

INTEGRATED SAFEGUARDS DATA SHEET

CONCEPT STAGE

Report No.: ISDSC14765

Date ISDS Prepared/Updated: 15-Jun-2015

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I. BASIC INFORMATION

A. Basic Project Data

Country:	South Africa	Project ID:	P149521
Project Name:	Technical Assistance Project for Development Carbon Capture and Storage in SA (P149521)		
Task Team Leader(s):	Nataliya Kulichenko		
Estimated Appraisal Date:	22-Jun-2016	Estimated Board Date:	28-Jul-2016
Managing Unit:	GEE08	Lending Instrument:	Investment Project Financing
Financing (In USD Million)			
Total Project Cost:	48.40	Total Bank Financing:	0.00
Financing Gap:	0.00		
Financing Source			Amount
Borrower			25.00
Carbon Fund			23.40
Total			48.40
Environmental Category:	B - Partial Assessment		
Is this a Repeater project?	No		

B. Project Objectives

20. The proposed development objective of this TAP is to demonstrate that CCS—one of the key climate change mitigation technologies—is feasible in South Africa, allowing the GoSA to advance to the next phase in its CCS Roadmap: large-scale CCS demonstration.

C. Project Description

The proposed TAP is part of the World Bank supported Programmatic Technical Assistance (PTA) that will include World Bank executed capacity building activities and the recipient executed TAP. In particular, the TAP will support two independent components, which contribute to the realization of the GoSA CCS Program: 1) the Pilot CO2 Storage Project (PCSP) and 2) the stand-alone CO2

Capture Pilot Plant (CCPP) project. The PCSP will comprise an estimated 90 percent of the activities and costs of the World Bank-supported TAP, because the first priority is to demonstrate that CO₂ can be stored in South African geological formations. In parallel to the TAP, the World Bank will be executing capacity-building activities under the PTA will support the geological data collection and analyses needed for the preparation and implementation of the PCSP, as well as the tasks on evaluation and selection of a capture technology for the CCPP. The PTA program will furthermore support capacity building needed to equip the counterpart staff with the necessary technical skills for the implementation of the two pilot projects.

Component 1: Pilot CO₂ Storage Project (PCSP)

The PCSP, envisioned in the GoSA CCS Roadmap, is divided into six sub-components scheduled to be completed in a series of seven consecutive stages between 2014 and 2025. The scope of proposed PCSP component within the TAP is narrower and aims to support the activities planned within Stages 3 to 6, which are scheduled to be completed between 2015 and 2019. The proposed TAP will conclude in 2019, leaving the overall completion (monitoring) of the PCSP thereafter solely in the hands of the GoSA. In order to manage prudently the PCSP activities, a review will be conducted at the conclusion of each stage in order to determine whether the results warrant proceeding to the next stage. This process is hereafter referred to as a “decision point.” The first stage, Project Initiation, was supported and completed by the TAP implementing agency – South African Center on Carbon Capture and Storage (SACCCS) in 2013, and a decision was made by the South Africa Department of Energy (DoE) and the SACCCS Board of Governors to proceed with the preparation and implementation of storage pilot project (PCSP).

Component 2: CO₂ Capture Pilot Plant (CCPP)

The CCPP involves the design, construction, and operation of a CO₂ capture pilot plant to be installed at an existing coal-fired plant. The capture plant will become a CO₂ capture learning facility for industry and academia. Eskom has indicated that they might be interested in hosting the CCPP at one of its coal-fired generating stations. A capacity building and research program associated with the CCPP will not be restricted to just South Africa, but will serve as a hub for capture research across the Southern African region and beyond. Overall, the CCPP development will entail the following eight tasks, the first three of which will be undertaken as part of the World Bank-supported PTA program:

- i. Review of South Africa’s technology options with respect to a CO₂ capture pilot plant;
- ii. Assessment and selection of the most suitable commercial capture technology;
- iii. Cost estimates based on the assessment and selection of a host site (a power plant);
- iv. Project development, including concept design, preliminary costing and scheduling, evaluating plant options, selecting preferred plant and basic design (including civil design);
- v. Project execution, including plant procurement and construction;
- vi. Plant commissioning;
- vii. Operation and testing, including running a capture research program; and
- viii. Plant decommissioning.

