ILLINOIS POLLUTION CONTROL BOARD
November 1, 2018

IN THE MATTER OF:	)	
	)	
PETITION OF PEORIA DISPOSAL COMPANY FOR MODIFICATION OF DELISTING ADJUSTED STANDARD ORDER FOR ELECTRIC ARC FURNACE DUST STABILIZED RESIDUE (AS 2008-010)	)	AS 18-1 (Adjusted Standard - RCRA)

OPINION AND ORDER OF THE BOARD (by B.K. Carter):

On September 21, 2017, Peoria Disposal Company (PDC) filed a petition with the Board to modify an adjusted standard delisting granted by the Board in 2009. RCRA Delisting Adjusted Standard Petition of Peoria Disposal Co., AS 08-10 (Jan. 8, 2009). The delisting concerns stabilized residue resulting from PDC's treatment of electric arc furnace dust (EAF dust) at its waste stabilization facility in Peoria, Peoria County. PDC's treatment of the EAF dust results in EAF dust stabilized residue (EAFDSR). The delisting excludes EAFDSR from the Resource Conservation and Recovery Act (RCRA) list of hazardous wastes upon meeting several conditions prior to disposal by landfilling. *See* RCRA Delisting Adjusted Standard Petition of Peoria Disposal Co., AS 08-10 (Jan. 8, 2009), *aff'd sub nom.*, Sierra Club v. IPCB, 2011 IL 110882. PDC's current petition seeks to modify the 2009 delisting order by (1) removing the condition to perform Toxicity Characteristic Leaching Procedure (TCLP) testing of the EAFDSR for dioxins and furans and (2) removing dioxins and furans from the list of chemicals PDC must test for. As more fully explained in this opinion, the Board denies PDC's petition to modify the 2009 delisting order because PDC's petition fails to adequately assess the risk posed by total concentrations of dioxins and furans in the EAFDSR.

As a brief introduction, "delisting" is a term of art that refers to the procedure for excluding a waste from the RCRA list of hazardous wastes. Under RCRA, EAF dust is a "listed" hazardous waste, designated as "K061." Because PDC's EAFDSR is derived from K061, it was considered K061 listed hazardous waste before the 2009 delisting. By complying with the conditions of that delisting, PDC may dispose of the EAFDSR as non-hazardous waste—at considerable cost savings compared to hazardous waste disposal, which involves special handling, documentation, treatment, and disposal in a hazardous waste landfill.

The conditions in the 2009 delisting include a requirement that PDC test the EAFDSR to ensure that the material is safe to be landfilled as non-hazardous waste. The testing must verify that the EAFDSR does not contain any of the 15 chemicals above maximum allowable concentrations ("delisting levels") specified by the Board's 2009 delisting order. Among the chemicals PDC must test for are dioxins and furans, which are carcinogens present in the EAF dust received by PDC. As only chemicals with delisting levels must be tested for under the delisting, granting PDC's request would eliminate the requirement to test for dioxins and furans in the EAFDSR. PDC claims that testing for dioxins and furans is unnecessary and expensive.

In this opinion, the Board first provides a summary of its decision, and sets forth the case's procedural history. The Board then gives factual background from both the AS 08-10 proceeding and this one. Next, the Board provides the legal framework for today's decision, including an overview of RCRA hazardous waste, delisting rules, and United States Environmental Protection Agency (USEPA) risk assessment methods. Finally, the Board analyzes, and states its reasons for denying, PDC's petition for modification.

SUMMARY OF DECISION

The Board denies PDC's petition for modification because it fails to adequately assess the risk posed by total concentrations of dioxins and furans in the EAFDSR. Since the 2009 delisting, USEPA has updated the factors used in its risk assessment model. Using USEPA's updated model, the dioxins and furans analysis in PDC's current petition indicates that the calculated risks to human health associated with samples of PDC's EAFDSR have changed since the 2009 delisting, showing significantly greater cancer risk from exposure by ingesting fish than exposure by dermally absorbing groundwater.

PDC's petition for modification does not address the calculated risks posed by the fish ingestion exposure pathway; the petition for modification only addresses the dermal groundwater absorption pathway. Further, though not sufficient to be considered representative of the EAFDSR, one sample from 2007 included in the current petition shows total concentrations of dioxins and furans that exceed both the revised maximum allowable concentration under USEPA's updated risk assessment model and the acceptable cancer risk level. Under these circumstances, the Board denies PDC's request to eliminate the delisting order's requirement of testing the EAFDSR for dioxins and furans.

PROCEDURAL HISTORY

On September 21, 2017, PDC filed a petition requesting that the Board modify (Pet. Mod.) the 2009 delisting adjusted standard (Peoria Disposal, AS 08-10 (Jan. 8, 2009)). Attached to the petition is a technical support document (TSD) prepared by PDC Technical Services, Inc. On September 26, 2017, PDC filed a certificate of publication, documenting that notice of its petition and the public's opportunity to request a hearing was published on September 23, 2017, in the *Peoria Journal Star*. *See* 35 Ill. Adm. Code 104.410. PDC waived a public hearing on the petition. Pet. Mod. at P12, citing 35 Ill. Adm. Code 104.406(j). The Board neither received any request for a public hearing nor determined that a hearing would be advisable. *See* 415 ILCS 28.1(d)(1) (2016); 35 Ill. Adm. Code 104.422(a). The Board notes that the record does not indicate that PDC served a copy of its petition on USEPA as required by Section 720.122(n)(1) of the Board's rules (35 Ill. Adm. Code 720.122(n)(1)).

