ASSESSMENT OF SOIL HEAVY METAL DISTRIBUTION IN NALAIKH DISTRICT, ULAANBAATAR, MONGOLIA

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All these years, numerous coworkers and friends have encouraged and motivated me. I am further gratitude to my colleagues from Ecotech project LLC, Smart Lab LLC for their support and for their help in obtaining data from the sampling of large number of soil and water.

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i. INTRODUCTION

Soil ecosystem services, like all ecosystem services, are critical for meeting societal needs like food and energy provision, as well as overcoming societal challenges like climate change mitigation and adaptation.

Large amounts of harmful pollutants are being discharged into the environment as a result of increased industrialization around the world. Mining, a complex industry, has a wide range of environmental consequences that affect nearly every element of life on Earth. Mining operations are regarded as a major source of metals that can be discharged into the environment, polluting rivers and accumulating in high concentrations in soils and sediments. [Peter S. Hooda Heavy elements in soils-2010: page 11].

Soil aims to increase understanding of the significance of soil functions and related ecological processes, according to the investigation of Geo-environmental Mapping and Assessment. Therefore, heavy metals in soils are most interested do to a research on geo-environmental side of soil and related parameters.

The thesis investigation has based compartment between recent and previous similar investigation reports and chemical analysis of soil around UB Nalaikh area.

The investigation area Nalaikh chosen within several reasons such as:

Nalaikh administratively belongs to capital city of Ulaanbaatar, The Coal Mine of Mongolia was established in 1921, Glass, brick and textile factories followed.

After Mongolia's communist government fell in 1990, most mine operations came to a halt. The mine's fallen-down remains form a disturbed structure, people's homes in round construction litter area, and coal dust fills the air.

Photo 1 Investigation polluted area (Rubbish eating cow)

The number of people settlement has been growing rapidly in recent years.

Table 1 Nalaikh district population by 2000-2018

[www.1212.mn Database of statistics]]

	Total land area (km^2)	Population estimate			Population density		
		2000	2010	2018	2000	2010	2018
Nalaikh district	689	23 400	31 500	37 600	34 km^2	46 km^2	55 km^2

As the Ulaanbaatar city's continues to urbanize, successful management of urban growth becomes increasingly important, particularly in suburb areas like Nalaikh, where urbanization is expected to be the fast heavy elements t. Many village towns will face difficulties in meeting the needs of their growing urban populations, including housing, transportation, energy systems, and other infrastructure, as well as employment and basic services such as education and health care. Integrated policies to improve the lives of both urban and rural residents are required, as are stronger links between urban and rural areas, based on existing economic, social, and environmental ties.

To ensure that the benefits of urbanization are fully shared and inclusive, urban growth policies must ensure universal access to infrastructure and social services, with a focus on the needs of the urban poor and other vulnerable groups for housing, education, health care, decent work, and a safe environment.

ii. STATE OF THE ART

The overall goal of the master thesis research is to learn about the environmental consequences and amount of metals accumulated in the techno sphere by human activities. The research within the project was focused on identifying and geo-environmental risk by soil heavy metal distribution its relation to nature, including geology, weather, and soil erosion (gully).

Heavy metals in soil (trace elements), unlike organic contaminants, are retained in soils indefinitely because they are not degradable. As a result, soils contaminated with Heavy elements pose a long-term risk of increased plant uptake and leaching, potentially harming the environment and human health. In terms of food chain contamination and eco-toxicity, arsenic, Cd, Hg, Pb, and Se are the most important. Excess Arsenic (As) intake is most likely caused by elevated concentrations in drinking water, which has been linked to an increased risk of skin cancer. [Peter S. Hooda Heavy elements in soils-2010].

Heavy metal concentrations (Cr, Cu, Hg, Ni, Pb, and Zn) and arsenic (As) were analyzed and estimated. The results revealed a wide range of Heavy metal concentrations and other soil properties. The results were compared to MNS 5850:2019 Soil quality. Soil pollutants' permissible value. The average soil (0-30 cm depth) of Cr, Cu, Pb, and Zn in soils were 18.14, 12.15, 11.89 and 46.29 mg/kg, respectively, As 7.98 mg/kg which is 1.5-2 times larger in the ger area.

Objectives are:

Objective 1- Determine the geography and geological conditions of the project area: The report covers the size of the site, the stability and distribution of soils and rocks related to geological and environmental risks

Objective 2- To determine the pollution and risk of the site: In order to determine the load of heavy elements and its distribution in the area. Identify the theoretical foundation for this discussion is to determine the current value of heavy metals in soil, and to be compared with recent and similar investigation values of heavy metals. Furthermore, to define the Pollution factor (CF); Pollution such as (DC); Pollution load index (PLI); Accumulation factor (EF) such as heavy metals pollution will be assessed to clarify root of the pollution already have;

Objective 3- Recommendation for further urban planning, possibility to extract heavy metals from soil.

iii. RESEARCH AREA (DESCRIPTION OF THE RESEARCH AREA WITH SUBCHAPTERS)

iii.1 Urban ecosystems

Location of the investigation site:

The thesis investigation area has included area of 1st, 2nd and 4th sub-district of Nalaikh within area of **14.5 km²**, Nalaikh district Ulaanbaatar city and it is framed as L-48-11 nomenclate. The area has covered ger area, apartments, heavy industries, old glass factory, farmland, dump area, rivers and military service complex.

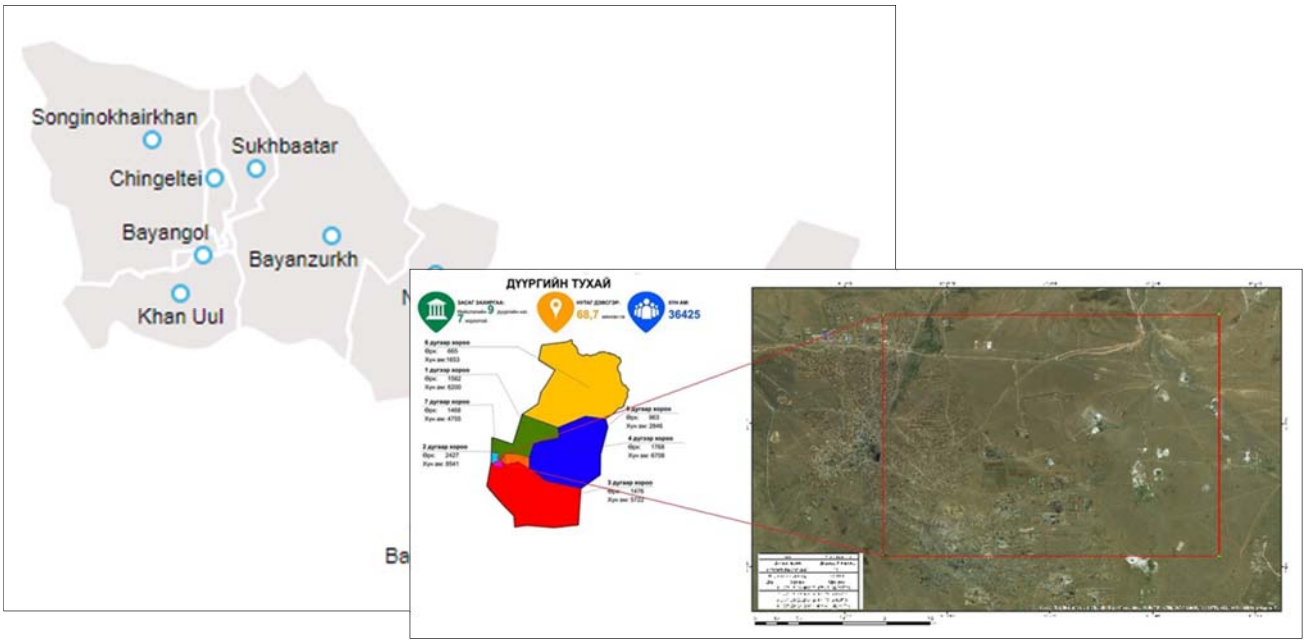


Figure 1 View of investigation area

Socio-economy and land use

The investigation area affected by human activities such as livestock, agriculture, coal mining, armed forces, construction materials and other industries, and waste landfills operating more than 100 years. (Attachment Map of land of the area)

iii.2 Landscape conservation and planning

The following seven general strategies are proposed to guide implementation of the Master Plan of Ulaanbaatar city. The general strategies are the methods proposed by the City to achieve a better future for Ulaanbaatar in the 2030 vision:

- Reduce centralized settlements by restructuring administrative units.
- Improve the administration of the City's planning system by instituting land-use zoning codes.
- Expand and improve the road and public transportation networks.
- Improve the current state of the socioeconomic infrastructure.

• Redevelop ger areas in stages, incorporating new apartment complexes and continuing apartment development.

• Enhance basic infrastructure, such as utilities and telecommunications.