The first three tasks will be supported through the WB executed activities under the PTA. Tasks (iii) through (viii) will be supported by the recipient executed TAP scheduled to be completed between 2015 and 2019. As with the PCSP, the CCPP includes comprehensive reviews to be conducted at the

end of each task to inform decision-making to proceed to the next task, ensuring that the basis for continuing with project implementation is justified.

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

Both components of the TAP have environment and social risks that might require addressing their mitigation. Technically, large CCS projects run the risk of having significant environment and social impacts due to injection of CO₂ into deep, permeable geologic formations. If the operation is not planned properly, potential adverse events could include leakage of CO₂ through the impermeable confining stratum (caprock); release of CO₂ via injection wells; induced seismicity; degradation of water quality in shallow aquifers (as a result of drilling exploration and injection wells, or due to leaking CO₂); and changes in soil chemistry and micro biota caused by leaking CO₂. Managing the risks of these impacts depends on proper selection of an injection site based on extensive geological data, application of good industrial standards in the design and installation of wells and tanks, and implementation of adequate monitoring systems and procedures. As part of the selection process for the proposed PCSP, sites will be pre-evaluated using a number of specific criteria including the identified potential environmental and social impacts. Presently available information indicates that the magnitude of these impacts will not be significant. For example, because of the pilot nature of the project, local seismic events that might occur when fluids are injected underground (similar to geothermal projects) will likely be small or negligible. Workplace and community health and safety risks from a sudden CO₂ release—either from the well or a ruptured storage tank—are not expected to be an important issue, either, since any release would involve a relatively small amount of gas, and it would be into an open rather than into a confined space. Therefore, the gas quickly would disperse in the atmosphere. Other impacts, not unique to CO₂ injection, that will need to be managed are those associated with exploration (temporary access roads and well drilling); with the construction of facilities (permanent access road and storage, compression, and injection equipment); and with transport of CO₂ to the site by truck. CO₂ injection is not specifically covered under South African environmental law, but a preliminary interpretation suggests that the project will require a waste management license from the Department of Environmental Affairs, which in turn will require preparation of an ESIA. Concomitantly, an ESIA will be conducted, and will include an analysis of alternative project locations before a selection is finalized or project activities on the ground are initiated. The support to the environmental regulatory and permitting aspects of PCSP will be provided through both the WB executed activities and TAP under the PTA.

The specific locations for seismic testing and exploratory drilling have not been identified or selected, meaning that the site of the injection well is not yet known. However, two general geographical areas have been pre-identified as potential locations: the Algoa and Zululand Basins. The Algoa Basin is sparsely populated, and the Zululand Basin has extensive wetlands. Both locations are home to several parks and reserves. However, the SACCCS and DoE made it clear that a selected location will not be within the boundaries of national parks and reserves. It is likely that some natural habitat will be affected by exploration, construction, and operations associated with the PCSP, while other critical natural habitat will need to be avoided. Activities under the project that could have adverse environmental impacts include a seismic survey and drilling of test wells in both target basins to evaluate the feasibility of CO₂ injection and storage. Basin exploration, site characterization, and PCSP operation activities are all routine practices in the oil and gas industry and will be executed in accordance with existing international health, safety, and environmental guidelines.

Furthermore, environmental and social risks will be mitigated through a site-specific environment and social management plan (ESMP), which will be legally binding for the recipient and all project

contractors. The SACCCS is in the process of producing this ESMP, an environmental management plan for the basin exploration and site characterization stages, and similar plans for the operation, closure, and post-closure stages. In order to further limit environmental and social risks (including the risk of CO₂ leakage), a comprehensive plan will be developed to ensure that all risks have been fully considered and that processes are in place to limit and remediate any impacts should they occur. Obtaining public acceptance of and support for the project will also be of primary importance. The SACCCS is committed to working with the national public and local communities to address any concerns, and has developed national and local stakeholder engagement plans that have already been initiated.

For Component 1, the PCSP, overall environmental and social impact risks have been rated “Substantial.” Similarly, the “Substantial” rating has been assigned for the overall project preparation risk, while a “High” risk rating is proposed for overall implementation.

