DCS

PR 61
(43 FR 49811)

TAUBE
PAUL
GARY
(An interesting twist -)

United States Steel Corporation

TEXAS URANIUM OPERATIONS
600 WINNEBAGO STREET
CORPUS CHRISTI, TX. 78401
(512) 883-7431

April 17, 1980

Director
Division of Waste Management
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Sir:

Please find attached comments related to the draft regulation 10 CFR Part 61: Disposal of low-level radioactive waste and low-activity bulk solid waste. Texas Uranium Operations operates six deep injection wells that dispose of low-level radioactive waste water generated by our in-situ leach uranium facilities. Since these regulations in their presently drafted form will have significant impact upon our deep well disposal system, it is our hope that the Nuclear Regulatory Commission will give careful consideration to each of the comments set forth in this correspondence.

Should the Nuclear Regulatory Commission staff desire additional information or have any questions concerning our attached comments, they may contact me at their convenience.

Sincerely,

David L. Durler

David L. Durler
Manager - Environmental Affairs

ejc
attachments
cc: Mr. R. L. Pollard, Manager, Texas Uranium Operations
Mr. R. L. Andes, Environmental Engineer, U. S. Steel Corporation
Ms. S. L. Keyes, Environmental Engineer, Texas Uranium Operations
Mr. R. Wilson, Attorney at Law, McGinnis, Lochridge & Kilgore

8005220316

COMMENTS ON THE DRAFT REGULATION 10 CFR PART 61
DISPOSAL OF LOW-LEVEL RADIOACTIVE WASTE AND LOW-ACTIVITY BULK SOLID WASTE

General Comment

It is apparent from reviewing the draft regulations that the Nuclear Regulatory Commission staff is developing rules for adequate disposal of low-level rad-waste. What is not apparent is if the draft regulations pertain to just commercial disposal facilities or to all disposal facilities whether private or commercial. It seems that, following a review of the draft rules, the intent of the staff is to regulate commercial sites (i.e., 10 CFR Parts 61.20 (b), 61.26, and 61.78). However, the objectives that the staff had in mind (as stated in the February 28, 1980, Federal Register, p. 13105) indicate that the regulations are applicable to a wide range of potential low-level waste (LLW) disposal methods. This being the case, that the draft regulations pertain to all LLW disposal methods (excluding those mentioned in 10 CFR 61.14, under definition of LLW), Texas Uranium Operations (U. S. Steel Corporation) submits the following comments on the draft regulations as they would affect our south Texas in-situ leach operation. In order to familarize the staff with the basis for our position, a process description of our operation is provided (see Attachment A).

Specific Comments

Subpart A

10 CFR 61.14 Definitions

1. Texas Uranium Operations is confused over the Nuclear Regulatory Commission's (NRC) use of the term by-product material. It is clear in the Uranium Mill Tailing Radiation Control Act of 1978 (UMTRC), and the the supplementary information for the draft 10 CFR Part 40 (August 27, 1978 FR50013) that the definition for by-product material has been amended to include discrete above ground wastes from operations such as ours. In fact, an NRC

10 CFR 61.14 Definitions (Continued)

official at a public hearing in Albuquerque, New Mexico (for proposed regulations 10 CFR Parts 30, 40, 70, 150, and 170; October 18-19, 1979, stated that mildly radioactive waste water was considered discrete above ground wastes or by-product material. However, since Texas Uranium Operations utilizes deep disposal wells for by-product material disposal, we are somewhat concerned over how this term is used in regard to our operation and 10 CFR Part 61. Furthermore, Texas Uranium Operations would like to know the relationship among 10 CFR Parts, 30, 40, 61, 70, and 151 as they apply to by-product material and LLW disposal permitting. It would behoove the NRC to clarify these points, especially in regard to by-product material that is not mill tailings.

2. The list of definitions should include the NRC staff's concept of a LLW disposal site. As mentioned previously, it appears that the regulations are geared for all methods of on-land disposal, when in fact, they are really designed for the shallow-land burial method.

