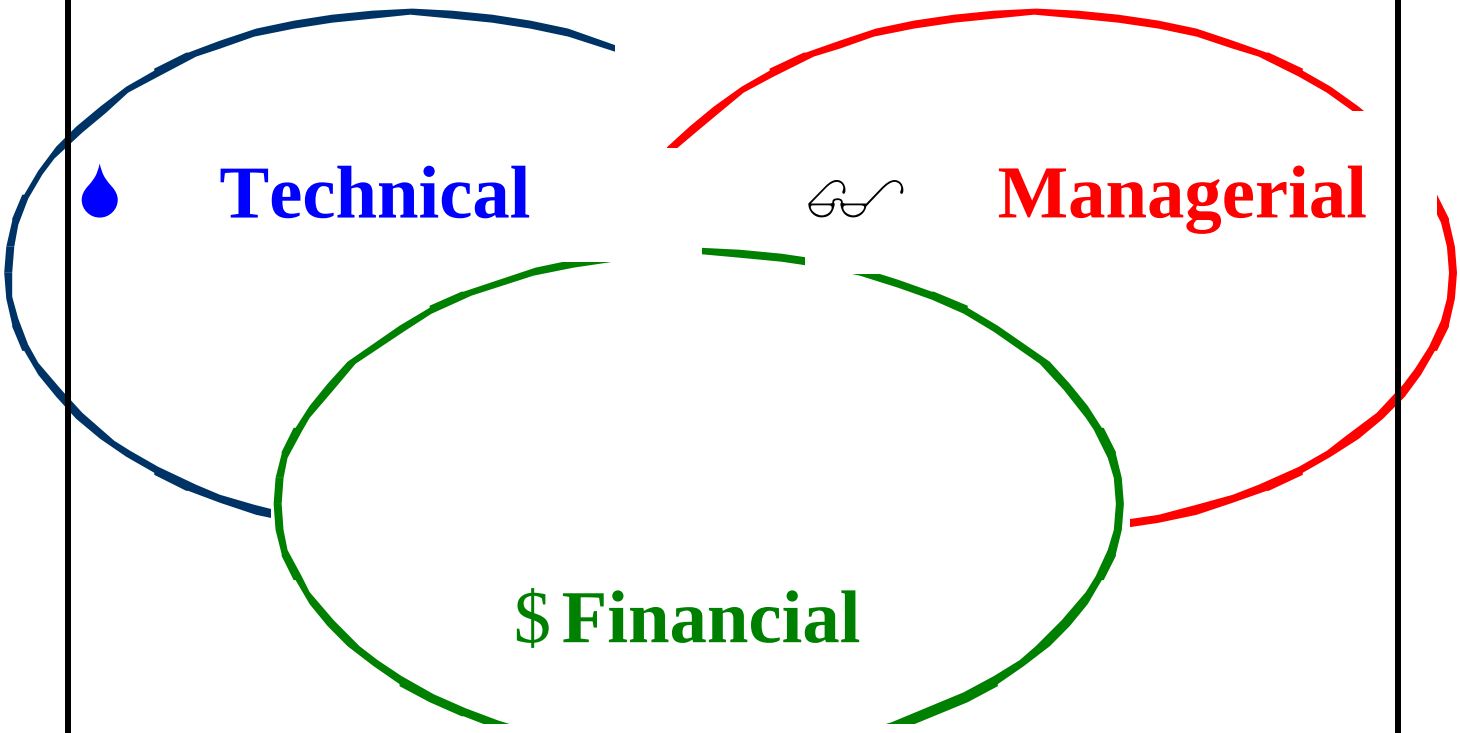
Capacity Assessment and Planning Worksheets for Public Water Systems



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The Safe Drinking Water Amendments of 1996 (SDWA) provide a new and stronger approach to preventing drinking water contamination. The SDWA now includes initiatives to (1) improve communication with the public, (2) provide funding for water systems, (3) assess and protect source water, (4) ensure water systems have adequate coverage by certified operators, and (5) help water systems develop and maintain technical, managerial and financial capacity. EPA Region 8 hopes to utilize all these new provisions in an effort to help Tribal water systems plan for, achieve, and maintain compliance with the SDWA and provide consistently safe drinking water to their customers.

