

Environmental Monitoring and Mitigation Plan						
Activity Type:	Small scale water system development and improvement including potable water, and sanitation, hygiene.					
Key Components:	IRP 2 provides recipient communities support for the planning, construction, and rehabilitation of small-scale water and sanitation projects. The construction work, when needed for the activity, will either be procured competitively or implemented by the grant recipient. The IRP 2 GMU will provide the grant recipient with IRP 2-developed guidelines when needed for environmental compliance and instruct the grantee on how to comply with the EMMP. The IRP 2 GMU will monitor IRP 2-supported activities for environmental compliance. The Environmental Review Form (ERF) will be completed as part of the grant process and will identify environmental impacts, mitigations, and the required planning documents to be completed by the grantee. The Program Compliance Officer (PCO) provides oversight for environmental compliance during the full activity life-cycle: planning and design (P&D), construction (C), or operations and maintenance (O&M).					
Scale:	The scale of this activity includes: a. Infrastructure provision consisting of: (i) rehabilitation or establishment of new connections to surface water, wells, and rain water harvest, (ii) construction and rehabilitation of sanitation facilities, such as flush toilets, septic pits, and latrines. b. Community development and capacity building - Water and Sanitation Committees. c. Hygiene education and sanitation promotion, consisting of public health and hygiene education and promotion of improved sanitation, and community awareness- creation and mobilization activities for schools, households and public places.					
Ambient Environment:	Small scale water potable and sanitation activities will occur in urban, peri-urban areas, currently highly populated by the presence of local homes and other buildings. The purpose of this activity is to improve the living conditions of beneficiaries through the implementation of small and medium-scale potable water supply and sanitation facilities and structures. Currently, the areas are not located on or near sensitive habitats, such as wetlands or undisturbed vegetation.					
Potential Environmental Impact	Mitigation Measure(s)	Phase of Mitigation Measure Planning and Design (P&D), Construction (C), Operation and Management (O&M)	Indicator	Responsible Authority	Timing	Priority of Mitigation Measure 1 = High, 2 = Medium, 3 = Low
1.: Inadequate system sizing for current and forecasted population changes can result in capacity deficiencies for both potable water and sanitation systems.	1.1: Conduct public outreach and consultation to design activity with local stakeholders. Ensure funding and maintenance of the system is secured and supported by users.	P&D	1.1: Documentation of local consultation and outreach to stakeholders. Documented analysis supporting water and/or sanitation system capacity requirements.	IRP 2 GMU, grantee, and Environmental Officer	Consultation prior to construction.	1
	1.2: Implementation plan incorporates operating guidelines appropriate for the size and complexity of the construction that are in conformance with internationally-recognized best management practices, Iraqi laws and regulations and USAID Sector Guidelines for Water and Sanitation, and World Health Organization. Design plan and implementation reviewed by certified local engineer. Factors to be considered in the system planning include: - Size of population to be serviced by potable water or sanitation system - Capacity of drinking water source to be developed. - Potential impacts to water flow and fresh water quality - Presence of naturally-occurring and anthropogenic contaminants in water sources - Proximity of drinking water systems to sanitary systems - Operation and maintenance requirements for drinking water and sanitary system.	P&D, C, O&M	1.2: IRP 2-approved design plan prepared using WHO and USAID policies.		Technical design prior to construction and follow up as needed during construction and O&M.	1
2. Water supply systems may become contaminated during construction, operation, or maintenance activities.	2.1: Conduct initial water testing in accordance with WHO and Iraqi regulations (where WHO standards for water testing cannot be implemented, conduct testing in line with Iraqi regulations only) to obtain information on the chemical, biological, and physical qualities of the proposed water source. Document water testing requirements and protocols in a Water Quality Assurance Plan (WQAP) for new water sources and if applicable, include approach for ongoing water quality monitoring. Conduct water testing for (1) arsenic, (2) fecal coliforms, (3) fluoride, (4) nitrate, (5) electrical conductivity, (6) TDS, (7) pH, and (8) turbidity, in line with WHO standards for water quality testing and as stated in the USAID cable on arsenic testing (May 12, 1998) that is attached to the Guidelines for Determining the Arsenic Content of Ground Water in USAID-Sponsored Well Programs in Sub-Saharan Africa (December 2003). USAID requires testing for arsenic for all USAID-funded water supply projects. In Iraq, arsenic testing is difficult to conduct as many government and university laboratories do not have the capacity to test water for arsenic. Where arsenic testing is not possible, IRP 2 will procure field water testing kits that include capacity for arsenic testing. Perform additional water quality tests, as appropriate (e.g., if mining, intensive agriculture, or industrial sites are present near the drinking water source).	P&D, C, O&M	2.1: IRP 2-approved WQAP for new water sources. Drinking water sampling as indicated in Iraqi Water Quality standards. In their absence, follow USAID Environmental Sector Guidelines for Water Systems or World Health Organizations Drinking Water Guidelines. Results reviewed by IRP 2 GMU and grantee.	IRP 2 GMU, grantee, and Environmental Officer	Sampling to establish baseline drinking water quality for existing water systems. For new access points, WQAP prepared prior to initiating construction work. Sampling conducted per the approved WQAP.	1
