


Defining the Design Basis for SFC Projects

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December 18, 2012




Topics for Today

- Thinking about projects v thinking about process
- Brief overview of PMPro
- When does the design happen?
- The basis of design - the EPR and its cousins
- The interagency engineering report format
- EPR and the STARS data system

The Logic of Scoping and Funding

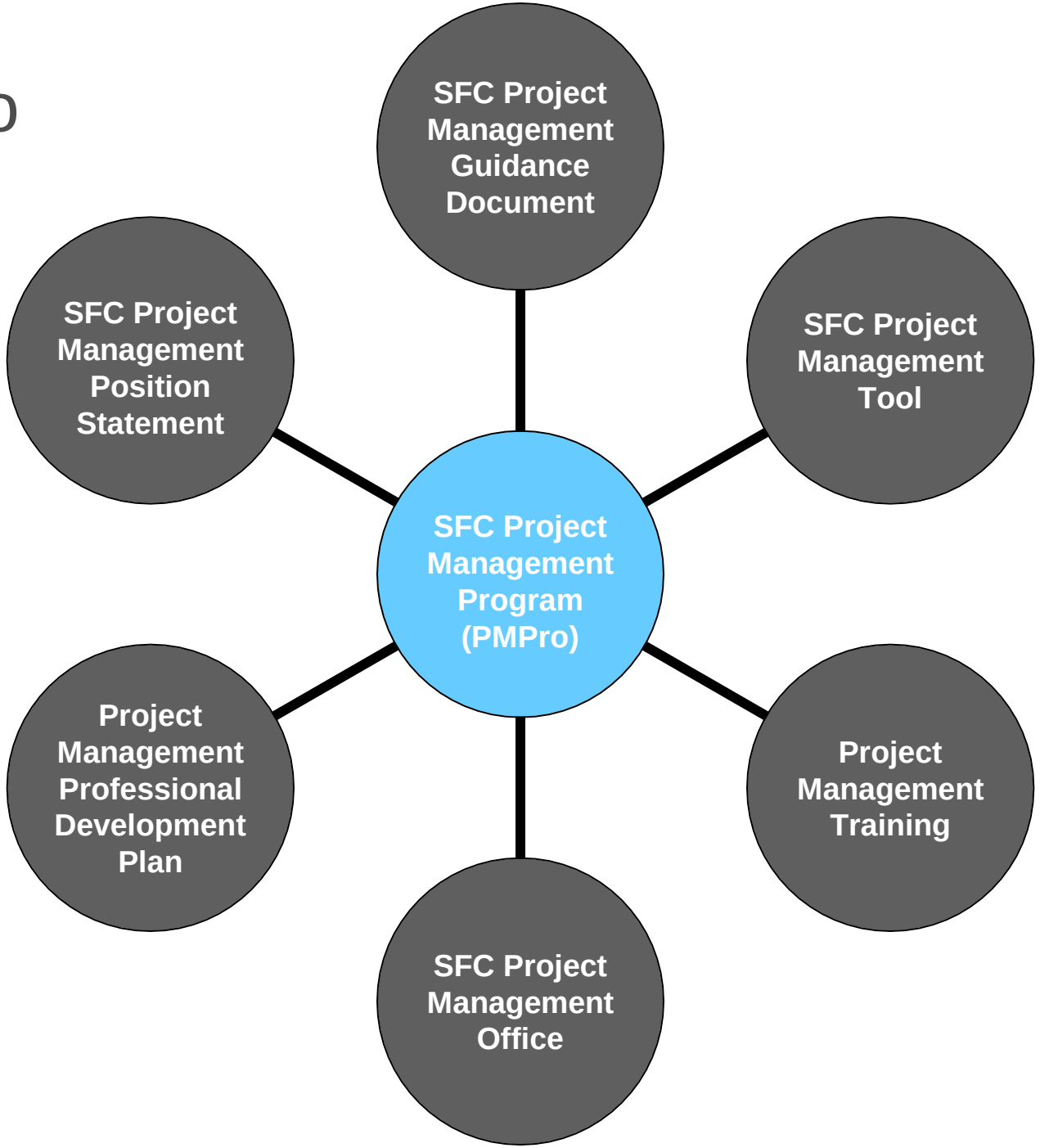
What makes the most sense?

To scope a project and then fund it.

