EPRI

Early Site Permit Model Program Plan

Technical Report

Early Site Permit Model Program Plan

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REPORT SUMMARY

The Early Site Permit (ESP) Model Program Plan (MPP) provides step-by-step guidelines on preparing an ESP application. The Plan identifies work tasks necessary to prepare the application and guides applicants on effectively planning and managing the ESP program, including identifying and managing subcontracted resources. A model program plan details how to prepare applications. The MPP also describes interfaces among tasks and provides a generic schedule for executing the steps in preparing an ESP application.

Background

Applicants seeking to deploy new nuclear power facilities must obtain site permits and approval for construction and operation from the Nuclear Regulatory Commission (NRC). All existing nuclear power sites and facilities were licensed under the requirements provided in 10 CFR Part 50. In 1989, the NRC published requirements for a new licensing process in 10 CFR Part 52 to provide early resolution of siting and design issues and to enhance the stability and predictability of the regulatory process. Subpart A of 10 CFR 52 provides the requirements for an ESP. An ESP allows for early resolution of site-related safety and environmental issues before a large commitment of resources is made.

Guidelines for an acceptable approach to implement the requirements of 10 CFR Part 52 Subpart A, Early Site Permits, is provided in the *Industry Guideline For Preparing An Early Site Permit Application – 10 CFR Part 52, Subpart A* (Application Guide [AG]). The Application Guide provides applicants with detailed descriptions of the content, format, and legal requirements for the ESP application (the "what"). In satisfying these requirements, applicants must conduct extensive site characterization studies and analyses to document the site's suitability for a standardized nuclear plant design. These studies involve data collection and analysis in a number of technical disciplines; input from each discipline is required to complete the site safety analysis report (SSAR) and the environmental report (ER) portions of the ESP application. This MPP describes the functional tasks necessary to complete these studies and describes how to prepare a compliant ESP application (the "how").

Objective

To provide applicants with a model program for planning, managing, and executing technical and administrative functions necessary for an ESP application.

Approach

The project team identified tasks that must be executed to develop information necessary to satisfy ESP requirements; the team also included descriptions of the interfaces among tasks and provided a generic schedule for preparing an ESP application. Team members organized MPP discussions around a model ESP work breakdown structure (WBS), which lists major areas of management planning and technical work, supplemented by additional detail describing tasks that comprise each of these areas. Task discussions identified applicable technical disciplines and provided a description of activities that must be executed to develop required information and analyses. The team also provided an overall model program schedule, supplemented by model schedules for each area of technical investigation.

Results

The model program plan provides up-to-date guidance for applicants to plan and execute scientific and technical studies necessary for preparing a complete ESP application.

EPRI Perspective

Preparing an Early Site Permit application requires management and technical expertise in the geosciences and environmental and socioeconomic disciplines, expertise that is not normally found in applicant organizations. The *ESP Model Program Plan* provides applicants with guidance on scoping and planning the work necessary to complete an ESP application. The MPP details the tasks that must be executed to develop information and analyses necessary to prepare the required application content.

Keywords

Early site permit
Plant parameters envelope
Site safety analysis report
Environmental report
ESP application

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1
INTRODUCTION

Guidance for applicants on an acceptable approach for implementing the requirements of 10 CFR Part 52 Subpart A, Early Site Permits is provided in the *Industry Guideline For Preparing An Early Site Permit Application – 10 CFR Part 52, Subpart A* (Application Guide [AG]). The Application Guide provides applicants with detailed descriptions of the content, format, and legal requirements for the ESP application (the "what"). This Model Program Plan (MPP) describes the functional tasks that must be executed to develop information necessary to satisfy these requirements (the "how"), in the form of a project plan. The MPP also includes descriptions of the interfaces among tasks and provides a generic schedule for executing the functional steps in preparing an Early Site Permit (ESP) application.

1.1 Background

Applicants seeking to deploy new nuclear power facilities must obtain site permits and approval for construction and operation from the Nuclear Regulatory Commission (NRC). All existing nuclear power sites and facilities were licensed under the requirements provided in 10 CFR Part 50. In 1989, the NRC published requirements for a new licensing process in 10 CFR Part 52 to provide early resolution of siting and design issues and to enhance the stability and predictability of the regulatory process. Subpart A of 10 CFR Part 52 provides the requirements for an ESP, which allows for early resolution of site-related safety and environmental issues, before a large commitment of resources is made.

In preparing an application for an ESP, applicants must conduct extensive site characterization studies and analyses to document the site's suitability for a standardized nuclear plant design. These studies involve data collection and analysis in a number of technical disciplines; input from each of these disciplines is required to complete the Site Safety Analysis Report (SSAR) and the Environmental Report (ER) portions of the ESP application.

1.2 Purpose and Goals

The ESP Model Program Plan provides applicants with guidance on scoping and planning the work necessary to complete an ESP application. The MPP details the tasks that must be executed to develop information and analyses necessary to prepare the required application content, as detailed in the Application Guide. Topics addressed in the MPP are:

- Task identification and scheduling for the application preparation effort.
- Interface requirements and approaches (e.g., NRC consultation and communications, landowner negotiations, public information program)

- Logistics requirements and approaches (e.g., site access, field program support).
- Contractor roles and management.
- Scope, timing, and products of individual technical investigations.
- Field data collection program scope descriptions (e.g., seismology, meteorology).
- Mechanisms for data and information management.
- Application preparation and submittal.
- Response to NRC review.

Work necessary to complete an ESP application falls within four broad functional areas. These are depicted conceptually in Figure 1-1.

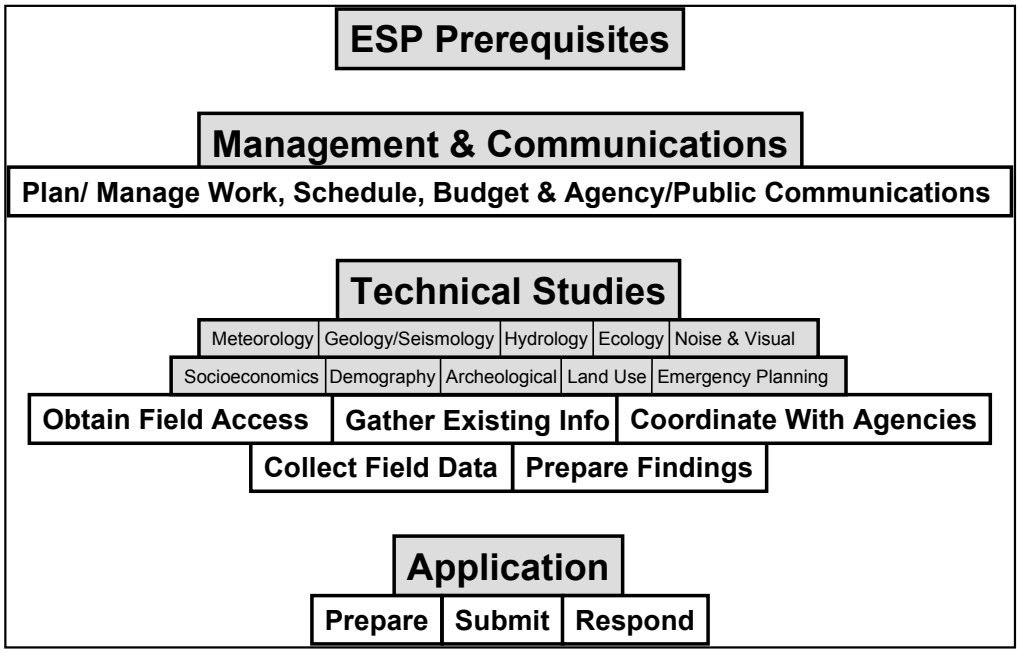

Figure 1-1
Key ESP Application Tasks

Precursors to initiating an ESP include selecting a proposed site and establishing the plant design(s), power level and number of units that will be reflected in the ESP application. Guidance for site selection is provided in the ESP Siting Guide; plant design information should be selected on the basis of applicant business plans and overall expectations for use of the site.

Preparation of an ESP application will typically start with organizational, planning, subcontracting, and public/institutional policy development components of the Management and Communications functional area, followed closely by the legal, public relations, and agency interface actions necessary to complete preparation for the technical studies. Technical studies themselves are initiated as soon as possible consistent with completion of critical management and technical preparation tasks. The ESP application is prepared by incorporating information

from the technical studies into the Site SAR and ER and melding these documents with required administrative and emergency planning information. Following submittal, applicants must participate in the licensing review by participating in specified NRC activities (e.g., meetings, hearings) and by preparing responses to NRC questions and comments.

As shown in Table 1-1, the MPP presents these tasks in the form of a Work Breakdown Structure (WBS), where each of the four functional elements is at the highest WBS level.

Table 1-1
MPP Functional Elements

Function	Objective	Representative Activities	Responsibility	MPP Section	WBS No.
ESP Prerequisites	Complete actions necessary to initiate ESP program	Select site(s) Select certified design(s), power level, number of units	Applicant	1	1
Management and Communications	Organize, plan and manage ESP program	1. Establish ESP program organization; identify subcontractors, responsibilities, public communications policy, and agency contact protocols. 2. Obtain site access. 3. Obtain permits. 4. Establish local support for field programs.	1. Applicant 2. Applicant 3. Applicant/ subcontractor(s) 4. Applicant/ subcontractor(s)	2	2
Technical Studies	Develop technical information for application	Literature data collection, Agency contact for data collection, Field data collection, Data reduction, Data analysis and modeling, Develop conclusions; Prepare report	Subcontractor(s)	3	3
Application	1. Prepare and submit application 2. Respond to review	1. Technical review, Technical editing, Report Production, Submit application 2. Support/attend hearings and meetings. Prepare and submit responses to NRC review comments and interrogatories	1. Subcontractor/ Applicant 2. Applicant/ Subcontractor	4	4

Each of the functional areas is comprised of a number of discrete, executable tasks. In order to provide detailed guidance for ESP application preparation activities (the ESP program), these subordinate tasks are given second, third, and fourth-order numbers (e.g., 2.2, 3.1.3, 2.4.4.5), consistent with the actual hierarchy of ESP program activities.

1.3 Report Structure

Discussion of the ESP program is organized around a model ESP Work Breakdown Structure (WBS), which lists major areas of management planning and technical work, supplemented by additional detail describing functional tasks that comprise each of these areas. The full model ESP WBS is presented in Appendix A.

Section 2 provides a scope description for management tasks and functions associated with preparing an ESP application. These discussions are based on the assumption that applicants will choose to subcontract significant portions of the technical work to specialty services providers. The Section addresses guidance for planning and managing the ESP program from a data collection and management perspective.

Studies that form the technical basis for an ESP application are the focus of Section 3. These discussions identify each applicable technical discipline and provide a functional description of tasks that must be executed to develop required information and analyses. Task descriptions are identified at a level of detail that will allow applicants to plan and manage the work of subcontractors, who will actually perform the work. Thus, the task discussions are presented at the level of detail necessary to understand and execute the scope of these assessments rather than as a detailed recitation of NRC requirements or a "cookbook" of methods for each technical study.

Section 4 describes the activities associated with the ESP application. This includes both the preparation and submittal of the application as well as the response to NRC reviews.

Scheduling the ESP program is the subject of Section 5. These discussions reference model program schedules; an overall program schedule is presented in Section 5.2, supplemented by model schedules for each area of technical investigation (at the 2.x WBS level) in Appendix B. These more detailed schedules provide typical task durations, precedence relationships, and interfaces with other components of the ESP effort. Overall scheduling considerations are discussed in Section 5.1.

Section 6 provides additional guidance on managing the ESP program; specific subjects include:

- Special considerations for developing an ESP at existing sites,
- Effective coordination of activities among WBS elements, and
- Management of subcontractors.

Appendix C describes incremental changes to the WBS elements and schedule based on assumed maximum use of data collected during a previous licensing action. Actual existing-site schedules will be dependent on the availability of extant data as well as technical and licensing considerations regarding its use.

2
MANAGEMENT AND COMMUNICATIONS

This section provides guidance to applicants on how to plan and manage the overall program for developing an ESP application, including management and organizational aspects of program planning. A model scope for the Program Plan itself is discussed. Discussions in this chapter are referenced to the overall ESP Work Breakdown Structure (WBS), which appears in Appendix A.

Planning issues addressed in this section fall within the Model ESP WBS Element No. 2. – Management and Communications. Guidance provided in this section addresses:

- Establishing the corporate legal structure for developing the ESP application,
- Identifying corporate responsibilities and authorities for developing the application,
- Preparing an ESP Program Plan that establishes a blueprint for executing actions necessary to prepare the application, and
- Completing other actions (e.g., subcontracted services procurement, quality assurance plan development, site selection) necessary to execute the Program Plan.

At the completion of this WBS element, applicants will be prepared to authorize and execute the technical studies described in Chapter 3.

WBS Element No. 2. - Management And Communications
2.1 Establish Applicant team corporate organization structure - The purpose of this element is to establish the overall corporate structure for applying for the ESP. Included will be defining the corporate or organizational entity that will be the applicant, establishment of new corporate structures, if any, and defining the legal and functional relationships between the applicant and the other corporate entities involved (e.g., parent company). **2.2 Define roles, responsibilities, and authorities -** Roles, responsibilities, and authorities of the corporate participants in the ESP program (and, if applicable, relationships to the eventual plant ownership and operating entity) must be defined. A clear single point of legal/corporate responsibility and authority for executing the ESP application support studies should be defined; these authorities should include all of the activities and interfaces addressed in the ESP Program Plan (WBS Element 2.4). **2.3 Establish plant design(s) to be considered; obtain Plant Parameter Envelope (PPE) from vendors** (AG Section 3.2.1.1) **-** In order to complete the ESP application, applicants must identify the candidate plant design(s) they wish to eventually deploy at the site. The plant PPEs establish the plant/site interface design requirements that the site must be able to satisfy for each

WBS Element No. 2. - Management And Communications

design; the ESP application provides data and analyses demonstrating that the site meets these design requirements. Thus, prior to initiating the ESP program, applicants must identify the designs they wish to consider and obtain plant parameter envelope (PPE) values for each of these designs from the reactor vendors. Additional discussion on the relationship between PPEs and the ESP application is provided in AG Section 3.2.1.1.

Applicants should also define other elements of their ESP strategy that affect application content as part of this WBS element. For example, a decision should be made as to whether site preparation activities will be undertaken under the ESP, and the basic strategy for providing emergency planning information (AG Section 3.4) should be determined.

2.4 Develop overall ESP Program Plan - The overall objective of this WBS element is to prepare a program management plan that provides:

- An integrated functional plan for developing the ESP application,
- A baseline against which actual progress can be measured, and
- An organized framework that the applicant can use to manage the technical studies and application preparation processes.

Recommended Program Plan components are discussed in the following WBS sub-elements.

2.4.1 Organization and responsibilities - This section of the Plan should track the overall roles, responsibilities, and authorities established in WBS Element 2.2 down to the functional level, where individual authorities and responsibilities are identified. Members of the program management team should be identified, along with their functional role and organizational interfaces. Although each applicant will have a unique organization, functional roles and authorities that should be addressed in this section of the Plan include:

Functional Roles:

Overall Program Manager	Data Management Supervisor
Quality Assurance Manager	Field Program Manager
Report Coordinator	

Authorities for:

Subcontracting (e.g., scope and budget changes)	Data acquisition contacts
Making contacts with regulators (NRC, others)	Contacts with the public
Contacts with elected officials	Contacts with the press

2.4.2 Subcontracting plan - Components of the application preparation effort that will be subcontracted should be identified, including scope (e.g., technical role, delivered product(s)), relationship with other organizations in the ESP program, data interfaces, and reporting relationships to persons in the applicant organization. Examples of issues to be considered include whether subcontracting will be done on a "turn-key" basis (i.e., one contractor completes all studies and prepares the application) and whether specialty subcontractors (e.g., drillers) will

WBS Element No. 2. - Management And Communications

be subcontracted by the applicant or by another subcontractor (e.g., foundation engineer). Where applicable, a plan to identify potential sources and to procure services should also be prepared; evaluation criteria for each subcontracted role should be developed and documented. As contractors are hired, their roles and responsibilities should be explicitly entered into the Plan.

2.4.3 Public and institutional relations plans - This section of the Plan should describe the relationship between the ESP application program and the applicant's overall public and institutional relations program and policy. In particular, the Plan should describe responsibilities for interfacing with the public and public officials and should provide guidance for both applicant and subcontractor personnel on how they should handle public or press inquiries (e.g., landowner requests, requests for interviews).

2.4.4 Regulator relations plan - A set of individual plans must be designed for each agency with regulatory authority over the site or the plant; this section of the Plan should address how the applicant (and, as appropriate, its subcontractors) will interface with the regulators. These plans should cover the applicant's policy on regulator communications and should identify overall timing, content, and documentation requirements for regulator contacts. They should address a hierarchy of contact types, ranging from policy discussions on permit strategies and requirements to technical discussions for clarification or concurrence. Agencies that should be considered in preparing the regulator relations plan are identified in the following sub-elements; examples of potentially important issues are identified for each.

2.4.4.1 Nuclear Regulatory Commission (NRC) – Since NRC is the lead agency for approval of the ESP application and the eventual Construction/ Operating License (COL), it should be the focus for the most detailed regulator interface planning. A high level of interaction should be considered by applicants at both the strategic level and with the staff for individual technical specialties. These discussions should serve to ensure that the technical studies and the application will conform to NRC expectations, resulting in no "surprises" following submittal and an expedited review and approval process.

2.4.4.2 Environmental Protection Agency (EPA) – Primary focus for EPA discussions are comments the agency may submit to NRC on the ESP application (in particular NRC's Environmental Impact Statement (EIS)). Additional interfaces to identify (and mitigate, if possible) relate to eventual issuance of a National Pollutant Discharge Elimination System (NPDES) Permit. (Note: NPDES permitting authority has been delegated to several states; in such cases, these discussions would be undertaken with the appropriate state agency.)

2.4.4.3 Army Corps of Engineers (COE) – Permits for construction in navigable waterways (Section 401) and in wetlands (Section 404) would be the focus of this portion of the Plan. Discussions should address requirements for site characterization activities undertaken as part of the ESP Program, as well as permits that would eventually be required for construction and operation of the plant. Interfaces to discuss site preparation activities to be undertaken under the ESP (once issued) should also be addressed in the Plan.

