

Centralized Waste Treatment Effluent Guidelines

Frequently Asked Questions - January 2022

This Frequently Asked Questions (FAQs) document is the third addendum to Chapter 10, Questions and Answers, of the [Small Entity Compliance Guide](#) (EPA 821-B-01-003, June 2001) for the Centralized Waste Treatment Effluent Limitation Guidelines and Standards (40 CFR Part 437).

This FAQ document provides additional information on determining applicability of the Centralized Waste Treatment (CWT) rule to wastewaters from resin regeneration activities, and they supplement information provided in the CWT Small Entity Compliance Guide and the preamble to the 2000 regulation.

Applicability of Centralized Waste Treatment Regulations to Wastewaters from Resin Regeneration Activities

Many questions arise from the regulated community as to the applicability of the CWT regulations to certain wastes generated from ion exchange (IX) resin regeneration. While EPA has provided technical support in the form of FAQs, stakeholders have reported that ambiguities remain with respect to certain applications. This FAQ document provides additional information to aid the regulated community, permit writers and control authorities in determining applicability of the CWT rule to these wastes.

Background

The Centralized Waste Treatment regulations apply to facilities that treat or recover metal-bearing, oily, and organic wastes, wastewater, or used material received from off-site. The CWT regulations are incorporated into NPDES permits for direct dischargers and permits or other control mechanisms for indirect dischargers. Covered wastestreams include materials received from off-site, solubilization water, used oil/emulsion breaking wastewater, tanker truck/drum/roll-off box washes, equipment washes, air pollution control waters, laboratory-derived wastewater, wastewater from on-site industrial waste combustors, landfills, and contaminated stormwater.

Ion exchange is a process whereby less desirable ions in water or wastewater are replaced with other ions. A common example is water softening, where scale-forming ions such as calcium and magnesium are replaced with sodium ions. This happens in an IX column, where the water passes through a resin containing concentrated sodium ions. The calcium and magnesium ions are captured by the resin and the sodium ions are released. In addition to softening, IX resins are used to remove contaminants or pollutants from water and wastewater streams or to

condition water prior to other uses. Examples include removal of contaminants (e.g., lead, PFAS) from drinking water, preparation of industrial process makeup water, or treatment of wastewater streams.

When resin reaches its ion exchange capacity, it can be regenerated and reused. Regeneration typically consists of flushing the resin with a concentrated chemical regenerant solution or acid which removes the accumulated ions and restores the ion exchange capacity of the resin. Regeneration of these resins can be done at the facility where it is being used, or at an off-site facility.

Some companies provide resin-containing vessels at customers' facilities and service and maintain the IX systems. Exhausted resin can be taken back to centralized facilities where they are regenerated. These regeneration facilities meet the definition of a CWT facility at 40 CFR 437.2(c) since they are a facility that treats (for disposal, recycling or recovery of material) any hazardous or non-hazardous industrial wastes, hazardous or non-hazardous industrial wastewater, and/or used material received from off-site. However, not all wastes are defined as CWT wastes, and therefore some CWT facilities are not subject to the CWT effluent limitations guidelines and pretreatment standards. Increasingly, questions are arising as to whether IX-resin regeneration wastewaters should be considered CWT wastes and therefore subject to categorical discharge standards. Since the resins may be from a variety of different sources and used in a variety of different applications, stakeholders have reported that it can be difficult in some cases to determine applicability of the CWT rules given the existing guidance provided by EPA.

Existing Guidance Regarding Applicability of the CWT Rule

While the preamble to the 2000 CWT final rule did not specifically describe applicability of the rule to wastewater from resin regeneration, it did indicate that the rule does not apply to wastes of "domestic origin including chemical toilet wastes, septage, and restaurant wastes or thermal drying of POTW biosolids."