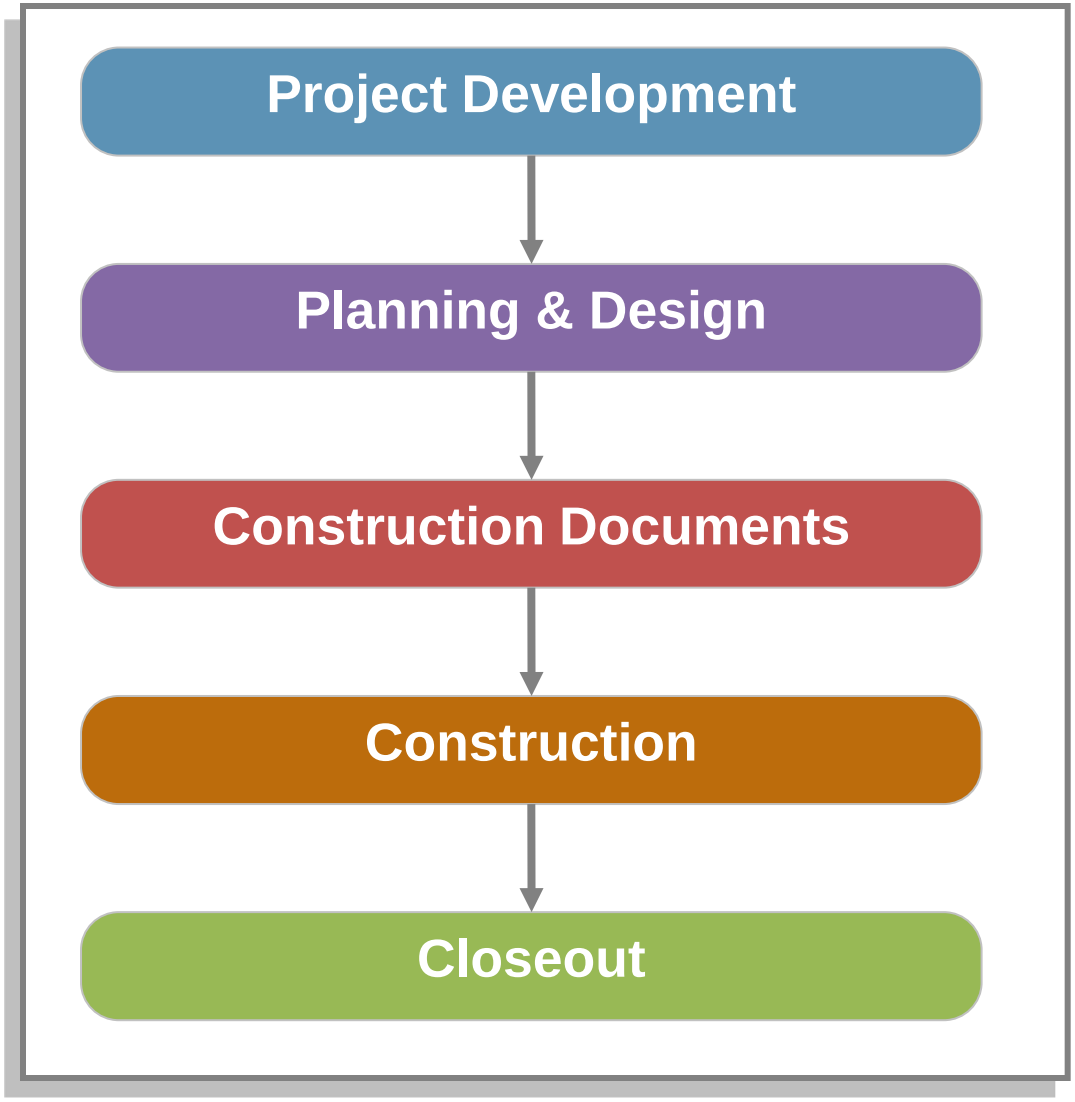
or

To fund a project and then scope it.

SFC PMPro Elements



Five Project Phases with PMPro



Thinking About Process

SDS "Proposed Facilities" description

SDS cost estimate

Project Development Plan (PDP)

Engineering Project Report (EPR)

Project Proposal

Funding Decision/Funds Obligation

Environmental Review and documentation

Project Summary

MOA, CPA, or PFA

Construction documents (plans/specs)

Construction documents (inspection/pay)

Record documents (As-builts)

Transfer Agreement

Closeout documentation

Final Report

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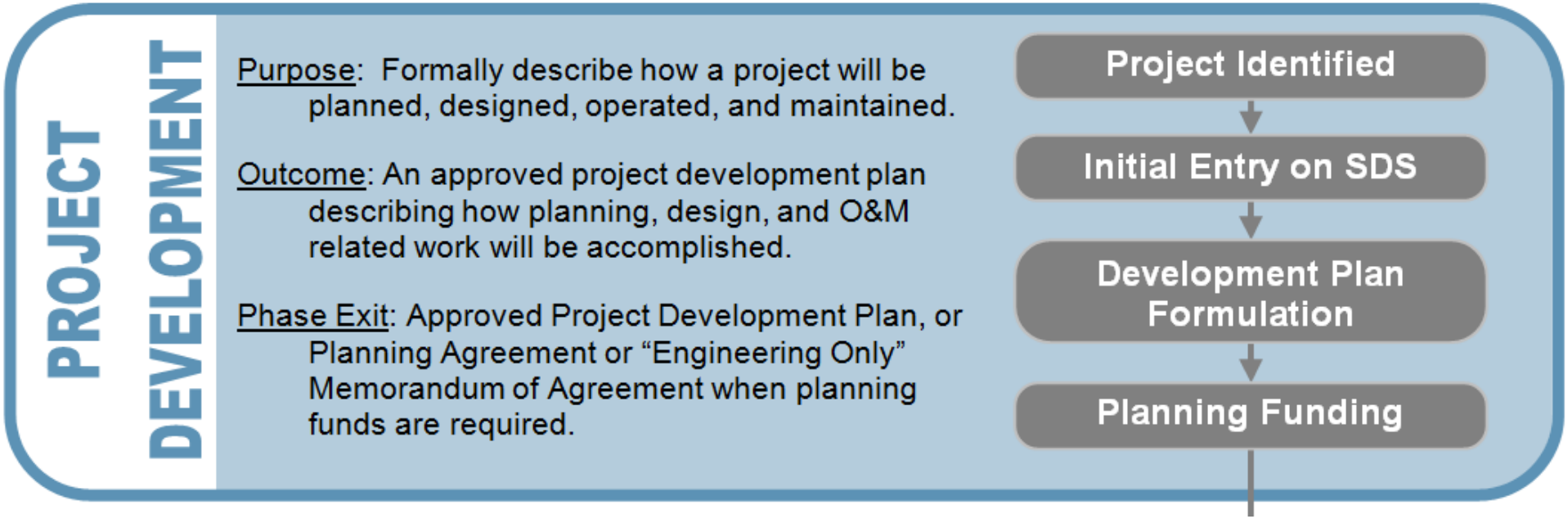
Project Development Phase



Planning and Design Phase

Initial Entry on SDS or HPS

- Immediate report of need with conceptual estimate.
  - Include preliminary planning and O&M costs here
- For “top-tier” SDS projects, this initiates the requirement to complete a Project Development Plan and to get Planning and Design funding, if needed.
  - Fine-tune planning and O&M requirements here
- A conceptual project will normally NOT be ready to fund due to inadequate scoping.

