

US EPA ARCHIVE DOCUMENT

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#### List of Subjects in 40 CFR Part 180

Environmental protection, Administrative practice and procedure, Agricultural commodities, Pesticides and pests, Reporting and recordkeeping requirements.

Dated: July 1, 2007.

**Debra Edwards,**

*Director, Office of Pesticide Programs.*

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## ENVIRONMENTAL PROTECTION AGENCY

### 40 CFR Parts 260 and 278

[EPA-HQ-RCRA-2006-0097; FRL-8326-1]

RIN 2050-AG27

#### Criteria for the Safe and Environmentally Protective Use of Granular Mine Tailings Known as "Chat"

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** The Environmental Protection Agency (EPA or the Agency) is promulgating mandatory criteria for the environmentally protective use of chat in transportation projects carried out, in whole or in part, with Federal funds. Specifically, chat used in such transportation projects will be safe and environmentally protective if it is used in asphalt concrete, in slurry seals, microsurfacing, or in epoxy seals for anti-skid on bridge decking. Chat used in such transportation projects will also meet EPA's criteria if it is used in Portland cement concrete, flowable fill, stabilized base, chip seals, or as road base providing, on a case-by-case basis, either: Synthetic Precipitation Leaching Procedure (SPLP, EPA SW-846 Method 1312) tests are conducted on the proposed material and the leachate testing results show that concentrations in the leachate do not exceed the Drinking Water Standards for lead and cadmium and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 ug/l; or EPA (or a State environmental Agency, if it chooses to do so) has determined, based on a site-specific risk assessment and after notice and opportunity for public comment, that the releases from the chat mixture in its proposed use will not cause an exceedance of the National Primary Drinking Water Standards for lead and cadmium in potential drinking water sources and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 ug/l in surface water. Furthermore, this rule also establishes a criterion that other uses of chat will be safe and environmentally protective and are acceptable if they are part of, and otherwise authorized by, a State or Federal response action undertaken in accordance with Federal or State environmental laws, with consideration of a site-specific risk assessment. This rule does not require that chat be sized (dry or wet) prior to its use, as long as this rule's criteria are complied with.

EPA is also establishing recommended criteria as guidance on the environmentally protective use of chat for non-transportation cement and concrete projects. Finally, the Agency is establishing certification and recordkeeping requirements for all chat, except that under the jurisdiction of the U.S. Department of Interior, Bureau of Indian Affairs (BIA). The chat covered by this rule is from the lead and zinc mining areas of Oklahoma, Kansas and Missouri, known as the Tri-State Mining District.

**DATES:** This final rule is effective on September 17, 2007.

The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register as of September 17, 2007.

**ADDRESSES:** The public docket for this final rule, Docket ID No EPA-HQ-RCRA-2006-0097, contains the information related to this rulemaking, including the response to comment document. All documents in the docket are listed in the <http://www.regulations.gov> index. Although listed in the index, some information may not be publicly available, e.g., Confidential Business Information or other information the disclosure of which is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in <http://www.regulations.gov> or in hard copy at the EPA Docket, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number of the Public Reading Room is 202-566-1744, and the telephone number to make an appointment to view the docket is 202-566-0276.

**FOR FURTHER INFORMATION CONTACT:** Stephen Hoffman, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue, NW, Washington, DC, 20460-0002, Mail Code 5306P; telephone number: 703-308-8413; fax number: 703-308-8686; e-mail address: [hoffman.stephen@epa.gov](mailto:hoffman.stephen@epa.gov). Additional information on this rulemaking is also available on the internet at <http://www.epa.gov/epaoswer/other/mining/chat/>.

The contents of this final rule are listed in the following outline

#### Contents of the Final Rule

- I. General Information
  - A. Does This Rule Apply to Me?
  - B. What Are the Statutory Authorities for This Final Rule?

- C. Definitions and Acronyms Used in the Rule
- II. Summary of This Rule
- III. Background Information
- IV. Rationale for This Rule and Response to Comments
- A. What Was the Process EPA Used to Develop This Action?
- B. What Criteria Are EPA Establishing for the Use of Chat?
- C. Relationship of This Rule to Other Federal Regulations and Guidance
- D. How Does This Rule Affect Chat Sales From Land Administered by BIA or Directly From Tribal Lands?
- E. How Does This Rule Affect CERCLA Liability, Records of Decision and Response Actions?
- F. How Does This Rule Affect the Use of Federal Funds Administered by the U.S. Department of Transportation for Transportation Construction Projects?
- V. Impacts of the Final Rule
- A. What are the Potential Environmental and Public Health Impacts From the Use of Chat in Transportation Construction Projects?
- B. What are the Economic Impacts?
- VI. State Authority
- VII. Statutory and Executive Order Reviews
- A. Executive Order 12866: Regulatory Planning and Review
- B. Paperwork Reduction Act
- C. Regulatory Flexibility Act
- D. Unfunded Mandates Reform Act
- E. Executive Order 13132: Federalism
- F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments
- G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks
- H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use
- I. National Technology Transfer and Advancement Act
- J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations
- K. Congressional Review Act

## I. General Information

### A. Does This Rule Apply to Me?

These criteria affect the following entities: aggregate, asphalt, cement, and concrete facilities, likely limited to the Tri-State Mining District. However, other types of entities not identified could also be affected—that is, the list is not intended to be exhaustive, but to provide a guide for readers regarding those entities that potentially could be affected by this action. To determine whether your facility, company, business, organization, etc., is affected by this action, you should examine the applicability criteria of this preamble. If you have any questions regarding the applicability of this action to a particular entity, consult the person

listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

### B. What Are the Statutory Authorities for This Final Rule?

Through Title VI, Section 6018 of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005 (HR 3 or “the Act”), Congress amended Subtitle F of the Solid Waste Disposal Act (42 U.S.C. 6961 *et seq.*) by adding Sec. 6006. This provision requires the Agency to establish safe and environmentally protective criteria (including an evaluation of whether to establish a numerical standard for concentrations of lead and other hazardous substances) for the use of granular mine tailings from the Tar Creek, Oklahoma Mining District, known as ‘chat,’ in cement and concrete projects and in transportation construction projects that are carried out, in whole or in part, using Federal funds. Section 6006(a)(4) requires that any use of the granular mine tailings in a transportation project that is carried out, in whole or in part, using Federal funds, meet EPA’s established criteria.

In establishing such criteria, EPA is required to consider “the current and previous uses of granular mine tailings as an aggregate for asphalt, and any environmental and public health risks and benefits derived from the removal, transportation and use in transportation projects of granular mine tailings” carried out, in whole or in part, using Federal funds. EPA is also required to consult with the Secretary of Transportation, and other Federal agencies in developing these criteria. RCRA section 2002(a) grants the Agency broad rulemaking authority, providing that the Administrator is authorized to prescribe “such regulations as are necessary to carry out his functions under this chapter.”

While this is a regulation promulgated under RCRA, the rule sets the criteria that must be complied with at transportation construction projects funded, in whole or in part, with Federal funds. The U.S. Department of Transportation (DOT) has statutory responsibility over the disbursement of federal funds for transportation projects. Therefore, USDOT will make reference to this rule as one of the regulatory requirements it requires all states to adhere to as a condition of receiving Federal funds for transportation projects using chat.

### C. Definitions and Acronyms Used in the Rule

- **Asphalt**—also known as asphalt cement, is liquid bitumen (heavy petroleum) used as the binder in cold,

warm, and hot mix asphalt, chip seals, slurry seals, and microsurfacing. The term ‘asphalt’ is sometimes used generically in place of cold, warm, or hot mix asphalt.

- **Asphalt concrete**—a layer, or combination of layers, composed of a compacted mixture of an asphalt binder and mineral aggregate.

- **Pozzolanic**—a siliceous material which when combined with calcium hydroxide in the presence of moisture exhibits cementitious properties.

- **State or Federal response action**—State or Federal response action undertaken pursuant to applicable Federal or State environmental laws and with consideration of site-specific risk assessments.

- **Raw chat**—unmodified lead-zinc ore milling waste that comes from the Tri-State Mining District.

- **Washed chat**—lead-zinc ore milling waste that has been wet-screened to remove the fine-grained fraction and which is sized so as not to pass through a number 40 sieve (0.425 mm opening size) or smaller.

- **Sized chat**—lead-zinc ore milling waste that has been wet-screened (washed) or dry sieved to remove the fine-grained fraction smaller than a number 40 sieve (0.425 mm opening size).

Non-transportation cement and concrete projects uses are:

—Construction uses of cement and concrete for non-residential structural uses limited to weight bearing purposes such as foundations, slabs, and concrete wall panels. Other uses include commercial/industrial parking and sidewalk areas. Uses do not include any residential use of cement or concrete (*e.g.*, residential parking areas, residential construction, concrete counter tops).

Transportation construction uses are:

—**Hot mix asphalt**—a hot mixture of asphalt binder and size-graded aggregate, which can be compacted into a uniform dense mass. Hot mix asphalt also includes hot mix asphalt sub bases and hot mix asphalt bases.

—**Portland cement concrete (PCC)**—pavements consisting of a PCC slab that is usually supported by a granular (made of compacted aggregate) or stabilized base and a sub base. In some cases, the PCC slab may be overlaid with a layer of hot mix asphalt. PCC uses also include bridge supports, bridge decking, abutments, highway sound barriers, jersey walls, and non-residential side walks adjacent to highways.

—**Flowable fill**—a cementitious slurry consisting of a mixture of fine

aggregate or filler, water, and cementitious materials which is used primarily as a backfill in lieu of compacted earth. This mixture is capable of filling all voids in irregular excavations, is self leveling, and hardens in a matter of a few hours without the need of compaction in layers. Most applications for flowable fill involve unconfined compressive strengths of 2.1 MPa (300 lb/in<sup>2</sup>) or less.

—*Stabilized base*—a class of paving materials that are mixtures of one or more sources of aggregate and cementitious materials blended with a sufficient amount of water that result in the mixture having a moist nonplastic consistency that can be compacted to form a dense mass and gain strength. This class of base and sub base materials excludes stabilization of soils or aggregates using asphalt concrete or emulsified asphalt.

—*Granular bases*—road base typically constructed by spreading aggregates in thin layers of 150 mm (6 inches) to 200 mm (8 inches) and compacting each layer by rolling over it with heavy compaction equipment. The aggregate base layers serve a variety of purposes, including reducing the stress applied to the sub grade layer and providing drainage for the pavement structure. The granular sub base forms the lowest (bottom) layer of the pavement structure and acts as the principal foundation for the subsequent road profile.

—*Embankment*—a volume of earthen material that is placed and compacted for the purpose of raising the grade of a roadway above the level of the existing surrounding ground surface.

—*Slurry seals*—a material composed of emulsified asphalt, aggregate, and mineral fillers, such as Portland cement or lime which is applied as a thin coating on top of asphalt or PCC road surfaces.

—*Micosurfacing*—polymer-modified slurry seal.

—*Cold mix asphalt*—an asphalt/ aggregate mixture composed of binders, soaps, or other chemicals which allow its use when cold or warm.

—*Epoxy seals*—the mixture of aggregate in epoxy binders. Epoxy seals are typically used as an anti-skid surface on bridge decking.

—*Chip seals*—a material composed of aggregate placed on top of a layer of an asphalt or asphaltic liquid binder. The aggregate may be rolled into the binder.

#### *Abbreviations and Acronyms Used in This Document*

ANSI American National Standards Institute  
 AASHTO American Association of State Highway and Transportation Officials  
 ASR Alkali-Silica Reaction  
 ASTM American Society for Testing and Materials  
 ATSDR Agency for Toxic Substances and Disease Registry  
 BDAT Best Demonstrated Available Technology  
 BIA Bureau of Indian Affairs  
 CAA Clean Air Act (42 USCA 7401)  
 CERCLA Comprehensive Environmental Response Compensation and Liability Act (42 USCA 9601)  
 CFR Code of Federal Regulations  
 CWA Clean Water Act (33 USCA 1251)  
 DOT Department of Transportation  
 EO Executive Order  
 EPA Environmental Protection Agency  
 FHWA Federal Highway Administration  
 FR Federal Register  
 ICR Information Collection Request  
 IEUBK Integrated Exposure Uptake Biokinetic (Model)  
 MCL Maximum Contaminant Level (Safe Drinking Water Act)  
 NIOSH National Institute for Occupational Safety and Health  
 NPL National Priorities List  
 ODEQ Oklahoma Department of Environmental Quality  
 OMB Office of Management and Budget  
 OSHA Occupational Safety and Health Administration  
 OU University of Oklahoma  
 OUs Operable Units  
 PCC Portland cement concrete  
 PEL Permissible Exposure Level  
 ppmv parts per million by volume  
 ppmw parts per million by weight  
 Pub. L. Public Law  
 RCRA Resource Conservation and Recovery Act (42 USCA 6901)  
 ROD Record of Decision  
 SMCL Secondary Maximum Contaminant Level (Safe Drinking Water Act)  
 SPLP Synthetic Precipitation Leaching Procedure (EPA SW 846 Method 1312)  
 SSL (Superfund) Soil Screening Level  
 TCLP Toxicity Characteristic Leaching Procedure (EPA SW 846 Method 1311)  
 TWA Time-Weighted Average  
 USACE U.S. Army Corp of Engineers  
 U.S.C. United States Code

#### **II. Summary of This Rule**

On April 4, 2006, EPA published a **Federal Register** notice (64 FR 16729)

seeking comment on a proposed rule that would establish criteria for the safe and environmentally protective use of chat in transportation projects funded, in whole or in part, with Federal funds, as well as proposed guidance on the use of chat in non-transportation cement and concrete projects. Based on a request to extend the comment period, the Agency again sought comment on this proposal on May 19, 2006 (71 FR 29117). The purpose of the proposed rule was to establish criteria that would identify environmentally protective uses of chat in federally funded transportation projects.

The Agency received many comments in response to its April 4 and May 19, 2006 notices. Numerous commenters generally supported the proposed rule, while other commenters suggested changes to the proposal. After considering all comments, we are finalizing the proposed rule with several significant modifications. The final rule, similar to the proposed rule, establishes criteria allowing the use of chat in federally funded transportation projects when used in asphalt concrete for roadway surfaces and in asphalt for road bases and sub bases. Upon consideration of the comments, the Agency is expanding its criteria for chat in federally funded transportation projects to include chat used in slurry seals, microsurfacing, epoxy seals, and cold and warm mix asphalt. However, a significant modification to the proposal is that before chat can be used in Portland cement concrete (PCC) federally funded transportation projects, a person must show, on a case by case basis that: (1) Synthetic Precipitation Leaching Procedure (SPLP, EPA SW-846 Method 1312) tests are conducted on the proposed material and the leachate testing results show that concentrations in the leachate do not exceed the National Primary Drinking Water Standards for lead and cadmium and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 ug/l; or (2) EPA (or a State environmental Agency, if it chooses to do so) has determined, based on a site-specific risk assessment and after notice and opportunity for public comment, that the releases from the chat mixture in its proposed use will not cause an exceedance of the National Primary Drinking Water Standards for lead and cadmium in potential drinking water sources and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 ug/l in surface water.

The Agency is making these changes in response to comments received on the proposed rule, including comments

from the Peer Review Panel, which argued that there were insufficient data for the Agency to determine the range of risk from the use of chat in PCC. In addition, based on comment, the Agency also concluded that the use of chat in flowable fill, stabilized based, chip seals and as road base may only be allowed if a case-by-case demonstration is made, as described above. This rule's approach will generate the data needed to determine if such uses are safe and environmentally protective. Such an approach is also similar to that already used by a number of states when they make beneficial use determinations.