On November 16, 2017, the Board issued an order finding that PDC met the adjusted standard notice requirements (415 ILCS 5/28.1(d)(1) (2016); 35 Ill. Adm. Code 104.408) and accepting the petition. In the same order, the Board directed the Illinois Environmental Protection Agency (IEPA) to file its recommendation concerning Board action on PDC's

petition. *See* 35 Ill. Adm. Code 104.416(a). IEPA filed its recommendation (Rec.) on November 22, 2017.

On its own motion, the Board incorporates by reference the record of docket AS 08-10 into this docket. *See* 35 Ill. Adm. Code 101.306.

FACTUAL BACKGROUND

PDC's Waste Stabilization Facility and Steel Mill Customers

PDC operates a waste stabilization facility (WSF) at 4349 W. Southport Road in Peoria, Peoria County under a RCRA Part B permit issued by IEPA. Pet. Mod. at P2. PDC's WSF is authorized to store and treat both hazardous and non-hazardous wastes. *Id*. At the WSF, PDC mainly treats RCRA hazardous wastes using a microencapsulation process that involves "reagents to reduce the leachability of inorganic hazardous constituents." *Id*. Of all the hazardous wastes PDC receives and treats, the largest volume is EAF dust. *Id*. at P2-P3.

PDC receives EAF dust at the WSF from steels mills that produce steel using electric arc furnaces. Pet. Mod. at P3. The EAF dust is the residual from air pollution control systems at the steel mills. AS 08-10 TSD at 1-2. In manufacturing steel, electric arc furnaces are commonly used to melt scrap metal. EAF dust consists of particulates captured from the furnace off-gases in, for example, a baghouse. *Id*. at 2-1, Fig. 2, 3.

The composition of EAF dust varies depending on the types of scrap and the types or quantities of flux and other additives used in the melting, but it is principally composed of iron and iron oxides, flux (typically lime or fluorspar), zinc, chromium and nickel oxides, and other metals associated with the scrap. AS 08-10 TSD at 2-1, 2-2; *see also id*. at 3-15 ("The variability in the EAF dust primarily results from variations in the characteristics of the scrap steel and the grade of carbon steel that is produced."). PDC acknowledges that "[d]ioxins and furans are present in the untreated EAF dust as unintentional by-products of incomplete combustion in the presence of various off[-]gases." TSD at P127. Dioxins and furans are a large group of naturally-occurring and synthetic organic chlorinated compounds. *Id*.

2009 Delisting

Before the Board granted the delisting in AS 08-10, PDC's treatment of EAF dust generated a stabilized residue that was disposed of in a RCRA Subtitle C (hazardous waste) landfill called "PDC No. 1 Landfill," also located in Peoria County. AS 08-10 Pet. at 12-13. PDC No. 1 Landfill was projected to reach capacity in 2009. *Id*. at 2. Due to the large fees for transporting EAFDSR to, and disposing of EAFDSR at, an off-site hazardous waste landfill, PDC petitioned the Board in 2008 to delist the EAFDSR. PDC sought to allow for disposal of the EAFDSR in RCRA Subtitle D (non-hazardous waste) landfills, providing PDC with a potential savings of $12.5 million annually. *Id*. at 12-13.

To justify the delisting, PDC developed a proprietary stabilization technology for treating EAF dust. AS 08-10 Pet. at 2; AS 08-10 TSD at 3-16. The technology stabilizes metals through

a series of chemical reactions while providing buffers to resist changes in pH. AS 08-10 TSD at 3-18. The EAF dust stabilization did not deviate from the process PDC had used for more than 19 years prior to filing its petition in AS 08-10, except for use of the newly-developed chemical treatment reagents. AS 08-10 Pet. at 3.

PDC's waste stabilization process involves mixing five- to six-ton batches of EAF dust with water and proprietary chemical reagents in a mixer or mix tanks, which are then dumped into roll-off containers or dump trucks and allowed time to cure. AS 08-10 TSD at 3-7 to 3-8. Each mixing cycle takes about 7 to 12 minutes and is followed by a curing period, ranging from 1 to 45 days, to complete the reaction. *Id*. at 3-11, 3-14. The curing time can be affected by a variety of factors, especially ambient air temperature. *Id*. at 3-17. As proposed, samples of the EAFDSR would then be collected and analyzed. *Id*. at 3-8. Batches not meeting the delisting levels would be allowed more curing time, reprocessed and retested, or managed as hazardous waste at a RCRA Subtitle C facility. AS 08-10 Pet. at 14.

On January 8, 2009, the Board granted PDC an "upfront" and "conditional" delisting. An upfront delisting applies to "wastes and/or waste residues that have not yet been generated, but will be generated in the future, based on available information (e.g., pilot-scale system data) that demonstrates that the petitioned waste will most likely meet the delisting criteria." USEPA Region 6 "EPA RCRA Delisting Program Guidance Manual for the Petitioner" at 8 (Mar. 23, 2000). "[A] conditionally delisted waste would exit the hazardous waste management system at the point it meets the established delisting levels, and would remain outside of the hazardous waste management system so long as the delisted waste generator complies with the conditions placed on the disposal of the delisted waste." "National Policy for Hazardous Waste Delistings" at 2, Memorandum from Elizabeth A. Cotsworth, Acting Director, USEPA Office of Solid Waste, to Regional RCRA Senior Policy Advisors, RO 14282 (July 1, 1998).