• Implement long-term environmental management. *[Ulaanbaatar 2020 master plan and development approaches for 2030. 2014]*

The investigation area Nalaikh is the main area for ecological, industrial corridor also will be the village for further land use planning.

iii.3 Environmental quality / Geo-environment risk

The risk assessment of the geological environment of the project area and the identification of potentially dangerous geological phenomena such as earthquakes, volcanoes, and windstorms and their effects are carried out. For each hazard, physical characteristics, information sources, risk conditions are defined, and a brief presentation of measures to prevent and reduce them is given as followings:

Geology:

These folds' axial planes strike NE and dip steeply north or south. Several NW- and NE-trending vertical faults cut the rocks in this area. The rocks are in fault contact with Mesozoic Granite to the west of the study area. The sandstone, greenish gray to dark gray, is commonly massive and coarse- to medium grained, but rarely bedded and fine-grained. The sandstone is ill-sorted, with dominantly angular to very angular grains. A 10 to 30 cm thick alternating bed of sedimentary rock and mudstone with grading and cross lamina. The mudstone is black to gray in color and is usually fissile but rarely massive. North of Nalaikh, conglomerate consisting of granules to boulders of red limestone's and sandstone is uncommon. The limestone's slabs are structurally intercalated in the non-bedded massive sandstone and are typically several tens of meters thick. The red sandstone is well-bedded with muddy films and contains numerous spherical radiolarian heavy elements ts. A bed of the limestone is generally 5 to 10 cm thick. An eastward-facing conformable succession of limestone, siliceous shale, mudstone and sandstone, in ascending order, is exposed at north of Nalaikh (Section 20100808, N47.829790°E 107.181931°; Figs. 5 and 6). The rocks in this section strike N 10° to 40°E and dip 70° to 90° to the north. At its western end, the limestone is in fault contact with the underlying sandstone, and it is conformably overlain by siliceous shale at its eastern end. The limestone is syncline folded. The axial plane of the fold strikes north east and steeply dips to north. Thickness of the limestone is at least 10 m.

This area's rocks are mostly thick massive sandstone with minor bedded sandstone, alternating beds of sandstone and mudstone, and conglomerate with slabs (Fig. 2). The rocks generally strike north east to north west, dip steeply north or south, and are complexly folded in the study area's north (Fig. 2) [Yuki NAKANE, Toshiyuki KURIHARA, Bakhat NURAMKHAAN, Manchuk NURAMKHAAN, Makoto TAKEUCHI, Kazuhiro TSUKADA, Sersmaa GONCHIGDORJ, and Khishigsuren SODNOM. 2012. Geological division of the rocks at southeast of Ulaanbaatar (Gachuurt-Nalaikh), central Mongolia. Bulletin of the Nagoya University Museum. No.28, p. 19-26]

The investigation site includes to Khentii geosyncline depression by Mongolian geologycal-environmental classification. The site is Tectonical formation of the Khentii mountains related neo-tectonic development and geo-structural general tectonic structures for the contains simple and Paleozoic structural layers of the sub - region. Modern talus - prolluvial origin and the site of Upper Quaternary (dpQII) , sediments and Neogene (N) dominated habitats . The soil is brown, brown, orange, red, brown, yellow and green sandy, loamy sealants, boulders, gravel, gravel, soil, gravel and clay containing soil and finance lap and deposited on the valley part of the soil layer formed. [Engineer-geological study Ecotech project LLC] **(Attachment No.3 Geological map)**

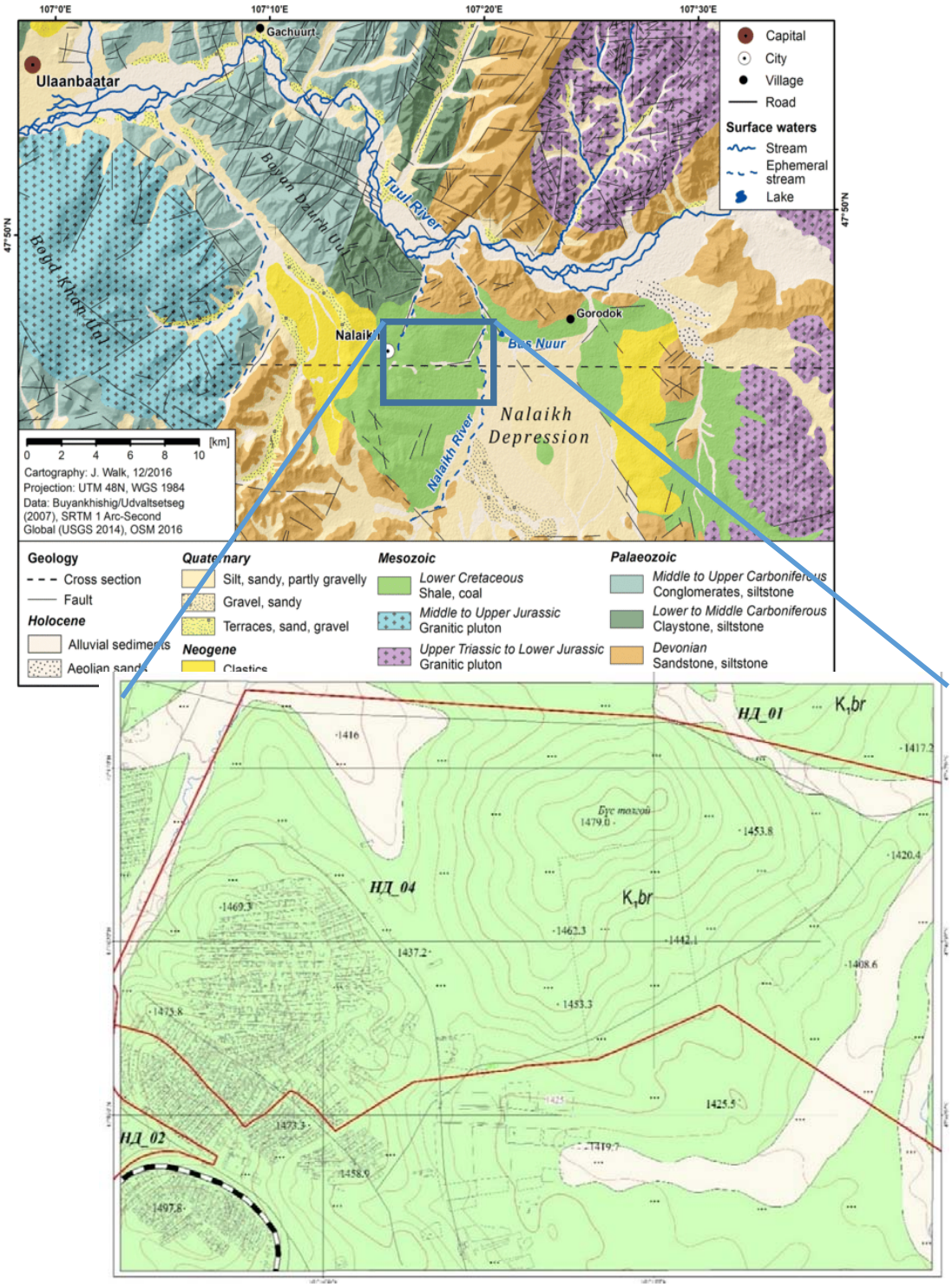


Figure 2 Geological map of Nalaikh area

Geomorphology

The Khentii Mountains run north-to-south, and lie just to the east of Ulan Bator. The Khentii Mountains receive the most rainfall and are the most forested, with marshy valleys separating the hilltops. **(Attachment Topographic map).**

This area belongs to the southwestern part of the Khentei mountain system. The interfluves are generally level surface with isolated peaks. The slopes asymmetric; they are steep (about 25°) near the summits; north-facing slopes are moderately steep (15°–18°), and southern slopes are gentle (5°–6°). North-facing slopes are much more severely eroded than south-facing slopes. The presence of sloped valleys, circle-shaped depressions, and terraced benches to the north of the main divide is a key characteristic of topography. Bedrock eluvium predominaheavy elements on the watersheds. Colluvial sediments predominate on gentle southeastern and eastern slopes, as well as in intermountain basins. On inclined plains, a solifluction layer composed of accumulated loose material and rock debris forms. The fine earth material of these substraheavy elements is sandy loam or silty loam. The predominance of coarse silt particles is clearly related to the regular alternation of freezing and thawing of loose material during periglacial lithogenesis [Soils of mountainous forest-steppe in the southwestern part of Khentei Ridge] (Mongolia). Vera Ivanovna Ubugunova Sep.2017].

Hydrogeology:

The aquifer formations in the Lower Cretaceous East Bayan Formation scattered around the mine contain the main aquifer, where the hydrogeological wells drilled there revealed groundwater between 0.5 and 70.1 m depth, lowering the water table between 3.6 and 43.7 m, yielding 0.6 to 15 L/sec in heavy elements ts. was. The yield of wells used for water supply of Russian military units reached 5.3-17.2 l/s. The source of water supply in Nalaikh city is the water-bearing pore layer in the alluvial sediments of the Tuul valley, Water-bearing pore formations in Neogene friable sediments, Related to aquifer formations in the Lower Cretaceous East Formation. Also, since 1990 Nalaikh city, glass factory used to have their own water supply system. Glass factory water supply drilled well 65.2-77.0 meter depth, with yielding of 4.0 l/sec, modern factories such break factory and metallurgical plants are operating their own well which are yielding is around 2-5 l/sec.

According to hydrogeological reports from Sherbakov and Bayaraa, the radius of the drop in the underground water level reached 2-3 km when water was removed from the Nalaikh mine.