10 CFR 61.20 (b) General Disposal Requirement

Texas Uranium Operations takes exception to this regulation that all LLW disposal facilities be situated on public lands. Our company operates six deep LLW disposal wells, all of which are sited on private land. In our particular case, it would be cost prohibitive to secure such land from a land owner due (in part) to the radius of influence from injecting into the permitted injection zone. In addition, the NRC must recognize that deep disposal wells are, if properly maintained and closed, very efficient and environmentally safe and need not be deeded over to civil authorities for perpetual surveillance. It is apparent from this particular rule that the NRC staff has not properly considered all LLW Disposal methods, particularly those utilized for private industrial use.

Subpart B

10 CFR 61.28 (b) and (c) Application for License - Financial Information

Texas Uranium Operations is of the opinion that deep underground injection wells utilized for the disposal of low-level radioactive waste water at mill sites should not be subject to post-Operational site maintenance, surveillance, and monitoring. Such requirements to confirm the integrity of the deep disposal waste system are unnecessary when the host strata is well below grade and any freshwater aquifer. Our company feels that this LLW disposal method is a viable, safe option for long-term disposition of process waste water generated by our in-situ uranium facilities. It should be recognized by the NRC that state agencies currently permit other industries--i.e., petrochemical--to utilize deep injection wells for the disposal of highly toxic fluids many times more hazardous than those generated by the in-situ uranium industry without, we might add, conditional long-term surveillance, ownership transfer, or annual post-closing site inspections. We would recommend that the NRC incorporate within these proposed regulations the provision to exempt any by-product waste systems that can exhibit adequate long-term containment from requirements for ownership transfer, site inspections, and long-term surveillance fees.

Subpart D

10 CFR 61.68 Post-Closure Observation and Maintenance

Texas Uranium Operations does not feel once injection has ceased for a particular waste disposal well that post-closure observation should be initiated, much less for a period of five years. It is our opinion that such disposal wells should be plugged and abandoned in a fashion similar to other industrial disposal wells. The plugging and abandonment procedure can be witnessed by appropriate NRC or state personnel and the license terminated.

10 CFR 61.70 Termination of License

For the termination of a LLW disposal well, why can't the plugging and abandonment procedures be incorporated within the license? The licensee should only be required to notify the appropriate permitting agency of their intent to plug and abandon a well (for the regulatory personnel to have an opportunity to witness the event) and then provide a plugging report to the permitting agency for review and approval.

Subpart F

10 CFR 61.78 Manifests

How does this rule apply in our situation where the operator of the LLW disposal site is is the sole generator of the waste?

Subpart G:

10 CFR 61.86 (b) Waste Form and Packaging

Needless to say, it is somewhat impossible to put our low-level rad-waste water into high integrity containers (Part 61.86 (f)) and shove them down a deep disposal well. We recommend that the staff review alternative methods of LLW containment, especially in light of the fact that our operation generates considerable amounts of waste water (1,000 gpm or more).

Subpart H

10 CFR 61.96 (d) (3) Site Suitablility

Since our LLW disposal facilities inject into groundwater aquifers, it would behoove the staff to restructure this rule. Groundwater (albiet saline) is always in contact with our waste; hence, this rule could adversely apply to deep disposal wells.

10 CFR 61.102 (a) Environmental Monitoring Applicant

Shouldn't this requirement be dependent upon the method of on-land disposal? It would appear applicable to shallow-land burial of rad-waste, but would it really be necessary for the deep disposal well method? Such an environmental inventory should be geared towards those methods that present the greatest potential for impacting the biosphere in the near-term (i.e., shallow burial, above grade storage, subgrade storage-mines).

10 CFR 61.104 (a) (1) Site Closure and Stablization

If, as this rule implies, a site can be shown to exhibit long-term containment integrity, why is it necessary to provide financial surety arrangements as contained in Part 61.28 (b) and (c)?

10 CFR 61.106 (b) (2) and (3) Physical Security

At present, one of our deep disposal wells is beyond the boundary of our immediate plant site and situated adjacent to a highway. This one-half acre LLW site is fenced but is not monitored for personnel access. For our company to monitor the site continously, as this rule implies, would be unnecessarily expensive and superfluous. The hazard presented at a well site is minimal from a radiological standpoint and does not justify such action.