The conditions of the 2009 delisting require that PDC test a daily composite sample to verify that every batch of EAFDSR meets the delisting levels before disposal as non-hazardous waste. The daily sample must be analyzed for 15 chemicals using the Toxicity Characteristic Leaching Procedure (TCLP): antimony; arsenic; barium; beryllium; cadmium; chromium (total); lead; mercury; nickel; selenium; silver; thallium; vanadium; zinc; and dioxins and furans, expressed as 2,3,7,8-TCDD (tetrachlorodibenzo-p-dioxin). Peoria Disposal, AS 08-10, slip op. at 94-96. Any delisted EAFDSR must be disposed of off-site in a RCRA Subtitle D landfill that is permitted by IEPA and that has a liner, groundwater monitoring system, and leachate collection system. *Id*. at 94

Petition to Modify

PDC's petition for modification is based on the past eight years of data for dioxins and furans in the EAFDSR. During that span, PDC has tested 1,285 samples using TCLP. The data consistently show 2,3,7,8-TCDD levels in the EAFDSR to be either below method detection limits or at very low concentrations. TSD at P129, App. 1 at P140. Of the 1,285 TCLP samples, five (or 0.4%) exceeded the 2009 order's delisting level for dioxins and furans. Pet. Mod. at P5. PDC states that "none of the five (5) apparent exceedances was confirmed by a second test of the relevant batch of EAFDSR (which retesting is expressly permitted [by the 2009 order])." *Id.*

Testing each batch of EAFDSR for dioxins and furans costs PDC $900. Removing this testing requirement would save PDC about $144,000 annually. Pet. Mod. at P7; TSD at P126.

LEGAL FRAMEWORK

RCRA Hazardous Waste

Section 22.4 of the Illinois Environmental Protection Act (Act) (415 ILCS 5/22.4 (2016)) requires the Board to adopt regulations that are "identical in substance" to federal RCRA hazardous waste regulations. The Board's regulations identifying hazardous wastes are found in 35 Ill. Adm. Code 721. Generally, under those regulations, a "solid waste" is considered a "hazardous waste" if it either exhibits a "characteristic" of hazardous waste (*i.e.*, ignitability, corrosivity, reactivity, or toxicity) or is "listed" as hazardous waste. A so-called "characteristic hazardous waste" remains a hazardous waste for as long as it exhibits the characteristic, but a so-called "listed hazardous waste" remains a hazardous waste until it is delisted. *See* 35 Ill. Adm. Code 721.103, 721.Subparts C, D.

USEPA lists wastes as hazardous because (1) the wastes "typically and frequently exhibit one or more of the characteristics of hazardous wastes"; (2) the wastes meet the criteria for listing (*i.e.*, contain significant levels of toxic or carcinogenic constituents, or cause specific detrimental effects on the environment); or (3) the wastes are "mixed with or derived from the treatment, storage or disposal of such characteristic and listed wastes and which therefore become hazardous under . . . the 'mixture' or 'derived from' rules, respectively." 69 Fed. Reg. 77690, 77692 (Dec. 28, 2004); *see also* USEPA Region 6 "RCRA Delisting Program--Guidance Manual for the Petitioner" at 5-6 (Mar. 23, 2000).

Subpart D of Part 721 sets forth the lists of hazardous wastes. Section 721.132 includes a list of hazardous wastes from specific sources (35 Ill. Adm. Code 721.132). *Compare* 40 C.F.R. § 261.32(a). In that list, USEPA hazardous waste number "K061" refers to "[e]mission control dust/sludge from the primary production of steel in electric furnaces." 35 Ill. Adm. Code 721.132(a). Accordingly, K061 is EAF dust. The K061 listing has the hazard code "T," which refers to "toxic waste," the basis for its listing. *Id.*; *see also* 35 Ill. Adm. Code 721.130(b)(1). The hazardous constituents for which K061 is listed as toxic are "[h]exavalent chromium, lead, cadmium." 35 Ill. Adm. Code 721.Appendix G (40 C.F.R. 261.Appendix VII); *see also* 35 Ill. Adm. Code 721.130(b)(2).

A material "derived from" the treatment of a listed hazardous waste is itself a hazardous waste. *See* 35 Ill. Adm. Code 721.103(e)(1); 40 C.F.R. §261.3(c)(2)(i). USEPA explained that "all of the residues from treating the original listed wastes are likewise considered to be the listed waste." 54 Fed. Reg. 1056, 1063 (Jan. 11, 1989); *see also* 60 Fed. Reg. 31107, 31108 (June 13, 1995).

Delisting Rules

USEPA has acknowledged that "a specific waste from an individual facility may not be hazardous" even though it is listed as a hazardous waste. 69 Fed. Reg. 77690, 77692 (Dec. 28, 2004). USEPA explained:

> Individual wastes may vary depending on raw materials, industrial processes, and other factors. Therefore, 40 CFR §§ 260.20 and 260.22 contain a procedure whereby anyone can petition [US]EPA to exclude or "delist" such a listed waste.
>
> Originally, the overall intent of the delisting process was to ease the regulatory burden on handlers of listed waste improperly captured by the broad listing definitions. Delisting has since evolved to also include listed wastes that are sufficiently treated such that they no longer pose a health threat. USEPA Region 6 "RCRA Delisting Program--Guidance Manual for the Petitioner" at 6 (Mar. 23, 2000).