With the promulgation of the 2000 CWT rule, EPA published a Development Document (DD) that includes, among other things, recommendations to permit writers, control authorities and CWT facilities to aid in implementation of the rule.¹ Included in the DD are examples of types of materials that are typically received at CWT facilities and the classification of different materials for determining the applicable subpart(s) for specific wastes (e.g., metals, organics, oily wastes, or multiple wastestreams). The DD also describes wastes that are exempt from regulation in the CWT rule, such as sanitary wastes. The document does not specifically address wastes from ion exchange regeneration.

EPA also answered applicability questions in the comment response document that accompanied the final rule. In that document, EPA addressed some questions regarding ion exchange (and other media, such as activated carbon) regeneration. Specific excerpts from the response to comment document that are relevant to ion exchange or resin generation are:

Comment #066: We would like to have the rules clarified to specifically include as an example in its definition of the "facilities subject to the guidelines and standards," facilities that receive hazardous waste ion exchange resins for treatment or recovery. However, that

¹ See <https://www.epa.gov/eg/centralized-waste-treatment-effluent-guidelines> for the Development Document, Small Entity Compliance Guide and FAQ documents.

it exclude ion exchange resins that are not a waste such as high purity exchange resins returned for regeneration.

EPA Response to Comment #066: The regeneration or recovery of both of these types of ion exchange resins can result in the generation of a contaminated wastewater. Since the CWT rule is not concerned with the source of the ion exchange resins but rather the pollutants contained in any wastewater generated, this distinction is not relevant. Note also, that in all cases, the CWT rule does not differentiate between hazardous and non-hazardous wastes.

Comment #143: *The definition of facility does not specifically address mobile operations.* Another example would be the regeneration of spent carbon, performed by vendors which transport the spent carbon to their centralized facilities for regeneration. Would each carbon vessel site be a separate facility, resulting in classification of the central regeneration facility as a CWT?

Recommendation: The City recommends that EPA consider mobile operations performed at customer sites as facility, i.e. on-site, operations, thereby removing such operations from the scope of the proposed rule.

EPA Response to Comment #143: EPA concludes that this is a poor example of mobile sources since the spent carbon is generated as a treatment residue at the customers facility. Certainly in this example the spent carbon would be considered as a waste generated at the customers facility and it would become subject to provisions of the CWT rule when the vendor transported it to their central regeneration facility.

Comment #148b: Within the City of Los Angeles, several electroplaters, metal finishers, and other metal processing facilities use ion exchange columns as a portion of their metal-bearing wastestream treatment systems. Some facilities regenerate the resin columns on-site, while others replace the cartridges through a contractor. Does EPA consider a facility which regenerates resin columns returned by users, but with the main business of providing fresh resin columns, as meeting the criteria for the Metal-bearing Waste Treatment and Recovery Subcategory?

EPA Response to Comment #148b: The answer is yes, EPA does consider the contractor or vendor facility that receives and regenerates spent ion exchange resin from off-site as a CWT facility. EPA bases this conclusion on the belief that the wastewater generated during the regeneration process will probably bear little similarity in character to the wastewater generated by the on-site manufacturing of virgin resins.

Comment #026: Additionally, it is the Districts' position that EPA has clearly mischaracterized the types of wastes received by waste treatment facilities. While many waste treatment facilities do handle the concentrated process wastes described by EPA in the preamble to the proposed rule, the facilities within the Districts' jurisdiction also treat a high volume of lightly contaminated cleaning wastes, commercial wastes, and off-site stormwater. There are also several facilities within the Districts' jurisdiction which receive wastes that only need treatment for conventional pollutants such as pH, suspended solids, and chemical oxygen demand. Some typical types of wastes received by these facilities are food processing facility wastewater, rainwater from construction activities, water softener regenerate, cooling tower blowdown, laundromat wastewater, water from drilling of drinking water wells, water from draining of landscaping ponds, wastewater from detergent and soap

production. These facilities typically charge low rates for such treatment, generally less than one dollar per gallon. The impact of the CWT effluent guidelines would be particularly onerous for these types of facilities, and the economic impact of the regulations on these facilities may not have been fully explored. The Districts recommend that EPA consider establishing a separate subcategory for these types of wastes.

