THE TEXAS SOLUTION

October 8, 2012

Cindy Bladey, Chief
Rules, Announcements and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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77 FR 34411
(1)

References: (1) Texas Radioactive Material License No. R04100, Amendment 18, CN600616890, RN101702439

(2) Federal Register, *Branch Technical Position on Concentration Averaging and Encapsulation*, Volume 77, Number 112, published on June 11, 2012

(3) Letter from J. Scott Kirk (WCS) to Cindy Bladey (NRC), *WCS Comments Regarding Potential Revisions to the Branch Technical Position on Concentration Averaging and Encapsulation*, dated April 15, 2012

(4) Letter from Robert J. Lewis (NRC), Summary of Existing Guidance for Reviewing Large-Scale Low-Level Radioactive Waste Blending Proposals (FSME-11-024), to All Agreement States, dated March 17, 2011

Subject: Final Comments Regarding the Branch Technical Position on Concentration Averaging and Encapsulation, Revision 1

Dear Ms. Bladey:

Waste Control Specialists LLC (WCS) is pleased to provide our final comments on the subject *Branch Technical Position on Concentration Averaging and Encapsulation (BTP)*, as requested in Reference 2.

RISK-INFORMED & PERFORMANCE-BASED POLICY

The U.S. Nuclear Regulatory Commission (NRC) has held several meetings with the licensed community, the general public and other stakeholders, including the Advisory Committee and Reactor Safeguards (ACRS), regarding revisions to the BTP. The NRC was directed by the Commissioners to incorporate its risk-informed, performance based philosophy as part of any revision to the BTP, as specified in the Staff Requirements Memorandum for SECY-10-0043. The NRC has developed policy, guidance, and regulations that have been risk-informed and

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performance based for more than a decade. However, concerns were raised during some of these stakeholder meetings regarding the nature of revising the BTP in a risk-informed manner as directed by the Commissioners.

The NRC's Strategic Plan (Fiscal Years 2008-2013) defines "risk-informed" as an approach to decision-making in which risk-insights are considered along with other factors such as engineering judgment, safety limits, and redundant and/or diverse safety systems. While the BTP includes a discussion regarding the NRC's Safety Culture Policy Statement as part of the BTP, a section on the manner in which the BTP was risk-informed is currently lacking. WCS believes that the BTP should be revised to include a similar discussion–especially given the deliberations raised during the stakeholder meetings regarding quantitative versus qualitative approaches to assessment of future intruder scenarios and the directive articulated by the Commissioners' to risk-informed potential revisions to the BTP.

TIME OF INTRUSION INTO WASTE

WCS agrees with the NRC that engineering controls for protecting a future intruder from unknowingly exhuming Class A, B and C Low-Level Radioactive Waste (LLW) should be considered when determining the time that intrusion occurs. At the Texas Compact Waste Disposal Facility located in Andrews County, Texas, the Texas Commission on Environmental Quality (TCEQ) has stipulated requirements that Class A, B and C LLW must be placed within reinforced concrete canisters, disposed of at a depth of at least 25 feet below grade and protected by an additional reinforced concrete barrier to protect an inadvertent intruder. These robust design and engineering controls are more than adequate to ensure that an intruder will not encounter the waste for a period of at least 500 years for Class A, B and C LLW. As such, WCS supports the language in BTP §4.9.6, *Time of Intrusion into Mixable Waste*, since it provides clarity that 500 years should be the initial time frame for considering intrusion into the waste as the basis of a realistic exposure scenario.

THRESHOLDS FOR HOMOGENEITY TEST

WCS had previously provided comments regarding homogeneity to the NRC (Reference 3). In our comments we addressed the NRC' Interim Guidance (IG) to the Agreement States (Reference 4) regarding actions that should be taken to ensure that waste blended by a waste processor in one state does not become problematic in the Agreement State hosting a disposal facility. The IG addressed several major topics including determining homogeneity. We supported actions recommended to be taken by the Agreement States to ensure that blended waste remains homogenous, is properly characterized and would not adversely impact a resident intruder.

WCS recommended that the NRC provide a more robust definition of homogeneity in the IG that includes measurable parameters, indicating that such a definition would ensure that this important characteristic is uniformly implemented by all regulators. WCS also encouraged the NRC to revise the BTP to provide specific requirements on the types of measurements and number of samples from the blending equipment to demonstrate that the average concentration and measurement uncertainty is known to a limit that would be acceptable to the NRC. WCS

also agreed with the NRC that for some waste streams, it would be difficult to demonstrate that the samples of waste in process tanks or individual disposal containers are representative of all the waste. Given the importance of understanding the measurement uncertainty in relation to potential impacts to the intruder, we suggested that the NRC should provide specific examples of acceptable methods needed to address the five sources of uncertainty discussed in the IG.

In the revised BTP, the NRC revised this section extensively stating that for waste near the classification limit (considering the measurement uncertainty) the proposed approach described in the August 2011 draft BTP would be difficult to achieve. The Staff revised the draft BTP taking steps to minimize the number of measurements needed to demonstrate waste homogeneity. Additionally, the staff developed a threshold for homogeneity testing to indicate the minimum concentration differences and annual volumes of waste produced, below which no homogeneity testing would be required.

