

Environmental Monitoring Report

Semi-Annual Report
For the period covered July–December 2020
Project Number: 45366-004
October 2021

Uzbekistan: Solid Waste Management Improvement Project

Prepared by the State Unitary Enterprise “Maxsustrans” for Tashkent Municipality, State Committee of the Republic of Uzbekistan of Ecology and Environmental Protection and the Asian Development Bank.

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Solid Waste Management Improvement Project

ADB Loan No.: 3067-UZB

**PROJECT MANAGEMENT, IMPLEMENTATION AND
SUPERVISION CONSULTANCY SERVICES**

Contract No.: SUE/Maxsustrans/QCBS-Cons_1-2016-01



Semi-Annual Environmental Monitoring Report

Reporting Period: July – December 2020

CLIENT – IMPLEMENTING AGENCY

State Unitary Enterprise (SUE) “MAXSUSTRANS” (Uzbekistan)

PIU SUPPORT CONSULTANT

Infratech Consulting SDN Ltd. (Uzbekistan)



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ABBREVIATIONS

ADB	Asian Development Bank
BER	Bid Evaluation Report
CDP	Corporate Development Program
CSC	Construction Supervision Consultant
EHS	Environmental Health & Safety
EIA	Environmental Impact Assessment
EIP	Environmental Impact Permit
EMP	Environmental Management Plan
GoU	Government of Uzbekistan
GRM	Grievance Redress Mechanism
IEE	Initial Environmental Examination
LARP	Land Acquisition and Resettlement Plan
Maxsustrans	State Unitary Enterprise “Maxsustrans”
MSW	Municipal Solid Waste
PIU	Project Implementation Unit
SCEEP	State Committee of the Republic of Uzbekistan of Ecology and Environment Protection
SLF	Sanitary Landfill Facility
SPS	Safeguard Policy Statement
SSEMP	Site-specific Environmental Management Plan
SWM	Solid Waste Management
SWMIP	Solid Waste Management Improvement Project

1 PREAMBLE

1.1 General

1. As per the Loan and Project Agreements for the L3067-UZB: Solid Waste Management Improvement Project (SWMIP), State Unitary Enterprise “MAXSUSTRANS” and Project Implementation Unit (PIU) is bound to ensure that (i) the project is constructed and operated in accordance with the national and local environmental regulations and guidelines, ADB's Environment Policy (2002) and the initial environmental examination (IEE) report; (ii) any adverse environmental impacts arising from the construction and operation of the project facilities are minimized by implementing the mitigation measures. Environmental monitoring program and other recommendations presented in the IEE report; and (iii) the implementation of the Environmental Management Plan (EMP) and violations of safety or environmental standards, if any, be regularly reported to ADB.

2. This report is the 10-th environmental monitoring report (EMR) for the project and covers July – December 2020 reporting period. This Environmental Monitoring Report describes the implementation of the environmental monitoring and mitigation measures recommended in the IEE reports, analyzes environmental data collected from the projects during the period of July – December 2020, and provides recommendations for the resolution of identified issues.

3. To be more specific, this EMR covers the following areas: (i) documentation review and compliance assessment with the applicable environmental regulations, (ii) environmental management institutional structure and responsibilities, (iii) mitigation measures undertaken to minimize adverse environmental impacts arising from the construction, (iv) environmental monitoring results and analyses, and (v) conclusions and recommendations.

4. The Government of Uzbekistan (GoU) took tough measures against COVID-19 and has taken all necessary preventive measures to prevent the spread of coronavirus infection from March 2020. In particular, all transport communication has been limited. Tashkent went into quarantine mode, and most organizations and institutions were transferred to remote work.

5. The project includes a dynamic Sanitary Landfill Facility (SLF) development concept approach. This utilizes the planned SLF as an immediate and effective solution for Tashkent's waste disposal challenges, with the potential to progressively expand the facility to become a disposal solution that can serve the Tashkent region over the long term.

6. In addition, the project finances:

- ❖ procurement of garbage trucks for collection and transportation household solid waste;
- ❖ procurement of equipment and machinery for the sanitary landfill;
- ❖ procurement of waste bins for waste collection points and containers for transportation of solid waste;
- ❖ revamping of two transfer stations in the city of Tashkent;
- ❖ reconstruction of two garages of Maxsustrans;
- ❖ construction of new landfill.

7. Collection points are equipped with functional and suitably sized waste bins, with provision for recyclable materials to be segregated and collected. Outdated collection vehicle fleets will be replaced with appropriately sized and highly efficient collection vehicles, dramatically reducing operation and maintenance costs. Transfer stations will be equipped with improved infrastructure and electromechanical components, and the transfer trucks to the landfill will be replaced by new ones. With these activities an improvement of the environmental impact should be also expected.

1.2 Headline Information

8. The GoU has applied for a loan from the Asian Development Bank (ADB) for the development and improvement of Solid Waste Management (SWM) system of the capital city (Tashkent). The loan reference number is L3067-UZB: Solid Waste Management Improvement Project (SWMIP). The loan was signed between the Republic of Uzbekistan and ADB dated 27 February 2014 and Project Agreement dated 12 March 2014 signed between ADB, Tashkent City Municipality and the State Unitary Enterprise “MAXSUSTRANS”.

9. The project was prepared to impact an improved urban environment and quality of life for the residents of Tashkent. The project will develop a sanitary landfill that meets international standards, rehabilitate transfer stations, and modernize the waste collection and transfer fleet. It will build capacity in waste management and help formulate a national strategy on SWM.

10. The GoU seriously recognizes the need to develop and implement a national SWM strategy. The Project will contribute to sustainable urban development in Uzbekistan by: (i) modernizing SWM to provide continuous and reliable municipal services; (ii) promoting financial sustainability of municipal services through tariff rationalization and prudent financial management; (iii) supporting policy and institutional reforms for improved sanitation and environmental management; (iv) mitigating climate change through a major reduction of Green House Gas emissions, and through compliance with international standards on waste minimization and material recycling; and through all these measures; (v) improving livability of cities.

11. The volume of the existing dumpsite is exhausted and the original plan of the city was to extend its dumpsite operations to an adjacent lot of additional 30 hectares (ha) of area. Being fully aware of the inevitable environmental impacts through the extension of this practice, the city asked the national government for assistance in this matter. Based on these activities, the Cabinet of Ministers approved in summer 2012 the location of new dumpsite on 30 ha of agricultural area for the utilization for waste management activities.

12. The GoU has already allocated a 30-ha land plot immediately to the south of the existing Akhangaran dumpsite (25 ha for landfill and 5 ha for facilities), to develop this facility to a SLF, designed to internationally accepted standards of environmental protection. A conceptual design has been completed for the interim 25-ha facility, which is naturally included as a component of the Project.

2 PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

13. The overall objective is to provide an improved SWM system in Tashkent, the capital city, to upgrade urban infrastructure and services. The project will develop a sanitary landfill that meets international standards, rehabilitate transfer stations, and modernize the waste collection and transfer fleet. It will build capacity in waste management and help formulate a national strategy on SWM.

14. Given the current SWM practices, the option converting and allocating an area adjacent to the existing dumpsite to an engineered Sanitary Landfill was decided. The proposed SLF concept will be based on the Best Environmental Practices (BEP) resulting to a *state-of-the-art* design consistent with international acceptable standards. This “stand alone” facility will drastically improve the SWM system (i.e. the handling and final disposal of MSW) with a possible integration capability for a long-solution to cover the entire Tashkent Oblast. The inclusion into the design of a multi-barrier system, leachate and gas collection systems will result in a significant reduction of anticipated impacts. The Project is to contribute to the following issues:

- Segregation of municipal solid waste stream;
- Proper collection and dumping to appropriate sites;
- Establishment of modern SWM systems;
- Remediation of old 'truck and dump' practices in cities and regions

15. The GoU through its Implementing Agency, the State Unitary Enterprise (SUE) “MAXSUSTRANS” utilizes part of this loan proceeds towards the cost of the contract for Consulting Services related to Project Management, Implementation and Supervision, supporting the Project Implementation Unit (PIU).

16. ADB approved the project on 27 November 2013 with a loan amount of \$69 million from its ordinary capital resources. The total project cost is \$76.3 million equivalent, inclusive of taxes and duties, and financial charges during implementation. The Loan and Project Agreements were signed on 27 February 2014. The loan became effective on 29 December 2014. The project is designed for five years of implementation with a loan closing date of 30 June 2019. On 17 December 2018, ADB approved a two-year loan extension with the revised Loan Closing Date of 30 June 2021 to complete all ongoing contracts and planned civil works, delayed due to start-up delays (including 10 months’ delay in effectiveness) and procurement delays (the first contract was awarded in 2016 only) because of the executing agency’s insufficient capacity and government’s prolonged contract registration process.

17. The project impact is improved urban environment and quality of life for the residents of Tashkent. The expected outcome is improved SWM services and management in Tashkent. The project has three outputs: **output 1** - rehabilitated and expanded SWM system in Tashkent; **output 2** - strengthened operational capacity; and **output 3** - national SWM strategy. Tashkent Municipality is the executing agency for the outputs 1&2, with State Committee of the Republic of Uzbekistan of Ecology and Environment Protection (SCEEP) being the executing agency for output 3. Maxsustrans is the implementing agency responsible for the day-to-day project implementation.

18. According to the Loan Agreement dated on 27 February 2014, the Project shall comprise:

Part A – National Municipal Solid Waste Strategy

- (a) preparation of a draft national strategy for the management of solid waste, including a draft sector investment program;

Part B – Solid Waste Management in Tashkent Municipality

- (b) construction and rehabilitation of municipal solid waste collection facilities;
- (c) procurement of municipal solid waste collection bins;
- (d) procurement of municipal solid waste collection vehicles and municipal solid waste transfer vehicles;
- (e) rehabilitation of municipal solid waste transfer stations and possible closure of an existing municipal solid waste transfer station;
- (f) design and construction of a new sanitary landfill, solid waste facility and closure of an existing landfill solid waste dumpsite;
- (g) capacity development support for Maxsustrans, including in the areas of operation and management and Project implementation; and
- (h) development and implementation of a waste minimization and recycling program and a parallel media and public awareness campaign about waste minimization and recycling.

19. However, «construction and rehabilitation of municipal solid waste collection facilities» was financed by Maxsustrans own funds. In addition, «closure of an existing landfill solid waste dumpsite» will be financed by Sejin G&E Co. Ltd. Company (Republic of Korea) (See explanation below). Therefore these components are no longer part of the Project according to the Decree of the Cabinet of Ministers of the Republic of Uzbekistan № 895 dated 1 November 2018 on measures to implement the investment project "Electricity generation through conversion of landfill gas formed at landfills "Akhangaran" and "MaydontoI" of Tashkent region". (Some information about this scope is provided in Annex 2.)

20. In order to improve the environmental situation in Tashkent city and Tashkent region, improve the living standards and quality of life of the population, reduce the negative impact of waste on the environment and public health, introduce modern innovative solutions and technologies in the field of waste management, as well as create new jobs, the Decree of the Cabinet of Ministers of the Republic of Uzbekistan № 895 dated 1 November 2018 on measures to implement the investment project "Electricity generation through conversion of landfill gas formed at landfills "Akhangaran" and "MaydontoI" of Tashkent region" was issued.

21. Before the GOU Decree on 14 September 2018, Investment Agreement has been signed between the GOU and Sejin G&E Co. Ltd. Company (Republic of Korea), which taken the following the obligations:

- to establish a foreign enterprise in the territory of Tashkent region in the form of a limited liability company with 100% foreign capital (hereinafter referred to as the foreign enterprise);
- to attract direct investments for construction, installation and commissioning in the estimated amount of \$55.0 million during 2018-2020;
- to install 12 units of new modern gas turbine generators and auxiliary equipment generating electricity from landfill gas (methane) formed at the landfills "Akhangaran" (Akhangaran district) and "MaidontoI" (Parkent district) of Tashkent region. The total production capacity of at least 16 MW/h, of which 10 units with the capacity per each 1.560 kW/h for Akhangaran landfill and 2 units with the capacity per each 500 kW/h for MaydontoI landfill.

2.2. Project Site Description

22. The Akhangaran landfill is located approximately 30-35 km south of the center of Tashkent City in the Akhangaran district of Tashkent Province. The facility has been in use since 1967 and is currently handling the wastes collected from Tashkent city and partial from Chirchik.



Figure 1. Location map of Akhangaran landfill

23. According to the detailed design of the project, 30.91-ha land plot located directly to the South of the existing Akhangaran dumpsite are required for the project. The following facilities shall be located in this new area:

- The landfill area is about 26.51 ha (including roads);
- Regulation pound - 0.7 ha;
- Check point - 0.76 ha;
- Other facilities (including water sump) 2.94 ha.

24. The landfill capacity is 7.66 million m³ in total, the expected service period is 12.1 years.¹

¹ This time period was taken from design documents of CUCD's Design Consultants (source: Instruction Manual for Construction of New Landfill). The designed period of service life of SLF is 12Y (See para. 27). The Project's IEE ([Solid Waste Management Investment Program | Asian Development Bank \(adb.org\)](#)) states that "The conceptualized sanitary landfill shall bear a maximum height of about 25m waste would have a volume of about 2,600,000 m³ or about 3,640,000 tons capacity and would last for about 5 to 7 years for Tashkent city only. The figure in the succeeding shows the proposed sanitary landfill. (Chapter 3.6.1.1)"

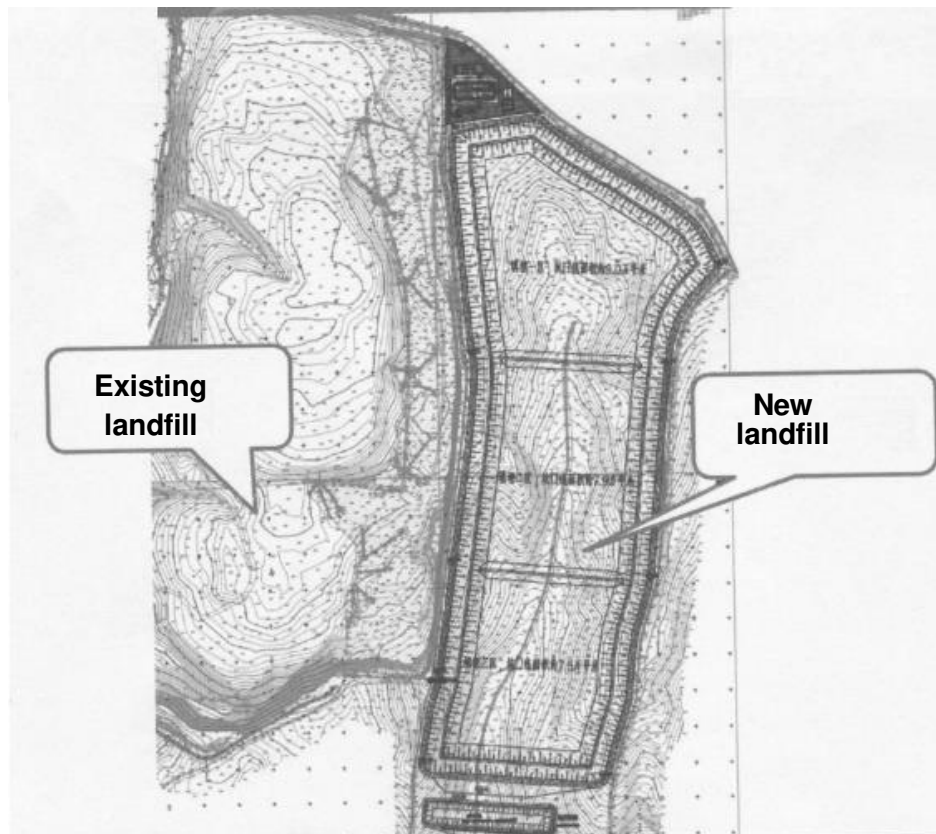


Figure 2. Designed new landfill site

25. **Access to the site:** The detailed design developed for the project showed that the new landfill will use the existing access road and require the construction of additional access road to the new site. This is visualized below on given image (see Figure 3).