United States Steel Corporation
TEXAS URANIUM OPERATIONS
600 WINNEBAGO STREET
CORPUS CHRIS'I, TX. 78401
(512) 883-743

## GENERAL PROCESS DESCRIPTION

The Clay West and Burns Ranch Plants use a solution mining technique to extract uranium from permeable low grade ore deposits approximately 300 to 600 feet below the surface. Uranium is present as an insoluble uranium oxide ($UO_2$). In the solution mining technique used, an alkaline solution is injected into the formation through injection wells (1). The alkaline solution reacts with the insoluble uranum oxide forming a water soluble carbonate complex (uranyl tricarbonate). This soluble uranium complex is produced at recovery wells, each containing a submersible pump (2). Injection and recovery wells are arranged in five-spot patterns throughout the field. Monitor wells surround the pattern area and are screened in appropriate stratigraphic horizons (production and non-production zones) to detect any leachate migration that may occur. There is a constant sweeping of liquid through the formation from the injection wells to the recovery wells. Submersible pumps in the re\ ery wells pump the pregnant solution to a field gathering tank (3). At the field processing plant, the flow is directed through sand filter columns (4) followed by ion exchange columns (5). The sand columns act as a filter and do not remove the soluble uranium complex. The soluble uranium complex is removed from the aqueous solution in the ion exchange columns. The barren solution leaving the ion exchange columns is brought up to the desired alkalinity by the addition of carbon dioxide followed by the addition of alkaline chemicals (6). Chlorine or copper sulfate is added to check the growth of algae and other organic material. The alkaline solution is pumped back to the injection wells in the field, completing the continuous loop (7).

When an increase in uranium concentration is found in the solution leaving an ion exchange column, that column is taken out of the continuous extraction circuit (8). Simultaneously, another column pair is put into service. The uranium must be removed from the ion exchange resin and the exchange resin regenerated before it is ready to be put back in service in the extraction circuit. At this time, the ion-exchange resin from the columns is pumped into a trailer and transported to an existing central elution plant for removal of uranium (8a).

At the central plant, the resin is eluted when the uranium complex is removed from the resin as a salt solution is passed through the column (9). The resin is regenerated as the uranium complex is removed. Before the uranium is precipitated from the rich solution, the heavy metal, molybdenum, is removed in an activated carbon bed. In order for the carbon bed to selectively absorb the molybdenum complex and permit the uranium complex to pass freely, the pH must be adjusted. This requirement is accomplished by adding sulfuric acid to the agitated tank containing the uranium rich solution until the desired pH is attained (10). This solution is passed through the molybdenum removal column (11) into small agitated tanks where ammonia is added to precipitate ammonium diurinate (12). Periodically the molybdenum must be removed from the molybdenum removal column by washing with a caustic solution.

The remaining processing steps involve the washing and drying of the precipitate. Initial washing occurs in a clarifier (13) where the precipitate settles to the bottom and a clear solution overflows the weir. A portion of the clarifier overlfow is used to make up the solution for the next ion exchange elution (14). The underflow is further concentrated by two centrifuges operated in series (15). The filter cake from the first centrifuge is reslurried before it reaches the second centrifuge. This operation and washing of the cake in the centrifuges reduces the concentration of impurities such as sodium, chloride, and sulfate ions present in the precipitate. The washed slurry is dried with a multiple stage hearth (16). The final product is a bright yellow powder (a combination of ADU and $U_3O_8$) known as "yellowcake" (17).