For Component 2, the CCPP, the environment and social risks are considered relatively low. This is due to the fact that the CCPP will most likely be hosted at an existing industrial facility away from communities and sensitive environments, and will involve chemical capture processes widely used in the production of liquid fuels from coal, as well as in the petrochemical industry in South Africa. Mitigation measures for environmental impacts from these similar chemical industry operations are well determined under the current South Africa’s environmental regulations and, thus, would be relatively easy to implement.

E. Borrowers Institutional Capacity for Safeguard Policies

The proposed implementing agency is the SACCCS, a division of South Africa National Energy Development Institute, which the legal entity responsible for the preparation and implementation of the TAP. The SACCCS is funded and guided by its core members and participants as well as its parent organization, the South African DoE. The SACCCS will be responsible for the overall planning and implementation of the pilot project. The SACCCS team will include environment and social experts to guide preparation of a comprehensive assessment of risks and impacts associated with the pilot project, including stakeholder engagement. The SACCCS has never been an implementing agency for World Bank-financed projects. Thus, an assessment of its environment and social management capacity will be undertaken as part of the ESIA. Based on the results of this assessment, an action plan will be developed and training offered as part of project implementation to strengthen the SACCCS’ capacity to manage environmental and social risks. In order to understand and mitigate any potential CCPP project impact risks, an ESIA and ESMP will be developed to cover preparation of plant design and its subsequent operation.

The team proposes assigning the TAP to Environment Category A, which has a policy on environmental assessment and natural habitat that will trigger the requirement of a comprehensive ESIA.

F. Environmental and Social Safeguards Specialists on the Team

Helen Z. Shahriari (GSU07)

Paula F. Lytle (GSU07)

Sanjay Srivastava (GEN01)

Thomas E. Walton (GENDR)

II. SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment	Yes	The PCSP (Component 1) that includes pilot testing

OP/BP 4.01		could cause significant environment and social impacts due to injection of CO2 into deep, permeable geologic formations. An ESIA will analyze the risks and impacts associated with leakage of CO2 through the impermeable confining stratum (caprock); release of CO2 via the injection well; induced seismicity; degradation of water quality in shallow aquifers as a result of drilling exploration and injection wells, or due to leaking CO2; and changes in soil chemistry and micro biota caused by leaking CO2.
Natural Habitats OP/BP 4.04	Yes	The ESIA will assess possible direct or indirect impacts on any critical or natural habitats.
Forests OP/BP 4.36	No	There is no possibility of the presence of or impacts on forest resources, as these will be avoided.
Pest Management OP 4.09	No	There is no possibility of involvement of pesticides.
Physical Cultural Resources OP/BP 4.11	No	There is no possibility of the presence of or impacts on physical cultural resources, as these will be avoided.
Indigenous Peoples OP/BP 4.10	No	There is no possibility of the presence of or impacts on indigenous communities.
Involuntary Resettlement OP/ BP 4.12	No	The project is unlikely to involve any involuntary resettlement, as such potential locations would be avoided.
Safety of Dams OP/BP 4.37	No	
Projects on International Waterways OP/BP 7.50	No	
Projects in Disputed Areas OP/ BP 7.60	No	

III. SAFEGUARD PREPARATION PLAN

A. Tentative target date for preparing the PAD Stage ISDS: 30-Jun-2015

B. Time frame for launching and completing the safeguard-related studies that may be needed.

The specific studies and their timing¹ should be specified in the PAD-stage ISDS:

The ESIA for the TAP two proposed components is under preparation by the SACCCS, and will be ready for public consultation around June 2015.

IV. APPROVALS

Task Team Leader(s):	Name: Nataliya Kulichenko	
Approved By:		
Safeguards Advisor:	Name: Nathalie S. Munzberg (SA)	Date: 22-Jul-2016
Practice Manager/ Manager:	Name: Sameer Shukla (PMGR)	Date: 22-Jul-2016

¹ Reminder: The Bank's Disclosure Policy requires that safeguard-related documents be disclosed before appraisal (i) at the InfoShop and (ii) in country, at publicly accessible locations and in a form and language that are accessible to potentially affected persons.