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Texas Commission on Environmental Quality

CHECKLIST WORKSHEET

MSW CME CHECKLIST B DETECTION MONITORING

Regulating Entity Name
.

Date:

Additional I D:

Investigator Name:

Item Number **Description** SECTION A: GROUNDWATER MONITORING SYSTEMS (330.403)

Answer **Citations** **Notes**

Item Number 1 **Description** Has a groundwater monitoring system been installed that consists of a sufficient number of monitoring wells, installed at appropriate locations and depths to yield representative groundwater samples from the uppermost aquifer?

Answer **Citations** 330.403(a) **Notes**

Item Number 2 **Description** Are background monitoring wells installed to allow determination of the quality of background
groundwater that has not been affected by leakage from a unit?

Answer **Citations** 330.403(a)(1) **Notes**

Item Number 3 **Description** Does the point of compliance monitoring system include monitoring wells installed to allow
determination of the quality of groundwater passing the point of compliance and to ensure the detection of groundwater contamination in the uppermost aquifer?

Answer **Citations** 330.403(a)(2) **Notes**

Item Number 4 **Description** Has owner/operator obtained executive director approval to operate a multi-unit groundwater
monitoring? Identify TCEQ approval date.

Answer **Citations** 330.403(b) **Notes**

Item Number 5 **Description** Has the executive director approved an alternative design for a groundwater monitoring system in accordance with 330.403(c) that uses other means in conjunction with monitoring wells to ensure detection of groundwater contamination in the uppermost aquifer from a solid waste management unit? Date of TCEQ approval.

Answer **Citations** **Notes**

Item Number 6 **Description** Are all parts of the groundwater monitoring system operated and maintained so that they perform at least to design specifications through the life of the groundwater monitoring program?

Answer **Citations** 330.403(d) **Notes**

Item Number 7 **Description** Was the groundwater monitoring system, including the number, spacing, and depths of monitoring wells or other sampling points, designed and certified by a qualified groundwater scientist? Was the groundwater monitoring system certification submitted within 14 days of certification?

Answer **Citations** 330.403(e) **Notes**

Item Number 8 **Description** Was the groundwater monitoring system certification approved by the executive director prior to construction of the system?

Answer **Citations** 330.403(e) **Notes**

Item Number 9 **Description** Is the design of the monitoring system based on site-specific technical information?

Answer **Citations** 330.403(e)(1) **Notes**

Item Number **Description** SECTION B: GROUNDWATER FATE AND TRANSPORT MODELING AND NOTIFICATION

Answer **Citations** **Notes**

MSW CME CHECKLIST B DETECTION MONITORING (Cont)

Item Number 10 **Description** Has owner/operator elected to use an applicable multi-dimensional fate and transport numerical flow model in accordance with 330.403(e)(2) that considers site-specific characteristics of groundwater flow as well as dispersion and diffusion of possible contaminants in the materials of the uppermost aquifer?

Answer **Citations** **Notes**

Item Number 10A **Description** Does the model have supporting documentation that establishes its ability to represent groundwater flow and contaminant transport, as needed?

Answer **Citations** 330.403(e)(2)(**Notes**

Item Number 10B **Description** Does the model have a sound set of equations based on accepted theory representing
groundwater movement and contaminant transport?

Answer **Citations** 330.403(e)(2)(**Notes**

Item Number 10C **Description** Does the model have numerical solution methods that are based on sound mathematical principles and supported by verification and checking techniques?

Answer **Citations** 330.403(e)(2)(**Notes**

Item Number 10D **Description** Is the model calibrated against site-specific field data?

Answer **Citations** 330.403(e)(2)(**Notes**

Item Number 10E **Description** Does the model have a sensitivity analysis to measure its response to changes in the values of major parameters, error tolerances, and other parameters?

Answer **Citations** 330.403(e)(2)(**Notes**

Item Number 10F **Description** Does the model show mass-balance calculations, where necessary?

Answer **Citations** 330.403(e)(2)(**Notes**

Item Number 10G **Description** Is the model based on actual field or laboratory measurements, or equivalent methods, that
document the validity of chosen parameter values?

