



RCRA Groundwater Monitoring Checklist

The following is EPA's RCRA groundwater inspection checklist. EPA inspectors refer to this checklist when inspecting a hazardous waste TSDF.

Section A—Monitoring System (40 CFR 264 to 265)

	Yes	No
1. Does the facility have a groundwater monitoring system in operation?	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, does the system consist of (40 CFR 265.91):		
1. Minimally, one upgradient monitoring well? (40 CFR 265)	<input type="checkbox"/>	<input type="checkbox"/>
2. Minimally, three downgradient monitoring wells? (40 CFR 265)	<input type="checkbox"/>	<input type="checkbox"/>
b. Are monitoring wells cased so that the integrity of the boreholes is maintained? (40 CFR 265.91)	<input type="checkbox"/>	<input type="checkbox"/>
c. Is a compliance monitoring system installed whenever hazardous waste constituents are detected at the compliance point? (40 CFR 264.92)	<input type="checkbox"/>	<input type="checkbox"/>
d. Is a corrective-action program initiated whenever the groundwater protection standard is exceeded? (40 CFR 264.100(c))	<input type="checkbox"/>	<input type="checkbox"/>
e. Is a detection monitoring program instituted in all other cases? (40 CFR 264.98)	<input type="checkbox"/>	<input type="checkbox"/>
2. Does the facility have a monitoring and response program? (40 CFR 264)	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, is a compliance monitoring system instituted whenever hazardous constituents are detected at the compliance point? (40 CFR 264.99)	<input type="checkbox"/>	<input type="checkbox"/>
b. Whenever the groundwater protection standard is exceeded, does facility institute a corrective-action program? (40 CFR 264.99)	<input type="checkbox"/>	<input type="checkbox"/>
c. In all other cases, does the facility institute a detection monitoring program? (40 CFR 264.99)	<input type="checkbox"/>	<input type="checkbox"/>

Section B—Sampling and Analysis (40 CFR 265.92)

1. Does the facility obtain and analyze samples from the groundwater monitoring system? (40 CFR 265.92(a))	<input type="checkbox"/>	<input type="checkbox"/>
2. Has the facility developed and followed a groundwater sampling and analysis plan? (40 CFR 265.92(a))	<input type="checkbox"/>	<input type="checkbox"/>
a. If yes, does this plan include procedures and techniques for (40 CFR 265.92(a)):		
1. Sample collection?	<input type="checkbox"/>	<input type="checkbox"/>
2. Sample preservation?	<input type="checkbox"/>	<input type="checkbox"/>
3. Analytical procedures?	<input type="checkbox"/>	<input type="checkbox"/>
4. Chain-of-custody control?	<input type="checkbox"/>	<input type="checkbox"/>
b. Does the facility determine the concentration or value of the following parameters in groundwater samples (40 CFR 265.92(b)):	<input type="checkbox"/>	<input type="checkbox"/>
1. Parameters characterizing the suitability of the groundwater as a drinking water supply, as specified in 40 CFR 265, Appendix 3?	<input type="checkbox"/>	<input type="checkbox"/>
2. Parameters establishing groundwater quality (chloride, iron, manganese, phenols, sodium, sulfate)?	<input type="checkbox"/>	<input type="checkbox"/>
3. Parameters used as indicators of groundwater contamination (pH, specific conductance, total organic carbon, total organic halogen)?	<input type="checkbox"/>	<input type="checkbox"/>
c. Has the owner/operator established initial background concentrations or values of all parameters specified at least on a quarterly basis? (40 CFR 265.92(c))	<input type="checkbox"/>	<input type="checkbox"/>
d. Has the owner/operator obtained at least four replicate measurements for each sample, and has the owner/operator determined the initial background arithmetic mean and variance? (40 CFR 265.92(c))	<input type="checkbox"/>	<input type="checkbox"/>



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| e. After the first year, does the owner/operator sample and analyze the following frequencies (40 CFR 265.92(d)): | | |
| 1. Samples collected to establish background water quality at least annually? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Samples collected to indicate contamination at least semiannually? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Elevation of groundwater surface at each monitoring well at each sampling event? | <input type="checkbox"/> | <input type="checkbox"/> |