Figure 3. Access road to new landfill site

26. According to the Decree No.3861 dated 15 June 2019 of the Khokim of Akhangaran District, one ha of land was allocated to Sejin G&E Co., Ltd for installation of new modern gas turbine generators and auxiliary equipment generating electricity from landfill gas (methane) formed at the "Akhangaran" domestic waste dump (Akhangaran District). This Decree was signed for implementation of the Investment agreement between the GOU represented by the State Committee on Investments and "Sejin G&E Co., Ltd" company (Republic of Korea) dated 14 September 2018 on implementation of investment project "Electricity production through conversion of landfill gas generated at "Akhangaran" and "Maidontol" landfills of Tashkent region".

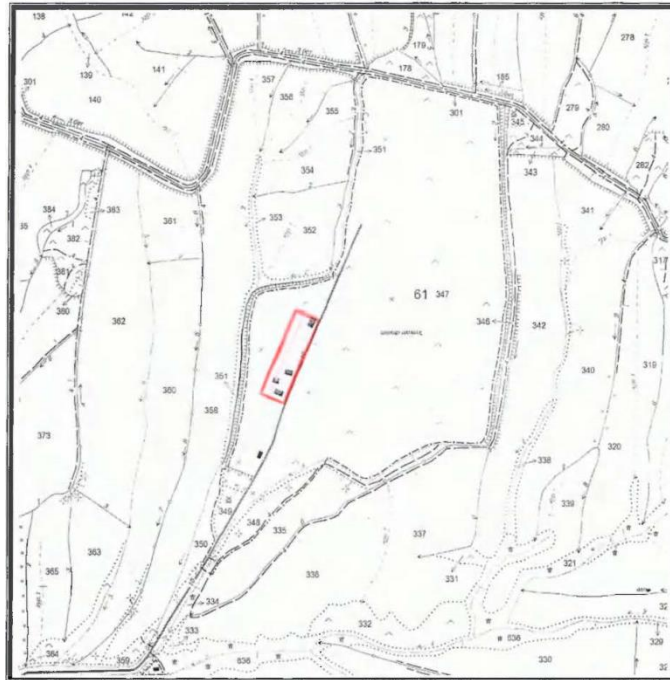


Figure 4. 1 ha allocated to Sejin G&E Co., Ltd

27. In 2019 the detailed design of the project was prepared by CUCD and finally approved in October 2019. As the results of Due Diligence conducted and cleared by ADB in October 2019 there are no involuntary land acquisition and resettlement impacts within the project. The project is at the pre-construction stage. Due to significant change in the scope of work of the package, the executing agency and Maxsustrans have proposed to rebid this package for new landfill construction only. In particular, they intend to remove from this package all works related to dumpsite closure in Akhangaran District, referring to the letter from SCEEP dated 4 November 2020 about on-going implementation of the above-mentioned investment project with "Sejin G&E Co., Ltd" company.

28. According to the mentioned Decree of Hokimiyat², SUE Maxsustrans shall:

- i. obtain the proper documents from local Architectural and Construction authority prior to start any design works for construction or rehabilitation on the new landfill;
- ii. ensure keeping the working conditions of the existing irrigation, melioration and engineering infrastructures located in the neighboring farmer and agricultural areas;
- iii. upon using of this land, do re-cultivation according to Regulation on land reclamation, removal, conservation and rational use of the fertile soil layer³.

² Decree of Hokimiyat of Akhangaran district, Tashkent region #1536 dated 25 August 2018 on allocated 30 ha lands from reserve land fund for project needs. Decree of Hokimiyat of Akhangaran district, Tashkent region #3860 dated 15 June 2019 on allocated 1.2 ha lands from reserve land fund for project needs.

iv. be aware that the allocated land shall be used within three years upon issuing this decree.

29. There was no real project progress during July-December 2020 reporting period, due to quarantine measures COVID-19 which began to weaken only at the end of June 2020.

30. According to the general requirements⁴ for the selection of landfill sites, the response to the site selection of this sanitary landfill is shown in Table 1.

Table 1: Response table of proposed site according to general requirements

No	Requirement	Compliance	Remark
1	The landfill shall be set up in accordance with the overall planning for urban construction, and meet the requirements of overall planning for local urban regional environmental and the requirements of development planning for local urban environmental health;	Accordant	The planning department agreed to use the land for environmental sanitation facility- [New SLF];
2	The landfill shall not affect the surrounding environment or affect the surrounding environment not exceeding current national standards. It is located in the down prevailing wind direction in summer, and is 500m away from the habitat of humans and livestock;	Accordant	There are no industrial enterprises, residential areas, water sources and key scenic spots and historical sites within 500m below and near the maximum frequency wind direction downstream;
3	The requirements for the landfill shall be consistent with the local atmospheric protection, water and soil resources protection, nature protection and ecological balance. The landfill shall be located in area with poor underground water, and shall be kept away from water sources and located in the downstream area of underground water flow direction to the greatest extent;	Accordant	The urban area is located on the side of the maximum frequency wind direction, where the underground water is less.
4	The landfill shall have a corresponding storage capacity. Its service life shall be more than 10 years. In special cases, it shall not be less than 8 years;	Accordant	After calculation, the sanitary landfill can serve for about 12 years ⁵ ;
5	It has convenient transportation, reasonable transportation distance, convenient water supply and power supply conditions;	Accordant	It is about 30km average away from each garbage station in the service area. The water is supplied by drilling wells, and the power supply is convenient;
6	The land acquisition cost is low and the land use value is low.	Accordant	The use value of hilly area and land is low.

31. Thus, it can be seen that the site meets the general requirements for landfills, and has good engineering conditions for water supply, power supply, road traffic and others, so the site is suitable as a construction site.

2.3. Necessity of Project Construction

32. The necessity of the construction of the project is mainly embodied in the following aspects:

- (1) Garbage sanitary landfills are essential as urban environmental infrastructure. If the garbage is piled up disorderly, it is difficult to match the modern city or meet the requirements of sustainable urban development. Harmless disposal of garbage is a civil project to maintain environmental health and ensure people's health.

³ SCEEP, the State Committee on Land Resources, Geodesy, Cartography and the State Cadastre, and the State Inspectorate "Sanoatgeokontekhnazorat" and other authorized bodies, in accordance with their competencies, will have to ensure effective control and monitoring of quality and timeliness of work on the re-cultivation of disturbed lands and restoration of their fertility, removal, conservation and use fertile soil layer.

⁴ Instruction Manual for New construed landfill developed by CUCD

⁵ See footnote 1.

- (2) The population of Tashkent has increased rapidly in recent years, and the daily output of garbage has reached about 1,700 tons. The existing irregular landfills have a long service life, and the storage capacity is tight. Meanwhile, the new regular landfills are about to be built and put into use, so the closure of the old landfills is imminent. This goal will also enable the execution of the President Decree of the Republic of Uzbekistan dated April 17, 2019 No. PP-4291 approving Strategy for Solid Household Waste Management in the Republic of Uzbekistan for the period 2019-2028.
 - (3) Tashkent has rich tourism resources such as natural and human landscapes. Its designated function is a modern ecological city with a good living environment suitable for leisure tourism. Therefore, how to effectively protect the ecological environment will become an important issue in Tashkent.
 - (4) The current domestic garbage disposal facility in Tashkent is an informal landfill in the southeastern of Tashkent. The capacity of the landfill is near saturating and will be closed within the project. The closing of the old dumpsite can guarantee that the domestic garbage generated in Tashkent is harmlessly disposed of basically to reduce its serious pollution to the environment and serious threat to soil and underground water. It is an important livelihood project to protect the landscape of Tashkent, so the project is an important infrastructure for Tashkent, and an indispensable link in the development of Tashkent.
33. In general, the domestic waste treatment facility is a major infrastructure of the city, and the closure of the existing landfill site is related to the ecological environment and sustainable development of Tashkent, as well as the vital interests of the general public. The construction of the project will create the necessary basic conditions for the development of Tashkent, and is of great significance to protect the ecological and tourism environment of the region, perfect the investment environment and improve people's living quality.
34. The construction will be confined to the distinct project site, there will be no temporary disruption of livelihood of any household or group of community in this area during construction period.

2.4. Project Contracts and Management

Summary of civil works contracts and works' progress is summarized in

35. Table 2. All awarded contracts included EMPs cleared by ADB and any conditions of applicable national EIA/IEE clearance.

Table 2: Summary of Civil Works Contracts and works' progress

Contractor	Scope	Contract Signed	Approval Date			Environmental personnel		Civil Works		Progress	
			SSEMP	COVID-19 HSMP	ERP	Environmental officer	Health and safety officer	Start	End	As of 30 June 2020	As of 31 Dec 2020
CW1: <i>To be selected</i>	Establishment of sanitary landfill	(Dec 2021)	-	-	-			(Jan 2022)	(Jun 2023)	-	-
CW2: JV of Future Growth Ltd., VBN Engineering Ltd and Eastern construction Ltd. (Uzbekistan)	Transfer station rehabilitation	12 Apr 2021	-	-	-	Mr. Nozimhon Saydullayev	Mr. Xasan Bashirov	15 Apr 2021	(14 Apr 2022)	-	-
CW3: <i>Cancelled</i>	Dumpsite closure ⁶										
CW4: Indigo Baraka Servis LLC (Uzbekistan)	Garage rehabilitation	7 Dec 2020	21 Dec 2020	21 Dec 2020	Jan 2021	Mr. Khabibulla Mukhtarov	Mr. Rakhmatilla Normatov	16 Dec 2020	15 Aug 2021	0 %	5%
CW5: Various local contractors	Construction and rehabilitation of municipal solid waste collection facilities ⁷	Various contracts				n/a	n/a	Various dates	Various dates	100 %	100 %

Note: The Month/Years in brackets are planned schedule.

COVID-19 HSMP = COVID-19 Health and Safety Management Plan, ERP = Emergency Response Plan, SSEMP = site-specific environmental management plan

⁶ Upon decision of the Government of Uzbekistan this Works contract was removed from ADB Project and implemented by other investment project managed by SCEEP/MIFT.

⁷ Financed by Maxsustrans own funds and removed from ADB Project

36. The project is being administered by the Project Implementation Unit (PIU), which is currently represented by the Head of PIU (Mr. Jasur Hamidov).
37. PIU has received an official letter from H.P. Gauff Ingenieure GmbH & Co. KG. dated 24 July 2020 about order of the local court of Nuremberg on opening of insolvency proceedings according to German Law regarding H.P. Gauff Ingenieure GmbH & Co. KG. PIU has also received an official letter from H.P. Gauff Ingenieure GmbH & Co. KG. dated 17 September 2020 about declaration of non-entry of the company in the contract No. SUE/Maxsustrans/QCBS-Cons 1-2016-01.
38. Considering the necessity to continue the PIU Consultant services in order to ensure uninterrupted implementation of the Project, the obligations under the Contract No. SUE/Maxsustrans/QCBS-Cons 1-2016-01 is assigned to the local partner of the Joint Venture - Infratech Consulting SDN Ltd. (Uzbekistan). Maxsustrans has signed Amendment No. 5 to the a.m. contract on 9 December 2020 with extension of the Consultant's service until 30 June 2021.
39. The full responsibility of the Consultant to perform this Contract against the Client is handed over to Infratech Consulting SDN Ltd. Mr. Dilshod Mavlyan-Kariev, K-4 national SWM Specialist (Deputy Team Leader) is in charge in the overall project administration and reporting for the Project.
40. PIU Consultants has National Environmental Expert – Mr. Sergey Karandayev, who implements environmental safeguards services. He is personnel in charge of environmental affairs. He is responsible for arranging on-field monitoring activities, providing inputs to this semi-annual monitoring reports and making sure the protection measures are implemented accordingly.
41. SUE Maxsustrans has recruited "China Urban Construction Design & Research Institute Co., Ltd." (CUCD) for Sanitary Landfill Design and Construction Supervision services. The design services of CUCD started in December 2018 and completed in October 2019. Based on design documents elaborated separately for sanitary landfill and dumpsite closure works, Maxsustrans has prepared the bidding documents and conducted the first bidding for the Works package CW1 – Establishment of Sanitary Landfill and Dumpsite Closure. The construction supervision services of CUCD are not started yet, because up to date Maxsustrans did not select the Contractor under package CW1. The service period of CUCD ended by 7 December 2020, and prolongation until 30 June 2021 (ADB Loan Closing Date) is currently considered by amendment to the Contract. To be noted that during construction period CUCD Consultants will serve as the "Engineer" with responsibility for design compliance and construction supervision. Originally, the supervision task was estimated for 18 months.
42. Engineer started with the work according to the ToR of CUCD since 14 December 2018. CUCD has already completed the design works of closure of old dumpsite and establishment of new sanitary landfill in Akhangaran district. During the construction works they will supervise all construction works to be performed under package CW1 – Landfill Construction.
43. According to Terms of Reference, Task 3 – Safeguard Management and Administration CUCD Consultants should conduct Environmental Impact Assessment (EIA) related to the proposed project - sanitary landfill and dumpsite closure designs and submit this for review and approval by SCEEP and obtain a positive conclusion. Referring to the Project's Initial Environmental Examination from May 2013 (page 7 and page 8, Figure 1 – Uzbekistan National EIA Process) and national legislation on environmental protection, for proposed projects, EIA documentation shall include a declaration on environmental impacts / consequences. Declaration on environmental impacts (Russian abbreviation "ZVOS") shall be prepared after design of the proposed project and Declaration on environmental consequences (Russian abbreviation "ZEP") shall be prepared before construction works. Commencement of the construction works under the Works package CW1-R is scheduled by

January 2022, so preparation of the EIA will be requested from CUCD Consultants during the 4th Quarter of 2021 – after prolongation of CUCD’s contract for works supervision phase.

44. Due to the pending tender for the selection of the contractor for the construction of the landfill (package CW1), the civil works could not be commenced during the reporting period. Up to date, no decision has been taken regarding contract award under this package CW1.

