AQUIFER STORAGE & RECOVERY

December 2016

Information for HMA Review | Data Supplement

Each Hazard Mitigation Assistance (HMA) application must comply with the requirements outlined in the HMA Guidance. According to the guidance, in addition to a general programmatic review, an Environmental Planning and Historic Preservation (EHP) review and a technical review must be performed by the Federal Emergency Management Agency (FEMA) for each proposed project. Early submission of accurate and complete information will facilitate FEMA's review process and the release of HMA funds. This Data Supplement augments the Aquifer Storage and Recovery Job Aid by providing additional information, examples, and potential sources of documentation for items listed in the Job Aid to help communities applying for HMA grants comply with application requirements. For more information, Subapplicants and Applicants are encouraged to refer to FEMA's Hazard Mitigation Assistance Guidance and Environmental and Historical Preservation Resources At-A-Glance Guide.

☐ PROVIDE A VICINITY MAP WITH ADDRESS AND PROJECT BOUNDARIES

Potential Sources: Provide a map showing project extents. Provide a clear delineation of areas disturbed to construct the project, including potential offsite areas such as spoils disposal locations.

Include the address(es) of the mitigation project. This includes street name and number, city, county or parish, state, and zip code for the property. A post office box number is not an acceptable address.

Map(s) and/or site survey(s) should show the project boundaries and identify all the property parcel(s) that are included in the project area, as well as adjacent parcels. Tax Parcel maps, Property Survey Map, U.S. Geological Survey (USGS) topographic map, aerial photographs are some acceptable resources. Obtain the information from the property owner, local building inspector, tax assessor records, deed to the property, or engineering plans.

Example: A site survey was conducted by a licensed surveyor to clearly establish project and property boundaries. Attached map shows the location of the project located at 4456 River Road NE, Martinsburg, Berkeley County, WV 25409.

☐ IDENTIFY PROJECT LOCATION BY LATITUDE AND LONGITUDE IN DECIMAL DEGREES

Potential Sources: There are several ways to obtain the latitude and longitude of a property. Options include:

- Use a Global Positioning System (GPS) device.
- Enter the property address into a mapping application to find the coordinates. Several free tools are available that generate the latitude and longitude coordinates when you type in an address. Enter "how to find GPS coordinates" into an Internet search engine to find a mapping application.

Note: Note that latitude and longitude are shown in either decimal degrees (e.g., 38.889463, -77.035237) or degrees, minutes, and seconds (38° 53' 22.1" N, 77° 02' 06.8" W). If your GPS or tool provides degrees, minutes, and seconds, you may need to convert this into decimal degrees in order to enter it into eGrants. Several free tools are available on the Internet for this conversion. Enter "coordinate converter" into a search engine to find one of these tools.

Example: Coordinates for the Washington Monument, Washington D.C. 38.889463, -77.035237. See Figure 1.

Figure 1: Washington Monument, Washington, DC (Source: http://www.publicdomainpictures.net/)

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☐ PROVIDE SITE PHOTOGRAPHS

Potential Sources: Use a phone, tablet, or camera to take clear, good quality photos for inclusion in the application.

- Show close and long range photos whenever possible.
- Include photos of the area where the flood / high water accumulates, and the area where the injection well will be placed if applicable.
- The photos should be taken from multiple angles.
- Provide photos with sufficient detail to explain the proposed project.
- Label the photos to explain exactly what they show and include directions.
- The photos should depict the areas detailed on the site maps.

Example: Figures 2 through 5 (below) illustrate the four sides of the structure, as required.

Figure 2: View looking west across project site

Figure 3: View looking west across project site showing outfall

Figure 4: View looking north across project site

Figure 5: Front and west side of building

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☐ PROVIDE CURRENT PROPERTY OWNERSHIP INFORMATION, INCLUDING ANY EASEMENTS OR COVENANTS

Potential Sources: Contact the local tax office to identify the property owners. If there are multiple properties included in the project, ensure that all property owners are provided and clearly identify what parcel (consistent with the site map) each property owner is associated with. Identify any current/potential easements, covenants, leases and/or liens on the property, as applicable.

Example: Parcel 1 owned by John Smith. Parcel 2 owned by XYZ Corp.

☐ PROVIDE A COPY OF THE FLOOD INSURANCE RATE MAP (FIRM) SHOWING PROJECT LOCATION

Potential Sources: FEMA Flood Insurance Rate Map (FIRMs) and Letters of Map Revisions (LOMRs) can be found on FEMA's Map Center website or through the local floodplain regulatory agency. https://msc.fema.gov/portal.

Example: Based on the FEMA Flood Map FEMA MAP {PANEL NO xxxx, Map NO. xxxx with effective date xxx}, the project would be constructed in the flood zone designation of {IDENTIFY FLOOD ZONE DESIGNATION and elevation} which are areas subject to inundation by the {PERCENT ANNUAL CHANCE FLOOD EVENT}.

☐ INCLUDE GEOLOGIC AND HYDROGEOLOGIC INFORMATION (E.G., AQUIFER TYPES, AQUIFER AND VADOSE ZONE CHARACTERISTICS, SUBSURFACE HOMOGENEITY/HETEROGENEITY, HYDROLOGIC CONDUCTIVITY, TRANSMISSION RATES, STORAGE COEFFICIENTS, WATER TEMPERATURES). INCLUDE COPIES OF INVESTIGATION REPORTS.

Potential Sources: Describe the local and regional geology and hydrogeology underlying the project, including information such as the depth to groundwater, depth to bedrock, geologic formations (including Karst formations), type of aquifer, aquifer and vadose zone characteristics, subsurface homogeneity/heterogeneity, hydraulic conductivity, transmission rates, storage coefficients, water temperatures. Include copies of investigation reports. Information can be found at:

- Groundwater observation well data (groundwater quality and groundwater levels) located on the USGS National Water Information Systems: Web Interface http://nwis.waterdata.usgs.gov/usa/nwis/gwlevels.
- Aquifer properties (e.g., hydraulic conductivity, transmission rates, storage coefficients, water temperatures, etc.) from local hydrogeology studies in academic journals such as: http://www.journals.elsevier.com/journal-of-hydrology-regional-studies or USGS publications: https://pubs.er.usgs.gov/.
- A map of the shallowest principal aquifers of the United States, portrayed in polygon format, can be found at: http://water.usgs.gov/ogw/aquifer/map.html.

Examples: See Figure 6; Map of Principal Aquifers of the United States obtained from the USGS.

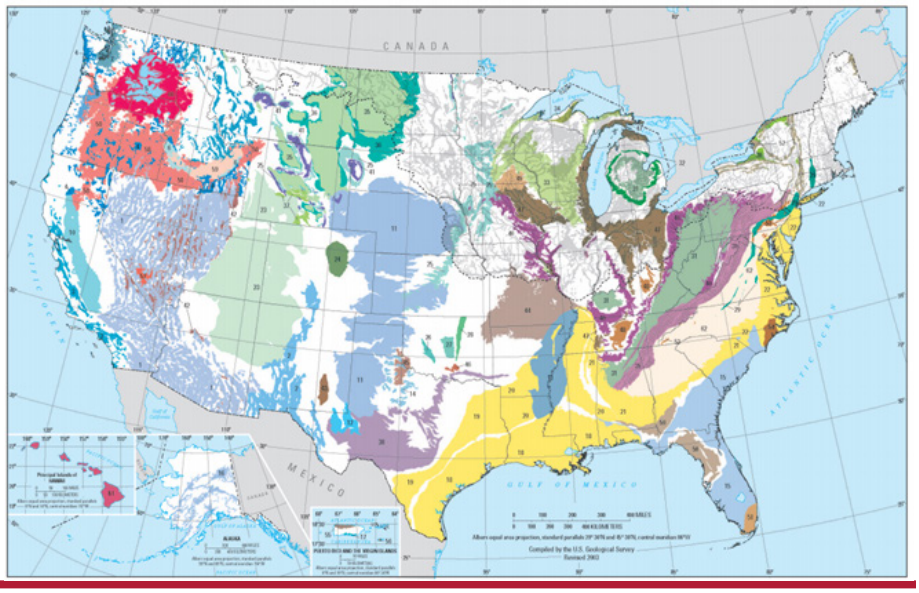

Figure 6: Map of principal aquifers of the United States (Source: USGS, http://water.usgs.gov/ogw/aquifer/map.html)

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☐ INDICATE CURRENT LAND USE TYPES (E.G., RESIDENTIAL, COMMERCIAL, INDUSTRIAL ETC.) ON AND NEAR THE PROJECT SITE

Potential Sources:

- National Land Cover Database can be found on the USGS' National Map Viewer website (http://viewer.nationalmap.gov/viewer/)
- The Multi-Resolution Land Characteristics Consortium's (MRLC) National Land Cover Database is available here: (http://www.mrlc.gov/nlcd2011.php)
- Contact the local planning agency.

