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SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

CORINTH WATER SUPPLY

Tishomingo and Alcorn Counties, Mississippi

TENNESSEE VALLEY AUTHORITY

NOVEMBER 2006

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Proposed Action and Need for the Proposal

The City of Corinth (Mississippi) Gas and Water Department proposes to construct a water intake, pumping station, water transmission line, and water treatment plant to produce potable water for Corinth and Alcorn County. According to the city, the public water system currently in place would not meet the future demands of the increasing population, nor provide adequate water for industrial and economic development that may occur in the future. The proposed system would have a capacity to remove 16.5 million gallons of water per day from the Tennessee-Tombigbee Waterway. The initial estimated annual average withdrawal would be 9 million gallons per day.

TVA Jurisdiction

The water intake and pumping station are proposed to be located on the Tennessee-Tombigbee Waterway (TTW) near Doskie, Mississippi. The water treatment plant is proposed to be located near Glen, Mississippi, and the water transmission line would extend for 19.3 miles along existing road rights of way in Tishomingo and Alcorn Counties. The water intake would be located in the Tennessee River Watershed along the former channel of Yellow Creek, and therefore would constitute an obstruction requiring approval under Section 26a of the TVA Act. Water levels in the divide section of the TTW are at the same level as TVA's Pickwick Reservoir. This water derives from the Tennessee River system rather than from the Tombigbee/Mobile Bay watershed and removals for use by the City of Corinth would constitute an inter-basin transfer into the Hatchie River watershed.

Stream crossings for the water transmission line would be buried under stream channels. All stream channel banks and bottoms would be restored to pre-project conditions following pipeline construction. Several of the streams to be crossed are in the Tennessee River Watershed; however, because permanent obstructions would not be created, Section 26a approvals would not be needed for these actions.

Background

Following submittal of an application by the Corinth Gas and Water Department, TVA coordinated the application with the seven Tennessee Valley states for comments. Comments were received from the states of Alabama, Kentucky, Mississippi, North Carolina, and Tennessee. Kentucky, Mississippi, and North Carolina did not object to the withdrawal. TVA has prepared more detailed responses to the comments of Alabama and Tennessee at the end of this SEA. Subsequently, the U.S. Army Corps of Engineers, TVA, and the Mississippi Department of Environmental Quality issued a Joint Public Notice on January 5, 2006. Responses were received from the National Marine Fisheries Service,

U.S. Fish and Wildlife Service, Mississippi Department of Archives and History, and the Alabama Office of Water Resources. These comments are discussed further in the USACE EA and in this SEA. TVA has prepared this supplemental EA to document its consideration of the issues related to interbasin transfer raised in response to the public notice, including the impact of withdrawal of 16.5 million gallons per day of water from the Pickwick Reservoir pool.

USACE EA

The EA prepared by the USACE examines the potential environmental impacts of a pumping plant site in Doskie and a 19.3-mile water pipeline crossing streams in the Tennessee and Hatchie River watersheds. The project would have no effects to endangered and threatened species. Pumping plant construction would result in the fill of 0.74 acres of forested wetlands and the conversion of an additional 0.98 acres of forested wetlands to herbaceous vegetation. The water pipeline would be constructed along existing road rights of way, minimizing the potential for disturbance of forests or other wildlife habitat. Construction of the intake and water pipeline would create minor and temporary impacts to water quality due to soil disturbance. All stream channel banks and bottoms would be restored to pre-project conditions. Through the use of Best Management Practices for erosion control, these construction impacts would be minimal. The certification required under Section 401 of the Clean Water Act was issued by the Mississippi Department of Environmental Quality on March 9, 2006.

Alternatives to the Proposed Action

(1) No Action.

If no action were taken, the city would likely continue to pump water from 12 active wells in the aquifer underlying the City of Corinth. Water levels are declining in these wells, suggesting that groundwater use is exceeding recharge. Water quality is also declining, and the iron content has increased to a level requiring treatment. Under the No Action Alternative, it is likely that the city would not be able to continue to meet its increasing water demands. Over time, the groundwater aquifer would be depleted.

(2) Water Supply Reservoir.