45. Main organizations involved in the project and related to environmental safeguards are presented in Table 3:

Table 3: List of organizations involved in environmental management under the Project

Organization	Name of main staff and Environmental Specialist	Contact data (including phone and web-site) and address of the organization	Employer	Commence-ment of Services	Completion of Services
PIU Support Consultant – Infratech Consulting SDN Ltd.”	Mr. Dilshod Mavlyan-Kariev, Deputy Team Leader Mr. Sergey Karandaev, Environmental Specialist	dilshod75@mail.ru infratech_consulting@asia.com +998712563901	SUE Maxsutrans	01.08.2017	30.06.2021 Extension of Service period for 30 months until 31.12.2023 is under discussion
Sanitary Landfill Design and Supervision Consultant –China Urban Construction Design & Research Institute Co., Ltd.”	Mrs. Yuwei Xue, Authorized representative Mr. Mingtao Nie Environmental Specialist	icc@cucd.cn +861 057365133	SUE Maxsutrans	08.12.2018	07.12.2020 Extension of Service period until 30.09.2023 is under discussion

46. The role of each agency in the project is presented in Table 4.

Table 4: Role of Agencies towards EMP Implementation

Agency	Role
Project Implementation Unit (PIU)	<ul style="list-style-type: none"> • Holds Overall responsibility with regard to EMP Implementation • Reporting to various stakeholders (ADB, Regulatory bodies) on status of EMP Implementation • Coordinating with Environmental Experts (PIU Support Consultant, Contractors and External Monitors) • Responsible for obtaining Regulatory Clearances • Review of the progress made by Contractors • Ensure the BoQ items mentioned in EMP are executed as per contract provision
PIU Support Consultants	<ul style="list-style-type: none"> • Assisting PIU in overall implementation of EMP • Review of periodic reports on EMP implementation and advising PIU in taking corrective measures • Conducting periodic field inspection of EMP implementation • Assisting PIU and reporting to various stakeholders (ADB, Regulatory bodies) on status of EMP implementation • Conduct environmental training for field officers and engineers of contractor
Engineer	<ul style="list-style-type: none"> • Supervise the implementation of the environmental protection and impact mitigating measures by the contractors • Supervise construction activities to ensure minimum impact on the natural and socioeconomic environment, • Regularly monitoring the performance of the Contractor(s) environment staff, verifying monitoring methodologies and results; • Review of the construction design to ensure compliance with project engineering design and the EMP with regard to environmental protection and impact mitigation; • Prepare the necessary remedial actions for any unforeseen impacts • Instructing the Contractor(s) to take corrective actions within timeframe as determined by the Environmental Specialist of CSC

Agency	Role
Contractor	<ul style="list-style-type: none"> • Address complaint related with environmental aspect of the project through GRM • Responsible for ensuring the implementation of EMP as per provision in the document • Discussing various environmental / social issues and environmental / social mitigation, enhancement and monitoring actions with all concerned directly or indirectly • To ensure environmentally sound and safe construction practices • Conducting periodic environmental and safety training for contractor's engineer, supervisors and workers • Sensitization on social issues that may be arising during the construction stage of the project • Conduct environmental monitoring and control activities including pollution monitoring, safety; and • Preparing and submitting monthly reports to PIU on status of implementation of safeguard measures • During the Covid-19 pandemic, the contractor will ensure necessary protection to the deployed WORK FORCE and minimize the risk of spread of infection.

47. The working environment among SWMIP and Engineer has remained sound during this reporting period. Depending on the Corona Pandemic regular meetings couldn't be held between PIU, Maxsustrans and Engineer. Currently the movement is not possible. Also, the contract final service date for Sanitary Landfill Design and Supervision Consultant was 07.12.2020. Extension of the service period is under discussion and additional agreement has not been signed during this reporting period.

48. Control over execution of the Decree of the Cabinet of Ministers of the Republic of Uzbekistan № 895 dated November 1, 2018 was assigned to the First Deputy Prime Minister of the Republic of Uzbekistan - Chairman of the Board of "Uzbekistontemiryo'llari" JSC A.J. Ramatov, Deputy Prime Minister of the Republic of Uzbekistan - Chairman of the State Committee of the Republic of Uzbekistan on investments S.R. Kholmuradov and Chairman of the State Committee of the Republic of Uzbekistan on ecology and environment protection B.T. Kuchkarov. The overall responsibility for EMP implementation and compliance with Investment Agreement lies with the Executing Agency, which is SCEEP, responsible for general project implementation. Thus, SCEEP fulfills all responsibilities for environmental monitoring of this component. However, PIU Consultant will continue to carry out environmental monitoring of this component.

2.5. Project Activities During Current Reporting Period

49. The civil works for collection points rehabilitation and construction had been completed using Maxsustrans own funds. During 2013-2017, SUE Maxsustrans independently built 150 units of new waste collection points (WCPs) and reconstructed more than 300 units of existing WCPs at the expense of Ipoteka Bank credit funds in the amount of 4.5 billion sum. All works at the expense of the Ipoteka Bank loan has been completed. In 2018, at the expense of SUE Maxsustrans' own funds, another 50 WCPs were built. ADB funds of \$3.124 million for these purposes were saved and in August 2019 were reallocated to other project components in agreement with the Ministry of Finance and ADB.

50. The status of three civil works packages of the Project is as follows: (i) package CW1 - Sanitary landfill and dumpsite closure (estimated cost \$23.5 million), bid was cancelled by decision of Tashkent City's Tender Commission, contract award is still pending; (ii) package CW2 - Transfer station rehabilitation (estimated cost \$7.0 million), Contract award was approved by ADB on 25 March 2021, the contract SUE/ Maxsustrans/ICB/W2 was signed with the Contractor (JV of Future Growth Ltd., VBN Engineering Ltd and Eastern construction Ltd., Uzbekistan) on 12 April 2021; and (iii) package CW4 - Garage rehabilitation, Contract № 15/02-20 was signed with Indigo Baraka Servis LLC (Uzbekistan) on December 7, 2020, the works commencement date – December 16, 2020. The civil works are going on in both garages of Maxsustrans: Mirabad and Bektemir district.

51. Work schedule within Contract No. 15/02-20 - Garage rehabilitation is provided as follows:

No	Name of works	Works start date	Works finish date
1	Territory preparation	16.12.2020	20.12.2020
2	Civil works	18.12.2020	20.04.2021
3	Finishing works	10.03.2021	20.06.2021
4	Electric installation work	10.04.2021	01.06.2021
5	Plumbing work	10.04.2021	10.05.2021
6	Special works, etc.	10.04.2021	01.06.2021
7	Landscaping	21.06.2021	30.07.2021

Table 5: Overview on project costs

Source of Financing	Total (million USD)	%
Asian Development Bank Financing		
Loan 3067-UZB (Ordinary Capital Resources)	69.00	90.79%
Governmental Financing		
Government of Uzbekistan (GoU)	7.00	9.21%
Total	76.00	100%

52. Since the beginning of the assignment the PIU Consultant has arranged the following procurement packages of the Project:

Table 6: Ongoing Contracts of the Project No. L3067 - UZB

Subproject/Contract No.	Category (works, goods or services)	Contract Amount (\$ equiv.)	Contract Completion
Capacity Development Program Consultant	Consultant services	1,377,600.00	31-Dec-19
Sanitary Landfill Design & Supervision Consultants	Consultant services	2,028,425.00	30-Jun-21
Financial Audit FY 2018 - FY 2021	Consultant services	32,000.00	30-Jun-21
Transfer Station Rehabilitation Design and Supervision Consultant	Consultant services	81,600.00	30-Jun-21
Garage Rehabilitation Design and Supervision Consultant	Consultant services	97,600.00	30-Jun-21
Supply of 59 Units of Waste Collection Trucks	Goods	4,189,000.00	31-Dec-20
Sanitary Landfill & Machinery Lot 1: Crawler Excavator, Bulldozer, Wheel Loader	Goods	1,977,422.00	31-Mar-21
Sanitary Landfill & Machinery Lot 2: Landfill Waste Compactor	Goods	1,582,934.00	30-Apr-21
CW4: Garage Rehabilitation	Civil Works	957,284.94	30-Jun-21

53. Measures taken by Sejin G&E Co., Ltd. under the investment project "Electricity generation through processing of waste gases generated at Akhangaran and Maidontol landfills in Tashkent region" are:

- By the Decree No.3861 dated 15.06.2019 Khokim of Akhangaran district allocated 1 ha of land with the right of permanent use for the construction of administration building and installation of equipment in the territory of Akhangaran dumpsite.
- Architectural-planning order (No. 1 and No. 2) was received from the Main Construction Department of Tashkent region.
- Design and cost estimate documentation for construction of administration building and electro-technical facility at the landfill in Akhangaran district of Tashkent region" was developed.
- The decision of the working body of the Council of Architecture and Urban Development on the approval of the design and cost estimate documentation "Construction of the design facilities and installation of equipment in the territory of the Akhangaran domestic solid waste landfill" was received from the Council of the Main Department of Construction of the Tashkent region.

- The decision of expertise of construction-estimate documentation, developed by the State unitary enterprise on expertise of town-planning documentation under the Ministry of construction of the Republic of Uzbekistan was received.
- Territorial inspection of construction supervision of the Ministry of Construction of the Republic of Uzbekistan was notified about the beginning of construction and installation works.
- Jointly with JSC "O'ZENERGOINJINIRING", a "Power Delivery Scheme" was developed for the facility "Electricity Production from conversion of landfill gas generated at the landfills "Akhangaran" and "Maidontol" of Tashkent region.
- Technical specifications were received from "Tashkent REN" JSC for power supply to the power grid of DEN "Akhangaran and Maidontol landfills, electricity generation from landfill gases".
- The disposal and reclamation of solid domestic wastes was carried out on the territory of Akhangaran Landfill. In total, 150,000 m³ of soil of 40 cm thick were covered with more than 40 ha, or more than 70% of the landfill area. Preliminary landfill reclamation works were completed at sites 1, 2 and 3 of the existing 4 sites, and the fourth site was left for future waste reception.
- A contract has been signed with O'ZENERGOINJINIRING and design and estimate documentation is being developed for the transmission of electricity generated at the Akhangaran and Maidontol landfills into the power grid.
- An application for the project documentation on the environmental impact (EIA, ECS) is being developed to obtain the decision of the environmental expertise of the State Committee for Ecology.
- Negotiations with the Ministry of Energy of the Republic of Uzbekistan to sign a contract for the sale of electricity.

54. **Project implementation delays.** The current delay relates to the government internal procurement review process, which has negatively affected the project implementation. For CW1, the original schedule for contract award is December 2019, IFB was posted on 15 October 2019 after 3.5 months' delay, on 26 November 2019, bid opening was conducted. Initial bid evaluation was completed by 10 December 2019. However, the bid evaluation report was not reviewed by the Tender Committee of Tashkent Khokimiyat until 17 February 2020 despite ADB's reminders through mission in December 2019, emails, and letters. No decision was made in the meeting because the executing agency did not attend.

55. ADB through letter, emails and video conference (due to travel restriction caused by COVID-19, no mission can be fielded since March 2020) requested government intervention to complete the review and submit Bid Evaluation Report (BER). On 23 May 2020, the Tender Committee was convened however, instead of submitting BER, the executing agency sent a letter requesting rebidding without justifications on 28 May 2020. ADB responded to the executing agency on 19 June 2020 requesting submission of BER to justify the request and extension of bid validity. The BER was submitted on 25 June 2020 which is 7 months after the bid opening. After receiving ADB's comments, the revised BER was submitted on 15 September 2020 proposing to award the contract to the noncompliant bidder. On 30 September 2020, ADB sent objection letter to the revised BER. Maxsustrans advised the Tender Committee reviewing the bid proposals and attempting to justify a request for rebidding called by the first deputy Mayor of Tashkent Municipality.

56. ADB reminded Maxsustrans that significant delays in procurement would cause huge risks on the project completion, Maxsustrans should clarify the procedures and requirements of ADB's Procurement Guidelines to the members of the Tender Committee, and the requirement of compliance with the Procurement Guidelines as agreed in the loan and project agreements between the government of Uzbekistan and ADB. ADB advised Maxsustrans to attend the procurement training organized by ADB and learn the FIDIC conditions which are internationally adopted for the contracts procured through international competitive bidding.

57. The revised BER for package CW1 with the last decision of Tender Commission to conduct the rebidding was sent to ADB at the end of December 2020. Due to significant change in the scope of work of the contract, the executing agency and Maxsustrans would like to rebid this package for new landfill construction only. In particular, they intend to remove from this package all works related to dumpsite closure in Akhangaran District, referring to the recent letter from SCEEP that the old dumpsite is given for implementation of other investment project with the South-Korean company SEJIN.

58. ADB reminded Maxsustrans and PIU that in accordance with paragraph 2.59 of the Procurement Guidelines, the borrower shall award the contract, within the period of the validity of bids, to the bidder who meets the appropriate standards of capability and resources and whose bid has been determined (i) to be substantially responsive to the bidding documents and (ii) to offer the lowest evaluated cost. A bidder shall not be required, as a condition of award, to undertake responsibilities for work not stipulated in the bidding documents or otherwise to modify the bid as originally submitted.

2.6. Issues with waste collection points

59. There were odours associated with the waste collection points. The collection bins were often open, some of the collection points were not well cleaned.

60. New containers were lidded euro containers and large bulky containers to reduce access to feral dogs and to reduce odours and visual nuisance at the collection points.

2.7. Description of benefit of the final Project Design

61. CUCD designed following New Sanitary Landfill with following main data:

- 24,62 ha for the clean storing of solid waste
- Expected lifetime based on current and delivering waste quantities in the future by approximately 12 years.⁸ TOR requested minimum 10 years.
- Optimized liner system to reduce the thickness for more waste space
- Enlargement of the depth
- Using a PS for leachate collection, pump sump below the surface (-20m)
- Max. height by 30 m over ground
- Part of the topsoil and other excavation material will be used for closure of the old landfill
- For emergency cases (fire) in the new Landfill
- Intermediate cover of sections for the new Landfill according to the operational plan

62. These variant gives the best impute for an ecological protection and increasing of the lifetime of the new landfill.

2.8. Description of any Changes to Agreed Construction methods

63. No changes to agreed construction methods took place.

⁸ See footnote 1.

3 COMPLIANCE WITH ADB LOAN COVENANTS

64. Table 7 shows the status of compliance with ADB's loan covenants⁹ relating to environment, health and safety during the monitoring period: June to December 2020.