Example: Based on the National Land Cover Database, the project site is surrounded by {IDENTIFY LAND USE} to the north, {IDENTIFY LAND USE} to the east, {IDENTIFY LAND USE} to the south, and {IDENTIFY LAND USE} to the west.

☐ SHOW ON A MAP ALL EXISTING SURFACE WATER BODIES, STORMWATER STRUCTURES, FLOODPLAINS, WETLANDS, WOODLANDS, AND RIPARIAN HABITAT INFORMATION. INDICATE WHICH BODIES OF WATER (E.G., RIVER, STREAM, WETLAND, OR POND) ARE LOCATED WITHIN 200 FEET OF THE PROJECT.

Potential Sources:

- Site survey conducted by a licensed surveyor, tax assessor maps, topographic maps, available satellite images such as those available from Google Earth maps, U.S. EPA NEPAassist tool (http://nepassisttool.epa.gov/nepassist/entry.aspx), and GIS data sources for the jurisdiction/agency, or available field surveys would include this information.
- Review the local jurisdiction's/lead agency's ordinances, codes to determine any special requirements regarding setbacks/restrictions to development and/or permits.
- Identify the location of any vegetation that will be affected and identify the type(s) of affected vegetation.
- Describe whether any part of the project site is within 200 feet of a body of water (e.g., river, stream, ditch, wetland, pond), and provide details about the proximity of the project site to the water body(ies) and the type of water body(ies).This information would be obtained internally from the project engineer or planner.
- Identify the location of areas with potential sinkhole risks.

Example: A site survey was conducted by licensed surveyor to clearly establish property boundaries. Attached is a map that shows the location of the project, all surface water bodies, stormwater structures, floodplains, wetlands and woodland. Based on the review of {IDENTIFY DATA SOURCE} the proposed project would be within {DISTANCE} of the {WATERBODY}.

☐ INCLUDE A STATE OR LOCAL TOPOGRAPHIC MAP WHERE AVAILABLE, OTHERWISE PROVIDE A USGS TOPOGRAPHIC MAP OF THE PROJECT SITE

Potential Sources: Topographic maps can be found on USGS' National Map website: http://nationalmap.gov/ustopo/. The USGS National Hydrography Dataset (NHD) contains GIS data detailing surface water bodies and stormwater structures. For more detailed information on locations of stormwater structures, check the local city or county's GIS data sources. Zoom in to provide sufficient detail of all existing surface water bodies. In addition, obtain or create a map showing locations of stormwater structures.

Example: See Figures 7 and 8.

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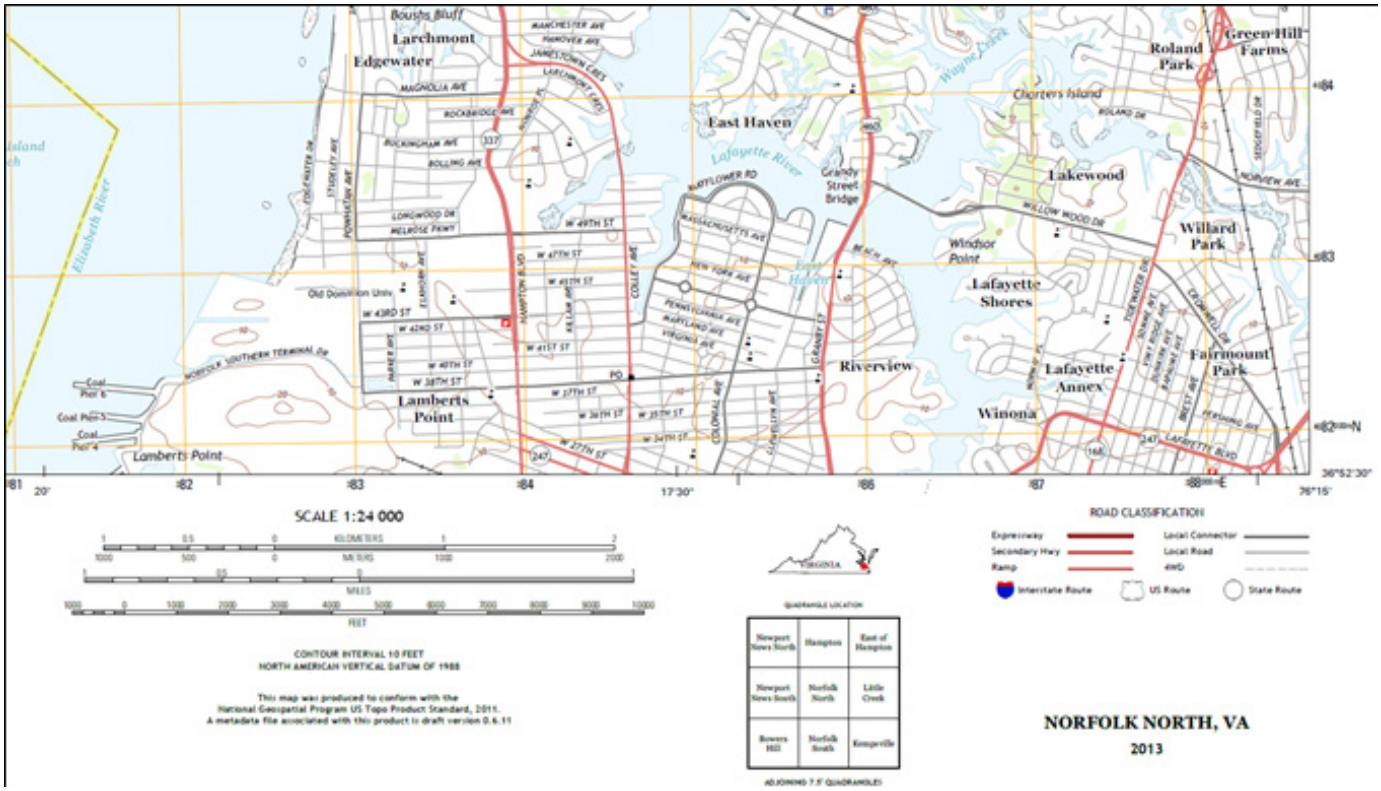

Figure 7: USGS Topo Map (Source: USGS, http://nationalmap.gov/ustopo/)

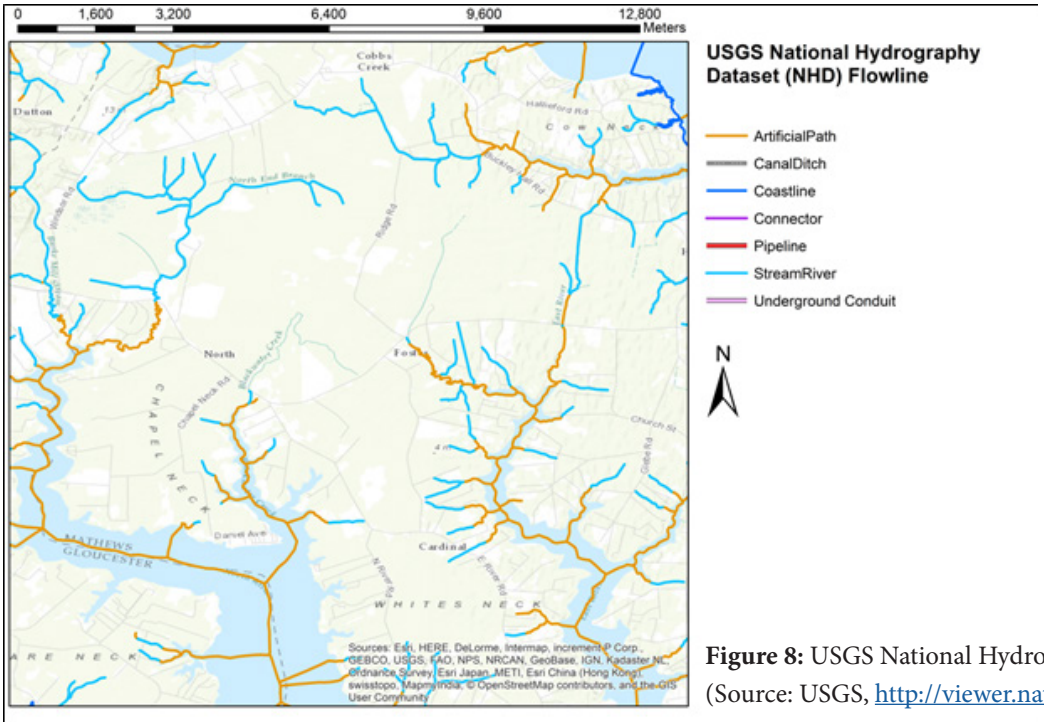

Figure 8: USGS National Hydrography Dataset (NHD) (Source: USGS, http://viewer.nationalmap.gov/basic/#productSearch)

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☐ INCLUDE THE NATURAL RESOURCES CONSERVATION SERVICE SOIL MAP FOR THE PROJECT SITE

Potential Sources: Soil maps can be obtained from State Natural Resources Conservation Service (NRCS) offices and the U.S. Department of Agriculture, Web Soil Survey website at: http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

Example: Based on the USDA's Web Soil Survey attached, the project would be constructed primarily in {INSERT SOIL TYPE(S)}. See Figure 9.

