Fact Sheet for Dangerous Waste Delisting and Treatment Variance Petitions
Emerald Kalama Chemical, LLC
January 20, 2022

Purpose of this Fact Sheet

This fact sheet explains and documents the evaluation the Department of Ecology (Ecology) performed in making a tentative decision to grant delisting and treatment variance petitions submitted by Emerald Kalama Chemical, LLC (Emerald).

Ecology is providing written notice of its tentative decision to grant the delisting and treatment variance petitions submitted by Emerald for public review and comment at least thirty (30) days before making the final decision on the petitions. Copies of the delisting petition, treatment variance petition, this fact sheet, and the draft approval letter are available for public review and comment from January 20, 2022 through February 22, 2022. For more details on preparing and filing comments about these documents, please see Appendix A - Public Involvement Information.

Upon the written request of any interested person, Ecology may, at its discretion, hold a conference to consider oral comments on the action proposed in the petitions. A person requesting a conference must state the issues to be raised and explain why written comments would not suffice to communicate the person’s views.

After evaluating all public comments, Ecology will make a final decision to grant or deny the delisting and treatment variances petitions. The approval or denial of the petitions will be by letter from Ecology. Ecology will summarize substantive comments and provide responses to them. Ecology will include the summary and responses to comments in this fact sheet as Appendix B - Response to Comments, and make it available with the final decision to approve or deny the delisting and treatment variance petitions. Ecology generally will not revise the rest of the fact sheet. The full document will become part of the administrative record contained in the facility’s regulatory files.

Summary

Emerald Kalama Chemical, LLC (Emerald) is an organic chemical manufacturing plant located in Kalama, Washington. Emerald generates industrial wastewater biological solids (IWBS) that state and federal law consider to be a listed dangerous waste designated as U019 (benzene) and U220 (toluene). Emerald tested the IWBS dangerous waste and have data showing that it does not contain chemicals at harmful levels and should not be considered dangerous.

Emerald submitted a delisting petition to Ecology and the Environmental Protection Agency (EPA) to exclude (or “delist”) up to 3,500 cubic yards of U019 (benzene) and U220 (toluene) IWBS dangerous waste annually from the list of federal hazardous wastes. Emerald also submitted a petition for a variance from the land disposal treatment standards. The exclusion and variance apply only to IWBS dangerous waste associated with Emerald’s on-site wastewater treatment facility.
Ecology is proposing to grant these petitions according to WAC 173-303-910(3) for the delisting petition and 40 CFR 268.44(h)-(m) (by reference in WAC 173-303-140(2)) for the treatment variance petition. These approvals will allow Emerald to manage the IWBS as solid waste instead of dangerous waste. This means they would be allowed to dispose the IWBS in a solid waste landfill.
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I. Background

Table 1 General Facility Information

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<thead>
<tr>
<th>Applicant</th>
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<tr>
<td>Address</td>
<td>1296 Third Street NW</td>
</tr>
<tr>
<td></td>
<td>Kalama, Washington 98625</td>
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<tr>
<td>Name: Contacts at Facility</td>
<td>Phil Oyer, Environmental Manager</td>
</tr>
<tr>
<td>Telephone #:</td>
<td>(360) 673-2550</td>
</tr>
<tr>
<td>Name:</td>
<td>Galen Hathcock, Site Director</td>
</tr>
<tr>
<td>Telephone #:</td>
<td>(360) 673-2550</td>
</tr>
<tr>
<td>Name: Responsible Official</td>
<td>Jan Eland, Vice President, Head of Global Technical Operations</td>
</tr>
<tr>
<td>Facility Location (NAD83/WGS84 reference datum)</td>
<td>Latitude: 46.02097</td>
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<td></td>
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A. Facility and Dangerous Waste Descriptions

Emerald is a chemical manufacturing facility in Kalama, Washington that uses toluene as a raw material to produce chemicals used in food, beverage, paint, and pharmaceutical industries to make flavorings, fragrances, preservatives, plasticizers, and other products.

