

## **CHAPTER 1**

### **Purpose of and Need for Action**

The Tennessee Valley Authority (TVA), with assistance from Innogy Technology Ventures Limited (ITVL) of the United Kingdom, is proposing to install a Regenesys™ Energy Storage Facility near Columbus Air Force Base (CAFB) in Lowndes County, Mississippi. CAFB is located approximately ten miles northwest of the city of Columbus. Figure 1-1 shows the location of CAFB.

The potential impacts of two alternatives and the No-Action Alternative are analyzed in this environmental assessment.

#### **1.1 Purpose of and Need for Action**

##### Purpose

The purpose of this action is to demonstrate the Regenesys™ technology as an effective electric power storage tool.

##### Need

The demand for electric power fluctuates widely from season to season and throughout the day. Peaks in demand may only last for a few hours in a year, yet power stations must maintain the capacity to meet these peaks. Typically, the average demand for electricity is about 60 percent of the maximum demand. When backup generating capacity is taken into account, calculations show that the average utilization of power stations is only 50 percent. They are designed to be operated 90 percent of the time or more. This under-utilization of high-cost production facilities is, of course, reflected in the price paid by all consumers. One way to improve power plant utilization and reduce expensive backup and peaking capacity is to store energy during periods of low demand for use during periods of high demand.

Also, some customers experience interruptions in their service due to the condition of the components supplying the power and/or their location in relation to the source of power providing the service. Currently, these conditions can only be corrected by upgrading existing substations, transmission lines, or both. These upgrades are costly. However, by storing energy in strategic locations throughout the system, these upgrades can be deferred for extended periods of time.

TVA needs a source of stored energy within its system that has high-energy storage capacity. Stored energy could provide a reliable, un-interruptible power source, improve power quality and reliability and allow TVA to take advantage of daily load cycles. It could also improve utilization of power plants that are currently cycled on and off to meet fluctuations in demand. Readily available, stored electric power could provide voltage support, frequency regulation, and rapid response to power demand. Finally, this source could defer the need for system upgrades. TVA already has one source of this stored energy, Raccoon Mountain Pumped Storage project near Chattanooga, Tennessee, but it has limited capacity, and suitable sites for pumped storage are limited. In an effort to supply stored energy throughout, TVA needs to demonstrate the Regenesys™ Energy Storage System to determine if this technology could provide benefits listed above to the TVA system.