USEPA made clear that a listed hazardous waste under the "derived-from rule" can be delisted. Even though "any solid waste generated from the storage, treatment, or disposal of a listed hazardous waste is itself a listed hazardous waste (40 CFR § 261.3(c)(2)(i), the 'derived-from rule')," the waste is still "eligible for exclusion." USEPA Region 6 "RCRA Delisting Program--Guidance Manual for the Petitioner" at 6 (Mar. 23, 2000); *see also* 40 C.F.R. § 261.3(d)(2).

Once delisted, the petitioned waste is no longer considered a listed hazardous waste and may be managed as a non-hazardous solid waste. USEPA Region 6 "RCRA Delisting Program--Guidance Manual for the Petitioner" at 9 (Mar. 23, 2000); *see also* Petition of Envirite Corp. for an Adjusted Standard from 35 Ill. Adm. Code 721 Subpart D: List of Hazardous Substances, Appendix I, AS 94-10, slip op. at 1 n.2 (Dec. 14, 1994) (delisting excludes a waste or treated waste residue from regulation as a hazardous waste); Petition of Keystone Steel and Wire Co. for Hazardous Waste Delisting, AS 91-1, slip op. at 18 (Feb. 6, 1992) (delisted waste "is nonhazardous, as defined in 35 Ill. Adm. Code 721"). The generator remains obligated, however, to determine whether the waste is characteristically hazardous waste. USEPA Region 6 "RCRA Delisting Program--Guidance Manual for the Petitioner" at 9 (Mar. 23, 2000)

On March 1, 1990, USEPA delegated to Illinois the authority to delist hazardous waste in lieu of USEPA. *See* 55 Fed. Reg. 7320 (Mar. 1, 1990); *see also* RCRA Update, USEPA Regulations, (7/1/85 through 1/31/86), R86-1 (July 11, 1986). In response to this delegation, the Board amended its hazardous waste regulations to allow adjusted standard procedures to be used for delistings. *See* RCRA Delistings, R90-17 (Feb. 28 & Apr. 11, 1991).

Specifically, under Section 720.122(n) of the Board's hazardous waste regulations (35 Ill. Adm. Code 720.122(n)), "[d]elistings which have not been adopted by USEPA may be proposed to the Board pursuant to a petition for adjusted standard." Adjusted standards are governed by Section 28.1 of the Act (415 ILCS 5/28.1 (2006)) and Part 104, Subpart D of the Board's procedural rules (35 Ill. Adm. Code 104.Subpart D). Under Section 28.1(b) (415 ILCS 5/28.1(b)

(2016)), the Board has "specif[ied] the level of justification required of a petitioner" for hazardous waste delistings in Section 720.122 (35 Ill. Adm. Code 720.122). Section 720.122 is substantively identical to the USEPA delisting regulation at 40 C.F.R. § 260.22. *See* RCRA Delistings, R90-17 (Feb. 28 & Apr. 11, 1991). The Board "will not grant any petition that would render the Illinois RCRA program less stringent than if the decision were made by USEPA." 35 Ill. Adm. Code 720.122(q).

USEPA Risk Assessment Methods

As part of evaluating a delisting petition, the Board has considered the USEPA risk assessment model and factors that are current at the time. *See*, *e.g.*, Petition of Peoria Disposal Co. for an Adjusted Standard from 35 Ill. Adm. Code 721.Subpart D, AS 91-3, slip op. at 9 (Mar. 11, 1993) (USEPA's composite model for landfills (EPACML)); Keystone Steel and Wire, AS 91-1, slip op. at 11 (USEPA's vertical and horizontal spread (VHS) model); Petition of BP Products North America, Inc. for RCRA Waste Delisting Under 35 Ill. Adm. Code 720.122, AS 07-1, slip op. at 7-9 (Feb. 15, 2007) (USEPA Composite Model for Leachate Migration with Transformation Products (EPACMTP) with DRAS version 2.0); Petition of BFI Waste Systems of North America, Inc. for Waste Delisting, AS 08-5, slip op. at 26-29 (Dec. 4, 2008) (EPACMTP with DRAS version 2.0). USEPA has likewise looked to its current risk assessment model and factors when reviewing a delisting request. *See*, *e.g.*, 73 Fed. Reg. 54713, 54714 (Sept. 23, 2008) ("This data was reviewed by [US]EPA and also evaluated using the [DRAS] currently used to evaluate new petitions."). In AS 08-10, PDC used EPACMTP with DRAS version 2.0 along with a manual spreadsheet provided by USEPA. Peoria Disposal, AS 08-10, slip op. at 43-45; TSD at 4-2. In its current evaluation, PDC uses EPACMTP with the latest DRAS version 3.0. Pet. Mod. at P8-P10.