Table 7. Status of compliance with ADB's Loan Covenants

Covenants	Reference to Loan and Project Agreement	Status of Compliance (as of 31 December 2020)
Conditions for Award of Contract		
6. The Borrower shall ensure that Maxsustrans shall not award any Works contract which involves environmental impacts until: (a) SCNP has issued a statement of ecological expertise; and (b) the Borrower has incorporated the relevant provisions from the EMP into the Works contract.	LA Schedule 4, para 6	To be complied. The EIA of construction of landfill site required by the national regulation will be prepared and approved before its works contract is awarded.
Consulting Services		
The Borrower shall recruit the individual consultants for capacity development in the areas of project management, procurement, safeguards, financial management and monitoring and evaluation in accordance with procedures acceptable to ADB for recruiting individual consultants.	LA Schedule 4, para 10	Complied. In July and August 2015 the Borrower has recruited four individual consultants (two international and two national specialists) for capacity development of the IA and PIU in the areas of project management, procurement, safeguards, financial management and monitoring and evaluation in accordance with procedures of ADB. The individual service contracts were completed in the beginning of 2017, when the PIU Support Consultant has been selected and the Contract Cons_1 was signed.
Implementation Arrangements		
<ul style="list-style-type: none"> On or before the date that is 6 months after the Effective Date {29 December 2014}, the Borrower shall cause Maxsustrans to establish a website for the Project on which key information about the Project will be made available. The Project website will be accessible to the public and will include the following information about the Project: <ol style="list-style-type: none"> Project scope, structure, responsible agencies, impact, outcome and outputs; Status of Project targets; 	LA Schedule 5, para 2	Complied. Project website is www.maxsustrans.uz . Project information is available in Uzbek, Russian and some key information on English as well. c. As of 31 December 2020, the following procurement related information has been posted: <ol style="list-style-type: none"> Contract award announcement: <ul style="list-style-type: none"> SUE/Maxsustrans/NBC-W4 Garage Rehabilitation Bid announcement:

⁹ ADB. Loan Agreement for L3067-UZB: Solid Waste Management Improvement Project (SWMIP). <https://www.adb.org/projects/documents/loan-agreement-solid-waste-management-improvement-project>

Covenants	Reference to Loan and Project Agreement	Status of Compliance (as of 31 December 2020)
<p>c. Procurement and consulting services information, including announcement of bidding processes, bidding procedures, list of participating bidders, names of winning bidders, amount of contract awards and a description of the goods or services procured; and</p> <p>d. All key safeguards related documentation, including the EMP and RP. The Project website will be updated regularly, and its content will be presented in the English, Russian and Uzbek languages.</p>		<ul style="list-style-type: none"> • None <p>d. As of 31 December 2020 the following safeguards related documentation has been uploaded:</p> <ul style="list-style-type: none"> • Semi-annual Environmental Monitoring Plan for January-December 2020 • Semi-annual Social Monitoring Report for January-December 2020
<ul style="list-style-type: none"> • The Borrower shall cause Tashkent Municipality and Maxsustrans to: (i) use their best endeavors to ensure that critical Project staff remain in their position on a full-time basis for a reasonable duration to ensure continuity in the implementation of the Project; and (ii) ensure that all Project Executing and Implementing Agencies are adequately staffed and provided with the necessary financial, technical, and other resources to perform their functions under the Project. 	LA Schedule 5, para 3	<p>Complied.</p> <p>Since 1 August 2018, Mr. Rakhmatilla Karshiev has been appointed as Director and Mr. Sherzod Kattakhodjaev as Deputy Director of Maxsustrans.</p> <p>On 30 June 2020 Mr. Rustam Shukurov, Acting Head of SWMI Project Implementation Unit has retired and since 7 July 2020, Mr. Jasur Khamidov was appointed as Acting Head of SWMI Project Implementation Unit.</p>
Environment		
<ul style="list-style-type: none"> • The Borrower shall cause Maxsustrans to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and the Project Facilities comply with (a) applicable laws and regulations of the Borrower relating to environment, health, and safety; (b) the Environment Safeguards; and (c) all measures, and requirements set forth in the IEE, the EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report. 	LA Schedule 5, para 5	<p>To be complied. Ongoing.</p> <p>Currently two companies are engaged by Maxsustrans, in particular:</p> <ol style="list-style-type: none"> Sanitary Landfill Design and Supervision Consultant (China Urban Construction Design & Research Institute Co., Ltd., China) Transfer Stations Rehabilitation Design and Supervision Consultant (Quality Planning Ltd., Uzbekistan) Garage Rehabilitation Design and Supervision Consultant (Quality Planning Ltd., Uzbekistan) <p>These Consultants have prepared the design documentation in compliance with applicable laws and regulations of Uzbekistan relating to environment, health, and safety; the Environment Safeguards; and all measures, and requirements set forth in the IEE, the EMP. The corrective or preventative actions, if any, are provided in Safeguard Monitoring Reports submitted by PIU Consultants to PIU and Maxsustrans.</p>
Human and Financial Resources to Implement Safeguards Requirements		
<ul style="list-style-type: none"> • The Borrower shall make available or cause Maxsustrans to make available necessary budgetary and human resources to fully implement the EMP and the RP. 	LA Schedule 5, para 9	<p>Complied. Ongoing</p> <p>To implement the EMP and the RP Maxsustrans has recruited:</p> <ol style="list-style-type: none"> Mr. Irakli Kaviladze (Georgia) as International safeguard specialist (contract signing date: 19-Aug-2015; contract completion date: 23-

Covenants	Reference to Loan and Project Agreement	Status of Compliance (as of 31 December 2020)
		<p>Jan-2017)</p> <p>ii) JV “H.P. Gauff Eng. & Infratech Consulting SDN Ltd.” as PIU Support Consultant (JV’s contract signing date: 11-Jan-2017; contract completion date: ongoing). The Consultant employed the National environmental specialist Ms. Julia Alekseeva (UZB) and replaced by Mr. Sergey Karandaev (UZB) and also the National social safeguard and development specialist Ms. Maria Malinovskaya. All national specialists were responsible up to date for monitoring of EMP and RP according to TOR of the PIU Support Consultant. The safeguard monitoring and reporting will be continued by PIU Support Consultant until commencement of the Works under the package CW1-R: Sanitary Landfill Establishment.</p> <p>iii) China Urban Construction Design & Research Institute Co., Ltd. as Sanitary Landfill Design and Supervision Consultant (contract signing date: 16-Nov-2018; contract completion date: ongoing). The Consultant employed the international key specialists: Mr. Mingtao NIE (CHN), Environmental specialist and Ms. Dajiang SUN (CHN), Social Safeguard Specialist. According to TOR of the Consultant, one of the key tasks of the Consultant’s safeguard specialists is to ensure that construction work is carried out by the Contractor in accordance with environmental and social norms and regulations of Uzbekistan and ADB.</p>
Safeguards–Related Provisions in Bidding Documents and Works Contracts		
<ul style="list-style-type: none"> The Borrower shall ensure or cause Maxsustrans to ensure that all bidding documents and contracts for Works contain provisions that require contractors to: <ul style="list-style-type: none"> (a) comply with the measures relevant to the contractor set forth in the IEE, the EMP and the RP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report; (b) make available a budget for all such environmental and social measures; (c) provide Maxsustrans and the Borrower with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE, the 	LA Schedule 5, para 10	<p>Complied. Ongoing</p> <p>The provisions listed in this covenant have been considered and included in the Bidding Documents for the Works packages, which are currently in bid stage:</p> <ul style="list-style-type: none"> - CW1: Sanitary Landfill Establishment and Dumpsite - CW2: Transfer Station Rehabilitation

Covenants	Reference to Loan and Project Agreement	Status of Compliance (as of 31 December 2020)
<p>EMP and the RP;</p> <p>(d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and</p> <p>(e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>		
Safeguards Monitoring and Reporting		
<ul style="list-style-type: none"> The Borrower shall do the following or cause Maxsustrans to do the following: <ul style="list-style-type: none"> (a) submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to effected persons promptly upon submission; (b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE, the EMP and the RP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and (c) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP or the RP promptly after becoming aware of the breach. 	LA Schedule 5, para 11	<p>Complied. Ongoing</p> <p>(a) Maxsustrans submitted to ADB the following Safeguards Monitoring Report in 2020, which have been disclosed at web site of IA https://maxsustrans.uz/uz/project/dokumenty-po-proektu: - Environmental Monitoring Report for 1. January – June 2020 and July – December 2020;</p> <p>(b) Complied. Ongoing;</p> <p>(c) Complied. Ongoing.</p>
Prohibited List of Investments		
<ul style="list-style-type: none"> The Borrower shall ensure that no proceeds of the Loan are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS. 	LA Schedule 5, para 12	Complied.
Health and Labor Standards		
<ul style="list-style-type: none"> The Borrower shall cause Maxsustrans to ensure that contractors engaged under contracts for Works: <ul style="list-style-type: none"> (a) comply with all applicable labor laws; (b) use their best efforts to employ women and local people, including disadvantaged people, living in the vicinity of the Works; (c) provide equal pay to men and women for work of equal type; (d) provide and adequately equip first-aid, health and sanitation, and personal hygiene facilities for male and female workers at the Works sites; 	LA Schedule 5, para 13	<p>Complied. Ongoing</p> <ul style="list-style-type: none"> In the Works Contract No. SUE/Maxsustrans/NCB-W4 “Garage Rehabilitation” dated 07.12.2020, paragraph 81 stipulates to: <ul style="list-style-type: none"> (a) comply with all applicable labor laws; (b) make every effort to recruit women and local residents, including the poor living in the immediate vicinity of the Works; (c) ensure equal pay for men and women for work of the same type; (d) provide and adequately equip first aid, health and sanitation and

Covenants	Reference to Loan and Project Agreement	Status of Compliance (as of 31 December 2020)
<p>(e) maximize female training and employment;</p> <p>(f) conduct an information and education campaign on sexually transmitted diseases and HIV/AIDS for construction workers as part of the health and safety program at campsites and adjacent communities during Works implementation; and</p> <p>(g) abstain from child labor.</p> <p>Relevant Works contracts must include specific clauses on these undertakings.</p>		<p>personal hygiene facilities for men and women at work sites;</p> <p>(e) maximizing the qualifications and employment of women;</p> <p>(f) conduct an information and education campaign on sexually transmitted diseases and HIV / AIDS for construction workers as part of the health and safety program in campsites and surrounding communities during work; and</p> <p>(g) refrain from child labor.</p> <p>The Contractor is “Indigo Baraka Servis” LLC, Tashkent, Uzbekistan.</p>

4 ENVIRONMENTAL SAFEGUARD ACTIVITIES

4.1 General Description of Environmental Safeguard Activities

65. During the reporting period, there were no any changes in the organizational structure of the project. The PIU Consultant has supervised and monitored the project implementation process.

66. During the monitoring period, the National Environment Specialist of PIU Consultant prepared environmental monitoring report(s) required by PIU and ADB and visited the project area to conduct visual assessment of the lands allocated for the project needs in July 2020. As mentioned in Table 7 of this report (*item: Human and Financial Resources to Implement Safeguards Requirements*) to implement the EMP and to monitor the environmental safeguard activities Maxsustrans has recruited:

- i) the international environmental specialist Mr. Irakli Kaviladze and after completion his services in January 2017,
- ii) the national environmental specialist of PIU Support Consultant (JV “H.P. Gauff Eng. & Infratech Consulting SDN Ltd.”) has continued to monitor and report on environmental safeguard activities since August 2017 up to date, and
- iii) starting from January 2022 (the indented commencement of the Works on the new landfill site) the international environmental specialist of Sanitary Landfill Design and Supervision (China Urban Construction Design & Research Institute Co., Ltd.) will be responsible for monitoring of implementation of EMP (i.e. SSEMP) and report to Maxsustrans/PIU/ADB accordingly.

4.2 Site Inspections

67. PIU's environmental consultant visited the project area to conduct visual assessment of the lands allocated for the project needs in July 2020. A new land plot for the landfill was allocated in the south of the existing landfill Akhangaran. The total size of the land is visually approx. 30 ha. The main access to the new landfill will be through the existing road already exist to the existing landfill and a new access road as junction from the existing road parallel south side of the existing landfill.



Land plot for new landfill



Land plot for additional access road



Figure 5. Photo of the project site – lands allocated for the construction of new landfill

68. Site visit also visually confirmed that there are no users / holders on the land where the construction of new landfill and additional access road will be developed. There is currently no agricultural activity or any improvements that have been made in this site. The project area does not have any households occupied the lands allocated for the project. According to the current sanitary-epidemiological standards and norms (“SanPiN”) No. 0350-17 “Sanitary standards and norms of the atmospheric air protection of human settlements of the Republic of Uzbekistan” residential and farming are not allowed at the sanitary protection zone of the landfill.

4.3 ADB Missions

69. A loan review mission ¹⁰ conducted loan review through video conference intermittently from 3 to 9 November 2020. The Mission held discussions with the Ministry of Finance (MOF), the Ministry of Investment and Foreign Trade (MIFT), the Tashkent Municipality, and Maxsustrans. The contents of this Aide Memoir (AM) were subsequently discussed and broadly agreed. The AM, together with its findings, recommendations and general agreements are subject to further confirmation from higher authorities of the Government of Uzbekistan (government) and ADB.

4.4 Issues Tracking (Based on Non-Conformance Notices)

70. There was no issue identified during the previous monitoring period (before June 2020).

¹⁰ The Mission comprised of Mr. Ruoyu Hu, Urban Development Specialist and Mission Leader; Ms. Mekhri Khudayberdiyeva, Senior Social Development Officer (Gender), Ms. Feruza Insavaliyeva, Associate Safeguard Officer, Mr. Doniyor Mukhammadaliyev, Senior Social Sector Officer, and Mr. Charles Felix Simbillo, Operations Analyst; The Mission received guidance and support from Ms. Cindy Malvicini, Country Director, Uzbekistan Resident Mission (URM).

Table 8. Issues Identified during the Previous Monitoring Period (before June 2020)

<i>Issue</i>	<i>Cause</i>	<i>Required Action</i>	<i>Responsibility</i>	<i>Timing (Target Dates)</i>	<i>Description of Resolution and Timing (Actual)</i>	<i>If not yet resolved, indicate the reason why and specify further required action and timeframe.</i>
1. None						

4.5 Trends

71. During the reporting period, monitoring and audits of construction sites did not reveal any issues and complaints from the public regarding non-compliance with environmental safeguards.

4.6 Unanticipated Environmental Impacts or Risks

72. COVID-19 pandemic is unanticipated impact. The detailed directions which must be followed as precaution to COVID-19 should be reflected in SSEMP to be submitted by the Construction Contractor before commencement of construction activities.

73. According to the ADB letter dated 01.09.2020 about the necessity of conducting COVID-19 risk assessment at the project level and updating the respective plans such as Health and Safety Plan (HSP) and Emergency Response Plan (ERP), as well as Environmental Management Plan (EMP), the PIU Support Consultant gave consultation for updating plans above.

74. All H&S procedures associated with COVID-19 pandemic and recommended by WHO and Uzbek government are addressed and followed. H&S plan has been updated accordingly ADB request. Special COVID 19 Emergency Response plan has been elaborated.

75. The health and safety requirements of any construction activity must also not be compromised at this time. If an activity cannot be undertaken safely due to a lack of suitably qualified personnel being available or social distancing being implemented, it should not take place.