Region 8 will be working with Tribes and other partners to identify and assist Tribal water systems that could benefit from capacity development assistance. The goal is to help Tribes assess their current capacity and develop, carry out, and periodically evaluate comprehensive plans to optimize their ability to consistently deliver safe drinking water in an affordable manner. The following worksheets are to assist water systems assess their technical, managerial and financial capacity and identify actions that can be taken to improve the delivery of safe drinking water to their customers.

Region 8 will also use this assessment/planning tool for all Tribes interested in applying for a Tribal Set-aside Construction Grant. Better understanding and attention to the technical, managerial and financial needs of a Tribal water utility can help ensure that construction grant funding is effectively utilized. This also satisfies the SDWA requirement that systems applying for funding under Section 1452, including the Tribal Set-aside Construction Grants, demonstrate adequate technical, managerial, and financial capacity. Now, what exactly is meant by technical, managerial and financial capacity?

- ***Technical capacity*** - the physical infrastructure of the water system, including but not limited to the source water adequacy, infrastructure adequacy, and technical knowledge. In other words, does your treatment system work the way it is supposed to? Are you providing the safest and cleanest water possible and required by law to your customers right now, and will you be able to in the future?

- ***Managerial capacity*** - the management structure of the water system, including but not limited to ownership accountability, staffing and organization, and effective linkages. In simpler terms, do you have an effective management structure? Do you have a capable and trained staff?

- ***Financial capacity*** - the financial resources of the water system, including but not limited to the fiscal controls, revenue sufficiency, and ability to access funds when needed. Basically, does your system have a budget and enough revenue coming in to cover costs, repairs, and replacements?

The development, implementation and analysis of comprehensive business plans can be an effective means of ensuring ongoing technical, managerial and financial capacity. The planning process can help you:

- Assess the ability of your water system's physical infrastructure and operations/maintenance procedures to effectively treat your water both now and in the future;

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- Establish a "plan of operations", i.e., operating and administrative tasks and procedures you do daily, weekly, monthly, annually, etc. to ensure proper operation and maintenance of your system

- Clearly identify the person(s) responsible for the proper management and operations of the system, including, but not limited to, the roles as operators, management, accounting personnel, project managers, boards, Tribal Council.

- Provide details of your water system's policies;

- Protect sources of water supply;

- Develop timely financial plans and arrangements to make efficient use of resources and ensure smooth operations;

- Communicate your plans to internal (utility boards, Tribal Councils, Environmental Directors, etc.) and external (customers, EPA, IHS, potential funding agencies, etc.) stakeholders.

After EPA receives these worksheets and/or any plans you have submitted, we will study them and other information located in our files to make a determination on whether or not your public water system has the technical, financial, and managerial capacity to be eligible to apply for a Tribal Set-aside Construction Grant. A final report will be available upon completion of the analysis. If it is determined that your system does NOT have the required capacity, you may still qualify for a Tribal Set-aside Construction Grant if you agree to take the steps needed for your system to gain the necessary capacity. If you have questions while completing the following worksheets, please call our office at **(303) 312-6153**, and we will be happy to help.

Applicant:	
Prepared by:	
Date:	

Contaminant: Any physical, chemical, biological, or radiological substance or matter in water;

Disinfectant: Any oxidant, including chlorine, chlorine dioxide, chloramine, and ozone, that is added to water in any part of the treatment or distribution process and that is intended to kill or inactivate pathogenic microorganisms;

Disinfectant contact time: The time in minutes that it takes for water to move from the point of disinfectant application or the previous point of disinfectant residual measurement to a point before or at the point where residual disinfectant concentration is measured;

Filtration: A process for removing particulate matter from the water by passing the water through porous media;

Ground Water: The supply of fresh water found beneath the surface of the ground, usually in aquifers, which is often used for supplying wells and springs;

Ground Water Under the Direct Influence of Surface Water: Any water beneath the surface of the ground with a significant occurrence of insects, microorganisms, algae, or large-diameter pathogens such a *Giardia lamblia*; or any water with significant and relatively rapid shifts in water quality characteristics such as turbidity, temperature, conductivity, or pH which closely correlate to climatological or surface water conditions;

Maximum Contaminant Level (MCLs): The maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards;

mg/L: milligrams per liter - equivalent to parts per million;

µg/L: micrograms per liter - equivalent to parts per billion;

NTU: nephelometric turbidity unit;

psi: pounds per square inch

Surface Water: All water that is open to the atmosphere and subject to surface runoff;

Turbidity: A cloudy condition in water due to suspended silt or organic matter.