Project Development Plan (PDP)

The PDP describes:

- How the design basis will be developed,
- What specific steps will be required, and
- How much money it will cost.

The PDP does not scope the project or estimate the capital cost

Elements of the PDP

- **Problem statement** – concise description of the problem or deficiency including assessment of O&M financial/managerial/technical capacity
- **Scope of Work** – define which planning & design deliverable will be completed; an Engineering Project Report or Community Master Plan
- **Schedule** – define how long will it take to complete the planning & design activities
- **Cost estimate** – are funds needed, how much, and from whom?

Elements of the PDP

- **Communications plan** – who are the stakeholders and how do you talk to them?
- **Procurement plan** - if outside services are needed, explain how they will be procured
- **Quality assurance plan** – explain how work quality will be ensured
- **Risk plan** – identifies and analyzes risks
- **Human resources** – defines who will complete the planning & design activities

PDP Approval and Funding

Planning $ Required?	Planning Document	Approval
No	PDP only	DE*
Yes	PDP Planning Agreement	DE* Area Director
Yes	PDP “Engineering Only” MOA	DE* Area Director

* Final review and approval levels are dictated by Area policy

Engineering Project Report (EPR)

- The design basis for SFC projects is the EPR.
- Replaces many “design” activities that were traditionally done while “doing the plans and specs”.
- An accurate SDS listing that includes O&M capacity building costs) results from the completed EPR.
- Project funding and a signed MOA completes the Planning and Design Phase.

Elements of the EPR

- **Executive summary** – concise description of the problem and recommended solution.
- **Background narrative** – includes tribal perspective, preliminary design objective and scope, and a summary of Indian homes to receive benefit from the proposed project.

Elements of the EPR

- **Preliminary design development** – records review, survey and mapping, subsurface investigation, evaluation of quantity and quality of flows, hydraulic modeling, geotechnical studies, video surveys, etc.
- **Growth projections** – estimates future populations, demands, flows, capacities, etc.
- **Alternatives considered** – includes detailed information on other options that could have resolved the problem being addressed.