WBS Element No. 2. - Management And Communications

2.4.4.4 Other Federal agencies – Depending on the site location and land ownership, other Federal agencies may have jurisdiction over the proposed site or nearby land that must be characterized (e.g., borehole installation). Alternatively, they may have provided formal comments on the NRC EIS, and/or they may be sources of data necessary to complete the ESP. Plans for contacting these agencies should be included in the Program Plan to a level commensurate with their role in ESP and COL licensing process.

2.4.4.5 State and local agencies – Each applicant must assess state and local regulatory requirements and identify the appropriate agencies for the ESP Program, construction, and operations phases of the site and plant. In addition to Federal authority delegated to states (e.g., NPDES permit, Prevention of Significant Deterioration (PSD) air quality permit), applicants should also consider the following permit types in preparing this section of the regulatory relations plan.

Drilling/well installation permit	Permit for construction in waterways
Soil disturbance permit	Biological specimen collection license
Building permit	Explosives license

2.4.5 Agency contact plan and protocols for data collection contacts - Once the overall suite of agencies and their relationship to the project have been identified as described in WBS Element 2.4.4, the policies and protocols for the ESP Program data collection program can be defined. This WBS element should provide guidance for project staff involved in contacting agencies to collect information and data necessary to complete the ESP application. Examples of the kinds of guidance that should be addressed in this component of the Plan are:

- How to describe the applicant's ESP project.
- How to describe the need for and uses of data being sought.
- How to deal with questions on future project phases (e.g., COL, design selection).
- How to address agency staff questions on permits or licenses (vs. data collection).
- Who to refer questions on applicant policies, plans, or business information.

2.4.6 Program schedule and budget - This section of the Plan consists of a cost and schedule baseline, against which the applicant's project management staff can measure progress. This information will also be useful in assessing the impact of unforeseen changes on the overall project and in taking measures to minimize deleterious impacts. Because this information is proprietary to the applicant, it may be useful to publish this information separate from the balance of the Plan and to restrict distribution within the project team appropriately.

2.5 Procure subcontracted services – As applicable to the applicant's plans (see WBS Element 2.4.2) this activity involves those actions necessary to bring the contractor support services members of the project team under contract. Scope items that should be considered in planning for each item of subcontracted scope are:

WBS Element No. 2. - Management And Communications

- Identifying the suite of qualified bidders.
- Determining whether awards will be sole source or competitive bid.
- Preparing Requests for Proposal (e.g., statements of work, terms and conditions).
- Establishing criteria for bid evaluation.
- Establishing contract negotiation boundaries and guidelines.
- Evaluating proposals and selecting winning contractor(s).

2.6 Prepare overall project quality assurance plan (QAP) - As part of the ESP planning process, applicants should develop a quality assurance plan that ensures data and analyses developed for the ESP application meet the required quality objectives as well as applicable NRC regulations.

2.7.1 Obtain site access - The process for obtaining site access is driven by two overarching considerations: (1) technical requirements for data collection (see Section 3) and (2) protocols for interacting with stakeholders/agencies as defined in Section 2.4.5 of the Program Plan.

The applicant should be prepared to develop a formal agreement with each property owner (and/or other stakeholders with legal authority over real property) that addresses all data collection activities. The agreement would outline the overall data collection program (e.g., data collection activities, location of test equipment, disturbance of land, entry/ egress requirements, and drilling of bore holes), the expected frequency and duration of activities, and the protocols to be followed by applicant personnel (including subcontractors) when on property not controlled by the applicant. These elements are specified in detail in the discipline-specific technical studies (see Section 3.0) and are formalized in the Data Management Plan and in supporting documentation (see Section 3.1.2). The agreement should refer to or contain copies of all permits required for onsite data collection activities (see Section 2.4.4.5). Applicant property management or real estate personnel should be involved in agreement development, if available.

If site access requires traversing properties owned by other entities, a separate formal agreement will be required. The formal agreement would serve as the basis for the applicant proceeding with data collection activities on and in the vicinity of the site.

Some components of the data collection program (e.g., drilling pads, roads) may involve significant disturbance of areas being accessed. In such cases, the access agreement must deal with redress of disturbed areas and must clearly establish a common expectation of the post-activity condition. Components of redress include site remediation (e.g., re-grading, re-vegetation) as well as specific conditions of any applicant-installed amenities that would remain (e.g., condition of roads, use of wells).

A key element of the site access strategy is to determine if an onsite office (e.g., trailer) can be located to serve as a hub for all data collection activities (see WBS Element 2.7.3, below). This

WBS Element No. 2. - Management And Communications

provision would also be documented as part of the formal agreement.

2.7.2 Establish local support infrastructure - The local support infrastructure represents facilities and services necessary to support field activities, i.e., establishment of a functional site office. For purposes of this discussion, it is assumed that the office is a dedicated, new facility (i.e., not in an existing building), located on or adjacent to the site premises. The required infrastructure includes:

- Physical structure – office or trailer for project management, equipment storage, and sample storage.
- Communications – phone, fax, data lines, computer equipment, pagers, cellular phones.
- Utilities – electrical, heat, air conditioning, water, sanitary service.
- Office equipment – furniture, supplies, computer equipment.
- Safety equipment – fire extinguishers, goggles, boots, hard hats, eyewash.
- Security provisions – keys, alarms, safe.
- Administrative – manuals, procedures, access agreements and protocols.
- Other – parking and provisions for equipment storage.

If there is an expectation that personnel will be interacting periodically with local stakeholders at the site office (in addition to its primary mission of supporting data collection and analysis), then provisions should to be made in terms of the office configuration (and public information materials) to accommodate this aspect of public communication.

2.7.3 Negotiate access to offsite data collection areas - Similar to Section 2.7.1, the strategy for obtaining access to offsite data collection areas should be driven by (1) the technical requirements as outlined in Section 3 of this program plan and (2) protocols for interacting with stakeholders/agencies as indicated in WBS Element 2.4.5.

Similar to Section 2.7.1, the applicant should be prepared to develop a formal agreement with offsite property owners (and any other stakeholders having demonstrated legal authority) that would address offsite data collection activities. In contrast to Section 2.7.1, it is envisioned that this document would be more narrowly focused, as the nature of offsite data collection is likely to be more limited in scope.

While a single (model) offsite access agreement would be most desirable, the applicant should be prepared to develop individual agreements for individual offsite property owners.

Scope and content of data collection access agreements with off-site landowners would be similar to that discussed in conjunction with WBS Element 2.7.1.

3
TECHNICAL STUDIES

The subsections that follow provide descriptions of functional work items that will be required in each technical discipline to complete an ESP application. Because the Application Guide and additional regulatory guidance identified therein (e.g., Regulatory Guides 1.165 and 4.2) specify application contents in detail, these discussions focus on the functional tasks for data collection and analysis that are necessary to develop these contents. As applicable, each section addresses field and literature data collection activities, laboratory analyses, data reduction and/or processing, and data analysis for each subject discipline.

These discussions focus on the practical/functional components of each investigation, for example:

- Preparation of discipline-specific technical project plans.
- Agency contacts required to obtain information.
- Typical equipment procurement and mobilization requirements.
- Discipline-specific site and near-site access requirements.
- Data acquisition plan/approach.
- Data period-of-record requirements.
- Typical field sampling program summaries.
- Typical laboratory analysis and sample handling/logistics issues (e.g., sample preservation).
- Discipline-specific scheduling issues.

Applicants can use WBS elements identified in this section to plan the ESP effort. Also, the WBS descriptions can be used as a template to evaluate subcontractor proposals and plans and/or to manage subcontractor activities. Additional considerations for use of the work element descriptions are provided in Section 6.

3.1 General

WBS Element 3.1 - General

3.1.1 Identify base map scales and develop standard base maps - Base maps scales should be selected and standardized base maps should be developed according to data presentation requirements of Regulatory Guides 4.2 and 1.70, as well as other application contents (see the Application Guide). Automated geographic information systems (GIS) should be strongly considered, especially if data from the site selection process were mapped on a GIS.

Several map scales will prove useful. For example, 1:24,000 – map scale would be appropriate for reporting technical data within and near the perimeter of the site (e.g., topography, hydrology, habitat, archeological and historic resources, and land use). A 1:62,500 to 1:500,000 – map scale could be appropriate for a working level display of technical data that has a larger areal extent of influence (e.g., population density, transportation systems, regional geologic conditions, and location of hazardous facilities). It is also possible that other display map scale would be required for other data displays and could be used in presenting site characteristic information to stakeholder groups.

The identity of base map features will depend on map scale and data presentation requirements; among these are the following:

- A site and near perimeter map displaying major geographic (site boundaries, bodies of water, roads) and political features (town, city, and county designations).
- A regional map displaying major geographic (site boundaries, transportation systems) and political features (town, city, county, and state designations).
- A host of separate discipline-specific maps that contain explicit technical data (e.g., land use patterns, habitat distribution, geologic features, and hydrologic features) overlain on essential geographic information (site boundaries, town, city, and county designations).

3.1.2 Develop data management plan -The Data Management Plan (DMP) should describe the principles, procedures, and specific protocols to be applied in acquisition, management, reduction, cataloging and storage of data (i.e., information obtained from literature reviews and field data collection activities). Effective management of ESP data is the critical objective of this WBS element; the DMP is an element of an overarching ESP Quality Assurance Program (see WBS Element 3.1.3). The DMP is, in turn, supported by a series of discipline-specific data collection and testing plans. These discipline-specific plans should be referenced in – and possibly appended to – the DMP.

Data Management Plan elements should include:

- Scope of the plan – what activities it addresses,
- Roles and responsibilities of key personnel – Data Management Supervisor, Field Program, Manager, Quality Assurance Program Manager,
- Overarching principles and processes of the data management program (e.g., peer review, data confirmation, chain of custody),

WBS Element 3.1 - General

- Management of subcontractor personnel and testing laboratories,
- Management of data obtained from third parties – e.g., air quality data obtained from state and local ambient air monitoring stations,
- Data storage requirements and methods (e.g., physical locations, environmental requirements for archived samples, number of copies), and
- Identification of the discipline-specific data collection and testing plans to which the DMP applies –included by reference or as a series of appended documents.

3.1.3 Establish quality assurance/quality control program - It is essential that the site information collected is accurate, representative, and reproducible and that data quality is commensurate with NRC requirements for nuclear power plant administrative records. The quality of the information will be crucial to developing comprehensive and defensible application documents. 10 CFR 50, Appendix B establishes quality assurance requirements for the systems, structures, and components and the managerial and administrative controls used to assure safe operation of a nuclear power plant. ESP development activities must be governed by a Quality Assurance Program and implementing quality control procedures and meet applicable NRC regulations. Applicants should note that data collection is but one – albeit crucially important – element of the ESP process to which this requirement applies.

There are 18 provisions in 10 CFR 50, Appendix B. Some of these provisions clearly apply to data collection and analysis processes; others clearly do not. In the broadest sense, data collection and analysis involves development of plans, procurement and erection/location of equipment, procurement of subcontracted services, testing and calibration of equipment, collection/acquisition of data, performance of analysis, and documentation of results. Those provisions of 10 CFR 50, Appendix B that would apply to these activities (and, would serve as a source for developing quality assurance/quality control procedures) include the following:

- Section I – Organization
- Section II – Quality Assurance Program
- Section IV – Procurement Document Control
- Section V – Instructions, Procedures, and Drawings
- Section VI – Document Control
- Section VII – Control of Purchased Material, Equipment, and Services
- Section X – Inspection
- Section XII – Control of Measuring and Test Equipment
- Section XVI – Corrective Action
- Section XVII – Quality Assurance Records
- Section XVIII – Audits

WBS Element 3.1 - General
3.1.4 Review site development plan - Identify construction locations, proposed plant layout (including final grade elevations), and proposed locations for power block, balance-of-plant, support facilities and infrastructure. This review will be necessary for planners in each of the technical disciplines listed in Sections 3.2 through 3.14 to identify locations for field data collection programs (e.g., measurement equipment, boreholes, sampling transects).

3.2 Meteorology

WBS Element No. 3.2 - Meteorology
3.2.1 Perform site survey - Review potential locations for the meteorological monitoring system. Evaluate exposure of the monitors during site preparation and construction activities (e.g., proximity to vegetation obstructions, topographic features, construction equipment, lay down area) and proper exposure during plant operation (i.e., location relative to major plant features). Schedule Note: Because a year of meteorological data are needed for the SSAR and ER, the location of the monitoring system must be identified and the system installed prior to initiating site preparation or construction activities. Potential locations for a meteorological data acquisition system; avoid locations that could unduly impede construction activities. **3.2.2 Select meteorological tower site** - Consider site development plan and site survey as well as logistics of providing electricity and telephone utilities, avoiding sensitive ecological areas, and tower/support building installation logistics (e.g., foundation conditions, guy anchor locations). **3.2.3 Collect climatic and meteorological data** - Obtain data from relevant NOAA weather stations and existing nearby meteorological monitoring stations. Catalog data relevant to the site. Schedule Note - Because acquisition of a complete record of site-specific meteorological data will take more than 18 months, initial estimates of transport and dispersion conditions and meteorological measurements for use in plant engineering design are obtained from available, representative meteorological monitoring stations in proximity to the plant site. **3.2.4 Obtain existing air quality data** - Obtain data from state and local ambient air quality monitoring programs and from those operated by private entities under permit requirements; catalog data relevant to the site. **3.2.5 Develop meteorological data acquisition plan** - Design meteorological acquisition system, calibration technique and schedule, data reduction procedures. Document basis for tower location, meteorological parameters to be measured, level on the tower of each measurement, specific meteorological equipment and sensors, routine data acquisition procedures, data processing procedures, calibration procedures, quality assurance procedures. **3.2.6 Procure meteorological instrumentation and shelter** - Identify sources, define specifications, obtain bids, and select suppliers. Schedule Note: Applicants should consider manufacturing time, calibration and checkout requirements, and shelter design requirements in scheduling this task.

WBS Element No. 3.2 - Meteorology
3.2.7 Procure meteorological tower - Identify sources, define specifications, obtain bids, and select suppliers. See Schedule Note in WBS Element 3.2.7.
3.2.8 Procure tower erection services - Identify sources, define specifications, obtain bids, and select suppliers. Schedule Note: Personnel needed to properly erect the tower are highly specialized and are typically in great demand; commitment of the tower erection services contractor to the installation schedule is a critical component of contractor evaluation.
3.2.9 Erect tower and install instruments.
3.2.10 Perform initial instrument calibration.
3.2.11 Perform meteorological data collection activities - Perform routine maintenance and calibration (WBS Element 3.2.13), conduct periodic data downloads, perform interim data reduction/analysis, ensure data quality. Schedule Note: This activity will span the period between initial calibration and the end of the required 1-year period of record.
3.2.12 Perform routine instrument calibration activities - Calibrate instruments; adjust and/or invalidate data when equipment is found to be operating outside acceptable limits; identify maintenance activity or replacement requirements.
3.2.13 Perform data reduction and review - Review data for reasonableness (i.e., within physically reasonable values), reject data based on this review or known calibration problems, make adjustments when possible based on calibration results. Follow NRC regulatory guidance concerning threshold values, replacement data, data recovery, etc.
3.2.14 Perform meteorological and atmospheric dispersion analyses - Prepare meteorological data summaries and routine and accidental atmospheric dispersion assessments that are required for the Site SAR and the ER.
3.2.15 Prepare report - Document results; format to provide and support applicable portions of Section 2.3 of the Site SAR and Section 2.3 and related impact analysis sections of the ER.

3.3 Geology/Seismology

WBS Element 3.3 - Geology/Seismology
3.3.1 Regional geologic and seismologic setting
3.3.1.1 Collect and analyze literature data - Obtain literature data from USGS, state geologic surveys, university geology/geophysics departments and libraries, and private (i.e. oil gas, mining, and waterwell companies) sources. Catalog data relevant to the site and surrounding region (320 km).
3.3.1.2 Develop field data collection plan – Identify scope, location and schedule for field data collection, including important regional geologic structures based on recent seismic hazard analyses. Conduct reconnaissance level analysis if necessary.
3.3.1.3 Prepare regional geologic maps – Plot regional geologic information on suitable scale maps. Prepare suitable regional cross sections. Establish Capable Faults and their characteristics

WBS Element 3.3 - Geology/Seismology

and associated seismic activity/ground deformation.

3.3.1.4 Prepare seismic source maps – Plot Regional seismicity from earthquake catalog. Correlate with Seismic Source Maps and/or regional geologic structure.

3.3.2 Sub-regional and site geologic and seismologic investigations

3.3.2.1 Collect and analyze literature data – See WBS Element 3.3.1.1, above.

3.3.2.2 Develop field data collection plan – Identify scope, schedule and location for sub-regional and site related field data collection. Establish whether existing database is current. Conduct reconnaissance-level studies if necessary to update existing geologic and geophysical databases. Review relevant seismicity catalogs and update where appropriate. Include, as applicable, surface survey locations, mapping schedule, cross section alignments, engineering and geologic borehole locations, core and soil sampling plan (e.g., number and type of samples, depth), surface survey transects, geophysical transects, and trenching alignments. Coordinate with ground water hydrology drilling activities (WBS Element 3.4) (e.g., use boreholes for both geotechnical sample collection and pumping/monitoring wells.

3.3.2.3 Identify sub-regional/local geologic structures of importance – Based on reconnaissance-level studies above, establish list of structures requiring detailed examination up to 40 km from site. Examine relevant structures in field and establish from studies whether they are "Capable" faults. Establish Capable Fault characteristics and associated seismicity/ground deformation. Establish known geologic hazards to site.

3.3.2.4 Develop geologic and geophysical mapping program – Define features to be mapped and at what scale; develop base maps and identify observation locations and access requirements.

3.3.2.5 Evaluate, select and procure subcontracted services – Conduct procurement (i.e., select qualified bidders, prepare RFP, evaluate bids, award contracts for support services (e.g., drilling services, geotechnical laboratory)).

3.3.2.6 Procure geophysical (seismic) testing equipment – Identify and purchase/rent equipment required to perform geophysical testing (e.g. monitoring instrumentation).

3.3.2.7 Conduct geophysical field testing – Perform field seismic, resistivity, and electro-magnetic investigations to identify deep and shallow geologic structures (e.g., faults, formation interfaces)

3.3.2.8 Develop geotechnical laboratory testing program – Define testing programs for samples by borehole location, depth, and material type (soil vs. rock); identify test methods, i.e. ASTM Standards, AASHTO, etc.