76. Due to the outbreak of CORONAVIRUS (COVID 19) all over the world, the ongoing Contractors were very much conscious and proactive about the pandemic of the COVID and took necessary precautionary and preventive measures. They organized special awareness meeting and training to the workers. They also adjusted work plan according to the situation and carried out appropriate precautionary and safeguard measures against spreading and infection of Coronavirus Pandemic during the reported period.

77. The ongoing Contractor has taken additional protective measures against its employees. Thus, all Contractor's employees were provided with protective/medical masks, medical gloves, and antiseptics. Every day, before the start of the working day, as well as at the end of the working day, the employee's body temperature was measured. Additional wet cleaning was carried out in the office.

78. In addition, the EHS management plan should be prepared by Contractor¹¹ within contract CW1 before commencement of civil works and aligned with relevant government regulations and guidelines on COVID-19 prevention and control, and with international good practice guidelines. The plan should include COVID-19 prevention and control measures,

¹¹ The Contract (CW1-Establishment of sanitary landfill) is planned to be signed in December 2021. EHS management plan to be prepared after contract signing.

including disinfection/cleaning of offices, construction sites and labor camps, on-site temperature checks, social distancing measures, mandatory use of personal protective equipment such as facemasks, provision of handwashing stations and hand sanitizers etc., and procedures to be adopted in the event any worker is infected with COVID-19.

5 RESULTS OF ENVIRONMENTAL MONITORING

5.1 Overview of Monitoring Conducted during Current Period

79. Initial Environmental Examination (IEE) report designed for all phases (design, construction and operation) for SWMIP was prepared in 2013. However, this 'Environmental Monitoring Report' covers only the design phase impact monitoring, as there is no construction activity.

80. Current Situation depend on the Corona Pandemic: No significant environmental issues were flagged and no complaints received from the local residents and no adverse impacts occurred as a result of no construction activities during the reporting period.

81. No specific environmental monitoring program was suggested for the closed dumpsite. In the technical specification a groundwater monitoring program (composition and level) is included covering both the closed dumpsite and the new sanitary landfill.

82. There are no surface water streams in the valley where the existing dumpsite is located and no traces of surface erosion in the bottom of the valley are visible. As the precipitation in the area is very low an attempt to monitor surface water run-off (and potential leak of leachate through the slopes) from the closed dumpsite is deemed inappropriate.

83. Other environmental monitoring such as noise and dust is not relevant as no activities take place at the site.

84. Meteorological monitoring should be included in the monitoring program and this should cover both the new landfill and the closed dumpsite.

85. Most of the environmental monitoring requirements are for the construction period of project site. At the construction stage, the Contractor's site engineer is responsible for the preparation and submission of monthly environmental supervision reports. Meanwhile, the PIU is responsible for the monitoring of environmental parameters and preparing environmental results reports. The National Environmental Specialist of PIU Support Consultant is responsible for compiling the environmental monitoring reports.

86. Monitoring and reporting of the project will be conducted prior to construction, during construction, and during operation. The PIU shall monitor the performance and implementation of the EMPs. Monitoring reports on the performance and in implementing the EMPs, shall be prepared prior to construction (detailed engineering design and procurement stages), during construction and during project operation, as follows: i) monthly progress reports; and ii) quarterly monitoring reports to be submitted to ADB. The monitoring report/s shall also document the relevant environmental aspect and its respective mitigation measure, as well as grievances received and resolved, if any.

87. Prior to commencement of any construction work, contractor has to submit a Site-specific EMP and compliance report to PIU ensuring that all identified impacts detailed in the environmental assessment have been undertaken. The PIU will review reports submitted by CC as soon as construction works commence.

88. The PIU supposed to organize an induction training to discuss the submitted SSEMP including environmental monitoring requirements and reporting of unexpected adverse impacts or impractical mitigating measures observed during the construction phase.

5.2 Trends

89. Not yet applicable.

5.3 Summary of Monitoring Outcomes

90. Not yet applicable.

5.4 Material Resources Utilization

91. Not yet applicable.

5.5 Waste Management

92. Not yet applicable.

5.6 Health and Safety

93. During the Covid-19 pandemic, the contractor will ensure necessary protection to the deployed WORKFORCE and minimize the risk of spread of infection.

94. These are exceptional circumstances and the contractor must always remain abreast of and comply with the latest Government advice on COVID-19.

95. The health and safety requirements of any construction activity must also not be compromised at this time. If an activity cannot be undertaken safely due to a lack of suitably qualified personnel being available or social distancing being implemented, it should not take place.

96. It is to be noted that emergency services are also under great pressure and may not be in a position to respond as quickly as usual.

97. The Contractor site in charge should remind the workforce at every opportunity of the Worksite Procedures which are aimed at protecting them, their colleagues, their families and the population residing in the vicinity.

5.7 Training

98. During the reporting period, external training courses on environmental issues were not conducted due to COVID pandemic restrictions. The trainings were also not conducted in view of the fact that the Engineer's contract was not renewed and the Contractor was not selected.

99. The Contractor will be obliged to hold, at regular intervals, training sessions with all work forces (including engineers and supervisors) that will address the following aspects:

- a. General aspects on work safety and environmental awareness building
- b. Worker's responsibilities in case of emergency and spills
- c. General work safety in relation to common work risks, demonstration and use of protective equipment (first aid, fire extinguishers, handling explosives,)
- d. Environmentally harmful activities
- e. First aid assistance and medical assistance in emergency cases
- f. Emergency/rescue action training, incl. use of towing equipment

100. Also, it's recommended to PIU to ensure all workers get training on COVID 19 requirements before start of any construction activity and during construction period frequent visual and verbal reminders to workers can improve compliance with hand hygiene practices and thus reduce rates of infection. Hand washing posters should also be displayed at work site and labor camp.

6 FUNCTIONING OF THE SEMP

6.1. SEMP Review

101. The assessment of compliance with the Environment Management Plan (EMP) commenced with the review of the environmental management conditions required for compliance during the construction stage of the project. These conditions are meant to be captured in the Specific Environmental Management plan (SEMP). In addition to previous explanation following items should be also taken in consideration by the upcoming monitoring.

102. The Specific Environment Management Plan (SEMP) is likely to have a requirement that detailed management plans are developed on a topic by topic basis (Waste Management Plans; Traffic Management Plans; Water Management Plans and etc.) Beside environmental management actions, SEMP defined what kind of mitigation measures have to be implemented by Contractor/Sub-contractor and how to conduct environmental monitoring during the construction work. SEMP will define place, time, parameters and responsibility of environmental monitoring. Sub-clauses of SEMP will also include Contractor's schedule of submitting reports to CUCD – Consultant and PIU as executing agency.

103. Construction of WCPs. Construction phase activities will include initial site preparation and civil works. The potential environmental impacts are likely to be localized and temporary: (a) traffic, exhaust emissions, and noise generated by vehicles and equipment; (b) generation of construction-related waste; (c) temporary pollution of air, soil, ground, and surface water; and (d) occupational noise and dust exposure of workers. However, these impacts can be mitigated by applying good international practices in construction and planning, including: proper signage; traffic management plan; use of PPE; restricted work hours to daytime.

104. Occupational health and safety issues for the workers and nearby residents during the proposed works will be addressed according to international standards to prevent exposure to spills, gas emissions, and fires, or explosions.

105. The construction of the closed type waste collection points is carried out in accordance with a typical or individual design (sketch), developed and agreed in accordance with the established procedure. Areas for installation of containers are removed from residential buildings, children's institutions, and from recreation places of the population at a distance of at least 20 m, but not more than 100 m.

106. The territory of the WCP adjoins the driveways, but does not interfere with the entrance of a special vehicle. With separate location of the site (away from the driveways), it is possible to easily access a special vehicle for emptying containers and the presence of turning platforms.

107. The distance of WCPs and containers from the windows and entrances of residential premises is established strictly in accordance with sanitary rules, norms and hygienic standards.

108. Waste collection points have landscaped access roads, night outdoor lighting, supply of drinking cold water supply and waste water to the sewage system, as well as storm sewers for the removal of rainwater.

109. The surface of the container installation site is asphalt or concreted. In order to prevent stagnation of water and rolling of containers, the slope of the site cover is set at 5-10% towards the roadway and convenient to the entrance of a special vehicle.

110. The following information is placed on the territory of the waste collection point:

- ❖ name or number of waste collection point;
- ❖ name of the organization and its contact details, including telephone numbers of the dispatch service operating the waste collection point;

- ❖ telephone number of the regional environmental authorities, as well as the schedule of removal of municipal solid waste.

111. The transportation of the excavated materials and construction related debris will be moderate because most of the material will be disposed off at the landfill site where the facility will be constructed. Transport vehicles used to carry construction machinery and materials could be a source of noise and exhaust emissions. Installation of facility structures and related equipment will also generate temporary noise and dust. Earthworks envisaged during construction could have potentially negative environmental impacts that include generation of dust or silt-runoff from exposed soil surfaces during rain.

112. The outcomes of the risk assessments, along with any existing mitigation or monitoring requirements set out in the EMP will be developed into the Site Specific EMP covering COVID-19 risks and providing suitable mitigation measures.

113. The EMPs indicated that Contractor would be responsible for conduction visual monitoring of above indicated parameters. No more requirements on environmental monitoring were included in EMP and as following in Site-specific Environmental Management Plan (SSEMP). Instrumental monitoring of quality of environment was not conducted.

114. Currently, monitoring of the above parameters was not carried out due to the fact that construction work did not begin

Public Awareness Activities:

115. No public awareness activities among population who lived along project sites were carried out within the project during the period of June – December 2020.

116. An awareness raising program went on during the reporting period. An awareness raising orientation on environmental safeguards was held for PMU staff.

117. A program for the whole year which reflects the Plan and Schedule of implementing the health and safety awareness for all the workers will be prepared in SEMP.

118. The consultation with affected people and other concerned stakeholders, including local persons, will be continued on an ongoing basis during the construction stage to provide timely disclosure of relevant and adequate information that is understandable and accessible to affected people and responsive to the needs of disadvantaged and vulnerable groups; and should enable to incorporate all relevant views of affected people and other stakeholders into the mitigation measures and implementation issues. The consultation process and its results will be documented.

7 GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

7.1. Good Practice

119. Not yet applicable.

7.2. Opportunities for Improvement

120. Not yet applicable.

8 SUMMARY AND RECOMMENDATIONS

8.1. Summary

121. The issues identified during this monitoring period is summarized in Table 9.

Table 9. Issues Identified During the Monitoring Period July - December 2020

Issue	Required Action	Responsibility	Timing (Target Dates)
The updated EIA of construction of new landfill site required by the national regulation has not been prepared ¹² .	An updated EIA of construction of new landfill should be prepared for further approval by the State Committee of Ecology and Environmental Protection (SCEEP) before construction works.	Maxsustrans together with recruited local firm and with support by CUCD Consultant	November 2021
Approval of the updated EIA by SCEEP has not been obtained	Approval of the updated EIA of construction of new landfill should be received from SCEEP.	Maxsustrans (with CUCD Consultant's support)	December 2021
The PAM (Solid Waste Management Improvement Project: Project Administration Manual Asian Development Bank (adb.org)) requires "international safeguards specialist" to implement and monitor the environmental safeguard activities of the Project	During the construction works on new landfill site, which is scheduled from January 2022 + 18 months, monitoring and reporting on environmental safeguard activities should be performed by international environmental specialist of Landfill Design and Supervision Consultant (CUCD). Note: Up to date this task has been performed by national environmental specialist of PIU Support Consultant. In the beginning of the Project (until January 2017) this task was performed by international environmental specialist Mr. Irakli Kaveladze.	CUCD Consultant	January 2022

122. In general, the implementation of environmental and social safeguards measures across different projects under SWMIP is in accordance with the loan covenants, contract specification and EMP stipulated in the contract and mostly found to be satisfactory during the reporting period.

123. The project is compiled in accordance with the planning of Tashkent, which can meet the landfill demand of domestic waste within the scope of service. From a technical and economic perspective, the project is feasible.

¹² The original EIA of construction of new landfill in Akhangaran district of Tashkent province has been prepared and approved by SCEEP in 2013. According to Decree of the Cabinet of Ministers of Uzbekistan from 07.09.2020 No. 541 "About further improvement of environmental impact assessment mechanism" a positive conclusion of the State ecological expertise is not legally valid, when the construction works has been not implemented during the three years since its issuing. In this case, the conclusion of the State ecological expertise shall be reviewed by the specialized expert branch office of the State Committee of Ecology and Environmental Protection of Uzbekistan (SCEEP), which has issued the previous conclusion before. The specialized firm shall examine (update) the environmental impact assessment items and environmental norms based on design outputs and current status on the site to the date of submission of the application to SCEEP.

124. The landfill capacity is about 7.66 million m³, which can meet the landfill requirements in 12 years.

125. The construction of the landfill has improved the utilization rate of land, prevented the domestic waste from landfilling, and reduced the secondary pollution to the surrounding environment.

126. The project has convenient transportation, suitable transportation distance, suitable terrain, convenient water and electricity supply, and good construction conditions.

127. The landfill adopts improved anaerobic landfill treatment technology and single-layer horizontal composite seepage control method. Flood control facilities are arranged with flood intercepting trenches. The whole engineering design process is mature and reliable.

128. CUCD have mobilized their Environmental Officer in their respective packages to ensure effective implementation of EMP, identification of additional environmental issues as well as record keeping on environmental safeguards.

129. The detail design (DD) for the New Sanitary Landfill has been finalized in August 2019. All documents have been submitted to the state expertise committee for their assessment and approval. This is necessary prior announcing the project for international tendering and submitting the corresponding bidding documents.

130. Due to the conditions that not sufficient land is allocated to new SLF this item will be not a part of the DD of CUCD. If the Client insist on building the plant later CUCD suggest to invite other expert to develop the design for a composting plant.

131. As soon as construction works commence (estimated Q2 2021), environmental monitoring will be continued.

132. Action plan for the reporting period from January-June 2021 and after:

#	Action	Time frame	Responsibility
1.	Safeguard Compliance and Monitoring Report	Q1, 2021	PIU Consultants National Social Safeguards and Development Specialist
2.	Collect and provide the relevant information on environmental indicators to PIU.	Permanent ongoing	PIU Consultants National Social Safeguards and Development Specialist
3.	Other routine issues like unscheduled site visits, follow up of the detected defects, environmental assessment of designs.	Upon the need	PIU Consultants National Social Safeguards and Development Specialist
4.	Reporting on environmental safeguards	Monthly Semi-annual (acc. Contract)	PIU Consultants National Social Safeguards and Development Specialist
5.	Sanitary Landfill Facility Establishment and Dumpsite Closure, Reporting on environmental safeguards, Other routine issues like unscheduled site visits, follow up of the detected defects, environmental assessment etc.		CUCD Consultant Contracted Construction Company

133. Specific Environmental Management Plan (SEMP) will be prepared before commencement of construction activities, during mobilization stage, before commencement of construction activities by Environmental Specialist of the construction company.

