

Project name, IRN	BR24992882-Development of new technologies for processing man-made waste with improvement of the environmental situation in the region
Completion date	01.07.2024 - 31.12.2026
Project supervisor	Shabanov Erbol Zhaksylykovich, PhD, associated professor
Report	<p>The intensive development of industry and the mining sector leads to the generation of significant amounts of waste, which negatively impacts the environment and public health. The Aktobe region, like many others, faces serious environmental problems caused by the accumulation of man-made waste. Existing methods of waste processing and disposal often cannot cope with the increased volumes and do not provide the required level of environmental safety.</p> <p>The implementation of the program will improve the environmental situation and will be an important step toward sustainable development and the conservation of natural resources for future generations. The program aims to address important problems of socio-economic development in the Republic of Kazakhstan, as specified in state strategic and program documents, through interdisciplinary research.</p> <p>To achieve this goal, an integrated approach was developed based on current indicators. In Aktobe, at the Aktobe Ferroalloy Plant alone, billions of tons of industrial waste have accumulated, of which only 15–30% is recycled. The low level of processing poses a serious threat to the environmental safety of the region and the health of its residents. As part of this approach, it is planned to introduce advanced technologies that will significantly increase the volume of waste processed, as well as develop effective methods for monitoring and controlling their disposal.</p> <p>Main directions of the program:</p> <p>Study the material composition of technogenic dust and cake from dry and wet gas purification furnaces for smelting ferrochrome, its activity relative to oxidizing and reducing reagents, the kinetics of leaching of the components of the object of study, enrichment by various physical and chemical methods, the purity of the resulting reaction products, and the possibility of obtaining products that are safe from a sanitary and hygienic perspective.</p> <p>Increase the physical and mechanical properties of epoxy resins, imparting special thermophysical properties and reduced flammability, by using man-made waste from industrial enterprises of the Republic of Kazakhstan as a filler (dust from gas purification systems of metallurgical enterprises and brick factories, as well as waste from the heat and power complex—aluminosilicate microspheres).</p> <p>Bring the quality of wastewater treatment to standard values and reduce the anthropogenic impact of industrial enterprises in Aktobe on the environment through the use of technical and technological solutions for adsorption treatment of wastewater from pollutants.</p> <p>Over time, reserves of rich natural chromium ore are depleting, posing the challenge for modern production to include technogenic waste, such as dust, sludge, and tailings, in processing and metallurgical processes. The accumulation of this waste leads to the formation of technogenic deposits.</p>
Purpose	The goal of the program is to reduce the anthropogenic impact of industrial facilities on the natural environment through the application of new technological and technical solutions.