EPA Response to Comment #026: Since the 1995 CWT proposal EPA has conducted additional sampling of raw wastewaters at non-hazardous CWT facilities, many of which accept and treat low concentration wastes such as those described by the commenter. EPA has incorporated these data into the wastewater characterization and economic impact analysis.

Additionally, EPA has defined the scope of the CWT rule such that many of the cited wastes are not covered by the CWT rule. The scope of the CWT with respect to each of the types of wastewater listed above is discussed below:

- **Food processing wastewater.** As detailed in Section V.X of the preamble to the final rule, wastewater from food processing operations is not subject to the CWT rule.
- **Water softener regenerant.** As detailed in section V.Y of the preamble to the final rule, the CWT rule does not apply to wastes of domestic origin. Water softener regenerant from systems used to treat water for drinking and domestic uses may not be covered by the CWT rule. However, water softener regenerant generated at industrial facilities is often included in the definition of process wastewater and, as such, may be subject to the CWT rule.
- **Cooling tower blowdown.** Cooling tower blowdown typically contains treatment chemicals, biocides, and dissolved metals and therefore may be subject to the CWT rule.
- **Laundromat Wastewater.** Wastewater from coin operated laundromats would be considered as domestic wastes and therefore would not be subject to the CWT rule. However, wastewater from industrial laundries may be subject to the CWT rule.
- **Water from draining of landscaping ponds.** As detailed in section V.Y of the preamble to the final rule, the CWT rule does not apply to wastes of domestic origin. This may include water drained from a landscape pond. See response to Scope - Sanitary 026.
- **Rainwater from construction activities.** The CWT rule distinguishes between contaminated and non-contaminated stormwater. Uncontaminated rainwater or rainwater contaminated only with suspended soil particles may not be subject to the CWT rule. However, if the rainwater were contaminated with spilled oil, paint, or other contaminants then it may be subject to the CWT rule.
- **Water from drilling of drinking water wells.** Like rainwater from construction activities the coverage of the CWT rule would be determined by the type and degree of contamination.
- **Wastewater from detergent and soap manufacturing.** This is clearly an industrial process wastewater source and therefore, would be subject to the CWT rule.

Since many of the wastes cited by the commenter are not subject to the CWT rule, there is no need to establish a separate subcategory for these wastewaters.

Following publication of the final rule, EPA published a Small Entity Compliance Guide, as well as two FAQ documents to further clarify topics, including whether certain activities or wastes are

subject to the rule. The December 2006 FAQ document includes discussion of ion exchange or resin regeneration:

Q11. What about facilities that perform ion exchange or resin regenerations? Are they subject to the CWT rule?

A11. Maybe. As detailed in EPA's comment response document for the CWT rule (see DCN 39.7), a contractor or vendor facility that receives and regenerates spent ion exchange resin from off-site is a CWT facility. This type of facility accepts materials from off-site for treatment and/or recovery. However, EPA notes that this refers to media or canisters used in industrial applications, and not for demineralization or water softening-related regenerations (e.g., drinking water-related regenerations). As a further point of clarification, demineralization or water softening-related regenerations would be exempt, even if they're from an industrial facility.

Additional Clarification for Facilities Conducting Resin Regeneration

The December 2006 FAQs, as well as the comment responses included above, provide some clarity with respect to applicability of the CWT rule to wastewater from ion exchange or resin regeneration activities. Specifically, existing guidance clarifies that wastes from regeneration of ion exchange resins used for *water softening or demineralization* are exempt from regulation under the CWT rule. However, regeneration of ion exchange resins used for other purposes are generally not exempt.