134. The preparation of the semi-annual environmental reports will be continued but all items / paragraphs, which haven't changed or developed will not repeated as in the Report.

135. The Environmental Monitoring Reports upon review and approval by ADB will be posted on the Maxsutrans website and disclosed on ADB web-site as before.

136. The next Semi-annual EMR (reflecting January-June 2021 reporting period) will be submitted in July 2021.

ANNEX 1: ENVIRONMENTAL MANAGEMENT PLAN (AS BEFORE)

Sources of Impact	Impacts	Type / Degree of Effect	Mitigation / Enhancement Measures	Institutional Responsibilities	Cost
I. Pre-Construction Phase					
Land Acquisition	Loss of Agricultural Land	Significant and Long Term	<ul style="list-style-type: none"> • Not necessary • The landlord gives it back to the No IR impacts; • No mitigation measures for involuntary land acquisition; • The required lands for construction allocated from the district reserve land; • There is no possibility of any impacts in terms of losing incomes and livelihoods. • No grievance and complaints are received on project activity. • Ensure clear delineation and fencing of landfill area 	PIU for implementation and monitoring	Included in project Cost
Environmental and Social Monitoring and Assessment	Organizational capacity and commitment	Temporary and short term	<ul style="list-style-type: none"> • Establish and maintain Environmental, Social and Health & Safety Management System (ESHS). Employ EHS management staff with the Company. 	CUCD	Own resources, Consultant remuneration
Occupational Health and Safety	PPE provision	Temporary and short term	<ul style="list-style-type: none"> • Carry out and keep updated OHS risk assessment of work places prepared by authorized consultant • Provide PPE for the staff of Company and include in tender documents the requirement for all contractors including the municipal waste collection company to provide adequate PPE according to OHS assessment of workplaces and the local regulations. 	PIU, CUCD	Own resources, Consultant remuneration
II. Construction Phase					
Land clearing	Generation of fugitive dusts	Temporary but long term	<ul style="list-style-type: none"> • Open only one area for development on a by phase basis as planned. • Minimize movement of vehicles inside the construction area • Cover exposed areas with tarps or similar materials / application of slope stabilization materials • Establish buffer zones and fences 	Contractor/ CUCD to monitor for compliance and reporting to IA / SCEEP (State Committee on Ecology and Environmental Protection)	Include such measure in the Contractor's TOR
	Noise generation	Temporary and short term	<ul style="list-style-type: none"> • Notify the affected communities, adequately in advance, about the expected nuisance. • Reduce project traffic routing through community areas wherever possible. • Install mufflers and silencers for machines and equipment • Avoid working during rest periods / night time 	Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP	Include such costs in the Contractor's contract

Sources of Impact	Impacts	Type / Degree of Effect	Mitigation / Enhancement Measures	Institutional Responsibilities	Cost
			<ul style="list-style-type: none"> Regularly maintain equipment Establish fences around the work area as barrier Impose minimum speed limits within the project site 		
	Possible Soil erosion	Short-term and temporary	<ul style="list-style-type: none"> Contain excavation and other similar activities within design boundaries Immediately stabilize areas once cut and fill activities are completed Introduce vegetative cover in areas that will remain permanently open Cover with pebbles or gravel areas that are to remain open for a long period of time Peak Ground Acceleration (PGA) values for the site should be determined and incorporated in the design. 	Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP	Include such measure in the Contractor's TOR
	Waste	Temporary and short term	<ul style="list-style-type: none"> Ensure that all hazardous waste from temporary storage facility located at the landfill is sent to an appropriate final disposal facility 	Contractor / PIU	Management time, as per contract
	Flora	Temporary and short term	<ul style="list-style-type: none"> Re-introduce local occurring vegetative cover in areas within the SLF where it would be most appropriate. Shallow rooted vegetation is recommended 	Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP	Include such measure in the Contractor's TOR
	Traffic	Temporary and short term	<ul style="list-style-type: none"> Regulate the entry and exit of vehicles and equipment in the construction site Properly regulate delivery of materials into the project site Impose minimum speed within the project site Do not allow vehicles to stay within the project site for a long period of time Regular monitoring to ensure that traffic flow remains optimal and clean-up of any debris can be undertaken immediately. Regular maintenance of equipment. 	Contractor / CUCD to monitor for compliance and reporting to IA	Include such measure in the Contractor's TOR
	Occupational health and safety	Temporary and short term	<ul style="list-style-type: none"> Induction and orientation meetings will be undertaken by all workers. Tool box talks are also recommended. Only qualified workers will be hired Strictly impose and monitor use of PPE by workers. Regular inspections will be conducted. Provide HSE manuals and require placement of safety signs and placards Restrict movement of personnel in danger zones Insurance Policy for Workmen Compensation should be 	Contractor / CUCD to monitor for compliance and reporting to IA	Include such cost / measure in the Contractor's contract

Sources of Impact	Impacts	Type / Degree of Effect	Mitigation / Enhancement Measures	Institutional Responsibilities	Cost
			provided. • Conduct awareness and training programs on safety and health issues to be handled by the designated HSE Officer.		
Community Impacts	Community health, safety and security	Temporary and short term	• Develop and implement procedures for protecting public health and safety (e.g. traffic management plan, fencing, drivers training program, pedestrian access and trespassing plan, road design, slope stability, clean-up of spills, well visible signage, awareness-raising)	Contractor / CUCD to monitor	Include such cost / measure in the Contractor's contract
	Loss of income of informal waste pickers		• Identify alternative livelihood options for the waste pickers in accordance with the principles of livelihood framework prepared as above and in consultation with the affected people.	Local Hokimiyat	Consultant remuneration
Closure of the existing dumpsite		Temporary and long term	<ul style="list-style-type: none"> • Conduct a detailed site assessment covering the entire 59 ha • Development of a 'safe closure plan' • Adequate and prompt covering and compaction to prevent exposure of wastes • Induction and orientation meetings with special focus in the use of PPE will be undertaken by all workers. • Require placement of safety signs and placards • Conduct of post-closure environmental monitoring • Maintenance of installed facilities. • Precautionary measures should be taken to ensure uncontrolled fires are not started as a consequence of the closure activities. 	Contractor / CUCD to monitor for compliance and reporting to IA / SCEEP Post closure management shall be handled by the IA / PIU	Include such cost / measure in the Contractor's contract
III. Operation Phase					
Operation of the SLF	Air Emissions / Air Quality	Permanent and long term	<ul style="list-style-type: none"> • Gas emission (i.e. generation of objectionable odors) from the landfill is expected to be moderate. • Provide all employees with appropriate PPE • Monitor air quality based on a specified in the monitoring program • Regulate movement of vehicles inside the landfill to minimize emissions 	PIU and SCEEP for monitoring	Cost should be included in the operating budget
	Health & Safety	Significant, permanent and long-term	<ul style="list-style-type: none"> • Strictly impose and monitor use of PPE by personnel especially those engaged in the handling of wastes • Provide and require safety signs and manuals • Restrict movement of personnel in danger zones • HSE manual and Insurance Policy for Workmen • Compensation should be provided. 	PIU and PIU Consultant for monitoring	Cost should be included in the operating budget

Sources of Impact	Impacts	Type / Degree of Effect	Mitigation / Enhancement Measures	Institutional Responsibilities	Cost
			<ul style="list-style-type: none"> • Conduct awareness and training programs on safety and health issues • Make available first aid kits in the landfill area • Make available a vehicle that can bring victims to hospitals • Strictly monitor the entry and exit of outsiders inside the landfill • Precautionary measures should be taken to ensure uncontrolled fires are not started as a consequence of operational activities. 		
	Noise	Insignificant, long term and permanent	<ul style="list-style-type: none"> • Install mufflers and silencers for machines and equipment • Avoid working during rest periods • Regularly maintain equipment • Impose minimum speed limits within the project site 	PIU and SCEEP for monitoring	Cost should be included in the operating budget
	Groundwater quality	Significant, permanent, long term	<ul style="list-style-type: none"> • Use of HDPE liner and establish leachate collection and treatment system as designed and planned • Monitor leachate quality, if any • Ensure that no leachate percolate into the ground by consistently conducting quality checks of liner prior to disposal. • Ensure that all leachate are collected and treated • Properly cover the landfill after the cell is filled • Introduce vegetative cover in areas where it would be applicable to promote evapo-transpiration and re- direct portions of the precipitation. 	PIU Consultant, PIU and SCEEP for monitoring	Cost should be included in the operating budget
	Vermin & other pests	Significant, temporary and short term	<ul style="list-style-type: none"> • Ensure that all containers are properly enclosed to avoid manifestation • Covering should be done every end of the day's operations 	PIU / SCEEP for monitoring	Cost should be included in the operating budget
Operation of the SLF	Traffic	Significant, long term and permanent	<ul style="list-style-type: none"> • Regulate the entry and exit of vehicles and equipment in the SLF • All dump trucks should carry a waste manifest / legal papers to avoid long stand by times at the gate. • Impose minimum speed within the project site. • Do not allow vehicles to stay within the project site for a long period of time • Proper maintenance of the internal road network. • Employ a traffic management system at the ingress/egress of the project site. A traffic circulation plan should be developed not to hamper the traffic flow. 	Local authorities	Cost should be included in the operating budget
Operation of	Air Emissions	Significant,	<ul style="list-style-type: none"> • Foul odors are expected to be a permanent feature of the 	SCEEP for monitoring	Included in the

Sources of Impact	Impacts	Type / Degree of Effect	Mitigation / Enhancement Measures	Institutional Responsibilities	Cost
auxiliary facilities (e.g. Leachate Treatment Plant)		permanent and long term	<p>plant. It is therefore necessary that most appropriate ventilation system is implemented. This system should also maintain the appropriate air exchange ratio to minimize stagnation within the plant.</p> <ul style="list-style-type: none"> • provide all employees with appropriate PPE • monitor air quality (indoor and outdoor) based on a specified in the monitoring program • Regular monitoring for any leaks (loss in pressure) and/or for spills 		operating budget
	Health & Safety	significant, permanent and long term	<ul style="list-style-type: none"> • Training for personnel pertinent to operations and maintenance. • Provide the necessary PPE and strictly impose and monitor its use by employees • Provide require safety signs and placards and restrict movement of personnel in danger zones • Conduct awareness and training programs on safety and health issues • Make available first aid kits • Strictly monitor the entry and exit of outsiders inside the facility 	Consultant, PIU/ SCEEP for monitoring	Included in the operating budget
Operation of auxiliary facilities (e.g. Leachate Treatment Plant)	Groundwater quality	Moderate, permanent and long term	<ul style="list-style-type: none"> • Ensure that all containers and tunnels are properly sealed • Ensure no leakages in the containers • Whenever applicable, all floors must be properly sealed • Ensure that leachate and other spills are properly collected and not disposed in sensitive areas • Water usage shall be monitored. 	Consultant, PIU/ SCEEP for monitoring	Cost should be included in the operating budget
	Noise	Insignificant, negligible and short term	<p>Note: There are no sources of high level noise from the operation of the plant.</p> <p>Whenever excessive noise is to be generated, this will be short term.</p>	PIU and SCEEP for monitoring	Cost should be included in the operating budget
	Vermin & other pests	Insignificant, negligible and short term	<p>The presence of vermin and pest will be very minimal since the facility and its equipment are totally closed. To ensure that employees are not exposed to deleterious materials;</p> <ul style="list-style-type: none"> • All workers and personnel shall be provided with appropriate PPE • Use of the PPE must be strictly implemented and monitored. 	PIU Consultant, PIU for monitoring	Cost should be included in the operating budget

IA = implementing agency

The Environmental Management Plan [especially for the construction phase] does not claim to be complete and can be expanded at any time according to the need and necessity.

ANNEX 2: INFORMATION OF DUMPSITE CLOSURE COMPONENT (CANCELLED COMPONENT)

1. At the existing dumpsite sorting of the solid wastes is carried out by the waste pickers. There are 35-40 waste pickers engaged in work. Consultant studied the situation with these waste pickers. Based on the results of survey, Consultant notes that waste pickers are people who are officially employed through the rehabilitation center. The employer is "Mehr Sahovat" Ltd. All these people are ensured with proper social and labor guarantees of their incomes / salaries by the employer. In compliance with the requested information, there are 7 permanent waste collection points (WCPs) and 30-35 waste pickers with hourly rate wage. The rehabilitation center provides these people with the work and guarantees for salary. After the existing landfill is closed, these people will be re-employed at the other infrastructural facilities like transfer stations, sorting stations, land and road improvement enterprises etc.
2. In 2020 dumpsite closure by soil was carried out by the Korean company "Sejin G&E Co., Ltd" within the framework of implementation of the Investment Agreement with the Government of the Republic of Uzbekistan dated September 14, 2018. Sejin G&E Co., Ltd. used the design developed by CUCD in 2019 to close the old dumpsite.
3. Sejin G & E Co., Ltd used design documentation developed by CUCD in 2019 for dumpsite closure. Principles of selecting old dumpsite closure technology in Tashkent: mature technology, moderate investment, reliable equipment, optimal input and output ratio, meeting actual condition of landfill in Tashkent and met requirement of environmental protection.
4. In the selection process, mainly considered the influence of following factors:
 - (1) Economic strength, investment ability and input and output ratio;
 - (2) Requirement of urban construction and social development on environment;
 - (3) Site location, topography, geology and hydrogeological conditions;
 - (4) Characteristics of various technical means, reliability and suitability of technology and equipment;
 - (5) The complexity of management and operation, and danger of secondary environmental pollution;
 - (6) Future development of waste mass and some special constraint factors.

Technical Requirements for Safe Closure of Disposal Sites

5. The technical requirements for safe closure of disposal sites were as follows.
 - 1) Different types of disposal sites were closed safely and the post-closure management should be carried out properly.
 - 2) Objectives for the safe closure of different disposal sites.
 - a. To prevent wastes from littering or overflowing from these disposal sites
 - b. To reduce gas pressurization or uncontrolled gas migration within the deposited waste beneath the capped surface to prevent fire or explosion within the facilities
 - c. To minimize offensive odors emitting from these disposal sites
 - d. To provide storm water run-off and drainage facilities
 - e. To minimize environmental pollution caused by leachate from these disposal sites
 - f. To prevent groundwater contamination
 - g. To take measures for wastes stabilization
 - 3) Appropriate measures and activities required to achieve safe closure were determined based on the conditions of the site including operation level, existing facilities, surrounding environment and post closure land use.

Closure technology selection principle and influence factors

6. Comprehensive consideration: considering the existing dumpsite site conditions, that is, the old dumpsite closure investment is limited, and the new landfill site construction has a

lot of covering soil, local rainfall is low, etc., it is determined that Tashkent landfill closure technology is transpiration type covering technology.

7. Transpiration covering technology can greatly reduce precipitation infiltration through the dynamic balance of precipitation in plants and covering layer, but allow a small amount of precipitation infiltration.

8. Using the transpiration type restoration technology is a new concept of landfill covering technology. National Committee for Ecology and Environmental Protection defines transpiration covering as: "covering layer composed by sustainable development plants, for substances causing hazards to environment, the plant covering can lower it to the acceptable level and covering technology needs minimum maintenance."