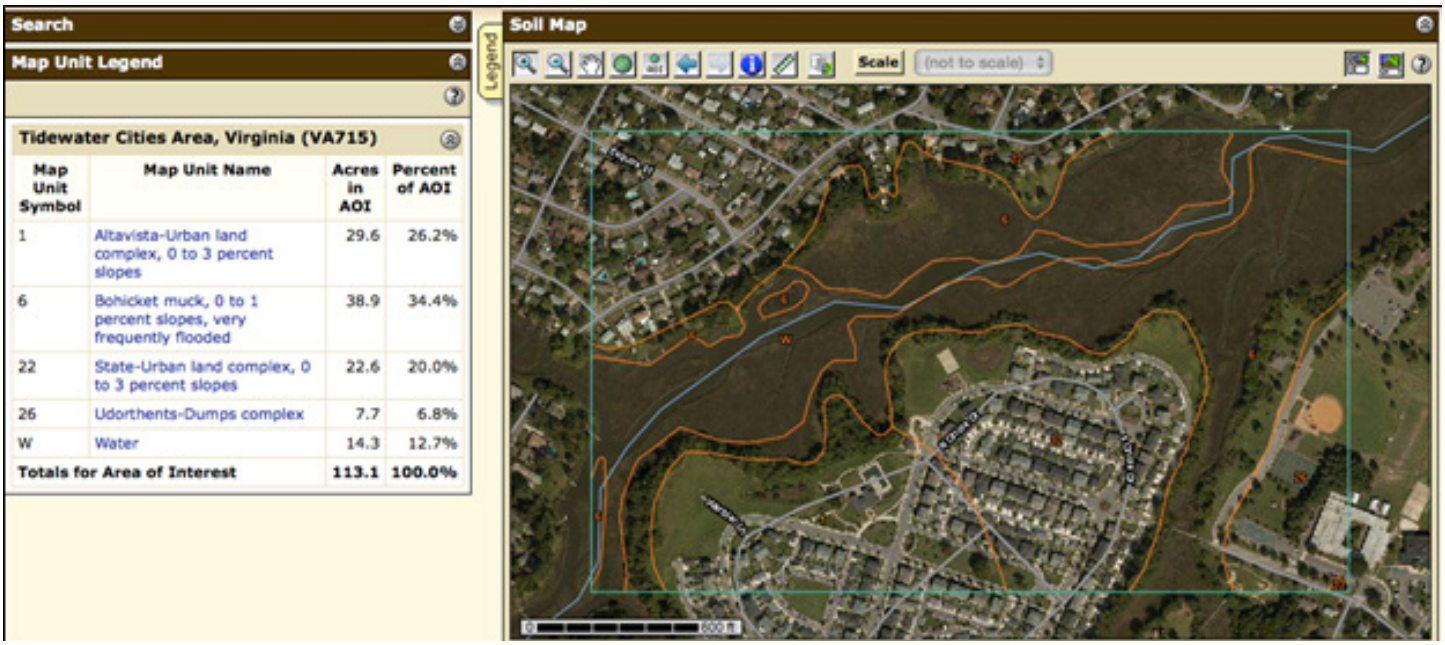

Figure 9: Web Soil Survey Map (Source: U.S. Department of Agriculture, http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx)

☐ INCLUDE COPIES OF EXPLORATORY STUDIES, WELL DRILLING LOGS, AND MAPS SHOWING WELL LOCATIONS

Potential Sources: The State Department of Environmental Quality and local government should have well records. Include information about the owner of the well, pumping capacity and drilling logs if available.

Example: A search of the well records provided by {IDENTIFY SOURCE AND REPORT DATE} was conducted. The details on each well are provided in the attached report. Each well is identified with a reference number that corresponds to the provided map.

☐ IDENTIFY PERMITTING REQUIREMENTS, RELEVANT AND LOCAL ORDINANCES. INCLUDE STATUS OF PERMIT APPLICATIONS, COPIES OF PERMITS OBTAINED.

Potential Sources: Permits may be federal, state, local, or a combination thereof (e.g., Maryland's Joint Federal/State (Corps/MDE) permit process). For summary information, include at a minimum, the name of the agency, permit type, status of the application or summary of determination of non-applicability, and date of the application/effective date/expiration date (as appropriate). These documents should be available with the project proposal / management records or consulting engineer, or obtain the information from the permitting agency.

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Review the U.S. EPA's Underground Injection Control (UIC) Program (under 40 CFR Part 144) at: https://www.epa.gov/uic/aquifer-recharge-and-aquifer-storage-and-recovery#well_regs. Also consult state UIC ordinances since some states have UIC programs that are more stringent that the U.S. EPA's program.

Example: This project requires {INSERT TYPES OF PERMITS} from {NAME PERMITTING AGENCY(IES)}. The table below summarizes the permits needed for the project and the status of the permit.

Permit Name	Permitting Agency	Date of Application	Effective Date	Expiration Date	Status of application (if unpermitted)	Comments

☐ INCLUDE AN UNDERGROUND UTILITIES MAP OR SHOW LOCATIONS OF UNDERGROUND UTILITIES ON THE PROJECT SITE MAP

Potential Sources: Obtain information about underground utilities at the project site (e.g., telecommunication, electricity distribution, natural gas, storm drains, water mains, wastewater pipes, oil and gas pipelines, etc.) from the project engineer/planner or local planning agency.

Example: Based on the attached existing {INSERT UTILITY TYPE} plans, provided by {IDENTIFY SOURCE}, there are no potential conflicts within the project site.

☐ PROVIDE A NARRATIVE DESCRIPTION OF THE PROJECT SCOPE OF WORK, INCLUDING THE METHOD OF RECHARGE (E.G., INJECTION, ENHANCED NATURAL STORAGE, MULTIPLE SOURCES), FREQUENCY AND TIMING OF RECHARGE, RECHARGE RATE CALCULATIONS, NUMBER OF PROPOSED WELLS/ BASINS

Potential Sources: This information would be obtained internally from the project engineer or planner. Attach any supporting construction or engineering designs.

Example: The proposed project consists of the construction of {INSERT NUMBER} Aquifer Storage and Recovery (ASR) wells, each capable of pumping {INSERT QUANTITY OF WATER IN MILLION GALLONS PER DAY [MDG]}. The recovery efficiency from these {INSERT NUMBER} wells is anticipated to be {INSERT EXPECTED FREQUENCY AND TIMING OF RECHARGE BASED ON RECHARGE RATE CALCULATIONS}.

☐ IDENTIFY AND SHOW ON A MAP THE CURRENT WATER SOURCES, QUALITIES AND CAPACITIES THAT SERVE THE COMMUNITIES THAT COULD BE IMPACTED BY THIS PROJECT. NOTE ANY USERS OR POTENTIAL USERS OF LARGE VOLUMES OF WATER, SUCH AS AGRICULTURAL, PUBLIC ENTITIES, OR INDUSTRY. EXPLAIN HOW THE PROJECT WOULD AFFECT THE QUALITY OR VOLUME OF WATER SUPPLIED TO THESE USERS.

Potential Sources: Consider the availability of the detained/retained water to potential users, under average conditions and during high demand conditions such as drought.

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This information would be obtained from:

- Local water purveyor
- U.S. EPA Safe Drinking Water Information System: https://www3.epa.gov/enviro/facts/sdwis/search.html
- USGS National Hydrography Dataset: http://nhd.usgs.gov/data.html
- USGS Water Resources of the United States: http://water.usgs.gov/data/
- State Department of Environmental Quality
- Open Public Records investigation of permitted water/wastewater discharges.

Example: A report prepared by {IDENTIFY, REPORT DATE} consulting engineers is provided. The overall findings are: {PROVIDE SUMMARY / CONCLUSIONS}.

☐ **DESCRIBE THE SOURCE, CHARACTERISTICS, AND QUALITY OF WATER TO BE INJECTED/INFILTRATED (E.G., RIVER, STORMWATER, RECLAIMED, UNTREATED AND NEED FOR PRE-TREATMENT). DESCRIBE POTENTIAL ECOLOGICAL EFFECTS DUE TO WATER QUALITY.**

Potential Sources: Geochemical modeling can be used to determine the need for source water pre-treatment for conditions such as high turbidity, suspended solids, possibly cross contaminated by sanitary, runoff from industrial activities, etc. Identify if the diverted water will have ecological impacts on the receiving area such as: settling of solids from stormwater, introduction of nitrogen as a result of runoff from agricultural areas, introduction of toxic contaminants from industrial operations. USGS National Hydrography Dataset http://nhd.usgs.gov/data.html; USGS Water ReSource(s) of the United States http://water.usgs.gov/data/; and State Department of Environmental Quality have additional, relevant data sets.