Questions from the regulated community continue to arise. This is likely due to the increased prevalence of usage of resins in various domestic and industrial water treatment applications and also the increased incidence of water treatment media providers providing a service where they collect spent resins from customers and regenerate those resins at a centralized facility (as opposed to being regenerated at the clients' facility). In addition, facilities are increasingly recycling various wastewater and stormwater streams due to the cost of procuring water as well as concerns over water scarcity and energy usage. These recycled streams may require varying levels of treatment, including IX, prior to their intended use.

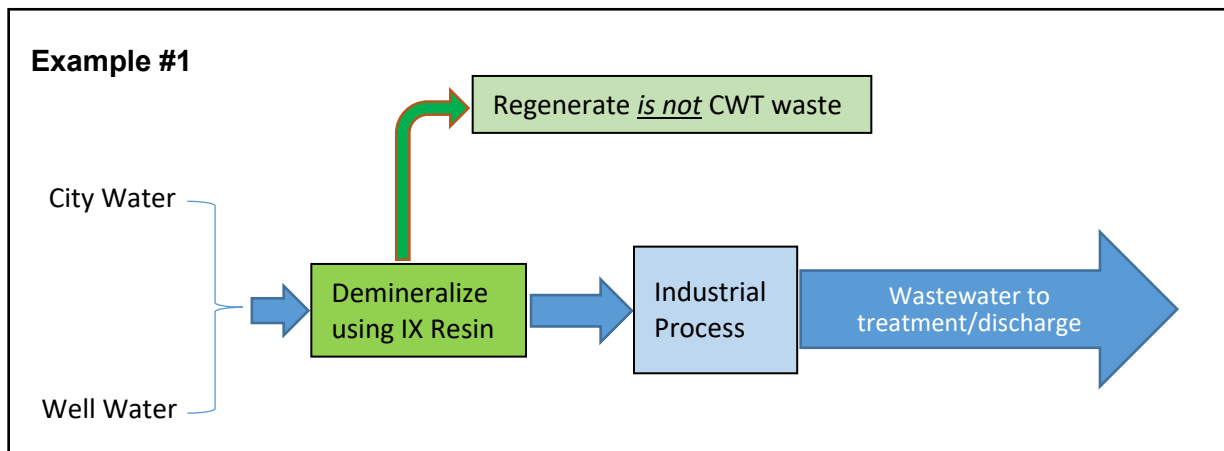
EPA is confirming that wastewater from regeneration of resins that are used for water softening or demineralization are not considered CWT wastes. This applies regardless of the source or the waste (i.e., resins used for water softening or demineralization at industrial facilities, or used for softening or demineralization as part of an industrial wastewater treatment system, are not considered CWT wastes). While these regeneration wastewaters are not considered CWT wastes, they still require proper management and the permit writer or control authority may require treatment prior to discharge. The permit writer or control authority should consider characteristics such as pH, as well as the constituents in the regenerate wastewater, when considering how to require management of these wastes.

If the resins are used for any purpose other than softening or demineralization, then the wastewater from regenerating these resins may be CWT wastes. In these cases, the permit writer or control authority should look at the characteristics of the regenerate wastewater, as well as the origin and purpose of the resin, to determine the appropriate CWT category for these wastes.