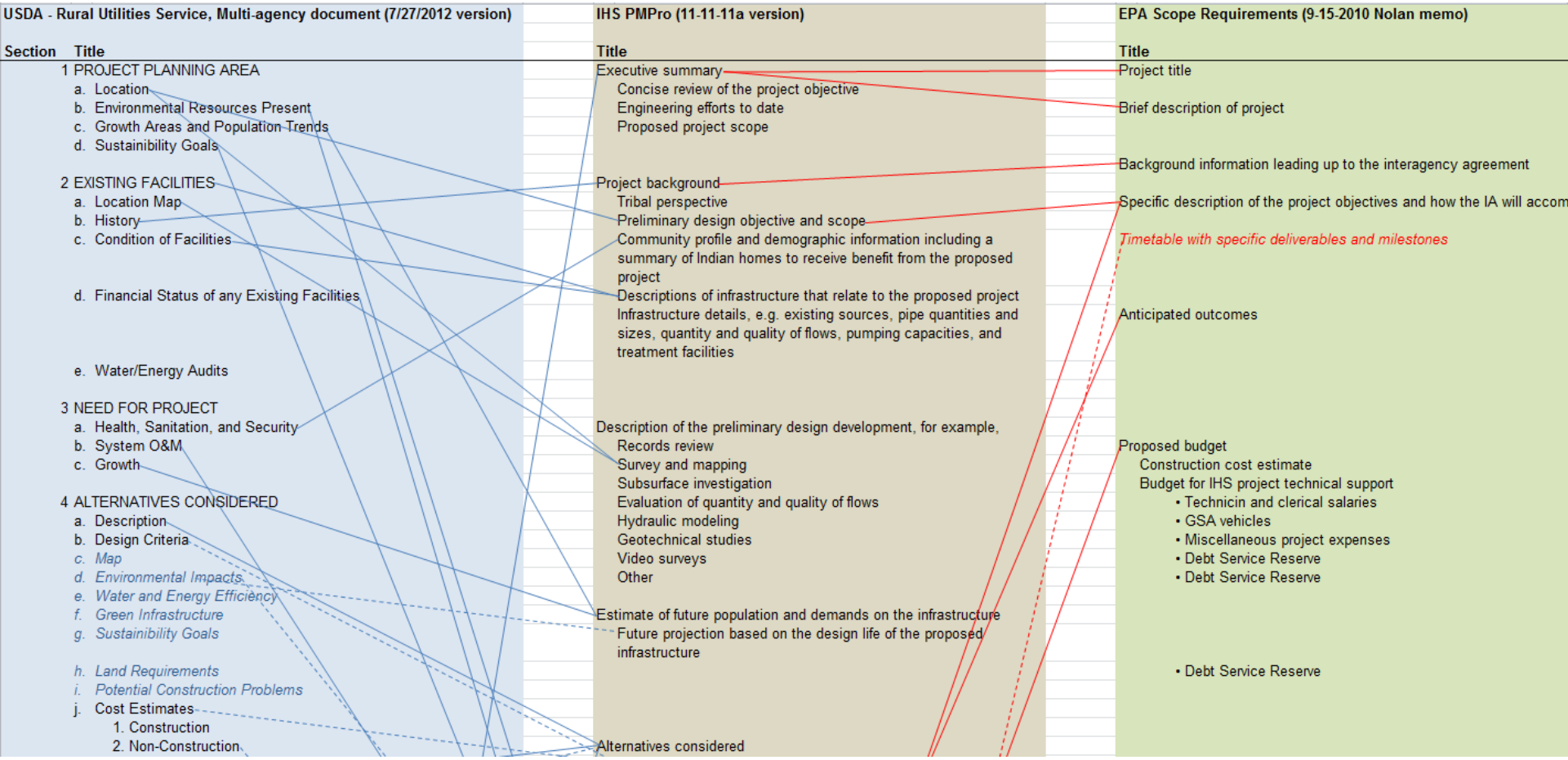
Elements of the EPR

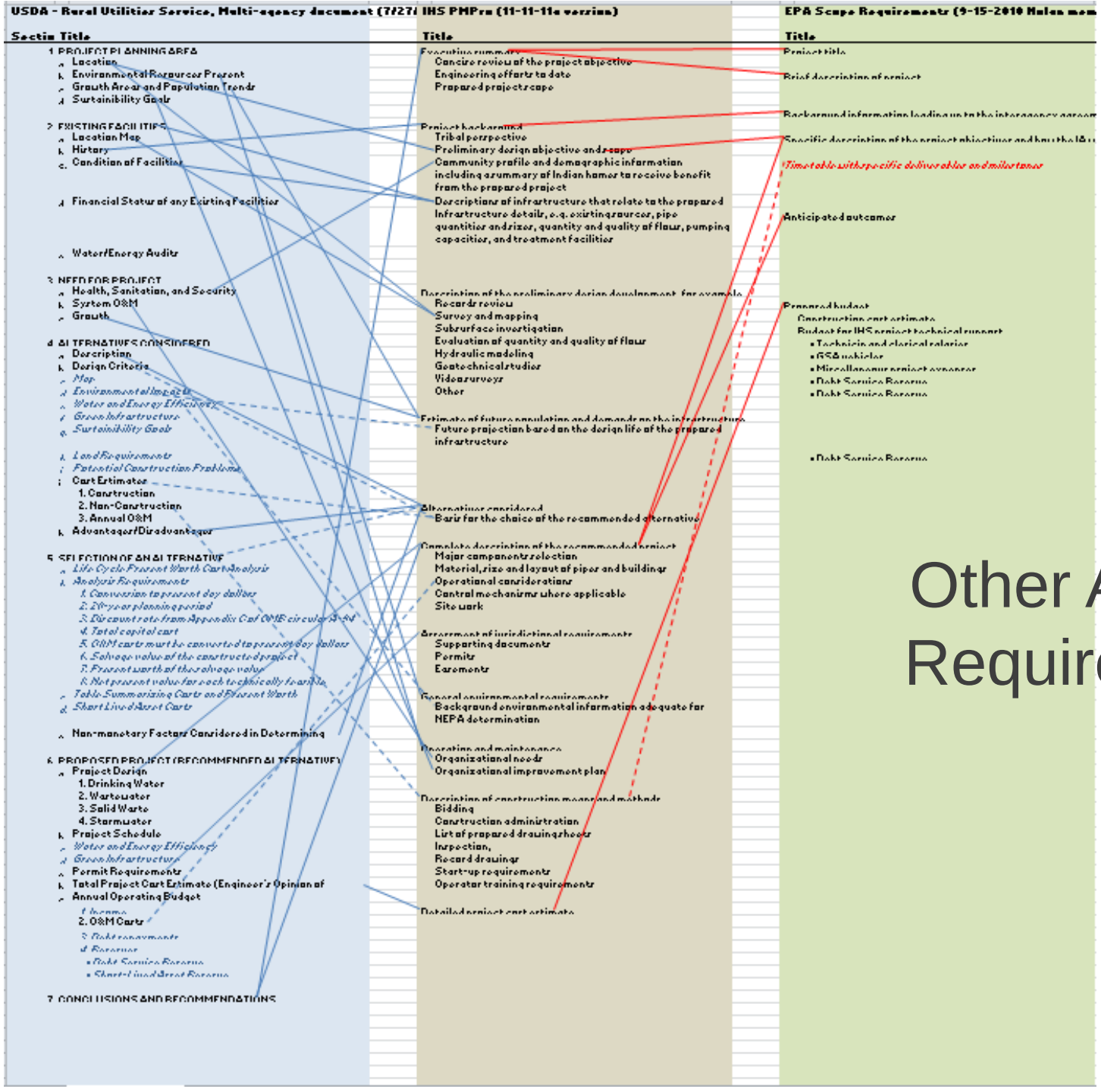
- **O&M considerations** – robust description of the O&M requirements, costs, and capacity of the tribe to operate and maintain the project.
- **Recommended solution** – describes the recommended project in detail using text, graphics, charts, and tables as needed to fully scope the project.
- **Permits required** – outlines the environmental, jurisdictional, and legal requirements to allow the project to advance.

Elements of the EPR

- **O&M organizational assessment** – needs and improvement plan.
- **Detailed cost estimate** – includes capital costs, O&M costs, and life cycle costs.