The Agency wishes to emphasize that the use of chat in transportation projects, funded in whole or in part using Federal funds, does not affect a person's obligation to comply with existing state or Federal materials specifications. Further discussion of this matter is noted in the sections entitled, Physical and Chemical Characteristics of Chat and Relationship of this Rule to other Federal Regulations and Guidance.

The Agency has retained its proposal that chat authorized by a State or Federal response action undertaken in accordance with Federal or State environmental laws need not comply with the criteria in sections 278.3 (a) or (b). Such response actions are undertaken with consideration of site-specific risk assessments. For example, unencapsulated uses of chat may be authorized in a State or Federal remediation action. This rule also retains the certification requirement, since the Agency believes that such notice is important for states and the public to know how and where chat is used in transportation.

EPA believes that this rule will encourage the environmentally sound use of chat in transportation projects funded, in whole or in part, with Federal funds.

### III. Background Information

#### 1. What Is Chat?

Chat is the waste material that was generated from the extraction and beneficiation of lead/zinc minerals to produce lead/zinc concentrate in the Tri-State Mining District of Southwest Missouri, Southeast Kansas and Northeast Oklahoma. Chat is primarily composed of chert, a very hard rock. The primary properties that make chat useful in asphalt-based road materials, Portland cement concrete, and epoxies are grain size distribution, durability, non-polishing, and low moisture absorption.

In 1980, Congress enacted the Solid Waste Disposal Act Amendments (Pub. L. 96-482) which added section 3001(b)(3)(A)(ii) (the Bevill Amendment) to RCRA. This section required the Agency to study extraction/beneficiation wastes and in 1989 the Agency promulgated a rule (54 FR 36592) which exempts extraction/beneficiation wastes from regulation under the RCRA Subtitle C hazardous waste regulations (see (40 CFR 261.4(b)(7)). Therefore, chat is a "Bevill exempt" waste and is not subject to regulation under RCRA Subtitle C. This exemption does not, however, affect CERCLA jurisdiction over chat, since chat contains hazardous substances, nor does it affect the jurisdiction of RCRA section 7003, as long as the chat is a solid waste.

#### 2. What Is the Areal Scope for This Action?

The Act directed EPA to develop criteria for chat from the Tar Creek, Oklahoma Mining District. However, there is no definition of the term "Tar Creek Oklahoma Mining District." Available literature references the "Tar Creek Superfund site," which is in Oklahoma, but the term "mining district" is only used in reference to the "Tri-State Mining District." For purposes of this final rule, the areal scope includes chat originating from the Tri-State Mining District of Ottawa County, Oklahoma, Cherokee County of southeast Kansas, and Jasper, Newton, Lawrence and Barry Counties of southwest Missouri, regardless of where it is used.

In 1979, the U.S. Bureau of Mines completed a study to identify all mined areas and mine-related hazards which confirmed that lead-zinc mining covers a portion of each of the States of Kansas, Missouri, and Oklahoma. This area is the same area known as the Tri-State Mining District.

Chat located in this historical mining district is a product of similar mineralization processes that sets it aside from related lead-zinc mineralization districts elsewhere in the United States. The Tri-State mineralization is specifically associated with wall rock alteration into dolomite and microcrystalline silica (chert). The term chat is derived from the word "chert," referring to the cherty wallrock found in this mining district. The lead/zinc ore and its related waste, chat, in this district also have a well defined lead to zinc ratio.

For over one hundred years of activity ending in 1970, the Tri-State Mining District has been the source of a major share of all the lead and zinc mined in

the United States. Surface piles of chat, as well as underground mining areas, extend uninterrupted across the Oklahoma-Kansas State line. In the proposal, the Agency did not include Lawrence and Barry counties in southwest Missouri as part of the areal extent of the rule, but requested comment on whether it would be reasonable to include them (see 71 FR 16732). Commenters requested that the Agency expand the scope of the rule to include these two counties in southwest Missouri. Based on communication with state regulatory officials in Kansas, Missouri, and Oklahoma and review of mineral geology studies, EPA concludes that there is no real factual distinction between chat derived from these three states, and believes that it is reasonable to apply this rule to the areal extent of all chat generated and currently located in the following counties: Ottawa county, Oklahoma, Cherokee county, Kansas, and Newton, Jasper, Lawrence and Barry counties in Missouri.

#### 3. Are There Any Current Regulations of Asphalt, Portland Cement Concrete or Chat Washing Facilities?

Based on the Agency's review of existing state and federal regulations, the Agency did not propose to apply any additional regulations on chat washing or hot mix asphalt and Portland cement concrete plants, although the Agency solicited comment on whether it would be prudent for this rule to apply additional controls, over those that currently exist, to address environmental releases from these types of facilities.<sup>1</sup> Specifically, at proposal, the Agency assessed existing regulations in Oklahoma, Kansas, and Missouri for hot mix asphalt plants and Portland cement concrete plants to determine whether those operations are appropriately regulated to address environmental releases for such facilities. (See memorandum entitled: *Evaluation of State Regulations* in the docket.) Those regulations set standards for point and fugitive air emission sources (see Kansas: K.A.R. 28-19-500, Missouri: 10 CSR 10-6.170, and Oklahoma: OAC 252:100-7/8/29) and also set requirements for water discharges from point source discharges (see Kansas: K.A.R. 28-16, Missouri: 10

<sup>1</sup> It should be noted that the statute does not require the Agency to set criteria for facilities that prepare chat prior to its use, but restricts the activities for which the Agency is to establish criteria for the use of chat in transportation projects funded, wholly or in part, with Federal funds. Nevertheless, the Agency evaluated the potential for environmental releases from these types of facilities—chat washing, hot mix asphalt and Portland cement concrete plants as part of the rulemaking.

CSR 20–6.200, and Oklahoma: OAC 252:606–5–5). In addition, Oklahoma, Missouri and Kansas all require that trucks transporting aggregate must be covered to reduce fugitive emissions and reduce damage to other vehicles from windblown debris. The Bureau of Indian Affairs (BIA) also requires that trucks transporting chat from Tribal lands be covered to prevent blowing dust from transport.

The Agency also assessed existing regulations in Oklahoma, Kansas, and Missouri for chat washing facilities to determine whether chat “washing” operations are adequately managed.<sup>2</sup> There are two commercial chat washing facilities in the Tri-State area and both are located within the Tar Creek Superfund site. While the States do not have specific regulations applicable to chat washing facilities, these facilities are subject to State general fugitive air emissions and general storm water discharge regulations. These general State permits require that fugitive dusts and runoff be controlled in a fashion so that dusts and other pollutants do not leave the property line or the boundary of the construction activity. In addition, because the two chat washing facilities are located within the Tar Creek Superfund site, the Agency may rely on CERCLA authority to establish any additional conditions that are considered necessary to be safe and environmentally protective.

The BIA is also establishing air and water standards for chat washing facilities located on Tribal lands and lands administered by BIA. BIA’s requirements include that the chat washing facility manage waste water discharges so that they do not exceed State standards, that fugitive dusts be controlled, and that fines are handled and disposed of so that they do not contaminate ground water. In addition, BIA requires all purchasers of chat from Tribal lands, or lands administered by BIA, to certify that the chat will be used in accordance with authorized uses set forth in EPA fact sheets and other guidance. (See report titled, *Chat Sales Treatability Study Workplan for the Sale of Indian-Owned Chat within the Tar Creek Superfund Site, Ottawa County, Oklahoma*, June 23, 2005.).

A number of commenters noted their concern that existing regulations do not adequately control releases from these types of facilities. As noted above, the Agency reviewed existing state and Federal regulations of these facilities,

and determined that they are in fact subject to regulation of their releases and that the existing regulations assure safe and environmentally protective conditions at these facilities—that is, hot mix asphalt plants, PCC plants and chat washing facilities. Therefore, the Agency is not promulgating additional controls for these facilities.

#### 4. Are There Existing Criteria for the Use of Chat?

As noted in a 2005 University of Oklahoma (OU) report, the Oklahoma Department of Environmental Quality (ODEQ) has determined that the following transportation uses of raw chat are inappropriate: Use in residential driveways and as gravel or unencapsulated surface material in parking lots, alleyways, or roadways (See *A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report*). ODEQ also identified the following non-transportation uses of raw chat that are deemed inappropriate for residential use:

- Fill material in yards, playgrounds, parks, and ball fields
- Playground sand or surface material in play areas
- Vegetable gardening in locations with contaminated chat
- Surface material for vehicular traffic (e.g., roadways, alleyways, driveways, or parking lots)
- Sanding of icy roads
- Sandblasting with sand from tailings ponds or other chat sources
- Bedding material under a slab in a building that has underfloor air conditioning or heating ducts
- Development of land for residential use (e.g., for houses or for children’s play areas, such as parks or playgrounds) where visible chat is present or where the lead concentration in the soil is equal to or greater than 500 mg/kg unless the direct human contact health threat is eliminated by engineering controls (e.g., removing the contaminated soil or capping the contaminated soil with at least 18 inches of clean soil)

EPA Region 6 also issued a Tar Creek Mining Waste Fact Sheet on June 28, 2002 that identified the following as acceptable uses of chat: (1) Applications that bind (encapsulate) the chat into a durable product (e.g., concrete and asphalt), (2) applications that use the chat as a material for manufacturing a safe product where all waste byproducts are properly disposed, and (3) applications that use the chat as sub-grade or base material for highways (concrete and asphalt) designed and constructed to sustain heavy vehicular

traffic. This fact sheet also incorporated the ODEQ list of unacceptable residential uses of chat.

In addition, EPA Region 7 issued a Mine Waste Fact Sheet in 2003 that identified the uses of chat that are not likely to present a threat to human health or the environment. Those uses are: (1) Applications that bind material into a durable product; these would include its use as an aggregate in batch plants preparing asphalt and concrete, (2) applications below paving on asphalt or concrete roads and parking lots, (3) applications that cover the material with clean material, particularly in areas that are not likely to ever be used for residential or public area development, and (4) applications that use the material as a raw product for manufacturing a safe product. The fact sheet also lists mine waste (chat) uses that may not be safe and environmentally protective and are similar to those listed by ODEQ and the Region 6 fact sheet. However, the Region 7 fact sheet also lists use as an agricultural soil amendment to adjust soil alkalinity as a use that may not be safe and environmentally protective.

This rule is more restrictive than the 2002/2003 Region 6 and 7 fact sheets. Therefore, the Agency is issuing new fact sheets on the use of chat from the Tri State Mining District in transportation construction projects funded, in whole or in part, with Federal funds and in non-transportation non-residential uses of chat. The new fact sheets are consistent with this rule. The fact sheets are available at <http://www.epa.gov/epaoswer/other/mining/chat/>.

#### 5. Physical and Chemical Characteristics of Chat

This section provides information on the physical characteristics, such as hardness, soundness (durability), gradation, shape and surface texture, and chemical characteristics, such as the leaching potential of chat.

##### Physical Characteristics

In an OU study (*A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report (August 2005)*), the specific gravity of the raw chat was found to be 2.67, which is similar to some commonly used aggregates, such as limestone and sandstone.

According to an ODEQ study (*Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site, Ottawa County Oklahoma, Revised June 2003*), chat consists of materials ranging in diameter from 15.875 mm (<sup>5</sup>/<sub>8</sub> inch) to

<sup>2</sup> While EPA recognizes that some chat is washed or sized prior to being used, today’s final rule does not require that chat be washed prior to its use. Therefore, imposing additional requirements for chat washing facilities would seem inappropriate.

less than 0.075 mm (the size fraction that passes the No. 200 sieve).

Since raw chat is a crushed material from mining operations, raw chat particles have fractured faces. Raw chat also has numerous inter-granular voids in the loose aggregate form. The more angular the aggregate the higher the amount of voids. The uncompacted void content or the fine aggregate angularity of raw chat was found to be 46%. This value exceeds the higher fine aggregate angularity required by most State DOTs.

Raw chat is harder than some other aggregates, such as limestone. The L.A. abrasion value (determined by the Test for Resistance to Degradation of Aggregate by Abrasion and Impact in the Los Angeles Abrasion Machine) of raw chat was found to be 18% which is lower than that of limestone (23%) used in the OU study. This makes chat a good material in road surfaces since it does not wear down as fast as other aggregates.

Cubical shape is another desirable property of a good aggregate. The coarse aggregate in raw chat (particles retained on a 4.75 mm (#4) sieve) has less than 5% flat or elongated particles. Therefore, chat is viewed as a desirable aggregate material.

State DOTs specify minimum aggregate durability indices depending on the type of road surface. In the OU study, the aggregate durability index of raw chat was found to be 78%. The insoluble residue of raw chat was found to be 98%. Oklahoma DOT has established a 40% insoluble requirement for combined aggregates used in a surface layer of hot mix asphalt, for the purpose of skid resistance. Surface treatments, like microsurfacing, have higher insoluble residue requirements. Thus, the use of insoluble aggregates like chat in hot mix asphalt surface mixes and other surface treatments can improve the skid resistance and safety of pavements.

State DOTs also specify aggregate requirements for hot mix asphalt and PCC. Most State DOTs, including Kansas, Oklahoma and Missouri, have adopted aggregate standards developed by the American Association of State Highway and Transportation Officials (AASHTO). According to AASHTO, the 0.075 mm (#200) sieve size is the dividing line between sand-size particles and the finer sized particles defined as silts and clays. These finer particles often adhere to larger sand and gravel particles and can adversely affect the quality of hot mix asphalt and Portland cement concrete. The AASHTO standards for Fine Aggregate for Bituminous Paving Mixtures (M 29-03) and Fine Aggregate for PCC (M 6-

03) specify limits for the amount of aggregate, on a percent mass basis, in hot mix asphalt and Portland cement concrete according to aggregate size and gradation. The aggregate sizes included in the AASHTO standards range from .075 mm to 9.5 mm which is within the range of particles found in raw chat. The AASHTO standards do not preclude the use of fine chat particles in hot mix asphalt or PCC. Depending on the designated grading, however, AASHTO limits particles finer than sieve size #50 in the range of 7% to 60% for aggregate in asphalt. Fine aggregate for use in concrete is limited by the States of Oklahoma and Missouri to between 5% and 30% for particles less than sieve size #50, while the corresponding values in Kansas are 7% to 30%. Therefore, chat used in asphalt or PCC must meet sizing specifications. This can be accomplished either by the raw chat meeting these specifications as is, or mixing the raw chat with other aggregates, by dry sizing, or by washing (wet sizing) the chat.

Current law requires that the chat used as an aggregate in transportation projects meet existing State Department of Transportation or Federal Highway Administration material specifications, which assure that the road surface, composed of hot, warm or cold mix asphalt, concrete or epoxy, is durable and will not degrade prematurely. As discussed below, in light of these existing requirements, EPA concluded that it was not necessary to establish any additional material specifications for the use of chat as an aggregate in federally funded transportation projects to ensure that when chat is used, it will be safe and environmentally protective.