Description of Water System: To start things off, you'll want to provide some basic information about your water system, including any of the following you may have already developed:

Item	Included	Need
Description of Water System Facilities		
System Map or sampling site plan		
As-built drawings for wells, spring boxes, distribution system		
Capital Improvement Plan		
Inventory (Equipment, supplies)		
Vendor's list		
Manufacturer's manual		
Plan of Operations:		
Explanation of Start up and normal operating procedures		
Operation & Maintenance checklists		
Monitoring Schedule – 1 year/5 year		
Safety Plan		
Staffing & Training		
Records & Reporting System		
Billing & Collection Procedures		
Emergency Response Plan		
Tribal Utility bylaws, regulations and ordinances		
List of needed O&M improvements		
Sample Results		
Source Water Protection Plan		
Cross-connection Plan		
Plan for tracking unaccounted for water		
Customer Complaint Response Procedure		
Last 3 years financial statements		
Budget/Financial plan (5 year)		
Most recent rate analysis and rate plan		

Your Water Supply: **For many water systems, obtaining a reliable quantity of water is a challenge. In some systems, it is the primary concern. Even if the quantity of water has never been a problem, it is worthwhile to "consider the source" for the future. The frequency of yes answers to the following questions shows how well you have considered future source availability. For questions where your answer is no, it should become more clear what steps you might take to better assess issues involved**

Please check (í) the appropriate box: Y*es*, *No*, or *Unknown* for each section. Please try to determine the answer to every question. ***If a section or question does not apply to your system, please write NA for not applicable.***

Do you know how much water you pump on an average day? Amount: __			
Do you know how much water you pump on a peak day? Amount: ___			
Do you know the maximum amount of water you can pump from your source? Amount: ____			
Is your source capacity higher than your peak day demand? Percentage higher or lower: _			
Can you meet peak demand without pumping at peak capacity for extended periods? Longest time pumping at peak demand**:**			
Have you been able to provide adequate volumes of water during drought cycles?			
Do you have an Emergency Response Plan that will allow you to meet system demand during a drought or shortage, such as the loss of the largest source? If yes, please attach.			

Do you know whether your system demands will be growing, declining, or remain stable over the next ten years? Please circle: growing, declining, or stable.			
Does your source have additional water available for appropriation?			
If you have large commercial, industrial, or irrigation users, do you know their long-term plans and understand their needs?			

If you purchase water from another system or a wholesaler, do you know their long-term plans for water supply?			
Do you have a contract to purchase water? If yes, with who? _____			
Are you currently staying within your contract?			
Do you know the terms affecting your supply during drought conditions?			

Are you knowledgeable about other demands being placed on the same water source that you are using?			
Do you know who the other users are and do you understand their future plans?			
Do you have water right? What quantity of water is attached to the water right? Water right permit number: _____			
Do you fully understand your legal rights to the water?			

Are alternative sources of water available to you?			
Are you knowledgeable of the characteristics and costs of using alternative sources?			

Do you know the depth of your well(s)? Depth(s)? _			
Do you know the geologic name of the aquifer system from which your water is drawn? If yes, geologic name:			

Treatment - Microbiological Contamination

Is your system using surface water or ground water under the influence of surface water?	**yes**	**No**	***(if you checked "no", skip to the next section – Ground Water Systems)***

Surface Water Systems

Is your filter plant in good physical condition (free from spalling concrete, peeling paint)?			
Are repair parts on hand?			
Are repair parts readily available?			
Do you have redundancy (back-ups/automatic switch-overs) for all major mechanical units? If no, list units you do NOT have redundancy for: _____ _____			

Can your plant achieve a filtered water turbidity that meets the regulation for you're your type of filtration? - 0.5 NTU for conventional - 1.0 NTU for slow sand, DE, other special technologies.			
Do you have on-line continuous turbidimeters on each filter?			
Have you adopted a turbidity goal lower than the standard?			
Do you have the capability to add coagulant before the filter?			

Ground Water Systems

Is your water free from variations in turbidity and temperature after storm events?			

