INTEGRATED SAFEGUARDS DATA SHEET
APPRAISAL STAGE

Report No.: ISDSA8080

Date ISDS Prepared/Updated: 26-Feb-2016

Date ISDS Approved/Disclosed: 08-Mar-2016

I. BASIC INFORMATION

1. Basic Project Data

Country:	Argentina	**Project ID:**	P145686
Project Name:	AR Flood Risk Management Support Project for the City of Buenos Aires (P145686)		
Task Team Leader(s):	Christophe Prevost,Maria Catalina Ramirez		
Estimated Appraisal Date:	28-Jan-2016	**Estimated Board Date:**	05-Jul-2016
Managing Unit:	GWA04	**Lending Instrument:**	Investment Project Financing
Sector(s):	Flood protection (100%)		
Theme(s):	Water resource management (100%)		
Is this project processed under OP 8.50 (Emergency Recovery) or OP 8.00 (Rapid Response to Crises and Emergencies)?	No		
Financing (In USD Million)			
Total Project Cost:	326.00	Total Bank Financing:	200.00
Financing Gap:	0.00		

Financing Source	**Amount**
Borrower	126.00
International Bank for Reconstruction and Development	200.00
Total	326.00

Environmental Category:	A - Full Assessment
Is this a Repeater project?	No

2. Project Development Objective(s)

Strengthen the Autonomous City of Buenos Aires to efficiently manage flood risk and improve the drainage systems in the Cildáñez, Maldonado and Vega watersheds.

3. Project Description

The Project would support the City of Buenos Aires's plan to reduce flood hazard and will build

upon the activities conducted under the Urban Flood Prevention and Drainage Project APL1, lessons learned, best practices, and experiences obtained from its implementation, as well as from activities in other countries. The proposed project will have three components:

Component 1: Institutional Development for Flood Risk Management (approximately US$31.2 million): This component will support the creation of a modern and sustainable framework for flood risk management within the City of Buenos Aires based on a permanent inter-institutional organization that goes beyond the life of the Project. Component 1 will finance systems, equipment, the development of risk models, policies and strategies, and capacity-building amongst other goods and services. At this point it is envisaged that the following four sub-components or activities will be financed:

- Hydro-meteorological observation, surveillance and alert system (SIHVIGILA for its initials in Spanish): This sub component will finance an integrated hydro-meteorological observation, monitoring, alert, alarm, and response system which will increase the City's severe-weather forecasting capacity thus improving flood preparedness and emergency management and recovery. City counterparts responsible for Component 1 are currently drafting an agreement with the National Meteorological Service that explores synergies and creates joint forecasting capabilities to incorporate a high resolution S-band Doppler-effect radar, the first of its kind in Argentina.
- Flood Risk Financing and Protection Scheme: This sub-component will finance technical assistance (TA) for the development a flood risk financial and protection program for homeowners and SMEs that includes the design of a strategy (based on existing data) of innovative retention and transfer instruments and products such as insurance (starting with a probabilistic flood risk model), flood exposure databases, hazard maps, risk-based pricing and underwriting tools, web-based production systems, claims management systems, etc. A regulatory capacity-building process as well as outreach and consumer education on flood risk insurance will also be fostered. The proposed Flood Risk Financing and Protection Scheme will enable the City of Buenos Aires to considerably reduce fiscal outlays on post-flood compensation payments by applying a rational fiscal and budgetary retention capacity and by transferring flood risk exposure to the private insurance and reinsurance markets.
- Flood Risk Social Communication and Education: This sub-component will finance the design of contents for communication and educational campaigns (formal and informal) on flood risk topics. Some of the activities could be implemented by local NGOs based on specific proposals aimed at building capacity in flood related topics and the dissemination of information. This sub-component aims at increasing social awareness on flooding risk and educating residents on emergency response plans and recommended behaviors to increase safety before and under an emergency, particularly targeting local neighborhood councils (comunas), civil-society organizations, and NGOs.
- Capacity Building for flood risk management: The objective is to support City institutions in charge of different functions related to flood hazard management including infrastructure planning, emergency response, and operation and maintenance of the City's increasing drainage infrastructure and systems amongst others.

Component 2: Flood Mitigation Infrastructure (approximately US$290 Million): This component will finance works for a total of approximately US$215 million. All works will be designed for the 10 year storm. This component includes the specialized independent supervision of the works. It will finance the following works in three of the City's drainage basins:

- Maldonado Stream Basin: Roughly 40 kilometers of secondary and tertiary drainage conduits which will convey water into the large drainage tunnels built with funds from the previous Bank loan;
- Vega Stream Basin: The Project will finance the construction of one large drainage tunnel

with an estimated length of 8.4 kilometers, which will act as a second emissary for the Vega stream. The new drainage tunnel will more than double the capacity of the existing one. The Project will also finance 10.5 kilometers of secondary and tertiary networks;

• Cildáñez Stream Basin: The activities in this basin will include (i) improvements to the existing conduits to increase the drainage capacity in the lower lands of the Cildáñez watershed to reduce the likelihood of flooding, (ii) the environmental recovery of Lake Soldati by diverting both sewage and storm runoff currently discharging into the lake, and (iii) the use of this pond as a flood retention basin to delay flows towards the Riachuelo River.

Component 3: Project Management (approximately US$4.3 million): To finance Project audits, monitoring and evaluation, including an impact evaluation based on baseline and post-project surveys, capacity building, training, and other operating costs.

4. Project location and salient physical characteristics relevant to the safeguard analysis (if known)

The Project is located in the city of Buenos Aires, capital of Argentina. The city is situated on the south bank of the La Plata River, has a surface area of approximately 200 square kilometers, and a population of approximately 3 million inhabitants (8 percent of the national population).