USEPA originally developed DRAS in 1998 as a software interface for EPACMTP to "compute the risks and hazards associated with a specific waste stream for which a delisting petition has been submitted." "User's Guide for the U.S. EPA Region 6 Delisting Risk Assessment Software (DRAS)," EPA906-D-98-001, August 31, 2000 at 1; USEPA "Hazardous Waste Delisting Risk Assessment Software (DRAS)" https://www.epa.gov/hw/hazardous-waste-delisting-risk-assessment-software-dras (last updated Apr. 17, 2017); "RCRA Delisting Technical Support Document," USEPA Region 6 at 1-4, 1-6 (Oct. 31, 2008). https://www.epa.gov/sites/production/files/2016-01/documents/dtsd-20081031-chaps1_6.pdf. In predicting risks, DRAS conservatively assumes that the petitioned waste will be disposed of in an unlined landfill or surface impoundment. "National Policy for Hazardous Waste Delistings" at 1-2, Memorandum from Elizabeth A. Cotsworth, Acting Director, USEPA Office of Solid Waste, to Regional RCRA Senior Policy Advisors, RO 14282 (July 1, 1998). USEPA released the current version of DRAS version 3.0 in October 2008, which was last updated in September 2010. "User's Guide for the Delisting Risk Assessment Software (DRAS) Version 3.0 (PDF)," at 1-1, USEPA Region 5 (Oct. 2008); USEPA "Hazardous Waste Delisting Risk Assessment Software (DRAS)" https://www.epa.gov/hw/hazardous-waste-delisting-risk-assessment-software-dras (last updated Apr. 17, 2017).

DRAS "assesses the toxicity of a petitioned waste by calculating: (1) chemical and waste volume-specific screening exit values [*i.e.*, delisting levels], and (2) cumulative carcinogenic

risks and hazard indices (for non-carcinogens)." "User's Guide for the U.S. EPA Region 6 Delisting Risk Assessment Software (DRAS)," EPA906-D-98-001, August 31, 2000 at 1. Delisting levels are the concentrations below which a waste must test to no longer be considered hazardous waste. DRAS calculates delisting levels as both TCLP concentrations in milligrams per liter (mg/L) and total concentrations in milligrams per kilogram (mg/kg).

The Board has held that using DRAS is not a regulatory requirement when petitioning to delist waste, but DRAS results are a factor the Board may consider in its delisting decision. *See* BFI Waste Systems, AS 08-5, slip op. at 6; BP Products, AS 07-1, slip op. at 6 n.2; *see also* USEPA Region 6 RCRA-Risk Assessment Program at http://www.epa.gov/earth1r6/6pd/rcra_c/pd-o/midlo.htm#risk (last updated Sept. 10, 2007).

BOARD ANALYSIS

In 2009, the Board found that PDC's EAFDSR, based on the "derived from" rule, is considered RCRA listed K061 hazardous waste. The Board determined, however, that on meeting delisting levels for specified chemicals, the EAFDSR would not be considered hazardous waste. Peoria Disposal, AS 08-10, slip op. at 90-92. The Board therefore granted PDC's petition for a delisting adjusted standard, subject to conditions. *Id*. at 91-97.

Condition 3 of the 2009 order requires PDC to test a composite sample of each daily batch for the 15 chemicals using TCLP and verify that the EAFDSR meets all delisting levels specific to each chemical before disposing of the EAFDSR as non-hazardous waste. Peoria Disposal, AS 08-10, slip op. at 64, 92-96. To dispose of the waste in a Subtitle D landfill, condition 4 of the Board's 2009 order requires that PDC's EAFDSR not exceed the delisting level for any of the 15 specified chemicals. *Id*. at 95-96. For condition 4, the Board added dioxins and furans—expressed as 2,3,7,8-TCDD (tetrachlorodibenzo-p-dioxin)—to PDC's proposed list of chemicals with delisting levels. *Id.* at 44-45. The 2,3,7,8-TCDD delisting level is 2.05×10^{-10} mg/L (*i.e.*, 0.000000000205 mg/L). *Id*.

In its 2009 decision, the Board noted that IEPA or PDC "can petition the Board for modification of the adjusted standard if future information indicates that this is necessary." Peoria Disposal, AS 08-10, slip op. at 78, citing Peoria Disposal, AS 91-3, slip op. at 10-11. PDC now requests that the Board modify condition 4 of the 2009 delisting by removing dioxins and furans from the chemicals with delisting levels, which would eliminate condition 3's requirement to test for dioxins and furans. That testing is costly, according to PDC, and "has been shown to add no information to inform the decision on whether any particular batch of EAFDSR can be safely placed in a properly managed Subtitle D Landfill." Pet. Mod. at P10.

PDC asserts that even at the highest TCLP concentrations detected over the past eight years, modeling using DRAS 3.0 shows "no incremental risk increase," meaning, PDC continues, the risk would be no greater than if the TCLP concentrations were below detection limits. Pet. Mod. at P8-P10; TSD at P132. PDC maintains that the chemical and physical properties of dioxins and furans, especially their "high affinity for fine-grained particulate matter, render them virtually immobile in a properly managed RCRA Subtitle D landfill." TSD at P127. The data, "[t]aken as a whole," continues PDC, show that the TCLP "leaching solution

is not mobilizing dioxins and furans from the treated EAFDSR." TSD at P132. IEPA recommends that the Board grant the requested modification because IEPA "does not take issue" with the statements in PDC's petition. Rec. at 1-3.