#### Chemical Characteristics

Dames and Moore, 1993 and 1995; *Sampling and Metal Analysis of Chat Piles in the Tar Creek Superfund sites* for the Oklahoma Department of Environmental Quality, 2002, and Datin and Cates; *Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site*, Ottawa County Oklahoma, Revised June 2003, provide data on metals concentrations in washed and unwashed (or raw) chat. The Dames and Moore study indicated that total lead concentrations in the raw chat ranged from 100 mg/kg to 1,660 mg/kg, while the Datin and Cates study noted that mean total lead concentrations from the raw chat piles located throughout the Tri-State area ranged between 476 to 971 mg/kg. The AATA International, Inc. December 2005; *Draft: Remedial Investigation Report for Tar Creek OU4 RI/FS Program* found that the

concentration of lead in the raw chat ranged from 210 mg/kg to 4,980 mg/kg, with an average of 1,461 mg/kg; cadmium ranged from 43.1 mg/kg to 199.0 mg/kg, with an average of 94.0 mg/kg; and zinc ranged from 10,200 mg/kg to 40,300 mg/kg, with an average of 23,790 mg/kg.

These studies show that as chat sizes become smaller, their metals content increases. The cited Datin and Cates report, *Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site, Ottawa County Oklahoma*, Revised June 2003, shows that total metals testing of wet screened material (larger fractions) resulting from chat washing have lead concentrations which range from 116 to 642 mg/kg, a range much lower than raw chat. Therefore, the data show that chat washing generates chat aggregate (greater than sieve size #40) with considerably lower metals concentrations than raw chat.<sup>3</sup>

#### 6. What Are the Environmental and Health Effects Associated With Pollutants Released From Raw Chat?

The Tri-State Mining District includes four National Priorities List (NPL) Superfund sites that became contaminated from the mining, milling, smelting, and transportation of ore and the management practices for chat. These sites are located in Tar Creek in Ottawa County, Oklahoma, Cherokee County in southeast Kansas, and in Jasper and Newton Counties in southwest Missouri. Superfund cleanup activities related to the millions of tons of mining waste that were deposited on the surface of the ground at these sites have been designated as Operable Units (OUs). OUs are groupings of individual waste units at NPL sites based primarily on geographic areas and common waste sources.

Certain uses of raw chat have caused threats to human health and the environment as a result of the concentrations of lead, cadmium and zinc present in the chat.<sup>4</sup> Evaluation of

<sup>3</sup> The Datin and Cates report also provides TCLP testing data that indicates the dry sieve sizes greater than #40 would not exceed 5 mg/l, as well as data on wet screened material (larger fractions) that also shows that the leaching potential of this material is below 5 mg/l (1.028 to 3.938 mg/l). 5 mg/l is the level of lead that defines whether a waste is hazardous under RCRA subtitle C. Thus, this is another indication that the larger sizes of chat have lower lead concentrations than do smaller sized chat particles. (Note: As indicated earlier, chat is considered a Bevill mining waste and is thus, exempt from regulation under RCRA Subtitle C. However, we are using the TCLP leachate value for lead simply as a comparative measure to evaluate the leaching characteristics of chat.)

<sup>4</sup> Information regarding the specific threats to human health from lead, cadmium and zinc can be

raw chat also indicates that this waste in most unencapsulated uses has the potential to leach lead into the environment at levels which may cause threats to humans (*i.e.* elevated blood lead concentrations in area children). Such threats have been fully documented in Records of Decision (RODs) for the OUs at these NPL sites (See Tri-State Mining District RODs in the docket to this action). Copies of Site Profiles and RODs can be searched at: <http://www.epa.gov/superfund/sites/rods/index.htm>.

#### IV. Rationale for This Rule and Response to Comments

##### A. What Was the Process EPA Used to Develop This Action?

In developing the proposed rule, the Agency initially reviewed information concerning the environmental effects of the improper placement and disposal of chat found in the RODs cited above for the four NPL sites located in the Tri-State Mining District (Tar Creek, Jasper County, Cherokee County, Newton County). The Agency then reviewed reports which identified current or past uses of chat, primarily studies prepared to support Oklahoma Governor Keating's Taskforce (Governor Frank Keating's Tar Creek Superfund Task Force, *Chat Usage Subcommittee Final Report*, September 2000) and research on chat uses conducted by OU (*A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report August 2005*), as well as interviewed the principal authors of the OU studies to further evaluate their findings. Additionally, the Agency interviewed representatives from the Departments of Transportation in Oklahoma, Kansas, and Missouri and met with the U.S. Department of Transportation, Federal Highway Administration to discuss the use of aggregate substitutes in road surfaces and relied on the joint EPA/FHWA document of the use of wastes in highway construction [*User Guidelines for Waste and Byproduct Material in Pavement Construction*, FHWA, 1997 (<http://www.rmrc.unh.edu/Partners/UserGuide/begin.htm>)]. Furthermore, EPA met with the BIA to discuss BIA requirements for the sale of chat on Tribal lands. The Agency also conducted a series of interviews with the environmental regulatory agencies in the three involved States to further

identify acceptable versus unacceptable uses of chat. Moreover, the Agency conducted interviews with companies which either used chat at that time or had used chat previously. As part of this effort, EPA representatives visited the Tri-State area to observe the condition of chat piles and confirm the location of chat washing and asphalt companies in the area. Finally, the Agency has communicated with the tribal members in the Tri-State area to inform them about this action and seek information about current uses.

Based on our review of the reports and interviews noted above, the Agency published a Proposed Rule on April 4, 2006, in which we specifically solicited comment on a number of issues (see 64 FR 16729). The Agency received approximately 20 comments on the proposal. The Agency's response to the comments received can be found in the docket for this rule (see Response to Comments Document). In addition, the Agency conducted an external Peer Review of the risk screen conducted for the proposal. The Peer Review Panel submitted comments to the Agency and based on those comments, the Agency conducted an additional risk screen of chat dusts from milling of road surfaces containing chat to determine if such an activity presented a risk to human health and the environment. Both the original risk screen and subsequent risk evaluations are noted in the risk section of the preamble to this final rule, and are also in the Docket to this final rule. The Agency also met with representatives from the Department of Transportation to seek their input on a number of issues raised by commenters. Finally, the Agency consulted with the Tribal interests to assure that their comments were fully understood by the Agency. Based on the additional work noted above, as well as responding to comments, the Agency is today finalizing the chat rule.

##### B. What Criteria Are EPA Establishing for the Use of Chat?

###### 1. Transportation Construction Uses

Transportation construction uses of chat addressed in this final rule are those construction activities that occur as part of transportation construction projects that are funded, wholly or in part, with Federal funds. The Agency has evaluated all the transportation construction uses and has concluded that chat used in hot, warm, or cold mix asphalt, slurry seals, microsurfacing and in epoxy seals, or other uses of chat that are evaluated on a case-by-case basis will be safe and environmentally protective.

###### a. What Is the Final Action?

This final rule establishes criteria that chat used in transportation construction projects that are funded, wholly or in part, with Federal funds, must meet as a condition of receiving Federal transportation funding. Specifically, those criteria define the following uses to meet the statutory standards: chat that is used in asphalt concrete, slurry seals, microsurfacing, or epoxy seals. The use of chat also meets EPA's criteria if it is used in PCC, stabilized road base, granular road base, flowable fill, and in chip seals, provided that on a case-by-case basis: (1) Synthetic Precipitation Leaching Procedure (SPLP, EPA SW-846 Method 1312) tests are conducted on the proposed material and the leachate testing results show that concentrations in the leachate do not exceed the National Primary Drinking Water Standards for lead and cadmium and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 ug/l; or (2) EPA (or a State environmental Agency, if it chooses to do so) has determined, based on a site-specific risk assessment and after notice and opportunity for public comment, that the releases from the chat mixture in its proposed use will not cause an exceedance of the National Primary Drinking Water Standards for lead and cadmium in potential drinking water sources and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 ug/l in surface water.

EPA has also established a criterion that other chat uses will be safe and environmentally protective if they are part of, and otherwise authorized by a State or Federal response action undertaken in accordance with Federal or State environmental laws. Such response actions are undertaken with consideration of site specific risk assessments.

In addition, for all chat used in transportation construction projects that are funded, in whole or in part, using Federal funds that is not subject to the BIA Chat Use Certification requirements described in Section IV.B1, the Agency is establishing a certification requirement similar to that required by BIA. Specifically, any acquirer of the chat must submit a signed, written certification that the chat will be used in accordance with EPA's criteria. The certification will also include the location of origin of the chat and the amount of chat acquired.

The certification must be provided to the environmental regulatory agency in the State where the chat is used, except for chat acquired on lands administered

found in the *Agency for Toxic Substances and Disease Registry (ATSDR) Fact Sheet for Lead*, September 2005, the *ATSDR Fact Sheet for Cadmium*, June 1999 and the *ATSDR Fact Sheet for Zinc*, September 1995, all of which are available in the Docket to today's final rule.



by the BIA which is subject to the BIA certification requirements. The Agency is also requiring that if the acquirer sells or otherwise transfers the chat, the new owner of the chat must also submit a signed, written certification as described in this section. Most commenters did not support the certification requirement, because they believe that it would increase the cost of using chat. As noted earlier, BIA has established a chat sales program affecting chat sales from tribal lands. That program includes a certification requirement similar to that found in this rule. The Agency believes that certification is necessary to assure that chat users comply with today's criteria, as well as serving as a means to inform State environmental agencies about the use of chat in their state. The Agency has reviewed the burden on industry to fill out and maintain the certification records and does not find that such a requirement is burdensome. Moreover, the Agency believes that the certification requirement will provide important information to state environmental agencies to ensure that the chat is used as required under this rule.

This rule also requires that chat users maintain records. The Agency is requiring that the acquirer, or any other person that receives a copy of the certification, maintain a copy of the certification in its files for three years following transmittal to the State environmental regulatory agency. If the use is based on a case-by-case basis, the acquirer must maintain copies of any SPLP leachate testing results or any site-specific risk assessment for three years.

b. What is the rationale for the Rule?

The Agency is basing this action on our review of various studies and data that show that certain uses of chat are safe and environmentally protective.

i. Hot Mix Asphalt

There are a number of factors which lead us to conclude that chat used in hot mix asphalt is safe and environmentally protective:

Several studies have been conducted on the use of chat in hot mix asphalt. The most comprehensive study was conducted by the OU School of Civil Engineering and Environmental Science. OU published their findings in a report titled, *A Laboratory Study to Optimize the Use of Raw Chat in Hot Mix Asphalt for Pavement Application: Final Report* (August 2005). OU tested the durability and leaching potential of a variety of mixtures of hot mix asphalt with raw chat for road surfaces and for road bases. In addition, OU milled (sawed) samples to simulate weathering.

The Agency relied on these findings as one of the principal sources of data supporting the use of chat in hot mix asphalt road surfaces and asphalt road bases. The OU study also confirms the findings of an earlier study conducted by the U.S. Army Corp of Engineers (*Tar Creek Superfund Site, Ottawa County, Oklahoma, Final Summary Report: Chat—Asphalt Paved Road Study* USACE—Tulsa District, February 2000). Specifically:

- Comparison of the Synthetic Precipitation Leaching Procedure (SPLP) results of milled (weathered) chat asphalt samples in the OU study with the National Primary and Secondary Drinking Water Standards ([www.epa.gov/safewater/mcl.html](http://www.epa.gov/safewater/mcl.html)), without dilution and attenuation, show that milled surface and road base mixtures did not exceed the primary drinking water standard for lead<sup>5</sup> (0.015 mg/l) or cadmium (0.005 mg/l). The OU results also show that milled asphalt road bases and surfaces did not exceed the secondary drinking water standard for zinc (5 mg/l).<sup>6</sup>

- The TCLP test was designed as a screening test to simulate leaching of materials in a municipal solid waste landfill. The SPLP test is also a screening test to simulate leaching of materials when exposed to acid rain. It is highly unlikely that road surfaces would be exposed to leaching conditions found in municipal solid waste landfills. Therefore, the Agency believes that of these two tests, the SPLP tests are likely to better mimic the leaching potential of such mixtures when they are to be used in road construction.

- The OU study tested unweathered and milled samples. The Agency believes milled samples represent worst case scenarios because milling exposes more surface area to leaching.

- In a dissertation submitted to the University of New Hampshire titled, *Contributions to Predicting*

<sup>5</sup> The National Primary Drinking Water Regulations set a Maximum Contaminant Level Goal of zero and a Treatment Technique action level of 0.015mg/l for lead.

<sup>6</sup> Several hot mix asphalt samples were also tested in the OU study using the Toxicity Characteristic Leaching Procedure (TCLP). For surface samples, TCLP average concentrations for lead ranged from <0.005 mg/l to a high of 0.46 mg/l. TCLP average concentrations for cadmium ranged from <0.010 mg/l to 0.223 mg/l and zinc concentration averages ranged from 11.3 mg/l to 28.53 mg/l. Road base samples usually have higher metals concentrations than do surface samples. For road base samples, average TCLP lead concentrations ranged from 0.069 mg/l to 2.008 mg/l, while average TCLP cadmium concentrations ranged from 0.011 mg/l to 0.087 mg/l and average TCLP zinc concentrations ranged from 19.9 mg/l to 41.33 mg/l.

*Contaminant Leaching from Secondary Material Used in Roads*, Defne S. Apul, September 2004, the author noted that if pavement is built on highly adsorbing soils, the concentrations of leached contaminants reaching groundwater are more than several orders of magnitude lower than the MCLs.

The ODEQ report entitled, *Summary of Washed and Unwashed Mining Tailings (Chat) from Two Piles at the Tar Creek Superfund Site, Ottawa County Oklahoma*, Revised June 2003, also evaluated leachate from asphalt containing chat removed from the Will Rogers Turnpike located near Quapaw, Oklahoma. This evaluation was conducted to determine if asphalt concrete containing chat that is removed at the end of its useful life poses contamination threats from metals leaching into the environment. TCLP results for lead ranged from less than 0.050 mg/l to 0.221 mg/l. There are no SPLP test data in this report. However, based on best professional judgment and review of TCLP versus SPLP results, EPA believes that if SPLP tests were conducted, there would be a reduction in lead concentrations of approximately one order of magnitude as compared to the results of TCLP tests. Therefore, we believe that SPLP results would not exceed the MCL for lead. Based on these results, EPA does not believe the disposal of chat asphalt should present risks to the environment. The Agency sought comment on whether data was available which would further clarify whether the leachate potential from end of life use of chat in asphalt presented any threats. The Agency did not receive any comments or information that disproves the Agency's contention that it is unlikely that end of life chat asphalt will adversely affect the environment.