Recently, the Nalaikh coal mine has basically stopped working, but due to the establishment of red brick, block and lead factories, hydrogeological research was conducted for the purpose of water supply for the brick factory. Hole 15-EVO No. 10: brown topsoil between 0-0.8 m, pale yellow sand, sandstone, loam between 0.8-5.0 m, argillite with ice crystals between 6.5-12.4 m, gray sand and gravel between 12.7-130 m, alternating narrow layers of argillite and coal; Well 15-PB02 opened blue-gray sand between 40-130 m in the order of 0-40 m sand, silt, and sand. Hydrogeological mapping was conducted as above formations. [MRPAM. Book III Ulaanbaaatar geo-ecology, hydrogeology N.Jadambaa. 2019] (Attachment No. 4 Hydrogeological map)

3 types of aquifers are found in the Nalaikh Depression, which are Upper and Modern Quaternary, Cretaceous, and Carboniferous in soils and rocks. The investigation site is hydro geologically related to slopes lap and valley of south branch mountains of Khentii mountain range and according to the soil water regime of the survey data, the maximum increase in water level is in August-October and maximum decrease in water level is In February-May. [Engineer-geological study Ecotech project LLC]

Climate

According to the climate regionalization code for construction purpose, the climate at the proposed construction site is harsh, being cold in winter and dry and hot in summer. Temperature variation is extreme with winter minimum temperatures as low as -37.2^{0}C and summers producing maximum temperatures regularly above 34.8^{0}C.

The meteorological parameters of the area described in the table below for "Climatic and geophysical parameters [CNaR23-01-09 of Terelj station, Mongolia]

Table 2 Climate parameters

Climate parameters	Unit
1. Air temperature	
• Average temperature	-1.3^{0}C

• Absolute maximum air temperature	32.8^{0}C
• Absolute maximum air temperature in July	30.2^{0}C
• Absolute minimum air temperature	-39.2^{0}C
• Average absolute minimum air temperature	-30.8^{0}C
• Average daily air temperature of outside	6.3^{0}C
• Absolute maximum	27.4^{0}C
2. Outside temperature calculation /area III/	
• The coldest 1 day	-28.3.^{0}C
• The coldest 3 days	-27.3^{0}C
• The coldest 5 days	-26.2^{0}C
• Calculated temperature of the wind	-18.1^{0}C
• The warmest 1 day	22.7C
3. Atmospheric humidity	
Humidity in 13 hours	
• The coldest month	77
• The warmest month	55
4. Amount of precipitation	
• Annual precipitation	233.1 mm
• Precipitation in warm season	220.8 mm
• Daily maximum precipitation	38.2 mm
5. Heating period:	
• Starting	15.Oct
• Ending	15.May
• Duration	242 days
• Mean temperature of heating period	-7.6^{0}C
6. Wind speed	
• Annual average wind speed	4.4m/sec
• Average wind speed in 3 months of winter	2.8 m/sec

Frequency of wind direction and windless period (%), speed m/Sec								
Direction	Frequency (%)				Speed (m/Sec)			
	January	April	July	October	January	April	July	October
North	22.9	30.1	31.9	23.6	7.1	10.1	6.5	7.7
North-East	2.2	2.2	4.8	2.2	3.2	4.7	4.6	3.6
East	1.9	0.6	2.1	0.6	2.1	1.3	4.9	1.6
South-East	6.7	4	10.5	6.4	3.7	6.3	8.3	5.4
South	17.7	12.7	13.7	23.5	3.2	6.3	7.4	5.2
South-west	13.5	13.6	6.1	13.2	2.6	5.7	5.2	4.4
West	10.3	10.7	7.9	8.5	3.0	7	5.5	1.7
North west	24.6	26.1	23	21.9	5	9.7	6.8	6.8
CO	40.4	13.2	21.2	27.6				

Wind barrier (load) Range III	
Wind pressure ^{0}/max gн/m^2	
Once in 5 years	33
Once in 10 years	34
Once in 20 years	42

7. Other climatic characteristics

Winter season construction and technical calculation temperature supply indicators (^{0}C)

The coldest 5 days' temperature, %				The coldest 1 day's temperature, %			
-41.8	-41.7	-39.4	-39.0	-43.3	-43.2	-41.5	-40.7

Outside temperature calculation / enthalpy /				
Air m	An	A Parameter	Б Parameter	B Parameter

		Temperature ^{0} C	Thermal contents, KJ /kg	Temperature ^{0} C	Thermal contents, KJ /kg	Temperature ^{0} C	Thermal contents, KJ /kg
654(879)	Warm	21.9	42.5	30.2	50.8	38.6	59.1
	Cold	-28.2	-28.5	-39.0	-39.4	-49.0	-49.2

Wet snow, thawing, frost								
Range	Wet snow		Thawing		Frost			
	Number of days	Duration	Number of days	Duration	Number of days	Duration	Number of days	
							In 10 years	In 5 years
III	1-5	2-3	1-5	6-14	1-2	1-3	10	5

Standardized load range of snow cover II 50(05) kg/m^2(gPa)					
Zone	Power of lightning			Single lightning	The number of squats per square meter
	Day	Medium duration	The longest duration	Minute	
II	22-36/29/	43-50/46/	56-100	83-121/94/	5-6

Seasonal freezing and thaw climate parameters							
Zone	Frost			Thawing			Zero-degree penetration depth (cm)
	Starting	Ending	Days	Starting	Ending	Days	Starting
II	10-20.X (15.X)	1.V-10.VI (20.V)	195-200 (207)	1-20.IV (10.IV)	1.VI-1.VII (15.VI)	51-80 (65)	300-400 (350)

Table 3 Average temperature in deep soil ^{0}C

Depth, m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
0.2	-19.4	-17.3	-9.8	-0.3	5.5	13.0	15.0	13.7	8.0	0.0	-9.4	-16.7	**-1.5**

0.4	-14.1	-13.5	-7.2	0.2	7.0	12.6	15.0	14.4	10.0	4.0	-3.4	-10.8	**1.1**
0.8	-9.2	-9.8	-6.3	-1.6	2.4	6.4	9.1	10.4	8.6	5.3	-0.4	-6.3	**0.5**
1.6	-3.6	-5.3	-4.6	-2.2	-0.5	1.4	4.1	5.8	6.4	4.8	1.9	-0.5	**0.3**
3.2	0.0	-0.5	-1.3	-1.1	0.8	-0.3	-0.2	0.3	2.4	2.8	2.0	0.8	**0.3**

Table 4 Soil surface temperature ^0C

Stat	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
Terelj	-27.7	-21.4	-8.3	3.2	14.2	20.3	20.3	18.2	9.9	-0.1	-14.2	-24.3	-0.8

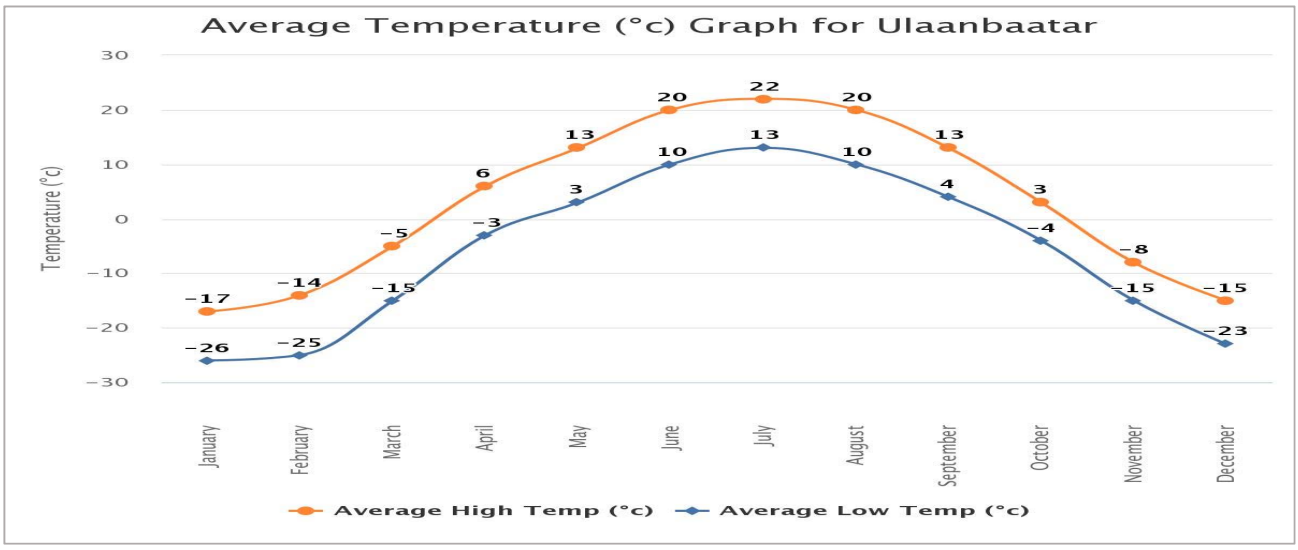


Figure 3 Annual average temperature

In the meteorological data of Ulaanbaatar city, it can be seen from the numerical data that the air temperature is increasing and the amount of precipitation is changing, data graphics are available from https://www.worldweatheronline.com/ulaanbaatar-weather-averages/ulaanbaatar/mn.aspx August 2022.