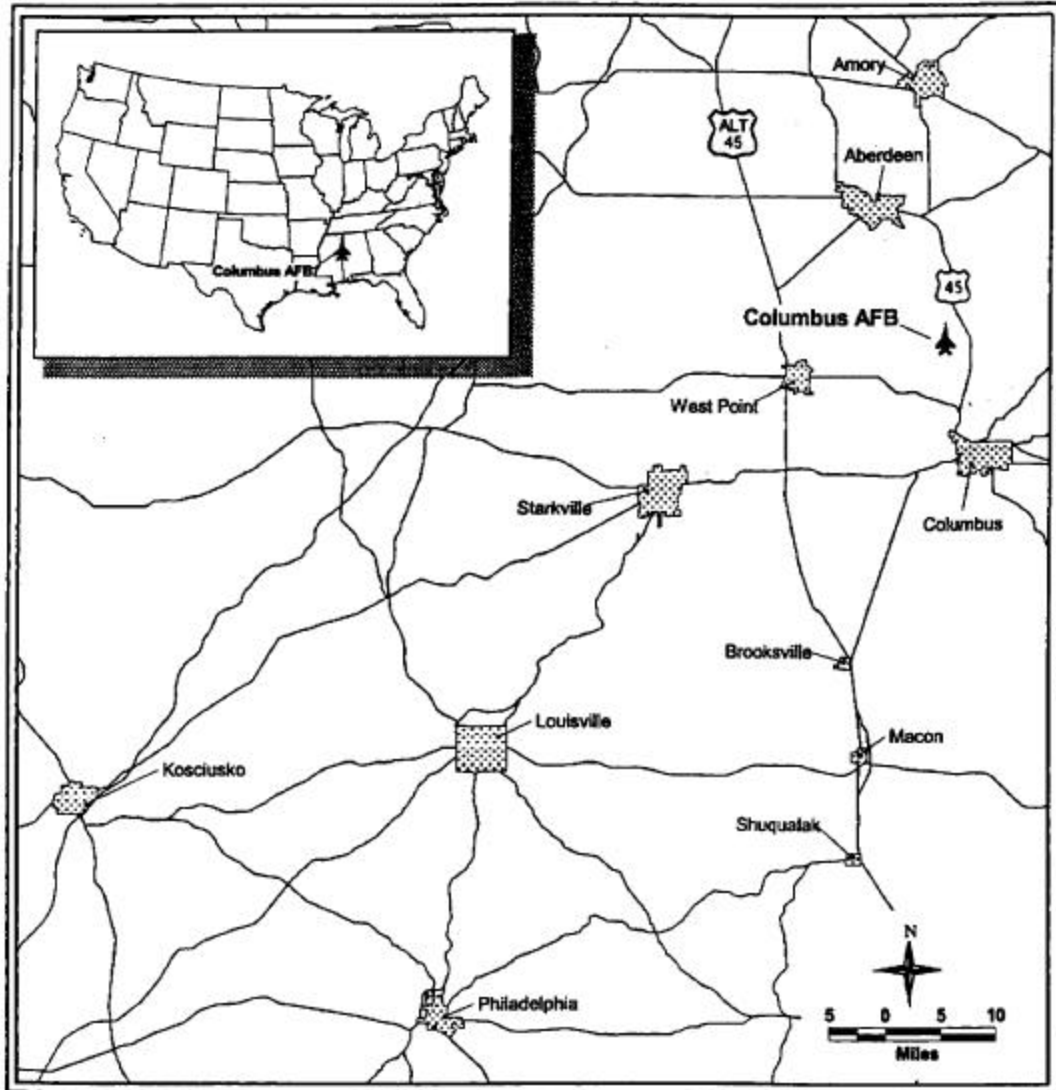


Figure 1-1 Location of Columbus Air Force Base

## 1.2 Related Environmental Documents

Because this is a new technology, TVA has not prepared a National Environmental Policy Act (NEPA) document for a similar project. However, ITVL is in the process of constructing the first Regenesys™ facility in the United Kingdom (UK). Prior to the initiation of construction, Innogy was required to develop and publish two environmental review documents that were submitted to regulatory agencies in the UK for approval. TVA used these documents, and an Environmental Assessment (EA) published by the United States Air Force (USAF), in the development of this environmental assessment. The referenced documents are listed below.

- Little Barford Power Station Black Start Facility Environmental Statement – October 2000
- Little Barford Power Station Regenesys™ Plant Supporting Document: Information to Environment Agency – October 2000
- Environmental Assessment – Three Military Construction Projects, USAF Air Education and Training Command, Columbus Air Force Base, Mississippi – January 10, 2001

### Tiering from *Energy Vision 2020*

Under the National Energy Policy Act of 1992 (PL 102-486), TVA was directed to employ a least-cost energy-planning process for the addition of new energy resources to its power system. TVA completed this planning process in December 1995 with the publication of *Energy Vision 2020 – Integrated Resource Plan/Programmatic Environmental Impact Statement* (TVA 1995).

This planning process led to the development of long- and short-term action plans by TVA for identification and implementation of the best energy choices for current and future consumers. The short-term action plan calls for research and development programs. Specifically, the short-term action plan provides for “research on targeted applications of demand-side management, distributed renewable and non-renewable generation, and storage technologies to achieve transmission and distribution system benefits” (TVA, 1995). The Regenesys™ project would be part of this plan.

## 1.3 The Decision to be Made

The decision to be made by TVA is whether to construct and operate a Regenesys™ Energy Storage Facility at one of two alternative sites near the TVA substation adjacent to Columbus Air Force Base.