The city conceptually evaluated construction of a water supply reservoir on either the Tuscumbia or Hatchie River. A reservoir of at least 430 acres would likely be needed to provide the needed water, and this was deemed infeasible due to the limited flow and the headwaters position of Corinth within this watershed.

(3) Groundwater Aquifer.

An additional aquifer, the Coffee Sand Aquifer in eastern Alcorn County, is also potentially available to Corinth. However, this water has also been found to have high iron content. The city does not expect that groundwater source would be able to sustainably support water withdrawals at the needed levels.

(4) and (5) Pumping Station and Water Intake Sites.

Two alternative sites along the TTW north of Burnsville were evaluated for a water intake and pumping station; however, the impacts to wetlands and jurisdictional streams were judged to be much greater than those at the preferred site.

The siting of a 19.3-mile water pipeline along existing road rights of way would minimize impacts to environmental resources. Alternative routes would have involved siting part or the whole of the pipeline on undisturbed land, resulting in greater adverse impacts to environmental resources. Hence no further consideration was given by the applicant to alternative routes. The water treatment plant was sited along the pipeline at a site where significant environmental resources would be avoided.

TVA has independently reviewed the alternatives considered and concurs with the city's alternatives evaluation. No additional alternatives have been identified that would have less environmental impact than that submitted in the application. Therefore, the proposed action was the only action alternative evaluated in detail.

Supplemental Assessment of Impacts

Impact on Pickwick Reservoir Operations.

Under the proposed action, the average annual withdrawal would be 9 mgd with a peak day withdrawal of 16.5 mgd. Minimum flow through Pickwick Reservoir on the Tennessee River, which could be affected by the withdrawal, is 5170 mgd (8000 cfs). The average annual withdrawal is 0.2 percent of the minimum Tennessee River flow at Pickwick Dam, and the peak day withdrawal is 0.3 percent of the minimum Tennessee River flow. This amount of water would likely have a minimal effect on TVA's operations of the Tennessee River system.

TVA operates its water control system consisting of dams and reservoirs to provide a biweekly average flow at Pickwick Dam of 15,000 cfs during June through August, a biweekly average flow of 9000 cfs during May and September and a daily average flow of 8000 cfs from October through May. The proposed withdrawal would range from 0.2 to 0.3 percent of the October-May minimum flow of 8000 cfs. During periods when minimum flow requirements exceed local inflow, TVA would attempt to maintain the minimum flow from Pickwick Dam with the proposed withdrawal in place by pulling the additional water needed from storage in the tributary storage reservoirs.

A simulation of reservoir operation using 100 years of hydrologic data predicted occurrences in which the minimum river flow target at Pickwick Dam was not reached due to very dry conditions. This occurred during 9 weeks over the 100-year simulation period or 0.17 percent of the time. Should such a dry period reoccur, TVA would choose between reducing the minimum flow by possibly as much as 0.2 to 0.3 percent or maintain minimum flow levels by supplying the withdrawal from water in storage in Pickwick Reservoir. Were TVA to supply the withdrawal from Pickwick storage, the Pickwick Reservoir elevation would fall from 0.04 to 0.08 feet or up to about 0.9 percent of the 9-foot minimum navigation channel depth. Because of the safety margin provided by a 11-foot channel, this rare occurrence would allow navigation to safely be maintained.

Wetlands

Under the proposed action, the pumping plant would be located on a 12-acre site along SR 365. The site is currently within the boundary of the TTW. Federally-owned wetlands would be impacted (1.72 acres). Impacts would be minimized by situating the pumping house on all available non-wetland habitat. Inlet tubes would be buried underground between the pumping house and the waterway. The permanent easement area above the inlet tubes would not be filled and after construction would be restored to the natural ground contour. Even though there would be wetland impacts, the impacts have been minimized. Other alternatives would have greater wetland impacts. Therefore, for compliance with Executive Order 11990, Protection of Wetlands, TVA concludes that there is no practicable alternative to construction in wetlands. Public notice of the potential wetland impact was provided by the USACE/TVA Joint Public Notice.