The works and improvements under Component 2 will be located in the Cildáñez, Maldonado, and Vega basins. The Cildáñez basin covers a suburban area in the southern part of the city of Buenos Aires (3131 hectares within the city) and is populated by around 290,000 inhabitants; the low basin, the primary target of the planned interventions under Subcomponent 2.1 (which have an influence zone of about 310 hectares), is populated by around 50,000 low-income residents who dwell in informal settlements and social housing in the surroundings of the Cildañez stream, where the Lake Soldati is located. This lake is actually a pond, a depressed area in the low basin. Now the lake area is environmentally degraded due to the discharge of wastewater from the informal settlements and the dumping of solid waste. The Maldonado and Vega basins comprise over 30 percent of the city's area and population and cover the central area of the city. The geographically delimited area of the Vega Basin, integrally located within the city, has a surface area of approximately 1700 hectares and is populated by around 280,000 people. The Maldonado basin has a surface area within the city of about 5100 hectares and is populated by over 1,000,000 people.

The La Plata River is the most important surface water resource of the study area. It has an average yearly flow of 22,000 cubic meters per second. The La Plata River is the receiving body of the present Vega and Maldonado basins discharges and, directly or indirectly, of all the Metropolitan Area of Buenos Aires basins discharges, including those of the Riachuelo River (where the Cildáñez stream discharges). The La Plata River is subject to pollution from domestic and industrial waste. Hydrologic characteristics of this river favor higher concentrations of contaminants in a relatively narrow strip, approximately 500 meters wide measured from the coastline. This coastal zone is seriously compromised due to the presence of physical and bacteriological contaminants.

The long history of man-made physical modifications to the city has caused the existing natural habitats' conditions to be almost entirely replaced by urban components; no natural habitats or environmentally sensitive areas are present in the zone directly affected by the projected works.

No known or suspected archeological sites have been documented in Project related studies or literature in areas that would be directly impacted by the works; however, the underground of the city of Buenos Aires could be considered of archeological potential.

There are two relevant groundwater systems in the project area:

(i) Epipuelches is a multilayer aquifer located in the Pampeano sediments (aquifer of medium to low productivity) and Postpampeano sediments (mostly an aquitard, of low productivity, and with waters of a high saline content). Pampeano sediments are not present towards the Eastern and

Southeastern parts of the city, including the Vega, Maldonado and Cildáñez low basin areas, and the La Plata and Riachuelo Rivers riverbanks. The water table in the shallow layers of the above mentioned sediments ranges between 2 and 15 meters below surface elevation and generally follows the surface morphology. The water table presents high levels of diverse chemical, physical, and biological contaminants originated by human activity. Based on its productivity and quality, Epipuelches aquifer is not exploited in the Project location zone;

(ii) Puelches is located in the Puelchenses sands underneath the Epipuelches aquifer and separated from it by a low permeability layer of clay. The Puelchenses sands, which are found at an average depth of 30 meters below surface elevation, rest on the impermeable Paraná aquiclude (underlying rock). The Puelches is a semi-confined aquifer; the layer of clay makes difficult but does not impede a low natural circulation of groundwater (ascendant and descendant) between the Puelches and Epipuelches aquifers. The Puelches is an extensive (it extends beyond the City and even the Province of Buenos Aires), very productive aquifer with a large amount of water that is safe for human consumption, irrigation, and industrial uses. However, its quality diminishes towards the La Plata River and the Riachuelo River (where Pampeano sediments are not present). In the Project location zone the Puelches aquifer is affected by high levels of nitrates (NO3-) and even, towards the riverbanks, by high saline contents; at present, it is only used in limited amounts for industrial purposes.

According to the project design and feasibility technical studies of the new tunnel in the Vega basin, the top of the tunnel segment to be built by conventional methods (approximately 2.4 kilometers) will be located between 10 and 15 meters below the surface and cut across the Pampeano sediments and the water table. The rest of the tunnel—built by TBM-EPB method (approximately 6 kilometers)—will be excavated at a depth ranging between 23 and 30 meters below surface (tunnel ceiling). This portion of the tunnel will be mostly located at the base of the Pampeano formation, but a segment of it will intersect the Puelches formation. The walls of the discharge chamber to be constructed in the margin of the La Plata River will traverse the Epipuelches (Postpampeano sediments) and Puelches aquifers.

Foreseen physical interventions below surface associated to the construction of the secondary and tertiary drainage conduits in the Vega and Maldonado basin, as well as to the envisioned works in the Cildáñez basin will not be developed at depths that go beyond 6 meters; they will not interact with the Puelchenses sands.

5. Environmental and Social Safeguards Specialists

Carlos Alberto Molina Prieto (GSU04)

Elba Lydia Gaggero (GEN04)

Robert H. Montgomery (GEN04)

Santiago Scialabba (LCC7C)

6. Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The Flood Risk Management Support Project for the City of Buenos Aires is classified as Category A according to World Bank Environmental Assessment OP/BP 4.01 based upon one of the flood mitigation works to be developed under Component 2, specifically the large drainage tunnel and its complementary works in the Vega basin (part of the Subcomponent 2.3), which has some potential significant socio-environmental adverse impacts

		although they are not considered irreversible or non-mitigable. The other works envisioned under the Subcomponent 2.3 in the Vega basin (secondary and tertiary drainage conduits construction), the Subcomponent 2.2 in Maldonado basin, and the Subcomponent 2.1 in Cildáñez basin, involve relatively standard, smaller-scale infrastructure works that have been assessed to have few and less adverse potential effects, site specific, non-irreversible, not significant, and can readily be prevented or mitigated with routine/standard measures. There are no significant negative indirect or long term impacts anticipated related to the Project. (Note: details on potential impacts associated with Component 2 of the Project are presented below, in Section II - Key Safeguard Policy Issues and Their Management) Activities under Components 1 and 3 such as institutional development and capacity building are not likely to generate adverse impacts. In fact, they are designed to enhance the positive outcomes, long-term benefits and sustainability of the project. Given that three different works and interventions in three different areas of the city are envisioned under the Project, three separate, specific Environmental Assessment instruments have been developed in accordance with the World Bank's Environmental and Social Safeguards Policies: - Subcomponent 2.1 - Cildáñez basin: To manage impacts related to this subcomponent, an ESIA (including an ESMP) has been prepared based upon the ESMF originally developed for the project. Note: During the first stage of project preparation (2013/2014), the specific physical interventions to be financed by the Bank were not fully defined and therefore it was not possible to accurately determine needed actions and associated details, secure the pertinent inter-institutional agreements and commitments, and properly integrate the local community’s input. For that reason, and following WB’s safeguards guidelines, an Environmental and Social Management Framework (ESMF) was developed to set the criteria to manage all potential impacts related to this component. The details of the proposed works were defined in a second phase of project preparation (2015) and an ESIA with its corresponding ESMP were prepared accordingly, also following the requirements of the local EIA system.