Other Agency Requirements





Other Agency Requirements

Interagency Engineering Report

Pre-Decisional/Not for Distribution

October, 2012

INTERAGENCY MEMORANDUM

Attached is a document explaining recommended best practice for the development of Preliminary Engineering Reports in support of funding applications for development of drinking water, wastewater, stormwater, and solid waste systems. The use of this best practice document may be required by state or federal funding agencies as part of the application process or project development. Federal agencies that have cooperatively developed this document encourage its use, but for state run programs, it is up to a state administering agency's discretion to adopt it, based on the programmatic needs of the state administering agency.

The best practice guide was developed cooperatively by:

- US Department of Agriculture, Rural Development, Rural Utilities Service, Water and Environmental Programs;
- US Environmental Protection Agency (EPA), Office of Water, Office of Ground Water and Drinking Water and Office of Wastewater Management;
- US Department of Housing and Urban Development (HUD), Office of Community Planning and Development;
- US Department of Health and Human Services, Indian Health Service (IHS);
- the Tribal Infrastructure Task Force; and
- the Small Communities Water Infrastructure Exchange;

Extensive input from participating state administering agencies was also very important to the development of this document.

A Preliminary Engineering Report (Report) is a planning document required by many state and federal funding agencies as part of the process of obtaining financial assistance for development of drinking water, wastewater, solid waste, and stormwater facilities. The attached Report outline details the requirements that funding agencies have adopted when a Report is required.

EPR Using the Interagency Format

Version Date December 12, 2012

INDIAN HEALTH SERVICE

SFC
PROJECT MANAGEMENT
PROGRAM (PMPro)

PROJECT MANAGEMENT GUIDELINE

For Planning, Designing, and

EPR Using the Interagency Format

Engineering Project Report may contain only a portion of the following items or may have additional information, depending on what is needed to satisfy actual project planning and design needs.

- Executive summary that provides a concise review of the project objective, engineering efforts to date, and proposed project scope.
- Project background that includes tribal perspective, preliminary design objective and scope, and a summary of Indian homes to receive benefit from the proposed project.
- Description of the preliminary design development, for example, records review, survey and mapping, subsurface investigation, evaluation of quantity and quality of flows, hydraulic modeling, geotechnical studies, video surveys, etc.
- Estimate of future population and demands on the infrastructure. The window for the future projection shall be the design life of the proposed infrastructure.
- Alternatives considered for the project and the basis for the choice of the recommended alternative.
- A robust description of the O&M requirements, costs, and capacity of the tribe to operate and maintain the alternatives considered and the selected alternative.
- Complete description of the recommended project. This shall include selecting major components, material, size and layout of pipes and buildings, operational considerations, control mechanisms where applicable, and site work.
- Assessment of jurisdiction and description of supporting documents, permits, and easements the proposed project will require.
- Discussion of general environmental requirements and background environmental information adequate for NEPA determination.
- Operation and maintenance organization needs and improvement plan.
- Description of construction means and methods, including bidding, construction administration, list of proposed drawing sheets, inspection, record drawings, start-up and operator training.
- Detailed project cost estimate.

Page 26 of the PMPro guideline

EPR Using the Interagency Format

CONTENTS

EPR Using the Interagency Format

3) NEED FOR PROJECT
   a) Health, Sanitation, and Security
   b) Aging Infrastructure
   c) Reasonable Growth

4) ALTERNATIVES CONSIDERED
   a) Description of Alternatives
   b) Design Criteria
   c) Map
   d) Environmental Impacts
   e) Water and Energy Usage and Efficiency
   *f) Green Infrastructure**
   *g) Sustainability Goals**
   h) Land Requirements
   i) Potential Construction Problems
   j) Cost Estimates
   k) Life Cycle Costs
   l) Capacity of Tribe to Operate the Alternative
   m) Other Factors

5) SELECTION OF AN ALTERNATIVE

6) PROPOSED PROJECT (RECOMMENDED ALTERNATIVE)
   a) Preliminary Project Design
   b) Project Schedule
   *c) Water and Energy Efficiency**
   *d) Green Infrastructure**
   e) Permit Requirements
   f) Total Project Cost Estimate (Engineer's Opinion of Probable Cost)
   g) Annual Operating Budget
      *i) Income/Rates**
      ii) Annual O&M Costs
      *iii) Debt Repayments**
      *iv) Reserves**