3.3.2.9 Perform drilling program (See also WBS Element 3.4) – Obtain necessary permits. Mobilize drilling rigs, obtain rock core and soil samples as required, observe and log drilling and sampling activity (e.g. cuttings analysis, depth to geologic formation horizons, blow counts, sample points), perform down-hole geophysical logging. Dispose derived water, cuttings, drilling mud and other derived materials in accordance with regulations and permit requirements.

3.3.2.10 Prepare geologic maps – Plot surface and subsurface features on maps.

3.3.2.11 Collect and deliver samples to laboratory – Label and index samples, package for

WBS Element 3.3 - Geology/Seismology
shipping, ship samples, document receipt and test program by sample. **3.3.2.12 Perform laboratory testing** – Prepare samples, perform testing, collect data, analyze data, and prepare report. Schedule Note: Depending on sample properties and test parameters, some tests can require weeks or months. **3.3.2.13 Perform geotechnical analysis –** Establish foundation load requirements and capacities of subsurface soils at site; define pad preparation requirements (e.g. fill, compaction), verify site properties fall within PPEs for plant loads. **3.3.2.14 Perform seismic analysis –** Identify Capable Faults from WBS Element 3.3.2.3, establish characteristic seismic events, analyze propagation, and model site response. **3.3.2.15 Perform probabilistic seismic hazard analysis –** Establish uncertainties in components of the seismic analysis; review other seismic hazard analyses performed in region; evaluate resulting uncertainties in site seismic hazard; as necessary, identify additional data and/or analyses necessary to reduce uncertainty to an acceptable level. **3.3.2.16 Evaluate site seismic response –** Characterize response of site to earthquake motions; establish site/structure interface; model propagation characteristics into structure. **3.3.2.17 Establish site-specific seismic design parameters –** Establish peak ground acceleration and characteristic frequency for SSE; verify that seismic conditions fall within the plant PPE. **3.3.3 Prepare report-** Document results; format to provide and support applicable portions of Regulatory Guide 1.70, Section 2.5, and Regulatory Guide 4.2, Section 2.5.

3.4 Hydrology (Ground Water)

WBS Element 3.4 - Hydrology (Ground Water)
3.4.1 Collect and analyze literature data - Obtain literature data from USGS, state geologic surveys, university libraries, local and regional water resources agencies, and private (e.g., water well drillers) sources. Catalog data relevant to the site and surrounding region. **3.4.2 Identify regional groundwater characteristics** - Identify and locate aquifers, including depth, flow directions and rates, recharge and discharge zones, water quality, water supply status and use (e.g., municipal, agricultural). Identify water table conditions and in-flow/out-flow conditions and interactions with surface water. Plot locations of public and private water wells on suitable scale map. **3.4.3 Prepare field testing/sampling plan** - Identify pumping and monitoring well locations and depths, well diameters, casing requirements, pumping rates, water quality sampling and testing locations, frequencies and depths; define ambient (in situ) water quality tests; correlate with drilling requirements for other investigations, engineering and geologic borehole locations (WBS Element 3.3). Coordinate with data requirements for computerized ground water models. Note: Pumping wells may require larger diameters than the boreholes installed during geotechnical investigation.

3.4.4 Prepare laboratory testing plan - Establish list of water quality parameters, identify tests and protocols (e.g., standard methods, ASTM), identify field preservation requirements, establish collection-to-analysis time limits, identify shipping requirements.

3.4.5 Evaluate, select, and procure subcontracted services - Based on field testing plan WBS Element 3.4.3 and laboratory testing plan WSB Element 3.4.4, conduct procurement (e.g., select bidders, prepare RFP, evaluate bids, award contracts for support services).

3.4.6 Procure pumping equipment and measurement instrumentation - Identify manufacturers and sources, determine availability and delivery times, place orders, perform receipt verification (e.g., specification compliance, verify calibrations and documentation).

3.4.7 Install pumping equipment and instruments - Obtain applicable permits. Following installation, verify installation to manufacturer's specifications, perform and verify instrument calibration.

3.4.8 Conduct aquifer pumping tests - Specify testing flow rates and duration, pumping and monitoring well locations, collect pretest water level and precipitation data, drawdown and recovery data, collect and reduce data. Ensure that discharge from tests is directed far enough away from pumping wells as to not influence results.

3.4.9 Perform data analysis and modeling - Perform QA program verification for computerized models. Format field data as required for input to computer models, specify analyses, perform modeling, and interpret results.

3.4.10 Identify ground water effects on plant - Define water table depths and ranges in respect to plant grade, sub-grade, and foundation requirements; determine de-watering requirements.

3.4.11 Conduct in situ water quality testing and collect water quality samples - Conduct in situ tests (e.g., pH, dissolved oxygen, temperature) in accordance with standard protocols and/or equipment manufacturer specifications. Collect samples at specified locations, using specified protocols; label and package samples for shipment; complete chain-of-custody forms; ship samples to analytical laboratory (ies). Schedule Notes: 1) Testing/sampling will be conducted periodically (weekly, monthly, and/or quarterly as specified in the field testing plan (WBS Element 3.4.3); 2) Water quality testing period of record requirements for the ESP will normally mandate at least one full year of record to obtain data for all phases of the annual hydrologic cycle.

3.4.12 Conduct laboratory testing; - Receive samples and complete chain-of-custody forms; conduct tests in accordance with specified protocols and methods; prepare report; disposition samples and derived wastes in accordance with permit/license requirements.

3.4.13 Prepare report - Document results; format to provide and support applicable portions of Regulatory Guide 1.70, Section 2.4, and RG 4.2, Section 2.4.

3.5 Hydrology (Surface Water)

WBS Element 3.5 - Hydrology (Surface Water)
3.5.1 Collect and analyze literature data - Obtain literature data from USGS gaging stations, flood data, and flood analyses, obtain flood data from FEMA, university libraries, and local and

WBS Element 3.5 - Hydrology (Surface Water)

regional water resources agencies. Catalog data relevant to the site.

3.5.2 Establish flood levels - Analyze literature data; establish probable maximum precipitation event(s); conduct flood modeling; establish design basis and probable maximum floods at plant site. Identify floodplains and wetlands.

3.5.3 Prepare field measurement program plan - Identify gaging station locations, water quality sampling and testing locations and frequencies; define ambient (in situ) water quality tests.

3.5.4 Prepare laboratory testing plan - Establish list of water quality parameters, identify tests and protocols (e.g., standard methods, ASTM), identify field preservation additives, establish collection-to-analysis time limits, identify shipping requirements.

3.5.5 Procure measurement instrumentation - Identify manufacturers and sources, determine availability and delivery times, place orders, perform receipt verification (e.g., specification compliance, verify calibrations and documentation).

3.5.6 Install gaging stations and instruments - Obtain applicable (e.g., Corps of Engineers) construction permits; install stations and instruments; verify installation to manufacturer's specifications, perform and verify instrument calibration.

3.5.7 Evaluate, select, and procure analytical laboratory services - Prepare Request for Quotation (based on field testing plan WBS Element 3.5.3 laboratory testing plan WBS Element 3.5.4), obtain and evaluate bides, negotiate and award contract(s). Note: This activity should be coordinated with acquisition of laboratory services for the ground water program (WBS Element 3.4.5).

3.5.8 Conduct water quality testing and collect water quality samples - Conduct in situ tests (e.g., pH, dissolved oxygen) in accordance with standard protocols and/or equipment manufacturer specifications. Collect samples at specified locations, using specified protocols; label and package samples for shipment; complete chain-of-custody forms; ship samples to analytical laboratory(ies). Schedule Notes: (1) Testing/sampling will be conducted periodically (weekly, monthly, and/or quarterly as specified in the field-testing plan (WBS Element 3.5.3). (2) Water quality testing period of record requirements for the ESP will normally mandate at least one full year of record to obtain data for all phases of the annual hydrologic cycle.

3.5.9 Conduct laboratory testing - Receive samples, complete chain-of-custody forms; conduct tests in accordance with specified protocols and methods; prepare report; disposition samples and derived wastes in accordance with permit/license requirements.

3.5.10 Perform data analysis and modeling - Compile and analyze water quality test results; determine impact on cooling water makeup chemistry requirements; conduct water quality modeling of impacts of plant discharges.

WBS Element 3.5 - Hydrology (Surface Water)
3.5.11 Prepare report - Document results; format to provide and support applicable portions of Regulatory Guide 1.70, Section 2.4, and Regulatory Guide 4.2, Section 2.4.

3.6 Terrestrial Ecology

WBS Element 3.6 - Terrestrial Ecology
3.6.1 Collect and analyze literature data - Obtain existing ecological data from federal and state agencies, local universities, and private (e.g., conservation) foundations. Map major terrestrial features (e.g., vegetative cover, land forms, threatened or endangered species locations and habitat, ranges of important species). Note: This activity may be coordinated with acquisition and analysis of aerial photographs, see WBS Element 3.9.1. **3.6.2 Initial identification of local species, abundancy, and habitat** - Identify successional states, ecological value of land forms and cover; establish species range and habitat, identify sensitive and important ecological resources (e.g., wetlands, migratory fowl corridors); identify general areas for field data collection. **3.6.3 Prepare field data collection program** - Establish field program schedule (e.g., periodic, seasonal based on migration and reproductive cycles); identify target species, transect locations, sampling frequencies, sampling techniques (e.g., specimen collection [e.g., trapping, road kill, hunter surveys, clippings], specimen preservation methods, survey methods [e.g., bird surveys)]). **3.6.4 Procure field sampling equipment and supplies** - Identify manufacturers and sources, establish functional requirements, determine availability and delivery times, place orders, and perform receipt verification. **3.6.5 Conduct field data acquisition and sampling program** - Obtain required wildlife disturbance and collection permits; execute program as described in WBS Element 3.6.3; modify scope and approach as required to address interim findings. **3.6.6 Collect and deliver samples to laboratory** - Collect samples at specified locations, using specified protocols; label and package samples for shipment; complete chain-of-custody forms; ship samples to taxonomic laboratory(ies). **3.6.7 Conduct laboratory testing** - Conduct species identification and abundancy analyses; preserve and archive verification specimens as required. Note: It is assumed that the organization conducting sample collection will have an internal analysis laboratory for sample identification and enumeration. If not, a separate laboratory will have to be identified and brought under contract, see, e.g., WGS Element 3.5.6. **3.6.8 Perform data analysis and modeling** - Conduct impact studies (e.g., habitat disruption, bird impingement, salt deposition) to characterize impacts of the nuclear power plant on

WBS Element 3.6 - Terrestrial Ecology
terrestrial ecology. **3.6.9 Final identification of local species, abundancy, and habitat** - Modify findings of WBS Element 3.6.2, as required, in light of field data, and laboratory and impact analyses (WBS Elements 3.6.5 through 3.6.8). **3.6.10 Prepare report** - Document results; format to provide and support applicable portions of Regulatory Guide 4.2, Sections 2.2, 4.1, 5.1.3, 5.2.3, and 5.5.

3.7 Aquatic Ecology

WBS Element 3.7 - Aquatic Ecology
3.7.1 Collect and analyze literature data - Obtain existing ecological data from federal and state agencies, local universities, and private (e.g., conservation) foundations. Map major terrestrial features (e.g., water bodies, important fisheries, stream bottom and benthic conditions, esturarine and wetlands areas, threatened and endangered species habitat, important species range & habitat). Note: This activity may be coordinated with acquisition of terrestrial ecology literature data (WBS Element 2.6). **3.7.2 Initial identification of local species, abundancy, and habitat** - Identify successional states, ecological value of water bodies and substrate; establish species range and habitat, identify sensitive and important ecological resources (e.g., wetlands, spawning areas); identify general areas for field data collection. **3.7.3 Prepare field data collection program** - Establish field program schedule (e.g., periodic, seasonal based on spawning and reproductive cycles); identify target species, transect and sampling locations, sampling frequencies, and sampling techniques (e.g., rotenone, electro-shocking, seines, benthic dredge, creel surveys). **3.7.4 Procure field sampling equipment and supplies** - Identify manufacturers and sources, establish functional requirements, determine availability and delivery times, place orders, and perform receipt verification. **3.7.5 Conduct field data acquisition and sampling program** - Obtain required Corps of Engineers, wildlife disturbance and collection permits, as required; execute program as described in WBS Element 3.7.3; modify scope and approach as required to address interim findings. **3.7.6 Collect and deliver samples to laboratory** - Collect samples at specified locations, using specified protocols; label and package samples for shipment; complete chain-of-custody forms; ship samples to taxonomic laboratory(ies). **3.7.7 Conduct laboratory testing** - Conduct species identification and abundancy analyses; preserve and archive verification specimens as required. Note: It is assumed that the organization conducting sample collection will have an internal analysis laboratory for sample identification and enumeration. If not, a separate laboratory will have to be identified and brought under contract, see, e.g., WGS Element 3.5.6.

WBS Element 3.7 - Aquatic Ecology
3.7.8 Perform data analysis and modeling - Conduct impact studies (e.g., habitat disruption, impingement and entrainment effects, thermal impacts) to characterize impacts of the nuclear power plant on aquatic ecology. **3.7.9 Final identification of local species, abundancy, and habitat** - Modify findings of WBS Element 3.7.2, as required, in light of field data, and laboratory and impact analyses (WBS Elements 3.7.5 through 3.7.8). **3.7.10 Prepare report** - Document results; format to provide and support applicable portions of Regulatory Guide 4.2, Sections 2.2, 4.1, 5.1.3, 5.2.3, 5.3, and 5.4.

3.8 Socioeconomics

WBS Element 3.8 - Socioeconomics
3.8.1 Collect economic data - Collect the following data on the area/region of interest: • The area's economic base, including important regional industries by category; employment such as from Department of Labor, U.S. Bureau of Economic Analysis, and state and local officials); size/nature of the regional heavy construction industry and construction labor force; total regional labor force; regional unemployment levels and future economic outlook; and inventory of rental and permanent housing within the area. • The area's political structure including regional political jurisdictions and tax districts (those directly affected by plant construction and operation); local and regional planning and administrative organizations. • Social services and public facilities (present capacity and projected percentage of utilization) including water and sewer/sewage disposal, police/fire, hospitals/doctors. • Housing information including sales and rental, number and types of units, turnover and vacancy rates, trends in addition to housing stock, adequacy of structures, location of existing and projected housing. • Local educational system (regional primary and secondary schools and higher education institutions), including capacity and present percentage of utilization). • Public and private recreational facilities and opportunities. • Regional tax structure and distribution of revenues to each jurisdiction and district. • Local plans concerning land use and zoning relevant to population growth, housing, and changes in land use patterns. • Highways and transportation systems (carrying capacity, road conditions, public transportation, proposed modifications). • Distinctive communities (historic districts, tourist attractions, cultural resources, visual resources).

WBS Element 3.8 - Socioeconomics
3.8.2 Data reduction and analysis - Group county- or community-specific data, as appropriate, to enable data to be summarized for the area. Determine population increases for the area resulting from construction- and operation-related in-migration and compare against local housing availability and potential disruption to public services (e.g., education, transportation, public safety, social services, public utilities, fire/police/medical) to determine impacts. **3.8.3 Perform economic modeling** - Use projections of direct and indirect employment associated with construction and operation to assess the economic impacts of construction and operation. Focus the evaluation on the totals of direct employment and payroll generated by the nuclear power plant, indirect jobs in the local economy, amounts of money contributed to the regional economy, and tax contributions to the local tax base. **3.8.4 Prepare report** - Document results; format to provide and support applicable portions of Regulatory Guide 4.2, Chapter 8.

3.9 Land Use

WBS Element 3.9 - Land Use
3.9.1 Obtain aerial photographs - Obtain aerial photographs of land use and zoning maps within the site boundary, adjacent to site, and offsite (within 5-10 miles and along proposed transmission corridors). Schedule Note: High-altitude and satellite photos are available commercially from existing photography. Applicants may require higher-resolution and/or more current photographs; typically these are obtained via specialty air photo firms that will "fly" the site area. Additional schedule time (possibly several months or more) must be provided for procurement and scheduling issues (e.g., cloud cover, leafing of deciduous trees). Stereoscopic photos should be considered for better identification of vegetation and use in site grading plans. **3.9.2 Collect and analyze literature data** – Obtain existing land use data to identify current and projected land uses in the area (site and vicinity) from USGS and SCS maps; aerial photographs, state agencies, zoning commissions, regional and local development authorities and real estate information. Review appropriate federal, state and local (county/municipality) and affected Native American tribal planning agencies' land use plans. Map land use data to show highways, railroad lines, utility rights-of-way that cross the site and vicinity; corridors (electric transmission lines, oil and gas pipelines, communications); and egress limitations from the area surrounding the site; and land use types and associated acreage. Classify land use types by the USGS major land use classification code. Identify the following sensitive land uses: • Special land-use categories such as Native American or military reservations, • State and national parks, national monuments, national forests, wild and scenic rivers, designated coastal-zone areas, wildlife refuges, wilderness areas and other special land uses (e.g., national trails, recreation such as golf courses, picnic, swimming, fishing, and boating),

WBS Element 3.9 - Land Use

- Agricultural areas/prime farmland (including principal agricultural products, crop areas, and average annual yields), and
- Residential areas.
- Other state and local protected areas.

3.9.3 Conduct windshield surveys - Conduct visual inspections along existing roads in the project area to confirm existing land uses and identify new developments not identified previously (e.g., residential, commercial). Take additional ground photographs to document where appropriate.

3.9.4 Conduct field verification surveys and interviews - Conduct detailed field surveys and interviews, where needed, to identify surrounding (potentially affected) landowners, property boundaries, land uses (e.g., gardens, dairies) and acreage, and planned developments.

3.9.5 Identify hazardous land uses. Identify the following hazardous land uses for areas within 5 miles of the site; map identified features in relation to the plant power block.

- Mining and quarrying operations (commercially exploitable mineral resources by type and ownership).
- Airports (major within 10 miles; small within 5 miles).
- Industrial or commercial facilities (including oil and gas storage areas, significant manufacturing plants, chemical plants and refineries).
- Military bases, munitions storage areas and ordinance test ranges, missile bases, firing or bombing ranges.
- Oil pipelines, oil or gas wells.
- Land and water routes for transporting hazardous materials, docking facilities or barge slips on waterways (for hazardous materials).
- Other power generating facilities; waste treatment and disposal facilities.