Finally, the Peer Review Panel that reviewed and commented on the risk screen for the proposed rule concluded that the use of chat in hot mix asphalt road surfaces and in asphalt road bases are safe and environmentally protective. The Agency, therefore, concludes that the use of chat in hot mix asphalt for pavement (which accounts for about 95% of the current chat usage), asphalt base, and asphalt sub base are safe and environmentally protective. EPA does not believe that it is necessary to establish specifications of what constitutes "hot mix asphalt" because transportation construction uses are required to comply with Federal and State Department of Transportation material specifications. These specifications delineate requirements which ensure that when chat is used in hot mix asphalt, the resulting product will be structurally stable. It is

recommended that chat users first determine if the proposed use meets State or Federal DOT materials specifications, since adherence to them is separately required under current law.

ii. Slurry Seal, Microsurfacing, Warm Mix Asphalt, Cold Mix Asphalt, and Epoxy Seal

While the proposal limited the use of chat as a direct ingredient in hot mix asphalt (including use as road pavement, asphalt base and asphalt sub base), many commenters requested that the Agency expand the scope of the criterion to include other road surface uses associated with asphalt that they believed retard the leaching of metals in chat in the same manner as does hot mix asphalt, including slurry seals, microsurfacing, cold mix asphalt, epoxy seals and chip seals. Commenters did not provide data to support their assertions. The Agency reviewed published information regarding the binding and durability characteristics of these uses and found that, except for chip seals, they would retard the leaching of metals in the same manner as hot mix asphalt. To further confirm this information, we met with Department of Transportation officials to determine which of these applications, if any, do in fact encapsulate chat similarly to hot mix asphalt. Based on those discussions and our review of published information, the Agency's criteria includes the use of chat in slurry seals, microsurfacing, warm mix asphalt, cold mix asphalt, and epoxy seals as safe and environmentally protective in transportation construction projects that are carried out in whole, or in part, using Federal funds, but does not include the use of chat in chip seals. Specifically:

- Slurry seals and microsurfacing involve the application of a mixture of asphalt, chemical binders, petroleum

liquids and aggregate on the top surface of roads. This "resurfacing" meets a number of needs, including repairing fine fractures in the road surface, extending the life of the road, and improving skid resistance. EPA reviewed literature on these uses and found that these uses have the same engineering characteristics as hot mix asphalt. EPA also met with the FHWA, U.S. DOT to determine if microsurfacing and slurry seals retard the leaching of metals in the same manner as hot mix asphalt. FHWA indicated that slurry seals and microsurfacing would bind metals in the same manner as hot mix asphalt and would result in similar leaching results. Based on this conclusion and our review of the literature, the Agency today views the use of chat in slurry seals and microsurfacing as safe and environmentally protective.

- As part of EPA's discussions with FHWA, we also discussed the ability of warm mix asphalt and cold mix asphalt to encapsulate and bind chat. Warm mix asphalt is a combination of asphalt, asphalt emulsions, paraffin or esterified wax, and mineral additives that allow the materials to be worked at temperatures much lower than hot mix asphalt. Cold mix asphalt is a combination of asphalt, petroleum liquids, soaps, and other chemicals which allow the materials to be worked with when cold. FHWA confirmed that warm and cold mix asphalt would encapsulate chat in the same manner as hot mix asphalt, and thus, would likely result in similar leaching results. Based on Agency conversations with FHWA and our review of the literature, the Agency also views the use of chat in warm and cold mix asphalt as safe and environmentally protective.

- EPA also discussed the use of epoxy binders on bridge decks with FHWA. Commenters and one of the chat washing companies noted that some

chat is sold to companies which mix chat with epoxy binders for use as an anti-skid coating for highway bridges. EPA evaluated the engineering durability of these epoxies and found that they are equal to or are more durable than asphalt. FHWA also confirmed that the use of epoxies would encapsulate chat equally to the binding found with asphalt, and thus, would result in similar leach results. Based on this conclusion, the Agency today views the use of chat in epoxy binders for anti-skid purposes as safe and environmentally protective.

In conclusion, the use of chat in hot mix asphalt, slurry seals, microsurfacing, warm mix asphalt, cold mix asphalt, or epoxy seals in transportation construction projects funded, in whole or in part, with Federal funds is safe and environmentally protective. Such uses do not require approval from EPA prior to their use, as long as certification and recordkeeping requirements are met.

iii. Concrete, Flowable Fill, Granular Road Base, Stabilized Road Base and Chip Seals and Conditions for Use

This rule regarding the use of chat in concrete pavement has changed from that presented in the April 2006 proposal and this rule sets additional requirements on chat used in PCC. In particular, the proposed rule allowed chat used as an aggregate in PCC without any testing or other requirements. The Agency proposed the use of chat in PCC based on the following data and information:

- An undated OU Surbec-Art Environmental study<sup>7</sup> and a 2000 OU study<sup>8</sup> conducted the only known assessments of total metals content and TCLP testing of concrete matrices mixed with raw chat. The 2000 OU results are also presented in the 2005 OU study. The results from those two studies are presented in the following Table:

	S1		S2		C40	
	Total (mg/kg)	TCLP (mg/l)	Total (mg/kg)	TCLP (mg/l)	Total (mg/kg)	TCLP (mg/l)
Lead .....	178	0.92	379	0.17	150	1
Cadmium .....	<sup>R</sup> 30	0.09	<sup>R</sup> 35	0.12	35	0.1
Zinc .....	4200	0.23	4400	0.16	4100	.....

<sup>R</sup> rounded to nearest whole number.

- While not a direct measure of the leaching potential of chat contained in PCC, waste stabilization technologies and their effectiveness are well defined

in the Agency's *Final Best Demonstrated Available Technology (BDAT) Background Document for Universal Standards, Volume A, July*

*1994 and Proposed Best Demonstrated Available Technology (BDAT) Background Document for Toxicity Characteristic Metal Wastes D004-D011,*

<sup>7</sup> Preliminary Report on the Findings of Environmental and Engineering Tests Performed on

Mine Residual Materials from Ottawa County, Oklahoma.

<sup>8</sup> Development of Holistic Remediation Alternatives for the Catholic 40 and Beaver Creek.

July 1995. One of those technologies is stabilization or encapsulation of the waste in a cement matrix, to reduce the mobility of the metals in the waste. That is, the metals are chemically bound into a solid matrix that resists leaching when water or a mild acid comes into contact with the waste. The Agency evaluated contaminant levels in unstabilized versus stabilized wastes to determine the reduction in mobility of metals, including lead and cadmium, when those wastes were stabilized in a cement matrix. These results indicate that stabilization with cement generally reduced lead and cadmium mobility by two to three orders of magnitude (see Table A4 of the July 1994 document cited above).

However, the Peer Reviewers and commenters who reviewed and commented on the risk screen analyses to the proposed rule raised concerns with the lack of data presented on the stabilization of chat in concrete. Specifically, the Peer Reviewers indicated that there were only three samples analyzed and that given the limited data, it was not possible for them to determine if risks existed from the use of chat in concrete. While the Peer Reviewers noted that it was likely that the concrete bound the metals in a similar fashion as asphalt, they also did not believe there was enough data or information to reach a definitive conclusion.

Some commenters also argued with the lack of leaching data for chat in PCC and questioned whether the Agency has sufficient information to finalize the proposal. Other commenters also noted that there were significant differences between stabilizing high metal bearing wastes with cement and the mixing of chat into PCC pavement. Commenters indicated that from a risk standpoint, concrete road surfaces after aging contain fine surface fractures that would allow rain water to percolate through the surface into groundwater. The Agency acknowledges these differences.

Commenters also noted that it was unlikely that chat would be used in concrete pavement since it can be a poor performing aggregate when used in PCC due to potential alkali-silica reaction (ASR) and freeze/thaw durability issues. This is the reason that chat is not an approved PCC aggregate by Oklahoma DOT. At proposal, the Agency also evaluated highway design specifications; *i.e.*, layering of compacted material and the movement of water through concrete (hydraulic

conductivity,<sup>9</sup>) and initially thought that such designs in general retard the movement of rainwater through concrete and into groundwater. Commenters questioned this conclusion. As a result, the Agency met with the FHWA to determine how extensively water flowed across and through concrete pavements. FHWA indicated that there is considerable water flow through concrete pavement either through flow out of the joints or cracks, or through flow from the shoulders downward into the base. Based on Agency discussions with FHWA, the Agency no longer believes that such designs in general retard the movement of rainwater through concrete.

Commenters also requested that the rule allow the use of chat in flowable fill. However, commenters did not provide information to support this request. While flowable fill involves the use of a pozzolanic material (cement), the ability of flowable fill to bind chat is unclear because flowable fill uses cement in amounts as little as 3 to 5 percent by weight. Therefore, the Agency does not have sufficient information to allow this use without additional information or setting additional conditions.

In addition, commenters requested that the rule allow the use of chat as granular road base. Such bases are typically constructed by spreading aggregates in thin layers and compacting each layer to reduce the stress applied to the sub grade layer and providing drainage for the pavement structure. The Agency acknowledges that some chat can meet state or Federal materials specifications for this use. These commenters did not, however, provide any information to support this request. As noted above, some washed chat has significantly lower lead concentrations than raw chat. However, as FHWA notes, highway designs retard some, but not all of the water flowing across and into ground water. Such water movement could leach metals from the chat road base into ground water. Because the Agency did not receive additional information on the leaching characteristics of this use, the Agency is unable to allow it without additional information or setting additional conditions.

Still other commenters requested that the rule allow the use of chat in stabilized base. Stabilized base uses chat mixed with cement or other pozzolanic materials to increase their bearing

weights. This additional material should reduce the mobility of the metals. However, the stabilized road base may use cement or other materials in amounts corresponding to 4 to 6 percent by weight which is less than that used in PCC. The commenters did not provide information to support this request. While some binding of metals is likely to occur, the Agency does not have sufficient information to allow this use without additional information or setting additional conditions.

Finally, at proposal, the Agency did not include an evaluation of the use of chat in chip seals. Commenters requested that the rule allow the use of chat in chip seals. These commenters did not, however, provide information to support this request. Chip seals involve application of an asphalt liquid on top of an existing road surface. After the application of the asphalt liquid, an aggregate (such as chat) is placed on the asphalt liquid and may then be rolled into the liquid. It is possible that several applications can be applied. In some circumstances, the aggregate layer is coated with asphalt liquids. EPA met with the FHWA to determine if chip seals were generally viewed as being able to retard the leaching of metals in the same manner as hot mix asphalt. FHWA indicated that under most circumstances, asphalt used in chip seals did not always fully coat chat particles, and chat could be released into the environment. Given the concerns raised by FHWA and the lack of data on this use, the Agency concludes that it does not have sufficient information to allow the use of chat in chip seals without additional information or setting additional conditions.

A number of commenters also noted that some washed chat does not test hazardous under the TCLP and that restricting all uses of raw chat, or encapsulated uses where leach data are not available, was overly restrictive.<sup>10</sup> The Agency has reviewed the TCLP/SPLP test data of raw chat and recognizes that some washed chat has significantly lower lead and zinc concentrations than raw chat. Nevertheless, the Agency remains concerned that the use of raw chat or chat mixed with other materials could pose risks to human health and the environment, based on the physical and chemical characteristics of the material, as well as the history of its use.

<sup>10</sup> While the Agency is not requiring that chat be washed or dry sized prior to being used, the rules also do not prevent a person from washing or dry sizing chat before it is used either directly or in combination with another material.

<sup>9</sup> According to the Portland Cement Association, the hydraulic conductivity of a typical Portland cement concrete is  $1 \times 10^{-11}$  cm/sec.

After careful evaluation of the comments received and the report from the Peer Reviewers, the Agency believes that the limited amount of leaching data on chat used in PCC, flowable fill, granular road base, stabilized road base, and chip seals do not provide enough support to determine that these uses of chat will be safe and environmentally protective.

In the proposal, the Agency requested comment on whether there was a need for leachate testing of chat used in hot mix asphalt or in PCC (see 54 FR 16738). Most commenters noted that the use of chat in hot mix asphalt was protective and that a requirement of additional SPLP testing was not warranted, however, they did not provide information to support this position. Nevertheless, as already discussed, the Agency believes there are sufficient data, particularly that provided in the 2005 OU study, to support its finding that chat used in hot mix asphalt, as well as warm mix asphalt, cold mix asphalt, slurry seals, microsurfacing, and in epoxy seals will be safe and environmentally protective without the need for further leachate testing.

Other commenters, while they did not call for specific leachate testing of chat used in PCC, did raise concerns as to whether there were sufficient data to reach the conclusion that chat used in PCC or other uses was protective. The Agency agrees that insufficient data exist to conclude that the use of chat in PCC would be safe and protective. Therefore, the Agency has concluded that additional information, either through the use of SPLP testing or through a site-specific risk assessment, is necessary to be able to conclude that the use of chat in PCC, as well as flowable fill, granular road base, stabilized road base, and chip seals would meet the statutory standards. Specifically, EPA has established a criterion defining the use of chat in PCC, flowable fill, granular road base, stabilized road base, and chip seals as safe and environmentally protective if, on a case-by case basis, either: (1) Synthetic Precipitation Leaching Procedure (SPLP, EPA SW-846 Method 1312) tests are conducted on the proposed material and the leachate testing results show that concentrations in the leachate do not exceed the National Primary Drinking Water Standards for lead and cadmium and the fresh water chronic National Recommended Water Quality Criterion

for zinc of 120 µg/l<sup>11</sup>; or (2) EPA (or a State environmental Agency, if it chooses to do so) has determined, based on a site-specific risk assessment and after notice and opportunity for public comment, that the releases from the chat mixture in its proposed use will not cause an exceedance of the National Primary Drinking Water Standards for lead and cadmium in potential drinking water sources and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 µg/l in surface water.

If a chat user chooses to conduct SPLP leachate testing and the results indicate that they do not exceed the standards noted above, the user does not need to submit the data to EPA (or a state, if it chooses to do so) for review and approval. However, the regulation requires that the user submit a certification statement to the environmental regulatory agency in the State where the chat is acquired and maintain copies of the SPLP testing results for a period of three years.

If a chat user chooses to prepare a site specific risk assessment, the assessment must be submitted to EPA, or the State environmental agency, at the State's option, prior to use. EPA or the State environmental agency will review the site-specific risk assessment and determine, after notice and comment, if the use is safe and environmentally protective (see Section iii c below). After EPA or the State makes its determination, the user will still be required to meet the certification and recordkeeping requirements described in Section IV. B. 1. of this final rule.

#### iv. Sizing of Chat Prior to Use

Finally, this final rule is not requiring that chat be sized before it is used because chat used in transportation construction projects must meet material specification standards established by either the State or Federal DOT. Those specifications set their own size standards which can be met in a variety of ways, such as by sizing chat or by blending chat with other sized aggregate. Since existing specifications address the sizing issue, this rule need not do so. However, some commenters recommended that the Agency allow any use of sized chat since it has lower lead concentrations than raw chat. Studies of the lead concentrations found in raw chat piles indicate that those concentrations vary from pile to pile. Data indicates that particles finer than sieve size #40 in raw

chat tend to have a TCLP for lead of greater than 5 mg/l, while larger particles in the raw chat tend to have a TCLP for lead of less than 5 mg/l. While the Agency acknowledges these results, commenters did not provide information showing a lack of risks from other uses of washed chat not covered by this rule. As a result, the Agency is unable to allow these other uses unless the user can show the use is protective through a case-by-case demonstration as discussed previously.

#### v. Use of the SPLP Versus the TCLP

EPA developed the TCLP as a tool to predict the leaching potential of constituents from waste in a municipal solid waste landfill. The TCLP method is used to determine if a waste is hazardous under 40 CFR 261.24 (see the Toxicity Characteristic rule, 55 FR 46369; November 2, 1990). The TCLP is also used in listing hazardous wastes to estimate leachate concentrations for use in groundwater modeling (for example, see the petroleum listing, 63 FR 42110, August 6, 1998). The TCLP leaching solution contains acetic acid that is adjusted to a pH of 4.93 or 2.88, depending on the acidity of the waste sample.