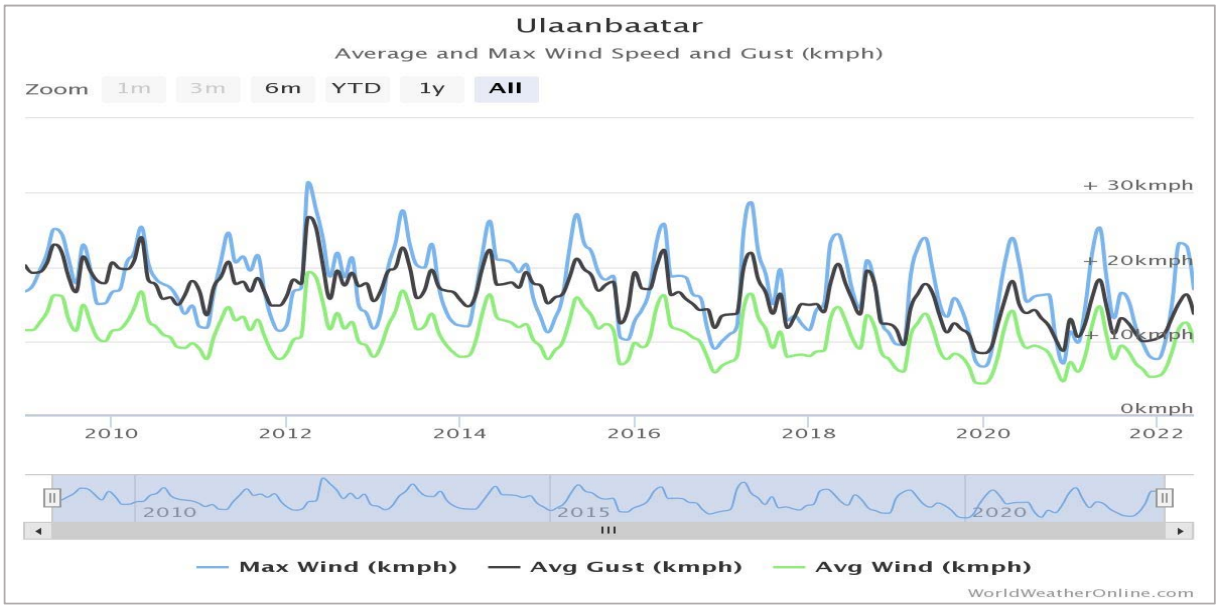


Figure 4 Last 10 years wind speed and gust

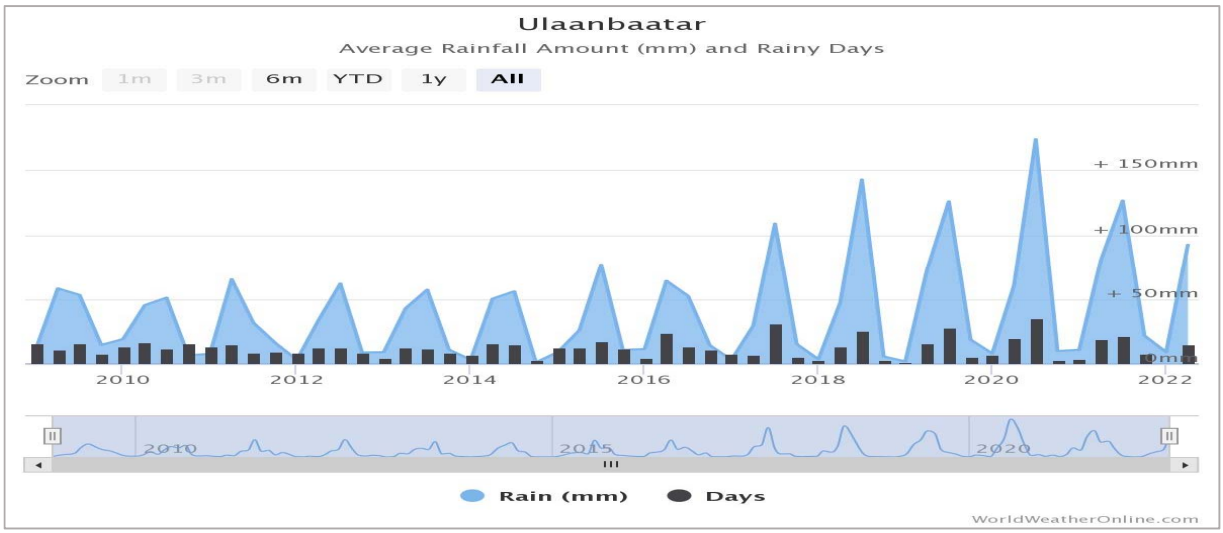


Figure 5 Last 10 years of average rainfall amount

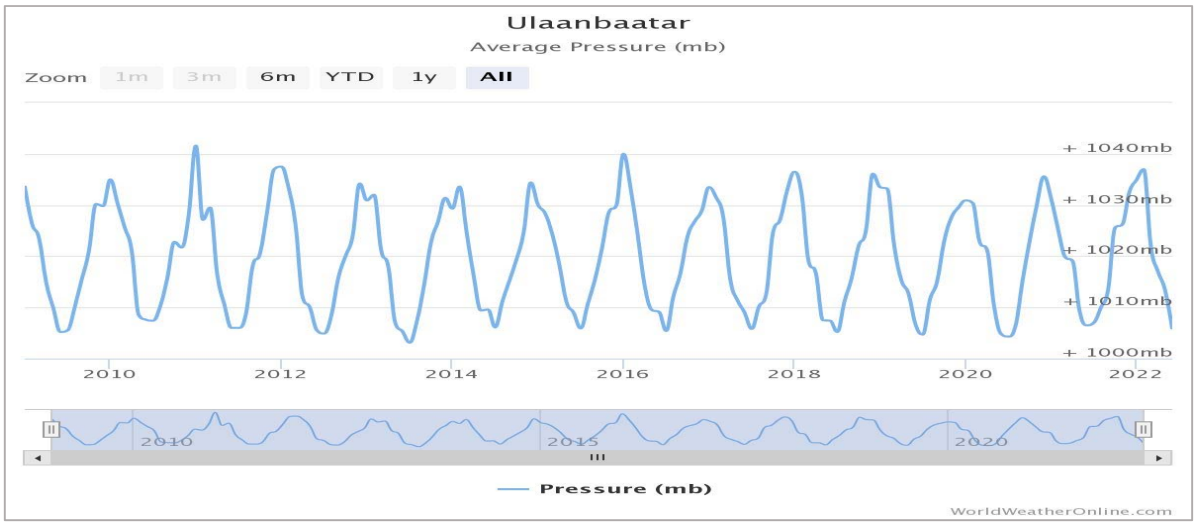


Figure 6 Last 10 years of average air pressure

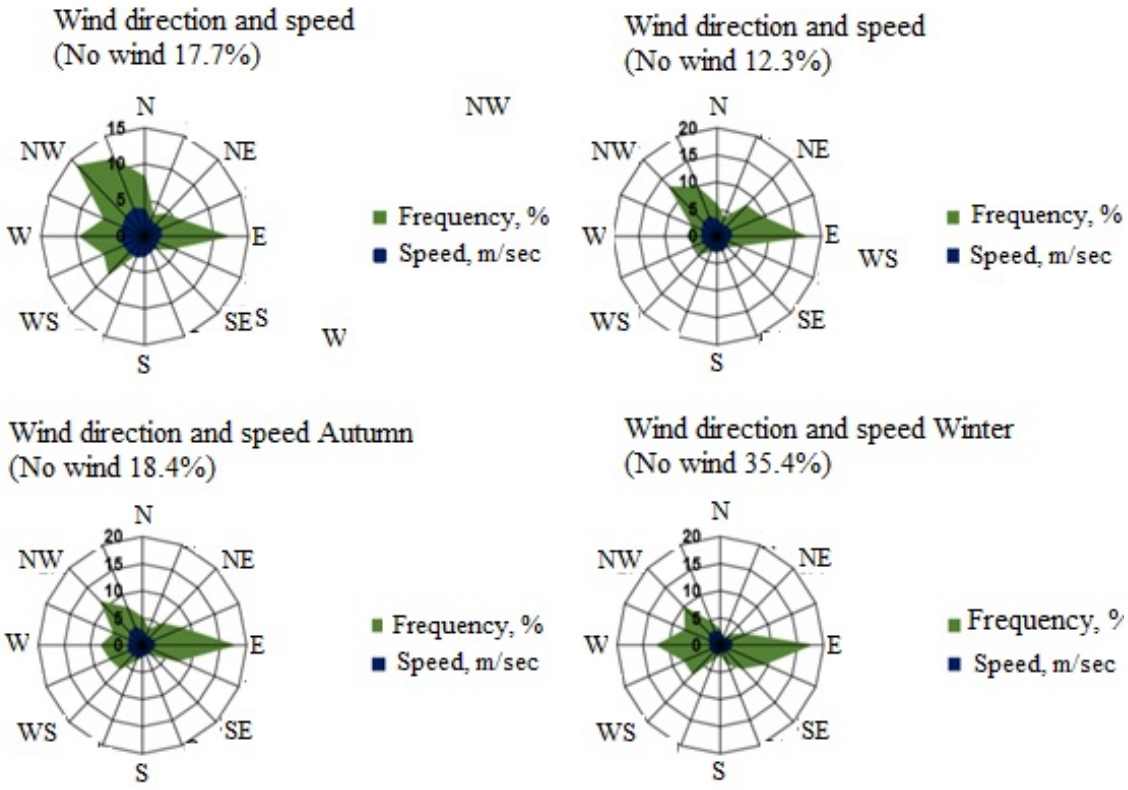


Figure 7 Wind direction and speed frequency, speed

Erosion

The Khentii Mountains get a lot of rainfall, geomorphological there are colluvium, talus and valleys delluvial-proluvial origin sediment are spread out the investigation site. Soil erosion is caused by flash flood. After shower rains, Quaternary loosen sediments in mountainous areas are dissolved and washed away with the rainfall water, causing a flash flood and destroying communication lines, affecting some villages and infrastructure.