Floodplains

Under the proposed action, the pumping plant would be located above the 100-year flood level of the TTW. The water intake and stream crossings would be within the floodplain of the TTW and tributary streams to the Hatchie and Tennessee Rivers. Because stream crossings would be returned to original contours, any floodplain impacts would be minor and temporary. Because the water intake is a water-dependent activity, TVA concludes that there is no practicable alternative to construction of this facility in the floodplain. Floodplain impacts of the water line would be minimized by construction in existing road rights of way and returning of impacted areas to original contours. Accordingly impacts to the floodplains of tributary streams have been minimized and permanent floodplain obstructions avoided. Public notice of the potential floodplain impact would provided by the USACE/TVA Joint Public Notice.

Cultural Resources

Corinth commissioned a cultural resources survey of the proposed water intake, water pipeline and water treatment plant site. Review of the water pipeline, to be located in existing road right-of-way, indicated no potential for cultural resources to be present. Where the supply line is likely to extend beyond graded right of way, it would be in silted, marshy floodplain or cut into hillside road cuts. Shovel testing of the treatment plant site provided no indication of prehistoric occupation of the area, and no standing structures were present. By letter of March 7, 2006, the SHPO concurred with these findings.

Other Impacts

As explained above, operation simulations show no change in minimum flow, or an insignificant change to reservoir elevations which means there would be no impact to navigation, fish and wildlife habitat, aesthetics, and recreation. The diversion could reduce hydropower generation by 720 to 900 Megawatt hours (MWh) per year, a small fraction of TVA system generation.

Cumulative Impacts

There are no additional active permits for municipal water withdrawal from the Tennessee River in the vicinity of the TTW. Resources potentially cumulatively affected by this action are described in the USACE EA. The major cumulative effects concern would be additional water withdrawals from the Tennessee River system. TVA considered the cumulative effects of existing and proposed water withdrawals within the Tennessee River watershed

in its Reservoir Operations Study, completed in 2004. The reservoir operating policy implemented in 2004 did not include provision for the cumulative impacts of inter-basin transfers such as the proposed Corinth withdrawal. However, during the development of the new operating policy, simulations were performed to test sensitivity of alternative policies to assumptions concerning inter-basin transfers. The proposed Corinth withdrawal was included in the assumptions for this analysis. It was determined that inter-basin transfers would not likely affect reservoir elevations under average hydrologic conditions (e.g. one year in two). Subsequent analysis showed that the proposed Corinth withdrawal alone would have little effect on reservoir elevations even under very dry conditions (e.g. one year in fifty).

TVA will evaluate future inter-basin transfer requests based on the total effect of all the previously approved transfers since 2004 plus the effect of the current request. For example, should the Corinth withdrawal request be approved, the next request for an inter-basin transfer would be evaluated based on the amount of that request plus the amount approved for Corinth.

Mitigation Measures

To compensate for the loss of 1.72 acres of forested wetlands at the pumping station site, the applicant would purchase 5.16 credits from the Pearl River Wetland Mitigation Bank.

TVA would include the following water withdrawal conditions in its Section 26a approval:

- Maximum peak day water withdrawal from the permitted intake site would be restricted to 16.5 mgd.
- No later than March 1 of each year following issuance of this approval, the city would be required to report to TVA the amount of water withdrawn and used.
- Without written concurrence from TVA, water withdrawn from the Tennessee River system shall not be sold, distributed, or otherwise transferred beyond the utility service territory.
- The Section 26a approval expires on November 1, 2026.

Preferred Alternative

Based on its independent analysis of environmental impacts, TVA's preferred alternative is to issue its Section 26a approval for withdrawal of 16.5 mgd from the Pickwick Reservoir pool along the TTW at Doskie, Mississippi.

TVA Preparers

Harold M. Draper, Senior NEPA Specialist

Charles E. Bohac, Water Supply Specialist

Agencies and Persons Consulted

Alabama Office of Water Resources, Onis "Trey" Glenn III and Marlon R. Cook*

Georgia Environmental Protection Department, Water Resources Branch, Kevin Farrell

Kentucky Department for Environmental Protection, Water Quantity Management, Bill Caldwell

Mississippi Department of Archives and History*

Mississippi Department of Environmental Quality, Sam Mabry*

North Carolina Department of Environment and Natural Resources, Division of Water Resources, Linwood Peele

Tennessee Division of Water Pollution Control, Paul E. Davis, Director*

U.S. Department of Commerce, National Marine Fisheries Service*

U.S. Department of the Interior, Fish and Wildlife Service*

Virginia Department of Environmental Quality, Division of Water Resources, Terry Wagner

*indicates response received

Attachments

Water Quality Certification, March 9, 2006

Public Notice and Responses

State of Tennessee Comments

The State of Tennessee provided the following comment on the proposed application in a letter dated January 10, 2005.

