Supplemental Environmental Assessment to the Programmatic Environmental Assessment (PEA) for Typical Recurring Actions Resulting From Flood, Earthquake, Fire, Rain, and Wind Disasters in California as Proposed by the Federal Emergency Management Agency

Mojave Water Agency

Groundwater Monitoring Wells Replacement Project

FEMA-DR-1577-CA, Project Worksheet 560

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1. INTRODUCTION

The Mojave Water Agency (MWA) has applied for funds from the Federal Emergency Management Agency (FEMA), through the State of California Governor's Office of Emergency Services (OES), to replace groundwater monitoring wells that were located along the Mojave River in San Bernardino County, California (Appendix A). The monitoring wells were lost as a result of the severe storms, flooding, and debris flows that occurred in the region from December 27, 2004 through January 11, 2005. The natural disaster resulted in the presidential disaster declaration FEMA-DR-1577-CA. FEMA is proposing to fund the project under the Public Assistance (PA) Program that was implemented in response to the presidentially declared disaster.

1.1 SCOPE OF DOCUMENT

FEMA has prepared a Final Programmatic Environmental Assessment for Typical Recurring Actions Resulting From Flood, Earthquake, Fire, Rain, and Wind Disasters in California (PEA), which assesses common impacts of the action alternatives that are under consideration at the proposed project site (FEMA, 2003). The PEA adequately assesses impacts from the action alternatives for some resource areas, but for the specific actions of this particular project, some resources are not fully assessed in the PEA.

Therefore, for this project to comply with the National Environmental Policy Act (NEPA), FEMA has prepared this Supplemental Environmental Assessment (SEA) to tier from the PEA and fully assess the additional impacts to resources that are not adequately addressed in the PEA. The SEA hereby incorporates the PEA by reference, in accordance Title 40 Code of Federal Regulations (CFR) Part 1508.28.

1.2 PURPOSE OF AND NEED FOR ACTION

Under the authority of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended and Title 44 CFR, the PA Program provides supplemental aid to states and communities to help them recover from major disasters as quickly as possible. Specifically, the program provides assistance for the removal of debris, the implementation of emergency protective measures, and the permanent restoration of public infrastructure. The program also encourages protection from future damage by providing assistance for

mitigation measures during the recovery process. Therefore, the purpose of this project is to provide PA funding to MWA to replace the groundwater monitoring wells that were lost during the presidentially declared disaster.

MWA manages groundwater in approximately 4,900 square miles of the High Desert in San Bernardino County. During the 2004-2005 winter storms, 17 groundwater monitoring wells were destroyed and lost from the Mojave River Basin monitoring well network, which is managed by MWA. These wells were originally installed from 1995 to 1997, and served as regular monitoring points used to obtain water level and water quality information. Therefore, action is needed to restore the groundwater monitoring network of the Mojave River Basin.

2. DESCRIPTION OF THE PROPOSED ACTIONS AND ALTERNATIVES

2.1 NO ACTION ALTERNATIVE

NEPA requires the inclusion of a No Action Alternative in the environmental analysis and documentation. The No Action Alternative is defined as maintaining the status quo with no FEMA funding for any alternative action. The No Action Alternative is used to evaluate the effects of not providing eligible assistance for the project, thus providing a benchmark against which action alternatives can be evaluated. The No Action Alternative is in conflict with FEMA's mission and the purpose of the PA Program. For the purpose of this alternative, it is assumed that MWA would be unable to implement a project for lack of federal assistance, and the groundwater monitoring network of the Mojave River Basin would not be restored. The level and quality of the groundwater would be at risk, which could threaten public health and safety. Adverse environmental, health, and safety effects resulting from such hazards would not be addressed under the No Action Alternative.

2.2 PROPOSED ACTION ALTERNATIVE

As defined in Section 2.3.5 of the PEA, the proposed project falls under the action alternative of Constructing New Facilities or Relocating Existing Facilities. MWA is proposing to replace the wells that were destroyed in the disaster with wells that are relocated to more accessible and less flood prone areas, and that use enhanced well designs. Under this Proposed Action Alternative, MWA would construct seven nested groundwater monitoring wells at five sites along the Mojave River between the Cities of Barstow and Apple Valley in San Bernardino County.

MWA would negotiate a 25-foot by 25-foot easement with the property owner of each of the proposed sites to ensure that MWA would have access to the wells into the future. MWA would then construct a nested monitoring well, comprised of two or more well casings installed within a single borehole, at each site. The boreholes would be 1 to 2 feet in diameter, and range in depth from 30 to 855 feet below the ground surface (bgs). Each well casing within the borehole would be approximately 3 inches in diameter. The screen interval of each well casing within the borehole would be set to different depths to allow monitoring of different hydrostratigraphic zones throughout the aquifer system. Table 1 below shows the screened intervals and total depths of the casings within the proposed wells.

