IMPLEMENTING SYSTEMATIC PROJECT PLANNING

What is systematic project planning?

Systematic planning is the process for determining where an individual or organization is going, how they are going to get there, and how they will know if they got there or not. Many in the environmental community have recognized the need for systematic project planning as reflected in the EPA's data quality objective (DQO) process, the U.S. Army Corps of Engineers' (USACE) *Technical Project Planning (TPP) Guidance* (USACE 1998), the U.S. Air Force's *Performance-Based Management Master Guidance* (November 2005) and others. In many cases confusion is caused by the different names applied to the similar Systematic Planning Processes used by different federal agencies and departments. In this document the Systematic Planning Process (SPP) will refer to the planning process that is based on the scientific method and includes planning management of the many non-science issues that impact site cleanup, such as uncertainty about budgets and contracts, stakeholder interests and fears, legal concerns, and regulatory interpretation. To be effective SPP must address all uncertainties that affect how a project's end goals are framed, shaping the decisions that must be made to bring the site to closure and reuse (Remediation 2005).

Effective SPP consists of several activities, including:

- Stakeholder involvement - building "social capital", a cohesive team of project stakeholders (such as site owners, regulators, community members, and technical specialists) suited to address site-specific problems
- Identification of project objectives/goals - development of clear objectives based on property re-use scenarios or known end uses and likely site remedies (i.e. site exit strategy). The project objectives drive the decisions that need to be made. Project objectives and decisions are identified by the stakeholders based on the information in a conceptual site model (CSM).
- Design of sampling and data management activities to achieve project objectives - stakeholders identify data needs based on the CSM, and develop strategies to collect and evaluate data needed to manage the principal sources of uncertainty that affect decision-making.
- Design of remediation approach, performance objectives, and metrics – stakeholders identify remedial options based on the CSM and develop strategies to implement, monitor performance, optimize, and shut down remedies.

SPP encompasses activities that extend beyond data collection to determine compliance with some action level or cleanup goal. During SPP, the CSMs is used to help evaluate site reuse options, guide remedial design, and develop long-term monitoring strategies. The Systematic Planning Process can be applied to individual sites or to entire installations. For federal facilities, the individual site systematic plans process must comply with the master installation-wide strategic plan. While there is no checklist for performing SPP, most SPP address the following key considerations:

- Building of social capital among project stakeholders

- Clear identification of project objectives, timelines, and other constraints
- Developing a CSM and defining potential exposure scenarios
- Addressing data and resource needs
- Identifying project boundaries and decision criteria
- Development of acceptable levels of uncertainty
- Agreement on ARARs and exit strategy
- Approaches for managing programmatic and project non-scientific and scientific uncertainties
- Translating project needs into sampling, analysis, and decision-making requirements

The foundation of SPP is formed by identifying stakeholders, articulating objectives, addressing constraints, recognizing the regulatory framework, and specifying decision statements. Achieving stakeholder consensus on reuse goals is an integral part of SPP, along with risk management, redevelopment concerns, scientific and legal defensibility, and site closeout.

When is SPP performed?

SPP is practiced throughout a project, and not just in the beginning phases. SPP is an iterative process that continues as the site CSM evolves. By building social capital, developing a CSM, and defining potential exposure scenarios, SPP is applicable to any type of environmental remedial project. These range from those for site assessment and investigation, to cleanup design and implementation, and to long-term operations and monitoring. For example, for a site that is looking to achieve closure, SPP can be used to bring together the key stakeholders needed to agree on the steps to reaching closure, even when those steps do not include performing additional field activities.

How does SPP build social capital among project stakeholders?

SPP is performed using teams. The core team would include representatives of the responsible party, regulatory agencies, local groups or organizations, and technical expertise resources. The intent of the core team is to support consensus-based decision-making. For core teams to be successful, participants must be committed to work through technical issues in a non-adversarial manner. Successful core teams are also ones where there is membership continuity over the life-cycle of a project, since the team will embody a collective understanding of the technical and political basis for work done to date, and work proposed for the future.