		- Subcomponent 2.2 - Maldonado basin: This Subcomponent will complete the network of secondary and tertiary drainage conduits planned for the basin in the HMP. These works were included in the executive project of the two large tunnels successfully executed under the previous Bank-funded Urban Flood Prevention and Drainage Project APL1. Therefore, they were part of the APL1's EIA developed in 2005 following the Bank's guidelines and requirements as well as local regulations. For managing impacts related to this Subcomponent, an updated ESIA has been prepared based upon the existing EIA of the Maldonado's secondary and tertiary drainage conduits originally developed for the APL1 and other relevant information. The new ESIA addresses environmental and social baseline conditions; potential adverse environmental and social impacts; risks; benefits; and includes an ESMP for construction and operation phases. - Subcomponent 2.3 - Vega basin: A full Environmental and Social Impact Assessment (ESIA) has been developed for the hydraulic works in the Vega basin. The ESIA addresses the background (planning stage—city's HMP preparation, including project alternatives analysis, and early consultations); establishes detailed environmental and social baseline conditions; identifies and assesses potential environmental and social adverse impacts and risks based on the type and scope of physical interventions and site characteristics, as well as expected benefits; designs appropriate mitigation, management, and monitoring measures; and presents an Environmental and Social Management Plan (ESMP) for the proper management of works during construction and operation stages. Preliminary reports of the ESIAs and ESMPs of the hydraulic works in the Vega and Maldonado basins were disclosed locally on December 27, 2013. Corresponding draft reports of these instruments were publicly disclosed in country in March, 2014, and through the World Bank InfoShop Website in April, 2014. The Cildáñez ESIA and corresponding ESMP was disclosed in country in September 2015 and in the InfoShop in January 2016. From the time of the development of the HMP, the city's Government, principally through the Ministry of Urban Development (MUD) and the Ministry of Environment and Public Space (MEPS), has implemented various forms of public input/participation that contributed to the development of the works designs and its corresponding

		social and environmental studies and instruments. Specific public consultation meetings on the draft ESIAs of the hydraulic works in the Vega and Maldonado basins took place as following: - ESIA Maldonado Basin: April 28, 2014; - ESIA Vega Basin: April 29, 2014 The revised ESIAs including the ESMFs, which took into account the stakeholders' views, were disclosed locally in August, 2014, and through the World Bank InfoShop Website in September, 2014. In addition, the ESIA of the hydraulic works in Vega basin had a Public Hearing according to the local EIA legal system, which took place on September 29, 2014. The Cildáñez's ESIA and its corresponding ESMP were disclosed in country on September 14, 2015 and in the Bank's InfoShop on January 26, 2016. The Cildañez ESIA's consultation process involved periodic meetings with the Red Intercomunal Cuenca Cildáñez (RICC), as a continuity of the consultation process initiated during the ESMF preparation, and technical interactions with other relevant stakeholders (such as academy). Note: A specific public consultation meeting on the draft ESMF of the hydraulic works in the Cildáñez Basin took place on May 30, 2014. In preparation to this meeting the MEPS, together with the Secretariat of Inclusive Habitat hold a series of weekly meetings from early May 2014 with neighbors and civil society groups to discuss and agree on the approach of the works in the Cildáñez low basin. During the consultation, these abovementioned meetings were highlighted by the attendees as very positive for project's ownership.
Natural Habitats OP/BP 4.04	No	This policy is not triggered since the Project does not require the significant conversion of natural habitats or critical natural habitats and will not take place in protected areas or ecologically important sites. However, the ESIAs and ESMF identified and assessed, as applicable, the potential impacts on non-critical natural habitats and environmentally fragile areas in the corresponding influence zones of the projected works.
Forests OP/BP 4.36	No	This policy is not triggered since the Project will affect neither forests nor forest-dependent communities, nor will it involve changes in the management of forests.
Pest Management OP 4.09	No	This policy is not triggered since the Project does not require the purchase or use of significant quantities of pesticides

Physical Cultural Resources OP/BP 4.11	Yes	No known or suspected archeological sites have been documented in Project related studies or literature in areas that would be directly impacted by the Project. However, since the underground of the city of Buenos Aires could be considered of archeological potential and Component 2 works entail large excavations and soil movement, a potential exists for the accidental discovery of physical cultural resources. Thus the policy is triggered. The necessary mitigation measures have been considered within OP/BP 4.01 and the specific EA instruments (e.g., ESMPs with chance finds procedures). None of the Project foreseen works will affect surface areas that require PCR protection (Historic Protection Areas and Protected Buildings, which are the two legal categories of the Autonomous City of Buenos Aires in regards to the protection of its urban patrimonial values).
Indigenous Peoples OP/ BP 4.10	No	This policy is not triggered since Project activities will not affect indigenous peoples as defined in the policy.
Involuntary Resettlement OP/BP 4.12	Yes	OP 4.12 has been triggered because at the beginning of project preparation the civil works to be carried out in the Cildáñez watershed were not fully defined and therefore it was possible that one or more physical interventions financed by this Subcomponent could potentially affect houses in some informal settlements in the Cildañez basin. For that reason, a Resettlement Policy Framework (RPF) has been prepared and was disclosed on August 29, 2014. The works in Cildáñez watershed have now been defined within selected from CABA's program for integrated urban water management in marginal areas. No resettlement is expected linked to the planned physical interventions. If any of the civil works planned for the Cildáñez Basin cause resettlement at the moment of the subproject execution (for example, due to an unexpected change in the present conditions of the implementation area), a Resettlement Action Plan (RAP) will be prepared before the start of the works. No resettlement will be done in the Maldonado and Vega watersheds.
Safety of Dams OP/BP 4.37	No	The Project will not support the construction or rehabilitation of dams nor will it support other investments which rely on the services of existing dams. Therefore, the Policy is not triggered.
Projects on International Waterways OP/BP 7.50	Yes	In consultation with LEGEN it was confirmed that the OP/BP 7.50 Policy on Projects in International Waterways is triggered. The Project involves the construction of a new drainage tunnel and discharge of storm water into the Rio de la Plata, which is an