While we recognize that this proposed transfer would not be subject to the permitting requirement under the Tennessee Inter-basin Transfer Act, we nevertheless believe that the considerations in our rules are valid grounds for review. We suggest that the applicant or, if more appropriate, TVA, develop a rationale to support the proposed withdrawal which, at a minimum, is based on the factors set out in our Rule 1200-4-13-.05, "Criteria for Issuance of Individual Permits".

TVA has developed information to address each of the factors in Tennessee's rule 1200-4-13-.05. The factors appear in *italics* with TVA's information appearing below each factor.

State of Tennessee 1200-4-13-.05 Criteria for Issuance of Individual Permits

(1) In reviewing a permit application, the commissioner shall consider information developed through studies, analyses, or inquiries undertaken by the commissioner and

information and comments submitted to the commissioner by the applicant, public agencies, affected persons, and the public.

TVA Response: TVA coordinated the proposed water withdrawal with the seven Tennessee Valley states and participated in the Public Notice process of the U.S. Army Corps of Engineers. Information submitted, developed, and used in the processing and review of the intake application included:

1. Joint Application Form and Attachments – Department of the Army/TVA Application for intake at Station 13, 182+36 on the Tennessee-Tombigbee Waterway submitted by Corinth Utilities Commission July 19, 2004

2. Comments received in response to TVA's letters to the states and comments received in response to the Joint Public Notice.

2. The USACE Environmental Assessment and TVA's Supplement.

(2) The following factors will be used by the commissioner in making a determination on a permit application:

(a) The quantity of the proposed withdrawal and the stream flow of the losing river(s), with special concern for low flow conditions;

TVA Response: Average annual withdrawal would be 9 mgd with a peak day withdrawal of 16.5 mgd. Minimum flow through Pickwick Reservoir on the Tennessee River, which could be affected by the withdrawal, is 5170 mgd (8000 cfs). The average annual withdrawal is 0.2 percent of the minimum Tennessee River flow at Pickwick Dam, and the peak day withdrawal is 0.3 percent of the minimum Tennessee River flow.

(b) Protection of the present uses, and consideration of projected stream uses of the losing river(s), including but not limited to, present agricultural, municipal, industrial and in-stream uses, and assimilative needs, with special concern for low flow conditions;

TVA Response: TVA operates its water control system consisting of dams and reservoirs to provide a biweekly average flow at Pickwick Dam of 15,000 cfs during June through August, a biweekly average flow of 9000 cfs during May and September and a daily average flow of 8000 cfs from October through May. The proposed withdrawal would range from 0.2 to 0.3 percent of the October-May minimum flow of 8000 cfs. During periods when minimum flow requirements exceed local inflow, TVA would attempt to maintain the minimum flow from Pickwick Dam with the proposed withdrawal in place by pulling the additional water needed from storage in the tributary storage reservoirs.

A simulation of reservoir operation using 100 years of hydrologic data predicted occurrences in which the minimum river flow target at Pickwick Dam was not reached due to very dry conditions. This occurred during 9 weeks over the 100-year simulation period or 0.17 percent of the time. Should such a dry period reoccur, TVA would choose between reducing the minimum flow by possibly as much as 0.2 to 0.3 percent or maintain minimum flow levels by supplying the withdrawal from water in storage in Pickwick Reservoir. Were TVA to supply the withdrawal from

Pickwick storage, the Pickwick Reservoir elevation would fall from 0.04 to 0.08 feet or up to about 0.9 percent of the 9-foot minimum navigation channel depth.

(c) Protection of water quality in the losing river(s) at low flow conditions:

TVA Response: As explained above, minimum flows from Pickwick Dam were established to be protective of water quality. The withdrawal would not significantly affect minimum flow; therefore, water quality would not be affected.