Table 1 MWA Monitoring Well Screened Intervals and Total Depths

Well No.	Owner	Screened Interval (feet bgs)	Total Depth (feet bgs)
1	Bureau of Land Management	20-30	35
		60-70	75
2	San Bernardino County	15-25	30
		40-50	55
		90-100	105
3	Elisabella LLC	302-312	317
		451-461	466
		690-700	705
4	Elisabella LLC	40-50	55
		90-100	105
		150-160	165
5	Riverside Cement Company	40-50	55
		90-100	105
		150-160	165
6	Riverside Cement Company	300-310	315
		500-510	515
		840-850	855
7	California Department of Fish and Game	8-13	18
		20-30	35

A 4-foot by 4-foot well box would cover each of the proposed wells. The well box would be set in concrete that would extend approximately one foot from each side of the well box. The top of the completed monitoring well would not extend above the ground surface.

During construction, machines such as drill rigs, support trucks, shakers, loaders, pick-up trucks, and Baker tanks would be used. The temporary construction area would be approximately 150 feet by 150 feet around each proposed well site. Staging would also occur within this area. Construction would occur between the months of September and February, in order to avoid the breeding seasons of the southwestern willow flycatcher and the least Bell's vireo.

The remains of the groundwater monitoring wells that were destroyed during the disaster would be abandoned in place.

2.3 OTHER ACTION ALTERNATIVES NOT CARRIED FORWARD

MWA considered reconstructing the lost wells at the same locations as before the disaster. Due to natural changes in the Mojave River, these sites now lie within the riverbed. Reconstruction at the pre-disaster sites would leave the wells vulnerable to flood hazard and repetitive damage. This alternative does not present a sensible solution to adequately protect

the facilities and their function. Therefore, the alternative was dismissed from further consideration.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The PEA has adequately described the affected environment and impacts of the proposed action for many resource areas, except for geology, seismicity, and soils; air quality; water resources; biological resources; cultural resources; and land use and planning. Therefore, the affected environment and environmental consequences for those resources are described in this section, which is intended to supplement the information contained in the PEA. Necessary avoidance and minimization measures, either stipulated in the PEA, or based on the results of the impact analysis in the SEA, that are appropriate for the proposed action, are discussed in Section 4.

3.1 GEOLOGY, SEISMICITY, AND SOILS

The proposed wells would be located along the upland banks of the Mojave River between the Cities of Barstow and Apple Valley. This area is located in the Mojave Desert geomorphic province, which is characterized by isolated mountain ranges separated by expanses of desert plains. The Mojave Desert is located south of the Basin and Range Province and is bounded by the Garlock fault to the north, the Colorado River and the California-Nevada border to the east, and the San Gabriel and San Bernardino Mountains and the San Andreas fault to the southwest. Other faults in the vicinity of the project area include the Helendale and Harper Lake-Camp Rock faults. Due to its proximity to the San Andreas and other prominent faults, the project area is considered seismically active.

Widely separated short ranges jutting up from desert plains are the common landforms of this region. Isolated mountains and plateaus are flanked by broad alluvial fans, locally extending down to dry lake beds (playas) and dunes. Cenozoic nonmarine sedimentary and granitic rocks and alluvial deposits and Precambrian rocks of all types can be found throughout the Mojave Desert. As can be expected in this hot, dry climate, Aridisols and Entisols are the prevalent soil types in combination with thermic or hyperthermic soil temperature regimes and aridic soil moisture regimes on foothills and valleys. Thermic or mesic soil temperature regimes and aridic or xeric soil moisture regimes can be expected on the mountains. Soils at the proposed well sites are generally fine grain sand and silt with rounded gravels (FEMA, 2006).

Implementation of the proposed action would result in permanent ground disturbance in the project area due to the installation of seven wells along the upland banks of the Mojave River. To construct the wells, soils and materials would be removed to allow for the installation of the groundwater monitoring wells. Depths of the boreholes would range from 30 to 855 feet bgs. Each borehole would be 1 to 2 feet in diameter. Excavated materials would be permanently removed from the site and disposed in accordance with applicable federal, state, and local laws. Project implementation would not alter site topography. Long-term impacts from the proposed removal of soils and materials would be negligible.