		international waterway shared by Argentina and Uruguay. The proposed Project works represent expansions of existing systems that would not adversely change the quality or quantity of the water flows or be adversely affected by other possible riparian water uses. Following the OP/BP 7.50 requirements, a formal notification of the proposed Project and its elements was sent by the Bank to the Republic of Uruguay on June 18, 2014. It was received and a courtesy translation was required by the government of Uruguay. No objection has been received from the government of Uruguay.
Projects in Disputed Areas OP/BP 7.60	No	The Policy is not triggered because the Project will not be implemented in areas known to involve disputed areas.

II. Key Safeguard Policy Issues and Their Management

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:

The Flood Risk Management Support Project for the City of Buenos Aires involves a series of works/physical interventions under its Component 2. One of them is an investment of a large scale and high technical challenges: the new tunnel and complementary works in the Vega basin. Because of this investment alone the Project has been categorized as A. This categorization was given based on the type and magnitude of the works, the relative complexity of the works' location (central area of the city of Buenos Aires), and the subsequent potential environmental and social impacts, even though they are not considered irreversible or non-mitigable. The rest of the projected physical interventions are relatively simple, small to medium sized-scale infrastructure works, for which no significant or irreversible impact is anticipated. In all cases, the potential adverse impacts of the construction stage are considered more important than those of the operational stage, although they are mitigable with the application of relatively routine/standard mitigation measures. As the works in the Vega and Maldonado basins will take place on or beneath roads and public space, without existing private formal or informal occupation or uses at present, no potential locations of land acquisition or related activities (such as easement) have been identified and involuntary use of land or expropriations are not foreseen for the Vega and Maldonado subcomponents. Civil works in the Cildañez basin will be carried out as part of CABA's program for integrated urban water management in marginal areas. No resettlement is expected linked to this physical interventions. If any of the civil works planned for the Cildáñez Basin cause resettlement at the moment of the subproject execution (for example, due to an unexpected change in the present conditions of the implementation area), a Resettlement Action Plan (RAP) will be prepared before the start of the works, accordingly to the provisions included in the Project's RPF.

The main potential positive impacts and long-term outcomes associated with the Project are related to the city's increased resilience to flooding events. They include the improvement of the population's quality of life, a reduction in related economic losses, and the efficient delivery of essential services such as energy, transportation, health and education, among other benefits. In addition, the development of large scale drainage infrastructure will boost the construction sector and create jobs. Anticipated potential positive impacts to the Cildáñez basin also include the betterment of sanitation conditions for the vulnerable residents who live in informal settlements

around Lake Soldati (improvement of water quality, less exposure to pests, etc.), and the improvement of the environmental and aesthetic conditions of the Cildáñez low basin, particularly of the lake's surrounding area.

A summary of expected potential impacts for each Subcomponent of Component 2 is described below

Subcomponent 2.1, Cildáñez basin: Under this subcomponent the Project will support the implementation of the "Program for integrated urban water management in marginal areas of the Maldonado-Cildañez Basin". The Program's general objective is to improve the existing drainage infrastructure to reduce the likelihood of flooding and promote better life conditions in a low-income area within the basin.

The influence zone of the Program—about 310 hectares in the low basin—is one of the most socially vulnerable areas of the city. It comprises a population of around 50,000 inhabitants who live precariously in the surroundings of the Cildáñez stream. There are around 12,000 inhabitants that live under flood risk due to the location next to the Lake Soldati (on the left bank of the stream), of which 5,000 have suffered flood related problems in the last flood events (Manzana 9 and 10 in Los Piletones Neighborhood, and Nueva Esperanza Neighborhood). Furthermore, other 24,000 have problems derived from floods and high water levels, permanence of puddles and returning of sewage derived from deficient constructions and saturated networks. The area also includes two neighborhoods on the right bank of the Cildáñez stream that have around 13,000 inhabitants: within Comuna 8 the Nágera Neighborhood (a social housing complex of middle income population) and within Comuna 9 the Villa 6, which in the last years has been urbanized into what is currently known as Cildáñez Neighborhood.

The specific different physical interventions include: (i) the construction of two drainage channels, (ii) the construction of a drainage collector around Lake Soldati, and (iii) the construction of a temporary retention area.

The main anticipated potential adverse impacts related to activities of Subcomponent 2.1 are related to the construction stage of infrastructure works. They include noise; vibration; exhaust emissions from machinery; dust emission and dispersion from excavation activities; disruptions in normal urban movement (traffic and pedestrian); and safety issues. None of these potential impacts is anticipated to be significant. Foreseen works and complementary interventions the Cildañez basins do not anticipate any significant negative impact on physical cultural resources; however, the ESMP and related construction contracts will include procedures and requirements related to chance find management. No resettlement is expected linked to this physical interventions. If any of the civil works planned for the Cildáñez Basin cause resettlement at the moment of the subproject execution (for example, due to an unexpected change in the present conditions of the implementation area), a Resettlement Action Plan (RAP) will be prepared before the start of the works, accordingly to the provisions included in the Project's RPF.

Expected benefits from the implementation of the Program include flood mitigation, betterment of sanitation conditions, and environmental and urban improvement of the area.