Example: The source water is characterized as {INSERT DESCRIPTION OF SOURCE WATER QUALITY, SUCH AS SALINE/ BRACKISH/FRESH} and requires {INSERT DESCRIPTION of PRETREATMENT ACTIVITIES SUCH AS MINIMIZING ARSENIC LEACHING} in order to minimize {CONTAMINANT} leaching and to avoid development of a permanent mixing zone along the interface of the naturally occurring groundwater and the injected source water.

☐ **DESCRIBE THE AMOUNT AND DEPTH OF GROUND DISTURBANCE ASSOCIATED WITH THIS PROJECT (E.G., GRADING; DIGGING FOR BURIED UTILITY LINES; NEW, TEMPORARY, OR PERMANENT ACCESS ROADS OR STAGING AREAS; INSTALLATION OF GROUNDWATER RECHARGE TRENCHES; NEW GROUNDWATER INJECTION OR EXTRACTION WELLS; ALL ASSOCIATED PIPE ROUTING)**

Potential Sources: The project engineer or planner can provide ground disturbance information , including the amount of cut and fill, depth of trenches, digging for buried utility lines, temporary or permanent access roads or staging areas, new groundwater injection or extraction wells and all associated pipe routing.

Example: The proposed project would result in {INSERT VOLUME OF GROUND DISTURBANCE} of ground disturbance. Approximately {INSERT AREA TO A DEPTH OF X} would be temporary disturbance and {INSERT AREA} would be permanent disturbance. Temporary disturbance would include disturbance for the following activities: {INSERT AREA, DEPTH and DESCRIPTION OF EACH ACTIVITY}. Permanent disturbance will include disturbance for the following activities: {INSERT AREA, DEPTH and DESCRIPTION OF EACH ACTIVITY}.

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☐ STATE THE CURRENT TOTAL ANNUAL PRODUCTION (IN GALLONS) OF WATER PER CAPITA PER DAY IN THE AREA AFFECTED BY THE PROJECT

Potential Sources: This information would be obtained internally from the project engineer or planner, or estimated based on review of local hydrogeology studies documenting the annual production of specific aquifer systems.

Example: The current total annual production (in gallons) of water per capita per day in the area affected by the project is {INSERT QUANTITY}.

☐ STATE THE UNCONSTRAINED POTABLE WATER DEMAND (IN MILLION GALLONS PER DAY [MGD]) FOR THE MUNICIPAL WATER SYSTEM SERVING THE POPULATION IN THE PROJECT AREA

Potential Sources: Local or regional water supply plans, local Department of Utilities, USGS Water Use in the United States database: http://water.usgs.gov/watuse/ can be used to obtain this information.

Example: According to the {INSERT SOURCE}, the unconstrained potable water demand (in million gallons per day [MGD]) for the municipal water system serving the population in the project area is {INSERT QUANTITY}.

☐ COMPARE THE VOLUME OF ADDITIONAL WATER SUPPLY EXPECTED IN MGD TO ANTICIPATED WITHDRAWAL RATES. PROVIDE THE MAXIMUM VOLUMETRIC PRODUCTION (NOT INJECTION) PUMPING RATE. INCLUDE CALCULATIONS AND/OR MODELS.

Potential Sources: This information would be obtained internally from the project engineer or planner. Useful groundwater modeling tools may include: MODFLOW, SEAWAT and/or PHREEQC. Attach any supporting calculations or model results.

Example: According to the {INDICATE TYPE OF MODELING OR ENGINEERING EVALUATION USED}, the proposed project would result in approximately {INSERT VOLUME OF ADDITIONAL WATER SUPPLY EXPECTED}; this volume of additional water would be offset by groundwater withdrawal for {INSERT TYPES OF GROUNDWATER WITHDRAWAL IN THE PROJECT AREA}, anticipated to be approximately {INSERT ANTICIPATED WITHDRAWAL RATES} during implementation and operation of the project. The proposed project would result in {INSERT MAXIMUM VOLUMETRIC PRODUCTION PUMPING RATE}.

☐ STATE THE AVERAGE DEPTH TO RECOVERABLE WATER AND THE TYPICAL DEPTH THAT STORED WATER MUST BE PUMPED FROM DURING PRODUCTION

Potential Sources: This information would be obtained internally from the project engineer or planner. Useful groundwater modeling tools may include: MODFLOW, SEAWAT and/or PHREEQC. Useful manuals and guidance documents include Aquifer Storage and Recovery – A Guide to Aquifer Recharge through Wells (Pyne, 2005); Aquifer Storage and Recovery Manual of Water Supply Practices M64 (AWWA, 2015), available at: http://www.awwa.org/store/productdetail.aspx?productid=26636.

Example: The average depth to recoverable water for this project is {INSERT QUANTITY}.

☐ DESCRIBE USAGE OF STORED WATER (E.G., ANNUAL WATER SUPPLY STRATEGY, STORED FOR USE DURING PERIODS OF EXTREME DROUGHT, ETC.)

Potential Sources: Information about usage of stored water (e.g., potable, irrigation, etc.) would be obtained internally from the project engineer or planner.

Example: The water stored as part of this aquifer storage and recovery project will be used by multiple water users in the vicinity of the project site, including {LIST USERS OF STORED} for {DESCRIBE TYPE OF USAGE, SUCH AS POTABLE, IRRIGATION, HYDROPOWER, ETC.}.

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☐ STATE THE LENGTH OF TIME THAT THE PROJECT AREA EXPERIENCES A MEASURABLE WATER SHORTAGE (DUE TO DROUGHT)

Potential Sources: The U.S. Drought Monitor (USDM), as part of the National Integrated Drought Information System (NIDIS), provides a weekly summary of current national drought conditions available at: https://www.drought.gov/drought/. Historical drought conditions can also be quantified by analyzing the following data sources: historical rainfall data (National Oceanic and Atmospheric Administration (NOAA)) found at https://www.ncdc.noaa.gov/cdo-web/, and historical streamflow data (USGS) found at Historical Streamflow and Stage (USGS): http://waterdata.usgs.gov/nwis/sw.

Example: See Figure 10.

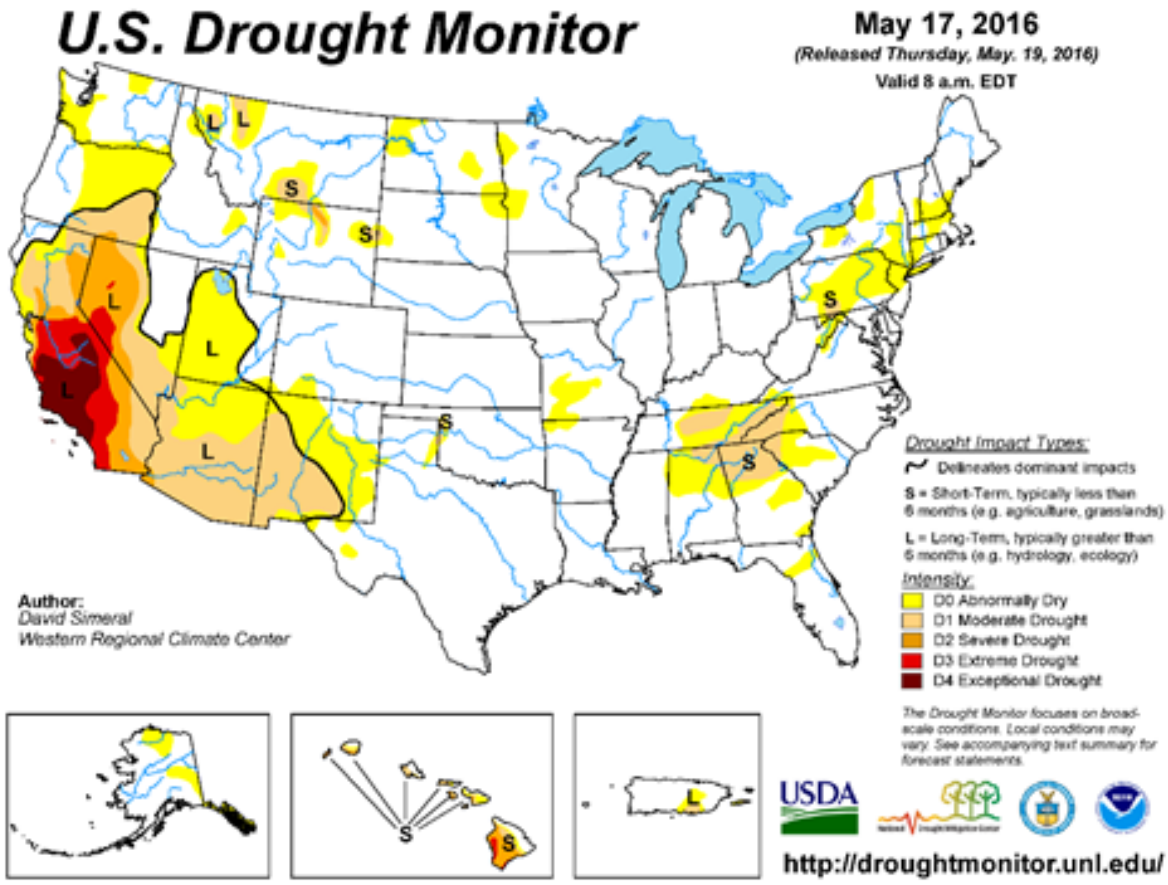

Figure 10: May 17, 2016 U.S. Drought Monitor Map (Source: NIDIS, https://www.drought.gov/drought/)

☐ EXPLAIN THE EFFECT ON, OR EXPECTED CHANGE IN CAPACITY, IF ANY, OF NEARBY STORMWATER MANAGEMENT FACILITIES AND RESERVOIRS AFTER THE PROJECT IS IMPLEMENTED

Potential Sources: This information would be obtained internally from the project engineer or planner. Attach any supporting calculations or model results.

