



Individual Aquifer Protection Permit Closure Strategy and Estimate Checklist for Wastewater Treatment Facilities

Permittee:		Inventory No.:	
Reviewer:		LTF:	
Today's Date		Checked By	

Checklist Instructions

This checklist is provided as a guideline for ADEQ staff in performing their substantive review and as guidance to the applicant on what information ADEQ will need to review for a Closure Strategy and Cost Estimates for Aquifer Protection Permit applications for wastewater treatment plants. The strategy should be reviewed first to make sure there is a complete facility list and acceptable strategy that meets regulatory requirements. Once this is accomplished, the cost estimates associated with each task should be reviewed.

This checklist is intended to address the closure of facilities typically found at wastewater treatment plants including: tanks, surface impoundments (including evaporation/infiltration ponds, recharge basins, lagoons and effluent storage pond), sludge drying beds and temporary sludge storage sites, monitoring wells and recharge wells. Please visit www.azdeq.gov to find program specific information including applications, rules, statutes, and other guidance information. This checklist does not supplant or supersede statutory or rule requirements and is not intended to be binding on the applicant or ADEQ staff.

If you have any questions or need assistance, please call ADEQ Groundwater Protection staff at 602 771-4999.

Section 1: Closure Strategy

Y: yes, meets the requirement; N: no, does not meet the requirement (see comment below); NA: does not apply	
<p>The closure strategy must address each discharging facility listed in the permit. Similar facilities may be addressed collectively in the narrative descriptions listed below.</p> <p>The requirements for closure and post-closure are listed in A.A.C. R18-9-A209 and definitions for "closed facility" and "clean closure" are included in A.R.S. § 49-201. A closure may achieve clean closure, in which case post-closure maintenance and monitoring are not required. If you have questions regarding clean closure requirements, please contact the ADEQ Groundwater Section.</p> <p>The information needed in a strategy to evaluate costs includes the narrative descriptions below.</p> <p>After the narrative description for each discharging facility is reviewed, the more detailed information for the cost estimates should be evaluated. The cost estimates items in Section 3, should match the activities described in the strategy.</p>	
	<p>The application shall include a closure strategy which includes</p> <ul style="list-style-type: none"> Description of each facility and the pollutants discharged Description of the closure method/strategy for each discharging facility (e.g. sludge removal, clean closure or closure in place) Description of the site investigation plan for each facility for the purpose of closure, including number, depth and method of sampling, and analysis of sludge and/or soils including list of parameters Description of any post-closure if applicable
comment	



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Section 2: Cost Estimate Description

Cost estimates for closure and post-closure must be derived by an engineer, controller, or accountant using competitive bids, construction plan take-off's, specifications, operating history for similar facilities, or other appropriate sources. The cost estimates must be representative of regional fair market costs.

The cost estimate should consider and specify unit rates¹ including equipment production rates, rental costs, standard labor costs, and analytical costs², as applicable. The cost estimates are to be provided for each discharging facility and contain details to demonstrate the estimates are sufficient to verify total costs. The most common deficiency associated with closure cost estimates is the lack of detail for line item costs. Line item details should include quantities (volumes, etc.), units, unit costs, itemized costs, and total cost.

Yes/No/NA Y: yes, meets the requirement; N: no, does not meet the requirement (see comment below); NA: does not apply

A summary of the cost estimate should be prepared and submitted for review. Similar facilities may be addressed collectively in the narrative descriptions requested below.

	Narrative description of the method used to develop the cost estimate (e.g. spreadsheet, other tool)
comment	
	If applicable, narrative of any previous cost estimate (amount, date, facilities covered), change(s) to previous cost estimate amount with reason for increase/decrease, previous financial assurance mechanism used
comment	
	Narrative description of how unit rates were developed for each line item in cost estimates ^{1,2}
comment	
	Summary of each discharging facility's closure costs
comment	
	Summary of total cost including contingency
comment	