The project would cause temporary impacts to the ground surface around the proposed well sites during construction. Temporary construction and staging areas would be approximately 150 feet by 150 feet around each proposed well site. The use of heavy machinery on unpaved surfaces is expected to disturb the ground surface and could increase local soil erosion. Best management practices (BMPs) would be utilized to minimize erosion and prevent runoff to the Mojave River.

FEMA has determined that implementation of the proposed action would not result in adverse, long-term impacts to geology, soils, and seismicity with the implementation of the avoidance and minimization measures described in Sections 4.1 of the SEA.

3.2 AIR QUALITY

The project area is located within the Mojave Desert air basin, and is under the jurisdiction of the Mojave Desert Air Quality Management District (AQMD). This basin, located in the southeastern portion of California, covers an area of over 18,000 square miles of desert. The area is mostly rural with a few sparsely populated urban centers. This basin exhibits a typical desert climate. The San Gabriel and San Bernardino mountain ranges block the desert from the cool, moist coastal air of the South Coast air basin. It is generally hot and dry in summer with mild winters and little annual rainfall (2 to 5 inches per year). The meteorology is affected by a moderately intense high-pressure circulation (sinking and warming of the air), except during periods of frontal activity during the winter. On average, 20 to 30 frontal systems move into the area each winter. Prevailing winds are from a westerly and southerly direction with the most common wind direction being west to east.

The primary sources of air pollution within the basin include military bases, highway and railroad facilities, cement manufacturing, and mineral processing. The northern portion of the basin is heavily impacted by air pollution carried over the San Gabriel and San Bernardino Mountains from the heavily urbanized South Coast basin. In the south-central portion of the basin, areas below the Tehachapi Mountain pass receive pollution from the San Joaquin air basin.

The Mojave Desert air basin fails to meet the federal air quality standards for two criteria pollutants under the Clean Air Act: ozone (O_3), and particulate matter less than 10 micrometers in diameter (PM_{10}) (EPA, 2006). For State standards, the basin is designated as non-attainment for O_3, particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$), and PM_{10} (California ARB, 2006). Atmospheric concentrations of the other criteria pollutants do not exceed state or federal standards.

Implementation of the proposed action would result in temporary impacts to air quality. These would include increases of fugitive dust and equipment combustion emissions that would be created by the operation of heavy equipment in the project vicinity. However, no long-term impacts to air quality are expected. Emissions of criteria pollutants would not exceed the threshold levels specified by the General Conformity Rule. Therefore, the proposed action qualifies as a General Conformity Rule exemption, and no further analysis is required to establish conformity with the State Implementation Plan. Implementation of the avoidance

and minimization measures described in Section 4.2 of the SEA would reduce temporary impacts to sensitive populations.

3.3 WATER RESOURCES

The Mojave River is the main surface water body in the vicinity of the project area. The headwaters of the Mojave River are in the San Bernardino Mountains. Historically, the annual recharge from the headwaters is approximately 75,000 acre-feet (Lahontan RWQCB, 2005). Aside from intense storm events, the majority of the Mojave River channel is typically dry. Surface water from the headwaters in the San Bernardino Mountains quickly percolates into the porous sands of the young Mojave River alluvium. Thus, groundwater is the primary source of water supply in most of the watershed.

The Mojave River has been selected as a priority or "focus" watershed by the Lahontan Regional Water Quality Control Board (RWQCB) because of numerous water quality issues associated with urban growth and past and current agricultural, industrial, and military land uses throughout the watershed. Because of water quality degradation associated with past industrial activities, some waters in the Mojave River watershed are listed as impaired for priority organics on the Clean Water Act Section 303(d) list (Lahontan RWQCB, 2005).

Water quantity is also an issue in the Mojave River Basin. Groundwater withdrawal since the early 1900s has resulted in discharge (primarily from pumping wells) that exceeds both natural and artificial recharge. This reliance on groundwater has resulted in overdraft conditions since the mid 1940s (USGS, 2003). MWA manages the limited groundwater supplies of the Mojave River Basin, and uses wells to monitor groundwater levels and quality.

Implementation of the proposed project would have a beneficial effect on water resources in the project area by allowing MWA to effectively monitor groundwater resources. Monitoring is necessary to ensure that limited groundwater supplies are not overdrawn and to ensure that water withdrawn for municipal purposes meets drinking water standards.

Temporary impacts to the Mojave River may occur during construction. The staging and use of heavy equipment on unpaved areas may lead to soil erosion, which could result in added runoff to the river system. BMPs would be utilized to minimize erosion and prevent runoff. Section 4.3 outlines the BMPs that would be implemented at the project site. With implementation of BMPs, no adverse impacts to water resources are anticipated as a result of construction activities.