On the other hand, EPA developed the SPLP as a method to predict the leaching from wastes or soils under exposure to the slightly acidic, dilute solution generated by normal rainfall. The SPLP test uses a leach solution which mimics acid rain, while the TCLP uses a leach solution which mimics acids formed in municipal landfills. In past actions, EPA has recognized that the TCLP's use of organic acids may not be appropriate for disposal scenarios that do not involve municipal landfills. For example, in the proposed rule for management and disposal of lead-based paint debris, EPA used the SPLP to assess leaching from landfills that do not accept municipal wastes (see 63 FR 70189; December 18, 1998). Similarly, EPA utilized the SPLP in screening low hazard wastes as part of its 1989 Bevill determination (see 54 FR 36592; September 1, 1989). The use of chat in transportation construction projects would preclude chat from being exposed to the conditions found in municipal landfills. Chat used in transportation construction projects will, however, be exposed to rainfall that then enters the groundwater.

In determining which leach test to require, the Agency believes that the SPLP is the more appropriate test. As stated previously, the TCLP was designed as a screening test to simulate the leaching potential of wastes in municipal solid waste landfills. Since it

<sup>11</sup> It should be noted that this case-by-case showing does not require public notice and comment.

is highly unlikely that road surfaces would be exposed to leaching conditions found in municipal landfills, and because the SPLP test is a more likely scenario that would simulate the leaching potential of metals in chat used in transportation construction projects, we are requiring that if chat is to be used in PCC, granular road base, flowable fill, stabilized road base or chip seals, the user make a case-by-case demonstration using the SPLP test.

vi. Rationale for Setting National Primary Drinking Water Standards Versus National Recommended Water Quality Criteria, and Dilution and Attenuation Factors (DAFs)

Because the Agency is requiring leachate testing if chat is to be used in PCC, granular road base, flowable fill, stabilized road base or chip seals, the Agency also must establish specific numeric criteria. In the proposal, the Agency requested comment on this issue. Specifically, the Agency stated, "For example, the Agency could specify that the results of testing would need to meet the Primary and Secondary Drinking Water Standards for lead, cadmium, and zinc. The Agency also solicits comment on whether the leachate should be measured against the National Recommended Water Quality Criteria which address acute and chronic biological effects." The Agency also requested comment on whether a Dilution and Attenuation Factor should be applied to reflect how contaminant concentrations may change as they move through the environment (see 64 FR 16738-39). The Agency received only one comment on this issue. The commenter suggested that SPLP results should be measured against state water quality standards for lead, cadmium and zinc, and the Agency should use the chronic criteria for protection of aquatic life.

The Agency disagrees with the commenter that we should use the State water quality criteria instead of the National Primary Drinking Water standards for lead and cadmium. State water quality criteria are established for the protection of aquatic life and human health in surface water for approximately 150 pollutants. National Primary Drinking Water standards protect public health by ensuring safe drinking water and protecting ground water. EPA has selected the National Primary Drinking Water standard for lead and cadmium since those standards are most protective of human health. The Agency has selected these standards for a variety of reasons. First, review of the Tar Creek Superfund site RODs indicated that one of the metals

of concern is lead. The 2005 OU studies on the use of chat in asphalt also indicated that lead, cadmium and zinc are the principle heavy metals of concern in chat. Those conclusions are based on review of a series of studies which evaluated the metals concentrations in raw chat piles. They are also the criteria that EPA used in determining that chat used in hot mix asphalt is safe and environmentally protective.

RODs also show that runoff from chat piles may be adversely affecting biological resources in streams throughout the Tar Creek Superfund site. Agency review of the environmental impacts of zinc (see ATSDR report on zinc) confirms that it can adversely affect aquatic species. Since the Agency agrees with the commenter that aquatic life should be protected, the Agency has decided to use the freshwater chronic National Recommended Water Quality Criteria for zinc of 120 µg/l. It should be pointed out that there is no National Primary Drinking Water standard for zinc and that the National Secondary Drinking Water standard for zinc is a non-enforceable guideline regulating contaminants that may cause cosmetic effects or aesthetic effects in drinking water. The Agency believes it is more appropriate to use the National Recommended National Water Quality Criteria for zinc since it addresses aquatic toxicity, as opposed to the National Secondary Drinking Water standard which addresses cosmetic and aesthetic effects.

As noted above, other commenters stated that they did not believe leachate testing is necessary when chat is mixed with asphalt or concrete. They asserted that such uses were safe and environmentally protective. With respect to most uses of chat in asphalt; *i.e.*, hot mix asphalt, warm mix asphalt, cold mix asphalt, slurry seals, and microsurfacing, the Agency agrees with the commenters. However, as stated previously, there is insufficient data or evidence that other uses of chat; *e.g.*, in PCC, granular road base, flowable fill, stabilized road base or chip seals are safe and protective. This final rule allows these uses of chat in transportation construction projects if the user conducts SPLP testing and the leachate does not exceed the National Primary Drinking Water Standards for lead and cadmium and the freshwater chronic National Recommended Water Quality Criteria for zinc of 120 µg/l.

At proposal, the Agency also solicited comment on whether Dilution and Attenuation Factors (DAFs) should be applied to the leachate criteria if such

criteria were established. The Agency received only one comment on this issue. The commenter suggested that to assess surface water quality, a DAF of 100 times the Water Quality Criteria be used, while for groundwater no DAF be used and reliance should be directly on the primary MCLs. This rule is not establishing DAFs due to the lack of data the Agency has regarding the leachate potential for uses requiring SPLP testing, a lack of data to properly establish DAFs which would assure that chat use is safe and environmentally protective, and because the Agency did not use DAFs in evaluating the use of chat in hot mix asphalt. Therefore, we are requiring that chat used in PCC, granular road base, flowable fill, stabilized road base or chip seals undergo SPLP testing prior to its use and the results compared to the National Primary Drinking Water Standards for lead and cadmium and the freshwater chronic National Recommended Water Quality Criteria for zinc of 120 µg/l, without DAFs. Again, if the test results do not exceed the National Primary Drinking Water Standards for lead and cadmium and the freshwater chronic National Recommended Water Quality Criteria for zinc, the test results do not need to be submitted to EPA or the State for review and approval.

vii. Rationale for Use of Site-Specific Risk Assessments

As noted above, a chat user can conduct SPLP testing prior to use in PCC, granular road base, flowable fill, stabilized road base or chip seals to demonstrate, on a case-by-case basis, that the use of chat in such uses are safe and environmentally protective. If the results of such testing exceed the standards noted above, the chat user may still make another case-by-case showing by conducting a site-specific risk assessment. Our rationale for allowing chat uses based on site-specific risk assessments is to encourage greater use of chat provided the uses are safe and protective. We believe site-specific risk assessments conducted according to EPA guidelines referenced below will provide the necessary data to determine whether a proposed use is safe and protective. The Agency received comments on the April 4, 2006 proposal requesting that EPA allow these uses of chat. Some commenters argued that allowing these uses would encourage greater use of chat and facilitate the elimination of chat piles. They also suggested that these uses would be more protective of human health and the environment than the chat piles, however, the commenters did not

provide data or evidence to show that these uses are in fact safe and protective. Nevertheless, EPA agrees with the commenters that encouraging chat use, as long as uses are safe and environmentally protective, would lead to a quicker drawdown of the chat piles and ultimately benefit the communities where the piles are located. As a result, the use of chat in PCC, granular road base, flowable fill, stabilized road base or chip seals will be allowed in transportation construction projects if there is a demonstration through a site-specific risk assessment, as described below, that the use is safe and environmentally protective.

Such risk assessments involve analyses of how the leachate moves into surface or groundwater and whether metals concentrations down gradient from the chat use location will exceed relevant standards. Therefore, risk assessments involve the modeling of leachate in the environment and findings of whether, after such movement, health or environmental based standards are exceeded. This type of surface and groundwater modeling involves analysis of the type and concentration of metals in the leachate and their mobility. A commenter noted that the Agency should compare the results of modeling of leachate movement in ground water against the National Primary Drinking Water standards as the basis in determining if a use is protective. We generally agree with this position, as it applies to lead and cadmium. However, in some cases, drinking water standards may not be relevant for ground water, for example where it is already contaminated so that it is not suitable for drinking, and controls are in place to prevent consumption. Also, where the ground water drains into surface water, the reviewing agency should consider the freshwater chronic Water Quality Criteria for zinc of 120 µg/l.

EPA, or the State environmental agency, if the State chooses to do so, will determine whether the proposed use is safe and environmentally protective based on the information in the site-specific risk assessment. The agency conducting the evaluation may request additional information from the chat user to assure that the risk assessment meets EPA or State criteria and there is sufficient information to determine if the proposed use is safe and environmentally protective.

EPA, or the state if it chooses to do so, will solicit public input by a number of means; for example, it can publish its proposed determinations in a local newspaper, prior to making a final determination. In addition, EPA will

provide sufficient time for the public to review and comment on the proposed decision. For example, EPA provides 45-days for public review and comment of proposed permit decisions under the hazardous waste regulations. Such timeframe may also be appropriate in this case. States might achieve the same level of public input by following a similar approach.

If a chat user decides to conduct a site-specific risk assessment, it is recommended that they consult with EPA or the State environmental agency to discuss how best to conduct the risk assessment to reflect existing site conditions and receptors.

EPA has established guidelines on how to conduct risk assessments. These guidelines were developed to help guide EPA scientists in assessing risks to human health from chemicals or other agents in the environment. They also inform EPA decision makers and the general public about these procedures. When risk assessments are conducted, we recommend that these guidance documents be utilized (see [http://cfpub.epa.gov/ncea/cfm/nceaguid\\_human.cfm](http://cfpub.epa.gov/ncea/cfm/nceaguid_human.cfm)). EPA's Superfund program has also developed guidance on how to conduct human health and ecological risk assessments. Those guidance documents can be accessed at: [http://www.epa.gov/oswer/riskassessment/superfund\\_hh\\_exposure.htm](http://www.epa.gov/oswer/riskassessment/superfund_hh_exposure.htm).

#### viii. Uses Authorized by a State or Federal Response Action

This rule also establishes a criterion that other uses of chat in transportation construction projects funded, in whole or in part, with Federal funds will be safe and environmentally protective if they are part of, and otherwise authorized by, a State or Federal response action undertaken in accordance with Federal or State environmental laws. Such actions are undertaken with consideration of site-specific risk assessments, which account for the full variety of conditions at the site, such as existing contamination in assessing risks to human health and the environment. For example, Region 7 assessed the protectiveness of using unencapsulated chat as road base for a proposed highway bypass and, as a result of a site-specific risk assessment, determined that such use, compared to other alternatives, was a more protective action (*Engineering/Cost Analysis—Highway 71, Jasper County, Missouri*, USEPA Region 7, August 2000).

This approach was included in the proposal and the Agency did not receive any adverse comments on this approach. The Agency also discussed

this option during the comment period with State environmental regulatory agencies who indicated that they supported the ability to utilize chat as a result of their response actions.

#### ix. Certification

At proposal, the Agency noted that the rule should include a certification requirement. A number of commenters objected to this requirement since they argued that this type of reporting would increase the cost of using chat and therefore discourage its use. The Agency noted at that time that the BIA had established a similar certification requirement for chat sold from lands under their authority.

The Agency does not agree that this rule's certification requirements will place an undue financial burden on chat users (see Economic impact section of this rule). In addition, the Agency believes that the certification requirement is necessary to assure that chat users comply with today's action, and that it is not used in a manner that would necessitate Federal or State cleanup actions. The certification will also serve as a means to inform State environmental agencies about the use of chat in their state.

This final rule requires that chat users must submit a signed, written certification to the environmental regulatory agency in the State where the chat is to be used within 30 days of the date of acquisition. The certification will contain the following information: location of origin of the chat, amount of chat acquired, and a Certification Statement that the chat used in this transportation project will meet the criteria established by this rule. If the chat is sold or otherwise transferred to another party, the acquirer shall provide a copy of the certification to the new owner of the chat. The new owner shall submit a certification according to § 278.4(a)(1). The new certification supersedes all previous certifications.

The acquirer of chat, and any other person that receives the chat, will also maintain copies of all of the following for three years; (a) A copy of the certification following transmittal to the State department(s) of the environment, and, as appropriate, (b) any SPLP testing results, or (c) any site specific risk assessments.

#### 2. Non-Transportation Uses—Cement and Concrete Projects

Title VI of Section 6018 of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005 (HR 3 or "the Act"), amended Subtitle F of the Solid Waste Disposal Act (42 U.S.C. 6961 *et seq.*) by adding Sec. 6006. This

provision also requires the Agency to develop environmentally protective criteria for the safe use of chat in cement and concrete projects. However, these criteria are only guidance and are not Federally enforceable since the Act requires only that transportation construction projects funded, in whole or in part, with Federal funds meet the criteria established in this rule.

Non-transportation uses of chat include its use as a raw material in the manufacture of cement and as an aggregate in PCC. This final rule establishes criteria as guidance for chat used in cement and concrete for non-transportation, non-residential projects. Specifically, chat used in cement and concrete in non-transportation construction projects should only be used in non-residential construction projects, and for structural purposes if, based on a case-by-case basis, a demonstration shows that the proposed use of chat is safe and environmentally protective. The remainder of this section discusses the approach and rationale for the approach taken.

a. What is our approach?

Based on the lack of leaching data available on the use of chat in PCC, the Agency is establishing guidance that chat used in cement and concrete projects for non-transportation uses rely on the same approach taken for the transportation use of chat used in PCC. That is, for such uses, the Agency recommends that chat only be used in cement and concrete for non-transportation, non-residential construction projects if, on a case-by-case basis, either: (1) Synthetic Precipitation Leaching Procedure (SPLP, EPA SW-846 Method 1312) tests are conducted on the proposed material and the leachate testing results show that concentrations in the leachate do not exceed the National Primary Drinking Water Standards for lead and cadmium and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 µg/l; or (2) EPA (or a State environmental Agency, if it chooses to do so) has determined, based on a site-specific risk assessment and after notice and opportunity for public comment, that the releases from the chat mixture in its proposed use will not exceed the National Primary Drinking Water Standards for lead and cadmium in drinking water sources and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 µg/l in surface water. It is recommended that such a finding should be subject to public notice and comment before any decision is final.

At proposal, the Agency sought comment on whether it should place some restrictions on the use of chat in cement and concrete in non-transportation projects. The proposal offered a restriction that chat used in such non-transportation projects be limited to non-residential uses. The Agency assessed information about potential exposure of metals in cement and concrete containing chat when used for residential purposes and was unable to find data on whether such use presented risks to human health or the environment. Due to the lack of information, the Agency proposed to limit potential exposures by limiting chat in cement and concrete to only non-residential uses. That is, the guidance would allow, after SPLP testing or site-specific risk assessment, chat in cement or concrete to be used in commercial and industrial uses. Some commenters supported this limitation to non-residential uses to limit potential human exposure to lead. Other commenters requested that such uses also be allowed in residential structural uses. However, the Agency did not receive data or information supporting this request. Considering the lack of data, the range of risks related to the residential use of chat in cement and concrete remains largely unknown, and that there is the potential for these uses to be used for "sham recycling," the Agency believes it is prudent to maintain the non-residential restriction in our guidance, even though we recommend in this rule that a case-by-case demonstration be made that such use is safe and environmentally protective.

b. What is the rationale for this guidance?

As noted previously, the Peer Review Panel that reviewed the risk screen document and commenters to the proposed rule indicated that there was insufficient leachate data to characterize the risk from the use of chat in cement and concrete. Therefore, as we discussed previously, this guidance recommends that for non-transportation construction projects, chat only be used in cement and concrete for non-residential uses and only if a case-by-case showing is made, based on SPLP testing or a site-specific risk assessment, that the proposed use is safe and environmentally protective.