¹Unit Rate Sources: The applicant should develop and implement a comprehensive unit rate breakdown for all closure and post-closure cost estimates. Line items in the unit rate cost breakdown should include detailed explanations for all components. This should include any assumptions, lengths, dimensions, unit rate conversions, and any other data necessary to justify unit rate costing. For the creation of a comprehensive unit rate breakdown, ADEQ recommends using the most current year costs referenced to a verifiable source such as RS Means. RS Means is a division of Reed Business Information that provides cost (materials, equipment, etc.) information to the construction industry so contractors in the industry can provide accurate estimates and projections for their project costs. It has become a data standard for government work in terms of pricing (unit rates), and is widely used by the industry as a whole. RS Means is accessible online and it is also integrated in a variety of cost estimating software packages (databases, etc.) to allow for fast and reliable estimating. Cost information is updated annually and is available online, via CD-Rom, or in book form. The RS Means website, for unit rate information, is located at <http://www.rsmeansonline.com>.

²Analytical Costs: The applicant should provide current analytical laboratory costs for all sample analysis required under the closure and post-closure strategy. The cost for each analytical method should be derived from an Arizona Certified (licensed) Laboratory. A list of Arizona Certified Laboratories can be obtained from the Arizona Department of Health Services (ADHS) which is located at <http://www.azdhs.gov/lab/license>.



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Section 3: Cost Estimate Details	
Yes/No/NA	Y: yes, meets the requirement; N: no, does not meet the requirement (see comment below); NA: does not apply
	List all treatment plant tanks .
comment	
	<p>Remove the sludge from treatment plant tanks and haul offsite in accordance with state and federal regulations. This cost shall include:</p> <ul style="list-style-type: none"> • Total estimated quantity of sludge to be removed from all tanks _____ (show calculation for this estimate) • Unit rate for transportation _____ X quantity of sludge = transportation cost • Unit rate for sludge disposal _____ X quantity of sludge = disposal cost <p style="padding-left: 40px;">Tank Sludge Removal Total Cost _____</p> <p>Disinfect treatment plant tanks and associated piping within the plant:</p> <ul style="list-style-type: none"> • Estimated total tankage volume _____ • Estimated total linear feet piping _____ • Unit rate for disinfection of tanks _____ X tankage volume = disinfection cost for tanks • Unit rate for disinfection of piping _____ X linear feet piping = disinfection cost for piping <p style="padding-left: 40px;">Tank/piping Disinfection Total Cost _____</p> <p>Sludge Removal and Disinfection Total Costs _____</p>
comment	
	List all treatment plant surface impoundments (recharge basins, evaporation basins, treatment lagoons, effluent storage ponds, wetlands, emergency influent storage pond). For each, provide the information below.
comment	



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Section 3: Cost Estimate Details

Yes/No/NA	Y: yes, meets the requirement; N: no, does not meet the requirement (see comment below); NA: does not apply
	<p><u>Closure Activities:</u> For each surface impoundment, choose either: A. Clean Closure or B. Closure in Place, based on the closure strategy described above in Section 1.</p> <p>A. Clean Closure (removal of pollutants above the applicable standards, e.g. Ground Protection Level (GPL), Soil Remediation Levels (SRLs))</p> <ul style="list-style-type: none"> • Site investigation/sampling plan preparation (lump sum) • Sediment, sludge, soil and liner removal <ul style="list-style-type: none"> ➢ Estimated quantity to be removed _____ (show calculation for this estimate) ➢ Unit rate for transportation _____ X quantity = transportation cost ➢ Unit rate for disposal _____ X quantity = disposal cost <p style="margin-left: 40px;">Surface Impoundment materials removal Total Cost _____</p> • Clean closure confirmation soil sampling and analysis <ul style="list-style-type: none"> ➢ Estimated total area of surface impoundment _____ ➢ Number of samples _____ ➢ Analytical cost per sample based on list of parameters in closure strategy: _____ ➢ Sampling Cost = Analytical cost per sample X number of samples _____ <p>Clean Closure of Impoundment Total Cost _____ (Sum of plan preparation, material removal and sampling)</p> <p>B. Closure in Place (pollutants remain above applicable standards)</p> <ul style="list-style-type: none"> • Engineering costs for closure configuration design (e.g. erosion control, surface water/storm water control, drawings, specifications) - lump sum _____ • Sediment, sludge and liner removal (if applicable) <ul style="list-style-type: none"> ➢ Estimated quantity to be removed _____ ➢ Unit rate for transportation _____ X quantity = transportation cost ➢ Unit rate for disposal _____ X quantity = disposal cost <p style="margin-left: 40px;">Sludge Removal Total Cost _____</p> • Backfill and capping costs <ul style="list-style-type: none"> ➢ Estimated quantity soil needed for backfill _____ ➢ Unit rate for transportation from borrow area _____ X quantity = transportation cost ➢ Unit rate for compaction and contouring _____ X quantity = construction cost <p style="margin-left: 40px;">Backfill and capping Total Cost _____</p> <p>Closure in Place of Impoundment Total Cost _____ (Sum of engineering design, material removal, backfill)</p>
comment	