Photo 2 a/ Main road from Nalaikh (2nd sub-district) to Erdene soum Aug 2019
b/ Nalaikh district main road (2nd sub-district) to Erdene soum Aug 2019

The gully erosion in the rapidly growing, which one of geo-environmental risk. Therefore, the research aims are to quantify gully properties in data-scarce and resource-limited contexts, to quantify the main properties of and processes related to the urban an gullies and to quantify the potential risk.

The study integrates existing hydrological and land use data, topo graphic surveys and data analysis, as well as basic hydro - meteorological and hydro-morphological data from the USGS data and executed using ArcGIS RUSSLE tool.

Slope Instability

The land's morphology can also have an effects to mobilization of water, contaminations. Steep slopes reduce the amount of water infiltration into the ground, allowing it to flow fast down to rivers as overland flow. Furthermore, steep slopes cause more through flow within the soil. Both have the potential to raise river levels. Water can penetrate the soil more easily on gentle slopes or flat land, increasing lag times.

The slope parameter of Nalaikh investigation total area 14.5 km^2 internal area of point coordinate given Figure No.3. Slope have produced and analyzed from digital elevation model (DEM) data through GIS program and mapped and the area has slope average degree of 0-16^{0,} **(Attachment No.6 Slope and Gully erosion map).**

The area of 16-degree slope is the angle formed by each surface section and a horizontal reference point that evaluates the rate of change in height and allows water to character of flow.

Landslides occur between 30^0 and 40^0, due to the low slope of the project site is 16^0 low risk of landslide.

Photo 3 Erosion can be found in the project area

The Project site is located in the upper reaches of the Tuul River basin. Annual mean river flow at Ulaanbaatar is 26.6 m3 /s, and at Songino is 25.8 m3 /s. The Tuul River's mean 5% statistical likelihood flow is 59.1 cubic meters during high flow years, and 6.0 cubic meters during low flow years. The Tuul River's maximum flow occurs during seasonal rainfall floods, not spring melt.

Table 5 According to the Climate and geophysics features for construction purpose [CNaR 23-01-09],

Average precipitation	
• Annual	233.1 mm
• Warm months	220.8 mm
• Maximum per day	38.2 mm

Region	Thunder			Duration of thunder event	Number of thunder event per 1 m^2
	Per day	Duration of single thunder event, min	Duration of longest thunder event, min	Minute	
II	22-36/29/	43-50/46/	56-100	83-121/94/	5-6

Temperature can also have an impact as it governs evaporation. Hot days allow for more evaporation, reducing the risk of a flood. Climate data for Terelj (Figure 5) provide figure for the average temperature and rainfall data from 2000-2022. The data show that the average annual rainfalls are increasing in Ulaanbaatar area.

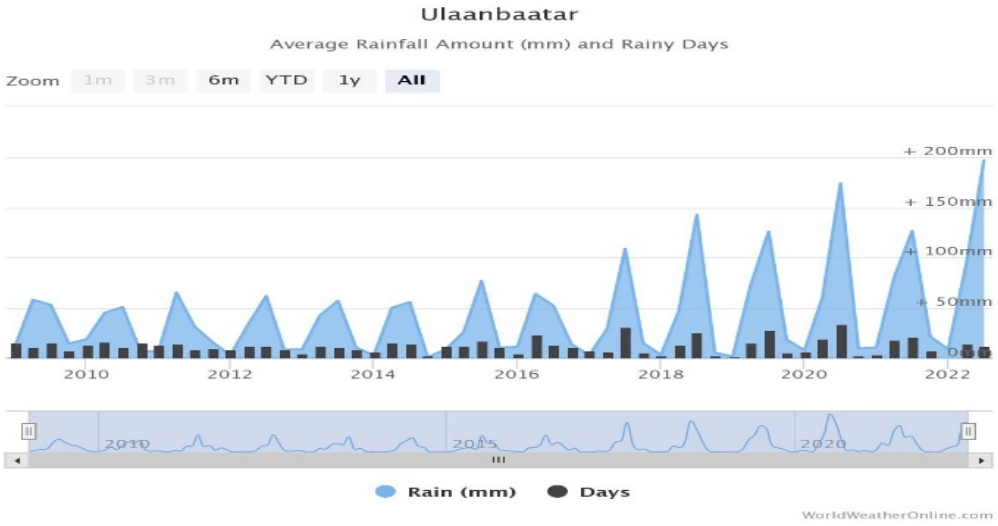


Figure 8. Rainfall Data, Ulaanbaatar by month (mm)

Permeability of soil

The type of soil and rock can also influence what happens to precipitation once it reaches the ground. Impermeable soils and rocks, such as clay or shale, do not allow water to infiltrate, causing water to run off and reducing river lag times while increasing flood risk. Water can infiltrate through permeable rocks. Water can penetrate into porous rocks through cracks, fissures, and bedding planes. Sandstone and other porous rocks allow water to enter their pores. [Engineer-geological investigation report. Ecotech Project LLC 2018]

Table 6. Soil permeability coefficient

Soil index	Soil name	Permeability coefficient

		Average cm/s	Maximum cm/s	Minimum cm/s
CL	Lean clay with sand	0.554	0.820	0.373
GC	Clayey gravel with sand	0.344	0.579	0.231
GC-GM	Silty and Clayey gravel with sand	0.302	0.534	0.219
SC	Clayey sand with gravel	0.371	0.460	0.317
SC-SM	Silty, Clayey sand with gravel	0.329	0.369	0.269

The study area has a gully running from southeast to northwest, and some parts of the gully will be levelled and covered with topsoil, and it will be an area that is beginning to be affected by human engineering activities. The research area is an area where washing can take place during the spring flood season and during the rainy season of summer and autumn, and it is an area where linear washing takes place intensively.

Heavy metal can be distribute by natural weathering and volcanic eruptions have also contributed significantly to heavy metal pollution.

Project site has **moderate risk of flood** depending on following parameters. **(Attachment no.6 Slope and gully map).**

iv. Heavy metal result

Heavy metals occur naturally in the soil environment as a result of weathering of rocks weathering processes of rocks, in addition as from human activities such as automobile wrong usage, fuel splitting, industrial and energy production, and waste disposal. Large amounts heavy metal pollutants deposited on the soil may be turned and transported by plants as they pass through the food chain to animals and humans at the top.

Therefore, heavy metal monitoring assessment is very important in order to assess human exposure and ensure a sustainable environment.

There are several ways of heavy metals contamination in the environment:

Heavy metals are naturally occurring elements in the earth's crust; however, human activities such as mining and industrial operation and production, and domestic and agricultural use of metal-containing compounds cause a significant amount of environmental contamination. Heavy metal distribution sources can be as followings:

• Environmental contamination can occur as a result of metal corrosion, atmospheric deposition, soil erosion, and heavy metal leaching into soil and ground water.

• Natural processes like weathering and volcanic eruptions have also contributed significantly to heavy metal pollution.

• Industrial sources include metal processing, mining, coal combustion for power plants, petroleum combustion, plastics, textiles, microelectronics, wood preservation, and paper processing plants. [Mariam Emiabata, B.Sc. Geophysics, UNILAG . HEAVY METALS CONTAMINATION AND ENVIRONMENTAL IMPACTS Page:3]

iv.1 Investigation method:

I have chosen to analyze soils of the Nalaikh to compare and provide a representative distribution of heavy metals within the area.

The soil sampling sites elements in the survey of Nalaikh soils were selected according to the Mongolian geological survey mapping sampling methodology, total of 150 samples taken from every 2.5-3 km of ger district, formal glass factory and river bank area according to *MNS 3298:1990 Nature Conservation. Soil. The general requirements for taking samples* for analysis shall follow the standard. Take 100 g of soil from 0-20 cm deep from 5 points in one area, mix together and prepare an average sample. The average sample size is at least 300 g. **(Attachment Map of samples taken)**

2 boreholes drilled around dump area to determine physical properties of soil, including heavy metals content.

Also, 10 water samples were taken from surface including Nalaikh River and springs.

The investigation is purposed for drawing, method is based on technical specification from client and according to CNaR11-03-11 (Construction Norms and Rules) and MRPAM mapping sampling methodology to determine soil properties and distribution, water, permafrost.

Surface and underground water sampled and filed analysis has been completed to determine Water quality index of the investigation area.

Table 7 Investigation methodology

Type	Analysis type
Soil chemical	NITON XRF analysis (Pb, Sn, Cu, Zn, Ni, Co, Cr, V, Mo, As, Hg, Cd)

	HANNA pH meter
Water, hydro chemical analysis	ICP OES method : Pb, Cu, Zn, Ni, Co, Cr, V, Mo, As, Cd, U, Th analysis and some bacteria for surface water HANNA Portable water instrument
Mapping	GIS

Mapping

Mapping of the investigation are performing by ArcGIS 10.4 software, produced several 1:5 000 map such as geological, hydrogeological, sampling, gully erosion map and Soil arsenic distribution map, Water arsenic distribution map and Geo-environmental map.

iv.2 Soil geochemical result

The surface of the soil in the study area of Nalaikh district is a land system that has been subject to anthropogenic changes and nature-anthropogenic changes, along with roads, streets, and fields that are partially covered with pavement.

In this study, aim to determine the current status of heavy metal pollution in the surface soil around 14.5 km^2, Nalaikh district Ulaanbaatar city and it is framed as L-48-11 nomenclate and map its distribution.

