Developing Process Maps for
Oil & Gas Permitting Processes

A Guide for States and Tribes

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Association of State Wetland Managers

Developing Process Maps for Oil & Gas Permitting Processes:
A Guide for States and Tribes

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To facilitate effective and efficient permitting of oil and gas construction and maintenance projects at the state and tribal level, there is a strong need for all parties involved to understand the steps, stakeholders, timing and points of access in state and federal permitting processes. These processes can be complex and confusing.

Process maps can provide a tool for training new regulatory staff on existing processes, communicating steps and expectations to permit applicants, or working internally to improve systems management for the permitting process.

To this end, ASWM has developed this resource as a guide to assist states and tribes review and document their permitting processes, develop them into visual process maps, and facilitate communications about the permitting process.

Contents Of This Guide:
- What Is A Process Map?
- How Can A Process Map Be Used To Improve Systems?
- How Process Maps Are Developed
- Common Protocols And Symbols Used In Process Mapping
- Tools To Develop Your Process Map
- Suggested Next Steps For States And Tribes Once Process Maps Are Made
- Example Process Maps
- Process Map Template

What is a process map?

A process map[1] is a planning and management tool that visually describes the flow of work. It depicts the series of events which produce a desired result highlighting the steps, decisions, resources and parties involved. Commonly used to formalize, communicate and evaluate organizational processes, process maps offer a simplified visual representation of often complex tasks. "Increased visibility [of a process] improves communication and understanding, and provides a common frame of reference for those involved…"[2] As such, process maps can help different parties agree on the steps of a process, reveal areas for improvement, and establish performance measures to ensure an effective and efficient process.
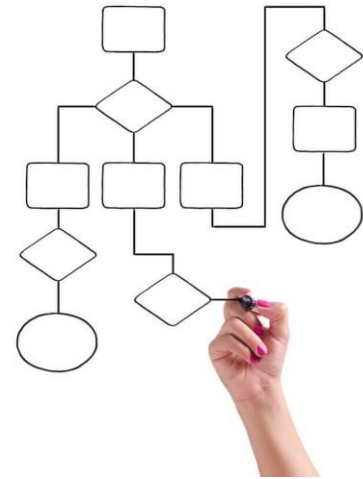
How Process Maps can be used to Improve Systems

Process maps can be used to improve systems in three main ways; documentation, communication, and trouble shooting. Advancement in each of these areas can help both internal and external stakeholders better navigate your State or Tribe's permitting process.

DOCUMENTATION: Organizational processes are often verbally relayed to employees during onboarding with little formal documentation provided. However, capturing this institutional knowledge is essential in the face of workforce turnover and varying levels of experience among new hires, consultants and permit applicants. Creating a process map presents an opportunity to define and formalize the who, what, where, when and why of the designated workflow. This internal infrastructure provides clarity for all parties involved and promotes both consistency and efficiency throughout the process.

COMMUNICATION: Process maps communicate the steps of the formalized process to both internal and external stakeholders. For example, they can be used to train new employees, inform permit applicants, or support interagency coordination. In addition, process maps can be used to convey responsibility for each step of the process, establishing performance expectations and accountability. The transparency of a formalized process map ensures everyone involved has a shared understanding of the process, an important component when working to establish collaboration and cooperation among varying parties.

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[1] A process map may be called by a range of different terms, such as flowchart, process flowchart, process chart, functional process chart, functional flowchart, process model, workflow diagram, process flow diagram or process flow diagram.

[2] Damelio, R. (2016). *Basics of process mapping*: Productivity Press.

TROUBLE SHOOTING: Beyond reducing the likelihood of discrepancies and mistakes, a formalized and documented process also allows for evaluation and re-engineering of the system. Process maps offer a streamlined perspective of complex processes, giving managers a bird's eye view of the workflow. This insight helps identify areas for improvement within the process such as redundant or inefficient steps. This information can then be utilized to re-engineer the process, making it more succinct, intuitive and effective. Process maps can also support evaluation efforts helping managers determine appropriate performance measurement points and benchmarks throughout the process. Finally, when created using standard symbols and protocols process maps can be easily compared between State and Tribe's allowing for information sharing, collaboration and improving regional permitting processes. This compatibility can be particularly pertinent for inter-state projects.

How Process Maps are Developed

There are specific conventions used to develop formal process maps. The following section provides guiding questions that are commonly used to help identify what the process map will include and how it will be developed. When developing a process map some important initial framing questions must be considered:

- Who will be using the process map and why?
- What is the goal of the process?
- Who is involved in the process?