Emerald treats dangerous waste in an on-site wastewater treatment facility. All dangerous wastes have one or more corresponding dangerous waste codes, consisting of a letter and three numbers (i.e., U001). Waste codes starting with an F, K, P and U are wastes from common manufacturing and industrial processes. These are called “listed” wastes. Where applicable, the dangerous waste codes for the waste streams discussed in this document are included.

The sources of listed dangerous waste that Emerald treats in their wastewater treatment facility include groundwater and stormwater contaminated from spills, process wastewater, and laboratory wastewater. Unused benzene (U019) and toluene (U220) commercial chemical products at Emerald’s facility become listed dangerous waste when they are discarded. For example, these chemicals would be discarded and become listed dangerous waste if spilled (Washington Administrative Code (WAC) 173-303-081). There is also potential for acetaldehyde (U001) to enter Emerald’s wastewater treatment plant if pure product acetaldehyde is spilled during loading and unloading operations. Emerald’s on-site laboratories use acetone and methanol as solvents. The spent solvents of acetone and methanol (F003) (WAC 173-303-082) and unused commercial methanol (U154) may enter Emerald’s wastewater treatment plant.
Some dangerous wastes have waste codes starting with the letter D. Wastes that are assigned dangerous waste codes starting with the letter D are called “characteristic” wastes. These wastes exhibit characteristics of ignitability, corrosivity, reactivity, and toxicity. Due to manufacturing processes, some wastewaters entering Emerald’s wastewater treatment plant contain benzene (D018) at levels that are toxic (WAC 173-303-090).

Based on the reasons above, the wastewater entering Emerald’s wastewater treatment system contains the following dangerous waste codes: U001, U019, U154, U220, F003, and D018.

The dangerous waste regulations specify that residues from treating listed dangerous waste are also listed dangerous waste. This is commonly called the “derived-from rule” (WAC 173-303-070(2)(a)). Emerald generates IWBS from their wastewater treatment facility. The IWBS are treatment residues and therefore the listed dangerous waste codes applicable to the dangerous waste being treated also apply to the IWBS. These waste codes are U001, U019, U154, U220, and F003. As noted in the delisting petition, certain dangerous waste codes applicable to the wastewater do not carry through to the IWBS due to an exception to the derived-from rule. This is commonly called the “ICR rule” (WAC 173-303-070(2)(c)), with ICR standing for “ignitable”, “corrosive”, and “reactive”. Certain listed dangerous wastes are only listed because of their ignitability, corrosivity, or reactivity. Residues from treating wastes that are listed dangerous wastes due to only ignitability, corrosivity, or reactivity, are no longer considered dangerous waste as long as the residue no longer exhibits any characteristics or criteria after treatment. Since U001, U154, and F003 are listed solely because of ignitability, and the IWBS do not designate for any characteristic in WAC 173-303-090 and criteria in WAC 173-303-100, these three waste codes no longer apply to the IWBS. Therefore, only the listed dangerous waste codes for benzene (U019) and toluene (U220) apply to the IWBS.

The “derived-from rule” does not apply to characteristic dangerous waste codes (dangerous waste codes beginning with the letter D). As stated above, some wastewaters entering Emerald’s wastewater treatment plant are assigned dangerous waste code D018. If residue from treating characteristic dangerous wastes no longer exhibits a characteristic, the characteristic waste code no longer applies to the residue. The IWBS do not exhibit toxicity for benzene. Therefore, the IWBS are not assigned any characteristic waste codes.

Based on the reasons above, the IWBS from Emerald’s wastewater treatment system contains the following dangerous waste codes: U019 and U220.

The ICR rule has one condition that must be met to allow dangerous waste codes to no longer apply to listed dangerous waste and any treatment residues. WAC 173-303-070(2)(c)(iii)(B) requires that the land disposal restrictions (LDRs) apply to all listed dangerous wastes and their treatment residues, including those that use the ICR rule to drop dangerous waste codes.
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For the IWBS, even though the U001, U154, and F003 dangerous waste codes are not applicable to the IWBS, the LDRs for these three dangerous waste codes continue to apply. For the reasons above, the LDRs for wastes with codes U001, U019, U154, U220, and F003 apply to Emerald’s IWBS. Sections I.E and II.B below have more information on LDRs.