(d) The reasonable foreseeable future water needs of the losing river basin;

TVA Response: The operational simulation discussed in (b) incorporated water demand projections for the Tennessee River Watershed area for the year 2030.

(e) The reasonable foreseeable future water needs of the applicant for the water to be transferred, including methods of water use, conservation, and efficiency of use;

TVA Response: The proposed withdrawal is based upon the report, "Long Range Plan Water Supply Needs for City of Corinth & Alcorn County," prepared by Cook Coggin Engineers, Inc., Tupelo, MS. The report describes existing and projected water use and alternative water supply sources to meet the projected future demand.

(f) The beneficial impact of any proposed transfer, and the capability of the applicant to implement effectively its responsibilities under the requested permit;

TVA Response: On September 13, 2004, the Mississippi Department of Environmental Quality issued a permit to the Corinth Gas and Water Department for the proposed withdrawal, thereby certifying that the withdrawal was for a beneficial purpose and that the Corinth Gas and Water Department (CGWD) could fulfill its responsibilities to serve the water needs of its customers.

(g) The nature of the applicant's use of the water, to determine whether the use is reasonable and beneficial;

TVA Response: Water uses would be residential, commercial, and industrial.

(h) Whether the proposed project shall promote conservation of water;

TVA Response: The proposed project would not necessarily contribute to the conservation of water, but it would reduce the draw down on the groundwater system from which CGWD presently obtains its water supply.

(i) The feasibility, the costs, and the environmental impacts of alternative sources of supply;

TVA Response: The applicant's Long Range Plan addressed alternative water supply sources. It was determined that existing surface water sources would not yield sufficient amounts of water without constructing impoundments. The Long Range Plan declared the impoundments not cost-effective.

The other alternative to meeting the increased demand was to expand the well system. This would continue to mine groundwater resulting in an increased depth and rate of drawdown. Another consideration in not relying on groundwater was that the existing groundwater is of poor quality. The iron content of available aquifers is at a level that requires treatment to produce acceptable potable water.

(j) The requirements of other state or federal agencies with authority relating to water resources;

TVA Response: The state permitting authority for this application is the Mississippi Department of Environmental Quality. A withdrawal permit was granted to the applicant on September 13, 2004. The federal authorities for this application are the Department of the Army, Corps of Engineers (Corps) and the TVA. Pursuant to Section 101(g) of the Clean Water Act, the authority of states to regulate the allocation of water quantities must not be impaired by the implementation of the Act. The TVA and USACE, however, regulate the construction of intake structures for the purposes of safeguarding navigation, water quality, and other interests. The applicant has made an application for constructing an intake structure by submitting a joint application to the Corps and TVA. The Corps permit was issued on July 13, 2006.

(k) The availability of water in the losing river basin to respond to emergencies including drought.

TVA Response: Normally during dry periods in which water requirements exceed local inflow, TVA taps its tributary storage reservoirs to supply the additional water required to meet system demands. Theoretically, the proposed withdrawal could result in increased drawdown of tributary reservoirs. A simulation of reservoir system operation over a 100-year hydrologic period showed that under median hydrologic conditions there would be no additional drawdown of any reservoir. Under increasing dryer conditions, reservoir levels fell slightly, but even under conditions so dry that they would occur no more than once every fifty years, the maximum draw down of any of the tributary reservoirs as a result of the proposed withdrawal would be 0.1 feet.

TVA has wide flexibility in the operation of its reservoir system. The response to item (b) suggested that under extreme drought, storage in Pickwick Reservoir itself could be used to meet the proposed withdrawal. Depending on the period that this might be necessary and the magnitude of the proposed withdrawal, Pickwick water elevation may fall by as much as 0.9 percent of the minimum navigation channel of 9 feet. Because TVA provides an 11-foot deep channel, this is well within the safety margin for navigational impacts, and a fall of this amount is not a significant concern.

(l) Whether the project shall have any beneficial or detrimental impact on navigation, hydropower, or other power generation, fish and wildlife habitat, aesthetics , or recreation;

TVA Response: As explained above, operation simulations show no change in minimum flow, or an insignificant change to reservoir elevations which means there would be no impact to navigation, fish and wildlife habitat, aesthetics, and

recreation. The diversion could reduce hydropower generation by 720 to 900 MWh/y.