<p>Expected results</p>	<p>The processes of dust and filter cake formation in dry and wet gas cleaning systems, the equipment used, and the qualitative and quantitative composition of the generated and potentially accumulated dust materials at ferrochrome smelting plants will be studied. The most priority types of dust and filter cakes for examination under this program will be identified.</p> <p>The chemical composition, structure, fractional composition, and specific surface area of dispersed fillers—technogenic waste from industrial enterprises (dust from gas cleaning systems of metallurgical plants and brick factories, as well as aluminosilicate microspheres from thermal power plants)—will be investigated.</p> <p>An assessment of the quality indicators of industrial wastewater and urban water bodies will also be conducted.</p>
<p>Research group</p>	<p>Supervisor – Shabanov Erbol Zhaksylykovich, PhD, associated professor, H index =4. Web of Science – 2. Researcher ID: AAB-8165-2020. ORCID: 0000-0001-6902-1211. Scopus Author ID: 56346154800. –</p>
	<p>Karabasova Laura Chapaevna, PhD, H index =5, Researcher ID DSU-2015-2022 ORCID 0000-0001-6902-1211 Scopus Author ID 57204819780</p> <p>Beceshev Amirbek Zarlykovic, c.ph.-m.s., associated professor, H index=10 Researcher ID AAO-5844-2020, ORCID ID 0000-0002-7038-4631, Author ID B Scopus 6602335201.</p> <p>Aikenova Nuriya Erkinovna, Phd, c.t.s. Hirsch index h =1. Researcher ID - AAP-9501-2021 Scopus Author ID: 57221555826 ORCID ID - 0000-0002-1144-4008</p> <p>Abilova Guzel Kabletovna, Phd, Hirsch index h =2, Researcher ID - AAN-3820-2020. Scopus Author ID: 57208254425 ORCID ID - 0000-0002-0028-4598</p> <p>Muhambetkaliev Azamat Bolatovich, Hirsch index h =3, Scopus Author ID: 57218196432 ORCID ID - 0000-0001-9163-1438 WoS 2</p> <p>Duimuhanov Nurbek Muktarovich Hirsch index h =0</p> <p>Abilberikova Aigerim Amangoskyzy, Hirsch index h =0, ORCID ID 0000-0002-0133-3005, Author ID B Scopus</p> <p>Orynbasar Raigul Orynbasarkyzy, c.h.s. Hirsch index h =3, ORCID ID 0000-0002-6198-3018, Author ID B Scopus 57218950994</p> <p>Zhumabek Arai Karimakynovna, c.h.s. Hirsch index h =1</p> <p>Ahmetova Marzhan Kuchkinbaevna, Hirsch index h =3, Researcher ID AAR-1671-2020, ORCID ID 0000-0001-6485-8063, Author ID B Scopus 57217105534</p> <p>Cherbakov Andrei Sergeevich, c.t.s., Hirsch index h=4, https://orcid.org/0000-0002-5376-7470, Author ID B Scopus 57352155700</p> <p>Serichaeva Gulbanu Dusenkyzy, Researcher ID AGP-4864-2022,</p>

ORCID 0000-0002-2411-7807

Sarsembin Ymbetaly Kyandykovich, PhD, H index = 1, Researcher ID: ACZ-0926-2022 ORCID 0000-0002-0796-3737 Scopus Author ID: 57199325753

Nurmakova Saule Mukanovna, c.t.s, masters, H index=1, Researcher ID: AAH-5937-2019 ORCID 0000-0002-2896-4261 Scopus Author ID: 58032459600

Dalbanbay Amantay, researcher, Researcher ID: T-6723-2017 ORCID 0000-0001-8793-4970

Abilkairova Madina Maksatovna, MSc ChME, ORCID 0000-0002-4205-4387 Scopus Author ID: 58001244700

Isengalieva Gylya Amirzhanovna, c.t.s. associate professor, H index =1, Scopus Author ID:57614848000

Muratkali Aliya, masters Hirsch index h =0

Myasnikova Lyudmila Nikolaevna, c.ph.-m.s., associated professor, H index=6, Researcher IDO-9697-2017, ORCID ID 0000-0003-3326-7206, Author ID в Scopus 16481268100

Omarova Zhanna Amanzholkyzy, Orcid:0009-0000-8866-7851

Wang Xin , PhD degree of Safety Science and Engineering, Associate Professor, H index=68, Researcher ID: AAN-6839-2020, ORCID ID: 0000-0001-5881-4400, Author ID in Scopus: 55619294251.

Aikenova Zhanylsyn Mergalievna, researcher. Hirsch index h =0

Shanina Zamzagyl Kyatovna, H index=1, Author ID в Scopus 7213518239

Sariev Otegen Raphhatovich, c.t.s., associated professor, H index=5, (WoS) - 5; ResearcherID: AGH-3529-2022 ORCID 0000-0003-0745-848X Scopus Author ID: 55355882800

Yaxitova Bagdagyl Tyleyovna, PhD, H index (Scopus) =2; ORCID ID: 0000-0003-1156-8809 Scopus Author ID: 57430892900

Samyratov Erylan Kairzhanovich, c.t.s., H index (Scopus) h=6; H index (WoS) - 4; Scopus ID: 55356056200 ORCID: 0000-0001-8591-8547 Researcher ID: AAW-7031-2020