Example: After the project is implemented, engineering analyses forecast an {INCREASE/DECREASE} storage in regional stormwater management facilities and reservoirs by approximately {INSERT QUANTITY OF STORAGE}.

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☐ PROVIDE CHARACTERISTICS (E.G., SIZE AND GEOGRAPHIC AREA) OF POPULATION THAT (1) IS IMPACTED BY DROUGHT AND (2) WOULD BE SERVED BY THE INCREASE IN WATER SUPPLY

Potential Sources: A map depicting potential users that would be impacted by drought and implementation of the project would be useful. Characteristics (e.g., size, geographic area, and demographics) of populations can be found on the U.S. Census Bureau website that provides online demographic data (population size, housing characteristics, business and industry, etc.). Data can be queried by state, county, city, town, or zip code at: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. To determine populations that are impacted by drought, refer to The U.S. Drought Monitor (USDM) to view a weekly summary of current national drought conditions at: https://www.drought.gov/drought/.

Example: Based on the USDM map from {INSERT DATE}, the population within the vicinity of the project area {IS/IS NOT} impacted by drought. According the U.S. Census Bureau, the population impacted by drought and to be served by the increase in water supply is comprised of {DESCRIBE POPULATION CHARACTERISTICS}.

☐ INCLUDE CONCEPTUAL PLANS, DESIGNS, AND SPECIFICATIONS

Potential Sources: The engineer's conceptual design should include drawings as well as information related to the seasonal high water levels, the area in which the high water accumulates, the type of aquifer and the injection well, mixing zone, type of withdrawal, transportation method, and treatment and re-use methods.

Refer to FEMA Fact Sheet for information on Aquifer Storage and Recovery and additional background and resources to consider when developing and describing the project: http://www.fema.gov/media-library-data/1449243910758-8e7fc3dc22f615f256085b8ad373d0a7/ASR_FactSheet_Sep2015_Dec508.pdf

Example: Figure 11 (below) illustrates a Conceptual hydrogeologic cross-section illustrating aquifer storage and recovery (ASR) in south Florida.

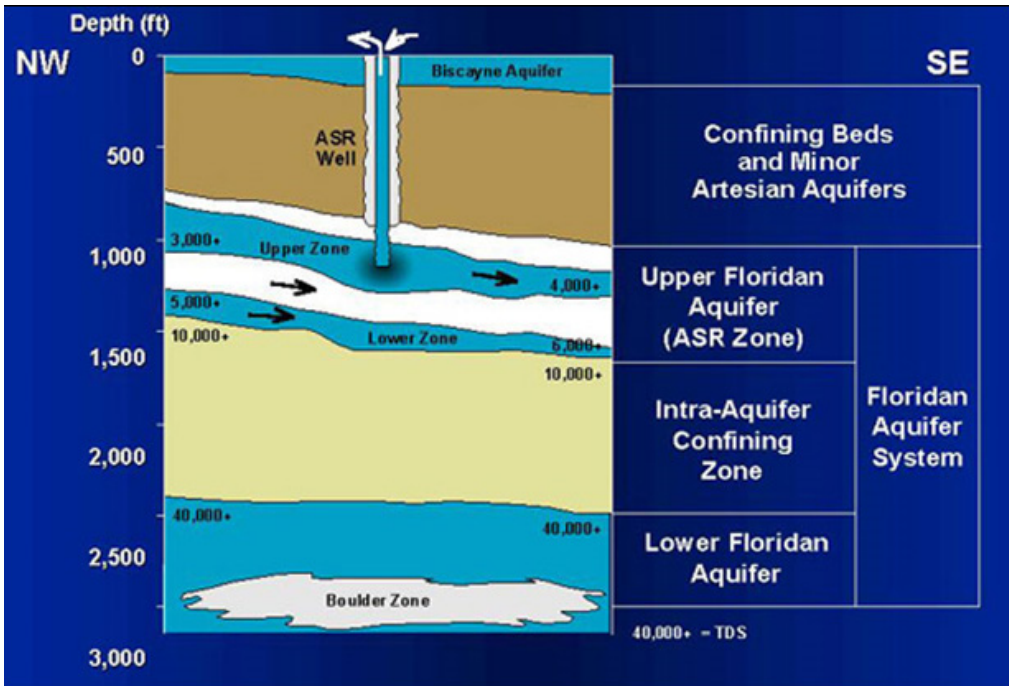

Figure 11: Conceptual Hydrogeologic Cross-Section (Source USGS: http://sofia.usgs.gov/publications/ofr/01-180/)

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☐ DESCRIBE AND/OR SHOW ON A MAP THE TYPE AND LOCATION OF ANY VEGETATION THAT WILL BE AFFECTED BY IMPLEMENTATION OF THE PROJECT

Potential Sources: Consult the project engineer, landscape architect, restoration ecologist, or forester assisting in project design and implementation to describe the treatment plan or landscaping plan for all vegetation that would be removed or affected (e.g., trimmed) by the project. Include:

- A description of the types of vegetation that would be removed
- The method of removal (e.g., herbicide, hand tools, bulldozer)
- The overall goal of the vegetation removal (e.g., decrease vegetation density, removal of ladder fuels, create a level and vegetation free site)

If vegetation would be planted, include details about the types of vegetation that would be planted and the general method of planting. For multiple project sites, include this information in similar detail for each project site.

Example: The attached planting plan identifies the species currently on site that will be removed as part of this project, see {REFERENCE LIST OR PLANTING PLAN KEY}. Following the removal of the undesirable species the following species will be planted in the {NAME ZONE OR SECTION OF THE PROJECT AREA OR REFERENCE PLANTING PLAN} in order to reestablish the naturally occurring vegetation types.

☐ IF USING INJECTION WELLS, DESCRIBE PROPOSED COMPLIANCE WITH EPA UNDERGROUND INJECTION CONTROL PROGRAM

Potential Sources: A Class V well is used to inject non-hazardous fluids underground. U.S. EPA regulates Class V wells as part of the Underground Injection Control (UIC) program under the Authority of the Safe Drinking Water Act. U.S. EPA Federal Requirements for Class V Wells can be found online at: https://www.epa.gov/uic/federal-requirements-class-v-wells, or from the state's environmental quality or ground water office.

Example: The response to this item is best presented in a table or list of each regulatory requirement and the explanation of how it will be met.

☐ DESCRIBE DEBRIS OR OTHER MATERIALS THAT WILL BE REMOVED AND HAULED OFF-SITE, AND PROVIDE INFORMATION ON WHERE IT WILL BE DISPOSED (INCLUDING TEMPORARY STAGING AREAS) IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS

Potential Sources: Project engineer or planner should have information about debris to be removed from the site (construction and/or existing debris on site), vegetation, and soil to be removed from the site, including types and estimated volumes. The State environmental department maintains a list of and the legal status of disposal sites, i.e., is the site a licensed landfill. Re-used materials should be analyzed to assure compliance with project specifications.

Example: Construction debris generated by the project would include materials from an existing structure that would be demolished, soil material from excavation, and vegetative material from plants and trees that would be removed. A Phase 1 Environmental Site Assessment has already been completed (attached) and the site has been determined to be clean and not contain any potential contaminated soils. Construction debris and vegetation debris would be disposed of at the local licensed transfer station {INSERT DETAILS OF FACILITY}, which has adequate capacity as described in the attached letter. All soil that would be excavated has been determined through geotechnical testing to be suitable for use in the detention basin berms. No excavated soil would be disposed of offsite.

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☐ DESCRIBE THE TYPE AND SOURCE OF ANY FILL THAT WILL BE IMPORTED TO THE PROJECT AREA FROM AN OFF-SITE SOURCE (E.G., EXISTING BORROW PIT)

Potential Sources: Project engineer can provide information about the type of fill that would be imported, the sources of the fill (including location) and a description whether the fill source is currently licensed and permitted to operate for this intended use. Fill companies can provide information about sources, gradations, etc.