3.9.6 Prepare report - Document results; format to provide and support applicable portions of Regulatory Guide 1.70, Sections 2.1 and 2.2, and Regulatory Guide 4.2, Sections 2.1.1, 2.1.2, 2.1.4, 5.2.4, and 5.6.

3.10 Demography

WBS Element 3.10 - Demography

3.10.1 Obtain Census data - Obtain data from the U.S. Bureau of the Census and local/regional planning agencies/commissions, economic development authorities, and governments. Include demographic characteristics such as age and sex distribution, transient or migrant population,

WBS Element 3.10 - Demography

racial and ethnic background, and income distribution. Data may be available on the internet.

3.10.2 Obtain economic growth projections - Obtain data from state and local agencies and local/regional planning agencies/commissions, economic development authorities, governments and local universities.

3.10.3 Perform demographic projections – Project population growth (as a function of distance and direction) for projected plant life (derived from economic growth projections with and without the proposed project). Determine the number of direct and indirect workers associated with project construction and operation activities; determine the total population (direct and indirect workers and their families) that would immigrate to the site area as a result of the project. Depending on the level of detail and credibility of economic growth projections available from public sources, regional economic modeling may be required to provide an adequate basis for SSAR/ER population projections and socioeconomic impact assessments.

3.10.4 Map demographic data – Convert data from enumeration units (e.g., Census tract) to radial/annular format (see Regulatory Guide 1.70, Section 2.1.3); map data at a suitable scale; develop corresponding data in tabular format; indicate demographic characteristics and projections for the "low-population zone" and "exclusion area boundary" populations.

3.10.5 Prepare report - Document results; format to provide and support applicable portions of Regulatory Guide 1.70, Section 2.1.3, and Regulatory Guide 4.2, Section 2.1.3, 5.2.4, and 5.6.

3.11 Archeological and Historical Resources

WBS Element 3.11 - Archeological And Historical Resources
3.11.1 Contact agencies to identify known resources - Contact agencies to identify known cultural resources. Consult with Federal, state, regional, local, and affected Native American tribal agencies, including the State Historic Preservation Officer and the Archeology and Ethnography Program of the National Park Service (in U.S. Department of Interior) to identify the presence of known cultural resources and the need for surveys to identify potential resources and/or determine eligibility of resources for the National Register of Historic Places (NRHP). **3.11.2 Conduct on-site archeological survey** - Based on agency consultation, conduct literature review and on-site surveys (Phase I and II) to identify location and significance of any properties listed in or eligible for inclusion in the NRHP as either a historic place or other significant site within 10 miles of the site or within 1.2 miles of transmission line routes, access corridors, and offsite areas. Identify any properties included in state or local registers or inventories of historic and archaeological resources, artifacts or other objects. Determine eligibility based on consultation with the appropriate resource agencies. **3.11.3 Map archeological and historical resources** - Based on the literature review, Phase I and Phase II surveys, and agency consultation, map all properties listed in or eligible for inclusion in the NRHP either as a historic place, as a historic place within 10 miles of site, or within 1.2 miles of transmission line routes, access corridors, and offsite areas. **3.11.4 Prepare report** - Document results; format to provide and support applicable portions of Regulatory Guide 4.2, Sections 2.6 and 5.6.

3.12 Noise

WBS Element 3.12 - Noise
3.12.1 Obtain existing noise data - Review state and local noise regulations (includes noise limits for various land uses); identify the closest noise sensitive areas (e.g., residents, recreational areas, hospitals, sensitive habitats). Contact local traffic authorities for ambient noise data. **3.12.2 Procure noise measurement equipment** - Obtain simple noise meter to measure existing sound levels at the site boundary. **3.12.3 Perform ambient noise measurements** - Using a noise meter, conduct a sound survey to determine existing (ambient) levels at the site boundary, including the closest noise sensitive areas (e.g., nearby residents and recreational users). Map noise measurement locations by distance and direction from the noise source (e.g., construction equipment, turbine building, mechanical draft cooling towers). **3.12.4 Perform data reduction and analysis** – Conduct noise impact analysis, using the sound

WBS Element 3.12 - Noise
survey results and modeling, to predict noise levels from project construction and operation; compare against applicable noise limits. Note: In the absence of regulatory limits, use a limit of 65 dB(A); noise levels below 60 to 65 dB(A) are considered by NRC to be of small significance. **3.12.5 Prepare report** - Document results; format to provide and support applicable portions of Regulatory Guide 4.2, Sections 2.6 and 5.6.

3.13 Visual Resources

WBS Element 3.13 – Visual Resources
3.13.1 Obtain pre-construction viewshed photographs - Determine pre-construction visibility of the site from potentially sensitive areas (e.g., residential, recreational, natural, and tourism); identify and locate any areas designated as scenic or visually sensitive in relation to the plant site (distance and direction); obtain pre-construction photographs to document illustrate: (1) representative views (viewshed) that would be affected by the project (especially from visually sensitive areas), and (2) surrounding landscape features which could help screen the facilities. **3.13.2 Perform visual impact modeling** – Using plant and transmission line design data and photo-editing techniques, model impacts of the project on the existing viewshed to compare vistas before and after construction and to determine impacts. Conduct qualitative or quantitative (modeling) analysis (depending on the anticipated level of impact) to measure secondary (e.g., economic, tourism) impacts on the site vicinity. **3.13.3 Prepare report** - Document results; format to provide and support applicable portions of Regulatory Guide 4.2, Sections 2.6 and 5.6.

3.14 Emergency Planning

WBS Element 2.14 – Emergency Planning
3.14.1 Identify site-specific features that could pose significant impediments to emergency planning **3.14.2 Select approach for addressing emergency planning -** Select either: a) Major features, or b) complete and integrated plan. **3.14.3 Prepare emergency planning information**

4
APPLICATION

Preparation of the original ESP application and responses to comments and questions resulting from NRC's review is an involved process requiring execution of discrete logistical activities. These are identified and discussed in the following subsections.

4.1 Prepare Application

Developing a complete application, once technical studies are complete, is a complex technical task that should be managed to completion as a multi-faceted project with a schedule, deliverables, and mechanisms to ensure proper quality. The final product will incorporate results of the technical studies (Section 3) into a formal application document that will exceed many hundreds (if not thousands) of pages, contain several thousands facts, and must be presented in a fashion that is clear, precise, accurate, and unambiguous to NRC. Guidance on executing this process is provided in the discussion of WBS Element 4.1, below.

WBS Element 4.1 - Prepare Application
4.1.1 Contents of application - The contents of an ESP application are detailed in 10 CFR 52.17 (http://www.nrc.gov/docs/cfr/part052/part052-0017.html) and are described in the Application Guide; hence, they are not repeated in this document. In addition to administrative information on the applicant, the early site permit application must include three major elements: the Site Safety Analysis Report (SSAR), Environmental Report (ER), and emergency planning information. Specific guidance for preparation of each of these application elements, including details of the document outlines, is provided in Sections 3.1, 3.2 and 3.3, respectively, of the Application Guide. This WBS element includes definition of applicant- or site-specific components of the application, such as redress plans, and identifying the associated application content requirements. These requirements will be defined primarily by the applicant's plans (e.g., whether site preparation activities are planned under the ESP). **4.1.2 Establish functional responsibilities for application preparation -** A project plan should be developed that establishes clear roles and responsibilities for each of the three application elements, as well as ensures that these elements are properly integrated and responsive to all requirements of 10 CFR 52. Beyond the specified technical expertise that is required to develop the detailed components of the SSAR, ER, and Emergency Planning information (EPI), functions that need to be established and assigned to ensure a quality and responsive application include the following:

WBS Element 4.1 - Prepare Application

- Application Manager (or Report Coordinator),
- SSAR, ER, and EPI Report Managers,
- Technical Staff to Verify Consistency and Regulatory Compliance,
- Technical Writers/Editors, and
- Word Processing/Graphics/Production Support.

4.1.3 Perform management functions - The Application Manager (or Report Coordinator) and the SSAR, ER, and EPI Report Managers provide day-to-day direction (in conjunction with the ESP Program Manager) for preparation of the application. Clearly, the application is the end product of the entire ESP Program effort and, therefore, must be effectively and conscientiously managed. Although once the technical inputs are prepared and the effort is one of integration, the integration process must be credible, defensible, and comprehensive. Applications are not unlike large technical proposals in that there are specific criteria to be addressed, and there is a technical and non-technical audience that must understand the written product and is responsible for evaluating the effectiveness of the written material to address the criteria. Accordingly, management of the application preparation process should be accomplished much like preparation of a large, multi-disciplined technical proposal. Specific management functions to be performed include the following:

- Establish an integrated and comprehensive schedule for application preparation with dedication of commensurate resources,
- Develop a work flow process that outlines all activities involved in the management (and modification) of information (and text) and "how" these activities will lead to development of an integrated application,
- Ensure that schedule and quality objectives are met for preparation of the application,
- Ensure that the roles and responsibilities of all parties on the project are clear, understood, and accepted, and
- Provide strategic guidance and direction on the nature of material provided in the main body of the application, versus what is provided as appended material, versus what is retained as technical back-up documentation.

4.1.4 Perform technical accuracy and consistency reviews - Once the technical specialists have completed developing their inputs to the SSAR, ER, and EPI, an additional series of activities are recommended to ensure quality and accuracy of the application. These activities should be prepared by knowledgeable technical and regulatory experts, and form the basis of a peer (or quality) review of the evolving application. These activities would focus on the application as a whole and would not duplicate technical QA reviews conducted as part of the

WBS Element 4.1 - Prepare Application

technical studies themselves; they include the following:

- Ensure that all factual statements and assertions are technically correct and are supported by appropriate data, analyses, and/or references,
- Ensure that all regulatory requirements are explicitly addressed in the application,
- Ensure that information appearing in more that one part of the application (e.g., SSAR and ER) is presented in a consistent fashion (i.e., cross-referencing), and
- Ensure that no conditions have changed since the development of the technical input to the SSAR, ER, and EPI, which would change the factual statements or assertions.

4.1.5 Perform technical writing/editing functions - It is essential that the text of the application communicate effectively to the NRC (and other stakeholders). Ambiguity and lack of clarity only result in unnecessary questions, and ultimately delays in the application process. The role of the Technical Writers/Editors are several and include the following:

- Ensure that the language used is clear, precise, and conveys exactly the message and meaning intended,
- Ensure that the text is written in "one voice,"
- Ensure that the terminology and phraseology used is consistent throughout the application – thereby avoiding ambiguity or uncertainty in the mind of the reader, and
- Ensure that verb tense, grammar, and other editorial elements are addressed.

The effectiveness of these individuals, and therefore the quality of the application process, is maximized when Technical Writers/Editors are actively involved in the early stages of developing draft material for the three ESP component reports and the application in general. This includes support in developing annotated outlines and providing instructions in writing style and approach to preparation of application documentation.

4.1.6 Provide production support. In preparation of an application, an enormous amount of information is being generated and revised on a continuous basis. The workflow process must be defined and accepted by all parties to maximize the likelihood of success. Completion of a timely and high quality application is as dependent upon the efforts of production personnel (e.g., word processing, graphics, and printing) as on any other organizational element. Accordingly, these resources need to be fully integrated into development of the workflow process, schedules, deliverables, and overall expectations regarding project quality. It is essential that the workflow process is formalized, including such aspects as who has version control (e.g., the original author at early stages of document preparation versus the document manager at latter stages) and who has change control authority. Beyond management of the written material, additional production responsibilities include graphics, printing, binding,

WBS Element 4.1 - Prepare Application
packaging, and mailing/delivery. Similar to the above, these functions must be fully integrated into the project plan and associated schedule. **4.1.7 Obtain internal approvals, signatures and notarizations.** **4.1.8 Submit application to NRC; obtain receipt confirmation and docket number** - Once all documentation is complete, instructions for submitting the application are provided in 10 CFR 52.15 (http://www.nrc.gov/docs/cfr/part052/part052-0015.html). Receipt confirmation should be obtained from NRC.

4.2 Respond to NRC Review

Responding to NRC questions, comments, and public hearings is an integral part of the ESP program. While applicants must react to actual events during the review process, the following general guidance can be used to plan and execute response efforts.

Schedule for dealing with comments is totally dependent on comment scope and the strategy derived for responding to them; elapsed time can range from days to months. Accordingly, no model schedule for this WBS element has been developed. In general, subordinate tasks within this element follow in sequential order.

WBS Element 4.2 - Respond To NRC Review
4.2.1 Support/attend hearings and public meetings - A variety of meetings among the applicant, NRC and the public will be scheduled during the application review process; such meetings may range from informal clarifying conferences with NRC staff to formal adjudicatory hearings. Applicant (and in some cases subcontractor) staff will be needed to provide formal company representation and technical support. Roles and responsibilities for individuals attending these meetings should be established as soon as possible once meeting notifications have been received, and any additional actions necessary to address meeting scope identified. Products, presentations, and policy positions that will be needed should be identified, and a plan established to produce them (e.g., technical analyses, regulatory positions). **4.2.2 Review comments/questions** - NRC comments/questions on the application are typically provided in formal transmittals. Transmittals should be initially reviewed to determine the overall scope of the interrogatory and to identify the individuals and organizations contributing to the response. **4.2.3 Prepare response plan** - Based on the analysis of WBS Element 4.2, a plan to develop responses should be developed. As with any project plan, this one should include roles and responsibilities, scope of work, deliverables, and schedule milestones. Subcontractor roles should be formalized in contractual documents, as required. Any conflict between requested response schedules and the ability to perform the required work should be negotiated with the regulators.

WBS Element 4.2 - Respond To NRC Review
4.2.4 Execute response plan - Work defined in WBS Element 4.3 is completed, with feedback, revision, re-planning, and regulator interface conducted, as required. **4.2.5 Compile response package** - Scope of this element is to prepare documentation that reports, in an appropriate format, the responses derived from WBS Element 4.3 and 4.4. For formal submittals to NRC, the processes outlined in WBS Element 3 should be implemented. **4.2.6 Obtain internal approvals, signatures, and notarizations.** **4.2.7 Submit response package to NRC; obtain receipt confirmation.** **4.2.8 Repeat as necessary** - Several separate interrogatories may be received from NRC during the application review process; the processes outlined in WBS Element 4 may be repeated for each of these.

5
SCHEDULE

This chapter provides guidance on overall schedule requirements (elapsed time) for completing an ESP program, including identification of strategic and logistical factors that can affect the time required to complete an application (Section 5.1).

More detailed guidance on the scheduling of individual tasks within the ESP WBS is provided in Section 5.2, supplemented by a model program schedule in Appendix B. This model schedule is provided by second-level (e.g., 2.x) WBS element, with functional interactions (e.g., precedence and precursor relationships) identified.

Schedule discussions in this chapter are referenced to "new" or "greenfield" sites, defined in the Siting Guide as "Undeveloped sites that were not used previously for any industrial purpose." Thus, overall schedule requirements, typical durations for individual WBS elements, and model schedules are based on regulatory requirements and the level of data collection and analysis effort anticipated at new sites. In general, schedule efficiencies should apply for existing and characterized sites, where data availability and understanding of site issues should make the ESP process more efficient. Where applicable, discussions in this chapter identify where these factors may affect schedule duration. For industrial sites, applicants should add the time to perform environmental audit and required cleanup actions to the greenfield site schedules.

Schedule durations incorporate an assumption that the ESP program is conducted in concert with an active, effective public and institutional relations program. It is assumed for purposes of this chapter that no major public opposition or interruptions to the data gathering effort (e.g., denial of site access, delays in obtaining data collection permits) interfere with conduct of the ESP program.

5.1 Schedule Planning

In planning the ESP effort, applicants should allow 18 to 24 months from selection of a proposed site to submitting an application to NRC. Actual ESP program schedules will depend on effective and efficient conduct of the ESP program scope of work and on several applicant- and site-specific factors as discussed below. Applicants should ensure that those factors applicable to their individual ESP are taken into account in planning the application development program.

Type of site - Existing sites may provide schedule advantages due to the fact that data and analyses relevant to the ESP application are already available (See Section 5.1).

Site complexity - Technical issues may present particularly complex challenges at some sites. Examples of such issues include extremely complex seismic or tectonic regimes, complicated

topographic conditions that affect atmospheric dilution, and complex ecosystems with high degrees of functional interaction or biological diversity. Schedule allowances for data collection and analysis time required to deal with such issues should be included in applicant plans. Because field data collection activities (e.g., geology/seismology mapping, borehole installation, meteorological tracer tests, entrainment modeling) are particularly time-consuming, applicants should identify and reflect such complexities as realistically as possible in schedule planning.

Applicant public/institutional relations strategy - Because both literature and field data collection are highly visible activities, these aspects of the ESP program must be coordinated with the applicant's overall public and institutional relations program. Any constraints in the timing of these activities emanating from the public announcement strategy (e.g., timing for announcing intent to file, site identification, and landowner notifications) should be incorporated into the schedule to ensure that there is no conflict with ESP activities. Applicants should devote as much advanced planning as required to ensure that acquisition of the necessary off-site access agreements does not impede ESP field activities.

Contractor, equipment and supply availability - Some expertise, services, equipment, and supplies necessary to conduct ESP studies are highly specialized and may not be available on short notice. Applicant's should confirm availability and/or allow for schedule extensions associated with these specialized components of the ESP program, either directly or through their higher tier subcontractors. Items/services that may be subject to availability concerns include drilling services, geophysical survey teams, meteorological towers and instruments, and geotechnical, analytical, and taxonomic laboratory services.

5.2 Model ESP Program Schedule

Based on the assumptions and conventions listed above, a model program schedule has been developed to provide applicants with a starting point for their site-specific ESP schedules.

Schedules are provided in two forms:

1. A master ESP schedule, which shows major components of the ESP program and highlights major milestones and overall timing requirements (Figure 5-1).

2. A detailed schedule (Appendix B) reflecting individual WBS element tasks, durations, and precedence relationships.

The schedule includes typical durations for component activities, relevant milestones and deliverables, and major points of interaction (e.g., precursor or precedence relationships) among WBS elements.

In adapting the model schedule to their site-specific ESP activities, applicants should be cognizant of both the duration of individual tasks and how task completion affects other components of the schedule. For example, an applicant might determine that site access authorizations will require more time than that reflected in the model schedule. This "delay" will affect all activities that include on-site data collection. Accordingly, in this example case, each subsequent activity (including application submittal) would be delayed accordingly.