B. Delisting and Treatment Variance Petitions

Emerald submitted a petition to EPA and Ecology to exclude (or “delist”) up to 3,500 cubic yards of U019 (benzene) and U220 (toluene) IWBS dangerous waste annually from the list of federal hazardous wastes. See Section II.A below for information on how Ecology evaluated Emerald’s delisting petition. Emerald also submitted a petition to Ecology for a site-specific variance from the land disposal treatment standards for acetaldehyde in the IWBS. See Section II.B below for information on how Ecology evaluated Emerald’s treatment variance petition. The delisting and treatment variance petitions apply only to the IWBS dangerous waste associated with Emerald’s on-site wastewater treatment facility.

C. Delisting Regulations

Ecology regulates the management of dangerous waste in Washington State in accordance with the Washington State Hazardous Waste Management Act, Chapter 70A.300 Revised Code of Washington (RCW) and the Dangerous Waste Regulations, Chapter 173-303 WAC.

EPA also regulates facilities that manage hazardous waste in accordance with the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) and the Hazardous and Solid Waste Amendments of 1984 (HSWA) and the regulations in Title 40 of the Code of Federal Regulations (CFR). EPA has authorized Ecology to implement these federal regulations in Washington.

Both the federal hazardous waste regulations and state dangerous waste regulations include provisions that allow a facility to petition for exclusion (“delisting”) from the list of federal hazardous wastes. The state provisions for delisting petitions are found in WAC 173-303-910(1) and (3). The federal provisions for delisting petitions are found in 40 CFR 260.20 and 260.22.

While Ecology has received final authorization to implement most of its dangerous waste program regulations in lieu of the federal program, including the listing and identification of U019 and U220 wastes, it has not been authorized to implement its delisting regulations program in lieu of the federal program. As a result, Emerald must seek approval of their delisting petition from both Washington State and EPA.

D. State-Only Criteria

The Washington State Dangerous Waste Regulations are more protective in some ways than the federal hazardous waste regulations. One area where the state regulations are more protective is determining what materials are regulated as dangerous waste. Washington has criteria for toxicity and persistence that the EPA does not.
Materials not regulated as hazardous waste by the federal regulations must also be checked during the delisting evaluation process against the state criteria in WAC 173-303-100.

E. Treatment Variance

The land disposal restrictions (LDRs) in the dangerous waste rules require dangerous wastes to meet certain treatment levels before being disposed in a landfill (WAC 173-303-140 and by reference 40 CFR 268). The EPA created treatment standards for wastewater and nonwastewater type hazardous wastes. The treatment standards are either concentration-based or technology-based standards (40 CFR 268.40). The state dangerous waste regulations (WAC 173-303-140(2)), by reference of the federal hazardous waste regulations (40 CFR 268.44(h)-(m)), include provisions that allow a facility to petition for a site-specific variance of the land disposal treatment standards. Ecology is authorized to make decisions independent of EPA on petitions requesting site-specific variances of the land disposal treatment standards. Thus, Emerald only needs to seek approval from Washington State for the treatment variance petition. Ecology notes that EPA has not authorized Ecology for the regulations at 40 CFR 268.44(a)-(g), which allow for a generator or treater of hazardous waste to petition for a variance from an applicable treatment standard beyond just one facility. EPA can only approve a treatment variance petition for non-site-specific situations.

Emerald only is requesting a treatment variance for U001 (acetaldehyde). As detailed below, Emerald demonstrated or believe that the IWBS meet the applicable nonwastewater LDRs (40 CFR 268.40) for U019, U154, U220, and F003.

The concentration-based LDR for U019 are 10 mg/kg benzene. Between 1998 and 2014, Emerald tested the IWBS for benzene with all 15 samples reported as non-detect with detection limits ranging from 0.044 to 3.8 mg/kg benzene. Therefore, Emerald’s treatment variance petition does not include U019.