Subcomponent 2.2, Maldonado basin: This Subcomponent will complete the network of secondary and tertiary drainage conduits planned for the basin in the HMP (around 46 kilometers). To date, the city has built about 32 percent of the network. The remaining 31 kilometers, distributed throughout many different sectors of the basin—which has a surface area within the city of about 5100 hectares—is proposed to be partially financed by the new Project. Part of these conduits will feed water directly into the large drainage tunnels built under the previous Bank loan, while another portion will enhance the flowing capacity of the upper Maldonado watershed which is diverted into the Cildáñez watershed, and ultimately flows into the Riachuelo River. It is important to remark that project works in the Maldonado basin will not have effects in the Cildañez

watershed; the planned works will not modify the existing diversion system that today diverts water from the Maldonado to the Cildañez watershed. The main potential adverse impacts on the urban social and environmental settings are similar to those of Subcomponent 2.1, since small to medium sized-scale infrastructure works in urbanized areas will take place. None of these potential impacts is anticipated to be significant. Foreseen works do not anticipate any significant negative impact on physical cultural resources; however, the ESMP includes (and, accordingly, related future contract will include) procedures and requirements associated to chance find management. No resettlement related impact has been identified for these works. The creation of jobs is the main positive impact expected from the construction stage.

The operational phase would have mostly positive effects: permanent social benefits with the optimization of the basin's flood protection infrastructure.

Subcomponent 2.3, Vega basin: The projected works comprise: i) construction of a tunnel of approximately 8,400 meters long with tunneling (approximately 6 km using a Tunnel Boring Machine of the Earth Pressure Balance type [TMB-EPB], and approximately 2.4 km using manual or conventional methods), and its complementary works; and ii) approximately 9.8 km of secondary and tertiary drainage conduits. This infrastructure will upgrade the current insufficient drainage system of the Vega basin—which dates back to the 1930s and 1940s—, significantly increasing the level of protection and reducing social and economic losses caused by flooding. Today, the Vega basin over-flows frequently, causing disruptions to the entire city of Buenos Aires by blocking the vital transportation network (road, railway, and subway) that links the districts in the North to downtown and to the industrial, populous areas of the South.

During the construction phase, predominant adverse potential impacts were found to be of medium intensity, short term occurrence, with a restricted affected area (operational area of influence); effects are mostly transitory. Potential adverse impacts include particulate matter emissions; increased noise level and vibration; and, mainly, impacts on the urban social setting due to discomfort, nuisance, disruptions in normal urban movement—traffic and pedestrian—, alteration of daily activities; visual impacts; etc. although they will have a transitory effect with a duration confined to the period of the execution of the works. None of these potential impacts is anticipated to be significant. There could also be negative impacts related to occupational health and safety of the staff if proper measures are neglected. The hydraulic works in the Vega Basin does not contemplate any physical displacement (resettlement) or loss of economic activity. The project does not anticipate any significant negative impact on physical cultural resources; however, the ESMP includes (and, accordingly, related future contract will include) procedures and requirements associated to chance find management.

Foreseen construction methods and technical provisions would allow structures to be isolated from groundwater and avoid an artificial hydraulic connection between aquifers (mainly by the use of earth pressure balance for tunneling and the use of hydro milling machine for the discharge chamber walls construction).

The ESIA performed a specific analysis on the potential subsidence from excavation activities. A risk assessment on buildings located along the tunnel alignment was made; risks proved to be "very low" and "negligible". However, future contractors will be required to perform audits and controls on the conditions of the buildings and infrastructure that could be affected by the works.

The main disposal site(s) for soil from excavations (estimated in around 250,000 cubic meters) have not been established at this advanced executive project design stage. The city will identify and select the specific location(s) of soil disposal site(s) during works execution based on the quality characteristics of the excavation materials and construction needs (e.g. part of the soil may be used as soil cover in diverse components of the works). The city will be the owner of the material, and will be responsible for the appropriate selection of disposal site(s) for exceeding soil from excavations and the management of the disposal (no involuntary use of land or expropriation

is foreseen in connection with the disposal site(s) selection); future final design and construction contractor of the works will be responsible for the management of material transportation. However, the ESIA has preliminarily identified four potential sites for the disposal of exceeding soil from excavation, which are located in the North, the South (two sites), and in the West of the city—three of them situated in the territory of the Province of Buenos Aires—, in order to assess the availability of such sites, the proper conditions of disposal and the management of material transportation. The ESIA provides recommendations and mitigation measures for the proper environmental management of the soil disposal sites, including soil disposal conditions.

The estimated highest potential positive impacts in the construction stage are the creation of jobs —some of them highly specialized in large scale infrastructure—, and the creation of informal economic activities. In general terms, they would be temporary impacts; but they may have effects that go beyond the works completion period.

During the operation stage, predominant potential impacts are positive, of high to medium intensity, with an extensive area of influence and mostly permanent effect. The highest and permanent positive impact expected of the operation and maintenance phase of the Vega basin's new drainage system is increased flood protection in the basin and the associated direct and indirect benefits on all the compartments of the social setting (population, economic activities, infrastructure and services, facilities, cultural heritage, urban movement, territorial structure, and landscape). These benefits could also reach the entire city of Buenos Aires. Another estimated positive impact is job creation. Potentially significant adverse impacts to the water quantity and/or quality of the La Plata River (average yearly flow of 22,000 m3/s) are not expected since the proposed works would not affect the drainage balance of the Vega basin (maximum flow of 60 m3/s), and the discharged storm water from the new emissary (with an estimated influence zone of up to 200 meters from the coastline—which is seriously compromised by diverse contaminants presence) would be of similar quality as that one currently being discharged by the existing drainage system. In addition, monitoring activities of the discharge of the Maldonado drainage system showed that the discharged storm waters improve the water quality of the receiving body in the influence zone of the discharge. It is foreseen that the same situation will be verified in the new discharge of the Vega basin.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

The positive impacts, long-term outcomes associated with the Project are related to the city's increased resilience to flooding events. They include the improvement of the population's quality of life, a reduction in related economic losses, and the efficient delivery of essential services such as energy, transportation, health and education, among other benefits. In addition, the development of large scale drainage infrastructure will boost the construction sector and create jobs. Anticipated potential positive impacts to the Cildáñez basin also include the betterment of sanitation conditions for vulnerable residents who live in the low basin, and the improvement of the environmental and aesthetic conditions in the watershed.