Below, the Board reviews the basis of the existing delisting level for 2,3,7,8-TCDD and relates it to PDC's current risk analysis. The Board then explains why it denies PDC's request to eliminate testing for dioxins and furans.

Delisting Levels

DRAS models the fate and transport of a chemical through multiple exposure pathways, and then bases the chemical's delisting levels (maximum allowable concentrations) on the most sensitive exposure pathway among groundwater pathways and surface pathways. Peoria Disposal, AS 08-10, slip op. at 83; USEPA Region 6 "RCRA Delisting Technical Support Document" at 3-2, 3-3 (Oct. 31, 2008) https://www.epa.gov/sites/production/files/2016-01/documents/dtsd-20081031-chaps1_6.pdf.

DRAS produces delisting levels in mg/L and mg/kg for groundwater pathways and surface pathways, respectively. Results of a TCLP analysis (mg/L) are used to assess the waste's potential impact on groundwater pathways (*i.e.*, ingestion of drinking water from groundwater sources; inhalation from groundwater sources by showering; and dermal absorption from groundwater sources by bathing). Results of a total concentration analysis (mg/kg) are used to assess the waste's potential impact on surface pathways (*i.e.*, direct inhalation of vapors and particles; ingestion of fish; ingestion of drinking water from surface water sources). USEPA Region 6 "RCRA Delisting Technical Support Document" at 3-2, 3-3 (Oct. 31, 2008) https://www.epa.gov/sites/production/files/2016-01/documents/dtsd-20081031-chaps1_6.pdf

With its petition for modification, PDC uses DRAS 3.0, the current version of DRAS. Pet. Mod. at P8-P9; *see also* TSD at P131. The DRAS 3.0 software became available only after PDC filed the AS 08-10 petition and the Board held a public hearing on that petition. During the AS 08-10 proceeding, USEPA advised PDC to use the earlier version of the software, DRAS 2.0—except for dioxins and furans in the fish ingestion pathway due to incorrect calculations in DRAS 2.0. For dioxins and furans in the fish ingestion pathway, USEPA provided updates to PDC through a spreadsheet for manual calculation. Peoria Disposal, AS 08-10, slip op. at 43-45; TSD at 4-2.

In the AS 08-10 proceeding, PDC identified the two most sensitive exposure pathways for dioxins and furans: the adult dermal absorption of groundwater and the fish ingestion pathway. For the adult dermal absorption of groundwater pathway, DRAS 2.0 calculated the maximum allowable TCLP concentration of 2.05×10^{-10} mg/L (*i.e.*, 0.000000000205 mg/L). For the fish ingestion pathway, the spreadsheet calculation showed the maximum allowable total concentration at 6.94×10^{-5} mg/kg (*i.e.*, 0.0000694 mg/kg). Peoria Disposal, AS 08-10, Resp. to Hearing Officer Ord., Att. 6, 7 (Aug. 7, 2008). Depending on the most sensitive exposure pathways, a chemical's delisting level may be set as a TCLP concentration (mg/L) and/or a total concentration (mg/kg). USEPA's "RCRA Delisting Technical Support Document," USEPA Region 6, EPA906-D-98-001, at 4-9 (Aug. 1, 2000).

According to PDC's current TSD, the 2009 order's delisting level for dioxins and furans is based on the fish ingestion pathway, which is a surface pathway measured in total concentration (mg/kg). TSD at P131-P132. However, this is inaccurate; the Board set the delisting level based on the adult dermal absorption of groundwater pathway measured in mg/L. The Board therefore established the delisting level only for the TCLP concentration (2.05×10^{-10} mg/L or 0.000000000205 mg/L), not the total concentration. Peoria Disposal, AS 08-10, slip op. at 44-45, 55, 96.

In its petition for modification, PDC's DRAS 3.0 calculations identify the same two most sensitive exposure pathways for dioxins and furans as in AS 08-10, but with different maximum allowable concentrations. Specifically, the adult dermal absorption of groundwater pathway now has a maximum allowable TCLP concentration of 4.03 mg/L. This is significantly higher (*i.e.*, less stringent) than the maximum allowable TCLP concentration—and 2009 delisting level—of 2.05×10^{-10} mg/L (*i.e.*, 0.000000000205 mg/L). The fish ingestion pathway, on the other hand, now has a maximum allowable total concentration of 3.54×10^{-8} mg/kg (*i.e.*, 0.0000000354 mg/kg). This is significantly lower (*i.e.*, more stringent) than the maximum allowable total concentration of 6.94×10^{-5} mg/kg (*i.e.*, 0.0000694 mg/kg) calculated in AS 08-10. TSD, App. 2 at P175. These results indicate that the maximum allowable concentration of dioxins and furans in the EAFDSR is now more stringent with the fish ingestion pathway and less stringent with the adult dermal absorption of groundwater pathway than in AS 08-10. While PDC's petition compares levels from samples of EAFDSR to the new less stringent maximum allowable TCLP concentration for the groundwater pathway, the petition does not address how sample levels compare to the new more stringent maximum allowable total concentration for the surface pathway.