It appears that inconsistent approaches were used to assess the likelihood of intrusion versus those used to establish thresholds for determining when analytical measurements would be need to demonstrate that waste had been adequately homogenized. For example, §4.9.4, *Considering the Likelihood of Intrusion*, states that because it is not possible to make precise estimates of the probability of intrusion, an adjustment should be made to the 1 mSv/yr (100 mrem/yr) radiation protection standards[1] specified in Title 10 of the Code of Federal Regulations (CFR), Part 20.1301. In practice, this adjustment involved an increasing of the allowable radiation dose to the public by a factor of five [(an increase from 1 mSv/yr (100 mrem/yr) to 5 mSv/yr (500 mrem/yr)] to account for a 20 percent probability of intrusion by an inadvertent intruder at some time into the future.

In contrast, the BTP currently uses acceptable radiation dose limits based on an intruder well-drilling scenario, where an intruder would be exposed to various sized hot-spots, ranged up to 20 mSv/yr (2,000 mrem/yr), to determine the threshold for determining homogeneity. The guidance establishing a threshold for homogeneity described in the current draft BTP was revised and requires a fewer number of samples to be taken from waste blended to the upper bound of the limits for Class A LLW. WCS conceptually agrees with the approach described in B.7, *Intrusion into Mixable Waste*. However, we strongly disagree that the threshold for homogeneity testing should be based on a radiation dose limit of 20 mSv/yr (2,000 mrem/yr)–which is equivalent to the annual occupational radiation protection standard currently being used by many in the international community and is also the limit under consideration by the NRC for future revisions to 10 CFR Part 20.

[1] The permissible dose of radiation to a member of the public is 1 mSv/yr (100 mrem/yr) pursuant to 10 CFR 20.1301. A radiation dose limit of 5 mSv/yr (500 mrem/yr) had been proposed to protect an inadvertent intruder when 10 CFR 61 was promulgated in 1981. This limit of 5 mSv/yr (500 mrem/yr) was also equivalent to the public dose limit in 10 CFR 20 that was in effect in 1981.

The current public dose limits for LLW disposal facilities are e, in part, 0.25 mSv/yr (25 mrem/yr) as established in 10 CFR 61.41.

The analysis, as described the BTP, underscores the problematic nature[2] of ensuring that waste blended to the upper bounds of the Class A limits is homogenous–it only works, as proposed, if the radiation dose limits for protecting members of the public are raised to levels more closely used for protecting occupational workers. If waste is not adequately blended to ensure homogeneity (especially for non-gamma emitting radionuclides, e.g., $^{239/240}Pu$, ^{63}Ni, and ^{99}Tc) then Agreement States hosting a disposal facility should first agree to assume this additional level of risks. Agreement States hosting a disposal facility may prefer that waste processors simply collect additional measurements to demonstrate that the waste has been blended adequately enough to comply with the guidance on homogeneity. WCS encourages the NRC to reassess the methodology needed to ensure that blended waste is homogenous based on a effective dose of 5 mSv/yr (500 mrem/yr) consistent with the dose limit that has been used to protect an inadvertent intruder since 10 CFR 61 was established in 1981.

TRAINING NEED TO SUPPORT UNIFORM IMPLEMENTATION OF THE BTP

The current version of the BTP is well written, much more easily understandable, and marks a substantial improvement of the guidance issued in 1995. However, much of the subject areas are complex and uniform implementation of the BTP is crucial for both the licensed community and the Agreement States that have regulatory oversight responsibilities over these facilities. WCS encourages the NRC to schedule workshops after issuance of the final BTP to provide the necessary training to ensure that this guidance is understood and well positioned for uniform implementation across the country.

CONCLUSIONS

WCS commends the NRC for their efforts in revising the BTP to reflect many of the advancements that have taken place since this guidance was established in 1995. WCS agrees that the BTP is more risk-informed and encourage the Commission to expand this discussion in the BTP. The Texas Compact Waste Disposal Facility located in Andrews County, Texas, is designed and engineered to protect the public for tens-of-thousands of years into the future. This design included robust barriers to protect potential intruders from inadvertently encountering Class A, B and C LLW.

The regulations established by the TCEQ prohibit dilution of radioactive waste for the purpose of changing its waste classification, among other things, to prevent shifting the burden of regulatory responsibility from waste processors to an Agreement State hosting a disposal facility. WCS encourages the NRC to take another look at the radiation dose limits that are currently used internationally to protect occupational workers as the basis for establishing a threshold for homogeneity tests. Agreement States hosting a disposal facility have expressed reservations regarding the BTP as it may shift the burden of responsibilities upon their shoulders should a waste processor inadequately characterize a waste stream needed to ensure homogeneity, especially for waste blended to the upper limits for Class A LLW.

[2] See Response to Comment 1.g., Appendix D, Analysis of Public Comments from October 20, 2011 Public Workshop, pp.88.

WCS requests that a copy of all correspondence regarding this matter be submitted directly to my attention by fax (432-525-8500) or email (skirk@valhi.net).

Sincerely,

J. Scott Kirk, CHP
Vice President, Licensing, Corporate Compliance and Radiation Safety Officer

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Fax Cover Sheet

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Subject: Final Comments Regarding the Branch Technical Position on Concentration Averaging and Encapsulation, Revision 1

Number of Pages : 6 (Including Cover Page)

Comments: Any questions, please call Scott Kirk

Note: If you do not receive the entire fax transmission or you have any questions, please contact Scott Kirk (432) 525-8500