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	<p>Sludge Drying Beds / Temporary Sludge Storage Site Remove the sludge from sludge drying beds/temporary sludge storage site and haul offsite in accordance with state and federal regulations.</p> <ul style="list-style-type: none"> • Estimated area of sludge drying beds/temporary sludge storage area _____ • Estimated quantity of sludge to be removed _____ (show calculation for this estimate) • Unit rate for transportation _____ X quantity of sludge = transportation cost • Unit rate for sludge disposal _____ X quantity of sludge = disposal cost <p style="padding-left: 40px;">Total sludge removal cost _____</p> <p>For <u>concrete</u> sludge drying beds/temporary sludge storage:</p> <ul style="list-style-type: none"> • Estimated total concrete area _____ • Unit rate for disinfection _____ X concrete area = disinfection cost for concrete disinfection <p>For <u>non-concrete</u> sludge drying beds/temporary sludge storage</p> <ul style="list-style-type: none"> • Confirmation soil sampling and analysis <ul style="list-style-type: none"> ➢ Estimated total area of sludge drying beds/temporary sludge storage _____ ➢ Number of samples _____ ➢ Sampling cost = Analytical cost per sample _____ X number of samples <p>Sludge Drying Bed/Storage Site Total Cost = _____ (Sum of sludge removal, and disinfection or confirmation samples, as applicable)</p>
comment	

	<p>Abandonment of POC well/recharge well³</p> <ul style="list-style-type: none"> • List all POC wells and recharge wells • Cost for well abandonment <ul style="list-style-type: none"> ➢ Depth of well (s) _____ <p>Well Abandonment Total Cost = abandonment rate per linear foot _____ x Depth of well(s)</p>
comment	

³ Well Abandonment: The applicant should provide detailed well closure costs that include contractor mobilization/demobilization, well pump removal, drill-out of top 20-feet of well, grouting, pad/casing removal, labor including per-diem, etc. A well unit cost should be developed based on these line items, site conditions (well depth, well diameter, etc.), along with the application of current industry standards and regulation requirements governing well abandonment. An excellent reference that describes the well abandonment process, abandonment methods, and Arizona governing rules can be found in the Well Abandonment Handbook, prepared by the Arizona Department of Water Resources (ADWR) and dated 2008. The ADWR website provides a list of Arizona licensed well drillers, most also do well abandonment, and is available at www.azwater.gov/under_permits/reporting/well_information/well_driller_list. Current values for most line items can be obtained from any Arizona licensed well driller.



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WWTP Post -Closure:	
Yes/No/NA	Y: yes, meets the requirement; N: no, does not meet the requirement (see comment below); NA: does not apply
	In consultation with ADEQ, check if post-closure cost would be required. You may need to provide a detailed post-closure cost if required.
comment	

Section 4: WWTP Cost Total Closure and Post-closure Costs with Contingency Costs:	
Yes/No/NA	Y: yes, meets the requirement; N: no, does not meet the requirement (see comment below); NA: does not apply
	Tanks and associated piping Total Cost _____ Clean Closure of Impoundment(s) Total Cost _____ Closure in Place of Impoundment(s) Total Cost _____ Sludge Drying Bed/Storage Site(s) Total Cost _____ Well(s) Abandonment Total Cost _____ Post-closure Total Cost _____ Closure and Post-closure Total Cost (sum) _____
comment	
	Contingency costs <ul style="list-style-type: none"> Provide a contingency percentage with rationale for selection _____ Contingency Costs = Total Closure Costs for all facilities _____ X contingency percentage = _____
comment	
	Total Closure and Post-closure Costs with Contingency _____
comment	