Before you draft your process map, ensure that you have a comprehensive understanding of the workflow from start to finish. This may require you to conduct one-on-one or group interviews with internal, and possibly external stakeholders, engaged at all stages of the process. Gather as much detailed information as you can on each step of the process. Some questions to include in your interviews are:

- What are the required steps to complete the process?
- Are there any timing requirements or restrictions for the process or specific steps?
- At what point are decisions made throughout the process and by whom?
- Are there any special documents or information needed to complete this process?
- Are there parts of the process that repeat?
- Are there points in the process that intersect with other internal or external processes?

Once you have gathered all the necessary information outline your process from start to finish detailing every step, decision and input. If you are confidant in the order and flow of your

process you may wish to utilize the process map symbols right away. However, if there is still some ambiguity surrounding your process it may be helpful to use a numbered list or write the steps on post-it notes so that you can easily rearrange the process as needed until you have it properly organized. Once you have finalized the order of your process use the standard symbols and protocol outlined in the following section to create your process map. Some things to keep in mind when creating the first draft of your process map:

- Include every step of the process, even those you consider intuitive or common sense. Leaving out parts of the process can create confusion leading to mistakes and inefficiency.
- Take the time to map the original process before implementing changes. Thoroughly understanding how the process currently operates helps create strategic, systematic changes rather than piecemeal incremental changes that may have unintended consequences.

Developing a process map should be an iterative process. Share the first draft of your process map with other stakeholders to ensure completeness and accuracy. Even if you are familiar enough with the process to self-generate much of the needed information, it is recommended that you seek feedback from other participants in the process. After incorporating the pertinent changes, circulate the revised version again for further assessment. Repeat this process until you are satisfied that the resulting process map is accurate.

Once satisfied that your process map is accurate you can use it to analyze the process and identify areas for improvement. Again, it is recommended to survey all stakeholders and process participants for feedback on the effectiveness and efficiency of the current process. Some areas to review include:

- What parts of the process work well and why?
- Are there repetitive steps in the process? Are they necessary?
- What parts of the process consistently take the longest to execute?
- At what parts of the process do issues, mistakes or bottlenecks routinely occur?
- Are there parts of the process that generate high costs?
- What is the client or external stakeholder experience throughout this process?
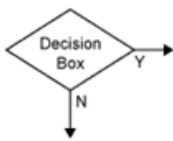- How does our process compare to others in the region?

You may also use your process map to identify appropriate places throughout the process for evaluation, quality control and benchmarking. Be sure to keep institutional capacity in mind throughout your analysis to ensure changes and benchmarks will be implementable. Finally, a

review schedule should be established to regularly evaluate and update process maps on an ongoing basis.

Common Protocols and Symbols Used in Process Mapping

Standard process mapping symbols are used to visually delineate between types of steps in the process such as preparation tasks, decisions or documents. Each step of the process is placed within the appropriate symbol and connected by arrows indicating the sequence and direction of the workflow. These symbols provide a streamlined perspective of the process allowing participants and managers to quickly identify client access points, decision junctures, or required documentation throughout the process.

Process Step¤	
Start¤	
End¤	
Database¤	
Document¤	
Decision¤	
Page Connector¤	

For example, consider a permitting process which requires a submitted application be evaluated first for completeness. This step should be written inside a diamond shaped "decision box" creating an intersection in the process where the result of this decision determines the next step taken. If it is determined that the application is complete it move on to content review. If incomplete it is returned to the applicant for revision.

Figure A and B show some of the most common process map symbols. Examples of completed process maps are also included at the end of this guide for your reference.

When drafting your process map it is important to keep it simple and easy to read. These tips from Robert Damelio's *The Basics of Process Mapping* can help you draft a coherent process map.

- ✓ Clearly define the boundaries of the process by marking the start and end points.
- ✓ Keep the flow of the process from left to right and from top to bottom.
- ✓ Keep symbols about the same distance from one another for ease of interpretation.
- ✓ Avoid having directional arrows intersect or overlap.
- ✓ Label the outputs of your decision symbols. *(i.e. Yes or No, Approved or Rejected, etc.)*
- ✓ Use a connector symbol to continue your process map from one page to the next. *(See KY Process Map in Examples of Process Maps section.)*

In addition to utilizing common symbols, implementing standard protocols when drafting your process map can help enhance comprehension of the process.

- Clearly title your process map identifying the organization, department, process and the primary contact responsible for the process. It is also advised to include the draft date and version number to avoid confusion. You may want to note who is involved in the process and the maps intended audience or use if space allows.