ID	Task Name
1	**1. SELECT SITE**
2	**2. MANAGEMENT AND COMMUNICATIONS**
3	**2.1 Establish applicant team corporate organization st**
4	**2.2 Define roles, responsibilities, and authorities**
5	**2.3 Establish plant design(s) to be considered; obtain**
6	**2.4 Develop overall ESP Program Plan**
13	**2.5 Procure subcontracted services**
14	**2.6 Prepare overall project quality assurance plan (QA**
15	**2.7 Obtain Access**
19	**3. TECHNICAL STUDIES**
20	**3.1 General**
25	**3.2 Meteorology (AG Sections 3.2.3.2 and 3.2.2)**
41	**3.3 Geology/Seismology (AG Section 3.3.3.5)**
66	**3.4 Hydrology (Ground Water) (AG Sections 3.3.3.2 an**
80	**3.5 Hydrology (Surface Water) (AG Sections 3.3.3.2 an**
92	**3.6 Terrestrial Ecology (AG Section 3.3.2)**
103	**3.7 Aquatic Ecology (AG Section 3.3.2)**
114	**3.8 Socioeconomics (AG Section 3.3.2)**
119	**3.9 Land Use (AG Sections 3.3.3.3 and 3.3.2)**
126	**3.10 Demography (AG Sections 3.3.3.4 and 3.3.2)**
132	**3.11 Archeological And Historical Resources (AG Sec**
137	**3.12 Noise (AG Section 3.3.2)**
143	**3.13 Visual Resources (AG Section 3.3.2)**
147	**3.14 Emergency Planning (AG Section 3.4)**
148	**4. APPLICATION**
149	**4.1 Prepare Application**

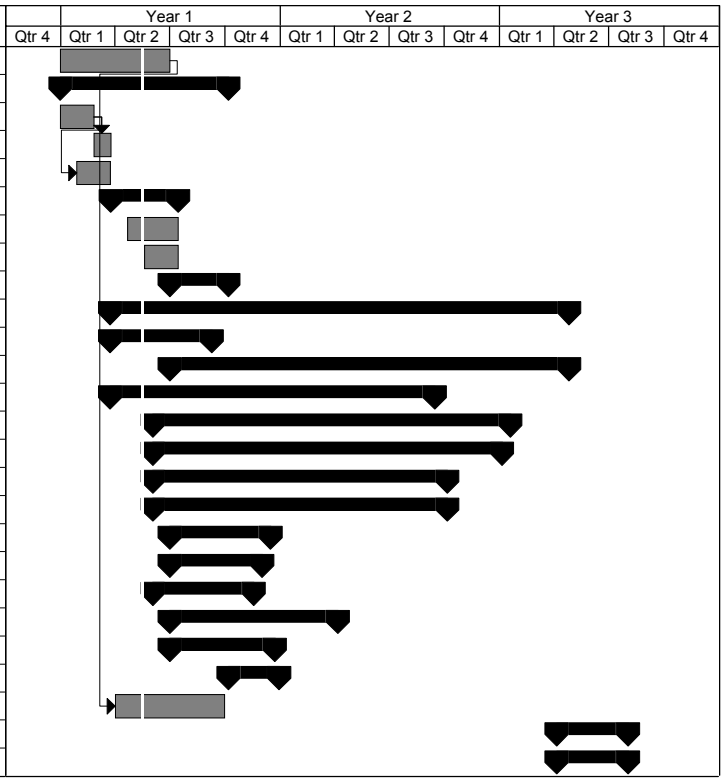

Figure 5-1
ESP Model Program Schedule by Summary Task

6
PLANNING CONSIDERATIONS

This section discusses three additional topics that should be considered when planning a project to prepare an ESP application: use of data for existing sites, coordination of WBS element activities and management of subcontractors.

6.1 Existing Sites

Existing sites possess a wealth of site data that will support both the ESP and future Combined Operating License (COL) actions. These data can provide significant portions of the information required to complete an ESP application and can potentially reduce the time required for executing the ESP program. Appendix C provides a model ESP program schedule that estimates the potential reduction.

Applicants should initiate discussions with NRC, as early as possible in the ESP planning process, to determine how data from operational environmental and radiological monitoring programs from existing plants can be used in the ESP application.

Based on results of these discussions, applicants may be able to significantly reduce the scope of - and time required for - field data collection programs required to support the ESP application. For example, because data records for many years are typically available at existing sites, the one-year period of record required for meteorology, hydrology, and ecology monitoring may be significantly reduced or eliminated entirely. Information from previous licensing actions and operational reports may also reduce the scope and time required for some analyses in the application.

Schedule reductions for the ESP seismic analyses may also be reduced at existing sites. However, considerable uncertainty exists in the degree to which previous licensing data will be useful in satisfying the new requirements of 10 CFR Section 100.23. Accordingly, applicants should discuss the seismic evaluation issue with NRC as early as possible in the planning process in order to develop realistic schedules for this portion of the ESP program.

6.2 Coordination of WBS Element Activities

Efficiencies in the ESP program can be achieved by coordinating individual tasks that support more than one of the WBS elements. Examples of support elements that should be coordinated across multiple tasks are as follows.

Drilling Program - Drilling services will be required in the ESP program field data collection effort to provide geologic and engineering boreholes, to collect rock core and soil samples, and to install ground water pumping and monitoring wells. Drilling services for all of these objectives generally involve the same set of equipment requirements and personnel skills. Accordingly, applicants may wish to ensure that drilling services are acquired and managed in an integrated fashion (e.g., by a single contractor).

Construction Activities - Similar to the case with drilling services, construction activities are required to support several of the management and technical WBS elements; examples include the site office, meteorological instrument tower and shelter, water quality stations, and water flow gaging stations. Applicants may find it useful to contract for all of these construction activities under a single subcontract. Coordination of these activities will reduce site access times and capitalize on familiarity with site conditions and constraints.

Literature Data Collection - Virtually all of the technical investigations require literature data collection; many of these investigations will involve contacting the same data sources. Federal, state, and local agencies, university libraries and other private data sources must be surveyed. To facilitate data gathering efficiency and minimize disruptions to the cognizant data holders, applicants may wish to establish a data requirements program to identify all data required from a given source and to coordinate data collection from each source, regardless of the technical discipline. For example, a single individual could be assigned to each agency or data source, with responsibility for agency interface and data collection.

6.3 Management of Subcontractors

The MPP is constructed in a format that provides guidance to applicants for planning the program for preparing an ESP application. Because the expertise required to implement the scope of activities required for an ESP application is not routinely part of applicant organizations, applicants will likely subcontract much of the work to specialized contractors.

Two strategies can be adopted for ESP subcontracting:

1. Applicant management of multiple specialized subcontractors.
2. General ESP contractor with "turn-key" scope of work.

Each of these approaches is discussed separately in the following subsections.

6.3.1 Applicant Management

In this approach, individual subcontractors are identified for each individual discipline specialty (e.g., seismology, ecology), or group of specialties, and the applicant assumes responsibility for coordinating and managing individual subcontractor activities and preparing the ESP application.

The applicant will act, in effect, as the "general contractor." In this role, the applicant would define subcontractor scopes in accordance with the individual WBS elements set forth in Chapter 3 of the MPP. Typically, subcontractor scopes would be assigned at the second tier WBS level

(level 2.x); it is recommended that subcontracting be accomplished at this level or above. As discussed in Section 6.3.2, scopes for subcontractors can be "aggregated" so that multiple WBS elements at the 2.x level can be accommodated by a single contractor (e.g., geology/seismology and ground water hydrology).

Applicants can use the scopes and schedules presented in Sections 3 and 5 of the MPP to define scopes of work, prepare RFPs, and award and manage the work of individual subcontractors. Overall management of the program, including program planning and preparation of the application itself (see Section 2 of the MPP) is the responsibility of the applicant. Program management requires the applicant to provide effective technical oversight of each of the independent elements of the ESP program, as defined in WBS Elements 3.1 to 3.14.

6.3.2 General Contractor

The entire ESP application can be subcontracted in a "turn-key" approach. In this alternative, the applicant will expect the selected contractor to produce a compliant ESP application, coordinating activities of all of the contributing discipline-specific experts (e.g., historic and archeological resources) and second-tier services providers (e.g., drilling contractors, and laboratories).

The management role of the applicant will be to ensure that the general contractor is performing in accordance with the assigned scope of work and schedule. While this approach relieves the applicant of day-to-day management responsibility for individual ESP activities, it also screens the applicant from a complete understanding of how the project is proceeding at the functional level.

In this alternative, the applicant can use the scope and schedule guidance provided in Sections 3, 4, and 5 of the MPP to oversee subcontractor activity. In particular, applicants should ensure that the contractor addresses each of the scope items identified in Chapter 3 of this MPP and that the WBS element durations and schedule milestones identified in Chapter 5 are met.

In the event applicants identify deviations from guidance provided in the MPP, they should consider and implement corrective actions. Such actions can include “work arounds,” re-prioritization of work activities, contractual remedies or, in extreme cases, re-assignment of responsibility for individual scopes of work.

7
REFERENCES

EPRI, Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application, Palo Alto, CA, 1006878, 2002.

Nuclear Energy Institute (NEI) Industry Guideline For Preparing An Early Site Permit Application - 10 CFR Part 52, Subpart A, Washington, DC, NEI 01-XX, 2002(Expected).

NRC/FEMA, Criteria for Preparation and Evaluation of Radiological Emergency Plans and Preparedness in Support of Nuclear Power Plants, Washington, DC, NUREG - 0654 - Revision 1, November 1980.

A
MODEL ESP WORK BREAKDOWN STRUCTURE

This Work Breakdown Structure (WBS) provides applicants with guidance on discrete tasks that must be completed to prepare an ESP application. Tasks (WBS elements) have been defined at a level of detail necessary for effective planning and management of the ESP application effort, including:

- Management organization and decision requirements
- Institutional (stakeholder and regulator) interfaces
- Technical studies
- Logistical support requirements
- Precedence relationships among tasks and critical path items (see Model ESP Program Schedule (see Section 4 and Appendix B)

First-level WBS Elements (1, 2, 3, and 4) are generally listed in the chronological order in which they will be executed; however, applicants may find it helpful to revisit some of the planning items as the ESP Program unfolds (e.g., to address findings of technical studies, conversations with NRC).

WBS Item 1 is the site selection study that results in identification of the site for which an ESP will be prepared. WBS Item 2 lists management/organizational tasks that applicants should complete as part of the overall ESP planning process. Upon completion of these activities, the applicant will have 1) established its organizational framework and responsibilities, 2) developed an ESP program plan, and, 3) selected one or more sites for which an ESP application will be prepared. Detailed in WBS Item 3 are major tasks comprising the technical studies necessary to prepare the Site SAR and the Environmental Report; included are logistical tasks necessary to support field data collection and information agency contacts. Final preparation of the ESP application and responses to NRC review are the focus of WBS 4, in sections 4.1 and 4.2, respectively.

For WBS elements where related guidance is found in the ESP Application Guide (AG) and/or the ESP Siting Guide (SG), references are shown in parentheses.

Table A-1
Model ESP Work Breakdown Structure

WBS #	WBS Element	Duration (Weeks)	Precedence Task(s)[1]
1.	**SELECT SITE**	26	See Note 2.
2.	**MANAGEMENT AND COMMUNICATIONS**		See Note 3.
2.1	Establish applicant team corporate organization structure	8	None
2.2	Define roles, responsibilities, and authorities	4	2.1
2.3	Establish plant design(s) to be considered; obtain PPEs from vendors (AG Section 3.2.1.1); establish site development plan	4	2.1
2.4	Develop overall ESP Program Plan		1.
2.4.1	Organization and responsibilities	2	2.2
2.4.2	Subcontracting plan	2	2.2, 2.4.1
2.4.3	Public and institutional relations plans	4	2.2 (See Note 4)
2.4.4	Regulator relations plan	8	2.4.3
2.4.4.1	Nuclear Regulatory Commission		
2.4.4.2	Environmental Protection Agency		
2.4.4.3	Army Corps of Engineers		
2.4.4.4	Other Federal agencies		
2.4.4.5	State and local agencies		
2.4.5	Agency contact plan and protocols for data collection contacts	4	2.4.3, 2.4.4
2.4.6	Program schedule and budget	8	2.4.5
2.5	Procure subcontracted services	12	2.4.2
2.6	Prepare overall project quality assurance plan (QAP)	8	2.4.1
2.7	Obtain Access		
2.7.1	Obtain Site Access	8	1.
2.7.2	Establish local support infrastructure	6	2.7.1, 2.7.3
2.7.3	Negotiate access to offsite data collection areas	13	1.
3.	**TECHNICAL STUDIES**		
3.1	**GENERAL**		
3.1.1	Identify base map scales and develop standard base maps	4	1.
3.1.2	Develop Data Management Plan	4	2.4.1, 3.1.3
3.1.3	Establish Quality Assurance/Quality Control Program	4	2.6
3.1.4	Review site development plan	2	2.3 (See Note 5)
3.2	**Meteorology (AG Sections 3.2.2.2 and 3.3.2)**		
3.2.1	Perform site survey	1	1., 3.1.4
3.2.2	Select meteorological tower site	1	3.2.1
3.2.3	Collect climatic and meteorological data	4	1.
3.2.4	Obtain existing air quality data	8	1.
3.2.5	Develop meteorological data acquisition plan	6	3.2.2, 3.2.3
3.2.6	Procure meteorological instrumentation and shelter	12	3.2.5
3.2.7	Procure meteorological tower	13	3.2.5
3.2.8	Procure tower erection services	6	3.2.7
3.2.9	Erect tower and install instruments	4	2.7.2, 3.2.8
3.2.10	Perform initial instrument calibration	2	3.2.9
3.2.11	Perform meteorological data collection activities	52	3.2.10
3.2.12	Perform routine instrument calibration activities	54	3.2.10
3.2.13	Perform data reduction and review	52	3.2.11

WBS #	WBS Element	Duration (Weeks)	Precedence Task(s)[1]
3.2.14	Perform meteorological and atmospheric dispersion analyses	8	3.2.13
3.2.15	Prepare report	8	3.2.14
3.3	**Geology/Seismology (AG Section 3.2.2.5)**		
3.3.1	Regional geologic and seismologic setting		
3.3.1.1	Collect and analyze literature data	6	See Note 6.
3.3.1.2	Develop field data collection program	4	3.3.1.1
3.3.1.3	Prepare regional geologic maps	4	3.3.1.2
3.3.1.4	Prepare seismic source maps	4	3.3.1.3
3.3.2	Sub-regional and site geologic and seismologic characterization		
3.3.2.1	Collect and analyze literature data	6	See Note 6.
3.3.2.2	Develop field data collection program	4	3.3.2.1
3.3.2.3	Identify sub-regional/local geologic structures of importance	4	3.3.2.2
3.3.2.4	Develop geologic and geophysical mapping program	2	3.3.2.2
3.3.2.5	Evaluate, select, and procure subcontracted services	4	3.3.1.2
3.3.2.6	Procure geophysical testing equipment	4	3.3.1.2, 3.3.2.5
3.3.2.7	Conduct geophysical field testing	4	3.3.2.5, 3.3.2.4, 3.3.2.6
3.3.2.8	Develop geotechnical laboratory testing program	6	3.3.2.2, 3.3.2.5
3.3.2.9	Perform drilling program	26	2.7.2, 3.3.2.2
3.3.2.10	Prepare geologic maps	4	3.3.2.7, 3.3.2.9
3.3.2.11	Collect and deliver samples to laboratory	26	3.3.2.9
3.3.2.12	Perform laboratory testing	30	3.3.2.11
3.3.2.13	Perform geotechnical analysis	12	3.3.2.12
3.3.2.14	Perform seismic analysis	6	3.3.2.13
3.3.2.15	Perform probabilistic seismic hazard analysis	8	3.3.2.14
3.3.2.16	Evaluate site seismic response	6	3.3.2.11, 3.3.2.12
3.3.2.17	Establish site-specific seismic design parameters	4	3.3.2.15, 3.3.2.16
3.3.4	Prepare report	8	3.3.2.17
3.4	**Hydrology (Ground Water) (AG Sections 3.2.2.2 and 3.3.2)**		
3.4.1	Collect and analyze literature data	8	See Note 6.
3.4.2	Identify regional groundwater characteristics		3.4.1
3.4.3	Prepare field testing plan	4	3.4.2
3.4.4	Prepare laboratory testing plan	4	3.4.2
3.4.5	Evaluate, select, and procure subcontracted services	6	3.4.3, 3.4.4
3.4.6	Procure pumping equipment and measurement instrumentation	4	3.4.3
3.4.7	Install pumping equipment and instruments	4	3.3.2.9, 3.4.5
3.4.8	Conduct aquifer pumping tests	2	3.4.7
3.4.9	Perform data analysis and modeling	8	3.4.8
3.4.10	Identify ground water effects on plant	4	3.4.9
3.4.11	Conduct water quality testing and collect water quality samples	52	3.3.2.9
3.4.12	Conduct laboratory testing	52	3.4.11
3.4.13	Prepare report	6	3.4.10, 3.4.12
3.5	**Hydrology (Surface Water) (AG Sections 3.2.2.2 and 3.3.2)**		
3.5.1	Collect and analyze literature data	6	See Note 6.