Planning for environmental projects includes a wide variety of individuals and institutions, including project management and technical personnel, customers, suppliers, scientific experts, and other stakeholders, who together will determine if the project is successful. This is called a team-based approach to planning. Team-based approaches to planning are often used in the Superfund process to streamline the process of reaching cleanup decisions. By jointly determining the information (and the associated quality criteria), the “team” ensures that needs and expectations are identified up-front and that rework to meet these expectations later is minimized. One example of a “team” might include Federal Facility personnel (e.g., base personnel, contract managers, contractors) which meet in a scoping meeting with their counterparts in regulatory agencies to develop the plan for environmental data collection. Other members would include technical experts in human health and ecological risk assessment, hydrogeology, chemistry, and quality assurance, along with design engineers who understand remediation choices, may participate in the process, either in team meetings or in consultations behind the scenes. Other members might include individuals from the community. Community stakeholders participate in the process through routine briefings and public meetings on the proposed team approach. The end result of the team-approached planning is that the team identifies the decisions to be made, along with known and missing information and determines what information must be collected to support quality decision making activities.

Project managers should facilitate stakeholder involvement and commitment throughout the project, particularly during field activities so that concerns can be managed and addressed in real time. Stakeholder involvement early in the process and continuing as the project is ongoing is crucial to avoiding disputes or last minute surprises associated with stakeholder concerns. Increased involvement of the project manager and senior project staff at critical times or delegating greater decision-making power to the field technical team is also necessary to ensure quality field investigations are conducted with optimum efficiency. Effective SPP requires the management of decision uncertainty (beginning with all parties agreeing on what the project decisions should actually be), the "human factor" is as integral to successful SPP as technological and scientific ones.

Why is it important to identify clear project objectives/goals during SPP?

It is critically important that project stakeholders agree on project objectives/goals before development of a project plan. The following are examples of the types of questions that often are considered during development of project objectives:

- What are the potential environmental issues at the site?
- What are the potentially-impacted media and receptors?
- What is the planned reuse?
- What is the economic viability of cleanup?
- Who is responsible for cleanup of the site?
- What is the nature and extent of contamination?
- What is the estimated fate and transport of contaminants?
- Are exposure pathways complete?
- What are the appropriate cleanup levels for the site?
- Is there sufficient data to support closure?
- What data are needed to support implementation of potential remedies?
- Do viable treatment or containment technologies or other alternatives exist?
- What is the preferred remedial alternative?
- What is the estimated cost for redevelopment of the site?
- What data are needed to evaluate remedy effectiveness?
- How can closure be documented?

- How can system performance be optimized and operating costs reduced?

Why Use Systematic Planning Process

Too often during the course of performing environmental investigations, insufficient attention is directed to establishing clear objectives for the work, sometimes leading to unproductive investigations that fail to efficiently gather the information necessary for scientifically defensible decisions.

Benefits Using Systematic Planning Process

There are certain benefits that result from using a Systematic Planning Process. The benefits include:

- Encouraging comprehensive, careful planning by soliciting input from concerned customers and stakeholders;
- Addressing costs and schedule in the design phase, the critical time to address total project constraints;
- Communicating and documenting proposed activities and decisions to be made so that *everyone* has a common understanding of requirements when considering the data collection or work design, strategies, and the end use of products;
- Addressing the concerns of customers, suppliers, and relevant technical experts for products, services, and activities, thus minimizing the possibility of repeating work because of inappropriate or inadequate project implementation; and
- Facilitating the application of promising innovative technology by reconciling technology capabilities with site-specific considerations.

Products of Systematic Planning Process (SPP)

There are several ways to document the progress of the Systematic Planning Process, i.e., correspondence, after action reports, progress reports, and meeting or planning minutes. The products of the SPP include: Living Conceptual Site Models, Dynamic Work Strategies, Demonstrations of Methods Applicability as necessary, and Standard Project Planning documents (Quality Assurance Project Plans, Field Sampling Plans, and Environmental Health & Safety documentation, Standard Operating Procedures, etc.)

Triad Systematic Planning Checklist

The following items are essential points to cover as part of a Triad systematic planning process for a hazardous waste site characterization/remediation effort.

Regulations and Guidance

- ✓ What is the regulatory framework within which action(s) are being taken?
- ✓ What pertinent guidance exists (e.g., if RCRA, what current RCRA guidance exists that will be relevant to any action taken. For groundwater actions see http://www.epa.gov/superfund/resources/gwdocs/)?
- ✓ What types of review (i.e., regulatory, in-house legal, etc.) will be required throughout the process?

- ✓ What are the site ARARs?
  - Will any ARAR waivers be required?
  - Does a TI waiver need to be considered?

Stakeholders

- ✓ Who are the key stakeholders pertinent to the action being taken:
  - Who is paying the bills?
  - Who has overall responsibility for the project?
  - Who has day-to-day responsibility for the project?
  - Who are the regulators?
  - Who is providing technical support and/or technical review?
  - Who are the public stakeholders?
  - One clear criterion for determining who is a stakeholder: If they hold a veto, legal or otherwise, they are a stakeholder.

