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It’s a bit early to know the true impact of recent regulatory activity related to this issue because much rides on the final rule outcomes for Effluent Limitation Guidelines (ELG) and Coal Combustion Residuals (CCR), which are not expected until late 2014. If the regulatory requirements are what we expect, the decision to close ponds may be straightforward. What may be controversial, however, will be how to close the ash ponds. Some facilities may want to close in-place, which may be more cost-effective than other solutions, but these facilities may face external pressures

**Successful Coal Ash Pond Management**

REGULATORY requirements, plant retirements, changes to facility operational profiles, environmental liability management and political and social pressures are among the factors driving utilities to close or consider closing their coal ash ponds. The process can be time-intensive and costly -- and fraught with uncertainties. Success requires careful attention to upfront analysis and strategic decision making as well as proper implementation and sequencing of all the regulatory, contractual, land use, and community issues contained in the selected solution(s). Facilities will need to plan their activities to take into account operational changes, regulatory impacts and long term land use issues. It is advantageous to know and anticipate environmental issues upfront to avoid expensive backtracking and delays.

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**About the Authors**

Mark Johnson, P.G., is a Senior Client Services Manager at TRC. He has 25 years of experience in environmental assessment and remediation.

Kent Nilsson, P.E., is a Senior Engineer at TRC. He has 29 years of experience in geotechnical and environmental engineering with a focus on landfill waste and innovative design.

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Coal ash storage ponds would be excavated and closed under new rules from the Environmental Protection Agency. While the EPA has confirmed it will finalize coal ash rules by Dec 19, 2014, it is not clear what those rules will look like. Many questions remain. Photo courtesy: TRC Companies Inc.
from social and political groups to remove the materials. If a plant is in an environmentally sensitive area, owners should proceed with caution and plan for different scenarios.

**RETIRING V. OPERATING PLANTS**

The process and closure options for ponds will vary based on whether a facility will be retired or continue to operate. Retiring plants will need to clearly define the property end use up front as different pond closure solutions may be required dependent on future site use. For example, high value properties in prime locations for commercial or residential redevelopment may require stricter clean up and maintenance than retired sites with little or no redevelopment potential or sites that will continue to support energy infrastructure. Site specific conditions and operational outlooks will initially drive and dictate the closure strategies.

**STRATEGY**

Although regulations are still in flux, it’s not too early to plan a course of action. It is important to develop a project management plan that anticipates regulatory changes while working concurrently within facility operations or retirement plans. Successful coal ash facility closure strategies map out in advance the regulatory, financial, social, political and environmental impacts and address future uses.

Data gathering is essential to meeting schedule requirements and budgeting properly for closure expenditures. One key strategy component will be to keep abreast of the CCR rule and its applicability to your plants/ash ponds, and evaluate and integrate the potential benefits of plant retirement or closing ash ponds sooner rather than later. In many cases, this may not be feasible due to operational constraints or pond size. In the absence of federal rules, owners/operators will need to look to state agencies for guidance.

Questions to ask at this stage of closure planning include: Will the closure remain in-place or will dewatered ash be removed; is there a viable market for the ponded material and what are the economic constraints; what are the long-term obligations and environmental liabilities and can and should these be addressed as part of the closure plan; what is the future land use; is the pond’s footprint needed for future operational needs; is there useable borrow material on-site or will it need to be purchased; are the ponds located within an environmentally sensitive area; are there siting or constructability constraints for an on-site landfill or a new, lined ash pond; what are the staffing demands; what are the outside resources needed, will they be available and what do they cost; and importantly, what is the price tag for all of the various options and schedules?

Part and parcel of a well-planned pond closure is the quality and detail selected strategy and schedule will be dictated in part by regulatory requirements and timing, future site use (retirement versus continued operations), and site-specific characteristics. It will be necessary, at a minimum, to keep National Pollutant Discharge Elimination Systems (NPDES) permits in place until facility changes and ash pond closures are complete. Additionally, design and construction specifications and bid packages will need to be prepared early in anticipation of meeting deadlines. Owners will also need to ascertain what regulatory approvals are necessary and factor these into their schedules.

The Environmental Protection Agency is expected to release a final rule for handling coal combustion residuals later this year.

“If a plant is in an environmentally sensitive area, owners should proceed with caution and plan for different scenarios.”

- TRC
of the schedule.

Coordination and timing of the varied steps requires close attention, skill and some pliability. You don't want to employ a work schedule that is so rigid that it will hamper closure should a proverbial "monkey wrench" get thrown into the mix. Creating a schedule that anticipates complications and provides alternative glide paths will reduce cost and delays.

Customization is also pertinent to the plan. What works for one facility may not work for the next.

A good closure strategy will be site- and pond-specific. If the plant is going to be retired, when it will be retired is a key early decision. For those facilities continuing to operate, necessary decisions include whether ponds are to be closed, cleaned out and used for other wastewater streams, or converted into landfills.

Other planning factors include thoughtful consideration of the environmental setting, potential impacts, the future use, remaining life and the ELG strategy.

REGULATORY PLANNING AND BENEFICIAL REUSE

Different regulatory frameworks impact closure planning and implementation. Understanding the federal and state specific requirements is crucial, and the potential beneficial reuse of coal ash byproducts is an important part of the overall evaluation. Successful closures integrate designs with regulatory obligations, permitting constraints, beneficial reuse opportunities, and construction considerations.