- Although these symbols are considered standard, include a key or legend on your process map to ensure all users can easily interpret them.

- Color coding can be useful to differentiate between different types of information, process steps, or responsible parties. For example, all steps in the process that require an applicant action might be in blue shapes while actions performed by internal employees are in orange shapes.

- Avoid crowding lengthy, detailed descriptions of steps into the process map symbols. Keep process step descriptions simple and your map visually digestible. Utilize supplemental documents to provide greater detail if necessary.

- Choose language carefully.
  - Keep your audience and purpose in mind. Who will be using the map? Will they understand it? Will it help them successfully complete the process?
  - Consider how users may interpret what is written. Avoid ambiguous language. Be as direct as possible, clearly stating each step and who is responsible for it.
  - Refrain from using technical terms or industry jargon. Use language a lay person or new hire could understand. If you use acronyms be sure to include their definitions.

- If your process intersects with additional internal or external processes draft a separate map for each one, indicating the points where they converge. Incorporating all the corelated processes into a single map is likely to result in too much detail and reduce the maps usefulness.

- Utilize software to create digital process maps that are uniform and clear. Digitization also allows process maps to be easily edited, updated, and reproduced as needed.

Tools to Develop Your Process Map

There are several programs available designed specifically to aid in the creation of strategic business tools such as process maps. Many are web based programs that offer monthly subscriptions like *Lucidchart* or require one time purchase fees such as *SmartDraw*. Microsoft

has developed its own digital design software, *Visio*. While all Office 365 commercial users can view documents through Visio Online, you must purchase a license to create and edit diagrams in the platform.

Depending on your organization's needs and capacity, purchasing special software to develop process maps may not be prudent or feasible. If this is the case **Microsoft Word** offers a convenient solution. Under the program's "insert shapes" menu you will find a selection of "flowchart" shapes which you can use to create your process map. If you hover over the shapes a definition of the symbol will appear, and you can customize the size and color of each shape. This YouTube video provides a helpful demonstration that takes you step by step through developing a process map in Microsoft Word. Examples of process maps created in Microsoft Word are included at the end of this guide. Additionally, ASWM has an online process map template you can use to get started.

Maintaining Process Maps

Once completed, the finalized process map must be maintained. Develop a regular schedule to review and update process maps and work with all relevant parties to come to agreement on any changes. Training should be conducted to leadership and staff is aware of these changes and why they have been made, as well as how changes affect permit review, conditioning and enforcement. Once internal staff is up to speed with the changes, the state/tribe should also work with potential applicants and consultants to make them aware of changes and how to prepare and submit applications using the updated process. Provide version numbers and dates updated on each map and refer to these numbers when communicating about the process.

Using Process Maps to Troubleshoot Permitting Processes

Process maps are well-suited for helping create shared understanding about permitting processes. However, sometimes process maps can also highlight issues. State and tribal permitting staff may want to consider either revising a process map or reviewing the process it depicts if maps are consistently not representative of the process they have been designed to depict. Building on the work of Dan Madison (2005), there are some tell-tale signs that a process map has an issue. Adapting Madison's work to inform pipeline permitting

process maps, the following checklist serves as a useful review list for staff as they review their process maps:

Checklist for Troubleshooting Permitting Processes Using Process Maps

☐ Some elements of the process consistently take longer than documented on the map.
☐ Adding staff time to a problematic process step depicted on the map does not improve it
☐ Different agencies consistently interpret the process map differently
☐ Established procedural steps are regularly circumvented to expedite permitting
☐ Exceptions and special cases are frequent and circumvent the mapped process
☐ Processes aren't measured or controlled, so may not be accurately reflected on map.
☐ When no one person or agency manages the total process, disconnects occur frequently.
☐ Applicants or staff members are consistently reporting issues with the process.

Example Process Maps and Process Map Template

As part of its Pipeline Permitting Project, ASWM developed two example process maps with partners from state permitting authorities. These maps are included in the appendix as design examples. Over time these maps may become out of date and may not reflect the current permitting process in these states. Consequently, they should not be used for regulatory purposes without checking with each state. Appendix A provides an example process map for Missouri's §401 certification process and Appendix B provides a second example process map for Kentucky's Missouri's §401 certification process. FERC process maps can be useful to assist in