3.3.1 Floodplain Management

Two of the proposed groundwater monitoring wells (numbers 5 and 6) would be constructed in the 100-year floodplain, as designated by FEMA on Federal Insurance Rate Map (FIRM) Community Panel Number 06071C 5805F, effective date March 18, 1996. The FIRM shows that the proposed sites are located within Flood Zone AE, just outside the floodway of the Mojave River. Flood Zone AE designates an area subject to inundation by the 1-percent-annual-chance flood event (or base flood) as determined by detailed methods. Flood Zone AE extends at least 1,000 feet in all directions from the proposed well locations. The base flood elevation in the vicinity of the site is approximately 2,610 feet above sea level.

The proposed wells would be installed on property owned by TXI Riverside Cement and located off a gravel road, roughly 20 feet from a chain-link fence. The area around the site is flat and covered with gravel, and may be used for parking or staging. Although the area is mapped as Flood Zone AE, the proposed site was not flooded during the 2004-2005 winter storms. MWA has determined that this is the most appropriate location for the monitoring wells because the location is close enough to the river to detect changes in the river's flow, is easily accessible from the gravel road, and is out of the way of the property owner. MWA considered alternate locations outside of the base floodplain (Flood Zone AE), but the alternate locations were either too close to existing production wells or too far from the river to allow for adequate use of the monitoring wells. Potential for damage to the wells from flooding would be mitigated by its installation in an area well outside of the active river channel and that was not damaged during the 2004-2005 winter storms. In addition, the wells would be completed with protective vaults that are equipped with rubber gaskets to prevent damage from surface water flows. The wells would be affixed with expansion locking plugs to further protect the wells from surface water infiltration.

The project is not expected to alter the floodplain and does not take place within the floodway of the Mojave River. The project, as proposed, conforms to applicable state and local floodplain protection standards. Therefore, FEMA has determined that the proposed action would not adversely affect the floodplain or be adversely affected by flooding and, consequently, is in compliance with Executive Order (EO) 11988, Floodplain Management. On July 31, 2006, FEMA published in the *Victor Valley Daily Press* a public notice regarding its intent to fund an action in the floodplain and received no public comment.

3.3.2 Protection of Wetlands

EO 11990, Protection of Wetlands, requires federal agencies to take action to minimize the loss of wetlands. The project area does not contain wetlands. Therefore, the proposed action complies with EO 11990.

3.4 BIOLOGICAL RESOURCES

Vegetation within this stretch of the Mojave River consists primarily of cottonwood-willow riparian woodland dominated by Fremont cottonwood (*Populus fremontii*) and black willow (*Salix gooddingii*), with saltcedar (*Tamarix* sp.) and an occasional western sycamore (*Platanus racemosa*) within the channel. The adjacent upland banks are typically disturbed or developed. In upland areas that are vegetated, desert scrub species such as creosote (*Larrea tridentate*), mesquite (*Prosopsis glanduosa*), and saltbush (*Atriplex* sp.) occur in sparse association.

Potential federally listed threatened and endangered species that may occur in the vicinity of the project area include the arroyo toad (*Bufo californicus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and least Bell's vireo (*Vireo bellii pusillus*).

The project area is within the historical range of the arroyo toad, but the U.S. Fish and Wildlife Service (USFWS) believes that the species has been extirpated from this section of the Mojave River due to upland development and construction of flood control levees (USFWS, 1999). Therefore, the arroyo toad is not expected to occur in or adjacent to the

project area and FEMA has determined that the proposed project would not impact the species.

The cottonwood-willow riparian woodland found in the project vicinity is suitable for the least Bell's vireo and willow flycatcher, but no occurrences of these species in the area have been documented. To ensure that project activities would not impact either species, suitable habitat would not be removed during project implementation, and construction within or adjacent to riparian habitat would avoid the breeding seasons for these species (i.e., construction would not occur from March 1 through August 31), as described in Section 4.4 of the SEA. With these mitigation measures in place, FEMA has determined that the proposed action would not impact the least Bell's vireo or willow flycatcher.

In a letter dated July 31, 2006, USFWS concurred with FEMA's determination that the proposed project is not likely to adversely affect the arroyo toad, least Bell's vireo, or willow flycatcher (Appendix B).

3.5 CULTURAL RESOURCES

FEMA subjected the project area to a cultural resources records review at the San Bernardino Museum Archaeological Information Center of the California Historical Resources Information System. In addition, the California Native American Heritage Commission (NAHC) was contacted for a review of its Sacred Lands File and a list of Native American groups and individuals that the Commission believes should be contacted about the project. The Sacred Lands File search was negative. FEMA sent letters to those groups and individuals listed by NAHC, but no responses have been received to date. An archaeological survey of the project area was undertaken on March 27 and May 22, 2006 by a FEMA-contracted archaeologist. The results of the survey were negative.