While the EPA has recently confirmed it will finalize coal ash rules by Dec. 19, 2014, it is not clear what those rules will be. While the current general consensus is that EPA is leaning toward a Subtitle D determination for CCR’s, many questions remain:

- Will all coal ash regardless of use or disposal require more toxicity testing and pose a greater virtual liability risk to utilities?
- Will there be limitations on beneficial reuse?
- Will these materials be so stigmatized that builders will not accept it?
- Will financial assurance be required?
- Is the time for closure sufficient to address CCR units?

While we await the answers, facility owners must plan for the different scenarios.

It is important to define closure options early on, including the potential beneficial reuse of pond materials, which is getting increased attention. In some cases, traditional in-place closure plans are being publicly challenged and facilities are implementing alternate solutions, including beneficial reuse, potentially lengthening their closure process and increasing the cost.

It is prudent to evaluate and incorporate potential beneficial reuse strategies (as well as other alternatives) upfront to avoid delay and budget overruns, especially for those facilities that may be within environmentally sensitive areas.

Constructing cost-benefit analyses and return on investment scenarios per site-specific factors and timelines, and vigilantly tracking state and federal activities that will affect ash pond decisions will be critical for successful closure planning.

ENVIRONMENTAL INVESTIGATION AND RISK ASSESSMENT

Coal ash facility closure plans must assess and address potential risks and liabilities as well as future area use. This requires a host of specialized planning skills including geotechnical evaluation, environmental assessment, landfill and pond closure design, environmental permitting, and construction engineering. Though quite obvious, the collection and evaluation of data is one of the first and most important steps for successful closure and compliance.

The evaluation of potential environmental liabilities associated with the historical pond use is critical. Due to their age, some ash ponds were constructed without regulatory oversight, liners, leachate collection and control, or they may be located in environmentally sensitive areas (e.g. adjacent to surface water bodies).

If not already done, a groundwater assessment will likely be necessary to ascertain whether environmental impacts exist. The need and timing of additional investigations (such as sediment, soil and surface water) should be evaluated on a case-by-case basis and guided by regulatory requirements (federal and/or state) and future site use.

At a minimum, a groundwater investigation plan should take into consideration the point of compliance determination issues (locations and potential aggregation of the ponds as a single unit), constituents of potential concern, well placement and construction (including potential use of wells for post-closure monitoring activities), sampling protocol, quality assurance/ quality control measures, statistical protocol, and determination of background conditions.

Care should be taken when determining groundwater background conditions because pond hydrology may influence or mask true background. Groundwater flow models may need to be constructed to determine groundwater flow rate and concentration gradients.

Finally, if any environmental impacts are identified, a risk assessment is necessary to identify not only potential receptors but also the potential for adverse risk. This risk evaluation should also include background determination and consideration.
Data to support the proposed closure options and alternatives, as well as data to support potential remedial alternatives for impacted media (e.g. groundwater) should be collected in conjunction with the environmental investigation, especially if a remedial design will be incorporated into the overall closure plan.

**POND CLOSURE**

Closure and remediation solutions vary greatly from facility to facility. Options are plentiful and include capping, dewatering and/or stabilizing, consolidating into a new landfill, disposing off-site, converting to wetlands, beneficial reuse, or a combination of these.

The ash pond closure design (closure plan) and construction will require close coordination with ongoing facility operations, especially if it is at an operating plant.

Trade-offs and competing priorities create complexities for even a simple pond closure.

Closures near residences for example are more likely to have restricted site access imposed by fences, utilities, and adjacent structures than closures in a non-populated area. This may constrain the type and size of construction equipment that can safely operate. Operating and working hours may also be limited when closing a pond in a suburban area due to noise impacts, extending schedules and increasing costs.

Hauling ash materials for off-site disposal or importing fill materials from off-site sources for inplace closure must also be a consideration in a suburban area. Heavy truck traffic may be more limited.

For such a condition, an in-place closure may be better suited than a “clean closure” with its removal of all pond solids, since total haul volumes (and corresponding truck traffic) would likely be less.

Real estate values for property occupied by a pond in a suburban location may be higher than the value of pond property in a rural setting. An operating plant at a suburban site may be property constrained, and the facility could potentially use a closed pond area for vehicle parking, plant expansion, material staging, etc.

These considerations may drive the final closure toward conditions that are more structurally robust, requiring stabilization/removal of ash solids, a reinforced cover, or other accommodations beyond a typical closure.

At the completion of closure, final documentation should include regulatory approval, close-out of permits, and development and approval of a long-term monitoring and maintenance plan (PostClosure Plan), to include cap maintenance, long term groundwater monitoring, and remediation system operation, as warranted.

**PREPARE NOW**

As industry awaits for the final ELG and CCR regulations, closure activities can commence.

Planning for different outcomes, while they may seem like an extra step, is prudent.

Gathering data to understand the complexity of the environmental conditions and inform the solution-making process is undeniably the first order of business. With sound, strategic guidance based in research and the willingness to be flexible, long-term success in coal ash pond closures is within reach.

― TRC

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