determining interstate natural gas pipeline permitting processes required prior to state §401 certification. Appendix C provides a template process map that can be adapted for use by a state or tribe. A link to the template is available on the ASWM.org website, providing the document in Microsoft Word.
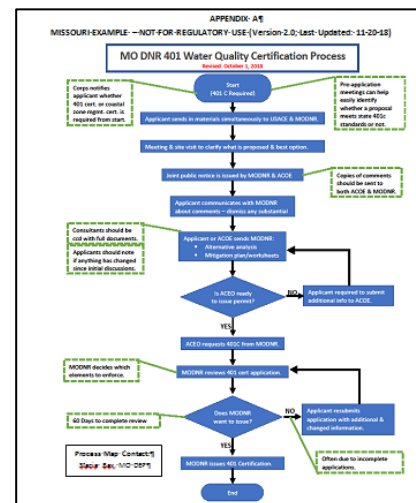
Additional Process Mapping Guidance:

• Madison, D. (2005). Process Mapping, Process Improvement and Process Management. Chico, California: Paton Professional.
• Damelio, R. (2016). Basics of process mapping: Productivity Press.

For More Information, Contact: Brenda Zollitsch, Senior Policy Analyst, Association of State Wetland Managers at Brenda@aswm.org or (207) 892-3399

MO DNR 401 Water Quality Certification Process
Revised: October 1, 2018

Corps notifies applicant whether 401 cert. or coastal zone mgmt. cert. is required from start.

Pre-application meetings can help easily identify whether a proposal meets state 401c standards or not.

Start (401 C Required)

Applicant sends in materials simultaneously to USACE & MODNR.

Meeting & site visit to clarify what is proposed & best option.

Joint public notice is issued by MODNR & ACOE

Copies of comments should be sent to both ACOE & MODNR.

Applicant communicates with MODNR about comments – dismiss any substantial

Consultants should be ccd with full documents.

Applicants should note if anything has changed since initial discussions.

Applicant or ACOE sends MODNR:
- Alternative analysis
- Mitigation plan/worksheets

Is ACEO ready to issue permit?

NO → Applicant required to submit additional info to ACOE.

YES

ACEO requests 401C from MODNR.

MODNR decides which elements to enforce.

MODNR reviews 401 cert application.

60 Days to complete review

Does MODNR want to issue?

NO → Applicant resubmits application with additional & changed information.

Often due to incomplete applications.

YES

Process Map Contact:
Stacia Bax, MO DEP

MODNR issues 401 Certification.

End

Commonwealth of Kentucky
Division of Water 401 Water Quality Certification Process
Revised: November 9, 2018

Start

Any applicant for a Federal license or permit to conduct any activity including but not limited to the construction or operation of facilities which may result in any discharge into jurisdictional water.

401 WQC   401 & EPA

Submit application for water quality certification.

401 Application PDF   WQC Application MS Word

An application can go through the NOD phase several times.

Request additional information from applicant. Issue a Notice of Deficiency (NOD)

NO ← Application Complete?

Applicant submits additional information within 30 days. — **YES**

YES

Does the activity qualify for & meet the conditions for general certification of a nationwide permit?

2017 General Certifications

YES → Issue general water quality certification for nationwide permit (if requested by the applicant)

End

NO →

After several NODs & submitted application is still incomplete, the process is suspended or certification is not issued.

End

NO

1

NO: Activity does not qualify for or meet the conditions for general certification of a nationwide permit OR the activity occurs in a Special Use Water OR the U.S. Army Corps of Engineers determines it will require an individual 404 permit.

Process Map Contact:
Stacia Bax, MO DEP

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1

Individual water quality certification: Water quality certification application fee payment form & fee submitted. Sit visit is conducted, mitigation is determined, & requirements are finalized, impact(s) & plan(s) are reviewed, special conditions are created as needed, & public notice is posted.

401 Fee Payment Form PDF   401 Fee Payment Form MS Word   EPA Mitigation Rule

Include mitigation statement or mitigation plan for permittee responsible. A complete mitigation plan must include public notice and many credits purchased.

YES ← Review / Respond to comments.

30-day Public Notice comments received & Processed.

Pending Public Notices

NO → Water quality certification or Agreed Order issued.

Issued Approvals

Issue or deny certification; certification process is revised with changes in activities and or conditions

Deny

Issue → Activity begins per certification conditions.

Begin compliance & monitoring phase of mitigation requirements.

Mitigation Guidelines

Ask to be notified 2 weeks prior to construction.

Process is suspended or certification is not issued. → End

End

Process Map Contact:
Name Here

BLANK MAP TEMPLATE (Version ___; Last Updated: _date_)

TITLE
DATE

Start

NO

YES

NO

YES

End

Process Map Contact:
Name Here