The heavy elements in the 336 surface soils (sampled 0-30 cm below the surface) were measured by ICP-OES (determined by an inductively coupled plasma optical emission spectrometer) and X-ray fluorescence (XRF) device for element analysis.

Heavy metal concentrations (Cr, Cu, Hg, Ni, Pb, and Zn) and arsenic (As) were analyzed and estimated. The results revealed a wide range of Heavy metal concentrations and other soil properties. The results were compared to MNS 5850:2019 Soil quality. Soil pollutants' permissible value. The average soil (0-30 cm depth) of Cr, Cu, Pb, and Zn in soils were 18.14, 12.15, 11.89 and 46.29 mg/kg, respectively, As 7.98 mg/kg which is 1.5-2 times larger in the ger area. (Attachment: Chemical result)

Table 8 Soil heavy metal statistical values

Sample	As mg/kg	Cd mg/kg	Cr mg/kg	Cu mg/kg	Ni mg/kg	Pb mg/kg	Zn mg/kg	pH
Quantity	352	77	353	353	353	353	351	336
Min	0.21	0.0001	3.4166	2.1729	5.5142	4.2063	7.1515	4.27
Max	28.07	10.44	38.67	51.48	32.32	85.78	248.11	9.82
Average	7.98	1.12	18.14	12.15	15.37	11.89	46.29	6.61
Median	7.61	0.89	17.69	11.79	15.19	11.35	44.70	6.57

Table 9 Soil heavy metal statistical compared with MNS 5850:2019 standard and World Clark values

Elements	Sample numbers	Average value of the samples, mg/kg	MNS 5850:2019			World Clark values (by Bowen 1979)		
			Permissible value, mg/kg	Exceeded samples	Percentage of exceeded samples %	Д Average value, mg/kg	Exceeded samples	Percentage of exceeded
As	352	7.98	20	3	1%	22	3	1%
Cr	353	18.14	150	-	-	70	-	-
Cu	353	12.15	100	-	-	30	3	1%
Pb	353	11.89	100	-	-	35	0	-
Cd	77	1.12	10	-	-	0.35	0	-
Ni	353	15.37	1000	-	-	0.06	0	-
Zn	351	46.29	600	-	-	1	0	-

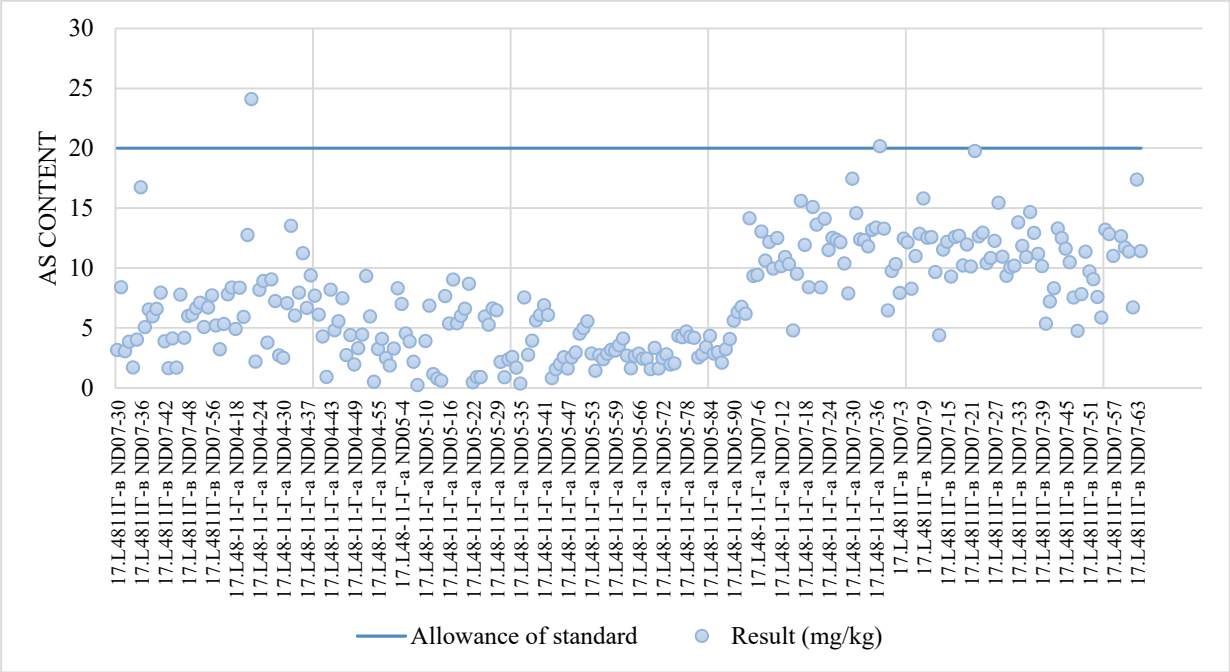


Figure 9 Nalaikh soil arsenic content

Photo 4 Arsenic content higher than 20mg/kg

The concentration of some heavy elements may be more or less different depending on the local soil and rock characteristics, and in some cases, it may be natural rather than human activity. It is estimated by the formula of Hakanson (1980).

Cn is the metal (*n*) As concentration in soil of the study area

Bn is the background value of the corresponding metal (*n*), As average value is 7.98 mg/kg

Factor 1.5 is the background matrix correction

$$I_{geo} = In(C)C = Log_2(\frac{C}{Ref_{base\ sample} * 1{,}5})$$

Geo-accumulation index ≤ 1.3 Natural Geo-accumulation index > 1.3 Anthropogenic

Table 10 Nalaikh soil arsenic geo-accumulation index

Sample ID		MNS 5850 standard Allowance of standard (mg/kg	Concentration of As Result (mg/kg)	Geo-accumulation index value
S1435	17.L4811Г-в ND07-36	20	16.73	1.55
S1235	17.L48-11-Г-a ND04-22	20	24.09	2.23
S1364	17.L48-11-Г-a ND07-4	20	14.14	1.31
S1377	17.L48-11-Г-a ND07-17	20	15.60	1.44
S1380	17.L48-11-Г-a ND07-20	20	15.09	1.40
S1383	17.L48-11-Г-a ND07-23	20	14.10	1.31
S1390	17.L48-11-Г-a ND07-30	20	17.45	1.62
S1391	17.L48-11-Г-a ND07-31	20	14.57	1.35
S1397	17.L48-11-Г-a ND07-37	20	20.16	1.87
S1408	17.L4811Г-в ND07-9	20	15.80	1.46
S1421	17.L4811Г-в ND07-22	20	19.76	1.83
S1427	17.L4811Г-в ND07-28	20	15.44	1.43
S1435	17.L4811Г-в ND07-36	20	14.65	1.36

S1462	17.L4811Г-в ND07-63	20	17.37	1.61

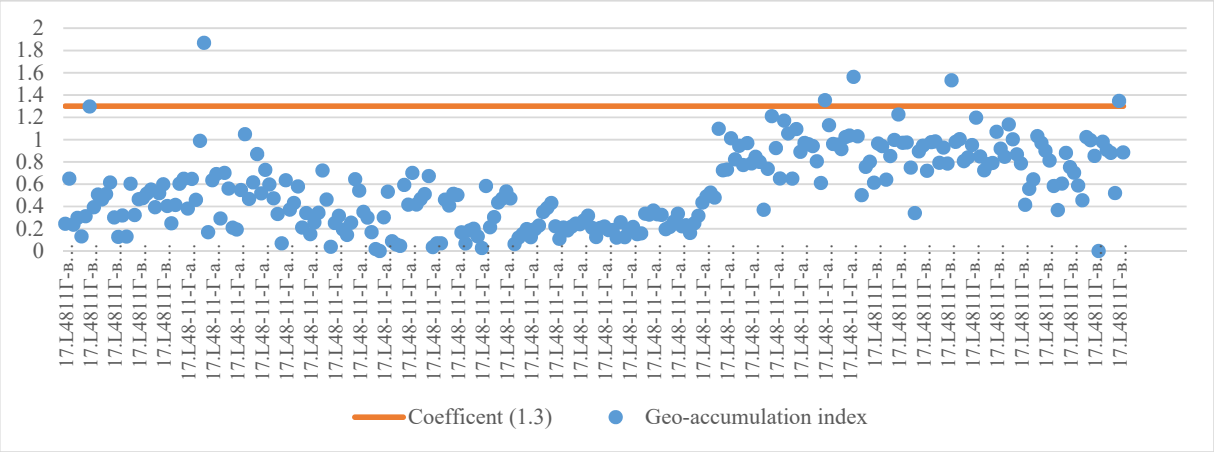


Figure 10 Nalaikh soil arsenic geo-accumulation index

Also, using the measurement results, I tried to evaluate the negative effects of arsenic pollution on the environment and the differences in pollution sources with the ecological risk index [Hakanson (1980)], which is the most commonly used international soil ecological and geochemical assessment.