WBS #	WBS Element	Duration (Weeks)	Precedence Task(s)[1]
3.5.2	Establish flood levels	6	3.5.1
3.5.3	Prepare field measurement program plan	4	3.5.1
3.5.4	Procure measurement instrumentation	6	3.5.3
3.5.5	Install gaging stations and instruments	8	2.7.2, 3.5.4
3.5.6	Evaluate, select, and procure analytical laboratory services	6	3.5.3
3.5.7	Conduct flow measurements, water quality testing and collect water quality samples	52	3.5.4, 3.5.6
3.5.8	Conduct laboratory testing	52	3.5.7
3.5.9	Perform data analysis and modeling	4	3.5.8
3.5.10	Prepare report	6	3.5.8, 3.5.9
3.6	**Terrestrial Ecology (AG Section 3.3.2)**		
3.6.1	Collect and analyze literature data	6	See Note 6.
3.6.2	Initial identification of local species, abundancy, and habitat	2	3.6.1
3.6.3	Prepare field data collection program	4	3.6.1
3.6.4	Procure field sampling equipment and supplies	4	3.6.3
3.6.5	Conduct field data acquisition and sampling program	40 (Four seasonal sampling periods)	2.7.2, 3.6.4
3.6.6	Collect and deliver samples to laboratory	44 (Four seasonal sampling periods)	3.6.5
3.6.7	Conduct laboratory testing	44	3.6.6
3.6.8	Perform data analysis and modeling	4	3.6.7
3.6.9	Final identification of local species, abundancy, and habitat	4	3.6.8
3.6.10	Prepare report	4	3.6.9
3.7	**Aquatic Ecology (AG Section 3.3.2)**		
3.7.1	Collect and analyze literature data	6	See Note 6.
3.7.2	Initial local species identification, abundancy, and habitat	2	3.7.1
3.7.3	Prepare field data collection program	4	3.7.1
3.7.4	Procure field sampling equipment and supplies	4	3.7.3
3.7.5	Conduct field data acquisition and sampling program	40	2.7.2, 3.7.4
3.7.6	Collect and deliver samples to laboratory	40	3.7.5
3.7.7	Conduct laboratory testing	44	3.7.6
3.7.8	Perform data analysis and modeling	6	3.7.7
3.7.9	Final identification of local species, abundancy, and habitat	6	3.7.8
3.7.10	Prepare report	4	3.7.9
3.8	**Socioeconomics (AG Section 3.3.2)**		
3.8.1	Collect economic data	6	See Note 6.
3.8.2	Data reduction and analysis	8	3.8.1
3.8.3	Perform economic modeling	6	3.8.2
3.8.4	Prepare report	4	3.8.3
3.9	**Land Use (AG Sections 3.2.2.3 and 3.3.2)**		
3.9.1	Obtain aerial photographs	8	1.
3.9.2	Collect and analyze literature data	8	See Note 6.
3.9.3	Conduct windshield surveys	4	3.9.2

WBS #	WBS Element	Duration (Weeks)	Precedence Task(s)[1]
3.9.4	Conduct field verification surveys and interviews	4	2.7.1, 3.9.3
3.9.5	Identify hazardous land uses	2	3.9.4
3.9.6	Prepare report	8	3.9.5
3.10	**Demography (AG Sections 3.2.2.4 and 3.3.2)**		
3.10.1	Obtain Census data	6	See Note 6.
3.10.2	Obtain growth projections	6	See Note 6.
3.10.3	Perform demographic projections	4	3.10.2
3.10.4	Map demographic data	4	3.10.3
3.10.5	Prepare report	4	3.10.4
3.11	**Archeological And Historical Resources (AG Section 3.3.2)**		
3.11.1	Contact agencies to identify known resources	8	See Note 6.
3.11.2	Conduct on-site archeological survey	26	3.11.1
3.11.3	Map archeological and historical resources	6	3.11.2
3.11.4	Prepare report	4	3.11.3
3.12	**Noise (AG Section 3.3.2)**		
3.12.1	Obtain existing noise data	6	See Note 6.
3.12.2	Procure noise measurement equipment	2	3.12.1
3.12.3	Perform ambient noise measurements	13	3.12.2
3.12.4	Perform data reduction and analysis	2	3.12.3
3.12.5	Prepare report	4	3.12.4
3.13	**Visual Resources (AG Section 3.3.2)**		
3.13.1	Obtain pre-construction viewshed photographs	4	2.7.1
3.13.2	Perform visual impact modeling	4	3.13.1
3.13.3	Prepare report	4	3.13.2
3.14	**Emergency Planning (AG Section 3.4)**		
3.14.1	Identify site-specific features that could pose significant impediments to emergency planning	Note 7.	Note 7.
3.14.2	Select approach for addressing emergency planning		
3.14.3	Prepare emergency planning information		
4.	**APPLICATION**		
4.1	**Prepare Application**		
4.1.1	Contents of application (AG Section 3.0)	1	None
4.1.2	Establish functional responsibilities for application preparation	2	4.1.1
4.1.3	Perform management functions	13	4.1.2
4.1.4	Perform technical accuracy and consistency reviews	6	4.1.2
4.1.5	Perform technical writing/editing functions	4	Note 8.
4.1.6	Produce application	4	4.1.5
4.1.7	Obtain internal approvals, signatures, and notarizations	2	4.1.6
4.1.8	Submit application to NRC; obtain receipt confirmation and docket number	1	4.1.7
4.2	**Respond to NRC Review**		
4.2.1	Support/attend hearings and public meetings	As required	
4.2.2	Review comments/questions	2	Begins with receipt of interrogatory
4.2.3	Prepare response plan	2	4.2.2
4.2.4	Execute response plan	4 (Nominal)	4.2.3
4.2.5	Compile response package	2	4.2.4
4.2.6	Obtain internal approvals, signatures, and notarizations	1	4.2.5

WBS #	WBS Element	Duration (Weeks)	Precedence Task(s)[1]
4.2.7	Submit response package to NRC; obtain receipt confirmation	1	4.2.6
4.2.8	Repeat as necessary	N/A	N/A

1 – Tasks that must be completed prior to completing this task. Note that some overlap of this and precursor tasks may occur (see Model Task Schedule in Appendix B).

2 – MPP scheduling for the ESP program assumes that the site has been selected, using a process equivalent to that in the Siting Guide, prior to initiation of site-specific ESP data collection activities.

3 – MPP scheduling incorporates the assumption that ESP management/planning activities are conducted in parallel with site selection; see Section B.2.

4 – Applicants should have a corporate public and institutional relations (P&IR) program in place prior to initiating ESP activities (e.g., during site selection). This WBS will address the specifics of P&IR for ESP tasks (e.g., landowner access, agency contacts).

5 – Review of the site development plan (facilities location and layout) will be required for each of the technical discipline studies (e.g., to plan field data collection studies, meteorological tower location).

6 – Literature data collection for these tasks can be initiated during, and coordinated with, data collection during the site selection studies. Except as these activities require contact with agencies, literature reviews can begin as early as applicants wish. The MPP model program schedule uses the convention that these activities have a six-week duration, with the first four weeks overlapping site selection (see Section B.1).

7 – Detailed scheduling for development of emergency planning information has been deferred pending development of additional guidance; see Application Guide Section 3.4.

8 – At completion of this activity, the application has been compiled from individual discipline reports and is ready for reproduction, binding, etc.

B
MODEL ESP WORK ELELMENT SCHEDULES

A model program schedule for preparing an Early Site Permit (ESP) application for a "new" or "greenfield" site is presented in this Appendix, along with descriptions of the major assumptions used in developing the schedule. Assumptions governing overall ESP management and administrative activities are provided in Section B.1; discipline or activity-specific schedules and assumptions are discussed in Section B.2. The overall MPP model program schedule is presented in Gantt chant format in Section B.3.

A number of assumptions were incorporated into development of the schedule. Actual task durations (including the overall duration of the ESP Program itself), and, in some cases, task precedence relationships, may be affected if these assumptions do not prove to be accurate for individual ESP projects. Overall and task-specific assumptions incorporated in the schedule are described separately below. Applicants should carefully evaluate schedule impacts in cases where it is determined that the MPP assumptions do not reflect actual circumstances associated with their ESP program.

B.1 Overall and Generic Scheduling Assumptions

The following overarching assumptions and conventions were adopted in developing the model schedule. These assumptions apply to all non-technical ESP tasks (WBS Elements 2and 4) or are incorporated into scheduling each of the technical tasks listed in WBS Element 3.

Site selection is completed within a six-month period following project initiation; for the schedule, this translates to selection and approval of the preferred site at the end of second quarter, Year 1 (Y1Q2). The formal kickoff of ESP activities is assumed to immediately follow preferred site selection, at the beginning of Y1Q3.

It is assumed that all organizational and planning activities antecedent to ESP development (WBS Element 1) are completed in parallel with site selection in the first half of Year 1. Under this assumption, all tasks listed in WBS Element 1, including associated products and milestones are complete at the end of Y1Q2. Thus, the schedule is based on applicants' being able to proceed with all data collection and analysis tasks, as scheduled, at the beginning of Y1Q3.

Negotiations for site and off-site access are assumed to begin at the start of Y1Q3; negotiations for access are assumed to require 8 and 13 weeks, respectively, for WBS Elements 2.7.1 and 2.7.3. Delays in obtaining landowner agreements for field program and data collection access will result in day-for-day delays in completing the ESP application. Accordingly, applicants may wish to initiate access negotiations during the later stages of site selection to minimize

delays associated with site access. Where possible, activities that do not require physical access to the site are initiated prior to completion of the site access tasks.

Literature data collection for each subtask in WBS Element 3 (i.e., each 3.x WBS Element) is assumed to have a six-week duration and to begin 4 weeks prior to completing site selection. This standard convention was adopted to reflect the fact that considerable literature data collection and analysis can be conducted in parallel with (or as part of) the site selection studies, thereby reducing overall duration of the ESP program. Actual "lead time" for collecting and analyzing literature data will depend on applicant public and institutional relations policies.

Because the schedule is based on completing literature data collection two weeks after project initiation, applicants should carefully evaluate the schedule impact of delays that affect this completion milestone. These effects will be task-specific. For example, literature data collection delays could affect the overall ESP schedule if collection of geologic and seismic data is delayed. Similar delays in collecting socioeconomic or land use data would be of much less concern, however, because each of these WBS elements has considerable "float."

Acquisition of permits (e.g., construction in navigable waters, wildlife collection) required for ESP program activities have been included as a component of the field data collection task within each 3.x WBS level discipline activity. If significant schedule delay or uncertainty in obtaining these permits is anticipated, applicants may wish to add a discrete permit acquisition task to the schedule to account for potential effects of these delays.

Individual task durations and schedules are based on the assumption that required equipment, subcontractors and specialty contractors are available, as required, at the time specified for task initiation.

Tasks are scheduled on the basis that they are initiated as soon as possible, given precursor tasks and requirements; applicants may wish to postpone investigations with large float times (for more effective program management), as discussed for individual tasks in Section B.2.

B.2 Task-Specific Schedules (WBS Level 3.x)

Scheduling assumptions that are specific to individual tasks are listed below. Each task schedule would be affected if these assumptions are not met. However, the impact of these assumptions on the overall ESP program will depend on which task is affected. For example, schedule impacts on the Meteorology task (WBS Element 3.2) will likely affect the overall ESP schedule, because work in this task extends over the full program duration. Longer delays in other tasks (e.g., Socioeconomics, WBS Element 3.8) might not affect overall duration at all because of long lead times associated with these tasks.

Meteorology (WBS Element 3.2) – In the schedule, work associated with meteorology drives ESP program duration and the application submittal date. (Completion date for this WBS element is about three months later than that for the next longest 2.x element.) This results from the required full year of on-site data collection combined with logistics associated with tower installation, instrument acquisition and calibration and data reduction and processing.

Applicants may wish to initiate some procurement and installation activity (e.g., WBS Elements 3.2.7 through 3.2.11), at multiple sites, if necessary, prior to final site selection to reduce overall duration times for the meteorology program.

Note: WBS Element 3.2.13, Perform routine instrument calibration activity, is shown as a continuous activity on the schedule. In practice these activities will be periodic (e.g., monthly, and quarterly) and will require only the time necessary to actually perform the calibrations, typically one week or less.

Geology/Seismology (WBS Element 3.3) – It has been assumed that six months (26 weeks) will be required to perform the drilling program, including installation of ground water testing and monitoring wells. Adequacy of the assumed time period should be evaluated in light of site-specific conditions and drilling program logistics (e.g., based on completion of the field data collection plan [WBS Element 3.3.2.2] and consultation with the drilling contractor(s) [WBS Element 3.3.2.9]). Effects of any time extensions required to complete WBS Element 3.3.2.9 should be evaluated as soon as possible for potential effects on the overall schedule for application preparation. In particular, effects on geotechnical and seismic analyses and on the ground water program should be assessed.

Hydrology (Ground Water) (WBS Element 3.4) – Completion of ground water characterizations will require collection of data over a full hydrologic cycle; an assumption that this will require a full year (52 weeks) of monitoring has been incorporated into the schedule. It was also assumed that the well installation will progress on a schedule such that monitoring can begin four weeks after the drilling program is initiated. Applicants should carefully evaluate both of these assumptions in light of site-specific conditions and drilling program logistics. Delays of more than about three months in initiating ground water monitoring could extend completion of the ground water program to a date beyond that estimated for WBS Element 3.2, thus delaying application submittal.

Hydrology (Surface Water) (WBS Element 3.5) – Completion of surface water characterizations will require collection of data over a full hydrologic cycle. An assumption that this will require a full year (52 weeks) of monitoring has been incorporated into the schedule.

Terrestrial Ecology (WBS Element 3.6) – Duration for the field-sampling program is listed as 40 weeks. This schedule is based on four seasonal field data collection and sampling visits conducted beginning in Y1Q3 Actual schedule for these studies will depend on site ecological conditions and on ESP program timing. Sites that do not experience four distinct seasons may not require four separate sampling visits to adequately characterize terrestrial conditions; for these sites, it may be possible to reduce the field-sampling schedule. Depending on ESP timing and yearly variations in weather, the assumed 40-week field data collection period (Y1Q3 to Y2Q2) may not overlap all four seasonal conditions. In such cases, the duration of this task must be extended to allow for sampling under representative seasonal conditions.

Aquatic Ecology (WBS Element 3.7) – See assumptions listed for WBS Element 2.6, above.

Socioeconomics (WBS Element 3.8) – Time required for ESP socioeconomics studies is not a significant constraint in the overall schedule. Because local and regional economic conditions could change (or new data could become available) over the two-year span of the ESP program, applicants may wish to delay starting these studies until later than shown on the schedule (e.g., Y2Q1) to ensure that the latest data are incorporated and that revision of the analysis is not required. This issue of task timing and the problem of conditions that may evolve over the ESP application preparation period also applies to WBS Elements 3.9 and 3.10.

Land Use (WBS Element 3.9) – The aerial photograph duration shown (WBS Element 3.9.1) addresses time necessary to obtain custom, site-specific photographs for land use analysis. Time of year, ground cover (e.g., leafing), and weather conditions may affect logistics associated with aerial photography and the actual time required may vary accordingly. Applicants may wish to discuss logistics for this task with air photo contractors early in the ESP process (e.g., during site selection) to obtain an accurate estimate of the time required for sites under consideration. Note that the duration assumed for this task does not address logistics of detailed aerial topographic mapping (e.g., as would be used for site grading design), which requires extensive ground-referencing during the photography over-flights.

Depending on development trends in the site area, land use conditions could change over the two-year span of the ESP program; accordingly, applicants may wish to delay starting these studies until later than shown on the schedule (e.g., Y2Q1) to ensure that the latest data are incorporated and that revision of the analysis is not required.

Demography (WBS Element 3.10) – Scope of studies reflected in the schedule includes studies necessary to provide demographic analyses required in the ESP application; demographic input to the cost-benefit analyses specified in 10 CFR 50, Appendix I are assumed to be part of the COL application. Depending on population growth trends in the site area, demographic conditions could change over the two-year span of the ESP program; accordingly, applicants may wish to delay starting these studies until later than shown on the schedule (e.g., Y2Q1) to ensure that the latest data are incorporated and that revision of the analysis is not required.

Archeological and Historic Resources (WBS Element 3.11) – Of the tasks associated with this WBS element, only the on-site survey (WBS Element 3.11.2) presents significant potential for schedule uncertainty or risk; a six month (26 week) duration has been assumed for the schedule. Uncertainties could arise as a result of (1) the presence of significant, known resources requiring a large mitigation or recovery effort, or (2) identification of such resources during the survey itself. Schedule impacts from the first condition can be mitigated by initiating early contact with the appropriate agencies to identify known resources. The second condition can be addressed by early initiation of on-site surveys, so that adequate time remains for mitigative actions. Thus, though there is considerable schedule float for these activities within the overall two year duration for preparing the ESP application, applicants may wish to proceed with archeological resources activities as early as feasible.

Noise (WBS Element 3.12) – No significant schedule uncertainties or issues are identified for these activities.

Visual Resources (WBS Element 3.13) – As shown in the schedule, there is considerable float in ESP visual resources activities. In scheduling this analysis, applicants need only be concerned that the "existing viewshed" photographs (WBS Element 3.13.1) are taken before any site preparation activities are initiated or the visual landscape is significantly altered by on-site ESP data collection activity.

Emergency Planning (WBS Element 3.14) – Preparation of emergency planning (EP) information required in the ESP application has been arbitrarily assigned a duration of 26 weeks. Because some EP information (e.g., egress constraints) will be evaluated during site selection, it has been assumed that this activity would begin 13 weeks prior to final site selection. Actual duration for this task will depend on the EP application option selected by applicants (Application Guide, Section 3.4) and, as applicable, the time necessary to effect liaison with local emergency response agencies.

B.3 Model ESP Program Schedule

The ESP model program schedule for a new or greenfield site is presented in the following pages. This schedule is in Microsoft Project® format.

The schedule is subject to the assumptions presented in Sections B.1 and B.2, above.