Example: All fill material, which would include concrete, aggregate rock, and rock riprap, would be provided by {NAME OF PROVIDER}, which stockpiles all the necessary materials at their processing plant located {ADDRESS}. All materials would originate from one of three quarries operated by {NAME OF COMPANY}. These existing quarries operate under permits from {NAME PERMITTING AGENCY (IES)}, and {NAME OF PROVIDER} has indicated that providing the needed borrow materials for the project would not exceed the overall availability capacity of the quarries.

☐ DISCUSS POTENTIAL IMPACTS ON ANY EXISTING WELLS, WATER QUALITY, AND FLOW WITHIN THE AQUIFER

Potential Sources: This information would be obtained internally from the project engineer or planner. Useful groundwater modeling tools may include: MODFLOW, SEAWAT and/or PHREEQC. Attach any supporting calculations or model results.

Useful manuals and guidance documents include Aquifer Storage and Recovery – A Guide to Aquifer Recharge through Wells (Pyne, 2005); Aquifer Storage and Recovery Manual of Water Supply Practices M64 (AWWA, 2015), available at: http://www.awwa.org/store/productdetail.aspx?productid=26636.

Example: The potential impacts of the project on existing wells, water quality, and flow within the aquifer include {DESCRIBE IMPACTS}.

☐ STATE NUMBER AND LOCATIONS OF NEW EXTRACTION WELLS PLANNED AND IF THEY WILL BE SEPARATE FROM INJECTION WELLS. INCLUDE OUTPUTS FROM MODELS USED FOR DESIGN.

Potential Sources: This information would be obtained internally from the project engineer or planner.

Example: The proposed project includes the construction of {INSERT NUMBER} new extraction wells. {INSERT NUMBER} will be separate from injection wells. See attached model outputs for details.

☐ INCLUDE A PROJECT SCHEDULE SHOWING START AND END DATES, MILESTONES, ACTIVITIES, AND DELIVERABLES. THE SCHEDULE SHOULD BE NO LONGER THAN 3 YEARS.

Potential Sources: A detailed project schedule for all phases of the project with start and end dates for each phase, milestones, and critical path activities would be obtained internally from the project engineer or planner.

Example: Based on the attached schedule, Phase I {OR INCLUDE SPECIFIC PROJECT ACTIVITY} would commence in November 2016 and end in April 2017. Phase II includes {IDENTIFY PROJECT ACTIVITY} and would immediately precede Phase I provided the Applicant obtains the following permits {LIST PERMITS OR OTHER CONCERNS}.

☐ PROVIDE COST INFORMATION FOR:

- Project development, including site selection, field testing, engineering, public outreach
- Land acquisition, including site access, permitting, and source water availability
- Construction, including labor, materials, equipment, and testing

- Operations and maintenance, including pre-treatment and post-treatment requirements and post-project monitoring, labor, electricity, consulting services, regulatory testing, treatment, and other miscellaneous costs

Potential Sources: Frequently used sources of cost data include:

- Material and labor costs for Applicant's force account labor and materials on similar projects
- Unit cost data from recent local projects of similar scope
- State agency data from recent projects of similar scope
- State Department of Transportation (DOT) contracts for stream maintenance at bridges or low-water crossings
- Cost estimates prepared by engineering consultants documenting quantities of work and unit costs
- Estimates based on published construction unit cost data; e.g., RS Means Cost Data

Example: Cost estimates must include detailed estimates of various cost item categories such as labor, materials, equipment, and subcontractor costs. Lump-sum estimates are typically not accepted.

☐ DETERMINE THE RECURRENCE INTERVAL ASSOCIATED WITH THE SEVERITY OF THE SCENARIO DROUGHT EVENTS THROUGH BEST AVAILABLE DATA AND METHODOLOGY DEEMED APPROPRIATE BY A LICENSED PROFESSIONAL

Potential Sources: At least one recurrence interval is needed to complete a benefit-cost analysis (BCA) in the ASR BCA Tool. There is not currently a single methodology to establish a recurrence interval for drought. Rather, FEMA encourages communities to use the best available data to document a recurrence interval. In addition to regional or local sources of historical drought periods, federal, state, and local resources are available to Subapplicants that can assist in selecting and evaluating drought impacts. A sample list of resources is provided below.

U.S. Drought Portal – http://www.drought.gov

Drought Risk Atlas - http://droughtatlas.unl.edu/Data.aspx

U.S. Bureau of Reclamation Drought Response Program - http://www.usbr.gov/drought/

Example: Recurrence interval information should be obtained from a licensed professional engineer, professional geologist, professional hydrologist, or any similarly qualified professional. Data entered into Step 3 of the ASR BCA Tool should be associated with a recurrence interval as shown in Figure 12.

Step 3

ASR Project Drought and Mitigation Information

Drought Recurrence Interval (years)	25	50	100	
Unconstrained Potable Water Demand (million gallons per day [mgd])	13.1	13.8	14.4	
Pre-mitigation System Supply Yield (SSY_{pre}, mgd)	12.5	11.7	10.8	
Pre-mitigation Duration of Impact (DOI_{pre}, days)	30	45	60	
Pre-mitigation Conditions % of Unmet Demand (DLF_{pre}, %)	5%	15%	25%	0%
Post-mitigation System Supply Yield (SSY_{post}, mgd)	13.1	12.8	12.3	
Post-mitigation Duration of Impact (DOI_{post}, days)	0	35	45	
Post-mitigation Conditions % of Unmet Demand (DLF_{post}, %)	0%	7%	15%	0%
Average Yield of ASR Project (mgd)	0.66	1.10	1.50	-

Figure 12: Step 3 of FEMA's ASR BCA Tool (Source: FEMA)

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☐ DETERMINE TYPE OF DAMAGES AND LOSSES TO BE MITIGATED AND USE THE AQUIFER STORAGE AND RECOVERY BENEFIT COST ANALYSIS TOOL

Potential Sources: Currently, the FEMA BCA Toolkit does not include an ASR module. Meanwhile, FEMA developed a Microsoft Excel based ASR BCA Tool, which serves as direct input and provides Benefit Cost Ratio (BCR) calculations. This module should be used to complete a BCA for ASR projects. Much of the information needed to complete the HMA application is also needed for the BCA, including: population, average daily water use, unconstrained potable water demand, maximum volumetric pumping rate, average depth to recoverable water, pre- and post-mitigation supply yield, pre- and post-impact duration (in days), capital costs, and operations and maintenance costs.

Example: See Figure 13 for an example of a project analysis using the ASR BCA Tool.

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ASR BCA Tool v1.0

Step 1

General Information

City:	Dry Spell
State:	CA

	Existing
Population Served by Project (*P*):	75,000
Average water use rate (gallons per capita per day)	170

Step 2

Project and Cost Information

Maximum Volumetric Pumping Rate (million gallons per day):	5
Average depth to recoverable water (feet)	225
Estimated Capital Cost of ASR Project (Present Value $US)	$ 3,000,000
Annual Operations and Maintenance Cost (Present Value $US)	$ 100,000
Useful Life	30
Annualized Cost	**$ 4,240,904**

Step 3

ASR Project Drought and Mitigation Information

Drought Recurrence Interval (years)	25	50	100	
Unconstrained Potable Water Demand (million gallons per day [mgd])	13.1	13.8	14.4	
Pre-mitigation System Supply Yield (SSY_{pre}, mgd)	12.5	11.7	10.8	
Pre-mitigation Duration of Impact (DOI_{pre}, days)	30	45	60	
Pre-mitigation Conditions % of Unmet Demand (DLF_{pre}, %)	5%	15%	25%	0%
Post-mitigation System Supply Yield (SSY_{post}, mgd)	13.1	12.8	12.3	
Post-mitigation Duration of Impact (DOI_{post}, days)	0	35	45	
Post-mitigation Conditions % of Unmet Demand (DLF_{post}, %)	0%	7%	15%	0%
Average Yield of ASR Project (mgd)	0.66	1.10	1.50	-

Step 4

ASR BCA Module Output

Drought Recurrence Interval (years)	25	50	100	
Pre-mitigation Damages (*PreDmg*)	$ 11,167,343	$ 52,899,457	$ 115,875,000	$ -
Pre-mitigation Annualized Damages	$ 486,105	$ 782,926	$ 1,158,738	$ -
Post-mitigation Damages (*PostDmg*)	$ -	$ 19,592,391	$ 50,695,313	$ -
Post-mitigation Annualized Damages	$ -	$ 315,157	$ 506,948	$ -

Total Pre-mitigation Annualized Damages	$ 2,427,769
Pre-mitigation Annualized Damages Present Value	$ 30,126,286
Total Post-mitigation Annualized Damages	$ 822,105
Post-mitigation Annualized Damages Present Value	$ 10,201,535
Mitigation Benefits	$ 19,924,751
Mitigation Cost	$ 4,240,904
Benefits Minus Costs	$ 15,683,847
Benefit-Cost Ratio	**4.7**

Additional Standard Values	
Discount Rate	7%
Economic Value of Loss of Water Service (*LWS*, per person per day)	$103

Figure 13: ASR BCA Tool Example (Source: FEMA)

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☐ PROJECT USEFUL LIFE IS 30 YEARS UNLESS THE USER PROVIDES A JUSTIFICATION FOR USING A DIFFERENT VALUE

Potential Sources: The FEMA standard value for the project useful life of an ASR project is 30 years. If a user enters a different value, supporting documentation from an expert should be provided.