Ecological Risk Index (Er)= Pollution Index (PI) * Dispersion Factor (Tr)

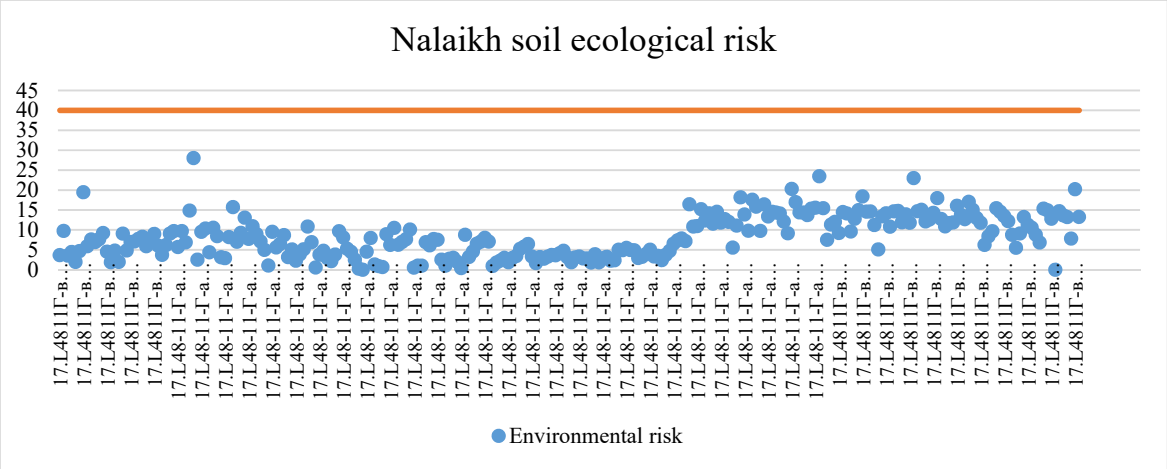
Dispersion Factor (Tr)= 10

Er < 40-Very low risk; 40 < Er < 80 –creates slight risk;

80 < Er < 160- Need to pay attention; 160 < Er < 320 - High risk;

Er > 320 - Very risky

Figure 11. Nalaikh soil arsenic ecological risk



The occurrence in concentrations less than 100 mg/kg, chemical elements in soil are referred to as heavy elements. In fact, many of these elements are present at much lower concentrations than this. Cadmium, chromium, cobalt, copper, gold, lead, manganese, mercury, molybdenum, nickel, palladium, platinum, rhodium, silver, thallium, tin, vanadium, and zinc are among the heavy elements of environmental and human/animal health importance. Other important heavy elements are metalloid (such as boron, arsenic, and antimony), nonmetal (such as selenium), actinoid (such as uranium), and halogen (such as iodine and fluorine) elements. [Peter S. Hooda Heavy elements in soils-2010].

Heavy elements are primarily obtained from the soil by plants, animals, and humans. Elevated levels of heavy elements in soil as a result of human activity pose a variety of environmental and health risks. [Peter S. Hooda Heavy elements in soils-2010].

Arsenic (As) is a naturally occurring and abundant element in the Earth's crust that is classified chemically as a metalloid due to its metallic and nonmetallic properties (Nriagu et al., 2007; Kesici, 2016). Arsenic is found in both organic and inorganic forms in soil, with the former being a highly toxic form (Shrivastava et al., 2015).

However, the average value of arsenic in the field is 7.98 mg/kg, not only indicating that it is a naturally occurring concentration, but also according to the comparison of international soil ecological and geochemical assessment or ecological risk index, it is assessed as a very low risk to the ecology of the region.

The research was concentrated on Arsenic because of the metal wat only heavy metal which was exceeded from the MNS 5850 standard allowance, were collected 260 soil samples.

Two methods were used in this study for heavy metal analysis, rapid test by XRF 177 soil samples, and average of As was 14.02 mg/kg and highest concentration was 55.01 mg/kg and lowest is 8.07 mg/kg.

Also, in previous studies of heavy metal in near Nalaikh area was conducted by ICP OES identifies as less toxic, which is similar with the current study result.

The measurement results of the present study were compared with previous literature to assess the difference between the present and previous studies, although the compared measurement results were different due to many parameters such as measurement condition and difference in measurement technique.

iv.3 Physical-mechanical properties of soil

To purpose of investigate heavy metals distribution in deep ground soil, I have managed to drill boreholes as well as determine physical properties.

Drilling work of 7 boreholes with depths of 4.00-6.00m, total 34.0 meters drilled by UGB50- 1BC drilling equipment. Bore holes drilled with steel rod in a diameter of 168mm by the dry circular methodology.

Table 11 Borehole log

Borehole numbers	Location (PK)		Height (м)	Depth (м)	Soil boundaries
	X	Y			
B-1(21)	664708.3293	5296443.2460	1464.14	8.0	5,50м
B-2(19)	664672.9454	5296471.1559	1463.64	8.0	5,00м
B-3(22)	664656.2204	5296449.7303	1461.69	7.0	
B-4(23)	664637.4045	5296498.7116	1463.18	8.0	5,40м
B-5(28)	664617.8367	5296310.2855	1455.52	8.0	4,20м
B-6(25)	664637.2452	5296335.0952	1455.47	8.0	4,50м
B-7(27)	664624.2498	5296345.2623	1455.28	8.0	4,80м

Sampled analyzed in laboratory according to ASTM, AASHTO, MNS-2487-2004 and Mongolian regulation classified in 7 soil elements.

Table 12 Soil physical properties

	SOIL CLASSIFICATION	Cohesion	Internal friction angel	Deformation module kgh/cm^2
		Normative kgh/cm^2 Pa	Normative /degree/	
		$C^н$	$\varphi^н$	$E^н$
1	**SC** – Clayey sands, sand-silt mixtured	37	25	26
2	**SC-SM –** Sand-silt mixtures, clayey sands	21	29	32
3	**SM –** Sand-silt mixtures	2	40	45
4	GC - Clayey gravels, gravel-sand-clay mixtures soil	36	20	24

5	**GC- GM** – Clayey gravels, gravel-sand-clay-mixtures	21	29	32
6	**GM –** Silty gravel, gravel-sand-silt-mixtures	21	29	32
7	**CL –** Silt and very fine sand	57	18	21

Soil physical properties

In the territory of the Nalaikh area, the main geomorphological patterns of erosion, sediment accumulation, and accumulation surfaces will be formed. In the center, the surface of accumulation of sediments or the part of the foothills is dominant. The depositional surface around the Nalaikh River covers only a small part of the center.

Of these, the main aquifer that affects urban planning is groundwater stored in the upper and modern Quaternary mountainside sediments, usually lying on top of perennially frozen subsoil. It occurs at a depth of 2.0-4.0 m from the ground surface with a thickness of 0.5-2.0 m.

The territory of the district belongs to the area of multi-year frosty soil. In the area, permafrost appears from a depth of 2.7 - 3.7 m, and merges with the upper border of permafrost and the lower border of the depth of seasonal freezing.

The water on the clay subsoil is 1.80-2.0m below the ground surface. Seasonal freezing takes place at a depth of 2.70-3.0 m. Due to human engineering activities and improper use, the moisture and ice of the frozen soil spread over the district has decreased, the visible boundary has decreased, and then it has started to thaw. Because of this, in some places, the upper boundary of the frost is lowered, and the frosty soil of many years is at a depth of 6-7m. [Mongolian geotechnical condition.D.Dashjamts.2015]

iv.4 Water Quality

To determine Arsenic content in water area of Nalaikh, 7 surface water and 4 groundwater sampled and analyzed. (Attachment results are attached)

The results of the chemical and physical characteristics of groundwater are compared with "MNS 6148:2010 Water quality: Maximum limit of substance contaminating the ground water. As well as Order of the Minister of Environment No. 143/A/352 of 1997 "Rules for the Protection of Water Resources from Pollution".

F_2= ((number of failed indicators)/(total number of indicators))×100 F2 is percentage of failed indicators

Calculated according to the formula $\boldsymbol{WQIndex = 100 - \frac{\sqrt{(F_1^2+F_2^2+F_3^2)}}{1.732}}$

Table 13 Rating of WQI value

WQI Value	Rating of Water quality
91-100	Excellent water quality
71-90	Good water quality
51-70	Medium water quality
26-50	Bad water quality
0-25	Very bad water quality

Table 14 WQI of river samples of the investigation area

Sample name	Water quality %	Water quality index
Elstei river (High) stream	61.1	Medium WQ
Elstei river (Down)	50.0	Bad WQ
Nalaikh river	55.6	Medium WQ
Baast river	66.7	Medium WQ
Enger shand stream	63.0	Medium WQ
Enger shand stream	65.0	Medium WQ
Orgidog stream	67.7	Medium WQ

Table 15 WQI of Water well and Springs

Sample No	MNS 6148:2010	ND04-UH-477	ND04-UH-478	ND04-UH-479
Cl^-	350	12.76	137.56	9.93
SO_4^{2-} mg/l	100	31.69	456.45	79.03
pH	6.5-8.5	7.88	8	8.02
EC Abs.[µS/cm]	800	491	487	706
RES[Ohm-cm]		1965	1984	1357
TDS, mg/l	1000	254	252	368

Al mg/l	0.5	0.005	0.001	0.006
As mg/l	0.01	0.003	0.001	0.000
Ba mg/l	2	0.013	0.050	0.034
Be mg/l	0.001	0.000	0.000	0.000
Cd mg/l	0.003	0.00	0.00	0.00
Cr mg/l	0.07	0.000	0.000	0.000
Cu mg/l	1	0.001	0.002	0.002
Fe mg/l	0.3	0.002	0.000	0.000
Hg mg/l	0.002	0.000	0.002	0.002
Mn mg/l	0.1	0.067	0.132	0.000
Mo mg/l	0.04	0.001	0.000	0.001
Ni mg/l	10	0.000	0.000	0.000
Pb mg/l	0.05	0.005	0.006	0.004
Rb mg/l		0.000	0.000	0.000
Sb mg/l	0.006	0.001	0.000	0.001
Se mg/l	0.04	0.000	0.000	0.000
Zn mg/l	5	0.001	0.003	0.000
WQI		100	91	100

v. Discussion part

Discussion in heavy metals:

According to predictions, urban areas can be considered risk areas for trace metals and will continue to stay so for a long time. The project's overarching goal was to gain systematic knowledge about the amounts and behavior of heavy metals in the Nalaikh area.