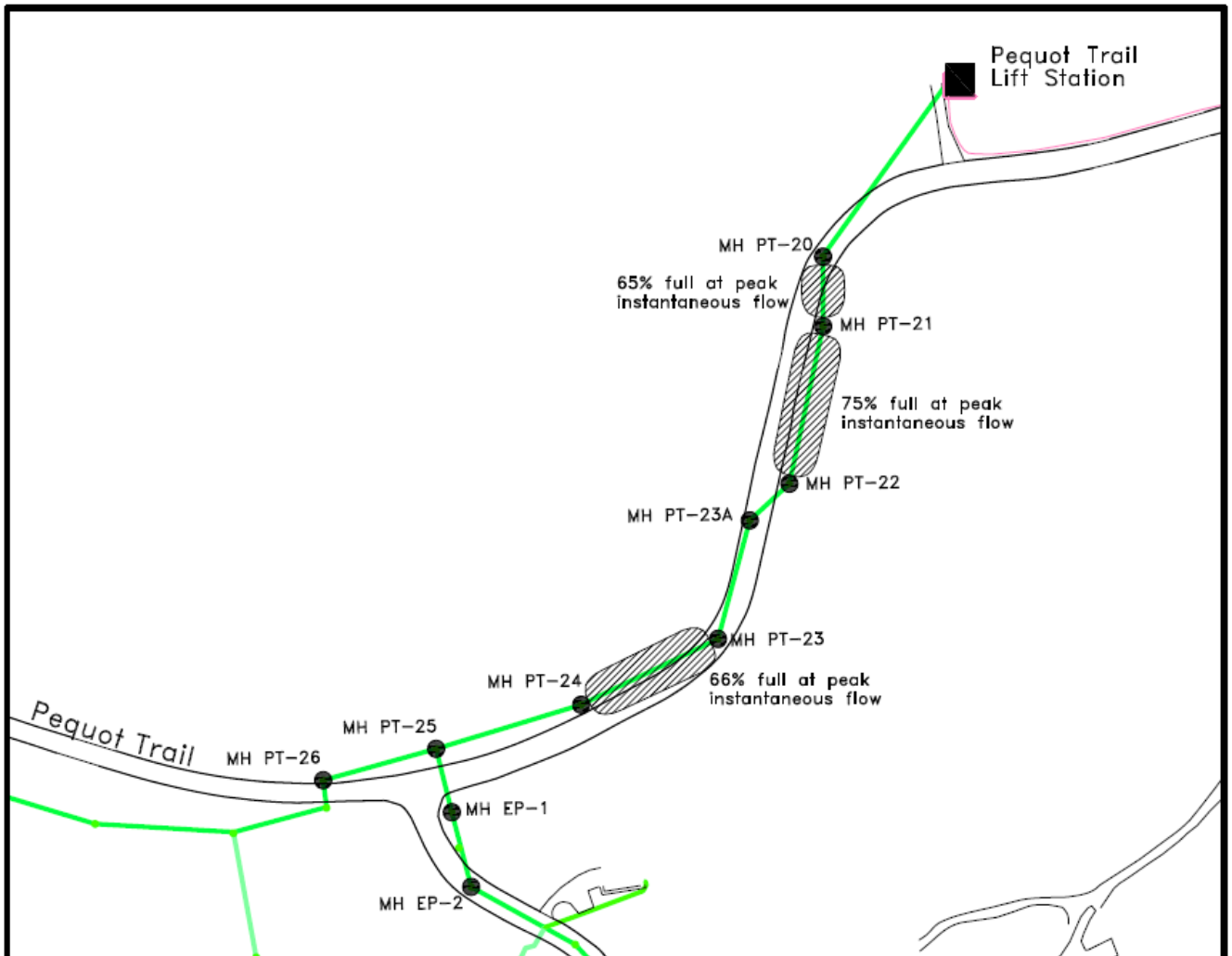
7) CONCLUSIONS AND RECOMMENDATIONS

TABLES

APPENDICES

EPR – Level of Detail

Ideally enough detail is included in the EPR so that the design is complete before the Construction Documents phase begins.



EPR – Level of Detail

Capital Cost Estimate Alternative 1		
Description	**Subtotal Cost**	**Total Cost**
Hidden Acres		
Gravity sewer, 2,400 LF @ $100/LF	$240,000	
Gravity manholes, 7 each @ $6,700/manhole (ave = 11.2 ft)	$46,900	
Ledge excavation, 2,200 CY @ $70/CY	$154,000	
Permits, easements, rights-of-way	$5,000	
Subtotal - Hidden Acres		$445,900
770 Shewville		
Gravity sewer; 3,150 LF @ $100/LF	$315,000	
Gravity manholes; 7 each @ $5,400/manhole (ave = 9.0 ft)	$37,800	
Ledge excavation, 3,200 CY @ $70/CY	$224,000	
Permits, easements, rights-of-way	$5,000	
Subtotal - 770 Shewville		$581,800
Upgrade to existing infrastructure		
Pequot Trail Lift Station		
Re-sheave pump and motors	$3,500	
Subtotal - Upgrade to existing infrastructure		$3,500

EPR Using the Interagency Format

to each of the collaborating agencies. IHS has agreed to accept the common format and include those requirements in the PMPro Guideline. The common format was also intended to replace the Bulletins 1780-2 through 1780-4 that have been required by USDA-RD for their funding since 2003.

The following sections of the interagency engineering report generally will not be required for IHS-funded projects but are required for USDA-funded projects:

Section	Title
1d	Project Planning Area: Sustainability Goals
2.1d	Existing Water Facilities: Financial Status
2.1e	Existing Water Facilities: Water/Energy/Waste Audits
2.2d	Existing Wastewater Facilities: Financial Status
2.2e	Existing Wastewater Facilities: Water/Energy/Waste Audits
2.3d	Existing Solid Waste Facilities: Financial Status
2.3e	Existing Solid Waste Facilities: Water/Energy/Waste Audits
4e	Alternatives Considered: Water and Energy Efficiency
4f	Alternatives Considered: Green Infrastructure
4g	Alternatives Considered: Sustainability Goals
6c	Proposed Project: Water and Energy Efficiency
6d	Proposed Project: Green Infrastructure
6g-i	Proposed Project: Annual Operating Budget - Income
6g-iii	Proposed Project: Annual Operating Budget - Debt Repayments
6g-iv	Proposed Project: Annual Operating Budget - Reserves

Page 27 of the PMPro guideline

A template and an example for the Engineering Project Report required for IHS projects can be found in Appendix 10 and 11 respectively. A digital copy of the template can also be found in

Mapping the EPR to the Project Summary

Per the Criteria (ver 1.01, 3/13/03, page 8.2), the Project Summary must include "appropriate detail" to allow all MOA signatories to understand the scope and nature of the project. Specifically, it must include:

