Appendix G

ICDF-WAC Recommendations – October 2004

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ICDF-WAC Recommendations – October 2004

Prepared for: ICDF Implementation Project

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The purpose of this report is to present new waste acceptance criteria (WAC) for several constituents of waste that will be placed in the INEEL CERCLA Disposal Facility (ICDF) landfill and evaporation ponds. The constituents to be considered are listed in Table A. Many of these constituents are components of paint that will be used to fix contamination to surfaces prior to demolition. Although the waste will contain only cured paint, WAC were developed by modeling environmental transport of some of the individual constituents present in uncured paint (see the yellow highlighted entries in Table A). The disposal requirements for the other constituents were evaluated based on qualitative review of their individual properties and the properties of the materials that actually will be placed in the ICDF (see Table B).

Table A. List of constituents requested for WAC calculation.

Constituent	Concen-tration	Mass Constituent	Mass Constituent	Mass of Waste Containing Constituent	Analysis Required	Deliverable
	(mg/kg or pCi/kg)	(mg)	(kg)	(kg)		
Polyurethane	6.94E+04	4.72E+09	4.72E+03	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 4
Glycerine	1.71E+02	1.16E+07	1.16E+01	6.80E+04	A, B, C, D, E, F, G, H	1, 2, 3, 4
Cyclohexanone	6.17E+00	4.19E+05	4.19E-01	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 4
Talc	1.60E+00	1.09E+05	1.09E-01	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 4
Titanium Dioxide	3.43E+00	2.33E+05	2.33E-01	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 4
Carbon Black	1.37E-01	9.32E+03	9.32E-03	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 4
Dibutyl Phthalate	3.47E+01	2.36E+06	2.36E+00	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 4
2-Amino-2-Methyl-1-Propanol	1.73E+01	1.18E+06	1.18E+00	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 4
2-Butoxy Ethanol (Ethylene Glycol Monobutyl Ether)	1.40E+00	9.54E+04	9.54E-02	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 5
Diethylene Glycol Monobutyl Ether	1.40E+00	9.54E+04	9.54E-02	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 6
Epoxy Resin	1.40E+00	9.54E+04	9.54E-02	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 7
Acrylic Resin	8.42E+00	5.72E+05	5.72E-01	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 8
Calcium Silicate	6.94E+01	4.72E+06	4.72E+00	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 9
Butyl Benzyl Phthalate	1.73E+01	1.18E+06	1.18E+00	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 10
UV-Blue	8.67E+00	5.90E+05	5.90E-01	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 11
1,2-Cyclohexanediamine	3.48E+02	2.37E+07	2.37E+01	6.80E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 12
Acrylic Acrylate Resin (Acrylic Anionic Polymer) (Waterworks Crystals)	1.00E+04	2.30E+08	2.30E+02	2.30E+04	A, B, C, D, E, F, G, H, I	1, 2, 3, 13

[A] Short term risk
[B] NESHAPS
[C] ARARs
[D] Design Inventory
[E] Fate and Transport
[F] Leachate Reduction
[G] Liner Compatibility
[H] Long Term Risk
[I] IDAPA
[1] Landfill WAC limit
[2] Evaporation Pond WAC limit
[3] Design Inventory Table Update
[4] Values for tables in WAC Appendices

Table B. Constituents evaluated qualitatively – no specific limit on the disposal amount/concentration unless stated in this table.

Constituent	Reason for elimination from WAC calculations
Polyurethane (as cured resin)	Polyurethane foam is a commercially available product typically used for commercial and residential insulation. It is not RCRA waste, and is a solid material that would be acceptable at an industrial waste landfill. It is insoluble, and would not affect the landfill liner.
Glycerine	Glycerine is rapidly metabolized by most organisms, and it is used as a food additive. Air exposure limits for glycerine are the same as for nuisance dust. Glycerine is highly soluble in water. Per the liner manufacturer's specifications (EDF-ER-278, rev. 2, App. C), the polyethylene liner is resistant to glycerine at concentrations of up to 50%.
Talc (magnesium silicate; paint component)	Talc is non-volatile and refractory. It is insoluble, and would not affect the landfill liner. Talc would meet industrial waste landfill WAC.
Titanium Dioxide (paint component)	Titanium dioxide is a common non-hazardous white paint pigment that also is used in over-the-counter sunscreens and as a food additive (whitener). It is non-volatile and refractory. It is insoluble, and would not affect the landfill liner. Air exposure limits for titanium dioxide are the same as for nuisance dust.
Carbon Black (paint component)	Pure carbon black (amorphous elemental carbon) is not RCRA waste. In pure form, it may be combustible, but as a minor component of paint does not pose a fire hazard. Air exposure limits are within a factor of 5 of the value for total airborne nuisance dust. It is insoluble and non-volatile, and would not affect the landfill liner.
Epoxy Resin (cured)	Cured epoxy resin is not RCRA waste. Acceptable at industrial waste landfill. It is a solid, insoluble, non-volatile material, and would not affect the landfill liner.
Acrylic Resin (cured)	Cured epoxy resin is not RCRA waste that would be acceptable at an industrial waste landfill. It is a solid, insoluble, non-volatile material, and would not affect the landfill liner.
Calcium Silicate (wollastonite; paint component)	Calcium silicate is non-volatile and refractory. It is insoluble and would not affect the landfill liner. Air exposure limits for calcium silicate are the same as for nuisance dust. It would be acceptable for disposal at an industrial waste landfill.
Acrylic Acrylate Resin (Waterworks® Crystals; an acrylic anionic polymer)	Waterworks® polyacrylamide is specifically used to solidify wastes – other uses for polyacrylamide are as a soil amendment for home vegetable gardens, and as an absorbent in disposable diapers. Unless contaminated by RCRA hazardous/listed materials, polyacrylamide is not RCRA waste. It is not OSHA-regulated; nuisance dust airborne exposure limits would apply.

1. BACKGROUND

The INEEL is disposing of remediation wastes at the ICDF and planned disposals have identified constituents that were not included in the original WAC and constituents for which the waste has soil concentrations greater than the original WAC. Since for many constituents, the WAC was simply set to 1000 times the original design soil concentration, a reevaluation is needed to calculate a WAC based on the predicted leachate and future peak groundwater concentrations.

2. METHODOLOGY

The WAC formulation processes are described in DOE/ID-10865, "Waste Acceptance Criteria for the ICDF Landfill and DOE/ID-10866, "Waste Acceptance Criteria for ICDF Evaporation Pond" were followed to establish WAC limits.

3. RESULTS AND DISCUSSION

Based on the documentation in DOE/10865 and DOE/ID-10866 tables were identified that need to be updated with the new constituents or new soil concentration estimates. The results are presented in the next two sections.