Do you know when your well was constructed? List year:			
Is your well(s) constructed according well construction standards and, if so, which standards (i.e., state or other)? _____			
Do you have a wellhead protection plan?			
If so, has it been implemented?			
Do you have a source water protection plan?			
If so, has it been implemented?			
Is your wellhead finished with a pitless unit or adapter that will prevent contamination from surface water?			

Disinfection

Do you disinfect? Getting ready to disinfect after the 1st of the year	**yes**	**No**	***(if you checked "no", skip to the Infrastructure - Pumping section)***

Do you regularly inspect and maintain your disinfection/chlorination equipment? *Type of Equipment:* _____ *How often?* _____ *Disinfectant used:* _____ *Type of regular maintenance:* _____ _____ _____			
Do you have back-up equipment? Type: _____			

Do you have adequate contact time following disinfection and before the first user in the distribution system (30 minutes for ground water systems)? *Contact time: _____*			
Can you detect a chlorine residual (at least a trace) at taps at the ends of the distribution system? Free Chlorine Residual: _____			

Disinfection By-Products

If you treat surface water, are you already practicing or could you adopt "enhanced coagulation" in your current plant?			
If you treat surface water, could you still meet current contact-time requirements if disinfection were not allowed before sedimentation?			

Infrastructure - Pumping

Do you routinely inspect for signs of pump or pump motor problems? How often:			
Once diagnosed, are problems corrected in a timely enough manner to avoid crisis financing, costly repairs, and unscheduled downtime?			
Do you hire a qualified pump contractor to perform an inspection of all pumping equipment, identify potential problems, and perform maintenance, on an annual basis? If not, who inspects this equipment?			

Is there sufficient standby/emergency power capacity to supply 100% of the average daily demand of the system (excluding fire demand)?			
Are any existing standby/emergency power equipment, controls and switches tested or exercised routinely under load conditions, for at least 30 minutes at a time?			
Is the standby/emergency equipment maintained on a regular basis?			
Has the local electric utility been made aware of the standby/emergency power provisions made by the water system, so that they can reinforce and safeguard the electrical facilities serving the water operations?			

Infrastructure - Storage

Does the system have sufficient gravity-flow (non-pumped) or emergency generator-supported pumping capability to ensure adequate distribution storage to provide safe and adequate service for up to 24 hours without power? If no, how long: _____			
Is there reserve storage capacity for fire protection? Amount: _____			

Are any openings such as vent pipes, screened to protect against the entrance of small animals, mosquitoes, flies and other small insects?			
Is there an entry hatch to allow access for cleaning and painting of the interior of the tank?			
Is your storage tank covered?			
Is the tank and the immediate surrounding area fenced?			

Is there a high and low water level signal system to control the pumps?			
Is there an altitude valve, to preclude the tank from overflowing?			
Is there a drain valve or hydrant to allow for draining of the tank?			

Is the tank inspected at least every three years by a qualified tank contractor for evidence of corrosion or pitting, leakage, and structural weakness?			
Is the tank contractor capable of analyzing the coating of paint on the interior and exterior surfaces of the tank to determine if it contains lead or other hazardous materials?			

Infrastructure - Distribution

Does the operator routinely flush, test, and maintain the hydrants in the system? How often: Yearly			
Are the locations of valves in the mains and curb stops on the service lines precisely known?			
Does the system keep a log of distribution system breaks to identify weak areas in the system?			
Are histories, locations, size, and type of mains and service lines detailed on records in a secure area?			
Are all valves exercised and lubricated periodically?			
Is the system free of severe “water hammer” problems?			
Are meter pits, pressure regulating valves, altitude valves, blow-offs, and other appurtenances maintained on a regular basis?			

Is unaccounted-for water in the water system monitored and analyzed each month?			
Is the unaccounted-for water less than 15 percent of the total water delivered to the mains? List percentage of unaccounted-for water:			
Are the normal operating pressures in the distribution system between 25 psi and 125 psi? Normal operating pressure:			
Do you have routine leak detection and repair program?			
Are all sources of supply and customers metered?			
Are the meters calibrated and tested routinely to ensure their accuracy and reliability?			

Is an annual inspection for cross-connections performed?			
Is there a program for installing and testing backflow prevention devices where potential contamination is present?			
Is there a program to eliminate “dead-ends” in the mains, where feasible?			