In the past, chat has been used in the manufacture of cement and used in concrete for building foundations and roads. Ash Grove Cement, in a communication with EPA (Memo to File: *Conversation with Ash Grove Cement Regarding Use of Chat*, which is

available in the docket to this final rule), indicated that it had produced cement clinker in 2001–2003 using chat as a silica substitute. According to Ash Grove, the clinker produced with chat met American Society for Testing and Materials (ASTM) standards for clinker. However, Ash Grove is no longer producing cement with chat. The Agency also reviewed published data and conducted interviews with chat sellers and State regulators and determined that chat is not currently being used in cement manufacturing or in non-transportation PCC projects.

Pursuant to section 6006(a)(1) of the Act, the Agency reviewed the possible use of chat as aggregate in concrete, and as it did in its transportation construction projects evaluations, concludes that certain non-transportation uses of chat in concrete may be safe and environmentally protective. However, due to the lack of data for non-transportation uses, information is required that shows such uses are protective. Consequently, EPA recommends that using chat in cement and concrete be allowed only if a case-by-case showing is made that shows such use is safe and environmentally protective (see discussion under concrete in transportation uses for further details of the approach recommended and our rationale). To meet this goal, the Agency recommends that such non-transportation uses of chat in cement and concrete projects be limited to non-residential foundations, slabs, concrete wall panels, retaining walls, commercial and industrial parking areas and sidewalks. Other non-residential uses also may be approved after a review of SPLP test data or a site-specific risk assessment as described throughout this final rule. As noted previously, we would not recommend that chat be used in residential settings (e.g., concrete countertops, sidewalks, foundations, slabs, driveways, roads).

There were comments raising concerns about the possible exposure of workers involved in non-transportation construction projects to chat in cement or concrete. The Agency has reviewed the Occupational Safety and Health Administration (OSHA) standards governing worker health and safety related to the construction and demolition of non-residential non-transportation uses of cement and concrete. Based on this review, the Agency concludes that existing standards require employers to provide adequate protection to workers from dusts and metals and these standards would extend to dusts and metals from cement and concrete containing chat. It should also be noted that when chat is

used as an aggregate in concrete, worker exposures would be limited since the metals would already be bound.

### *C. Relationship of This Rule to Other Federal Regulations and Guidance*

For all uses of chat in transportation construction projects carried out, in whole or in part, with Federal funds that is affected by this action, users must meet the relevant specifications (e.g., for durability, granularity) established by the relevant state departments of transportation and the Federal Highway Administration (FHWA), prior to it being used in transportation projects. This final rule does not affect or change these specifications and requirements.

The FHWA established minimum standards at 23 CFR Part 626 for Highways (including references to the AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing) and at 23 CFR Part 633, Required Contract Provisions. Aggregate requirements for Concrete include AASHTO-6, Fine Aggregate for Portland cement concrete and AASHTO-80, Coarse Aggregates for Portland cement concrete. Technical requirements for Hot Mix Asphalt include AASHTO-29, Fine Aggregate For Bituminous Paving Mixtures and ASTM D6155, Standard Specification for Nontraditional Coarse Aggregates for Bituminous Paving Mixtures. FHWA National Highway Standard Specifications and Supplements is divided into topic areas corresponding to the divisions used in the "Guide Specifications for Highway Construction" Manual published by the AASHTO and can be accessed at (<http://fhwapap04.fhwa.dot.gov/nhswp/servlet/LookUpAgency?category=Standard+Specifications+and+Supplements>)<sup>12</sup>.

In addition, ASTM Standard C-33 restricts the amount of chert that may be mixed into PCC when the chert has a specific gravity (ratio of its density to the density of water) less than 2.4. Chat in the Tri-State area, a form of chert, has a specific gravity greater than 2.4 and thus, would not be limited by this standard. Chat does, however, have the potential to be a poor performing aggregate when used in PCC due to its potential alkali-silica reactivity (ASR)<sup>13</sup>.

<sup>12</sup> State highway construction specifications can be found at the following internet web sites for Oklahoma (<http://www.okladot.State.ok.us/materials/700index.htm>), Kansas (<http://www.ksdot.org/burMatrRes/specification/default.asp>), and Missouri ([http://www.modot.State.mo.us/business/standards\\_and\\_specs/highwayspecs.htm](http://www.modot.State.mo.us/business/standards_and_specs/highwayspecs.htm)).

<sup>13</sup> The Agency also reviewed studies on the potential for alkali-silica reactions in chat concrete

The Agency also assessed current regulation of dusts from milling and demolition. As part of this assessment, based on the Peer Review comments, the Agency conducted an additional risk screen from the milling of chat encapsulated in asphalt road surfaces. Based on this review and analyses, we conclude that exposure to fine particles released during milling and demolition operations would be limited to on-site workers (for the basis of this conclusion, see Section V). The Occupational Safety and Health Administration have established limits for worker exposure to the metals found in chat (29 CFR 1926.55—Safety and Health Regulations for Construction, Gases, Vapors, Fumes, Dusts, and Mists, available at: [http://www.osha.gov/pls/oshaweb/owastand.display\\_standard?group?p\\_toc\\_level=1&p\\_part\\_number=1926](http://www.osha.gov/pls/oshaweb/owastand.display_standard?group?p_toc_level=1&p_part_number=1926)). EPA has reviewed the OSHA standards (see Section V "What Are the Environmental and Health Impacts?" below) and concludes that the OSHA standards require adequate worker health and safety protection and thus, it is not necessary to promulgate additional standards to address this issue.

### *D. How Does this Rule Affect Chat Sales From Lands Administered by BIA or Directly From Tribal Lands?*

BIA signed a Memorandum of Agreement with EPA Region 6 in February 2005, designed to lead to the renewed sale of chat from Tribal lands and from lands administered by BIA. EPA's rule does not prevent chat sales, nor is it intended to delay such sales. This rule is consistent with BIA's chat sales requirements.

The draft sales agreement prepared by BIA requires the submittal of a certification which requires buyers of chat from tribal lands to use it in a fashion which is deemed acceptable by EPA. This rule requires the same certification for the use of non-tribal chat.

### *E. How Does This Rule Affect CERCLA Liability, Records of Decision, and Response Actions?*

If waste material, such as chat, is used in a way that creates a threat to human health or the environment, the owner of the property and the party responsible for creating the hazardous situation could be liable for conducting or financing a response action under CERCLA or State law.

This rule establishes criteria for chat use in federally funded transportation

and concludes that it can be used if appropriate materials testing is conducted prior to use.

construction projects. However, such Federal funding does not include compensation for any response action as defined in CERCLA section 101 (25), (42 U.S.C. Section 9601 (25)) involving chat or other hazardous substances.

Finally, nothing in this rule shall affect existing RODs issued at EPA National Priorities List sites or Removal Decisions associated with chat nor does the rule affect the determination of liability as noted in CERCLA Sections 104, 106, and 107 or State corrective action decisions.

### *F. How Does This Rule Affect the Use of Federal Funds Administered by the U.S. Department of Transportation for Transportation Construction Projects?*

Through Title VI of Section 6018 of the Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005 (HR 3 or "the Act"), Congress amended Subtitle F of the Solid Waste Disposal Act (42 U.S.C. 6961 *et seq.*) by adding Sec. 6006. This provision requires, among other things, for the Agency to develop environmentally protective criteria (including an evaluation of whether to establish a numerical standard for concentrations of lead and other hazardous substances) for the safe use of granular mine tailings from the Tar Creek, Oklahoma Mining District, known as "chat," in transportation construction projects that are carried out, in whole or in part, using Federal funds. Section 6006(a)(4) requires that any such use meet EPA's established criteria.

As noted above, the oversight of Federal funds used in transportation is the responsibility of the U.S. DOT. Its policies and procedures related to the management of those funds can be found in the Code of Federal Regulations beginning at Title 23 Part 1(23 CFR 1). DOT requires that users of Federal transportation funds must comply with applicable State or Federal regulations (23 CFR 1.9 and 1.36). DOT will include reference to compliance with this rule in its guidance regarding the awarding of federal transportation funding.

## **V. Impacts of the Final Rule**

### *A. What Are the Potential Environmental and Public Health Impacts From the Use of Chat in Transportation Construction Projects?*

For the proposed rule, we conducted an assessment of the risks associated with the proposed use of chat. (See the preamble to the proposed rule at 71 FR 16729, April 4, 2006 and the *Report on Potential Risks Associated with the Use of Chat from the Tri-State Mining Area*



in *Transportation Projects* (RTI, 2006) for more details on this assessment.) Data from studies conducted by OU present total metal concentrations and leaching characteristics of (1) asphalt concrete surface and base mix formulations prior to roadway application, (2) asphalt and stabilized base samples from roads currently in use, (3) spent asphalt concrete samples that were broken up and stored in piles, and (4) milled asphalt concrete samples intended to simulate weathering. These studies show that the metals are tightly bound in the encapsulated matrix when the total metals concentrations in asphalt concrete samples are compared to corresponding TCLP and SPLP leachate concentrations. In particular, for asphalt concrete surface mix and stabilized road base uses for all four categories, the highest TCLP concentrations reported for lead and cadmium were below the toxicity characteristic (TC) regulatory limits (5 mg/L and 1 mg/L, respectively). In fact, when the metals were detected, in many cases, they were below the drinking water MCLs for lead and cadmium.<sup>14</sup> For zinc, when detected, the TCLP concentrations were found to be generally above the SMCL (5 mg/L) by up to a dilution and attenuation factor of 16. As we have noted earlier, however, we believe that use of the TCLP in evaluating the leaching potential of encapsulated chat used in transportation construction projects is inappropriate since it does not accurately reflect the environmental conditions of the management scenario. Rather, we believe the SPLP is a more appropriate test of the conditions expected to lead to leaching of metals from this material. In addition, where leachate testing was conducted using the TCLP and SPLP methods, in all cases, the concentrations of the metals were approximately an order-of-magnitude lower for the SPLP as compared to the TCLP. In most cases, the SPLP concentrations were below the MCLs for lead and cadmium and were always below the SMCL for zinc.

In summary, this assessment concluded that based on the available reports and data reviewed, the use of chat as an aggregate for hot mix asphalt poses negligible risks to human health through the groundwater exposure pathway, while some unencapsulated uses of chat may pose substantial risks

to human health and the environment. The leachate data representing the binding capacity of the asphalt matrix—particularly in hot mix asphalt—show that the metals are tightly bound throughout the life of these products.

By inference and based on limited data, it appears as though certain other uses of chat, such as chat contained PCC, flowable fill and stabilized base would have similar binding properties that would reduce the leaching of metals. However, the available leachate data on these uses are very limited, and may be a concern given the volume of chat that could be used in road construction projects.

In addition to these data deficiencies on specific uses, we identified other data gaps with respect to risk, including the milling of chat-containing asphalt concrete. Milling of asphalt concrete roadways during resurfacing would likely release to the air fine chat particles, which could lead to contamination of residential soils and homes located in the vicinity of a road construction project. Our assessment concluded that these events would be episodic and infrequent (corresponding to approximately once over a 15 year lifespan of the asphalt), resulting in transitory exposures of relatively short durations. The Agency assumed that the milling operations would be subject to regulations and best management practices that would protect the health of workers. However, the data were not available to evaluate the potential exposures to nearby residents from chat concrete particles blowing on to residential areas. The assessment concluded, however, that the uncertainty of the exposures to residents from milling and management of encapsulated chat products during road resurfacing could be an area for future study.

The Agency also considered in its assessment non-transportation uses and the demolition of structures containing chat. We did not perform any environmental modeling as with the evaluation of transportation uses. However, with existing fugitive dust regulations and demolition practices, we concluded that exposures from dust generated during the use or demolition of chat in concrete buildings would not pose significant risks to human health.

Concurrent with the public notice and comment period for the proposed rule, the Agency conducted an external peer review of its assessment, *Report on Potential Risks Associated with the Use of Chat from the Tri-State Mining Area in Transportation Projects*. Based on the comments received from the public and from the Peer Reviewers, the Agency

has revised the screening evaluation report to reflect those comments. The following discussion provides the Agency's response to the major comments received from the peer reviewers. In addition, the revised report and our response to comments are provided in the docket for this rule.

The following are the major issues raised by the peer reviewers and the Agency's responses.

#### (1) Potential Exposures During the Milling Process Were Not Evaluated

The peer review commenters believe that the lack of data on air emissions from the grinding of the road surface prior to resurfacing ("milling") is a considerable source of uncertainty in evaluating the potential risks of using chat in hot mix asphalt. They contend that potential exposure to chat dust generated during the milling of asphalt concrete roads, in addition to the storage of milled materials, should be evaluated through pathways that consider both the inhalation of dust and the incidental ingestion of metals contaminated soil from areas adjacent to a roadway being milled. In addition, peer review commenters noted two additional concerns associated with the milling process: (a) Addressing the short-term exposure of lead to a developing fetus or young child during critical and sensitive periods of growth, and (b) considering background levels of lead in the screening analysis.

The Agency believes that the concerns raised by the peer reviewers are valid and conducted further study to address them. Specifically, we performed a screening analysis to evaluate exposures through direct inhalation of air emissions associated with milling and incidental ingestion by a child of metals-containing soils adjacent to a milled roadway. The assessment was designed to be conservative by selecting both a methodology and the use of high-end parameters that result in upper-bound estimates of hazard and risk. Examples of high-end parameters used in the screen are: (1) Total metals concentrations for lead, zinc, and cadmium from the 2005 OU study where chat comprised 40% of the aggregate used in hot mix asphalt, where typical hot surface mix includes up to 20% chat, (2) the risk screen utilized maximum, hourly air concentrations, rather than an average concentration for inhalation exposure to an adult and also to a child (using the Agency's Integrated Exposure Uptake Biokinetic Model for lead in Children (IEUBK)), (3) the risk screen assumed the placement of the milled asphalt concrete storage pile on the side of a

<sup>14</sup> Comparisons of leachate concentrations with drinking water criteria assume that no dilution or attenuation occurs before the dissolved metals reach a drinking water well or surface water. The Agency believes this worst case scenario is highly unlikely to occur in the area of the country where the use of chat is occurring.

road closest to a receptor and locating the receptors at the point of maximum off-site air concentration, (4) the risk screen assumed exposure to chat dust occurs 24 hours/day, for seven days a week, and (5) protective assumptions were used with respect to emissions factors for street sweeping and storage pile loading/unloading operations and meteorological conditions.

The results of this additional analysis show that the milling of chat in asphalt concrete roadways will not adversely affect public health. Specifically, for the direct inhalation pathway, the highest cancer risk predicted for cadmium was  $2 \times 10^{-9}$  (that is, 2 excess cases of cancer per 1,000,000,000 people exposed to the estimated air concentration). The highest non-cancer hazard quotient for cadmium was 0.004 (a hazard quotient is the ratio of the air concentration of cadmium and the level at which no adverse effects are expected; if the hazard quotient is less than 1, then no adverse health effects are expected as a result of exposure). For the direct ingestion of soil adjacent to the roadway, the predicted concentrations of metals in soil were 37.6 (Zn), 3.2 (Pb), and 0.2 (Cd) mg/kg soil, all of which are below (a) The generic EPA Superfund Soil Screening Levels (SSLs) for cadmium and zinc, (b) the 400 ppm CERCLA/RCRA screening level for lead in residential soils, and (c) the background soil concentrations for the western U.S. The comparison with background concentrations was intended to provide additional insight into the contribution to the current environmental "burden" of these metals in the area in which chat-containing surface mixes could be used. A soil concentration below background levels suggests that the milling operations will not result in significant increases in the zinc, lead, and cadmium concentrations in soil.

