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United States Steel Corporation

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October 1, 1980

Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington D. C. 20555

Attention: Docketing and Service Branch

Re: U.S.N.R.C. Regulatory
Guide 4.14 - Revision 1
(April, 1980)

Dear Sir:

Please find a tached our company's comments on the U. S. Nuclear Regulatory Commission's Regulatory Guide 4.14--Radiological Effluent and Environment Monitoring at Uranium Mills. Since U. S. Steel Corporation is actively involved in the in-situ leach mining of uranium, we would request that the N.R.C. staff seriously consider these comments in light of our experience.

Should there be any questions about these comments, please contact me at your convenience.

Sincerely,

David L. Durler

David L. Durler
Manager - Environmental Affairs

Acknowledged by card 10/6/80

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enclosure

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COMMENTS ON
U.S.N.R.C. REGULATORY GUIDE 4.14
RADIOLOCICAL EFFLUENT AND ENVIRONMENTAL MONITORING
AT URANIUM MILLS

GENERAL COMMENT

It is readily apparent that the subject guide is directed towards conventional milling processes that utilize mill circuits and tailing impoundments. Throughout the introduction and discussion, reference is directed towards the environmental impact of the mill circuit (i.e., haul roads, ore pads, ore crushing facilities, and tailing impoundments) and the programs acceptable for proper environmental surveillance. The Nuclear Regulatory Commission (NRC) staff fails to recognize unconventional methods of uranium extraction and processing (i.e., in-situ solution mining) in their revamping of this regulatory guide. Our concern in regard to this is that unconventional "milling" or processing may be construed to be synonymous with conventional methods of milling. As a result, the environmental impacts associated with conventional milling may unjustly be considered part of the in-situ process also. Hence, environmental pre-operational and and operational programs directed toward the conventional method of milling may not be totally applicable to the in-situ process where such environmental concerns may be negligible or absent. Although it is recognized that the programs described in this guide are not requirements, the in-situ industry is reluctant to assume that such requirements will be easily modified by all future regulatory agencies to fit individual sites.

The following comments deal more specifically on the preoperational and operational monitoring recommended in NRC Regulatory Guide 4.14, and suggest more meaningful programs applicable to the in-situ method of uranium processing.

1.1 Preoperational Sampling Program

1.1.1 Air Samples

Since the in-situ uranium mining process does not entail the hauling, dumping, crushing, or milling of ore material, it should be apparent that suspended particulate would be minimal. Hence, the recommendation for five continuous particulate samples at or near the plant boundary may be somewaht superfluous. For preoperational monitoring of particulates at a proposed in-situ mine and facility, care must be taken to identify the areas of concern, i.e., the mine site (pattern area) or the central processing plant. For some existing in-situ operations, the pattern area and associated facilities may be several miles from the central plant where the resource is concentrated, dryed, and drummed. One central processing plant may serve three or four mine sites, each with its own pattern area. Under these circumstances, it does not seem justified to monitor suspended particulates for each and every distinct site within one processing flow diagram.

1.1.2 Water Samples

Process ponds are an integral part of most in-situ uranium

mines. The ponds handle and temporarily store waste fluids prior to their ultimate disposition (i.e., deep well disposal, evaporation, R.O. treatment). It should be recognized, however, that these ponds may be lined with CPE or hypalon and have underdrain detection systems. Such by-product waste ponds should not be required to have groundwater monitor wells located hydrologically downgradient from their proposed location. If an applicant can demonstrate that a pond design is adequate to alleviate potential groundwater degradation, it should not be a requirement to install monitor wells.

Indiscriminate water sampling from all area water wells within a two kilometer radius of the proposed mine is unrealistic. For a proposed in-situ operation, only those area water wells that are screened or completed in the anticipated production zone should be sampled. Wells completed in deeper or shallower horizons need not be sampled.

1.1.4 Soil and Sediment Samples

Recomendation for acquiring soil samples does not address whether the samples are to be taken from the mine (or pattern) area, the central plant area, or both. It is not inconceivable for an applicant to have three or four distinct pattern areas that feed one central processing facility. It would behoove the NRC to define where, in the in-situ method, the mining ends and the "milling" begins. For example, U. S. Steel Corporation currently has five active pattern areas that serve two central plant facilities. By the requirements in part 1.1.4, it would be necessary to acquire 224 surface soil samples and 112 subsurface soil samples for the above

mentioned seven locations.

In addition, it seems somewhat unscientific to divise such an indiscriminate soil sampling procedure. It would seem more realistic to sample soils based upon their character (soil series), their location (topography), and vegetative relationship (grassy area or brush land). Furthermore, the soil sample sites should be so located as to allow for repeated sampling during the mining activity in order to monitor potential adverse effects.

2.1 Operational Sampling Program

2.1.2 Air Samples

During operations particulate sampling devices should be placed such that suspended decay products from Ra-222 (i.e., Pb-210) may be addressed. Sampling devises for wind blown particulates from ore pads, haul roads, or tailings ponds are not necessary in an in-situ operation. The major potential radiological threat in an in-situ operation is the uncontrolled releases of radon-222 into the atmosphere and its resulting decay products. Hence, radon-222 and its decay products should govern how many and where such sampling sites are to be situated. The location of all such air sampling sites should be site specific to the area in question.

Furthermore, the number and location of such sites should always consider whether or not all in-situ facilities are affected. In other words, must the same operational sampling be required of pattern areas and related facilities or central plant facilities?

2.1.3 Water Samples

For an in-situ operation, water samples need not be sampled from all water wells within a two kilometer radius of the pattern area or central plant facility. Groundwater degradation is only a potential possibility near the actively mining patterns; hence, only human consumption wells within, say, 800 feet of the protective production zone monitor well ring should be sampled and only semiannually. It should be remembered that the ore deposit is surrounded stratigraphically by monitor wells to detect vertical or lateral migration of leaching solutions. These wells, therefore, negate the proposed intensive area water well monitoring.

Sediment or surface water samples taken monthly is somewhat superfluous in light of the fact that an in-situ operator has no tailings impoundments. Quarterly sediment or surface water samples are sufficient to monitor potential watershed contamination.

2.1.4 Vegetation, Food, and Fish Samples

Vegetation, crop, and aquatic sampling is not necessary in area active mining/processing by the in-situ method. Suspended particulates are generally lacking in this method since their predominant sources (i.e., tailings ponds) are nonexistent. Such sampling should be based upon the size of an in-situ operation and the projected radon emmissions to the surrounding environment. Vegetative sampling and analysis may be necessary if it becomes apparent that such measures are warranted.