ID	Task Name
1	1. SELECT SITE
2	**2. MANAGEMENT AND COMMUNICATIONS**
3	2.1 Establish applicant team corporate organization structu
4	2.2 Define roles, responsibilities, and authorities
5	2.3 Establish plant design(s) to be considered; obtain PPE
6	**2.4 Develop overall ESP Program Plan**
7	2.4.1 Organization and responsibilities
8	2.4.2 Subcontracting plan
9	2.4.3 Public and institutional relations plans
10	2.4.4 Regulator relations plan
11	2.4.5 Agency contact plan and protocols for data coll
12	2.4.6 Program schedule and budget
13	2.5 Procure subcontracted services
14	2.6 Prepare overall project quality assurance plan (QAP)
15	**2.7 Obtain Access**
16	2.7.1 Obtain site access
17	2.7.2 Establish local support infrastructure
18	2.7.3 Negotiate access to offsite data collection areas
19	**3. TECHNICAL STUDIES**
20	**3.1 General**
21	3.1.1 Identify base map scales and develop standard
22	3.1.2 Develop Data Management Plan
23	3.1.3 Establish Quality Assurance/Quality Control Prc
24	3.1.4 Review site development plan
25	**3.2 Meteorology (AG Sections 3.2.3.2 and 3.2.2)**
26	3.2.1 Perform site survey
27	3.2.2 Select meteorological tower site
28	3.2.3 Collect climatic and meteorological data
29	3.2.4 Obtain existing air quality data
30	3.2.5 Develop meteorological data acquisition plan
31	3.2.6 Procure meteorological instrumentation and she
32	3.2.7 Procure meteorological tower
33	3.2.8 Procure tower erection services
34	3.2.9 Erect tower and install instruments
35	3.2.10 Perform initial instrument calibration
36	3.2.11 Perform meteorological data collection activitie
37	3.2.12 Perform routine instrument calibration activities
38	3.2.13 Perform data reduction and review
39	3.2.14 Perform meteorological and atmospheric dispe
40	3.2.15 Prepare report
41	**3.3 Geology/Seismology (AG Section 3.3.3.5)**
42	**3.3.1 Regional geologic and seismologic setting**
43	3.3.1.1 Collect and analyze literature data
44	3.3.1.2 Develop field data collection plan
45	3.3.1.3 Prepare regional geologic maps
46	3.3.1.4 Prepare seismic source maps

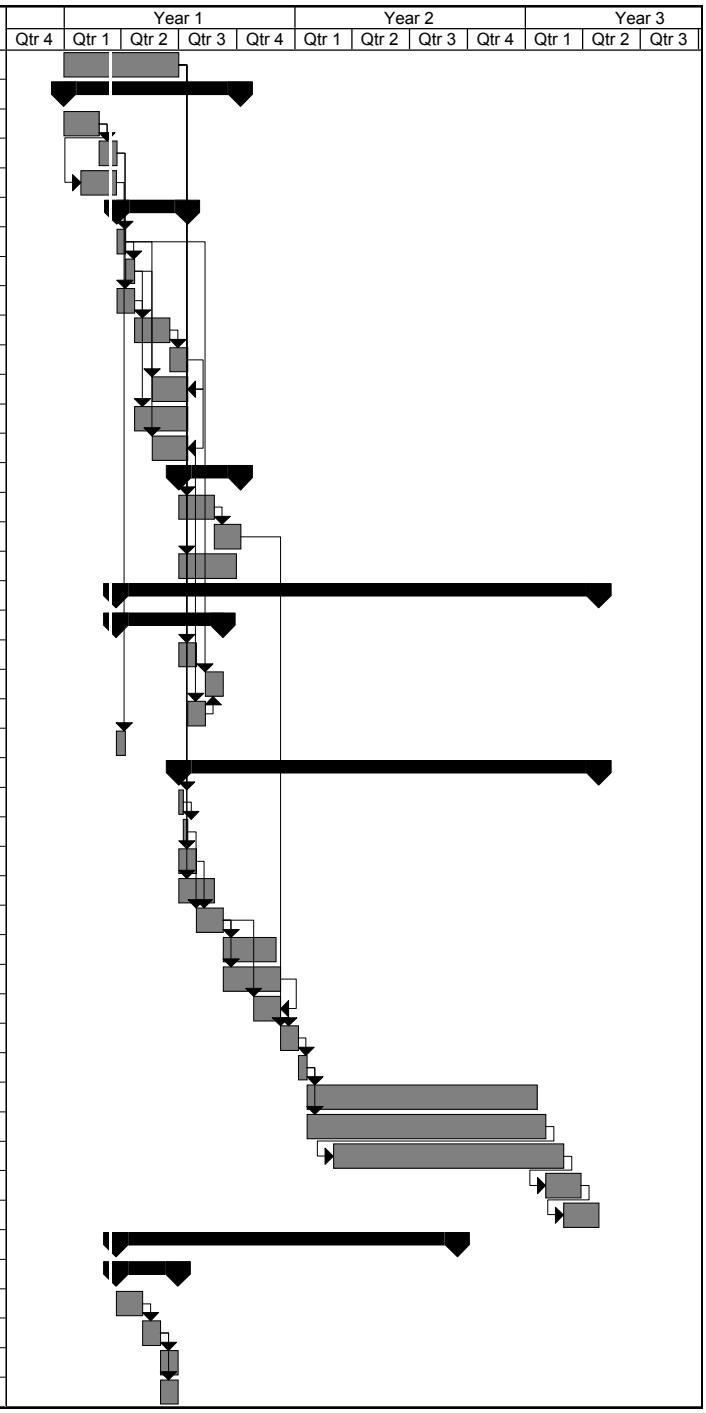

Figure B-1
Model ESP Program Schedule

ID	Task Name
47	**3.3.2 Sub-regional and site geologic and seismolo**
48	3.3.2.1 Collect and analyze literature data
49	3.3.2.2 Develop field data collection program
50	3.3.2.3 Identify sub-regional/local geologic stru
51	3.3.2.4 Develop geologic and geophysical map
52	3.3.2.5 Evaluate, select, and procure subcontra
53	3.3.2.6 Procure geophysical testing equipment
54	3.3.2.7 Conduct geophysical field testing
55	3.3.2.8 Develop geotechnical laboratory testing
56	3.3.2.9 Perform drilling program
57	3.3.2.10 Prepare geologic maps
58	3.3.2.11 Collect and deliver samples to laborato
59	3.3.2.12 Perform laboratory testing
60	3.3.2.13 Perform geotechnical analysis
61	3.3.2.14 Perform seismic analysis
62	3.3.2.15 Perform probabilistic seismic hazard a
63	3.3.2.16 Evaluate site seismic response
64	3.3.2.17 Establish site-specific seismic design p
65	3.3.3 Prepare report
66	**3.4 Hydrology (Ground Water) (AG Sections 3.3.3.2 and**
67	3.4.1 Collect and analyze literature data
68	3.4.2 Identify regional groundwater characteristics
69	3.4.3 Prepare field testing plan
70	3.4.4 Prepare laboratory testing plan
71	3.4.5 Evaluate, select, and procure subcontracted se
72	3.4.6 Procure pumping equipment and measurement
73	3.4.7 Install pumping equipment and instruments
74	3.4.8 Conduct aquifer pumping tests
75	3.4.9 Perform data analysis and modeling
76	3.4.10 Identify ground water effects on plant
77	3.4.11 Conduct water quality testing and collect wate
78	3.4.12 Conduct laboratory testing
79	3.4.13 Prepare report
80	**3.5 Hydrology (Surface Water) (AG Sections 3.3.3.2 and**
81	3.5.1 Collect and analyze literature data
82	3.5.2 Establish flood levels
83	3.5.3 Prepare field measurement program plan
84	3.5.4 Prepare laboratory testing plan
85	3.5.5 Procure measurement instrumentation
86	3.5.6 Install gaging stations and instruments
87	3.5.7 Evaluate, select, and procure analytical laborat
88	3.5.8 Conduct flow measurements, water quality testi
89	3.5.9 Conduct laboratory testing
90	3.5.10 Perform data analysis and modeling
91	3.5.11 Prepare report
92	**3.6 Terrestrial Ecology (AG Section 3.3.2)**
93	3.6.1 Collect and analyze literature data
94	3.6.2 Initial identification of local species, abundancy,
95	3.6.3 Prepare field data collection program
96	3.6.4 Procure field sampling equipment and supplies
97	3.6.5 Conduct field data acquisition and sampling pro
98	3.6.6 Collect and deliver samples to laboratory
99	3.6.7 Conduct laboratory testing
100	3.6.8 Perform data analysis and modeling
101	3.6.9 Final identification of local species, abundancy,
102	3.6.10 Prepare report

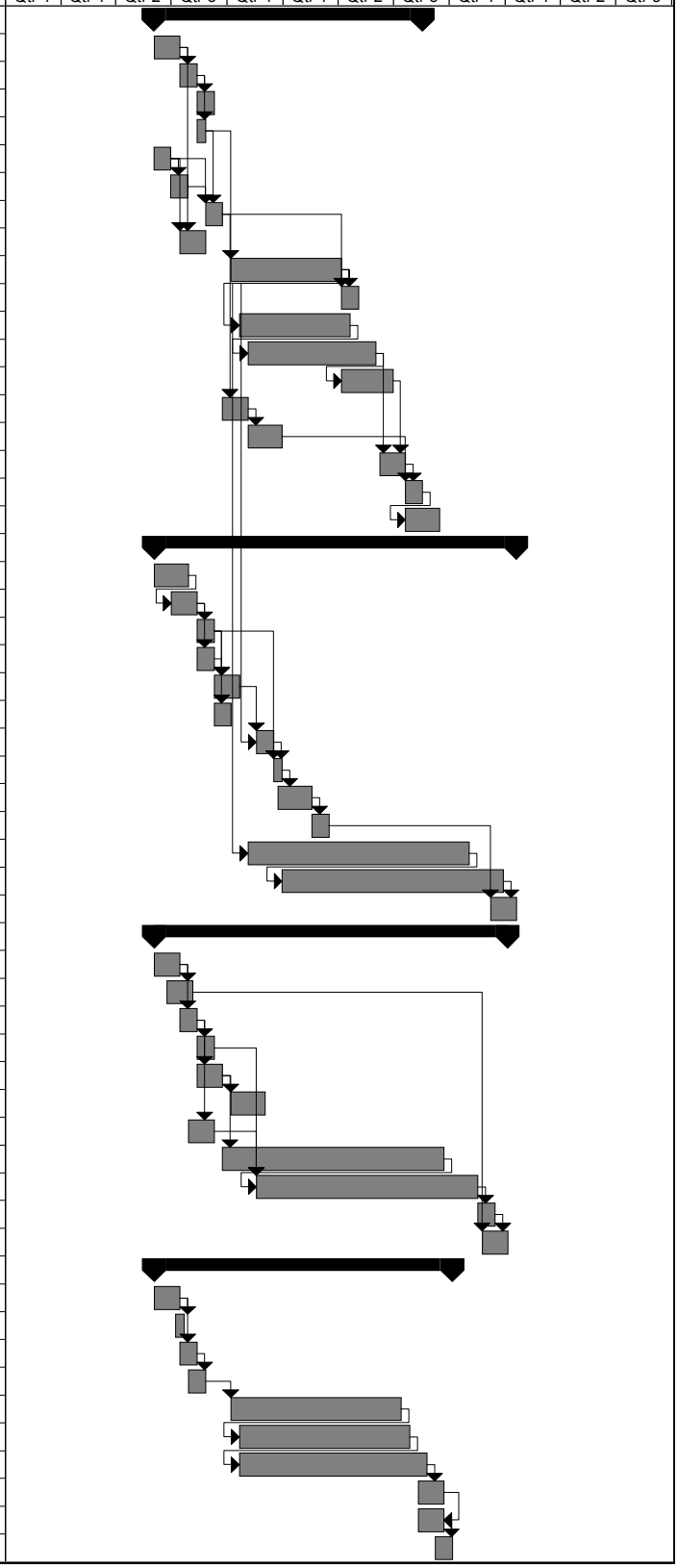

Figure B-1 (continued)

ID	Task Name
103	**3.7 Aquatic Ecology (AG Section 3.3.2)**
104	3.7.1 Collect and analyze literature data
105	3.7.2 Initial local species identification, abundancy, ar
106	3.7.3 Prepare field data collection program
107	3.7.4 Procure field sampling equipment and supplies
108	3.7.5 Conduct field data acquisition and sampling prc
109	3.7.6 Collect and deliver samples to laboratory
110	3.7.7 Conduct laboratory testing
111	3.7.8 Perform data analysis and modeling
112	3.7.9 Final identification of local species, abundancy,
113	3.7.10 Prepare report
114	**3.8 Socioeconomics (AG Section 3.3.2)**
115	3.8.1 Collect economic data
116	3.8.2 Data reduction and analysis
117	3.8.3 Perform economic modeling
118	3.8.4 Prepare report
119	**3.9 Land Use (AG Sections 3.3.3.3 and 3.3.2)**
120	3.9.1 Obtain aerial photographs
121	3.9.2 Collect and analyze literature data
122	3.9.4 Conduct windshield surveys
123	3.9.5 Conduct field verification surveys and interviews
124	3.9.6 Identify hazardous land uses
125	3.9.7 Prepare report
126	**3.10 Demography (AG Sections 3.3.3.4 and 3.3.2)**
127	3.10.1 Obtain Census data
128	3.10.2 Obtain growth projections
129	3.10.3 Perform demographic projections
130	3.10.4 Map demographic data
131	3.10.5 Prepare report
132	**3.11 Archeological And Historical Resources (AG Secti**
133	3.11.1 Contact agencies to identify known resources
134	3.11.2 Conduct on-site archeological survey
135	3.11.3 Map archeological and historical resources
136	3.11.4 Prepare report
137	**3.12 Noise (AG Section 3.3.2)**
138	3.13.1 Obtain existing noise data
139	3.13.2 Procure noise measurement equipment
140	3.13.3 Perform ambient noise measurements
141	3.13.4 Perform data reduction and analysis
142	3.13.5 Prepare report
143	**3.13 Visual Resources (AG Section 3.3.2)**
144	3.13.1 Obtain pre-construction viewshed photographs
145	3.13.2 Perform visual impact modeling
146	3.13.3 Prepare report
147	**3.14 Emergency Planning (AG Section 3.4)**
148	**4. APPLICATION**
149	**4.1 Prepare Application**
150	4.1.1 Contents of application (AG Section 4.1.0)
151	4.1.2 Establish functional responsibilities for applicati
152	4.1.3 Perform management functions
153	4.1.4 Perform technical accuracy and consistency re
154	4.1.5 Perform technical writing/editing functions
155	4.1.6 Produce application
156	4.1.7 Obtain internal approvals, signatures, and notar
157	4.1.8 Submit application to NRC; obtain receipt confi

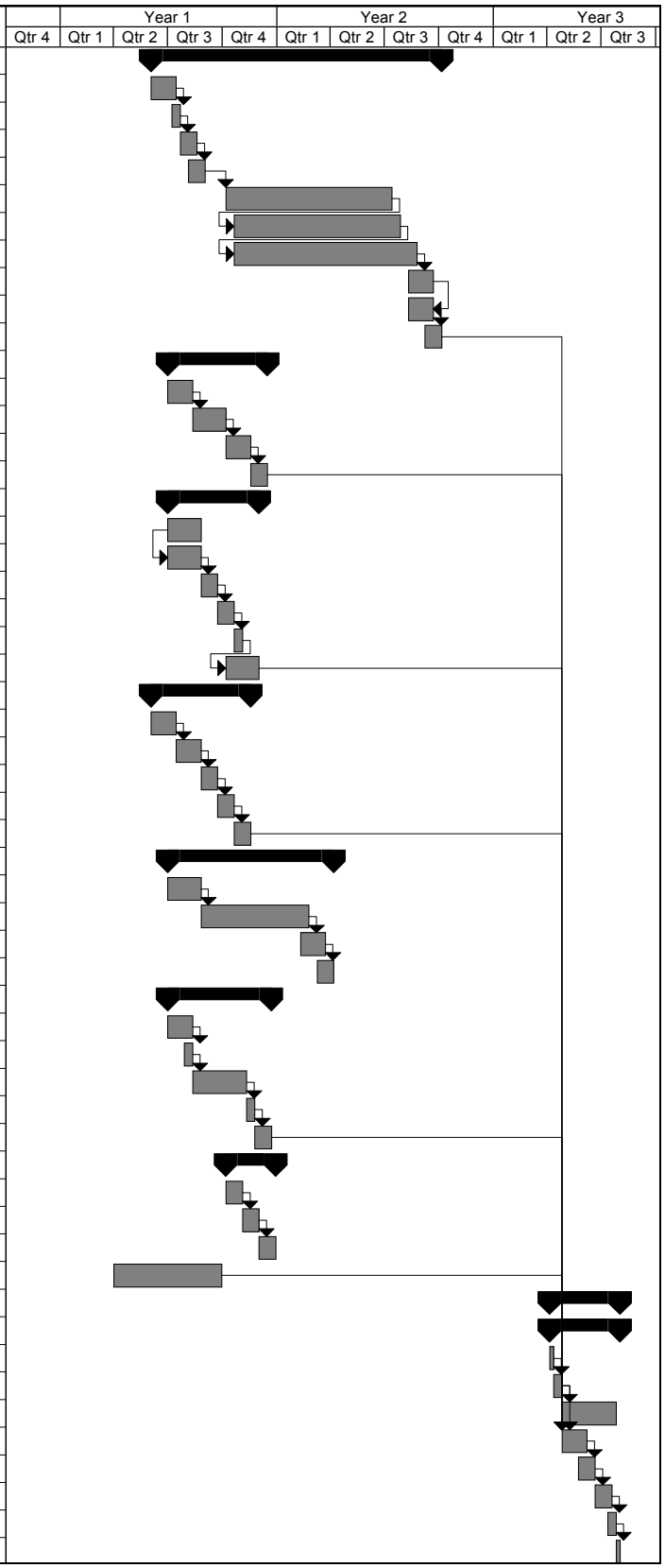

Figure B-1 (continued)

C
MODEL ESP SCHEDULE – EXISTING SITE

Applicants seeking an ESP at an existing site may be able to significantly reduce the effort – and time – necessary to prepare an application by utilizing data collected during a previous licensing action and, where applicable, during the operating phase of existing plants. The extent of any reductions in effort and time will depend on NRC's acceptance of data collected previously for use in a new ESP application. This Appendix provides a model ESP program schedule that reflects potential existing-site efficiencies.

Assumptions incorporated into development of the ESP existing-site schedule are provided in Section C.1; the existing-site ESP model program schedule is presented in Gantt chant format in Section C.2.

C.1 Scheduling Assumptions

C.1.1 Overall and Generic Assumptions

Overall, the schedule for existing sites reflects the same WBS and task interrelationships discussed in Sections 2 through 4, and the same assumptions and cautions listed in Appendix B also apply. However, the duration for individual tasks has been adjusted to reflect the use of existing data in developing an ESP application, as described in Section C.2. WBS elements that would not be applicable in the existing-site case have been deleted; WBS element numbering is the same as that presented in Appendix A

The actual degree to which existing data can be used in a current ESP application will depend on a number of factors, including:

- Conformance with current regulatory guidance and practice (e.g., seismology).
- How well data represents the geographic location for which the ESP is sought (e.g., meteorology, ecology).
- How representative the data is with respect to current conditions (e.g., land use, demography).

Successful use of existing data in an existing-site ESP application depends on resolution of these site-specific and technical issues. As noted in Section 6.1, applicants should initiate discussions with NRC, as early as possible in the ESP planning process, to determine the appropriate role of previously developed data in an ESP application.