There are no significant negative indirect or long term impacts anticipated related to the Project.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

An analysis of alternatives was performed in connection with the hydraulic works. During the HMP (circa 2004) a thorough alternative analysis was carried out considering technical, environmental, and socio-economic parameters. For the hydraulic works in the Vega basin in particular (as the subcomponent that defines the whole Project as Category A), during the planning stage (preparation of the city's HMP), four alternatives for the management of floods were identified and analyzed on a pre-feasibility basis. The main options for flood protection that were

considered are (i) different levels of protection: 5, 10, and 20 years of storm recurrence periods; and (ii) different control systems and combinations of them (conveyance tunnel, storage reservoirs). Only the manual or conventional method for the construction of the conveyance tunnel was considered during the planning stage; it essentially covered the works' technical requirements and its cost was significantly lower when compared to the use of Tunnel Boring Machine technology. The construction of additional secondary and tertiary drainage conduits to reinforce the network in the basin was considered in all the alternatives. The hydraulic modeling of the different solution alternatives was performed with the help of the software package InfoWorks CS. The goal was to seek a solution that would afford the city of Buenos Aires protection against floods associated with rainfall events having return periods of up to 10 years, while mitigating the impact of storm events with return periods larger than a decade. The alternatives were analyzed from technical, economic and socio-environmental perspectives, applying a multi-criteria evaluation analysis. Protection levels, initial investment costs, operation and maintenance costs, beneficiary population, averted damage and potential social and environmental impacts—during the construction and operation phases—were the main comparison criteria. Identification and evaluation of potential social and environmental impacts were based on a specific expedited environmental assessment of the different alternative works, considering the main characteristics of each one and the social and environmental sensitivity as described in the preliminary studies that were carried out for the development of the basin baseline. As a result of this analysis, the following alternative was originally selected: i) construction by manual method of a tunnel of approximately 8,400 meters long with tunneling or access shafts every 500 meters and two vents to evacuate air accumulated inside the tunnel; ii) six flow diversion chambers; iii) an outlet shaft on the riverbank of the La Plata River; and, iv) a pump station for maintenance purposes.

At the present design stage of the Vega hydraulic works, alternatives were re-analyzed taking into account the present conditions and the experience acquired. As a result, the design was modified in one main aspect: approximately 6 kilometers of the tunnel will be built using a Tunnel Boring Machine of the Earth Pressure Balance type (TMB-EPB) due to i) its optimal technical aptitude to operate at significant depths and, consequently, its ability to minimize the risk of disturbing the existing underground relevant infrastructure (such as a master aqueduct and two subway alignments—only one subway crossed the area of the works location at the time the HMP was prepared); and ii) the minimization of construction impacts on the surface (e.g., noise, dust emission and disruptions in normal urban movement). The advantages of the TBM-EPB method were observed in the successful implementation of the APL1.

Other particular design aspects are also targeted to prevent or minimize the potential negative impacts and risk of the works. They include i) the use of hydro milling machine to build the outlet shaft (future discharge chamber) vertical structure, which will reach the underlying rock, method that will allow a minimal disturbance and the excavation of the shaft under "dry" conditions; ii) the chamber shaft will serve as temporary access for the tunnel boring machine during construction and the shield of this machine will be lost during the works (it will not be recovered), in order to avoid further disruptions on the surface; iii) foreseen construction methods and technical provisions would allow structures to be totally isolated from groundwater and avoid an artificial hydraulic connection between aquifers (mainly by the use of earth pressure balance for tunneling and the use of hydro milling machine for the discharge chamber walls construction); iv) the alignment of the Vega new drainage tunnel and its complementary works are entirely placed under roads and public space (minimizing risks on buildings from excavation activities and potential resettlement related impacts); main ancillary facilities for the construction of the tunnel (e.g. main camp, factory and deposit of voussoirs) will be also placed in a city-owned land.

During the current project preparation, the Bank's technical team reviewed and endorsed the engineering proposal presented by the CABA for the Cildañez, Maldonado and Vega basins. The

Bank's team validated the technical selection of the infrastructure and made recommendations to optimize the design and reduce potential risks during the construction and operation phases. Recommendations focused on geotechnical conditions, hydrologic modeling, hydraulic design, and behavior of sediments and their implications for excavation procedures and tunnel design.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

The overall environmental assessment process for the interventions in the three basins involved in the Flood Risk Management Support Project for the City of Buenos Aires is based on a multi-phase approach: i) the pre-feasibility studies (finished during the HMP preparation), which analyzed alternatives on the basis of their technical, socioeconomic, and environmental merits, and ii) a more thorough and updated environmental assessment for each specific project/work to be developed based upon the HMP. These actions have been, and continue to be, complemented with dissemination and various forms of public input/participation. Thus, social and environmental aspects have been taken into account in each phase of the design for the infrastructure works: from the preliminary ideas to the bidding stage.

The definition of the technical aspects and the deepening of the environmental assessment of the works have incorporated the experience and results of the execution of the past Bank-financed projects, including outreach and participation activities. With this in mind, adjustments to the construction sequence for the new Vega tunnel are planned (TBM-EPB technology application) for with respect to the one originally proposed in the HMP, which in turn is recommended for high occupancy zones where human intervention is high. Meanwhile, interventions in the Cildáñez basin are formulated with the purpose of addressing the current socio-environmental situation and the expectations of the community of the surrounding area, which are considerably different than those that were current at the time the HMP was created, for which modifications to the technical approach are required. Previous implementation experiences and stakeholders input were used to refine the works design and the Terms of Reference of the related EA studies of the new Project.