Example: The proposed project has a project useful life of 30 years in accordance with FEMA Standard Values.

☐ ADDITIONAL BENEFITS MAY BE AVAILABLE DEPENDING ON THE PROJECT'S DESIGN:

- Reduced loss of function of roadways: provide traffic counts and detour times

Potential Sources: Traffic counts and detour times are available from your local department of transportation or department of public works as well as your State department of transportation. The Federal mileage rate is available from the Internal Revenue Service (IRS) website at: IRS Federal Standard Mileage Rates.

- Reduced damages due to subsidence: provide documentation of quantified reduction in structural damage to facilities in vicinity of project

Example: An ASR project may result in aquifer recharge and water table stabilization, which can help slow or lessen land subsidence, which, in turn, would potentially reduce structural damage to facilities in the vicinity of the project. This information is available from the project engineer, the local building department, or the local emergency management agency.

☐ IDENTIFY AT LEAST 2 ALTERNATIVES, INCLUDING THE DO-NOTHING CASE, AND EXPLAIN WHY THE PROPOSED APPROACH IS THE PREFERRED OPTION

Potential Sources: The project engineer/planner can provide information about other feasible alternatives that would address the purpose of the project and the reasons why these alternatives were dismissed and not pursued for FEMA funding. They can provide a statement supporting the reason that the proposed project is the most practicable alternative.

Example: The following alternatives were considered in the grant application: {LIST ALL ALTERNATIVES CONSIDERED}. Alternative {IDENTIFY ALTERNATIVE} was not considered practicable because of the increased costs resulting from the inability of the Public Works Department to provide the labor and equipment necessary for construction. The proposed project was considered the only practicable alternative, as it provides {IDENTIFY PROJECT OBJECTIVE SUCH AS DROUGHT MITIGATION} and was found to be the most cost-effective.

☐ DESCRIBE THE PROPERTY HISTORY AND ANY STUDIES, INVESTIGATIONS OR ENFORCEMENT ACTIONS RELATED TO THE PROPERTY (SUCH AS PENDING/CURRENT LITIGATION). PROVIDE DETAILS OR COPIES OF THE DOCUMENTS.

Potential Sources: Obtain the information from the property owner, local building inspector, tax assessor records, or deed to the property. Review Sanborn maps, environmental reports such as Environmental Data Resources, Inc. (EDR), U.S. EPA EnviroFacts (www.epa.gov/enviro), the state environmental department, city environmental department, and local, state, or national historic registers.

Example: Based on a Phase I investigation conducted by {IDENTIFY SOURCE} the proposed project area was determined to {DESCRIBE HISTORICAL USE FINDINGS}. Town records of the area {DESCRIBE FINDINGS}.

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☐ IF A BUILDING(S) OR OUTBUILDING(S) IS WITHIN SIGHT OF THE PROJECT, PROVIDE THE DATE WHEN THE OLDEST STRUCTURE WAS ORIGINALLY CONSTRUCTED. NOTE A CURRENT AERIAL PHOTOGRAPH OR MAP THE YEAR OF CONSTRUCTION OF BUILDINGS AND STRUCTURES WITHIN SIGHT OF THE PROJECT. NOTE FEMA IS CONCERNED WITH BUILDINGS AND STRUCTURES 50 YEARS OF AGE OR OLDER, NOT MORE RECENT ONES.

Potential Sources: Construction date can be obtained from local real estate or taxing agency.

Example: The structure on {INSERT BUILDING ADDRESS} was built in {INSERT CONSTRUCTION YEAR}. See attached aerial map for location.

☐ IDENTIFY IF THE PROJECT IS LOCATED WITHIN A DESIGNATED COASTAL ZONE OR COASTAL BARRIER RESOURCE SYSTEM UNDER THE STATE'S COASTAL MANAGEMENT PROGRAM

Potential Sources: Coastal Zone Management (CZM) is administered by the National Oceanic and Atmosphere Administration (NOAA) and implemented at the State level, and coastal jurisdiction extent and permitting requirements vary from state to state. Applicants should review this information from the State CZM program to ascertain whether their project is in a coastal zone, and determine the permitting requirements imposed by their state. To determine if your state and/or project lies within coastal zone boundaries, go to the following link: http://coastalmanagement.noaa.gov/mystate/welcome.html.

The following link describes each state's coastal zone boundary: http://coast.noaa.gov/czm/media/StateCZBoundaries.pdf

Information about the applicable CZM plans and regulatory agency should be obtained through the state regulatory agency of the coastal zone, either by phone or through the state agency's website. Review of the applicable coastal zone management plan or direct communication with the agency regulating the coastal zone would need to occur to determine any project-specific restrictions related to the project's occurrence within the coastal zone.

Example: The {INSERT STATE} coastal zone generally extends {INSERT DISTANCE} inland from the mean high tide line. The proposed project lies within the designated coastal zone and would require {IDENTIFY PERMITS}. The following activities {IDENTIFY ACTIVITIES} are regulated under this/these permits. A complete permit application form {PROVIDE APPLICATION LINK} including all required documentation and any {APPLICABLE FEES} should be submitted {IDENTIFY TIMING OF SUBMITTAL}.

☐ IDENTIFY ANY KNOWN CONTAMINATED MATERIALS LOCATED ON-SITE (E.G., ASBESTOS, LEAD-BASED PAINT, UNDERGROUND STORAGE TANKS, CHEMICAL STORAGE CONTAINERS) THAT WILL REQUIRE REMOVAL PRIOR TO CONSTRUCTION

Potential Sources: Obtain the information from the property owner, local building inspector, local enforcement agency, site environmental assessments, and visual inspections. The U.S. Environmental Protection Agency (EPA) shows potential hazardous materials sites, at the following web link: http://www.epa.gov/emefdata/em4ef.home and http://nepassisttool.epa.gov/nepassist/entry.aspx.

Enter information, such as a city or an address, and view details on sites that are potential hazardous materials concerns on a map. Additionally, the U.S. EPA provides online data that can be searched by State and county that provides the location and details related to Superfund cleanup sites at: https://cumulis.epa.gov/supercpad/cursites/srchsites.cfm.

Other sources include site inspections, environmental reports such as Environmental Data Resources, Inc. (EDR), U.S. EPA EnviroFacts (www.epa.gov/enviro), the state environmental department, and city environmental department.

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Example: Based on the review of the {LIST AVAILABLE RECORDS SUCH AS PHASE I SITE ASSESSMENT}, the following contaminants {IDENTIFY CONTAMINANTS} were found on the project site. Clean-up actions would require {LIST ACTIONS TO BE TAKEN SUCH AS REMOVAL OF UNDERGROUND STORAGE TANKS (USTs)}.

☐ **IDENTIFY IF THE PROJECT SITE IS LOCATED ON OR WITHIN ONE MILE OF A SITE ON THE FEDERAL NATIONAL PRIORITIES LIST OR STATE HAZARDOUS WASTE SITE LIST. IF A PHASE I ENVIRONMENTAL SITE ASSESSMENT HAS BEEN COMPLETED, INCLUDE A COPY.**

Potential Sources: Enter information, such as a city or an address, and view details on sites that are potential hazardous materials concerns on a map. Additionally, the U.S. EPA provides online data that can be searched by State and county that provides the location and details related to Superfund cleanup sites at: https://cumulis.epa.gov/supercpad/cursites/srchsites.cfm and https://www3.epa.gov/enviro/facts/sdwis/search.html. State Departments of Environmental Protection (DEPs) often have superior information.

Example: Based on the review of the {LIST RESEARCH SOURCES AND / OR PHASE I SITE ASSESSMENT}, there are {IDENTIFY NUMBER} wells within one mile of the project property. The data associated with the contaminated sites indicate that the migration of the contamination {HAS / HAS NOT} reached the project property.

☐ **IDENTIFY ANY SOIL OR GROUNDWATER CONTAMINATION KNOWN TO EXIST WITHIN A ONE-MILE RADIUS OF THE PROJECT SITE. INCLUDE ANY NATURALLY-OCCURRING CONTAMINANTS (E.G., ARSENIC, SELENIUM, BRACKISH WATER) THAT COULD ADVERSELY AFFECT THE REGIONAL GROUNDWATER AFTER THE PROJECT IS IMPLEMENTED.**

Potential Sources: Obtain the information from the property owner, local building inspector, local enforcement agency, state and/or city environmental department, site environmental assessments, local hydrogeology reports, and visual inspections. The USGS National Ground-Water Monitoring Network website shows USGS groundwater monitoring wells with associated water quality metrics, such as chloride, hydrogen sulfide, and nitrogen concentrations, at the following link: http://cida.usgs.gov/ngwmn/index.jsp.