	2.2 A Water Quality Assurance Plan (WQAP) is prepared for both existing and new drinking water access points. The WQAP will specific how IRP 2 will assure safe drinking water for the project and conform to applicable USAID/WHO drinking water standards and Iraqi drinking water requirements given project implementation conditions. WQAP will include requirements for initial testing and long-term monitoring with water standards. • WHO guidelines recommend testing eight water quality parameters where water supplies are developed and/or rehabilitated: (1) arsenic, (2) fecal coliforms, (3) fluoride, (4) nitrate, (5) electrical conductivity, (6) TDS, (7) pH, and (8) turbidity. At a minimum, testing for arsenic, fecal coliforms and nitrites must be conducted in accordance with the WQAP before the drinking water source is made available for public use. • Ongoing monitoring of water parameters as outlined in the WQAP is required. IRP 2 will work with the grantee, local authorities, and service providers to promote ongoing water quality monitoring at the conclusion of IRP 2 activity support.	P&D, C, O&M	2.2: WQAP prepared for new drinking water access points. Submitted to DCHA BEO for review.		WQAP prepared prior to initiating construction work. Sampling conducted per the approved WQAP.	1

	2.3: Clean and disinfect water systems following construction or maintenance activities using chemical disinfectants (e.g. chlorine). Monitor disinfectant residual levels in water source and ensure that levels are in compliance with Iraqi drinking water standards or WHO guidelines.	C, O&M	2.3: Logs of water monitoring and disinfection.	IRP 2 grantee or community authorities based on maintenance agreement.	Construction and ongoing during water system use.	1
	2.4: IRP 2 grantee or other designated entity responsible for maintaining the water system implements a water quality monitoring program of the supply system throughout operation. Document water testing requirements, including responsible parties, frequency of testing, and protocols to conform with Iraqi drinking water standards or WHO guidelines.	P&D, C, O&M	2.4: IRP 2-approved and implemented drinking water monitoring program. Records maintained to demonstrate program operation.		Ongoing monitoring throughout water system operation.	1
	2.5: Provide community outreach process, educational materials, and training to users/community on the proper use, operation, and maintenance of the water supply system to ensure the long-term sustainability of the water system.	C, O&M	2.5: IRP 2-approved community outreach process in Implementation Plan. Review of outreach, educational materials, and user training procedures to verify that training was conducted. Conduct site visits to document that users/community are trained and following proper procedures.		Community outreach throughout water system operation.	1
	2.6 Reduce/eliminate sources of livestock contamination at new and rehabilitated community drinking water wells. Prohibit livestock watering at community potable water systems. Control livestock grazing in vicinity of community drinking water wells.	P&D, C, O&M	2.6: IRP 2 guidelines to grantee and education material to the community will instruct them on operation of the water system including livestock contamination at community potable water systems.		IRP 2 water system guidelines and educational material prepared and provided to community before initiating system use.	1
3. Water system design defect or operational failure results in the presence of stagnant water.	3.1 Control potential accumulation of stagnant water from stand pipes - Install drainage structure to remove water from the containment - Monitor and infrastructure maintenance to minimize leaks from cracked containment structures, pipes, and damaged valves	P&D, C, O&M	3.1: IRP 2-approved design to reduce potential accumulation of stagnant water from stand pipes. Local certified engineer review of design and construction as needed. IRP 2 guidelines will instruct system operator on maintenance practices.	IRP 2 GMU, grantee, and Environmental Officer	IRP 2 water guidelines and local engineer design, if needed, prior to initiating construction.	1
4. Construction of water and sanitation systems can impact the surrounding environment. Waste can impact the environment and surrounding community.	4.1 Management of construction waste: - Waste material will not be allowed to accumulate at the construction site and will be disposed at appropriate disposal sites - Waste material shall be separated into non-hazardous waste and hazardous material	P&D, C	4.1: IRP 2-approved waste management plan/procedure plan for wells and latrines. Conduct site visit(s) to evaluate if design plan was properly implemented.	IRP 2 GMU, grantee, and Environmental Officer	Approve design prior to activity and site inspections during construction.	1
