancy has been noted.

Actions:

Figure A-1 will be cited when discussing collector wells #1 and #2 changes will be incorporated into revised EE/CA.

28. Comment:

Appendix A, page A-10, third paragraph: A portion of this paragraph questions the accuracy of estimates made from wells having only a few observed concentrations. Statistically, there is little difference in have only a "few" observations versus having a maximum possible number of 6 observations (the number of sampling rounds that are used in this EE/CA). The logic applied in this paragraph appears to be questionable.

Response:

The model has been calibrated using all available uranium sampling data including data from studies other than the RI/FS. This resulted in data sets for individual wells in exceedance of 50 values.

Actions:

No change to the EE/CA is necessary.

29. Comment:

Appendix A, page A-15, fourth paragraph: This paragraph refers to particle tracking under the no action alternative as shown on Figure A-4. Figure A-4 does not show particle tracking under the action alternative.

Response:

This should have been referenced to A-5 which denotes both the no action and water supply particle tracking alternatives.

Actions:

Change will be noted in revised EE/CA.

30. Comment:

Appendix A, Figures A-10 and A-11: It is impossible to associate the interceptor wells with their respective curves in either of these figures. A combination of solid, dashed, or dotted lines should be used so the reader can discern which curve represents each well.

Response:

Curves were labeled on Figures A-10 & A-11 to identify the associated wells with respect to their curves.

Actions:

Change to the figures will be incorporated into the revised EE/CA.

31. Comment:

Appendix C, page C2-1, fourth paragraph: The word "are" should be removed from the sentence beginning "The model predicts...". This sentence should be qualified by stating, if such is the case, that further sampling is occurring in order to test the assumption of no plume mixing.

Response:

The typographical error is noted. Requirements for further sampling are not a part of the Risk Assessment.

Action:

The phrase "source are will not be drawn" will be changed to "source will not be drawn".

32. Comment:

Appendix C, page C3-6: It is not appropriate to use 1 l/day as an average intake of water for risk assessment purposes. USEPA uses a standard 2 l/day value and does not suggest that this is necessarily a maximum daily intake.

Response:

EPA suggests that 2 l/day is a "reasonable worst case [emphasis added] drinking water rate for adults" (Exposure Factors Handbook, EPA/600/889/043, EPA 1989).

Action:

The definition of the expression "maximum daily intake" will be expanded and referenced to EPA's Exposure Factor Handbook.

33. Comment:

Appendix C, page C3-8: Values for the parameters listed on this page were omitted.

Response:

The omission of values for the parameters on page C3-8 is noted.

Action:

These values will be included and referenced in the revision of the EE/CA.

34. Comment:

Appendix C, page C5-1, Carcinogenic Effects: It is inconsistent with USEPA risk assessment methodology to calculate carcinogenic risks in terms of "risks of fatal cancer." USEPA does not separate carcinogenic risks into fatal and non-fatal. DOE's presentation of carcinogenic risk in this manner is very misleading and can give the appearance that carcinogenic risks are smaller than they really are.

Response:

U.S. EPA does differentiate between fatal and non-fatal cancer risks. See pages 10-7, 10-24, 10-29 and 10-31 of EPA's Risk Assessment Guide for Superfund, Volume I: Human Health Evaluation Manual (September, 1989). The source stated that "approximately 50% of all of the cancers induced by radiation are lethal." DOE's presentation of carcinogenic risk is not meant to mislead a reader, but rather to state the excess risk of fatal cancers from the four alternatives.

Action:

Since the risks in question are fatal risks, and they are already clearly presented as such, no additional clarification is proposed.

35. Comment:

General Comment: DOE has not addressed the option of pumping from the area of highest uranium contamination and treating this water as part of this removal action. At the same time, water from the leading edge of the south plume could be pumped and discharged as described in the EE/CA. This option should be evaluated.

Response:

The option of pumping from the area of highest uranium contamination and treating was not evaluated as part of this removal action since OU #5 remedial action will address this. The removal action is being implemented to prevent the further migration of the south plume. In addition the pump and discharge (Alternative 4) has been modified to pump and treat in the revised EE/CA (reference response to Comment 4).

Actions:

No change to the EE/CA is necessary.

Comments on the Responsiveness Summary

1. Comment:

Page 97, DOE response to Ohio EPA Comment #7 on the draft EE/CA: The response to this comment is not only inadequate but makes little sense. It is requested that DOE provide clarification.

Response:

Response will be changed to "The data from Rounds 5 and 6 have been verified. However, complete validation of the data is still in progress."

Actions:

Revised page 97 will be inserted into responsiveness summary. A copy of the revision will be placed in the two Administrative Record locations.