In order to address the concern of lead exposures for children, the Agency used the IEUBK model, which includes multiple pathways of lead exposures (for example, inhalation of dust, ingestion of soil and dust, and dietary intake), and is considered a good predictor of potential long-term blood-lead levels for children in residential settings. We ran the IEUBK model using the maximum air concentration estimated from the direct inhalation analysis, and both the soil concentration we estimated due to milling operations and a separate analysis using a background soil concentration for lead reported in the western U.S. In both cases, a hypothetical child exposed to the estimated air and soil levels resulted in a chance of less than 5% of exceeding

a 10µg/dL blood-lead level. The blood-lead levels predicted were 4.328µg/dL and 4.473µg/dL, respectively, from the lead levels we estimated in soil from milling operations and for background soils. The criterion of no more than a 5% chance of exceeding a 10µg/dL blood-lead level is the current Agency guidance level. The Center for Disease Control considers a blood-lead level of 10µg/dL to be of concern for children.

A complete discussion of the screening analysis for the milling of asphalt concrete roads is available in the public docket supporting this final rule. In addition, the screening level analysis was reviewed by selected Agency experts in the fields of emissions modeling and risk assessment. Their comments are also in the docket supporting this final rule. Responses to their comments are reflected in the final document for the screening analysis (RTI, 2007).

#### (2) Demolition

The peer review commenters raised concerns that dusts resulting from the demolition of chat contained in asphalt concrete and PCC could pose a threat to human health. Road surfaces using chat may also be demolished at the end of their useful life (like conventional asphalt concrete, the useful life could be on the order of 15 years). The demolition of road surfaces containing chat would likely involve low emissions of chat dust particles, theoretically with subsequent dispersion and deposition to nearby soils. Based on discussions with demolition contractors, it is apparent that dusts from such demolitions are regulated under the State fugitive dust regulations. Exposure to such dusts probably would be limited to workers because existing State regulations require that dusts be contained within the area of origin. As noted elsewhere in this preamble, OSHA has established exposure limits for dusts and metals for workers in construction and demolition. Most, if not all, road concrete which is demolished is reused as fill or as road base. Based on the information noted above, the Agency concludes that exposure to chat in demolished pavement does not present a significant risk.

#### (3) Data Are Insufficient To Establish Risks From the Use of Encapsulated Chat in Products Other Than Hot Mix Asphalt

The peer review commenters noted that there is very limited information to determine whether the use of chat in products other than HMA poses low risk. One of the Peer Reviewers stated that it is "likely that the risk from other

encapsulated forms will be closer to HMA than to unencapsulated forms, but it is not possible to state how close it will be to the HMA risks."

The Agency generally agrees that data are insufficient to determine if the use of specific products other than HMA evaluated in the *Report on Potential Risks Associated with the Use of Chat from the Tri-State Mining Area in Transportation Projects* are environmentally safe. Consequently, as discussed elsewhere in this preamble, the Agency is allowing the use of chat in Portland cement concrete products (and certain other uses) if a person can demonstrate, on a case-by-case basis, either that: (1) Synthetic Precipitation Leaching Procedure (SPLP, EPA SW-846 Method 1312) tests are conducted on the proposed material and the leachate testing results show that concentrations in the leachate do not exceed the National Primary Drinking Water Standards for lead and cadmium and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 µg/l<sup>15</sup>; or (2) EPA (or a State environmental Agency, if it chooses to do so) has determined, based on a site-specific risk assessment and after notice and opportunity for public comment, that the releases from the chat mixture in its proposed use will not cause an exceedance of the National Primary Drinking Water Standards for lead and cadmium in potential drinking water sources or the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 µg/l in surface water.

We believe this approach directly addresses the Peer Review commenters concerns, while at the same time allow persons to proceed with the use of chat in other products or activities if they can make the relevant showing.

#### (4) Non-Transportation Risks-Demolition

Peer review commenters requested that the Agency carefully review whether existing regulations adequately protect workers from the demolition of chat encapsulated materials. To address that request, this assessment considered how dust generated during the demolition of nonresidential buildings which used chat encapsulated in PCC would occur and whether regulations address worker exposure.<sup>16</sup> The Agency

<sup>15</sup> It should be noted that this case-by-case showing does not require public notice and comment.

<sup>16</sup> The American National Standards Institute ANSI-A 10.6-1983 American National Standard for Demolition Operations Safety Requirements set minimum dust exposure limits and recommends

assumed that such buildings would be demolished once every 30 years, based on the Internal Revenue Service allowable straight-line depreciation for non-residential real property of 31.5 years. The Agency determined that demolition practices, as noted by the National Association of Demolition Contractors, would generally generate dusts for periods rarely in excess of 20–30 minutes when buildings are imploded. Furthermore, the Agency has reviewed the fugitive dust demolition regulations in Oklahoma, Missouri, and Kansas and found that building demolition requires a general fugitive dust permit that mandates that demolition related dusts be contained within the property line (most often through the use of water sprays). Based on this information, the Agency concludes that dusts from the demolition of nonresidential buildings with chat contained in PCC are not likely to present a significant threat to human health.

Even if chat metal levels do not trigger OSHA requirements, however, other OSHA controls would still be utilized to address worker health risks from exposure to fine particulates, which indirectly addresses the issues associated with chat. In particular, demolition of concrete structures is known to produce extremely fine particles of crystalline silica. Breathing crystalline silica dust can lead to silicosis, a commonly known health hazard which has been associated historically with the inhalation of silica-containing dusts. Silicosis is a lung disease which can be progressive and disabling; it can lead to death. The OSHA standards for exposure to dust, (29 CFR 1926.55) prohibit employee exposure to any material at concentrations above those specified in the “Threshold Limit Values of Airborne Contaminants for 1970.” OSHA has established for crystalline silica dust a Permissible Exposure Level which is the maximum amount to which workers may be exposed during an 8-hour work shift. NIOSH has recommended an exposure limit of 0.05 mg/m<sup>3</sup> as a time-weighted average for up to a 10-hour workday during a 40-hour workweek. Although the Agency has no reason to believe that chat contained in PCC would increase the levels of fine particulates, including crystalline silica, we believe the OSHA/NIOSH standards will provide adequate protection to workers from potential exposure.

that no worker shall be permitted in any area that can adversely affect them when demolition operations are being performed.

OSHA has also established worker health and safety standards specific to building demolition in 29 CFR 1926 Subpart T. These standards require an engineering survey of the building prior to demolition to identify any risks and implementation of project wide dust controls. The standards also require compliance with NIOSH respirable dust standards which essentially require the use of respirators, if standards noted in 29 CFR 1910 are exceeded. Based on the Agency’s review of the OSHA standards, we conclude that these regulations provide adequate protection to onsite demolition workers.

One of the Peer Reviewers noted that NIOSH and OSHA standards may not apply to county or State highway workers and that those safeguards would not actually protect workers potentially exposed to dusts during milling or demolition. The Agency has reviewed State and Federal worker health and safety laws as they apply to demolition, and does not agree that there is insufficient regulatory protection of workers. The commenter also noted that existing regulations are not being enforced. While the Agency has not been able to determine whether this allegation is accurate, it is beyond the scope of this effort to determine whether these regulations are being enforced by the states or others.

#### (5) The Risk From the Generation of Chat Fines During Processing Was Not Evaluated

The peer review commenters noted that the rule should include criteria addressing the handling and disposal of chat fines resulting from the wet sizing of chat. First, the Agency would note that this final rule does not require that the raw chat be washed or sized prior to being used. Therefore, any fines that are generated would not be the result of this rule. Nevertheless, the Agency evaluated the risks from exposure to fines from chat washing facilities during Superfund Site investigations at the NPL Sites in the Tri-State Mining District. The information we have shows that fines may release metals into the environment. However, the release of these metals can be effectively controlled by EPA through its oversight authority of the Tar Creek Superfund site. In addition, we believe that most chat washing will continue to be conducted at the two known commercial chat washing facilities located within the Superfund Sites. However, to the extent that other chat washing facilities become operational, we also believe that they will be adequately controlled based on our review of the air and water regulations

in Oklahoma, Missouri and Kansas. (See Section III for a discussion of EPA’s evaluation of the states regulatory programs to control air and water releases at asphalt plants, PCC plants and chat washing facilities.)

#### (6) Ecological Risks

The peer review commenters noted that there should be a more comprehensive analysis of the ecological risks from chat use. Environmental quality information presented in several studies indicated that damages to streams had been documented for the Tri-State Mining Area; however, these studies did not address encapsulated chat uses, but were from multiple sources of contamination associated with lead and zinc mining, including subsurface sources (flooded mine shafts), surface sources (chat piles, tailing sites), and smelting operations. SPLP analyses for chat encapsulated in hot mix asphalt (OU, 2005) shows that zinc concentrations, when detected, were below EPA’s National Recommended Water Quality Criteria (<http://www.epa.gov/waterscience/criteria/wqcriteria.html>) for the protection of aquatic life. This study did not find detectable levels of lead or cadmium in any leachate using the SPLP method. We do not foresee that environmental conditions could occur where metals from chat used in transportation projects, that are funded, in whole or in part, using Federal funds, would reach surface waters at levels of concern either through run-off to nearby soils, which would have subsequent attenuation before reaching surface waters, or via the groundwater pathway, which would have additional attenuation and dilution in groundwater before reaching nearby receiving waters.

#### B. What Are the Economic Impacts?

This Part summarizes projected cost impacts, economic impacts, and benefits associated with this final rule. A brief market profile is first discussed, followed by specification of the economic baseline. Costs and economic impacts are next discussed. These estimates are presented on an annualized basis. Finally, this Part presents a qualitative discussion of potential benefits associated with this final rule.

#### 1. Chat Market Profile

Chat is a byproduct of mining and milling operations that has been exempted from regulation as a “hazardous waste” under Subtitle C of

RCRA.<sup>17</sup> However, it can pose risks to human health and the environment. Currently, chat in the Tri-State Mining District is found in above-ground piles of varying sizes, reflecting the different types of mining operations that occurred in each area. The total quantity of chat in the Tri-State Mining District is roughly 100 million tons. A small percentage of this total is currently used annually in road building or other beneficial use projects.

A small, but well-established market for chat in transportation applications currently exists. The preparation and use of chat is dominated by a few small operations that purchase, process, and sell chat to area hot mix asphalt plants for use as an aggregate. Approximately 95 percent of all current chat use is for aggregate in hot mix asphalt. A wide range of different projects comprise the remaining 5 percent.<sup>18</sup> We have no evidence there is any current use of chat in cement or Portland cement concrete.

The demand for chat as aggregate in transportation uses is price sensitive and is limited by various technical and performance standards. However, consistent demand exists as long as chat can be provided at prices that are competitive with other sources of aggregate. The key cost drivers for chat include raw material costs, processing and sizing, if conducted, and transportation. The current market price for chat, and other forms of aggregate, is approximately five dollars per ton. This estimate excludes transport cost, but includes processing and sizing, even though such operations are not required as part of this rule.

A limited number of small companies act as brokers, processors and distributors (washers and haulers) of the chat in the Tri-State Mining District. Chat haulers and washers buy chat from several owners, each typically owning only a small amount of the total quantity of chat. Chat is both privately and publicly owned, including chat piles located on land controlled by the Quapaw Tribe of Oklahoma.

Historical trends and information from regional chat suppliers suggest that the demand for chat for transportation-related uses is unlikely to change significantly over the next couple of decades. The currently viable market is well defined and transportation costs make chat economically unattractive

beyond current market limits. Within the current market, rates of growth for new roads are modest (estimated at less than 2 percent per year) and population densities are low in areas where the use of chat is economically competitive. We are not able to determine what, if any, impact this rule may have on chat demand for use in asphalt concrete. Significant chat use in other applications, such as Portland cement concrete, does not appear to be viable at this time either for economic or other reasons.

## 2. Cost Impacts

The value of any regulatory action is traditionally measured by the net change in social welfare that it generates. Our economic assessment conducted in support of this rule evaluated compliance costs only. Social costs are not assessed due to data limitations and the lack of equilibrium modeling capabilities associated with this industry. The data applied in this analysis were the most recently available at the time of the analysis. Because our data and analytical techniques were limited, the cost impact findings presented here should be considered generalized estimates.

Our cost analysis examined the potential impact of the rule based on the use of encapsulated chat that comes from the Tri-State Mining District. Ninety-five percent of all chat that is used beneficially is used in hot mix asphalt transportation construction applications. Our cost analysis, therefore, focused on the use of chat as aggregate in hot mix asphalt. Chat may also be used for a variety of non-asphalt transportation and commercial building products.

However, available data appear to indicate that non-asphalt uses of chat from the Tri-State area generally are not common either due to economics or a lack of demand.

Our analysis indicates that the incremental cost impacts associated with this rule are approximately \$210,000 per year. This estimate incorporates costs associated with certification, recordkeeping and reporting. Sampling and analysis costs, if any, for use in concrete pavement and nonresidential concrete are not included because the Agency is unaware of any such use currently taking place and further believes that such use, if it occurs, will be minimal. Additional "expanded use" scenarios are examined in the economic support document prepared for this action: *Assessment of the Potential Costs, Benefits, and Other Impacts of Chat Use in Transportation Projects*, December 18, 2006. This

document is available in the docket established for this final rule.

## 3. Economic Impacts

Our findings indicate that this final rule is unlikely to result in any significant economic impacts to chat suppliers or users in the short term. However, the potential impact of this rule on chat use over the next ten to twenty years is undetermined. As a result, it is not possible to estimate regional or local economic impacts over the long term.

## 4. Benefits

This final rule is designed to establish standards intended to clarify and facilitate the safe use of chat in transportation applications carried out, in whole or in part, with Federal funds. The social benefits of this action are related to reduced human health and environmental damage in the Tri-State Mining District associated with the timely removal of chat from existing piles. Should there be no accelerated use of chat in transportation projects above the current annual rate, human health and environmental benefits may be equivalent to those expected under a no action baseline.

## VI. State Authority

This final rule is promulgated under the authority of RCRA Section 6006. It becomes effective in all relevant States on its effective date of September 18, 2007; after that date, chat cannot be used in federally funded transportation projects except in compliance with today's regulations, regardless of current State law. At the same time, nothing in this rule restricts the authority of States, under State law, to establish different requirements or procedures for the use of chat in federally funded transportation projects. States are neither expected nor required to pick up this rule or to seek approval or authorization.

Several provisions of this final rule directly affect States. Specifically, Section 278.3(b)(2) prohibits the use of chat in Portland cement concrete or in certain other uses (in Federally funded transportation projects,) unless approved by EPA or the State environmental agency, if the State chooses to be the approving entity, where the use will occur. While the rule would allow either EPA or the relevant State agency to approve such uses, EPA ordinarily expects to defer to the State where a potential chat user requests approval. EPA would only expect to act where the State preferred not to, and in these cases, it would work in close consultation with the State. In addition,

<sup>17</sup> See 40 CFR 261.4(b)(7).

<sup>18</sup> Current other uses of chat include: component in anti-skid surfaces, sand blasting material, and waste water treatment filters. The Agency believes that additional evaluation, outside the scope of this rule, is necessary to determine the environmental suitability of using chat as sand blasting or as filter media.