Example: Based on the review of the {USGS NATIONAL GROUND-WATER MONITORING NETWORK}, the following contaminants {IDENTIFY CONTAMINANTS} were found within groundwater wells within a one-mile radius of the project site. Clean-up actions would require {LIST ACTIONS TO BE TAKEN SUCH AS REMOVAL OF UNDERGROUND STORAGE TANKS (USTs)}.

☐ **DESCRIBE ANY KNOWN FEDERALLY- OR STATE-LISTED THREATENED/ENDANGERED SPECIES OR SPECIES OF CONCERN AND THEIR CRITICAL HABITAT WITHIN THE PROJECT AREA AND ANY SPECIAL PROVISIONS OR MEASURES REQUIRED TO AVOID, MINIMIZE, OR MITIGATE DIRECT AND INDIRECT SPECIES IMPACTS**

Potential Sources: U.S. Fish and Wildlife Service Mapper Information for Planning and Conservation (USFWS IPaC) https://ecos.fws.gov/ipac/; State Department of Environmental Quality Natural Resource mapper tools are possible sources. Consultation with the State Department of Environmental Quality may be required, particularly if a species is identified as having construction restrictions (e.g., a certain month/season for nesting or spawning).

Example: The USFWS IPaC report notes the potential for four migratory bird species {LIST SPECIES}. The {STATE AGENCY AND DOCUMENT TYPE AND DATE} indicated an additional species on the site. The attached list provides the species, status {e.g., SPECIAL CONCERN – NESTING, FORAGING, STATE THREATENED, ETC}.

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☐ IDENTIFY IF ANY BUILDINGS ON THE PROPERTY HAVE BEEN LISTED OR HAVE BEEN DETERMINED TO BE ELIGIBLE FOR LISTING IN ANY LOCAL, STATE, OR NATIONAL HISTORIC REGISTERS, OR IF THE PROPERTY IS LOCATED WITHIN 0.5 MILE RADIUS OF A LOCAL, STATE, OR NATIONAL HISTORIC DISTRICT

Potential Sources: The National Register of Historic Places can be viewed at: https://www.nps.gov/nr/research/. Also check the applicable State Historic Preservation Office (SHPO) / Tribal Historic Preservation Office (THPO) and the local community planning office to determine if the structure has been previously identified as listed or eligible for listing on the local, state, National Historic Register.

Example: The {NAME THE HISTORIC RESOURCE} is located {# MILES IN WHAT DIRECTION} of the project property. The historic resource is {OUTSIDE/WITHIN} a 0.5 mile radius of the center point of the project property. Based on the information provided by {NAME RESOURCE, PERSON, AGENCY}, {DESCRIBE} archaeological resources {ARE/ARE NOT} known to exist at the project site. The project property is not listed or eligible for listing on the {LIST LOCAL GOVERNING AGENCY and STATE/TRIBE} and / or National Registers of Historic Places.

☐ DESCRIBE ANY KNOWN ARCHAEOLOGICAL ARTIFACTS, CULTURAL RESOURCES, OR HUMAN REMAINS ON OR LOCATED WITHIN A 0.5 MILE RADIUS OF THE PROPERTY

Potential Sources: Contact your State Historic Preservation Office (SHPO) / Tribal Historic Preservation Office (THPO), local planning department, local libraries, historical societies, university and college libraries, and State and local natural history museums, cultural resources surveys/reports within project area. Note that some of these resources are considered sensitive, and information about some archaeological sites is confidential and only available to professionally qualified individuals or at the discretion of a tribe. Include a copy of any archaeological survey done.

Near-complete list by State and county of properties included in the National Register of Historic Places (NRHP) is at: http://nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome.

A list of SHPO websites can be found at: http://www.nps.gov/nr/shpolist.htm. A list of THPOs in each state can be accessed through http://nathpo.org/wp/thpos/find-a-thpo/.

Example: A cultural resources report was prepared for this project and cultural resources were identified within 0.5-mile radius {LIST RESOURCES}. No archaeological resources are known to exist at the project site.

☐ IDENTIFY ANY NATIVE AMERICAN TRIBAL LANDS, TRADITIONAL CULTURAL PROPERTIES, OR OTHER NATIVE AMERICAN RESOURCES (E.G., TRADITIONAL FISHING AREAS) THAT ARE LOCATED ON OR ADJACENT TO THE SUBJECT PROPERTY

Potential Sources: Consult the resource data listed below to identify whether there are either Indian Tribal governments located in the project area, or Indian Tribal governments with a demonstrated interest in the project area. A complete list of all Federally-recognized Indian Tribal governments and their contact information is available on the National Park Service's (NPS's) Tribal Preservation Program website at: http://www.nps.gov/tribes/Tribal_Historic_Preservation_Officers_Program.htm.

- A directory of Tribal Leaders for all Federally-recognized Indian Tribal governments is maintained by the Bureau of Indian Affairs and is available at: http://www.bia.gov/cs/groups/xois/documents/text/idc002652.pdf.
- A map of all Indian Reservations in the Continental United States is available on the NPS's The Native American Graves Protection and Repatriation Act (NAGPRA) website at: http://www.nps.gov/nagpra/DOCUMENTS/ResMap.htm.

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- A complete list of all Federally- and State-recognized Indian Tribal governments is available through the National Conference of State Legislatures at: http://www.ncsl.org/issues-research/tribal/list-of-federal-and-state-recognized-tribes.aspx.
- Contact the local SHPO office for a list of Indian Tribal governments in an area. A list of SHPO websites can be found at: http://www.nps.gov/nr/shpolist.htm. A list of THPOs can also be accessed through http://nathpo.org/wp/thpos/find-a-thpo/.
- Contact your local SHPO, local planning department, local libraries, historical societies, university and college libraries, and State and local natural history museums.

Example: The project site is located near an Indian Reservation, {STATE NAME OF RESERVATION AND TRIBE}. Contact information for the tribe was obtained from the list maintained by the NPS and {NAME INDIVIDUAL AND TRIBAL ROLE} was contacted about the project {INSERT ALL COMMUNICATION METHOD} on {INSERT DATE(s)}. This individual stated that there may be tribal resources near the project site and that the tribe would like to be officially contacted by a federal agency if one intends to fund or permit the project. No additional information was provided by the tribal representative.

☐ **DESCRIBE ANY PUBLIC OUTREACH THAT HAS OCCURRED (E.G., PUBLIC NOTICES ISSUED, NOTIFICATIONS PUBLISHED IN NEWSPAPERS, PUBLIC MEETINGS HELD, PUBLIC COMMENTS SOLICITED)**

Potential Sources: Obtain this information from the public affairs office or public information office of your agency or of any partnering agencies or organizations.

Example: Public outreach on this project has included outreach through the following media: {INSERT ALL MEDIA USED}. A list of each of the outreach events, including the type (e.g., public meeting, web, etc.), the dates of occurrence, summary of content and summary of public response is provided in the attached document.

☐ **ENCLOSE COPIES OF ANY PREVIOUS COORDINATION, CORRESPONDENCE, OR CONSULTATION WITH FEDERAL, STATE, TRIBAL, AND LOCAL RESOURCE AGENCIES (E.G., U.S. FISH AND WILDLIFE SERVICE, STATE/TRIBAL HISTORIC PRESERVATION OFFICE, U.S. ARMY CORPS OF ENGINEERS, STATE AGENCIES)**

Potential Sources: These documents may be available with the project proposal / management records or consulting engineer, or obtain the information from the agency. For summary information, include a summary of the report, issues raised, reason for the report or investigation, date of the report/investigation, and conclusions of the report/investigation.

Example: As a part of previous activities at the project site, a Phase I Environmental Site Assessment had been prepared for the project site in {INSERT YEAR HERE}. The report, provided by {INSERT AGENCY} is included in this packet. Communication and responses from other agencies are included as {INSERT ATTACHMENTS SUCH AS EMAIL or MAIL COMMUNICATION}.

☐ **DESCRIBE ANY OTHER ENVIRONMENTAL AND HISTORIC PRESERVATION REQUIREMENTS THAT THE PROJECT IS OR WILL BE SUBJECT TO, SUCH AS STATE/TRIBAL OR LOCAL ENVIRONMENTAL REVIEWS, OTHER AGENCY REVIEWS, ETC.**

Potential Sources: Discussions with project proposal / management team or consulting engineer, or regulatory agencies. Review FEMA Hazard Mitigation Assistance Guidance: Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program at: http://www.fema.gov/media-library-data/1424983165449-38f5dfc69c0bd4ea8a161e8bb7b79553/HMA_Guidance_022715_508.pdf.

Example: The response to this item is best presented in a table or list of each regulatory requirement and the explanation of how it will be met.