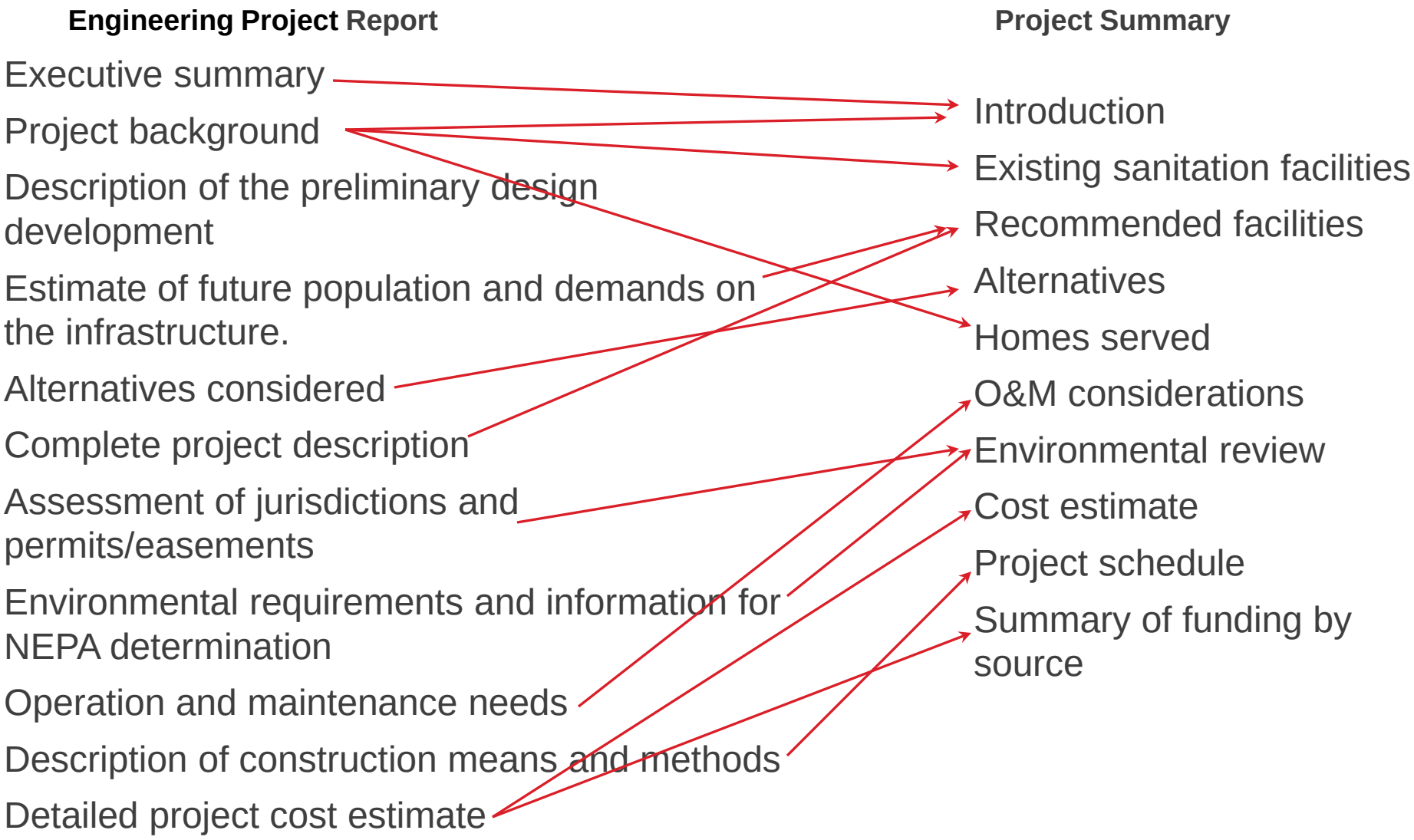
- Introduction
- Existing sanitation facilities
- Recommended facilities
- Alternatives
- Homes served
- Operations and maintenance considerations
- Environmental review
- Cost estimate
- Project schedule
- Summary of funding by source

Mapping the EPR to the Project Summary

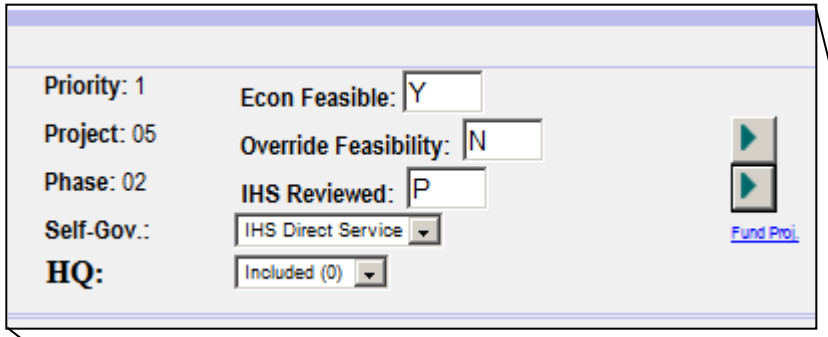
Per the PMPro guideline (12-12-12, page 26), the Engineering Project Report must include:

- Executive summary
- Project background
- Description of the preliminary design development
- Estimate of future population and demands on the infrastructure.
- Alternatives considered with O&M considerations
- Complete project description
- Assessment of jurisdictions and permits/easements
- Environmental requirements and information for NEPA determination
- Operation and maintenance needs (i.e. comparison of O&M financial & technical requirements compared to tribal capacity)
- Description of construction means and methods
- Detailed project cost estimate that includes capital, administrative, operator training, O&M manual, as-built, and O&M equipment costs