Answer **Citations** 330.403(e)(2)(**Notes**

Item Number 11 **Description** Has owner/operator notified the executive director,and any local pollution agency with jurisdiction that has requested to be notified, in writing of changes in facility construction, or operation, or changes in adjacent property that affect, or are likely to affect, the direction and rate of groundwater flow and the potential for detecting groundwater contamination from a solid waste management unit, and that may require the installation of additional monitoring wells or sampling points?

Answer **Citations** 330.403(e)(3) **Notes**

Item Number **Description** SECTION C: MONITOR WELL CONSTRUCTION SPECIFICATIONS (330.421)

Answer **Citations** **Notes**

Item Number 12 **Description** Monitor Well Construction. Does monitor well construction provide for maintenance of the integrity of the bore hole, collection of representative groundwater samples from the water-bearing zone(s) of concern, and prevention of migration of groundwater and surface water within the bore hole?

Answer **Citations** 330.421(a) **Notes**

Item Number 13 **Description** Was the monitoring well(s) drilled by a Texas-licensed driller with installation and
development supervised by a licensed professional geoscientist or engineer familiar with the area geology?

Answer **Citations** 330.421(a)(1)(**Notes**

MSW CME CHECKLIST B DETECTION MONITORING (Cont)

Item Number 14 **Description** Was the well drilled by a method that will allow installation of the casing, screen, etc., and that will not introduce contaminants into the bore hole or casing?

Answer **Citations** 330.421(a)(1)(**Notes**

Item Number 15 **Description** Was the diameter of the boring at least four inches larger than the diameter of the casing?

Answer **Citations** 330.421(a)(1)(**Notes**

Item Number 16 **Description** Was a log of the boring made by or under the supervision of a licensed professional geoscientist or engineer familiar with the area geology, and was the log sealed, signed, and dated by the licensed professional?

Answer **Citations** 330.421(a)(1)(**Notes**

Item Number 17 **Description** Is the well casing two to four inches in diameter, National Science Foundation-certified PVC Schedule 40 or 80 pipe, flush-thread, screw joint (no glue or solvents), PTFE (such as Teflon) tape or O-rings in the joints, with no collar couplings?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 18 **Description** Is the top of the casing at least two feet above ground level? Was the casing cleaned and
packaged at the place of manufacture? Is the casing free of ink, labels, or other markings? Is the casing and screen centered in the hole? Is the top of the casing protected by a cap or screw-plug seal?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 19 **Description** Is the cap vented to prevent buildup of gases and designed to prevent moisture from entering the well?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 20 **Description** Is the screen compatible with the casing, generally of the same material, and constructed without any glues or solvents? Does the well screen exclude field-cut slots?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 21 **Description** Is a blank-pipe sediment trap installed below the screen?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 22 **Description** Is a bottom cap placed on the bottom of the sediment trap?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 23 **Description** Did owner/operator ensure that the sediment trap does not extend through the lower confining layer of the water-bearing zone being tested?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number **Description** SECTION D: MONITOR WELL FILTER PACK AND CASING

Answer **Citations** **Notes**

Item Number 24 **Description** Did owner/operator ensure that the screen opening is not larger than the smallest fraction of the filter pack?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 25 **Description** Does the filter pack, placed between the screen and the well bore, consist of prepackaged, inert, clean silica sand or glass beads? Does the filter pack extend from one to four feet above the top of the screen?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 26 **Description** Did owner/operator ensure that open stockpile sources of sand or gravel were not used to
construct the filter pack?

Answer **Citations** 330.421(a)(2)(**Notes**

Item Number 27 **Description** Was the annular seal placed on top of the filter pack and is it at least two feet thick? (If a bentonite-grout casing seal is used in the well bore, then it may replace the annular seal.)