One of the alternatives is to construct and operate the facility on CAFB property. If this alternative were to be selected, then the United States Air Force would have to decide whether to issue a Real Estate Permit allowing TVA to conduct these activities.

## **1.4 Scope of the Environmental Review and Key Issues for the Proposed Project**

### Scoping Discussions

Internal TVA scoping meetings resulted in the identification of the following environmental issues for installation of the facility.

- The impacts of a potential bromine release in the event of a major accident scenario (see Appendix D).
- Visual impact of the proposed development (see Sections 3.4 and 4.4).
- Noise levels associated with the operating system and the impact of these levels on surrounding areas (see Sections 3.2 and 4.2).
- Transportation of required raw materials to the site and of waste materials from the site (see Sections 3.10 and 4.10).
- Impacts of construction and operation of the facility on air and water quality, biological resources, socioeconomic resources, historical and archeological resources, and infrastructure.

TVA met with officials at CAFB to describe the proposal. A list of concerns expressed by base personnel is presented below. To avoid redundancy, only those issues not listed above are included.

- Development of a detailed Major Accident Response or HAZMAT Contingency Plan (see Appendix D).
- Proximity of the facility to residential areas and the medical facility (See Sections 3.2, 3.4, 4.2, and 4.4).
- Environmental justice issues (see Sections 3.13 and 4.13).
- Potential interference with flight patterns (see Appendix D).

TVA and CAFB personnel met with representatives of the Mississippi Department of Environmental Quality (MDEQ) in Jackson, Mississippi. During this meeting, the following nonpermitting issues were raised by the MDEQ.

- Flammability of emitted hydrogen gas (a byproduct of the electrolyte management system, see Sections 2.6 and 4.5).
- The potential for formation of trace amounts of hydrobromic acid due the emission of both bromine and hydrogen (see Section 2.6).

## **1.5 Necessary Federal/State Permits or Licenses**

TVA submitted an Air Permit to Construct application to the MDEQ. In a letter from the MDEQ, TVA has been informed that the facility would not require an Air Permit based on Mississippi Regulation APC-S-2, Section XII.D.7.

An EPA identification number would be obtained for shipment of hazardous wastes generated.

If Alternative B were selected, TVA would coordinate the treatment, storage, and disposal of toxic and hazardous materials with the Department of Defense as provided in 10 U.S.C. Section 2692.

If Alternative B were to be selected, TVA would obtain a real estate permit from the United States Air Force.

## **1.6 Coordination and Consultation**

The Draft EA was released for a 30-day period of public and intergovernmental review on June 13, 2001. It was sent to the agencies and organizations listed in Appendix E. In addition, a notice of availability was placed in the Columbus, Mississippi, daily newspaper, *The Commercial Dispatch* on June 13, 2001, and two copies of the Draft EA were sent to the Columbus-Lowndes County Public Library, 314 North 7<sup>th</sup> Street, Columbus. The Draft EA was also placed on TVA's Web site.

The comments received are summarized in Appendix E, along with TVA's responses.

Coordination with the Alabama Historical Commission under Section 106 of the National Historic Preservation Act has been completed. A copy of the concurrence letter from the Mississippi State Historic Preservation Officer is included in Appendix E.

## **1.7 Organization of the Environmental Assessment**

This environmental assessment is divided into seven chapters. Chapter 1 states the purpose of, and need for, the action and lists related environmental documents, decisions to be made, scoping issues, and necessary permits and/or licenses. Chapter 2 provides history and a rationale for formulation of alternatives, describes the No-Action Alternative and Alternatives A and B, summarizes environmental impacts of each alternative, summarizes mitigation that could minimize potential for impacts, and identifies the preferred alternative. Chapter 3 describes resources that could potentially be affected by this proposed project. Chapter 4 describes environmental consequences of each alternative. Chapter 5 lists persons involved with preparation of this document, and Chapter 6 lists persons and agencies consulted. Chapter 7 lists references cited in the EA. The appendices contain descriptions of the screening process and applicable technical information and a summary of responses to comments received on the draft EA.