	4.2 Control erosion during system design through design, physical barriers and slope stabilization, as determined appropriate for location. If needed, a certified local engineer will review and approve activity design.	P&D, C	4.2: Preparation of a erosion control plan/procedure following IRP 2 guidelines and appropriate for the activity size. Site visit or other monitoring tools show that erosion control is on plan and effective.		Erosion control plan/procedure in place prior to initiating construction.	1
5. Contamination of surface and groundwater sources by pathogens, if latrine systems are not properly sited, constructed, and maintained.	5.1 Reduce sources of contamination from pit latrines following BMPs including - Use ventilated improved pit latrine design to trap insects and vectors - Evaluate water table depth including seasonal fluctuations prior to latrine installation. Pit latrines will not be installed in locations of shallow water table or vulnerable to contamination as determined by field assessment. - Ensure that there is a system in place for maintaining, emptying, and disposing of waste in an appropriate process.	P&D, C, O&M	5.1 Develop sanitation guidelines for the design, construction and maintenance of the sanitation system. Have plan reviewed by a local certified engineer as needed.	IRP 2 GMU, grantee, and Environmental Officer	IRP 2-approved plan reviewed and approved prior to initiating work.	1
	5.2 Reduce potential groundwater contamination from septic tanks - Evaluate depth to water table, including seasonal fluctuations, to determine appropriate tank depth. - Establish a reliable system for removal and disposal of sludge - In locations of high-water table, modify septic tank installation to prevent leakage.	P&D, C, O&M	5.2 Develop sanitation guidelines for the design, construction and maintenance of the sanitation system. Have plan reviewed by a local certified engineer as needed.		IRP 2-approved plan reviewed and approved prior to initiating work.	1
6. <i>Climate risk:</i> Construction workers may face increased risk of heat exhaustion or impacts of climate-related extreme events (e.g., heavy rain storms, flooding, dust storms or wildfires)	6.1 Ensure that health and safety practices are implemented during project installation and operation using the IRP 2 guidelines, as appropriate. Workers will be provided with appropriate PPE and instructed on its user will be instructed on safe use of equipment. <u>Workers will have appropriate licenses and instructed on</u>	P&D, C, O&M	6.1: IRP 2-approved HASP plan/procedure. Workers provided with PPE and instructed on use. Record show workers have appropriate licenses and report work-related violations.	IRP 2 GMU, grantee, and Environmental Officer	IRP 2-approved HASP plan/procedure prior to initiating work. Record show PPE provided and trained on use. Log of <u>work-related</u>	1
	6.2: Incorporate heat stress into Health and Safety Guidelines provided to grantees. Workers on IRP 2 grant projects are provided with a work schedule that allows for breaks and water consumption at regular intervals.	C	6.2: Implementation plan documents process of providing work breaks.		Throughout construction period	2
	6.3: <u>Ensure emergency plans are in place (and well communicated to crew) to respond to climate-related</u>		6.3: Documented emergency plans <u>in place at the work site</u>		Throughout construction period	2
7. <i>Climate risk:</i> Increased frequency and/or intensity of extreme precipitation events and flooding, along with sea level risk and storm surge can affect access to, use, and health of water supply	7.1: To respond to increased intensity of storm events, use enhanced construction methodologies and resilient materials to maximize project longevity and durability.	P&D	7.1: Mitigation of climate risk considerations in building designs or justification for not including. For <u>7.2: Mitigation of climate risk</u>	IRP 2 GMU, grantee, and Environmental Officer	Prior to construction	1
	7.2: Consider alternative locations, if proposed site faces <u>7.3: Based on climate data and trends, incorporate design</u>	P&D	7.3: IRP 2-approved design that <u>7.4: IRP 2-approved design that</u>		Prior to construction	2
	8.1 Design potable systems to increase efficiency based on anticipated changes in the hydrologic system from long	P&D	8.1 IRP 2-approved design that <u>8.2: IRP 2-approved design that</u>		Prior to construction	1
		P&D	8.2: IRP 2-approved design that <u>8.3: IRP 2-approved design that</u>		Prior to construction	1
8. Pit Latrines - Groundwater supply contaminated with pathogens (O&M)	8.1 Evaluate depth to water table, including seasonal fluctuations and groundwater hydrology, if possible	P&D	8.1 & 8.2 Document water table and retention time studies in ERF, if applicable	IRP 2 GMU, grantee, and Environmental Officer	Prior to construction	1
9. Septic Tanks - Groundwater supply contaminated with nitrogens and	9.1 Evaluate depth to the water table, including seasonal fluctuations and groundwater hydrology	C	9.1 & 9.2 Document communications on maintenance and handling requirements and/or the delivery of	IRP 2 GMU, grantee, and Environmental Officer	Prior to construction	1