An Environmental and Social Impact Assessment, including an Environmental and Social Management Plan, has been developed for each of the hydraulic works related to Subcomponent 2.1 (Cildáñez Basin) Subcomponent 2.2 (Maldonado Basin), and Subcomponent 2.3 (Vega Basin). The ESIAs (i) present a detailed description of the legal and institutional framework related to the works' execution; (ii) present a detailed description of the social and environmental conditions in the area of influence of the works; (iii) identify and assess potential environmental and social impacts based on the type and scope of physical interventions and site characteristics; (iv) identify and design appropriate mitigation, management, and monitoring measures; and (v) organize those measures under an Environmental and Social Management Plan for construction and operation stages, constituted by a series of (interrelated) programs including a Legal and Institutional Aspects Management Program, an Occupational Health and Safety Management Program, a Monitoring and Control Program, a Communication and Community Participation Program, and a Contingencies Program, among others.

The execution of works under Component 2 will be contracted to construction companies, who will be required to comply with the environmental and social requirements of the corresponding ESIAs/ESMPs.

During the construction of the Vega new tunnel and complementary works, the contractor will be supervised by an independent, specialized supervision firm, including all the social, environmental, occupational health and safety related aspects.

The project Operational Manual will incorporate relevant environmental and social aspects, including compliance with project specific safeguard instruments (ESIAs/ESMPs, RPF), inclusion of environmental and social conditions in project contracts, supervision and reporting

responsibilities, among others.
The MoF will set up a Project Coordination Unit (PCU) within the UMF that will preserve the continuity of the team of specialists that has been taking part in the preparation of the Project, including a senior social specialist and a senior environmental specialist, who will be supporting the implementing units (for example, the Ministry of Urban Development (MUD). The MUD will be implementing the three subcomponents under Component 2 and will be responsible for all Bank safeguard related issues associated with those subcomponents. The MUD developed the environmental and social safeguards documents, consultations, and processes for the Vega and Maldonado Hydraulic Works. The Ministry of Environment and Public Space (MEPS), supported by the MUD, developed the environmental and social safeguard documents, consultations and processes for the interventions in the Cildáñez watershed. The active participation of the MEPS in the preparation phase was important given its functions related to Public Space and the envisioned CABA's strategy to revitalize the southern areas of the city. The MEPS also has a solid relationship with the Secretariat of Inclusive Habitat articulating interactions with the local community, which helped to generated conditions that will facilitate the foreseen interventions in the area. The MEPS and the MUD, along with other public organisms involved (Secretariat of Inclusive Habitat, Buenos Aires Sur Corporation, Environmental Protection Agency, Social Intervention Management Unit), have been holding periodic meetings from January 2014 to coordinate present and future actions in connection with the hydraulic works and complementary interventions in the Cildañez basin. The MUD has staff and experience related to Bank safeguards. Nevertheless, it will strengthen its socio-environmental team to ensure effective and adequate capacity during Project implementation. In addition, the MUD will be supported by the senior specialists of the PCU. Component 3 provides resources to support the MUD social and environmental safeguards management.
In summary, the mitigation strategy for environmental and social risks of the Project builds upon the experience acquired from previous project and includes: (i) strong technical designs, including the use of the best available technologies that minimize potential adverse environmental and social impacts and risks; (ii) sound social and environmental management instruments; (iii) more resources to ensure technically strong social and environmental staff; (iv) strengthening and capacity building activities targeted to social and environmental staff; (v) consultation processes for each works' subcomponent; (vi) communication and participation programs to build broad community support concerning the hydraulic works; (vii) establishment of a robust grievance and redress mechanism to manage project related information requests, complaints and grievances.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

Key stakeholders are the neighbors who live in the Vega, Maldonado and Cildáñez basins (in the last case, particularly the low-income residents who dwell in informal settlements and precarious social housing in the surroundings of Lake Soldati in the Cildañez basin), as well as the civil society organizations such as the intercommunal neighbors' associations (for example Red Intercomunal de la Cuenca del Cildáñez -RICC-, Inter Consejo Consultivo Comunal de la Cuenca del Arroyo Vega -ICCCCAV-).
The city's Government, mainly through the MUD and the MEPS, has implemented various forms of public input/participation, from the time of the HMP preparation to date, that fed the development of the works designs and its corresponding social and environmental studies and instruments, such us:

- Publication of the HMP's pre-design reports, meetings and seminars to present the findings, with the participation of local and international professionals and experts on the subject,

NGOs, neighbors, etc. (from 2002 to 2004).

- Implementation of Procedure PSHX-GG-0001 – Outreach to the Community, of the EMP of the construction phase of the APL1's drainage tunnels for the Maldonado stream (2008 to 2012)
- Informative and consultation meetings about the HMP, completed and future hydraulic works projects, and the issue of floods that the Ministry of Urban Development conducted in 2013 with residents of the city. The following meetings were held:
  - Comuna 10, two meetings in the month of May; Comuna 9, one meeting in April, two in July, one in August and one in September. In connection with the Maldonado and Cildáñez basins' works.
  - Development Associations of the Parque General Belgrano and Nuevo Belgrano neighborhoods, March; Comuna 15, October. In connection with the Vega basin's works.
- Meetings between the Ministry of Urban Development and the Argentine Society of Engineers. (March and November 2013)
- Customer service centers for complaints and inquires of the Ministry of Urban Development and the Ministry of Environment and Public Space for city residents (contact info, email: mduvecinos@buenosaires.gob.ar; phone: 4323-8000 ext. 4070; email: proyectos_mayep@buenosaires.gob.ar.
- Meetings that the Ministry of Environment and Public Spaces has held with NGOs, forums, and community representatives, particularly from the informal settlements in the surroundings of Lake Soldati, Los Piletones and Nueva Esperanza neighborhoods, and other public agencies that work in the area (e.g. the city's Secretariat of Inclusive Habitat and Buenos Aires Sur Corporation, the Water and Sanitation Utility of the MABA, and the Matanza-Riachuelo Basin Authority). From August 2013 to date.
- Meetings between the CABA officials, the Bank, and local neighbors associations for the Maldonado, Vega and Cildáñez Basins.- From September 2014 to date.