Section 278.3(b)(3) provides that EPA or a State, if it chooses to do so, may approve the use of chat authorized as part of a State or Federal response action undertaken pursuant to applicable Federal or State environmental laws. In such cases, EPA expects that the State would rely on its existing cleanup regulations and procedures in approving the use.

**VII. Statutory and Executive Order Reviews**

*A. Executive Order 12866: Regulatory Planning and Review*

Under Executive Order (EO) 12866 (58 FR 51735, October 4, 1993), this action is a “significant regulatory action.” This action may raise novel legal or policy issues [3(f)(4)] arising out of legal mandates, the President’s priorities, or the principles set forth in the Executive Order. Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under EO 12866. Any changes made in response to OMB recommendations have been recommended in the docket for this action.

This rule is projected to result in cost impacts of approximately \$210,000 per year. This figure is significantly below the \$100 million threshold established

under part 3(f)(1) of the Order. In addition, this rule is not expected to adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities. Thus, this rule is not considered to be an economically significant action.

We have prepared an economic assessment in support of this rule. This document is entitled: *Assessment of the Potential Costs, Benefits, and Other Impacts of Chat Use in Transportation Projects*, December 18, 2006. Findings from this document are briefly summarized under Section V. B above.

*B. Paperwork Reduction Act*

The information collection requirements in this rule have been submitted for approval to OMB under the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* via this preamble instead of a separate Information Collection Request (ICR) document.

The certification, reporting, and record keeping required under this rule is necessary to ensure the safe use of the product containing chat. Certification, recordkeeping and reporting requirements under this rule are not subject to confidentiality restrictions.

Since the burden associated with this rule is insignificant, a separate ICR is not necessary. The burden is projected to affect a limited number of entities. These include: three State governments (Oklahoma, Missouri, Kansas), one Native American tribe (Quapaw Tribe of Oklahoma), and no more than fifty sand and gravel companies located in the States of Oklahoma, Missouri, and Kansas (NAICS 4233202).

The burden on respondents is estimated at 3,800 hours per year, with a total annual cost ranging from \$152,000 to \$228,000, depending upon labor costs. Respondents would also need to read and understand the rule. The burden associated with reviewing the regulation is estimated at 100 hours, with a total annual cost estimated at \$5,000. The burden on governmental entities is estimated at 380 hours per year, with total costs ranging from \$15,200 to \$22,800 per year. These estimates do not include costs related to a user making a case-by-case showing to EPA or a State environmental agency that a proposed use is safe and environmentally protective. Those costs are not included because the Agency believes that there will be very few such requests made in any one year. All these estimates are summarized in the Table below.

**SUMMARY OF ESTIMATED BURDEN TO RESPONDENTS AND GOVERNMENT**

Activity	Number of hours per project	Estimated cost per hour	Estimated number of affected projects per year	Estimated total annual burden (hours)	Estimated total annual cost
Burden to Respondents:					
Certification, Reporting, Record keeping .....	5.0	\$40–\$60	760	3,800	\$152,000–\$228,000
Burden to Government (affected States):					
Certification review and recordkeeping .....	0.5	40–60	760	380	15,200–22,800

**Note:** The additional burden to respondents associated with reading and understanding the regulation is estimated at 100 hours, with a total average annual cost estimated at \$5,000.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a governmental entity. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of

information; and transmit or otherwise disclose the information.

An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA’s regulations in 40 CFR are listed in 40 CFR part 9.

*C. Regulatory Flexibility Act*

The Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), 5 U.S.C. 601 *et seq.*, generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the

Administrative Procedure Act, or any other statute. This analysis must be completed unless the agency is able to certify that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small not-for-profit enterprises, and small governmental jurisdictions.

The RFA provides default definitions for each type of small entity. Small entities are defined as: (1) A small business as defined by the Small Business Administration’s (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a

population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. This section summarizes whether the rule establishing criteria for the use of chat in transportation construction projects, carried out, in whole or in part, with Federal funds, may adversely impact small entities. The market for both chat and "virgin" aggregate in hot mix asphalt production is mature and dominated by small businesses. In order to have a significant economic impact on a substantial number of small businesses, the criteria for chat use would have to cause a significant decrease in the quantity of chat that is used in highway applications. Our analysis indicates that the current market area is not likely to experience any significant change in the demand for chat as a result of the rule. That is, while many chat processors, distributors, and users of chat are small businesses, significant economic impacts on a substantial number of these entities are not expected.

The reader is encouraged to review our regulatory flexibility screening analysis prepared in support of this determination. This analysis is incorporated into the "Assessment" document, as referenced above.

#### *D. Unfunded Mandates Reform Act*

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), Pub. L. 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written Statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector, of \$100 million or more in any one year. Before promulgating an EPA rule for which a written Statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other

than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

This final rule contains no Federal mandates (under the regulatory provisions of Title II of the UMRA) that may result in expenditures of \$100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. The total costs of this action are estimated at \$0.21 million per year.

#### *E. Executive Order 13132: Federalism*

Executive Order 13132, entitled "Federalism" (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure "meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications." "Policies that have Federalism implications" is defined in the Executive Order to include regulations that have "substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government."

This rule does not have Federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The rule focuses on establishing criteria for chat use in transportation construction projects, carried out, in whole or in part, with Federal funds, without affecting the relationships between Federal and State governments. Thus, Executive Order 13132 does not apply to this rule.

Although section 6 of Executive Order 13132 does not apply to this rule, EPA did consult with representatives of State governments in developing this rule. Representatives from the States of

Kansas, Missouri, and Oklahoma provided valuable input.

#### *F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments*

Executive Order 13175: Consultation and Coordination with Indian Tribal Governments (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications." "Policies that have tribal implications" is defined in the Executive Order to include regulations that have substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

Under Executive Order 13175, EPA may not, to the extent practicable and permitted by law, issue a regulation that has tribal implications, that imposes substantial direct compliance costs for which the Federal government does not provide funds to pay such costs, and that is not required by statute, unless EPA consults with tribal officials early in the process of developing the regulation. Similarly, to the extent practicable and permitted by law, EPA may not issue a regulation that has tribal implications and that preempts tribal law unless EPA, among other things, consults with tribal officials early in the process of developing the regulation.

EPA has concluded that this rule does not have tribal implications in that it does not have substantial direct effects as specified in the Executive Order. In particular, EPA notes that this rule does not impose substantial direct compliance costs or pre-empt tribal law. However, the Agency recognizes the significant interest that some tribes have in this rule. Specifically, some chat piles are located on Indian country lands. Allotted lands of the Quapaw Tribe of Oklahoma (Quapaw Tribe) are estimated to contain about half of the 29 chat piles located within the Picher Mining Field site. This rule is not expected to significantly change the demand for, and income from, chat use. To the extent this rule encourages the removal of chat from existing piles, there is likely to be an improvement to the environment and human health in these areas.

During the development of this final rule, the Agency carefully reviewed comments submitted on the proposal by the Quapaw Tribe. Agency personnel also consulted with representatives of

the Quapaw Tribe to assure the tribe that their concerns were given due consideration.

*G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks*

Executive Order 13045 "Protection of Children from Environmental Health Risks and Safety Risks" (62 FR 19885, April 23, 1997) applies to any rule that: (1) Is determined to be "economically significant" as defined under Executive Order 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to the Executive Order because it is not economically significant as defined in Executive Order 12866, and because the Agency does not have reason to believe the environmental health or safety risks addressed by this action present a disproportionate risk to children.

*H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use*

This rule is not a "significant energy action" as defined in Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use" (66 FR 28355 (May 22, 2001)) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

*I. National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law No. 104-113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards. This rule does not require the application of

technical standards (e.g., materials specification, sampling, analyses). As such, the National Technology Transfer and Advancement Act does not pertain to this action.

*J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations*

Executive Order 12898 (59 FR 7629 (Feb. 16, 1994)) establishes Federal executive policy on environmental justice. Its main provision directs Federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it does not affect the level of protection provided to human health or the environment. Our analysis indicates that chat piles in the Tri-State Mining District are, in some cases, located near low-income populations. In addition, Quapaw allotted lands are located within the Picher Mining Field. Existing data on the human health and ecological impacts associated with chat suggests that these populations may be adversely affected by the presence of the chat piles. Thus, the removal of the chat from piles for transportation construction applications that are considered protective of human health and the environment would likely have a positive impact on these communities.

*K. Congressional Review Act*

The Congressional Review Act (CRA), 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a final rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. Prior to publication of this final rule in the **Federal Register**, we will submit all necessary information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States. Under the CRA, a major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

**List of Subjects in 40 CFR Parts 260 and 278**

Environmental protection, Chat, Certification and recordkeeping requirements, Incorporation by reference, Indians—lands, Mine tailings, Waste.

Dated: June 5, 2007.

**Stephen L. Johnson,**  
*Administrator.*

■ For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

**PART 260—[AMENDED]**

■ 1. The authority citation for part 260 continues to read as follows:

**Authority:** 42 U.S.C. 6905, 6912(a), 6921–6927, 6930, 6934, 6935, 6937, 6938, 6939, and 6974.

■ 2. Section 260.11 is amended by revising the first sentence in paragraph (a) and paragraph (c)(3)(vii) to read as follows:

**§ 260.11 References.**

(a) When used in parts 260 through 268 and 278 of this chapter, the following publications are incorporated by reference. \* \* \*

\* \* \* \* \*

(c) \* \* \*

(3) \* \* \*

(vii) Method 1312 dated September 1994 and in Update III, IBR approved for part 261, appendix IX and § 278.3(b)(1).

■ 3. Part 278 is added to read as follows:

**PART 278—CRITERIA FOR THE MANAGEMENT OF GRANULAR MINE TAILINGS (CHAT) IN ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE IN TRANSPORTATION CONSTRUCTION PROJECTS FUNDED IN WHOLE OR IN PART BY FEDERAL FUNDS**

Sec.

278.1 Definitions.

278.2 Applicability.

278.3 Criteria for use of chat in Federally funded transportation projects.

278.4 Certification and recordkeeping requirements.

**Authority:** 42 U.S.C. 6961 *et seq.*

**§ 278.1 Definitions.**

(a) *Asphalt concrete*—a layer, or combination of layers, composed of a compacted mixture of an asphalt binder and mineral aggregate.

(b) *Chat*—waste material that was formed in the course of milling operations employed to recover lead and zinc from metal-bearing ore

minerals in the Tri-State Mining District of Southwest Missouri, Southeast Kansas and Northeast Oklahoma.

(c) *Chip seal*—a material composed of aggregate placed on top of a layer of an asphalt or asphaltic liquid binder. The aggregate may be rolled into the binder.

(d) *Cold mix asphalt*—refers to an asphalt and aggregate mixture composed of binders, soaps, or other chemicals which allow its use when cold

(e) *Epoxy seal*—refers to the mixture of aggregate in epoxy binders. Epoxy seals are typically used as an anti-skid surface on bridge decking

(f) *Federal or State response action*—State or Federal response action undertaken pursuant to applicable Federal or State environmental laws and with consideration of site-specific risk assessments.

(g) *Flowable fill*—a cementitious slurry consisting of a mixture of fine aggregate or filler, water, and cementitious materials which is used primarily as a backfill in lieu of compacted earth.

(h) *Granular road base*—road base typically constructed by spreading aggregates in thin layers of 150 mm (6 inches) to 200 mm (8 inches) and compacting each layer by rolling over it with heavy compaction equipment. The aggregate base layers serve a variety of purposes, including reducing the stress applied to the sub grade layer and providing drainage for the pavement structure. The granular sub base forms the lowest (bottom) layer of the pavement structure and acts as the principal foundation for the subsequent road profile.

(i) *Hot Mix Asphalt*—a hot mixture of asphalt binder and size-graded aggregate, which can be compacted into a uniform dense mass. Hot mix asphalt also includes hot mix asphalt sub bases and hot mix asphalt bases.

(j) *Microsurfacing*—polymer-modified slurry seal.

(k) *Portland cement concrete (PCC)*—pavements consisting of a PCC slab that is usually supported by a granular (made of compacted aggregate) base or sub base.

(l) *Pozzolanic*—a siliceous material which when combined with calcium hydroxide in the presence of moisture exhibits cementitious properties.

(m) *Slurry seal*—refers to a material composed of emulsified asphalt,

aggregate, and mineral fillers, such as Portland cement or lime which is applied as a thin coating on top of asphalt concrete or Portland cement concrete road surfaces.

(n) *Stabilized base*—a non-asphaltic road base composed of aggregate mixed with a pozzolanic material which increases the bearing strength of the material.

(o) *Transportation construction projects*—these activities relate to the construction of roads and highways and include bases, sub bases, road surfaces, bridges, abutments, shoulders, and embankments. They are not related to any residential use.

(p) *Tri-State Mining District*—the lead-zinc mining areas of Ottawa County, Oklahoma, Cherokee County of southeast Kansas and Jasper, Newton, Lawrence, and Barry Counties of southwest Missouri.

(q) *Warm mix asphalt*—refers to a mixture of an asphalt binder with aggregate, paraffin or esterified wax, and mineral additives that allow its use at temperatures much lower than hot mix asphalt.

#### § 278.2 Applicability.

These requirements apply to chat from the Tri-State Mining District used in transportation construction projects carried out, in whole or in part, using Federal funds.

#### § 278.3 Criteria for use of chat in Federally funded transportation projects.

Chat can be used in transportation construction projects carried out, in whole or in part, using Federal funds if:

(a) The chat is used in hot, warm or cold mix asphalt, in slurry seal, microsurfacing, or in epoxy seal; or

(b) The chat is used in Portland cement concrete, granular road base, flowable fill, stabilized road base or chip seal if, on a case by case basis either:

(1) Synthetic Precipitation Leaching Procedure (SPLP) tests are conducted on the proposed material using EPA SW-846 Method 1312, incorporated by reference in § 260.11 of this chapter, and the leachate testing results show that concentrations in the leachate do not exceed the National Primary Drinking Water Standards for lead and cadmium and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 µg/l; or

(2) EPA (or a State environmental Agency, if it chooses to do so) has determined, based on a site-specific risk assessment and after notice and opportunity for public comment, that the releases from the chat mixture in its proposed use will not cause an exceedance of the National Primary Drinking Water Standards for lead and cadmium in potential drinking water sources and the fresh water chronic National Recommended Water Quality Criterion for zinc of 120 µg/l in surface water; or

(c) The use of chat has been authorized pursuant to a State or Federal response action.

#### § 278.4 Certification and recordkeeping requirements.

(a) *Certification*. For chat used under the jurisdiction of the U.S. Department of Interior, Bureau of Indian Affairs, the EPA certification below is not applicable. In other jurisdictions, the acquirer shall:

(1) Submit a signed, written certification to the environmental regulatory agency in the State where the chat is to be used within 30 days of the date of acquisition. The certification shall contain the following:

(i) Location of origin of the chat;

(ii) Amount of chat acquired; and

(iii) Certification Statement: I certify under penalty of law that the chat used in this transportation project will meet EPA criteria found in § 278.3.

(2) *Transfer*. If the chat is sold or otherwise transferred to another party, the acquirer shall provide a copy of the certification to the new owner of the chat. The new owner shall submit a certification according to paragraph (a)(1) of this section. The new certification supersedes all previous certifications.

(3) *Recordkeeping*. The acquirer of chat, and any other person that receives the chat, will maintain copies of all of the following for three years; a copy of the certification following transmittal to the State department(s) of the environment, and, as appropriate; any SPLP testing results; or any site-specific risk assessments.

(b) [Reserved]

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