## NATURE AND DISPOSITION OF SOLID AND LIQUID WASTE

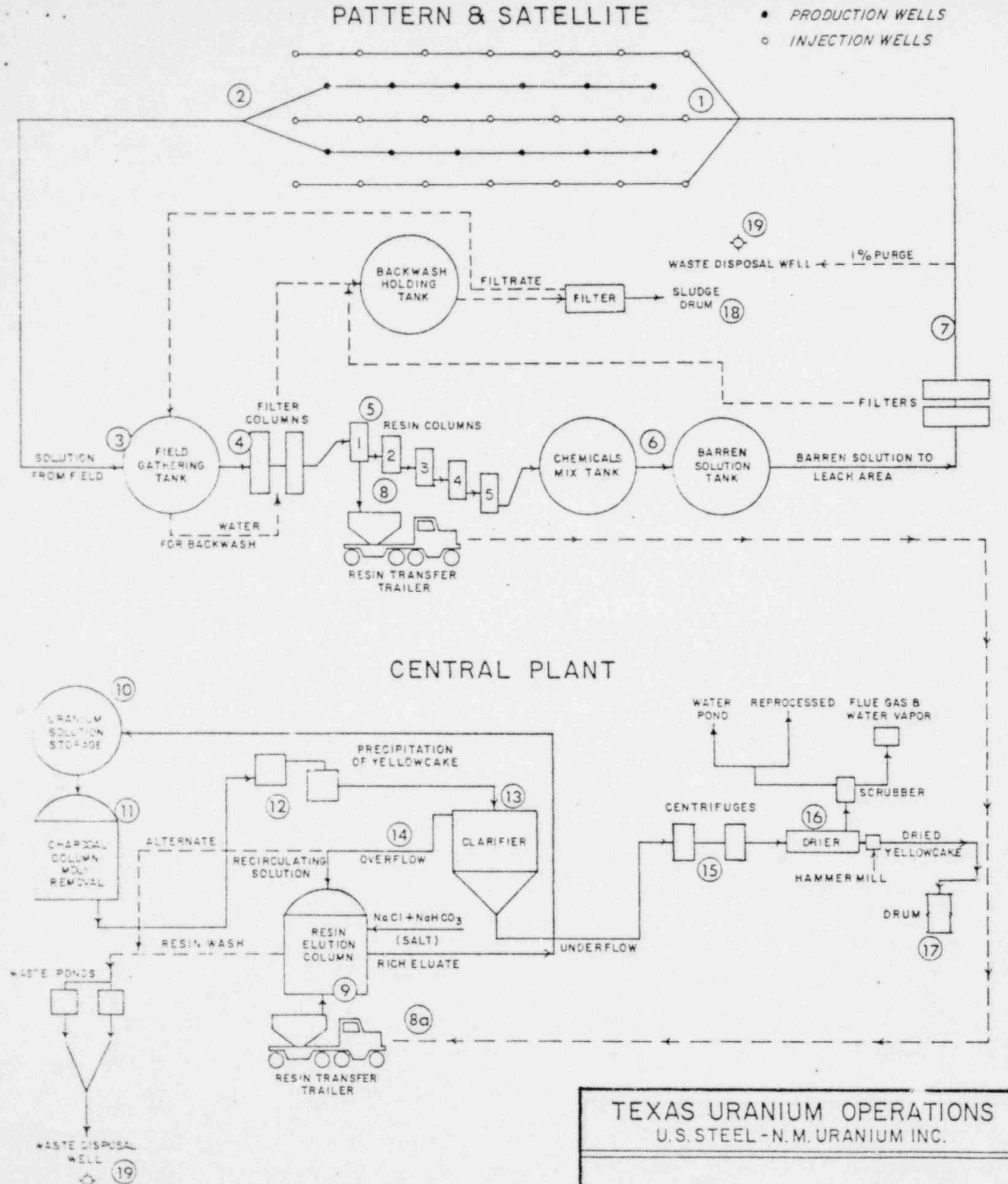
### Solid Waste

Solid waste generated at the Clay West or Burns Ranch facilities can be differentiated into two classes: un-contaminated solid waste and contaminated solid waste. Un-contaminated solid waste includes any material that has not come in contact with a hazardous substance such as yellowcake, backwash water, or leaching solution. Such wastes may include waste paper, scrap material (PVC, metal fittings, pumps, etc.), wood and sand or gravel. The majority of this waste is either buried at a landfill site located near the plant facility or sold as scrap.

Contaminated solid waste is mostly process generated. Such waste material is usually associated with process water or laboratory analytical procedures. Such radioactive solid waste will include resin, activated carbon, filter medium (sand, cartridge filters, or diatomaceous earth), scrap metal or PVC, laboratory waste material, and sludge. Any waste that cannot be adequately decontaminated through acid or steam treatment is drummed (18) for eventual shipment to an approved out-of-state L.S.A. commercial disposal site.

### Liquid Waste

Waste water that is generated by the satellites or the central plant facilities includes backwash water, laboratory waste water, bleed or purge water, and post-mining restoration fluids. Additional waste water may include recovered spill fluids, curbed rain water, and process water. All waste water generated by either the central plant or the satellite is disposed of through a deep injection well system following its retention in a holding pond (19).




TEXAS URANIUM OPERATIONS
U. S. STEEL - N. M. URANIUM INC.

PROCESS FLOW DIAGRAM
SATELLITE & CENTRAL FACILITIES
PRODUCTION PLANT