Conceptual Site Model - What is the current Conceptual Site Model (CSM) for the site?

- ✓ What are the project boundaries?
  - Are there individual sites that all contribute to a larger site?
- ✓ What are the contaminants of concern or potential concern?
- ✓ What are the potential receptors under current and reasonably expected future exposure pathways?
- ✓ What is the site geology and hydrogeology?
- ✓ What are the contaminant fate and environmental transport mechanisms?
  - Geochemical conditions?
  - Biological conditions?
- ✓ What information is currently available pertinent to the contamination status of the site?
- ✓ Has a risk assessment been performed, and if not is one required?
- ✓ Are there residual sources contributing to a groundwater plume?
  - How are source areas being defined?
  - Does the site have a DNAPL source?
- ✓ What is the groundwater designation?
- ✓ What are the contaminant levels that require action, what is their technical basis, and how are they defined?
- ✓ What past remedial actions and locations of remedial components and monitoring points?
- ✓ What are all historical, current, and expected future land uses?
- ✓ What are the decisions that will need to be made?
- ✓ Where are the sources of uncertainty within the CSM that prevent decisions from being made based on existing information?
- ✓ Which of those uncertainty sources can be addressed by data collection?
- ✓ What decision uncertainty cannot be addressed by data collection? What contingencies are required to address this uncertainty?

Exit Strategy

- ✓ What is the exit strategy for the overall project (note components may vary based on the stage of CSM development)?
  - o What are the environmental conditions that pose an unacceptable risk that requires remediation?
  - o What are the remedial action objectives (RAOs) that must be met to mitigate the risk?
  - o What is the means selected to achieve the objectives?
  - o Metrics to be used to demonstrate success?
  - o Manner in which cleanup goal attainment will be demonstrated?
  - o What are the required post closure actions?
- ✓ What are the agreed to land use and risk strategies?
- ✓ How does the site exit strategy translate into project decision logic?
  - o Program level decision logic and how does it link to project level decision logic?
  - o What is the project level decision logic?
  - o How do goals for individual sites impact each other?
  - o Are there logical interim actions to take?
  - o What is the field level decision logic?
  - o Who needs to be involved at various decision points?
- ✓ How will decision logic be documented?
  - o What is the written or graphical summary of the program and project decision logic which show the planned action steps, performance metrics, decision points, conditions that elicit alternatives, contingency actions, and conditions required for response complete?

<u>Remedy</u>

- ✓ What is the proposed future land use for the project?
- ✓ What precedents exist for problems of this sort either on-site or at similar sites?
- ✓ Is there a presumed remedy that will most likely be implemented, if remediation is necessary?
- ✓ What are the information requirements necessary for documenting closure?
- ✓ What is the probability of the remedy failure and what is the consequence of failure?
- ✓ Would the RA benefit from a phased combined technology approach?

<u>Project Planning and Management</u>

- ✓ Who constitutes the core planning team for the project (i.e., who will actively participate in planning and decision-making)?
- ✓ What is the core team's expectations for the systematic planning process?
- ✓ What are the project boundaries (spatial, temporal, contaminant-specific, programmatic)?
- ✓ Does this project have linkages with other planned, on-going, or completed projects on site? If so, what are those linkages?
- ✓ What is the overall project strategy?

- ✓ What constraints are known that might affect project strategy (e.g. budgetary, programmatic, real-estate access, procurement, schedule, past precedent, litigation potential, etc.)?
- ✓ How can a dynamic work strategy be implemented using real-time techniques to address data gaps?
- ✓ Is there a way to compress activities required to achieve exit strategy?
- ✓ What are the analytical and/or measurement options for addressing data gaps?
- ✓ What contract mechanisms are available to execute the work and are they the most suitable for the project?
- ✓ What will the documentation process look like to support the strategy (e.g., types of documents, purpose, review requirements, etc.)?
- ✓ What is the project communication strategy?
    - Specifically define what decisions individual stakeholders need to weigh in on.

General Facilitated Systematic Planning Session Characteristics

- Introduce and clearly define participant roles/responsibilities
- Identify meeting objectives
- Establish expectations and ground rules
- Provide structure worksheets for meetings
- Keep meetings on timeline
- Provide a means for articulating CSM
- Identify and gain consensus on key project uncertainties and contingencies
- Define acceptable levels of uncertainty
- Translate into sampling, analysis, and decision-making requirements
- Track progress and provide updates
- Identify and track action items
- Support consensus decision-making
- Provide mechanism for decision-making when consensus is not achievable
- Establish tentative project schedule