2. Comment:

Page 99, DOE response to Ohio EPA Comment #19: DOE's response to the comment regarding the abandonment of existing contaminated water supplies is inadequate. Regardless of whether DOE has the legal or statutory authority to force affected users to abandon existing contaminated wells, it should note in the EE/CA that it will attempt to gain permission from owners of contaminated wells to properly abandon their wells once an alternate water supply is provided. Also, DOE can, and should, provide pertinent information on contaminated wells to the Hamilton County Health Department and request that those contaminated wells be condemned by the health department. Local health departments have the statutory authority to condemn private wells and require the proper abandonment of said wells.

Response:

In addition to notifying the water well owners that their water is contaminated the DOE also plans to coordinate efforts with the Department of Health (DOH) who has the authority to condemn private wells that are a health concern. This effort will ensure that no land owners are drinking water contaminated with radionuclides (i.e. uranium).

Actions:

Revised Page 99 will be inserted into Responsiveness Summary. A copy of the revision will be placed in the two Administrative Record locations.

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

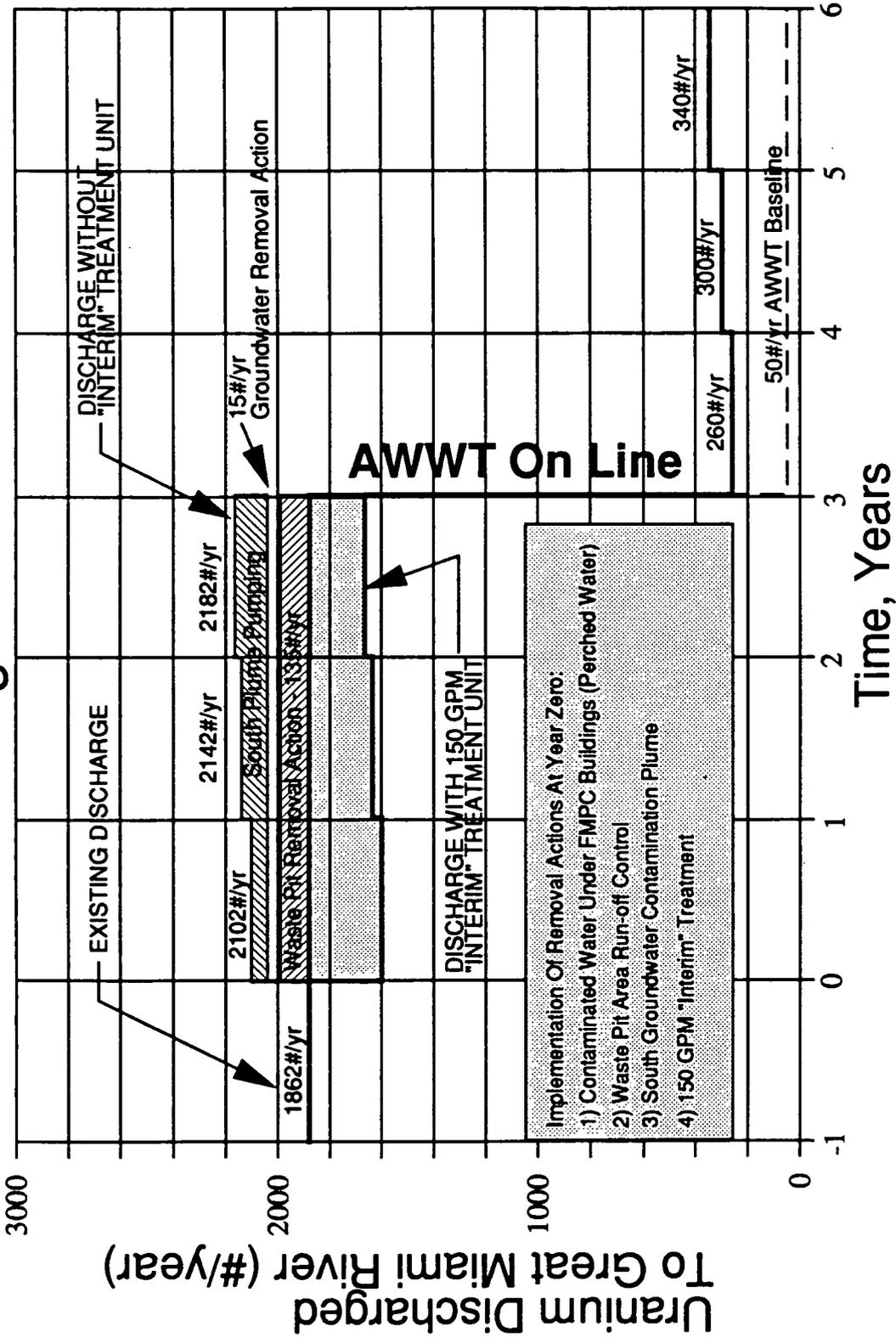


FIGURE 1