MSW CME CHECKLIST B DETECTION MONITORING (Cont)

		Answer	**Citations**	330.421(a)(2)(	**Notes**
Item Number	28	**Description**	Was a casing seal placed on top of the annular seal to prevent fluids and contaminants from entering the bore hole from the surface? Does the casing seal consist of a commercial bentonite grout or a cement-bentonite mixture?		
		Answer	**Citations**	330.421(a)(2)(	**Notes**
Item Number	29	**Description**	Is the top of the casing seal between five and two feet from the surface?		
		Answer	**Citations**	330.421(a)(2)(	**Notes**
Item Number	30	**Description**	Was high-quality structural-type concrete placed from the top of the casing seal (two to five feet below the surface) continually to the top of the ground to form a pad at the surface?		
		Answer	**Citations**	330.421(a)(3)	**Notes**
Item Number		**Description**	SECTION E: MONITOR WELL SURFACE PAD AND SECURITY		
		Answer	**Citations**		**Notes**
Item Number	31	**Description**	Is the formed surface pad at least six inches thick and not less than four feet square, or five feet in diameter? Does the pad contain sufficient reinforcing steel to ensure its structural integrity?		
		Answer	**Citations**	330.421(a)(3)	**Notes**
Item Number	32	**Description**	Does the top of the pad slope away from the well bore to the edges to prevent ponding of water around the casing or collar?		
		Answer	**Citations**	330.421(a)(3)	**Notes**
Item Number	33	**Description**	Was a steel protective pipe collar placed around the casing "stickup" to protect it from damage and unwanted entry? Was the collar set at least one foot into the surface pad during its construction?		
		Answer	**Citations**	330.421(a)(4)	**Notes**
Item Number	34	**Description**	Does the top of the collar have a lockable hinged top flap or cover?		
		Answer	**Citations**	330.421(a)(4)	**Notes**
Item Number	35	**Description**	Is a sturdy lock installed, maintained in working order, and kept locked when the well is not being bailed/purged of sampled?		
		Answer	**Citations**	330.421(a)(4)	**Notes**
Item Number		**Description**	SECTION F: MONITOR WELL DEVELOPMENT AND ADDITIONAL ISSUES		
		Answer	**Citations**		**Notes**
Item Number	36	**Description**	Is the well number or other designation marked permanently on the protective steel collar?		
		Answer	**Citations**	330.421(a)(4)	**Notes**
Item Number	37	**Description**	Is a protective barrier installed where monitoring wells are likely to be damaged by moving equipment or are located in heavily traveled areas?		
		Answer	**Citations**	330.421(a)(5)	**Notes**
Item Number	38	**Description**	Unusual Conditions. Where monitoring wells are installed in unusual conditions, were all aspects of the installation approved in writing in advance by the executive director?		
		Answer	**Citations**	330.421(b)	**Notes**
Item Number	39	**Description**	Development. After installation, was the monitoring well developed to remove artifacts of drilling, and to open the water-bearing zone for maximum flow into the well?		
		Answer	**Citations**	330.421(c)	**Notes**
Item Number		**Description**	SECTION G: MONITOR WELL ELEVATION SURVEY, LOGS AND DAMAGED AND UNUSED WELLS		
		Answer	**Citations**		**Notes**

MSW CME CHECKLIST B DETECTION MONITORING (Cont)

Item Number 40 **Description** Upon completion of the monitoring well, was the location of the well and all appropriate elevations associated with the top-well equipment surveyed by a registered professional surveyor?

Answer **Citations** 330.421(d) **Notes**

Item Number 41 **Description** Was the elevation surveyed to the nearest 0.01 foot above mean sea level (with year of the sea-level datum shown)?

Answer **Citations** 330.421(d) **Notes**

Item Number 42 **Description** Was the point on the well casing for which the elevation was determined permanently marked on the casing?

Answer **Citations** 330.421(d) **Notes**

Item Number 43 **Description** Was the location given in terms of the latitude and longitude at least to the nearest tenth of a second, or accurately located with respect to the landfill grid system?

Answer **Citations** 330.421(d) **Notes**

Item Number 44 **Description** Were monitoring well installation and construction details submitted on forms available from the TCEQ completed and submitted within 60 days of well completion?

Answer **Citations** 330.421(e) **Notes**

Item Number 45 **Description** At the same time, was a copy of the detailed geologic log of the boring, a description of
development procedures, any particle size, or other sample data from the well, and a site map drawn to scale showing the location of all monitoring wells and the point of compliance submitted to the executive director?