Is there a low percentage of mains less than 6 inches in diameter in the water system? List percentage			
Is there a program to gradually replace sub-standard sized mains? Working with IHS			
Are there suitable rights-of-way and easements provided to the water system for expansion, maintenance, and replacement of mains and services?			
Is there sufficient earth cover (six feet) to protect the mains from frost damage or heavy loads, if driven over?			
Are materials of mains designed and selected to resist corrosion, electrolysis, and deterioration?			

Do you receive few complaints regarding the taste and odor of chlorine or any other tastes and odors? List number of complaints in the past year: __			
Do you test for corrosive water (ex. Langlier Index)?			
Can you maintain adequate pressure in the distribution system under all conditions of flow?			

Please check (í) the appropriate box: Y*es*, *No*, or *Unknown* for each section. Please try to determine the answer to every question. ***If a section does not apply to your system, please write NA for not applicable.***

Operation & Maintenance

Does the person operating your system have current water treatment plant and water distribution operator certification credentials? If yes, list classification(s):			
Does your operator receive additional training on an ongoing basis to keep current on new developments in the field?			

Does your water system obtain any regular or occasional technical assistance from outside sources, such as EPA, HIS, an outside engineer, other utilities or organizations specifically dedicated to providing technical assistance? If yes, who: __			

Management & Administration

Is there a clear plan of organization and control among the people responsible for management and operation of the system?			
Does your utility have a governing board?			
Is your utility board knowledgeable about the basic information included in the "Getting Started" section of this assessment?			
Is there a process that ensures that the utility board approves of any significant changes to the basic plans and operating procedures?			
Are the limits of the operator's authority clearly known?			
Are all the specific functional areas of operations and management assigned?			
Does everyone involved in operations know who is responsible for each area?			
Is someone responsible for scheduling work?			

Do you have explicit rules and standards for system modifications?			
Do you have rules governing new hook-ups?			
Do you have a water main extension policy?			
Do you have standard construction specifications to be followed?			

Do you have measures to assure cross-connection control and backflow prevention?			
Do you have policies or rules describing customer rights and responsibilities?			

Do you fully understand monitoring requirements and have a scheduling mechanism to assure compliance?			
Do you have a mechanism to obtain the most recent information on regulatory requirements?			
Do you know how to obtain clarification or explanation of requirements?			
Do you maintain adequate records to document compliance? If yes, for how long? 5 years			
Do you know what to do in the event of a violation?			

Do you have an Emergency Response Plan?			
Is there a contingency for making emergency interconnections to neighboring systems, and do you know they will work if needed?			
Does everyone involved in operations know what they are to do in the event of contamination from a toxic hazardous waste spill in your source water or a main break or a tank failure?			
Do you have a clear chain-of-command protocol for emergency action?			
Is someone responsible for emergency operations, for communications with state regulators, for customer relations, for media relations? If yes, who (title): ___			

Do you have a safety program defining measures to be taken if someone is injured?			
Does everyone understand the risks and safety measures involved in handling water treatment chemicals?			
Do you have written operating procedures for both routine and emergency system operations?			
Are you fully aware of Occupational Safety and Health Administration (OSHA) confined space (such as trenches/manholes) regulations?			

Do you have a planned maintenance management system -- a system for scheduling routine preventive maintenance? Under development			
Do you have a system for assuring adequate inventory of essential spare parts and back-up equipment?			
Do you have relationships with contractors and equipment vendors to assure prompt priority service?			

Do you have records and data management systems for system operating and maintenance data, for regulatory compliance data, and for system management and administration?			

Are you getting the outside services and technical assistance you need? Including:			
Engineering advice,			
Technical/operations assistance,			
rate case preparation and other financial advice,			
legal counsel,			
Insurance?			
Does your utility board have a good understanding of the plans developed for properly operating, maintaining, improving and funding the system?			

Please check (í) the appropriate box: Y*es*, *No*, or *Unknown* for each section. Please try to determine the answer to every question. ***If a section does not apply to your system, please write NA for not applicable.***

Financial

Do you have an annual budget?			
Do you have within the annual budget a provision for deposits to separate reserve accounts for equipment replacement and/or capital improvement?			
Do you have a capital budget or capital improvement plan that projects future capital investment needs some distance (at least five years) into the future?			
Does your capital improvement plan include expected funding sources for each project?			
Do you have a process for scheduling and committing to capital projects?			
Does your planning process take account of all the potential capital needs suggested by your answers to the technical questions in these worksheets?			
Does your long-term planning incorporate analysis of alternative strategies that might offer cost saving to customers, such as consolidation with other nearby systems or sharing of operations and management expenses with other nearby systems?			