Cancer Risk Levels

DRAS 2.0 and the spreadsheet calculation used by PDC in AS 08-10 calculated the cancer risk associated with samples of EAFDSR. For assessing the suitability of a waste to meet delisting levels and in calculating the associated cancer risk, the highest detected values are used. When setting standards, USEPA Region 5 and the State of Illinois generally use target levels of 10^{-6} for cancer risk, which equates to one in one million. 65 Fed. Reg. 75897, 75901-75902 (Dec. 5, 2000); 67 Fed. Reg. 1892 (Jan. 15, 2002); *see also* USEPA Region 6 "RCRA Delisting Technical Support Document," Ch. 4 (Oct. 31, 2008) https://www.epa.gov/sites/production/files/2016-01/documents/dtsd-20081031-chaps1_6.pdf; USEPA Region 6 "RCRA Delisting Program Guidance Manual for the Petitioner," Att. A (Mar. 23, 2000); USEPA "Hazardous Waste Delisting Risk Assessment Software (DRAS)" https://www.epa.gov/hw/hazardous-waste-delisting-risk-assessment-software-dras (last updated Apr. 17, 2017).

In the AS 08-10 proceeding, the cancer risk targets set by USEPA Region 5 and confirmed by IEPA were:

- Individual cancer risk of 1×10^{-4} for arsenic and 1×10^{-6} for all other chemicals; and

- Aggregate cancer risk of 1 x 10^{-5} (not including the contribution from arsenic). AS 08-10 TSD at 6-5.[1]

PDC used DRAS 2.0 and the spreadsheet in AS 08-10 to calculate the cancer risk of the highest values in the EAFDSR samples. For the adult dermal absorption of groundwater pathway using DRAS 2.0, the cancer risk of a 4.00 x 10^{-11} mg/L (*i.e.*, 0.0000000000400 mg/L) 2,3,7,8-TCDD sample was 2.00 x 10^{-7} (*i.e.*, 0.000000200). For the fish ingestion pathway using the spreadsheet, the cancer risk of a 1.60 x 10^{-4} mg/kg (*i.e.*, 0.00016 mg/kg) 2,3,7,8-TCDD sample was 2.31 x 10^{-6} (*i.e.*, 0.00000231). Peoria Disposal, AS 08-10, Resp. to Hearing Officer Ord., Att. 6, 7 (Aug. 7, 2008).

With DRAS 3.0, PDC calculated different cancer risk levels in its petition for modification. Specifically, for the adult dermal absorption of groundwater pathway, the cancer risk of the highest value sample—4.6 x 10^{-10} mg/L (*i.e.*, 0.00000000046 mg/L)—is 1.17 x 10^{-16} (*i.e.*, 0.000000000000000117). TSD at P132, App. 1 at P146, App. 2 at P193. For the fish ingestion pathway, the cancer risk of a 1.60 x 10^{-4} mg/kg (*i.e.*, 0.000160 mg/kg) 2,3,7,8-TCDD sample (which is the December 13, 2007 sample used in AS 08-10) is 4.51 x 10^{-3} (*i.e.*, 0.00451). TSD at P131, App. 2 at P182, P197, P213. These results indicate that the cancer risk level from dioxins and furans in the EAFDSR is now significantly higher with the fish ingestion pathway than with the adult dermal absorption of groundwater pathway.

Comparing Maximum Allowable Concentrations and Cancer Risk Levels

A "delisting level" is "the maximum allowable concentration of a waste constituent that will not exceed the target risk level for that compound." "User's Guide for the U.S. EPA Region 6 Delisting Risk Assessment Software (DRAS)" at 13, USEPA Region 6, EPA906-D-98-001 (Aug. 31, 2000). USEPA elaborated:

> The delisting levels for each waste constituent are the maximum concentrations (total and TCLP) allowed for the constituent in any batch of the petitioned waste, based on the most sensitive pathway associated with exposure dependent on the TCLP waste constituent concentration and the waste constituent total concentration. USEPA's "RCRA Delisting Technical Support Document," USEPA Region 6, EPA906-D-98-001, at 4-10 (Aug. 1, 2000).

With the update from DRAS 2.0 to DRAS 3.0, the factors and methods used in the risk assessment modeling have been revised, many significantly. For example, DRAS 3.0 includes new Dilution Attenuation Factors. *See* 73 Fed. Reg. 54764-54765 (Sept. 23, 2008). For dioxins

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[1] A separate cancer risk level of 10^{-4} for arsenic was used to more closely follow USEPA's Maximum Contaminant Level of 0.01 mg/L. Peoria Disposal, AS 08-10, slip op. at 46-47. For non-carcinogenic chemicals, the target used was a hazard quotient of 1.0. AS 08-10 TSD at 6-5.

and furans, the table below compares the maximum allowable concentrations and cancer risk levels calculated by PDC in AS 08-10 and this proceeding.

Dioxins/ Furans (2,3,7,8-TCDD)	**Maximum Allowable Concentration Calculated by**		**Cancer Risk Level Calculated by**	
	DRAS 2.0 or Spreadsheet	**DRAS 3.0**	**DRAS 2.0 or Spreadsheet****	**DRAS 3.0*****
TCLP	2.05×10^{-10} mg/L* or 0.000000000205 mg/L	4.03 mg/L	2.00×10^{-7} or 0.000000200	1.14×10^{-16} or 0.000000000000000114
TOTAL	6.94×10^{-5} mg/kg or 0.0000694 mg/kg	3.54×10^{-8} mg/kg or 0.0000000354 mg/kg	2.31×10^{-6} or 0.00000231	4.51×10^{-3} or 0.00451

* The delisting level from the 2009 order.