Technology-based treatment standards under 40 CFR 268.40 are identified using abbreviations which EPA calls “technology codes”. The technology code LDR EPA established for U154 is “CMBST”. 40 CFR 268.42 Table 1 contains descriptions of the technology-based treatment standards corresponding to each technology code. The federal rules in 40 CFR 268.42 Table 1 describe “CMBST” as “High temperature organic destruction technologies, such as combustion in incinerators, boilers, or industrial furnaces . . .” The federal regulations allow for a concentration-based alternate treatment standard for U154 of 0.75 mg/L methanol measured by the Toxicity Characteristic Leaching Procedure (TCLP). In 2001, Emerald tested the IWBS for methanol with the one sample reported as non-detect with a detection limit of 0.75 mg/kg methanol. Ecology notes that Emerald tested for methanol using a totals analysis instead of a TCLP analysis. TCLP analysis is a method which estimates the concentration of a pollutant in leachate from the waste being analyzed. Since the total concentration of methanol measured in mg/kg was less than the LDR TCLP concentration of 0.75 mg/L, this indicates that a TCLP analysis of the IWBS would also be below 0.75 mg/L methanol.
Instead of requesting a treatment variance from the U154 technology-based LDR of “CMBST”, Emerald chooses to meet the concentration-based alternate treatment standard. Therefore, Emerald’s treatment variance petition does not include U154.

The concentration-based LDR for U220 is 10 mg/kg toluene. Between 1998 and 2014, Emerald tested the IWBS for toluene with 13 of the 14 samples reported as non-detect with detection limits ranging from 0.044 to 3.8 mg/kg. Emerald detected toluene in one sample of IWBS at a concentration of 0.069 mg/kg. Therefore, Emerald’s treatment variance petition does not include U220.

The applicable concentration-based LDR for F003 is 160 mg/kg for acetone. In 2001, Emerald tested the IWBS for acetone with the one sample reported as non-detect with a detection limit of 0.050 mg/kg. Another applicable concentration-based LDR for F003 is for methanol, which is equivalent to the LDR for U154 stated above which Emerald chooses to meet (0.75 mg/L methanol measured by TCLP). Therefore, Emerald’s treatment variance petition does not include F003.

Although not covered by the delisting or treatment variance petitions, Emerald must show compliance with the LDRs for all applicable waste codes that don’t receive an approved treatment variance. This means Emerald must meet the LDRs described above for U019, U154, U220, and F003. See Section II.B below for information on how Ecology evaluated Emerald’s treatment variance petition for U001’s technology-based LDR.

II. Evaluation of Delisting and Treatment Variance Petitions

A. Delisting Petition

Emerald’s delisting petition, and subsequent documentation as requested by the EPA and Ecology, included data showing that there are no harmful levels of chemicals in the IWBS and the IWBS does not meet the criteria for which it was listed. Ecology and EPA performed an extensive review of the waste information and data provided in the delisting petition and subsequent documentation. The agencies evaluated the risk of delisting the IWBS waste using EPA’s Delisting Risk Assessment Software (DRAS). This software predicts the concentration of hazardous waste constituents that might be released from the wastes and if these concentrations would pose a threat to human health and the environment. More information regarding this analysis is provided in EPA’s notice in the Federal Register for the proposed delisting at https://www.federalregister.gov/ (Docket #: EPA-R10-RCRA-2018-0661). Ecology worked closely with EPA in developing the federal proposed delisting documentation and draft proposed rule. Ecology incorporates by reference EPA’s notice in the Federal Register into this fact sheet as additional basis for making a decision on Emerald’s delisting petition.

Ecology and EPA have concluded that the petitioned IWBS waste (U019 and U220) is nonhazardous with respect to the original federal listing criteria and that there are no other factors (including additional constituents) other than those for which the waste was listed that would warrant retaining the waste as hazardous waste.
The proposed delisting of the IWBS dangerous wastes means the wastes are not federally regulated as hazardous waste. Ecology went on to determine if the wastes are regulated under state-only criteria.

Emerald performed fish bioassay testing on the IWBS in 2000 and 2014 and the percent mortality of the rainbow trout was zero for both tests. This means the IWBS did not designate as dangerous waste for the state toxicity criteria in 2000 and 2014.