Preliminary reports of the ESIAs, including ESMPs, of the hydraulic works in the Vega and Maldonado basins were disclosed in country on December 27, 2013. Corresponding draft reports of these documents and instruments were disclosed in country on March 14, 2014, and through the World Bank InfoShop Website on April 7, 2014. Specific public consultation meetings on the aforementioned draft instruments took place during April 2014. The Cildáñez's ESIA and its corresponding ESMP were disclosed in country on September 14, 2015 and in the Bank's InfoShop on January 26, 2016.

The main issues from the earlier consultations can be summarized as follows: (a) ensuring strong technical designs for the hydraulic infrastructure to reach the objective of flood mitigation; (b) ensuring structures totally isolated from underground materials, in particular avoiding any cross contamination between aquifers derived from the works; (c) high expectations of the basins' inhabitants of a prompt solution of flooding problems with the projected works; and (d) emphasis on implementing non-structural measures along with the hydraulic infrastructure. From the public consultation meetings on the safeguard instruments held on April and May of 2014, a particular new outcome can be added to the previous ones: ensuring communication channels between the neighbors and civil society associations and the government for project's ownership and control.

In this regard, pertinent issues from public input have been taken into account. For example, (i) the Bank's technical team reviewed and endorsed the engineering proposal presented by the CABA for the Cildañez, Maldonado and Vega basins; (ii) strong technical specifications will be incorporated into bidding documents, including the use of the best available technologies that minimize potential adverse environmental and social impacts and risks; (iii) sound social and environmental management instruments have been developed for each hydraulic works; (iv) the required ongoing consultation during the execution stages of the envisioned works under each

subcomponent of Component 2 will be implemented through communication and community participation programs, as part of the corresponding ESMPs. Among other things, they will inform the involved neighborhoods in an adequate and timely manner about the status of the works (implementation schedule, traffic diversion, special warnings, etc.), and promote participation to ensure appropriate interaction and feedback from the main stakeholders of the works; (v) these participation programs at the works level will be articulated with the grievance and redress mechanism that will also be implemented for the Project as an integral part of the current city's claims management system to efficiently solve questions, suggestions, and complaints. In addition, the proposed Flood Risk Management Support Project for the City of Buenos Aires (P145686) will prioritize the implementation of Component 1 (non-structural measures), along with the physical interventions.

The revised drafts ESIAs/ESMPs of the Vega and Maldonado Basins, which took into account the stakeholders' views, were disclosed in country in August, 2014, and through the World Bank InfoShop Website in August and September, 2014. In addition, the ESIA of the hydraulic works in Vega basin had a Public Hearing according to the local EIA legal system, which took place on September 29, 2014. The Cildañez ESIA's consultation process involved periodic meetings with the Red Intercomunal Cuenca Cildáñez (RICC), as a continuity of the consultation process initiated during the ESMF preparation, and technical interactions with other relevant stakeholders (such as academy).

Citizens residing in the Arroyo Vega basin submitted a complaint to the World Bank's Grievance Redress Service raising issues regarding some aspects of project design as well as access to project information, consultation, and stakeholder participation in project preparation. The task team, in collaboration with the GRS, provided clarifications to the complainants on the project as designed and proposed actions within the project scope to address issues they raised.

B. Disclosure Requirements

Environmental Assessment/Audit/Management Plan/Other	
Date of receipt by the Bank	27-Dec-2013
Date of submission to InfoShop	07-Apr-2014
For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors	14-Apr-2014
"In country" Disclosure	
Argentina	14-Mar-2014
Comments:	
Resettlement Action Plan/Framework/Policy Process	
Date of receipt by the Bank	02-Feb-2014
Date of submission to InfoShop	06-Aug-2014
"In country" Disclosure	
Argentina	27-Aug-2014
Comments:	
If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/ Audit/or EMP.	
If in-country disclosure of any of the above documents is not expected, please explain why:	

C. Compliance Monitoring Indicators at the Corporate Level

OP/BP/GP 4.01 - Environment Assessment	
Does the project require a stand-alone EA (including EMP) report?	Yes [×] No [ ] NA [ ]
If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?	Yes [×] No [ ] NA [ ]
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?	Yes [×] No [ ] NA [ ]
OP/BP 4.11 - Physical Cultural Resources	
Does the EA include adequate measures related to cultural property?	Yes [×] No [ ] NA [ ]
Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?	Yes [×] No [ ] NA [ ]
OP/BP 4.12 - Involuntary Resettlement	
Has a resettlement plan/abbreviated plan/policy framework/ process framework (as appropriate) been prepared?	Yes [×] No [ ] NA [ ]
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?	Yes [×] No [ ] NA [ ]
Is physical displacement/relocation expected? Provided estimated number of people to be affected	Yes [ ] No [ ] TBD [ ]
Is economic displacement expected? (loss of assets or access to assets that leads to loss of income sources or other means of livelihoods) Provided estimated number of people to be affected	Yes [ ] No [ ] TBD [ ]
OP 7.50 - Projects on International Waterways	
Have the other riparians been notified of the project?	Yes [×] No [ ] NA [ ]
If the project falls under one of the exceptions to the notification requirement, has this been cleared with the Legal Department, and the memo to the RVP prepared and sent?	Yes [ ] No [ ] NA [×]
Has the RVP approved such an exception?	Yes [ ] No [ ] NA [×]
The World Bank Policy on Disclosure of Information	
Have relevant safeguard policies documents been sent to the World Bank's Infoshop?	Yes [×] No [ ] NA [ ]
Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?	Yes [×] No [ ] NA [ ]
All Safeguard Policies	
Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?	Yes [×] No [ ] NA [ ]

Have costs related to safeguard policy measures been included in the project cost?	Yes [×] No [ ] NA [ ]
Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?	Yes [×] No [ ] NA [ ]
Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?	Yes [×] No [ ] NA [ ]

III. APPROVALS

Task Team Leader(s):	Name: Christophe Prevost,Maria Catalina Ramirez	
Approved By		
Safeguards Advisor:	Name: Francis V. Fragano (SA)	Date: 26-Feb-2016
Practice Manager/ Manager:	Name: Rita E. Cestti (PMGR)	Date: 08-Mar-2016

Public Disclosure Copy