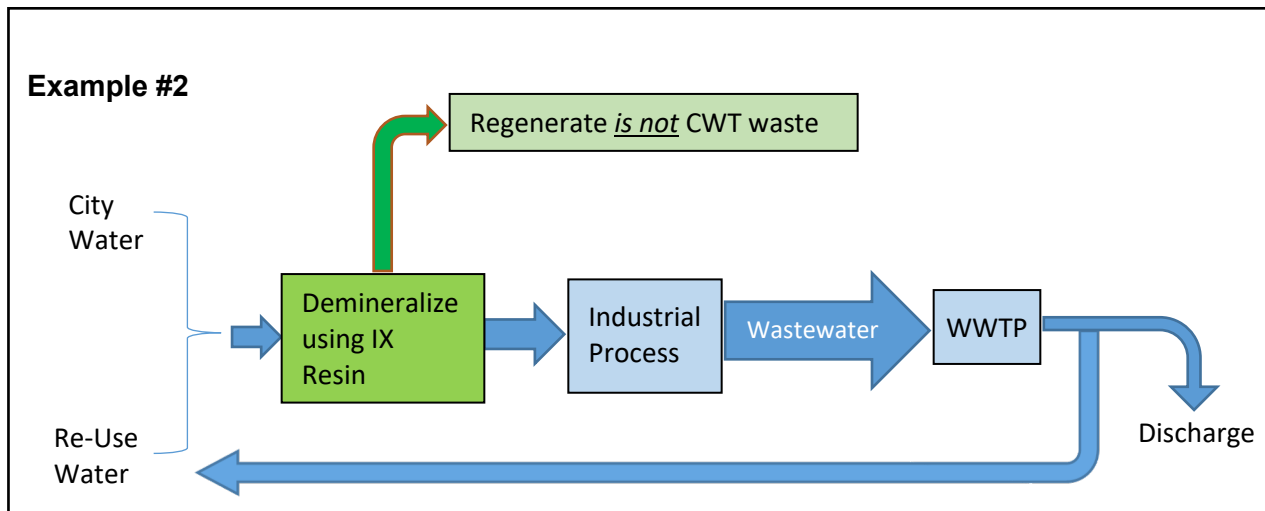
Examples of Ion Exchange Usage and Applicability of the CWT to Regenerate

While EPA cannot identify every possible situation where resins might be used, the following examples provide additional clarity on applicability of the CWT rule to facilities that regenerate resins. In the examples, situations where the resins are used are described with EPA's recommended approach for applying the CWT rule to the CWT facilities that regenerate these resins. Note that these are only examples, and the permit writer or control authority is responsible for determining applicability of the CWT rule to specific wastewaters and to specific facilities.

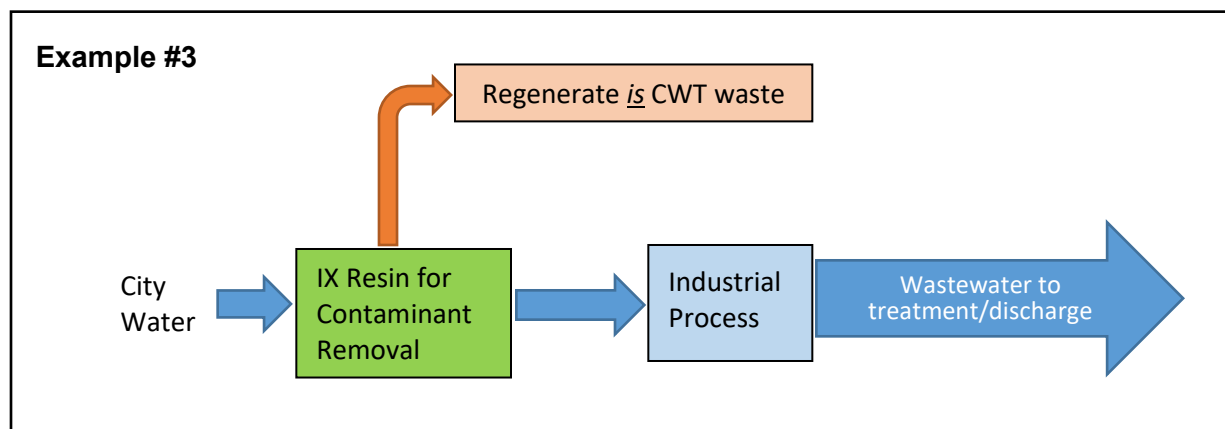
Example #1. This facility uses ion exchange resin to demineralize makeup water for an industrial process. In this example, the makeup water is a combination of city (drinking) water and water obtained from a well (located either on-site or off-site). Demineralization in this example is exchange of calcium and magnesium ions for sodium ions (also known as softening). If the resin were sent to an off-site facility for regeneration, then the wastewater generated is not CWT waste as the purpose of the IX media was for demineralization or softening.