According to the delisting petition, the Emerald facility does not use halogenated organic chemicals or polycyclic aromatic hydrocarbons in their manufacturing processes and these chemicals would not be generated in the wastewater treatment plant. Therefore, the IWBS would not contain persistent chemicals. Consequently, the IWBS would not designate as dangerous waste under the persistence criteria. According to the Dangerous Waste Regulations (WAC 173-303-070(3)(e)(ii)), Emerald may apply knowledge of the waste instead of testing when designating the IWBS. Emerald must keep all data and records supporting this knowledge-based determination on-site.

Emerald provided data and information demonstrating that the IWBS wastes are not regulated by the state criteria. Ecology agreed with this demonstration. Therefore, the proposed delisting of the IWBS means the wastes are not state regulated as dangerous waste.

B. Treatment Variance Petition

As described above, U001’s (acetaldehyde) LDR applies to the IWBS. The LDR for U001 is technology-based. There is no concentration-based LDR for U001. The technology-based LDR for U001 is “CMBST”. The federal rules in 40 CFR 268.42 Table 1 list “CMBST” as “High temperature organic destruction technologies, such as combustion in incinerators, boilers, or industrial furnaces . . .”

Emerald submitted a treatment variance petition to Ecology concurrently with the delisting petition. Approval of the treatment variance petition would exempt Emerald from meeting the technology-based standard of combustion for U001 (acetaldehyde). Emerald provided information in the treatment variance petition to show why the combustion treatment standard is not appropriate for the IWBS waste. Ecology has the authority to implement 40 CFR 268.44(h)-(m), which allows Ecology to approve a site-specific variance from an applicable treatment standard if either of the following criteria are met:

1) *It is not physically possible to treat the waste by the method specified as the treatment standard (40 CFR 268.44(h)(1)).*

   Ecology believes Emerald could send the IWBS waste to a hazardous waste incinerator for combustion. Therefore, this option does not allow Ecology to approve the site-specific treatment variance.

2) *It is inappropriate to require the waste to be treated by the method specified as the treatment standard, even though the treatment is technically possible.*
To show that this is the case, the treatment by the specified method must be technically inappropriate (40 CFR 268.44(h)(2)(i)).

As noted in Emerald’s treatment variance petition, Emerald’s wastewater treatment plant provides a viable and proven treatment method for organic chemicals, including acetaldehyde. Ecology agrees that it is not necessary, nor is it technically appropriate to treat the IWBS by combustion, as the potentially discarded acetaldehyde that may be present in the wastewater entering the wastewater treatment plant would likely be present in very low concentrations. The IWBS that are produced in the wastewater treatment plant are essentially the dead and decaying microorganisms used to digest the influent wastewater and thereby chemically transform the undesirable components present in the wastewater into benign compounds. The IWBS are unlikely to contain acetaldehyde at a concentration that would be harmful to human health or the environment.

The IWBS are mainly water (about 90%) and likely would need to be de-watered before being incinerated. Removing water would require a considerable amount of energy that would likely have a negative impact on the environment. Also, the potential negative environmental impact of emissions from transporting the wastes to an incinerator would be significant based on truck and train emissions. For these reasons, Ecology believes the combustion treatment standard for the IWBS waste is technically inappropriate.

III. Proposed Decision

Ecology has reviewed all information submitted as part of the delisting and treatment variance petitions and has made a tentative decision to grant these petitions.

Through the delisting petition, Emerald requested an exclusion (“delisting”) up to 3,500 cubic yards of U019 (benzene) and U220 (toluene) IWBS dangerous waste annually from the requirements of the state dangerous waste regulations and the federal hazardous waste regulations.

Ecology is proposing to grant the exclusion, pending approval by EPA after publication in the Federal Register and any subsequent revisions resulting from public comment. This approval is conditional. Emerald must meet delisting levels, conduct waste verification testing, and meet data submittal requirements and other conditions, as outlined in EPA’s notice of proposed delisting and Washington State’s approval letter. EPA’s notice of the proposed delisting is incorporated by reference into this fact sheet and is additional basis for Ecology’s decision. EPA’s notice can be found at: https://www.federalregister.gov/ (Docket #: EPA-R10-RCRA-2018-0661). Emerald must dispose the IWBS waste in a Subtitle D permitted solid waste landfill.