Taizhigitova Meryert Myratovna, H index(Scopus) h=3 ORCID : 0009-0005-2635-3431

Yeskalina Kyralai Tolegenkyzy, Hirsch index h =1, ORCID ID 0000-0002-2804-7076

Yusupova Zharkinai Nietbayevna, H index(Scopus) h=1 (Scopus Author ID: 57614877500);

Jundibayeva Akgul Sultanbekovna-Master of Technical Sciences, Hirsch index h =0

Adaybayeva Rysgul Almasovna-Master of Technical Sciences, ORCID ID 0000-0001-9968-7954

Nurtazin Anuar Abaevich Hirsch index h =0

Bekeshova Zharkyn Abaevna Hirsch index h =0

Seksenbayeva Aiyym Altynbayevna-Master of Technical Sciences, Hirsch index h =0

Zhuniskaliv Talgat, Doctor of Philosophy (PhD). Project executor.Scopus ID: 57218196497, Researcher ID: AAG-6131-2021, ORCID:0000-0001-9757-0605

Aktymbayeva Aigul Sagyndykovna Hirsch index h =0

Akuov Askhat Maksotovich – Candidate of Technical Sciences, Senior Lecturer, Aktobe Regional University named after K. Zhubanov (Aktobe, Kazakhstan), Scopus ID: 36558881000,ORCID ID:0000-0002-5163-5378, Researcher ID:AGL-4223-2022

Beknazarov Rakhym Agibayevich – Doctor of Historical Sciences, Professor, Aktobe Regional University named after K. Zhubanov (Aktobe, Kazakhstan) Scopus ID: 57211600750, ORCID ID: 0000-0002-1033-9660 , Researcher ID: CDU-6374-2022

Usenkulova Sholpan Zhenisbekovna Hirsch index (Scopus) h=1, Scopus ID: 57191588031 ORCID ID: 0000-0001-9417-755X

Ubayev Zhiger Kartbayevich – PhD, Associate Professor, Aktobe Regional University named after K. Zhubanov (Aktobe, Kazakhstan) Scopus ID: 57211061571,ORCID ID: 0000-0002-8862-3506, Researcher ID: CDN-9919-2022

Hu Yuan Director of Institute in Fire Safety Materials at State Key Professor, Scopus ID: 35261989400

Mostovoy Anton Stanislavovich Hirsch index (Scopus) h=16, Scopus ID: 55998338500, ORCID ID: 0000-0003-2828-9988

Zhunusova Elvira Baktygaliyevna Hirsch index (Scopus) h=0, Scopus ID: 57930048800

Nurtay Zhadyra Tastenbekkyzy – PhD, Assistant Professor, Kazakh University of Technology and Business named after K. Kulazhanov (Astana, Kazakhstan),Scopus Author ID: 58805879200,ResearcherID: ABD-5479-2021ORCID ID: 0000-0002-0744-0389

Nurlybay Sultan Alimzhanuly Hirsch index h =0

Nurlybayeva Tomiris Alimzhankyzy Hirsch index h =0

Sultamuratova Zadagul Bolatbekovna – Candidate of Chemical Sciences, Associate Professor, Aktobe Regional University named after K. Zhubanov (Aktobe, Kazakhstan)), h-index h=2 Scopus ID: 57266437600, ORCID ID: 0000-0003-3052-9338, Researcher ID: DXL-7546-2022

Zholmuratova Gulzat Serikkyzy– doctoral student, Hirsch index h =0

	<p>Duysengali Aknaz Berikkyzy– master’s student, Hirsch index h =0</p> <p>Ilyasov Kuanish Zhanbulatovich– master, Hirsch index h =0</p> <p>Zhakyupova Gulmira Zhalgasbaykyzy Zhalgasbaevna – teacher. Department of Oil and Gas Engineering, Hirsch index (Scopus) h=4, Scopus ID: 57192555823, ORCID ID: 0000-0001-7714-4836</p> <p>Sharafieva Akbobek Sagynbaykyzy Hirsch index h =0</p>
<p>Publications in scientific publications</p>	