Answer **Citations** 330.421(e) **Notes**

Item Number 46 **Description** Was a copy of all forms required by other agencies submitted to the commission?

Answer **Citations** 330.421(e) **Notes**

Item Number 47 **Description** Damaged Wells. Did owner/operator ensure that any monitoring well that is damaged to the extent that it is no longer suitable for sampling was reported to the executive director, who may make a determination about whether to repair or replace the well?

Answer **Citations** 330.421(f) **Notes**

Item Number 48 **Description** Has owner/operator properly abandoned and plugged any monitoring well that was no longer
used?

Answer **Citations** 330.421(g) **Notes**

Item Number 49 **Description** Was the operation performed after obtaining prior authorization in writing from the executive director?

Answer **Citations** 330.421(g) **Notes**

Item Number **Description** SECTION H: DETECTION MONITORING PROGRAM FOR TYPE I LANDFILLS (330.407)

Answer **Citations** **Notes**

Item Number 50 **Description** Does the detection monitoring program monitor for all constituents listed in 330.419 at least semiannually during the active life of the facility and the closure and post-closure care period?

Answer **Citations** 330.407(a) **Notes**

Item Number 50A **Description** Did owner/operator establish background groundwater quality by collecting and analyzing for
the constituents listed in 30 TAC 330.419 a minimum of four statistically independent samples from each background and point of compliance well?

Answer **Citations** 330.407(a)(1) **Notes**

MSW CME CHECKLIST B DETECTION MONITORING (Cont)

Item Number 50B **Description** Was the initial background sampling for a well completed on a quarterly basis, unless an alternative schedule was approved by the executive director?

Answer **Citations** 330.407(a)(1) **Notes**

Item Number 50C **Description** Upon completion of background monitoring and during background updates, did owner/operator evaluate the background data to ensure that the data are representative of background groundwater constituent concentrations unaffected by waste management activities, or other sources of contamination?

Answer **Citations** 330.407(a)(1) **Notes**

Item Number 50D **Description** Was the evaluation documented in a report and submitted to the executive director before the next subsequent groundwater monitoring event following the updated background period?

Answer **Citations** 330.407(a)(1) **Notes**

Item Number 50E **Description** Was at least one sample from each background and point of compliance well collected and analyzed during each subsequent semiannual sampling event?

Answer **Citations** 330.407(a)(1) **Notes**

Item Number 50F **Description** Has the executive director specified an appropriate alternative frequency (no less than annually) for repeated sampling and analysis of the constituents listed in 30 TAC 330.419 during the active life and the closure and post-closure care period?
Alternative frequency specified?

Answer **Citations** **Notes**

Item Number 50G **Description** For the purpose of establishing background groundwater quality, has the executive director
agreed to consider analytical data acquired prior to the effective date of 30 TAC Chapter 330 in addition to the data required in subsection 330.407 and in 330.409(b)? Date TCEQ agreed to consider date?

Answer **Citations** **Notes**

Item Number **Description** SECTION I: SSI DETERMINATION

Answer **Citations** **Notes**

Item Number 51 **Description** Not later than 60 days after each sampling event, did owner/operator determine whether there had been a statistically significant increase (SSI) over background of any tested constituent at any monitoring well?

Answer **Citations** 330.407(b) **Notes**

Item Number 52 **Description** If there had been an SSI, did owner/operator notify the executive director, and any local pollution agency with jurisdiction that had requested to be notified, in writing within 14 days of this determination?

Answer **Citations** 330.407(b) **Notes**

Item Number 53 **Description** If an SSI over background of any tested constituent at any monitoring well occurred, did owner/operator immediately place a notice in the operating record describing the increase and establish an Assessment Monitoring Program meeting the
requirements of 330.409 within 90 days of the date
of the notice to the executive director, except as provided in the following two items?

Answer **Citations** 330.407(b)(1) **Notes**

Item Number 54 **Description** If an SSI over background of any tested constituent at any monitoring well occurred, did owner/operator elect to submit the results of resampling as appropriate for the statistical method being used within 60 days of determining the SSI to confirm or disprove the determination?