No properties eligible for listing on the National Register of Historic Places were identified through the literature review or pedestrian survey of the project area. Therefore, FEMA determined that the proposed project is not expected to have any effect on historic properties. FEMA informed the State Historic Preservation Officer (SHPO) of its determination in a letter dated August 23, 2006, and has received no response to date. In accordance with Stipulation VII of the Programmatic Agreement Among FEMA, SHPO, OES, and the Advisory Council on Historic Preservation, FEMA has assumed concurrence, as SHPO did not object to FEMA's determination within 21 days. Therefore, the project complies with Section 106 of the National Historic Preservation Act. Minimization and avoidance measures are described in Section 4.5 of the SEA and FEMA's letter to SHPO can be found in Appendix C.

3.6 LAND USE AND PLANNING

The proposed project sites are located on federal, state, county and privately owned land. Installation of the monitoring wells would not require a change in current land use, but MWA is negotiating easements with the respective property owners to ensure future access for maintenance of the wells. It is likely that future development would not occur at the well sites.

MWA would comply with all local laws and ordinances and would obtain necessary permits for well installation prior to construction.

3.7 CUMULATIVE IMPACTS

Cumulative impact is the impact on the environment, which results from the incremental impact of the proposed action when added to other past, present, and reasonable future actions regardless of the person or group that undertakes the other actions. FEMA knows of no other projects planned in the vicinity of the proposed project sites. The project replaces a function that existed prior to the 2004-2005 winter storms, and cumulative impacts are not expected to occur as a result of the proposed action.

4. MINIMIZATION AND AVOIDANCE MEASURES

The following minimization and avoidance measures applicable for the proposed action have been extracted from the PEA Section 4, or from measures developed for this SEA based on site specific impacts.

4.1 GEOLOGY, SOILS AND SEISMICITY

To avoid adverse impacts to geology, soils, and seismicity, MWA would be responsible for implementing construction BMPs to minimize soil loss from the construction and other disturbed areas. Examples of BMPs include the following measures: developing and implementing an erosion and sedimentation control plan, installing and maintaining silt fences or hay bales, mulching cleared areas, revegetating with native species when construction is completed, covering soil that is stockpiled on-site, and constructing a sediment barrier around stockpiles to prevent sediment loss.

4.2 AIR QUALITY

MWA would be responsible for implementing the following BMPs to reduce potential short-term air quality impacts from construction activities:

- Watering disturbed areas;
- Scheduling the location of the staging areas to minimize fugitive dust;
- Keeping construction vehicles tuned properly;
- Requiring all trucks to cover their loads;
- Sweeping adjacent streets and roads if visible soil is carried over to these areas from the construction site; and
- During high-wind periods, curtailing activities to the degree necessary to prevent fugitive dust from construction operations from being a nuisance or hazard on- or off-site.

All construction activities would comply with all Mojave Desert AQMD rules and standards.

4.3 WATER RESOURCES

To avoid and minimize any adverse impacts to water resources, MWA would be responsible for implementing construction BMPs that would prevent soils from eroding and resulting in sedimentation in the project vicinity. Examples of BMPs include the following measures: developing and implementing an erosion and sedimentation control plan, installing and maintaining silt fences or hay bales, mulching cleared areas, revegetating with native species when construction is completed, covering soil that is stockpiled on-site, and constructing a sediment barrier around stockpiles to prevent sediment loss.

4.4 BIOLOGICAL RESOURCES

In order to avoid impacts to the least Bell's vireo and the southwestern willow flycatcher, MWA would be responsible for implementing the following avoidance measures at the project sites:

- No riparian vegetation would be removed or disturbed; and
- Construction activities would not occur from March 1 through August 31.

4.5 CULTURAL RESOURCES

If unanticipated resources are discovered during construction, MWA would stop project activities in the vicinity of the discovery, take all reasonable measures to avoid or minimize harm to the property, and notify OES and FEMA as soon as practicable so that FEMA can re-initiate consultation with the SHPO, in accordance with the Programmatic Agreement. If the discovery appears to contain human remains, MWA would also contact the San Bernardino County Coroner immediately. If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she would contact the NAHC by telephone within 24 hours.

4.6 LAND USE AND PLANNING

MWA would be responsible for securing maintenance easements with property owners and obtaining necessary local permits prior to construction.

5. REFERENCES

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