9. At transpiration covering technology design, covering objects and thickness are two key factors for plant covering system design.

Closure Phase - Requirement on ecological restoration

10. Akhangaran old dumpsite is a land without ecological restoration and has potential pollution hazards. After ecological restoration, the local ecological community was restored to some extent. In the future, with the construction of regional ecological restoration project, a vibrant green space will be presented, which can improve the green area of Tashkent, and even provide a demonstration base for tourism and environmental protection science popularization education for the citizens. The strong comparison of "yesterday", "today" and "tomorrow" of landfill will leave deep impression for people and be suitable for the positioning of Tashkent as an oasis city.

11. This project plans to learn from the successful experience of relevant international projects, according to the current conditions of this storage yard and local conditions, integrate advanced concepts such as circular economy, energy conservation and emission reduction, land ecological restoration, and build it into an environmental protection demonstration project in Tashkent.

12. To sum up, it was urgent to improve urban sanitation facilities and properly dispose of urban domestic garbage at present for the construction of a beautiful, clean and civilized Tashkent, and a need to promote the sustainable development of society and economy. The implementation of the SWMIP in Tashkent city - Sanitary Landfill Establishment Project can reduce the pollution of garbage to the city, improve residents' life quality, protect the ecological environment and investment environment, and effectively use land resources. So, the construction was very necessary and urgent.

Post Closure Land-use Plan

13. The post-closure land-use plan will be considered and planned by Sejin G&E Co, however such plan will only be implemented after the safety closure of the site has been carried out. It will be necessary to formulate the improvement plan such that it will become possible to use the land after the landfill has been closed safely. The post closure land use plan will be used to plan and decide on how the landfill should be operated, the covering material to be used, the depths of the waste layers, etc.

14. In the preparation on the post closure land use plan, consideration will be towards the stability of the closed site, and the period of time required for the completed landfill to stabilize. The stabilization process depends on the types and volume of the solid wastes, types and volume or thickness of cover material applied, the type and method of intermediate treatment processes being carried out such as crushing or compaction. All these factors will be evaluated to confirm whether the land of the closed site is suitable for the proposed post closure land use.

15. Prior to implementing the post closure land use plan, it is important to ensure that all the factors that have impact on the environment be dealt with and active countermeasure are in place. Such measures include ensuring that proper post-closure procedures have been

carried out prior to closure; all leachate and gasses discharge are being monitored and treatment facilities provided; the slopes and ground have been properly compacted and showing no signs failure; and all the waste have been properly covered and all pollutions are being contained.

16. In order to determine the suitability and evaluating the stability of the closed site, all necessary tests and ground/soil analysis will be carried out so that the data obtained may be used to estimate the degree of stability, to predicted subsidence rate, and to estimate the load bearing capacity of the ground.

17. Within the reporting period, National Environment Specialist of PIU Support Consultant has inspected the Akhangaran dumpsite in July 2020. During the inspection, overall methodology to assess and monitor EMP implementation for future construction activity was conducted. Several on-going works were reviewed and meetings to validate environmental performances by National Environment Specialist.

Establishment of Safe Closure System

18. Sejin G&E Co used "Instruction Manual for Dumpsite Closure" developed by CUCD prior to the dumpsite closure starts and updated during the operation and the cell-by-cell development of the landfill. The Manual includes the mitigation measures to be implemented at the dumpsite site during and after the dumpsite closure, i.e. during and after establishment of the final cover.

19. Because no cover soil at all was placed over waste on the Akhangaran Dumpsite, the waste is scattered and odour and landfill gas are generated. To address these issues, it was necessary to carry out earth covering primarily in areas where plastics and other easily scattered wastes were dumped.

20. All disposal sites were assigned with the targeted safe closure system at the initial stages of its safe closure plan. The procedure to identify the safe closure system for each disposal site was as follows:

- 1) Site assessment survey was carried out in order to determine the general conditions, environmental conditions and land use conditions of the site. From the results of the survey, the environmental pollution potential and land use potential were evaluated.
- 2) The proper safe closure plan was then formulated and the physical closure works were carried out.

21. The appropriate closure system was assigned and applied to prevent environmental pollution and hazards.

22. The closed disposal site was provided with the necessary facilities for the safe storage of waste, to prevent environmental pollution and to accelerate early stabilization of the waste at the dumpsite. The facilities required for safe closure were planned, designed and implemented based on the following requirements.

- (1) Stabilization of Critical slopes or Reformation of Shape/Slope and Waste Storage Facility. The exposed waste should be compacted. The shape or slope of the filled waste were modified if they were deemed to be unstable and/or when the waste had been overfilled. The gradient of the slopes was less than 1:3 or slopes ranging from 2 to 4% to facilitate drainage and prevent ponding and soil erosions. The waste storage bank, suitable retaining wall or embankment structures were constructed as the shape of the filled waste was not stable, and the boundary of the site was limited. The proposed modification and improvement works were described in the safe closure plan prepared by CUCD.
- (2) Final Soil Cover and Vegetation. The final cover were the cover soil laid on top of the final waste layer, after the disposal site had been completed. The purpose of final cover was to provide improvement to the sanitary conditions, the landscape, post-closure land use, the reduction of the leachate quantity, reduction of offensive odor, prevention of outbreak of fire, reduce the breeding of vectors, minimize leachate

generation, serve as vegetation layer, etc. The final soil cover are at least 40 cm which include 10 cm topsoil and 30 cm compacted soil.

Closure construction scale

23. The dumpsite closure area was about 463,100m². As per actual condition, the whole enclosure engineering was composed of stack shaping, final site covering system, landfill gas collecting and processing system, rainwater drainage system, ecological restoration system, etc. This project adopted transpiration covering design. Transpiration covering was used to excavate earthworks directly from new landfills.

24. Transpiration covering systems were designed to provide adequate water storage capacity and control water infiltration into bottom waste through transpiration. The transpiration type covering system design considered climate, soil type and thickness.

25. To drain surface rainwater out of closure area in time, the rainwater drainage system was set at landfill after closure. The rainwater diversion and drainage system were divided into platform drainage ditch and annular flood intercepting ditch.

(1) Background environmental monitoring of the site

26. Before the domestic garbage sanitary landfill is put into operation, the environmental protection department and the Sanitation and Anti-epidemic Station shall carry out background monitoring for various environmental and microbial indicators, as well as the groundwater and surface water, and put them into the archives.

(2) Environmental quality monitoring of the site

27. To ensure that the anticipated environmental protection objectives are achieved, a sound environmental monitoring system shall be established and improved at the site. Environmental monitoring items are provided in Tale 6 below. This Environmental monitoring items were proposed by the Landfill design consultants CUCD in their Instruction Manual for Dumpsite Closure and New Landfill Construction based on site conditions and their design solutions. Environmental monitoring locations during dumpsite closure works are provided in Figure 6 and Figure 7.

Table 10. Environmental monitoring item table

Monitoring item		Note
Surface water	pH、SS、DO、BOD5、CODcr、NH3-N、NO2-N、NO3-N、CL-、TP etc.	Three background monitoring shall be conducted for the landfill, once in dry season, flood season and normal season, and twice in peak month.
Groundwater	13 items of PH, total hardness, chloride, COD, ammonia nitrogen, volatile phenol, cyanide, Escherichia coli, etc. Water level shall be monitored at the same time	The monitoring wells shall be cleaned three days before sampling. The amount of water taken out during well washing is 3-5 times the amount of water stored in the wells, and the monitoring indicators will be adjusted when necessary. The monitoring points are groundwater monitoring wells and domestic water wells. It shall be monitored three times a year, the sampling time is in April, August and November, respectively.
Leachate	SS、COD、BOD5、NH4-N、coliform value	Monitoring points are: leachate collection wells, leachate treatment facilities outlet. It shall be monitored three times a year, the sampling time is in April, August and November, respectively.
Atmosphere	TSP, odor intensity, ammonia, hydrogen sulfide, methyl mercaptan	There is a monitoring point in both upper and lower wind directions. When the wind direction is not fixed, the monitoring point can be increased appropriately. It shall be monitored twice a year, the sampling time is in April and August, respectively.
Landfill gas	CH4、CO2、CO、N2、O2、H2、H2S	The monitoring point is the methane collection orifice, which can monitor one point. It shall be monitored once a year in August.
Fly breeding	Field boundary noise	Within 1~3 years after the landfill is opened, it shall be

Monitoring item		Note
monitoring		monitored 4 times a year, preferably in July ~ December
Noise	Field boundary noise	

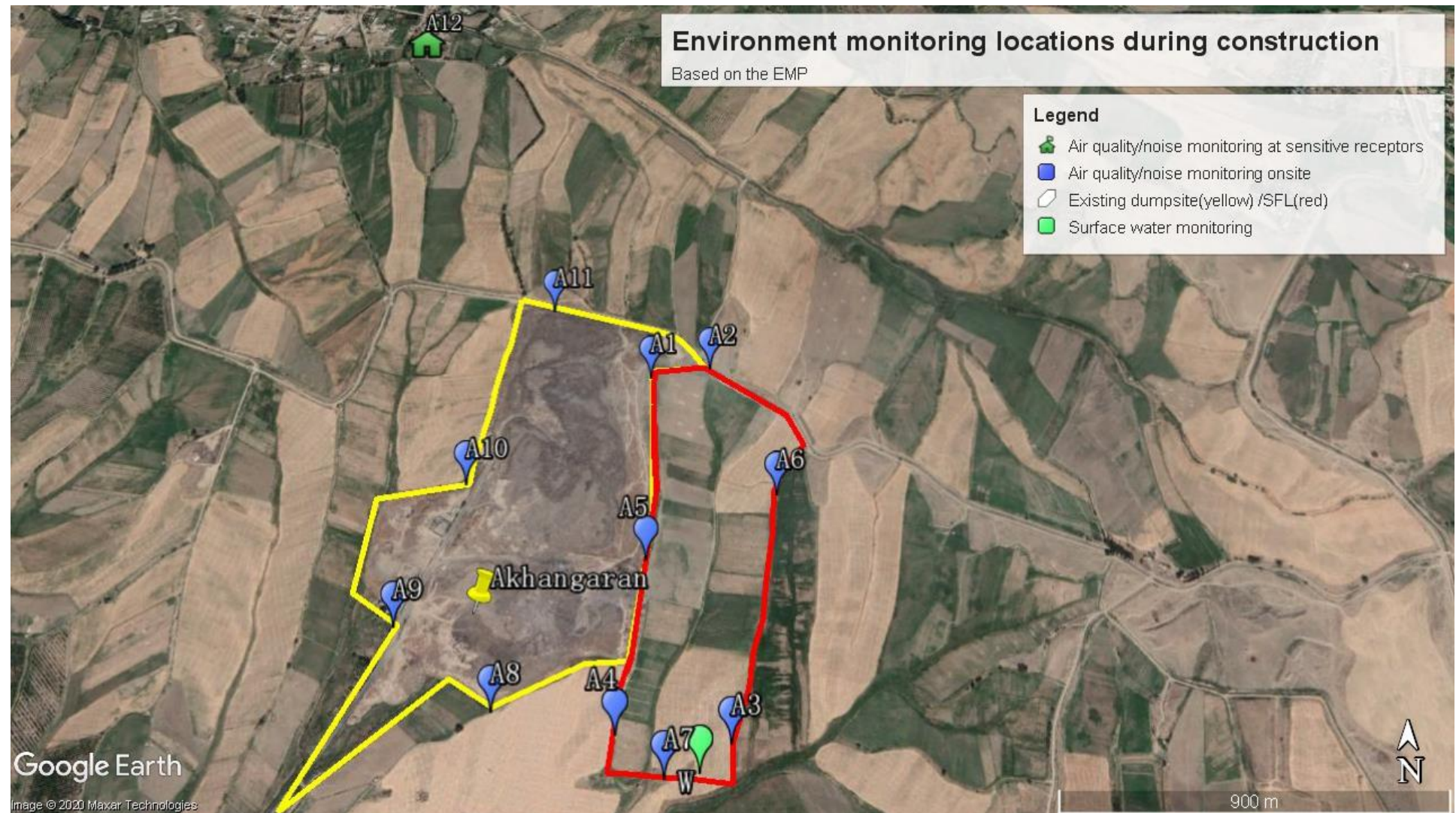


Figure 6. Environment monitoring locations during construction

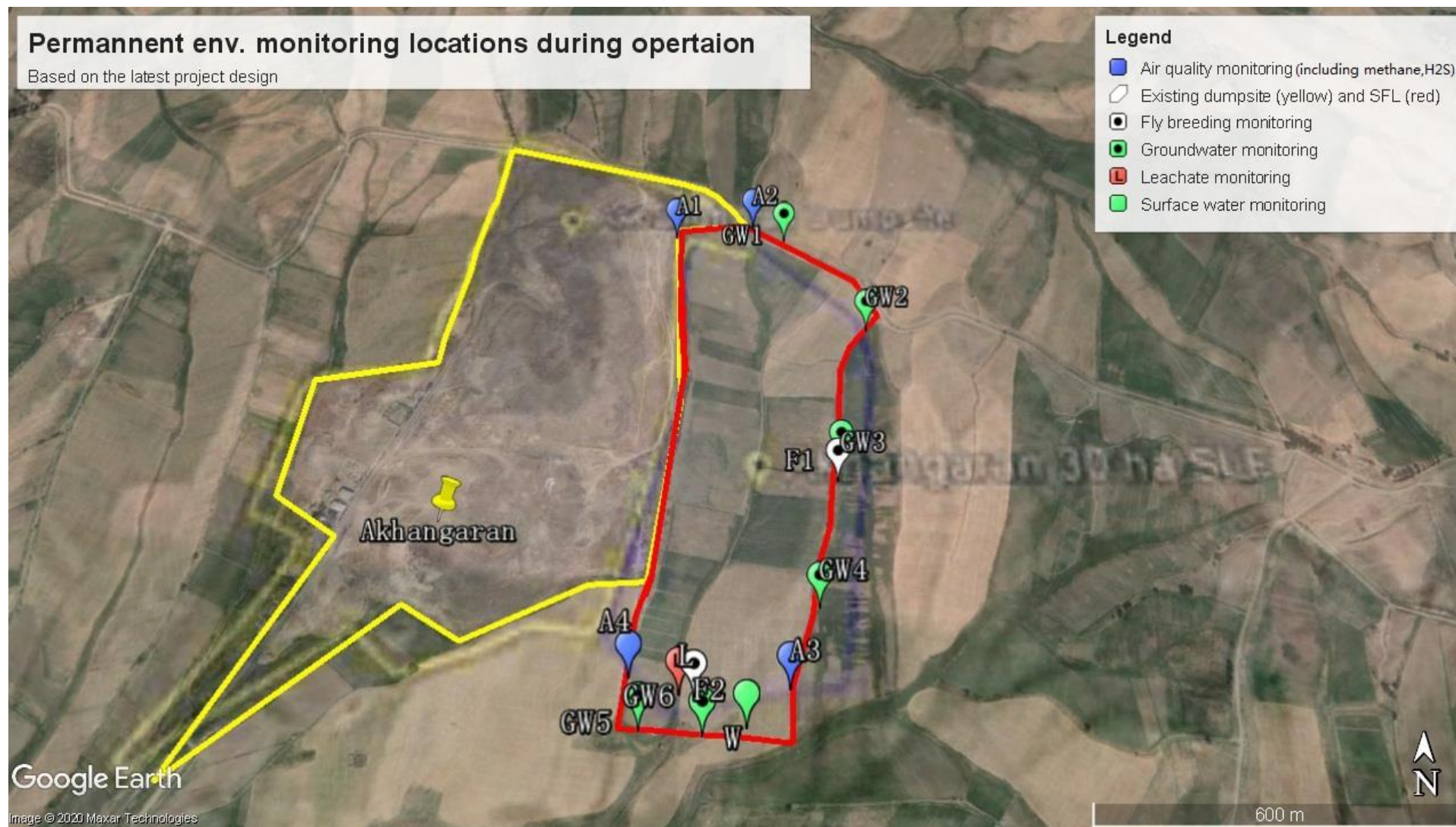


Figure 7. Permanent environment monitoring locations during operation

(3) Monitoring institution, personnel

28. According to the needs of the project, the existing environmental protection authority can be responsible for the environmental management and monitoring of the site, and the full-time environmental supervisor shall be equipped to be responsible for the environmental quality management of the sanitary landfill and dumpsite closures.

