

exemption loading limits for these chemicals.

We also solicit comment on retaining benzaldehyde as a K181 constituent in the § 261.32(c)(1) list, if we were to adopt this alternate approach to assessing biodegradation. Benzaldehyde is a naturally occurring chemical that is found in many foods, and is widely used in flavors and fragrances;⁴⁵ it is on FDA's list of generally recognized as safe (GRAS) substances (21 CFR 172.515). While our primary degradation reference did not report a degradation rate for benzaldehyde, we are aware that benzaldehyde is fairly reactive and will degrade to benzoic acid, which is 40-times less toxic (*see* IRIS database). When we used a conservative surrogate degradation rate for benzaldehyde, the modeling results showed this constituent would not present a problem (*i.e.*, the results were well above 10,000 kg/yr.). We request information on the degradation rate for this chemical. We also request information on the frequency of benzaldehyde use in dyes and/or pigments production, as well as information on the likelihood that nonwastewaters will contain loadings of benzaldehyde at or above our proposed loading limits. If we adopt this alternate way of assessing biodegradation, information indicating that benzaldehyde is rarely used or unlikely to exceed the proposed loading limit may lead us to delete this chemical from the listing.

5. Lead as a Potential K181 Constituent

We are proposing not to set K181 standards for the metal, lead, despite modeling results for the clay-lined landfill scenario (4,900 kg/yr) that are below our screening threshold of 10,000 kg/yr. We do not believe it is appropriate to set lead standards for K181 for a number of reasons. First, we think it is unlikely that lead is used extensively in current dyes and/or pigments production. While historical information indicates that lead has been used in this industry (*e.g.*, as an oxidizing agent), we believe that environmental regulations (such as the Toxicity Characteristic) and increased general concerns about the use of lead in consumer products may have contributed to declines in the use of lead in this industry. Our analysis of the TRI data shows very limited reporting of lead releases by the 35 dyes and/or

pigments manufacturers that report to the TRI. In fact, only two facilities report lead releases: Eastman Chemical (Kingsport, TN) and Harshaw Chemical/Engelhard Corporation (Louisville, KY). As previously discussed, Eastman is a very large chemical manufacturer, with an extensive product list (over 1,200 plastics/polymers, fibers and other chemicals). Dye production accounts for an extremely small portion of their operations. We do not believe their waste is representative of dye and/or pigment wastes in general, or that it is likely that their reported lead releases are associated with their very limited dye product line. Harshaw Chemical is a major manufacturer of inorganic pigments, and currently generates a significant quantity of characteristic lead wastes (D008) as well as listed wastes from the production of inorganic pigments containing lead (K002 and K003).⁴⁶ Therefore, we believe that the lead releases reported by Harshaw in the TRI are highly likely to be associated with their inorganic pigment production (rather than their organic pigment processes). The TRI data is consistent with this interpretation. Harshaw reported in the 2000 TRI that all of the lead sent offsite for disposal underwent stabilization/solidification; nearly all of this (except for 45 kg) was sent to a Subtitle C facility. No other dyes and/or pigment manufacturers reported any releases of lead in 2000.

Second, we evaluated the available analytical data for these wastes for lead. Our analytical results showed two samples contained lead, with a maximum concentration of 16.8 mg/kg. By assuming that this is a typical concentration in these industries' wastes (despite the TRI data that indicates that it is rarely reported in releases from these industries), we calculated the necessary waste quantity that would need to be generated in order to exceed the modeled threshold level of 4,900 kg/yr. The resultant calculated theoretical minimum waste quantity of 274,000 metric tons is significantly greater than the total quantity of nonwastewaters that we estimate that all of the potentially impacted facilities generate in total (47,000 metric tons). This analysis indicates that, even if any other dye and/or pigment manufacturers do generate lead-bearing wastes, they are unlikely to contain lead at mass loading levels above the modeled threshold level.

Finally, we also note that lead is currently regulated as D008, a

characteristic hazardous waste when TCLP levels exceed 5.0 mg/L. The TC levels serve as a safety net for lead-bearing wastes, if any, that might be generated by facilities manufacturing the relevant dyes and pigments. We are soliciting comments, however, on whether we should include a threshold loading limit for lead in the K181 listing.

6. Waste Analysis Concerns

Some problems have surfaced in past chemical analysis of dyes and/or pigments production wastes for some of the potential constituents of concern in Table IV-1. In a few cases, our analysis could not distinguish between co-eluting compounds when we used the typical EPA methods (*e.g.*, method 8270 in SW-846). However, significant improvements have been made in instrument sensitivity and chromatographic column performance in the approximately ten years since EPA conducted its prior analyses. In general, we believe that following methods in SW-846 should be adequate for the constituents in Table IV-1: method 8270 (GC/MS), method 8315 (HPLC), and method 8321 (HPLC/MS or HPLC/UV).⁴⁷ Therefore, we believe that these constituents may now be readily measured by the majority of laboratories equipped to perform such analyses.⁴⁸

The most problematic constituent appears to be 1,2-phenylenediamine (also known as o-phenylenediamine). We originally promulgated numerical treatment standards for 1,2-phenylenediamine in a prior rulemaking (64 FR 15583, April 8, 1996). However, we subsequently withdrew the standard because of poor method performance (*see* 63 FR 47409, September 4, 1998). The methods used at the time did not provide adequate recovery of the chemical from samples at the 5.6 mg/kg level. We solicit comment on options to deal with this potential problem (short of dropping the constituent, which is also an option) and other analytical issues. For example, we could allow generators to use knowledge of their waste in lieu of testing for these constituents (regardless of waste quantities generated—*see* section V for differing testing requirements for smaller and larger waste quantities). Alternatively, we could allow the generator to show compliance with the

⁴⁵ See the "Flavor And Fragrance High Production Volume Consortia—The Aromatic Consortium Test Plan For Benzyl Derivatives," December, 2001 submitted to EPA's High Production Volume Challenge Program (<http://www.epa.gov/chemrtk/benzylde/c13450tc.htm>).

⁴⁶ See 1999 data from the facility in EPA's Biennial Reporting System (BRS) for hazardous waste.

⁴⁷ See the discussion on page 3-25 and elsewhere in the background document "Best Demonstrated Available Technology (BDAT) Background Document For Dye and Pigment Production Wastes", which is in the docket for today's rule.

⁴⁸ See the Economic Analysis Background Document for our cost estimates. See also <http://www.speclab.com/price.htm>.