** For samples measured at 4.00×10^{-11} mg/L (*i.e.*, 0.0000000000400 mg/L) and 1.60×10^{-4} mg/kg (*i.e.*, 0.000160 mg/kg). Peoria Disposal, AS 08-10, Resp. to Hearing Officer Ord., Att. 6, 7 (Aug. 7, 2008).

*** For samples measured at 4.60×10^{-10} mg/L (*i.e.*, 0.000000000460 mg/L) and 1.60×10^{-4} mg/kg (*i.e.*, 0.000160 mg/kg). TSD at P132, App. 2 at P186, P193.

The results from the past eight years of TCLP concentration tests for 2,3,7,8-TCDD on EAFDSR samples (TSD, App. 1 at P140-P168) meet the DRAS 3.0 maximum allowable TCLP concentration of 4.03 mg/L. However, during the 2009 proceeding, one EAFDSR sample (Sample ID R5-01, Laboratory ID 1065168004, Dec. 13, 2007) was subjected to the relevant test for the fish ingestion pathway—that is, total concentration measured in mg/kg. The result of the total concentration test on that sample—1.60×10^{-4} mg/kg (*i.e.*, 0.000160 mg/kg)—exceeds PDC's DRAS 3.0 maximum allowable total concentration of 3.54×10^{-8} mg/kg (*i.e.*, 0.0000000354 mg/kg). Peoria Disposal, AS 08-10, Resp. to Hearing Officer Ord. at 9-10, Att. 5, 7 (Aug. 7, 2008); TSD, App. 2 at P171, P182, P183, P185, P186, P196, P197, P198, P200, P201, P212, P213, P214, P216. Further, for that same total concentration sample, PDC's DRAS 3.0 evaluation calculated a cancer risk level of 4.51×10^{-3} (0.00451), exceeding the acceptable target risk of 10^{-6} for cancer.

Board Ruling

In its petition to modify the 2009 delisting, PDC provides the past eight years of testing data for 2,3,7,8-TCDD. Those data include TCLP concentrations in mg/L but not totals concentrations in mg/kg. The only total concentration value for 2,3,7,8-TCDD in PDC's current petition (TSD, App. 2 at P171) dates to the AS 08-10 proceeding (Sample ID R5-01, Laboratory

ID 1065168004, dated December 13, 2007). Peoria Disposal, AS 08-10, TSD, Table 3a, App. L, and App. N; *see also* Peoria Disposal, AS 08-10, Resp. to Hearing Officer Ord. at 9-10, Att. 5 (Aug. 7, 2008). And, that total concentration value (1.60×10^{-4} mg/kg or 0.00016 mg/kg) under PDC's DRAS 3.0 analysis exceeds both:

- The maximum allowable concentration of 3.54×10^{-8} mg/kg (*i.e.*, 0.0000000354 mg/kg); and

- The one-in-a million or 10^{-6} target risk with a cancer risk level of 4.51×10^{-3} (*i.e.*, 0.00451).

This one sample from 2007 with a total concentration value is not an adequate basis to decide whether concentrations of 2,3,7,8-TCDD in PDC's EAFDSR are problematic. Under the Board's delisting regulations, "[d]emonstration samples must consist of enough representative samples, but in no case less than four samples, taken over a period of time sufficient to represent the variability or the uniformity of the waste." 35 Ill. Adm. Code 720.122(h). However, for the fish ingestion exposure pathway, PDC has not demonstrated that total concentrations of 2,3,7,8-TCDD in the EAFDSR would meet the DRAS 3.0 maximum allowable concentration, as calculated by PDC, or pose an acceptable cancer risk. Because PDC has not justified its request to remove dioxins and furans from the 2009 order's list of chemicals to test for, the Board denies PDC's petition.

CONCLUSION

The Board denies PDC's petition to modify the 2009 delisting order. Nothing in this denial precludes PDC from filing another petition for modification based on a risk assessment method that is current at the time and accepted by USEPA. PDC must serve a copy of any such petition on USEPA. *See* 35 Ill. Adm. Code 720.122(n)(1). If PDC files another petition for modification based on DRAS 3.0, the petition must address the deficiencies identified in today's order.

In addition to serving a copy of this order on PDC and IEPA, the Board's Clerk will serve a copy on USEPA as required by 35 Ill. Adm. Code 720.122(n)(2).

IT IS SO ORDERED.

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2016); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702. Filing a motion asking that the Board reconsider this final order is not a prerequisite to appealing the order. 35 Ill. Adm. Code 101.902.

Names and Addresses for Receiving Service of Any Petition for Review Filed with the Appellate Court	
Parties	**Board**
Elias, Meginnes, & Seghetti, P.C. Attn: Brian J. Meginnes, Janaki Nair 416 Main Street, Suite 1400 Peoria, Illinois 61602	Illinois Pollution Control Board Attn: Don A. Brown, Clerk James R. Thompson Center 100 West Randolph Street, Suite 11-500 Chicago, Illinois 60601
Illinois Environmental Protection Agency Attn: Michelle M. Ryan 1021 North Grand Avenue East P.O. Box 19276 Springfield, Illinois 62794-9276	

I, Don A. Brown, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on November 1, 2018, by a vote of 5-0.

Don A. Brown

Don A. Brown, Clerk
Illinois Pollution Control Board