(4) Monitoring content and distribution

29. Monitoring of surface water around the site

(5) Sampling point layout

30. Three points are laid in the landfill zone.

(6) Water sample collection

31. Instantaneous sampling shall be the main method, and the sampling tool for the water sample at the horizontal point can be determined according to the specific project; the vertical point water sample at the seepage layer shall be collected by the vertical water collector. The sampling frequency is: the background monitoring can be sampled 3 times; in the first year after the landfill is opened, the dry season, the flood season and the normal season are sampled one time, and the dry season and the flood season in the second year are sampled one time.

(7) Groundwater monitoring

(i) Monitoring well setting

32. There are six groundwater monitoring wells in the landfill, which are:

- One background well, which is set at 20m upstream of groundwater flow in slag yard.
- Two contaminated diffusion wells, which are set at 50m on each side of the vertical trend of groundwater respectively.
- Two pollution monitoring wells, which are set at 30m and 50m downstream of groundwater flow in slag yard respectively.
- One leachate monitoring well, which is set at the outlet of the leachate pipeline.

33. The borehole diameter of the monitoring well is not less than $\Phi 110\text{mm}$.

34. Before the slag yard is put into use, the groundwater background quality shall be monitored. When the slag yard is put into use, the groundwater shall be monitored continuously until the concentration of sewage pollutants produced by the slag yard is lower than the corresponding limit for two consecutive years.

35. The groundwater monitoring indicators include pH, total hardness, total dissolved solids, permanganate index, ammonia nitrogen, nitrate, nitrite, sulfate, chloride, volatile phenols, cyanide, arsenic, mercury, hexavalent chromium, lead, fluoride, cadmium, iron, manganese, copper, zinc and fecal coliform.

(ii) Sampling method

Pump the well water 1~3 times to clean the sampler.

(iii) Sampling frequency

- 1) According to the actual situation, it is not less than once a year in flood season, normal season and dry season. Atmospheric monitoring of the site

(i) Sampling point layout

36. One point is arranged in the upper wind direction of the site, and one point is arranged in the downwind wind direction of the site; three points are arranged in the site. The gas-conducting system is arranged at the outer discharge port.

(ii) Atmospheric sampling

37. Sampling frequency: background monitoring gas-collection once before landfill, continuous monitoring after start-up, CO and CH₄ monitoring once a month.

2) Soil monitoring

(i) Sampling point layout

38. Shallow-layer layout: Arrange several sampling points at the surface of the landfill at 15~20cm. Deep-layer layout: Take 1 mixed sample at the filling depth of 2m as point 1, and determine the number of sampling points according to the difference of depth.

(ii) Soil sampling

39. After arranging several points on the surface soil according to diagonal method, plum blossom method, chessboard method and meandering method, the topsoil of 15cm is excavated with a small shovel at each point, and then 1000g soil sample is taken at each point; the deep soil shall be sampled by empty pipe dry drilling, and a 1000g mixed sample is taken every 2m. The sampling frequency is: in the background monitoring before landfill, the topsoil shall be taken as the background value once; after the landfill, the deep waste samples shall be drilled once a year, and a mixed sample shall be taken at a depth of 2m.

3) Gas production monitoring of the landfill

(i) Sampling point layout

40. The outward discharge port of the gas-conducting system shall be taken as the sampling point.

(ii) Atmospheric sampling

41. Sampling shall be carried out using airbags or air pockets. If it cannot be sampled by natural methods, it can be pumped out; the sampling frequency is continuous monitoring. When it is necessary to make CH₄ curve, it shall be sampled once a month.

4) Leachate monitoring

(i) Sampling point layout

42. Leachate sampling points are set in each monitoring well.

(ii) Leachate sampling

43. A rigid plastic bucket shall be used as the water extractor. Pumps shall not be used to pump water. Each time, 500~1000 ml of water shall be taken. The sampling frequency is: once a month after the landfill is opened, and after the second year, it shall be sampled every quarter and continuously monitored.

5) Landfill gas monitoring

44. In addition to the above sampling monitoring projects, key online monitoring of some projects is implemented, including methane concentration.

Stack slope shaping principle

45. Akhangaran dumpsite had been formed for many years and had become increasingly stable. Therefore, at the stack shaping, the excavation of the stack was avoided, but the original terrain was made full use, stack was not disturbed as much as possible, and the principle of "few excavation and more filling" was followed. Specific shaping principle of the project stack slope was as follows:

- a. At stack shaping, pay attention to control over layered compaction degree on the basis of waste mass;
- b. The waste mass slope is shaped and restored as per slope of no more than 1:4 and the top slope of waste mass shall be no less than 5%;
- c. The side slope is designed with step slope with step width of no less than 2m;
- d. Optimize shaping and restoration process, mainly perform excavation, transportation, filling and compaction with bulldozing and movement as assistance;
- e. Combine closure road and platform and consider landfill mode and scope of cutting garbage;
- f. Ensure stable slope after stack shaping and compact it by a special garbage compactor;

- g. The shaping combines waste mass shrinkage deformation features and it doesn't adopt large scope integral rigid structure;
- h. After shaping, the slope is convenient for closure, greening, road, platform and other engineering practice;
- i. Ensure that the slope is flat without concave surface after stack shaping; at shaping operation, prevent closed or semi-closed space which is easy to cause methane gas enrichment;
- j. No closed buildings and structures are built on the garbage slope in the shaping process;
- k. Landfill gas, slope rainwater collection and drainage and other closure facilities shall be considered;
- l. At stack shaping, try to dump waste mass at south away from the karst boundary.

(1) Coverage

46. Coverage operation is an important part of landfill operations, which play an extremely important role in the surrounding ecology and the working environment of workers. The site is in an environmentally sensitive area located, and garbage coverage is not only the requirement of landfill operation process, but also the need to protect the surrounding ecological environment and improve the living environment of the surrounding residents. Therefore, in this project, the actual situation of the landfill and the surrounding area is combined, so that the coverage and final coverage of the landfill operation are designed in more detail.

47. The coverage is usually divided into daily coverage, intermediate coverage and final coverage. Daily coverage is timely coverage after daily landfill operation. Clay or HDPE membrane with a certain thickness can be used as the coverage material. Temporary coverage material can be used to cover the slope of landfill garbage the next day, and then the landfill operation will continue after uncovering the coverage material the next day. The intermediate coverage refers to the surface coverage of the garbage after the landfill heap has reached a certain height (generally 5 meters), and the coverage material is generally HDPE membrane. The final coverage refers to the surface coverage of the garbage landfilled to the design elevation. The coverage material is usually natural soil, the thickness shall be according to the requirements of the closure design, usually about 1 meter. HDPE membrane can also be used to cover the closure.

48. The coverage material can be determined according to the process requirements and local conditions. In general, poorly permeable clay or other synthetic materials are selected. According to the actual international use situation of the current garbage dump operation, the following coverage scheme is recommended.

49. During the operation of this landfill, 0.5mm HDPE membrane is suggested to use to replace the clay layer and the associated increased work and transport costs for daily coverage and/or temporary coverage of permanent slope. HDPE membrane is used for intermediate coverage, which combines with leachate, odor and fly control in operation.

50. Cover soil at the landfill site plays important roles in sanitation, fire prevention, reduction of leachate volume, odour and vermin control etc.

51. In general, it was necessary to carry out the landfilling process in consideration of the following aspects related to cover soil:

- As far as possible, the landfilled waste shall never be exposed. It shall be covered as soon as possible with cover soil.
- Cover soil shall be laid at specified areas to prevent gas dispersion, fire and also for movement of collection vehicles, when necessary.
- A final cover soil shall be laid on the top layer of the landfill site. In this case, the thickness of the final cover soil depends on the proposed usage of the completed landfill site.
- The cover soil shall cover the landfilled wastes properly, sufficiently spread and compacted with proper thickness and gradients.

52. Functions of Cover Soil. The cover soil prevents bad odour from dispersing, reduces the littering and flowing out of wastes, eliminates the breeding of vectors etc. It also acts as a fire breaker to prevent fire from spreading. It also provides good appearance for the landfilling areas as a mean of protecting the environment. In addition, it also ensures easier spreading and compaction works, prevents rainwater from seeping into the inner layers of the landfill site etc. However, when a large amount of cover soil is used, the capacity of landfill becomes lesser and it also reduces the permeability of the landfill site and subsequently reduces the waste decomposition rate. Therefore, the thickness and type of cover soil shall be properly selected. The availability of cover materials depends on the location of the landfill site and the financial capability of the operator. If new cover soil material is not available, old landfilled wastes buried for about 3 to 6 months can be utilized effectively as cover soil.

(2) Impacts on Biological and Ecological Resources, including vermin

53. The proposed developments and mitigation measures will have a **targeted specifically negative influence on the number of species of fauna** that are using the existing waste management system as an easy source of food and as a breeding area. These negative effects are very desirable and wanted for hygienic reasons. The same species will try to continue to use the landfill area and associated facilities as a food resource, the numbers that can be supported by the waste activities will drastically reduce. These are generally the species classed as vermin or nuisance and improved control of these species is a **positive social impact**.

54. The unloading area for the waste will include flies brought to the site within the waste vehicles, and a range of flies attracted to the odor of the waste across the whole dump area. Birds and rats and maybe dogs too will try to access the waste before it is processed, during processing, the organic fraction and the waste residues going to landfill. Larger scavengers such as dogs will also be attracted to the waste.

55. Fencing and gates will control the larger scavengers and prevent their access to the site. It is required to ensure that diseases never “run out” from the landfill, especially into surface- and groundwater, cared out by rodents or birds, etc.

56. Rats will be able to access the waste piles easily and need active and passive controls and measures of combat through good management of the site to minimize stored waste on the site, clean the working areas and ensure that recycled bays and storage areas for recycled bins do not become nesting areas. The site requires a hard standing to avoid rodents digging holes in through the base. It is likely that additional controls in the form of chemical baiting will be needed at commencement of operations to avoid a build-up of rodents digging nests in the area of the plant. This includes the site of the closed old dump as well. Each site needs a vermin control plant to monitor and manage insects, rodents and dogs. Exterminate rodents on site at least once every 3 months and exterminate mosquitoes and flies at least twice each year.

57. The problem of dogs, birds, rats and flies feeding and breeding on the landfill is partially the unpleasant working conditions for those employed on the site, partly the ability of the landfill to provide a continuous source of new vermin to move out into the city, but also the potential for any bacteria, viruses or fungi from the waste being carried into local settlements and the city on feet or in faeces and hence spreading disease.

58. Rats will require a specific elimination program prior to commencement of recultivation. These demand special operations to reduce the excessive numbers of and prevent a large movement of rats into the near villages and maybe nearby cities after destruction of the current nests.

59. Chemical baiting or poison on the landfill is unlikely to be effective due to the large amount of available food and the hectareage involved. Baiting should take place in the surrounding settlements and service ducts to control rat movements from the site. An ongoing monitoring and management plan is required. After the areas of open waste are reduced (closing of the old dump), it looks practical than to use chemical baits on the closed areas.

60. All animals which touch the landfill can be a potential transmitter for any bacteria, viruses or fungi from the waste. Likewise, the “Waste Trucks and lorries” are a potential risk which unlike animals predictable and can be permanently suppressed by regular disinfection and other appropriate measures. Which can be washing and disinfection of tires, vehicle underbody, container etc. prior leaving of the landfill side. A other aspect is the protection of the workers on the landfill and all labors which are handling waste or passing the landfill with necessary actions like change their work suit, cleaning the shoes and boots etc..

61. It is the task of the Environmental expert from Landfill Supervisor (Consultants side), Contractor and as well from Maxsustrans/ PIU side to monitor and to include all necessary measures during and after the construction in the corresponding manuals.

62. Flies are important pollutants in landfills, which have a great impact on the surrounding environment of the landfills. Temporary not operated landfill areas can be covered with 0.5mm thick HDPE membrane in combination with other landfill operation process can help to eradicate the flies. Excavated material can be used as well but it will reduce the capacity of the landfill.

63. Systematic fly eradication in landfills requires the following steps:

- 1) Garbage collection and transportation in landfills is treated in a sealed way, which can not only prevent adult flies from breeding, but also kill fly maggots.
- 2) Landfill operations are arranged in a reasonable way, which can reduce the exposed area, increase the compaction density of garbage, and control odor and fly breeding.
- 3) Regularly eliminate flies by drugs and alternate medication is adopted. The adult flies are killed directly to control the density of the adult flies.

64. The fly eradication design in the above steps is to change the environmental conditions of the fly and prevent its growth to achieve the fly eradication.

(3) Control of dust float

65. Fly dust and floating materials come mainly from waste paper, dust, plastics and other light materials that can be blown by the wind in the landfill. The following methods are proposed to control the fly dust and floating materials.

- 1) All vehicles used to transport garbage in the site are sealed vehicles;
- 2) Clean vehicles are equipped, and regular cleaning measures are taken for public roads;
- 3) The operation surface in the landfill is covered in time;
- 4) Both the temporary closure and the final closure shall be covered in time;
- 5) In the case of strong winds, although the landfill operation is still in progress, only one working area shall be reserved, and other exposed parts shall be temporarily covered with coverage materials;
- 6) The installed fence should have special measures to avoid a.m. flying plastic bags

(4) Collection and treatment of exhaust gas

66. When the domestic waste in the landfill is buried more than 10m, the landfill gas in the landfill shall be collected and treated to prevent pollution to the surrounding environment caused by gas leakage. The treatment method shall be determined according to the amount of gas collected and the local actual situation.