Section C—Preparation, Evaluation, and Response (40 CFR 265.93)

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| 1. Did owner/operator prepare an outline of a groundwater quality assessment program? (40 CFR 265.93(a)) | <input type="checkbox"/> | <input type="checkbox"/> |
| a. If yes, did program determine the following (40 CFR 265.93(a)): | | |
| 1. Whether hazardous waste or hazardous waste constituents have entered the groundwater? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Rate and extent of hazardous waste or hazardous waste constituent migration in groundwater? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Concentrations of hazardous waste or hazardous waste constituents in groundwater? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. For each well, has owner/operator calculated the arithmetic mean and variance, based on four replicate measurements for each sample, and compared the results with initial background mean? (40 CFR 265.93(b)) | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Has owner/operator submitted information documenting any significant increase in comparisons for upgradient wells (or decrease in pH)? (40 CFR 265.93(c)) | <input type="checkbox"/> | <input type="checkbox"/> |
| d. If the comparison for downgradient wells shows a significant increase (or pH decrease), has the owner/operator obtained additional groundwater samples from those downgradient wells in which a significant decrease was detected? (Samples must be split in two, and analyses must be obtained of all additional samples to determine whether the significant difference was a result of lab error.) (40 CFR 265.93(c)) | <input type="checkbox"/> | <input type="checkbox"/> |
| 1. If analyses were performed, and confirmed the significant increase (or pH decrease), did the owner/operator notify the EPA regional administrator within 7 days? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. If analyses confirmed significant increase (or pH decrease), did owner/operator submit to the EPA regional administrator within 15 days after notification a certified groundwater quality assessment program? (40 CFR 265.93(d)) | <input type="checkbox"/> | <input type="checkbox"/> |
| a. If yes, does plan include the following: | | |
| 1. Number, location, and depth of wells? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Sampling and analytical methods for those hazardous wastes and hazardous waste constituents at the facility? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Evaluation procedures, including any use of previously gathered groundwater quality information? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Schedule of implementation? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Did owner/operator implement the groundwater quality assessment program and, at a minimum, did the owner/operator determine the following (40 CFR 265.93(d)(4)): | | |
| a. Rate and extent of the migration of the hazardous waste constituents in the groundwater? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Concentrations of the hazardous waste in the groundwater? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Did owner/operator submit a report to the EPA regional administrator containing the requests of the assessment outlined in No. 2 within 15 days? (40 CFR 265.93(d)(5)) | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Did owner/operator notify the EPA regional administrator of reinstatement of indicator evaluation program upon finding that no hazardous waste or hazardous waste constituents had entered the groundwater? (40 CFR 265.93(d)(6)) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. If owner/operator determined that hazardous waste or hazardous waste constituents entered the groundwater, did the owner/operator either continue to make the determinations listed in No. 2 on a quarterly basis until final closure or groundwater quality assessment plan was implemented prior to post-closure care, or cease to make determinations required in No. 2 if groundwater quality assessment plan was implemented during post-closure? (40 CFR 265.93(d)(7)) | <input type="checkbox"/> | <input type="checkbox"/> |



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| 6. If any groundwater quality assessment program is implemented to satisfy No. 2 prior to final closure, has owner/operator completed the program and reported to the regional administrator, as outlined in No. 3 above? (40 CFR 265.93(e)) | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. If owner/operator does not monitor at least annually to satisfy No. 2, does owner/operator evaluate data on groundwater elevation obtained under No. 2e in Section B to determine whether the requirements for location monitoring wells are satisfied? (40 CFR 265.93(f)) | <input type="checkbox"/> | <input type="checkbox"/> |
| a. If evaluation shows that the requirements for monitoring wells are not satisfied, has owner/operator modified the number, location, or depth of the monitoring wells to bring the system into compliance? | <input type="checkbox"/> | <input type="checkbox"/> |

Section D—Recordkeeping and Reporting (40 CFR 265.94)