(m) The quantity, location, and timing of water returned to the basin of origin or a downstream basin;

TVA Response: Approximately 84 percent of the wastewater generated in the service area would be treated in a POTW and discharged to surface waters primarily in the Tuscumbia River, a tributary of the Hatchie River.

(n) Climatic conditions;

TVA Response: Water demand varies seasonally ranging from 77 percent of average annual demand during January to 136 percent of average annual demand in May.

(o) Any offsetting increases in flow in the basin of origin that may be arranged through permit conditions;

TVA Response: There would be no offsetting flows in the Tennessee River basin.

(p) The number of downstream river miles from which water will be diverted as a result of the transfer;

TVA Response: The transfer would effectively occur from the Yellow Creek embayment whose mouth is at TRM 215. The length of the Tennessee River below this point is 215 miles of which 176 miles lie in Tennessee.

(q) Such factors as are reasonably necessary to carry out the purpose of the Act and this rule chapter.

TVA Response: Another factor considered by TVA was the cumulative effect of the transfer. TVA implemented a new reservoir operating policy in 2004 based on the results of a two year study in which TVA examined a number of alternative reservoir operating polices in an effort to produce greater overall public value from the reservoir system. Development of the new operating policy included assumptions about the growth in water demand within the Tennessee River watershed, but it did not include provisions for inter-basin transfers.

During the development of the new operating policy simulations were performed to test sensitivity of alternative policies to assumptions concerning inter-basin transfers. It was determined that inter-basin transfers would not likely affect reservoir elevations under average hydrologic conditions. This conclusion was dependent upon the size and the location of the transfers. Therefore, TVA would evaluate future inter-basin transfer requests based on the total effect of all the previously approved transfers plus the effect of the current application compared to conditions as they were when TVA's new reservoir operating policy was implemented (2004).

State of Alabama Comments

The State of Alabama provided the following comment on the proposed application in a letter from Trey Glenn dated December 17, 2004.

We cannot concur in this requested withdrawal to the extent that it involves or authorizes an interbasin transfer of water in violation of established principles of riparian law.

> TVA Response: Comment noted. The state of Mississippi granted a withdrawal permit to the applicant. According to the Mississippi Department of Environmental Quality, Mississippi enacted a statutory procedure for water use and permitting that replaced traditional common law theories (appropriation doctrine and riparian rights doctrine). In Mississippi, beneficial uses of surface waters are to be permitted as long as the permitted use would not cause the flow in the stream or the level in the lake from which the water is withdrawn to fall below a minimum level established by the state.

What is the division of responsibility between TVA and the Corps in this area?

> TVA Response: Both TVA and USACE have permitting authority within the Tennessee River Watershed. Section 26a of the TVA Act provides that the unified development and regulation of the Tennessee River system requires TVA approval before constructing, operating, or maintaining any obstruction affecting navigation, flood control, or public lands or reservations across, along, or in the Tennessee River or any of its tributaries. The Tennessee Tombigbee Waterway in the vicinity of the proposed intake follows the former channel of Yellow Creek, a tributary of the Tennessee River.

What authority exists for any water supply withdrawals from the Tennessee-Tombigbee Waterway (or in the proposed area of the withdrawal)?

> TVA Response: Water withdrawals from the Tennessee River Watershed would need approvals from TVA, USACE, and the state where the intake structure for the withdrawal is located. Water withdrawals from the Tombigbee River Watershed would need approvals from USACE and the state where the intake structure for the withdrawal is located.

What other water supply withdrawals are occurring from the Tennessee-Tombigbee Waterway?

> TVA Response: TVA is aware of a water withdrawal in Itawamba County, Mississippi, from the Tombigbee River. A diversion channel at Mackey's Creek connects the Tombigbee River to the TTW and provides a guaranteed flow of water from the TTW.

Even if no interbasin transfer was involved, we would ask that a full evaluation of the impacts of the withdrawal on downstream flows and other instream and out-of-stream uses be conducted prior to soliciting the state's and the public's comments.

> TVA Response: See the TVA response to the Tennessee statute's 17 factors to be considered in evaluating an interbasin transfer.