Mapping the EPR to the Project Summary



EPR and STARS



Home | Community | SDS | PDS | HPS | OMDS | HITS | Service Requests | Reports

Filter | Project Grid | Review | Submittals | Reports — Current user: dpaer

Project Details | Homes | Costs | Milestones | Attachments (6) | Journal (4)

Contact Us | HELP | Log Out

Save | Delete | Narrative Report | Record Comparison

1: SENE-Irving WWPTP Upgrade (... | Go

Last Submittal: 2013 (IHS National)

Project/Phase Name: SENE-Irving WWPTP Upgrade (SUP) (max. length 100 chars)

Area: NASHVILLE

Tribe: SENECA NATION OF NEW YORK

Reservation: CATARAUGUS

EPA Region: 02 EPA PWS ID: None

Number: NY13817-0502 change

Community: IRVING

District: NORTHERN

Field Office: Manlius

Priority: 1 | Econ Feasible: Y

Project: 05 | Override Feasibility: N

Phase: 02 | IHS Reviewed: P

Self-Gov.: IHS Direct Service

HQ: Included (0)

Fund Proj.

OM Systems:

Select Systems

System	System Type	Organization	EPA # Score
5858280091--SENE-IRVING INDUSTRY COM SEWER	Sewer	SENE - Cattaraugus Utilities	5

Area-Defined Fields

Local Code: 02 - EPA, REGION 2

Engineering Only: ☐ Engineer: Kathol, John Created: 06/29/2011 Last Update: 08/03/2012 by Tillock Darrall

DEFICIENCY LEVELS

Initial: 3 *Suggested: 3*

Final: 1 *Suggested: 1*

RATING SCORES

Health Impact: 15

Deficiency: 12

Previous Service: 0

Capital Cost: 14

O & M Capability: 10 *Suggested: 5*

Contribution: 8

Tribal: 16

Other Considerations: 0

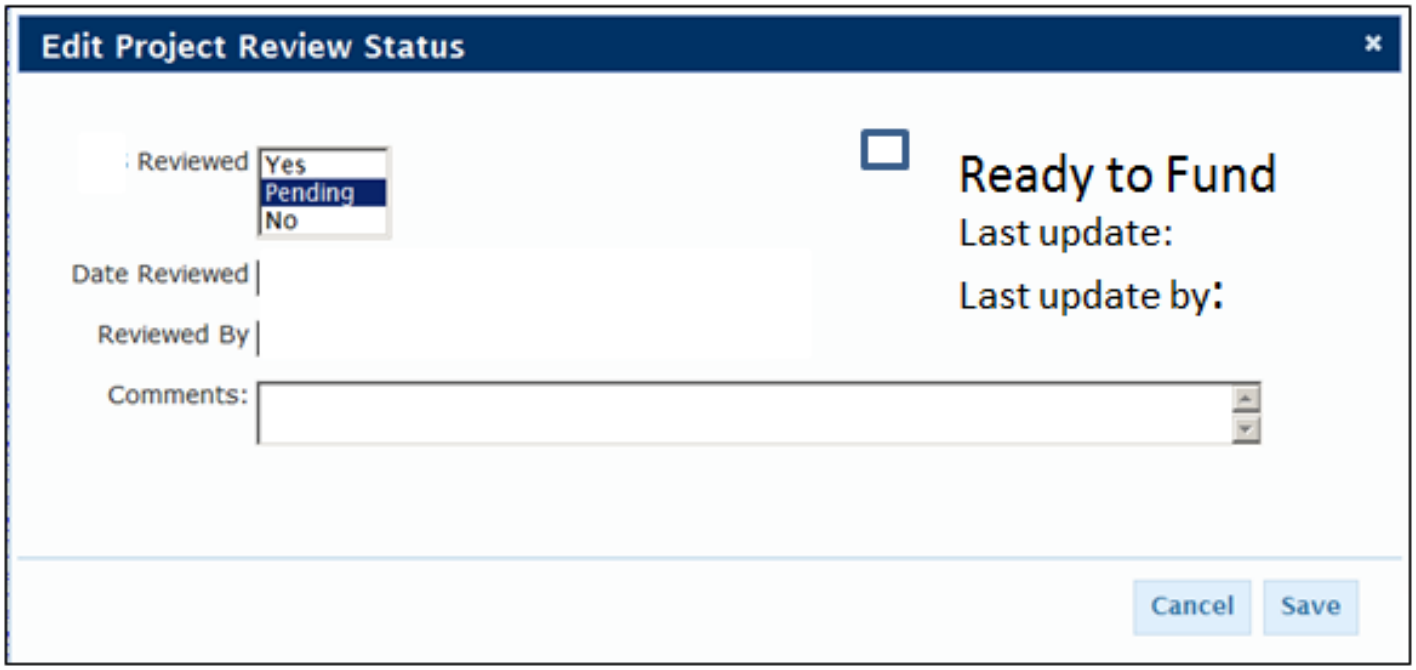
Total Score: 75

HOMES	Community State Code	Home Type	Eligible	Number of Homes	Initial Def. Level	Final Def. Level	First Service	Water Service	Sewer Service	Solid Waste Service	O & M Service
Group A	NY13817	E1	Y	55	3	1	N	N	Y	N	N

Total 55

COSTS	IHS Cost	IHS Unit Cost	Eligible Cost	Eligible Unit Cost	Allowable Unit Cost	Contributions	Ineligible Cost	Total Cost
Water (W):	$ 0	$ 0	$ 0	$ 0	$ 33,250			$ 0
Sewer (S):	207,500	3,773	415,000	7,545	33,250	207,500		415,000
Solid (L):	0	0	0	0	14,250			0
O & M (O):	0	N/A	0	N/A	N/A			0

EPR and STARS



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