Answer **Citations** 330.407(b)(2) **Notes**

MSW CME CHECKLIST B DETECTION MONITORING (Cont)

Item Number 55 **Description** If an SSI over background of any tested constituent at any monitoring well occurred and owner/operator had reasonable cause to think that a source other than a landfill unit caused the contamination, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality, did owner/operator elect to submit a report providing documentation to this effect?

Answer **Citations** 330.407(b)(3) **Notes**

Item Number 56 **Description** Did owner/operator notify the executive director, and any local pollution agency with jurisdiction that has requested to be notified, in writing within 14 days of determining an SSI over background at the compliance point that owner/operator intends to make a demonstration under 330.407(b)(3)?

Answer **Citations** 330.407(b)(3)(**Notes**

Item Number 57 **Description** Within 90 days of determining an SSI, did owner/operator submit a report to the executive
director, and any local pollution agency with jurisdiction that has requested to be notified, that demonstrates that a source other than a monitored landfill unit caused the contamination, or that the SSI resulted from error in sampling, analysis, statistical
evaluation, or natural variation in groundwater quality?

Answer **Citations** 330.407(b)(3)(**Notes**

Item Number 58 **Description** Was the report prepared and certified by a qualified groundwater scientist?

Answer **Citations** 330.407(b)(3)(**Notes**

Item Number 59 **Description** Did owner/operator ensure that the groundwater sample was not filtered for constituents addressed by the demonstration prior to laboratory analysis?

Answer **Citations** 330.407(b)(3)(**Notes**

Item Number 60 **Description** Did owner/operator continue to monitor in accordance with the detection monitoring program?

Answer **Citations** 330.407(b)(3)(**Notes**

Item Number 61 **Description** If owner/operator did not make a demonstration satisfactory to the executive director within 90 days after the date of the notice to the executive director, did owner/operator initiate an assessment monitoring program?

Answer **Citations** 330.407(b)(4) **Notes**

Item Number **Description** SECTION J: GROUNDWATER MONITORING REPORT

Answer **Citations** **Notes**

Item Number 62 **Description** Did owner/operator submit an annual detection monitoring report within 90 days after the facility's last groundwater monitoring event in a calendar year that included the following information determined since the previously submitted annual report?

Answer **Citations** 330.407(c) **Notes**

Item Number 62A **Description** Date of last groundwater monitoring event in calendar year and date of annual detection
monitoring report submittal?

Answer **Citations** **Notes**

Item Number 63 **Description** Did the report include a statement regarding whether an SSI has occurred over background values in any well during the previous calendar year period and the status of any SSI events?

Answer **Citations** 330.407(c)(1) **Notes**

Item Number 64 **Description** Did the report include the results of all groundwater monitoring, testing, and analytical work obtained or prepared under the requirements of the permit, including a summary of background groundwater quality values, groundwater monitoring analyses, statistical calculations, graphs, and drawings?

MSW CME CHECKLIST B DETECTION MONITORING (Cont)

Answer **Citations** 330.407(c)(2) **Notes**

Item Number 65 **Description** Did the report include the groundwater flow rate and direction in the uppermost aquifer, and include all applicable documentation?

Answer **Citations** 330.407(c)(3) **Notes**

Item Number 66 **Description** Did the report include a contour map of piezometric water levels in the uppermost aquifer based at a minimum upon concurrent measurement in all monitoring wells, and include all data or documentation used to establish the contour map?

Answer **Citations** 330.407(c)(4) **Notes**

Item Number 67 **Description** Did the report include recommendation for any changes?

Answer **Citations** 330.407(c)(5) **Notes**

Item Number 68 **Description** Did the report include any other items requested by the executive director?

Answer **Citations** 330.407(c)(6) **Notes**

Item Number 69 **Description** If owner/operator determined that the detection monitoring program no longer satisfied the
requirements of 30 TAC 330.407, did owner/operator, within 90 days of this determination, submit an application for a permit amendment or modification to make any appropriate changes to the program?

Answer **Citations** 330.407(d) **Notes**

Item Number 69A **Description** Date of determination and date of permit amendment/modification submittal?

Answer **Citations** **Notes**