As part of EPA’s proposed rule, Emerald must sample the IWBS for acetaldehyde, barium, benzaldehyde, benzene, benzoic acid, benzyl alcohol, cobalt, copper, formic acid, methanol, nickel, phenol, toluene, and zinc.
This sampling is required in order to verify that Emerald is meeting the delisting exclusion limits established by DRAS and as documented in EPA’s proposed rule. Ecology will require Emerald to submit the sampling results to Ecology at least once per year.

Separate from delisting, Ecology will require Emerald to sample for acetaldehyde instead of meeting the LDR treatment standards of combustion. Emerald must collect a representative grab sample of IWBS once every quarter for eight quarters and sample for acetaldehyde. Quarterly sampling periods are January through March, April through June, July through September, and October through December. If the treatment variance is approved, Emerald must submit to Ecology by January 15th of every year the previous year’s acetaldehyde sampling results. Ecology believes quarterly sampling for acetaldehyde is appropriate as an initial sampling frequency to determine the variance of acetaldehyde in the IWBS.

Ecology used the EPA’s DRAS to determine an alternative treatment standard for an allowable concentration of acetaldehyde in the IWBS waste. This concentration must be met in order for Emerald to send the IWBS waste to a permitted solid waste landfill.

The alternative treatment standard for acetaldehyde in the IWBS waste from the DRAS model is 8.65 mg/L. This alternative treatment standard is based on the Toxicity Characteristic Leaching Procedure analysis in the model. Ecology believes this alternative treatment standard is sufficient to minimize threats to human health and the environment posed by land disposal of the waste (40 CFR 268.44(m)). For each roll-off box of IWBS waste that exceeds the alternative treatment standard for acetaldehyde, Ecology will require Emerald to meet the original technology-based standard of high temperature organic destruction, such as combustion, for that roll-off box.

If after eight quarters of sampling for acetaldehyde and Emerald has not exceeded the alternative treatment standard, Emerald may reduce sampling of acetaldehyde to twice per year (once between January and June and once between July and December). If Emerald exceeds the alternative treatment standard at any point, Emerald must stay at or revert back to quarterly sampling. If Emerald repeatedly exceeds the alternative treatment standard, Ecology may require more frequent than quarterly sampling for acetaldehyde to better define how many roll-off boxes exceed the alternative treatment standard.

Ecology notes that Emerald may use the acetaldehyde sampling from the delisting exclusion to meet the alternative treatment standard. As noted in EPA’s proposed rule, Ecology does not currently accredit any laboratory for analysis of acetaldehyde in samples of solid material. Therefore, samples for acetaldehyde may be analyzed by a laboratory that otherwise holds accreditation for the other analytes to be sampled under EPA’s delisting conditions for exclusion.

See the draft approval letter for detailed requirements Emerald must follow for monitoring IWBS wastes and reporting.
Appendix A -- Public Involvement Information

Ecology proposes to approve the delisting and treatment variance petitions. If approved, Emerald would be allowed to dispose of the IWBS waste as solid waste instead of dangerous waste. This means they would be allowed to dispose of the IWBS waste in a permitted solid waste landfill. This fact sheet describes the facility and Ecology’s reasons for proposing to approve the petitions.

Ecology will place a Public Notice on January 20, 2022 on Ecology’s website to inform the public and to invite comment on the proposed approval of dangerous waste delisting and treatment variance petitions.

The notice:

• Tells where copies of the Fact Sheet and Draft Approval Letter are available for public evaluation.
• Offers to provide the documents in an alternate format to accommodate special needs.
• Urges people to submit their comments, in writing, by the end of the comment period.
• Tells how to request a conference to consider accepting oral comments on the action proposed in the petition.


For more information, contact us by telephone, (360) 407-6934, or by writing to the address listed below.

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The primary author of this fact sheet is Greg Gould.
Appendix B -- Response to Comments

Ecology will fill out this appendix after the public comment period.