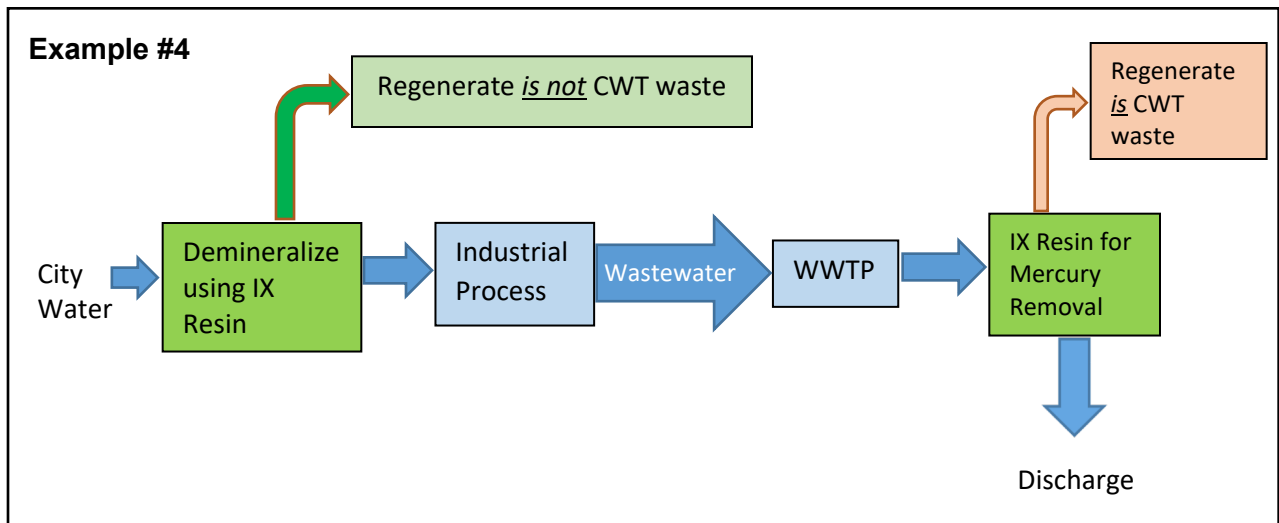
Example #2. This facility uses ion exchange resin to demineralize makeup water for an industrial application. In this example, city water is supplemented with re-use water that is recycled from the facility. In this example, the reuse water is treated process wastewater from the facilities' wastewater treatment plant (WWTP) but may also be from sources such as cooling water or stormwater. If the resin were sent to an off-site facility for regeneration, then the wastewater generated would not be considered CWT waste if the purpose of the IX resin is water softening or demineralization.



Example #3. This facility is conducting ion exchange for removal of contaminants other than for the purposes of water softening or demineralization in order to generate high-purity makeup water for industrial processes. Examples include removal of metals or per- and polyfluoroalkyl substances (PFAS). If the resin were sent to an off-site facility for regeneration, then the wastewater generated would be considered CWT waste since the IX resin is not used for demineralization or softening. In this case, regeneration of the resin would produce a wastestream concentrated with pollutants that are found in the source water. Those pollutants could include PFAS and metals which would require proper management.



Example #4. This facility is using ion exchange resins in two locations. The first is to conduct demineralization of the makeup water for the industrial process. The second is to conduct mercury removal of wastewater prior to discharge. In this case, if the resins were taken off-site for regeneration then regenerate of the water demineralization resin would not be considered CWT waste while regenerate of the mercury removal resin would be considered CWT waste.



Example #5. This facility is using resins for two different purposes. The first is for mercury removal in the wastewater that is to be discharged and the second is to demineralize a portion of the treated wastewater that is diverted for reuse. In this case, if the resins were taken off-site for regeneration, then regenerate of the mercury removal resin would be considered CWT waste and the regenerate from the water softening or demineralization resin would not be considered CWT waste.