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| 1. Unless owner/operator is monitoring to satisfy the requirements of 40 CFR 265.93(d)(4), does owner/operator (40 CFR 265.94(a)): | | |
| a. Keep records of the analyses required in 40 CFR 265.92(c) and (d), the associated groundwater surface elevations required in 40 CFR 265.92(e), and groundwater surface elevations required in 40 CFR 265.93(b) throughout the active life of the facility and throughout post-closure? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Report the following information to the EPA regional administrator (40 CFR 265.94(a)(2)): | <input type="checkbox"/> | <input type="checkbox"/> |
| 1. Within 15 days of analysis for each quarterly sampling event, does owner/operator submit results of background concentrations? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Does owner/operator inform the EPA regional administrator about any parameters that exceed minimum contaminant levels listed in Appendix III? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. (Annually) does owner/operator report concentrations or values of parameters listed in 40 CFR 265.92(b)(3) for each well, including required evaluations for these parameters under 40 CFR 265.93(b)? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Does owner/operator also identify differences from initial background concentrations found in the upgradient wells no later than March 1 following each calendar year? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Does owner/operator submit results of the groundwater surface elevations under 40 CFR 265.93(f), along with a description of the response, if needed? (40 CFR 265.94(a)(2)) | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. If groundwater is monitored to satisfy requirements of 40 CFR 265.93(d)(4), did owner/operator do the following (40 CFR 265.94(b)): | | |
| a. Keep records of analyses and evaluations specified in the plan throughout active life and post-closure? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. (Annually, until final closure) submit to the EPA regional administrator a report containing the results of the groundwater quality assessment program, including the calculated rate of migration of hazardous waste or hazardous waste constituents by March 1 following each calendar year? | <input type="checkbox"/> | <input type="checkbox"/> |

Section E—General Requirements

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| 1. Does facility comply with the following requirements (40 CFR 264.97): | | |
| a. Are sufficient wells installed at appropriate locations and depths? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Have sampling and analysis techniques been consistent? | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Have groundwater elevation data been recorded? | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Have background concentrations been determined? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. If groundwater is monitored to satisfy requirements of 40 CFR 265.93(d)(4), did owner/operator: | | |
| a. Keep records of the analyses and evaluations specified in the plan throughout the facility's active life, and, for disposal facilities, throughout post-closure? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Report the following groundwater monitoring information: | | |
| 1. During the first year when initial background concentrations are being determined, did owner/operator submit values within 15 days after completing analysis? | <input type="checkbox"/> | <input type="checkbox"/> |



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| 2. If yes, did owner/operator also submit an identification of any parameters whose concentrations exceed maximum levels in Appendix III? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. (Annually) did owner/operator report concentrations or values of the parameters listed in 40 CFR 265.93(b)(2) for each well, along with required evaluations for these parameters under 40 CFR 265.93(b)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Did owner/operator also separately identify any significant differences from initial background concentrations for upgradient wells? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Did owner/operator report on the results of groundwater surface elevations (and a description of the results if necessary) by March 1 of the following year? | <input type="checkbox"/> | <input type="checkbox"/> |

Section F—Detection Monitoring Program (40 CFR 264.98)

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| 1. Has owner/operator established detection monitoring system to provide reliable indications or detection releases? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. If yes, are the following components included in the system: | | |
| 1. Background values? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Determination of groundwater flow rate? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Determination of groundwater compliance point semiannually? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Determination of statistically significant increases over background concentrations? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Notification to the EPA regional administrator if there was a statistically significant increase? | <input type="checkbox"/> | <input type="checkbox"/> |

Section G—Compliance Monitoring Program (40 CFR 264.99)

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| 1. Does facility operate a compliance monitoring program? | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Does facility determine concentrations of hazardous constituents at least quarterly? | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Does facility determine groundwater flow rate and direction in uppermost aquifer at least quarterly? (40 CFR 264.99(e)) | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Does facility analyze samples for Appendix IX constituents annually? (40 CFR 265.99(g)) | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Does facility make statistically significant increases over background values? (40 CFR 264.99(h)) | <input type="checkbox"/> | <input type="checkbox"/> |
| e. If there is an increase, does facility notify the EPA regional administrator and establish a corrective-action program? (40 CFR 264.99(h)) | <input type="checkbox"/> | <input type="checkbox"/> |

Section H—Corrective-Action Program (40 CFR 264.100)

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| 1. Does facility follow a corrective-action program that meets the facility's permit requirements? | <input type="checkbox"/> | <input type="checkbox"/> |
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