Do you regularly review your rates? How often? Yearly			
Do you have a plan in place for periodic increases in rates?			
Is the rate structure based on metered watered use? List water rates per 1000 gallons: _1.23 for commercial customers			
Do users pay the same or higher rate per 1000 gallons as they use more water?			
Does the rate structure assure proportionality among users?			
Do you have procedures for billing and collection?			
Is your billing collection rate greater than 95%? It was74% last month			
Do you have collection procedures specifically for delinquent accounts?			

Do you have audited financial statements?			
Does your water system presently operate on a break-even basis?			
Does the water system keep all the water revenues (i.e., water revenue does not support other municipal departments or unrelated activities)?			
Do you employ standardized accounting and tracking systems?			
Do you track budget performance?			
Do you keep records to substantiate depreciation of fixed assets and accounting for reserve funds?			
Are financial management recordkeeping systems organized?			
Are controls exercised over expenditures?			
Are controls exercised to keep from exceeding your budget?			
Are there formal and/or written purchasing procedures?			

Financial Spreadsheet

Please complete the financial spreadsheet on the following page (Page 5-3) using the guidance presented on the reverse side of the form.

GUIDELINES:

This cash flow projection form provides a systematic method of estimating cash receipts, disbursements and balances. The entries listed on the form will not necessarily apply to every PWS, and some entries may not be included which would be pertinent to each PWS. It is suggested, therefore, that the form be adapted to each particular PWS, with appropriate changes in the entries as may be required.

Procedure: Most of the entries on the form are self-explanatory; however, the following suggestions are offered to simplify the procedure:

(1) First gather the audited financial statements, internally prepared statements or budgets and other information for the current year and the two prior years. Please include the most recent audit financial statement with your self-assessment report.
(2) Complete the columns for the prior two years using actual data from your audited financial statements, if available, or your internally prepared financial statements. Keeping in mind that, for purposes of this analysis, it is important to use **cash** receipts and disbursements. ***Suggestion: Round the amounts at least to the nearest dollar.***
(3) Complete the current year's column using the most recent budget information. Include all expenditures incurred by the utility.
(4) Complete the form using the suggestions in the partial form below for each entry. Be sure to include any expenditures resulting from planned plant improvement and estimate the impact of inflation on all expenditures.
(5) Item #1 (Beginning Cash on Hand) plus item #3 (Total Cash Receipts) minus Item #6 (Total Cash Paid Out) should equal Item #7 (Ending Cash Position).
(6) Item #13 (Total Reserves) plus Item #12 (Operating Cash) should equal Item #7 (Ending Cash Position).
(7) Item #1 (Beginning Cash on Hand) should equal Item #7 (Ending Cash Position) from the prior financial period.
(8) Items #8 & 9 are used together to determine the impact of the rate structure on the equivalent residential user. If industrial or business customers contribute a significant portion of the revenues, these amounts should be looked at separately. Consideration should be given to design a rate structure so that each category of user pays its proportional share of the costs of operating and maintaining the PWS.
(9) Item #10 is used to determine to what extent a PWS's net operating income is able to cover its debt service requirements.
(10) Item #11 is used to determine to what extent a PWS's rate structure produces revenues sufficient to cover operating expenses.
(11) Item #12 is the operating cash balance at year end. The operating cash balance at the end of any financial period should be adequate to meet the cash requirements for a minimum of one month. If there is too little cash, additional cash may have to be injected or expenditures may have to be reduced. If there is excessive cash on hand, the money should be invested or otherwise deposited into interest bearing accounts (e.g., set up reserves for replacement or capital improvements, etc.)

Putting it all Together: Do you have Technical, Managerial, and Financial Capacity?

EPA will be reviewing these worksheets, and information we have in our files, in order to make a determination whether you have the technical, managerial, and financial capacity to qualify for a Tribal Set-aside Construction Grant. Remember, even if you do not have the required capacity right now, you may still qualify if the grant is going to be used to obtain capacity. Keep in mind that certain other changes may also have to be made, such as managerial and financial changes, in order to qualify. If you need more information or assistance in using and completing these worksheets, please contact:

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