To convert the model schedule in Appendix B, a specific set of assumptions was made regarding how the ESP program scope can be reduced at an existing site. In general, the schedule presented in this Appendix reflects maximum utility of existing data (i.e., maximum reduction in effort) for all ESP program activities and disciplines. In reality, the use of existing data will vary by site and by technical discipline. Accordingly, applicants should carefully examine the model existing-site schedule assumptions to determine how well they correspond to conditions surrounding their ESP program. Obviously, adjustments to the existing-site schedule should be made to reflect actual site and technical issues, as well as associated licensing issues identified in conversations with NRC.

C.1.2 Management and Communications Assumptions (WBS Level 2.x)

No changes were made for WBS Elements 2.1 through 2.6. These management functions are, in general, applicable to both existing and greenfield sites. In both cases, these activities are scheduled in parallel with site selection studies. WBS elements for negotiating site access and establishing site infrastructure have been deleted.

C.1.3 Management and Communications Assumptions (WBS Level 3.x)

Scheduling assumptions for technical tasks (as they differ from the model ESP schedule in Appendix B) used to develop the existing-site ESP schedule are listed below. Approximate reductions in task duration resulting from applying the listed assumptions are shown in brackets.

Site Access (WBS Element 2.7) [10 weeks] – It is assumed that the applicant already has full access to the site under consideration and that no new legal arrangements are required to effect access for site surveys, etc. The need for off-site access is assumed to be minimal; any new legal arrangements can be negotiated quickly through existing channels of communication.

Meteorology (WBS Element 3.2) [83 weeks] – It is assumed that meteorological data from an existing on-site monitoring program will be adequate for the ESP application. The following activities have been eliminated:

- Procurement and erection of the meteorology tower.
- Instrument procurement and calibration.
- Data collection for a one year period-of-record data
- Data reduction and review

Geology/Seismology (WBS Element 3.3) [42 weeks] – It is assumed that a nominal, 6 week duration, on-site field drilling and testing program will be necessary to develop engineering and earthquake response data at the new site. It is also assumed that no major new geologic drilling or testing will be required to identify or characterize capable faults or earthquake propagation characteristics of the site region.

Hydrology (Ground Water) (WBS Element 3.4) [75 weeks] – It is assumed that some ground water samples will be collected from geotechnical boreholes to confirm ground water quality in the water table at the new site; no deep aquifer ground water testing is included in the schedule. No pumping tests of water table or deep ground water aquifers are incorporated into the schedule.

Hydrology (Surface Water) (WBS Element 3.5) [71 weeks] – It is assumed that existing site water quality monitoring stations adequately characterize surface water quality entering and leaving the site property and that no additional water quality monitoring is required. It is also assumed that flooding analyses for the existing plant need only to be updated for the new site; no major new flood analysis will be required.

Terrestrial Ecology (WBS Element 3.6) [53 weeks] – It is assumed that a single field trip to the new site will be conducted to confirm on-site species presence and habitat; minor laboratory analysis of samples is also assumed.

Aquatic Ecology (WBS Element 3.7) [52 weeks] – See assumptions listed for WBS Element 2.6, above.

Socioeconomics (WBS Element 3.8) – No change from model ESP schedule.

Land Use (WBS Element 3.9) – No change from model ESP schedule.

Demography (WBS Element 3.10) – No change from model ESP schedule.

Archeological and Historic Resources (WBS Element 3.11) [13 weeks] – Assumed duration for on-site archeological survey has been reduced to 13 weeks to account for a higher degree of knowledge of historic resources at an existing site.

Noise (WBS Element 3.12) – No change from model ESP schedule.

Visual Resources (WBS Element 3.13) – No change from model ESP schedule.

Emergency Planning (WBS Element 3.14) – No change from model ESP schedule.

C.1.4 Application Assumptions (WBS Level 4.x)

No change from model ESP schedule.

C.2 Model Existing-Site ESP Program Schedule

The ESP model program schedule for an existing site is presented in the following pages. This schedule is in Microsoft Project® format.

The schedule is subject to the assumptions presented in Section C.1, above. Overall, the existing-site schedule shows a total reduction in time from site selection to filing the ESP of about one year over the model ESP schedule presented in Appendix B. Applicants are cautioned that such dramatic schedule efficiencies can only result in the unlikely event that optimal conditions pertain in each and every the technical area. As discussed above, applicants should carefully evaluate any projected schedule efficiencies in light of actual technical data, site conditions, and NRC positions.

ID	Task Name
1	1. SELECT SITE
2	**2. MANAGEMENT AND COMMUNICATIONS**
3	2.1 Establish applicant team corporate organization struct
4	2.2 Define roles, responsibilities, and authorities
5	2.3 Establish plant design(s) to be considered; obtain PPI
6	**2.4 Develop overall ESP Program Plan**
7	2.4.1 Organization and responsibilities
8	2.4.2 Subcontracting plan
9	2.4.3 Public and institutional relations plans
10	2.4.4 Regulator relations plan
11	2.4.5 Agency contact plan and protocols for data col
12	2.4.6 Program schedule and budget
13	2.5 Procure subcontracted services
14	2.6 Prepare overall project quality assurance plan (QAP)
15	**2.7 Obtain Access**
16	2.7.3 Negotiate access to offsite data collection area
17	**3. TECHNICAL STUDIES**
18	**3.1 General**
19	3.1.1 Identify base map scales and develop standarc
20	3.1.2 Develop Data Management Plan
21	3.1.3 Establish Quality Assurance/Quality Control Pr
22	3.1.4 Review site development plan
23	**3.2 Meteorology (AG Sections 3.2.3.2 and 3.2.2)**
24	3.2.3 Collect climatic and meteorological data
25	3.2.4 Obtain existing air quality data
26	3.2.13 Perform data reduction and review
27	3.2.14 Perform meteorological and atmospheric disp
28	3.2.15 Prepare report
29	**3.3 Geology/Seismology (AG Section 3.3.3.5)**
30	**3.3.1 Regional geologic and seismologic setting**
31	3.3.1.1 Collect and analyze literature data
32	3.3.1.3 Prepare regional geologic maps
33	3.3.1.4 Prepare seismic source maps
34	**3.3.2 Sub-regional and site geologic and seismol**
35	3.3.2.1 Collect and analyze literature data
36	3.3.2.2 Develop field data collection program
37	3.3.2.3 Identify sub-regional/local geologic stru
38	3.3.2.4 Develop geologic and geophysical maj
39	3.3.2.5 Evaluate, select, and procure subcontra
40	3.3.2.8 Develop geotechnical laboratory testing
41	3.3.2.9 Perform drilling program
42	3.3.2.10 Prepare geologic maps
43	3.3.2.11 Collect and deliver samples to laborato
44	3.3.2.12 Perform laboratory testing
45	3.3.2.13 Perform geotechnical analysis
46	3.3.2.14 Perform seismic analysis
47	3.3.2.15 Perform probabilistic seismic hazard a
48	3.3.2.16 Evaluate site seismic response
49	3.3.2.17 Establish site-specific seismic design
50	3.3.3 Prepare report
51	**3.4 Hydrology (Ground Water) (AG Sections 3.3.3.2 ar**
52	3.4.1 Collect and analyze literature data
53	3.4.2 Identify regional groundwater characteristics
54	3.4.9 Perform data analysis and modeling
55	3.4.10 Identify ground water effects on plant
56	3.4.11 Conduct water quality testing and collect wate
57	3.4.12 Conduct laboratory testing
58	3.4.13 Prepare report
59	**3.5 Hydrology (Surface Water) (AG Sections 3.3.3.2 ar**
60	3.5.1 Collect and analyze literature data
61	3.5.2 Establish flood levels
62	3.5.11 Prepare report

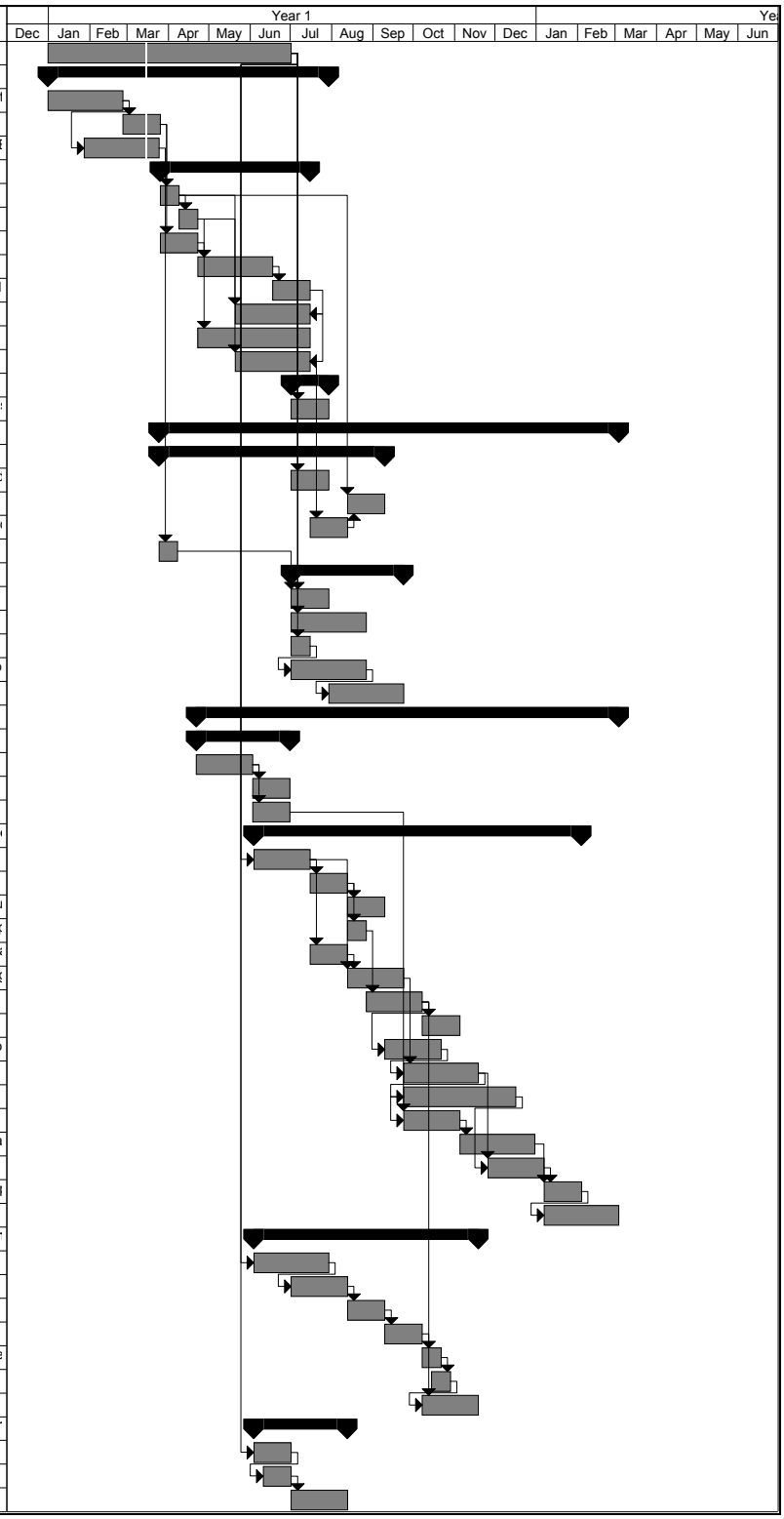

Figure C-1
Model Existing-Site ESP Program Schedule

ID	Task Name
63	**3.6 Terrestrial Ecology (AG Section 3.3.2)**
64	3.6.1 Collect and analyze literature data
65	3.6.2 Initial identification of local species, abundancy
66	3.6.3 Prepare field data collection program
67	3.6.5 Conduct field data acquisition and sampling pr
68	3.6.6 Collect and deliver samples to laboratory
69	3.6.7 Conduct laboratory testing
70	3.6.8 Perform data analysis and modeling
71	3.6.9 Final identification of local species, abundancy,
72	3.6.10 Prepare report
73	**3.7 Aquatic Ecology (AG Section 3.3.2)**
74	3.7.1 Collect and analyze literature data
75	3.7.2 Initial local species identification, abundancy, a
76	3.7.3 Prepare field data collection program
77	3.7.5 Conduct field data acquisition and sampling pr
78	3.7.6 Collect and deliver samples to laboratory
79	3.7.7 Conduct laboratory testing
80	3.7.8 Perform data analysis and modeling
81	3.7.9 Final identification of local species, abundancy,
82	3.7.10 Prepare report
83	**3.8 Socioeconomics (AG Section 3.3.2)**
84	3.8.1 Collect economic data
85	3.8.2 Data reduction and analysis
86	3.8.3 Perform economic modeling
87	3.8.4 Prepare report
88	**3.9 Land Use (AG Sections 3.3.3.3 and 3.3.2)**
89	3.9.1 Obtain aerial photographs
90	3.9.2 Collect and analyze literature data
91	3.9.4 Conduct windshield surveys
92	3.9.5 Conduct field verification surveys and interview
93	3.9.6 Identify hazardous land uses
94	3.9.7 Prepare report
95	**3.10 Demography (AG Sections 3.3.3.4 and 3.3.2)**
96	3.10.1 Obtain Census data
97	3.10.2 Obtain growth projections
98	3.10.3 Perform demographic projections
99	3.10.4 Map demographic data
100	3.10.5 Prepare report
101	**3.11 Archeological And Historical Resources (AG Sec**
102	3.11.1 Contact agencies to identify known resources
103	3.11.2 Conduct on-site archeological survey
104	3.11.3 Map archeological and historical resources
105	3.11.4 Prepare report
106	**3.12 Noise (AG Section 3.3.2)**
107	3.13.1 Obtain existing noise data
108	3.13.2 Procure noise measurement equipment
109	3.13.3 Perform ambient noise measurements
110	3.13.4 Perform data reduction and analysis
111	3.13.5 Prepare report
112	**3.13 Visual Resources (AG Section 3.3.2)**
113	3.13.1 Obtain pre-construction viewshed photograph
114	3.13.2 Perform visual impact modeling
115	3.13.3 Prepare report
116	**3.14 Emergency Planning (AG Section 3.4)**
117	**4. APPLICATION**
118	**4.1 Prepare Application**
119	4.1.1 Contents of application (AG Section 4.1.0)
120	4.1.2 Establish functional responsibilities for applicat
121	4.1.3 Perform management functions
122	4.1.4 Perform technical accuracy and consistency re
123	4.1.5 Perform technical writing/editing functions
124	4.1.6 Produce application
125	4.1.7 Obtain internal approvals, signatures, and nota
126	4.1.8 Submit application to NRC; obtain receipt confi

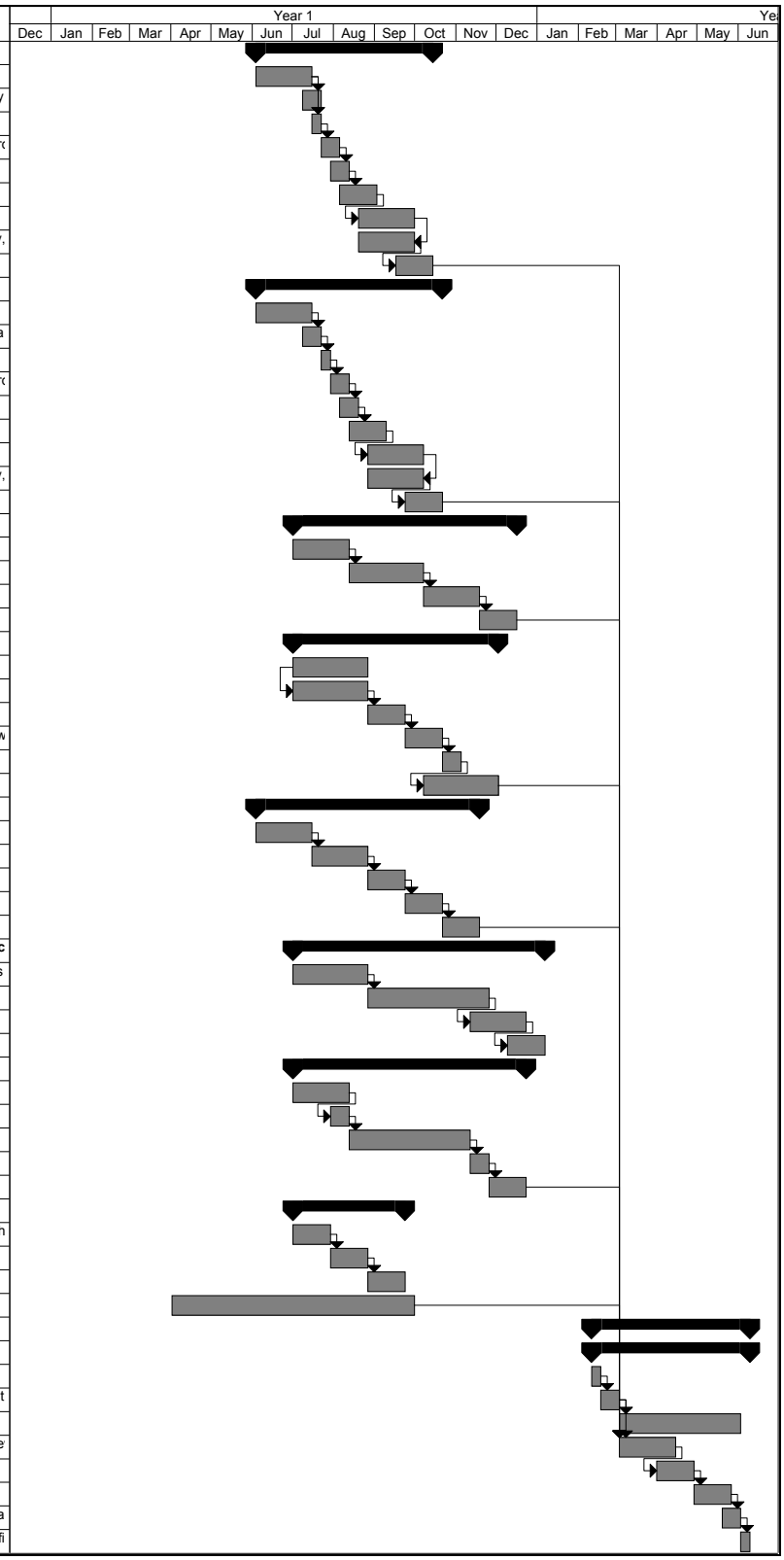

Figure C-1. (continued)

Strategic Science and Technology Program

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