The aim of the present study was to evaluate human health and potential ecological risk assessment in the ger district of Nalaikh area. Soil samples were collected for these risk assessments based on reference studies that investigated heavy element distribution in soil samples near the ger, industrial, waste, old glass factory, and mine area in Nalaikh area. In total, 356 soil samples were collected and 26 heavy metals were identified by inductively coupled plasma optical emission spectrometry (ICP-OES) and X-ray fluorescence methods. To validate the soil level of contamination, the measured heavy metals values were compared to the reference data such as MNS 5850 standard, mean value of the area and world Clark values. Pollution indices such as the geo-accumulation index and ecological risk were used to assess soil contamination..

The results were compared to MNS 5850:2019 Soil quality. Soil pollutants permissible value. The average soil (0-30 cm depth) of Cr, Cu, Pb, and Zn in soils were 18.14, 12.15, 11.89 and 46.29 mg/kg, respectively, As 7.98 mg/kg which is 1.5-2 times larger in the ger area. (Attachment: Chemical result)

However, the average value of arsenic in the field is 7.98 mg/kg, not only indicating that it is a naturally occurring concentration, but also according to the comparison of international soil ecological and geochemical assessment or ecological risk index, it is assessed as a very low risk to the ecology of the region.

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Also, in previous studies of heavy metal in near Nalaikh area was conducted by ICP OES identifies as less toxic, which is similar with the current study result.

The measurement results of the present study were compared with previous literature to assess the difference between the present and previous studies, although the compared measurement results were different due to many parameters such as measurement condition and difference in measurement technique.

Discussion in soil gully

According to Sherbakov and Bayaraa, the radius of the drop in the underground water level reached 2-3 km during the removal of water from the Nalaikh mine. The geological formation of Nalaikh coal mine consists of Lower Cretaceous, Neogene and Quaternary age sediments. Lower Cretaceous sediments contain coal. Therefore, sedimentary rocks of Lower Cretaceous age have been environmentally disturbed by mine activities. The Neogene and Quaternary sediments overlying the Lower Cretaceous sediments have also been significantly affected by geo-ecological changes.

Several studies have been done anIn the case of underground mines, Geoecological changes of coal-bearing rock formations and underground water contained in them. Dorge (2002) studied respectively. It was found that three cracks, 50-100m long, 5-50cm wide and 1-3m deep in places that can be measured, formed from east to west. [MRPAM. Book III Ulaanbaatar geo-ecology, hydrogeology N.Jadambaa. 2019]

The mining and geological conditions of the Nalaikh mine have worsened during the years of operation, due to the privatization of the mine by individuals with poor management. Since the beginning of Mongolia's transition, the Nalaikh mine has been disintegrated, and now there are many small groups of private coal miners are still operating. Coal production has decreased dramatically, but due to technogenic reasons such as many small "gate" and relatively increased penetration without anchoring, as well as many years of frost and hiil, expansion and exploitation phenomena, mud and clay are widely distributed, and there are many sulfur iron grains in coal. Due to this, geoecological changes have not decreased due to the formation of rock formations and depressions on the surface of the earth.

SUMMARY AND OUTLOOK

- The study area covered 14.5 km2 of Nalaikh district with anthropogenic load and could be further expanded into an industrial zone, covering geo-risk and human activities.
- Soil geochemical studies have identified man-made anomalies around the plant that exceed arsenic standards.
- Arsenic levels in surface and groundwater near Nalaikh and Elstei rivers have been found to no-exceedance from standards. But concertation of sulfate and bacteria was exceeded the standard value. Which made water quality index 50-65%.
- Mineral and coal mining activities, which are common in the suburbs of Ulaanbaatar, have become a major factor in ecosystem degradation. It has been stopped since 2018, the mine have not remediate completely which is still affecting to the environment.
- Miners working at informal coal mines frequently risk their lives in unventilated mine shafts with few timber supports that are prone to collapse.
- Our study of geo hazards at the site shows that serious geological phenomena — earthquakes — have no consequences and may hinder further urban development development.
- In order to reduce geotechnical risks during urban planning and geotechnical studies such as earthquakes and soil liquefaction during the development phase, assistance in micro-location of facilities, and understanding of project site variability.
- Effective use of climate control and weather forecasts will focus on establishing a good disaster prevention system.

✓ Urban planning and rehabilitation activities need to be planned taking into account the geological and geomorphological features of the area, its location in the natural zone, the characteristics of adjacent ecosystems, the degree of erosion and the risk of external influences on the landscape.

✓ As the soil around the study area is degraded due to technical impacts, protection measures such as greening, vegetation, and increasing the number of integrated roads, especially in ger areas, are another form of degradation prevention.

✓ The widespread mining and coal mining activities in the suburbs of Ulaanbaatar are extremely detrimental to the ecosystem and require immediate rehabilitation to improve ecological capacity.

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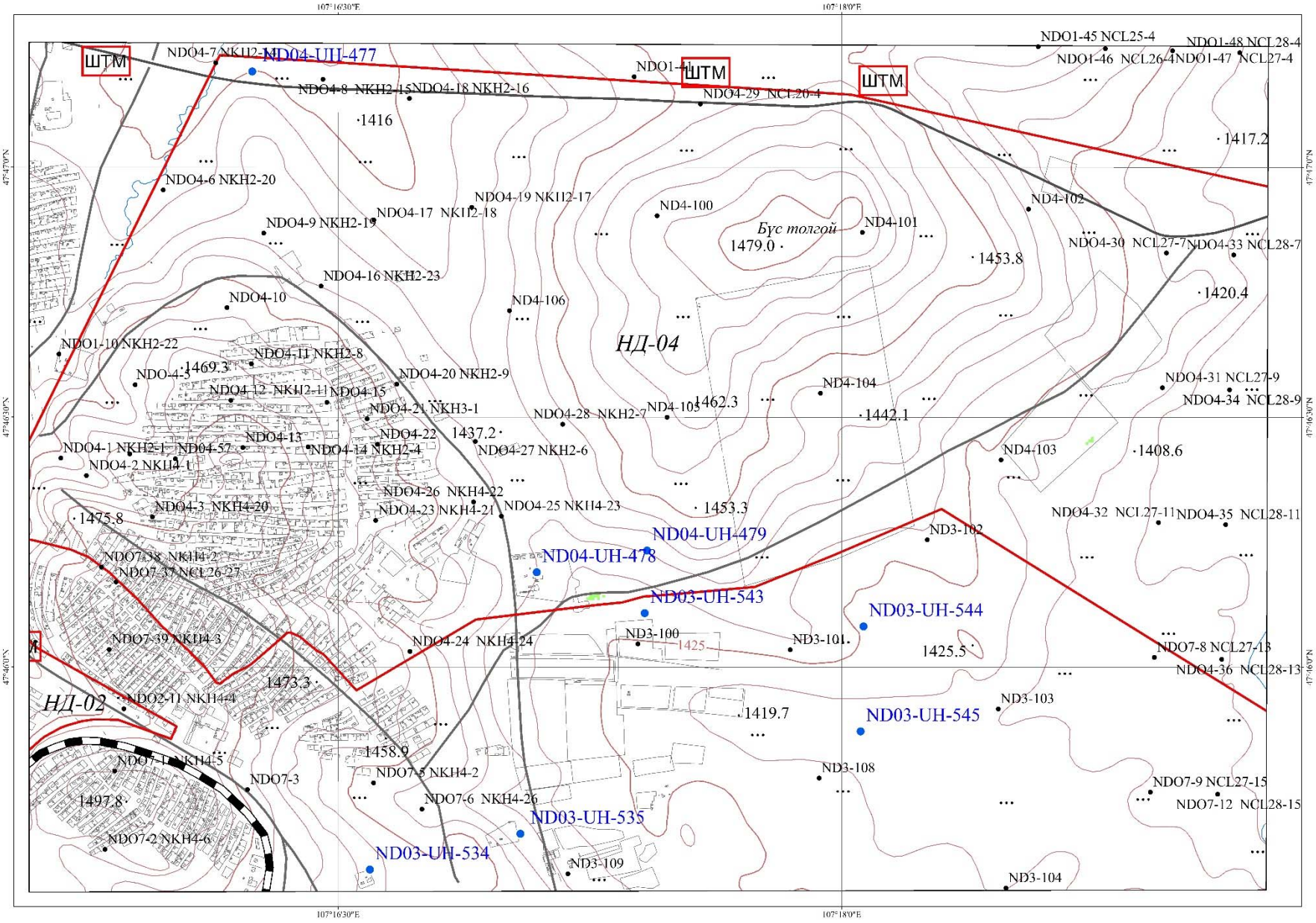
SOIL and WATER SAMPLED POINT MAP OF NALAIKH AREA Scale 1 :5 000



ТАНИХ ТЭМДЭГ

Талбайн хэмжээн дэх түүний үсэны дээжлэлт түүний дугаар

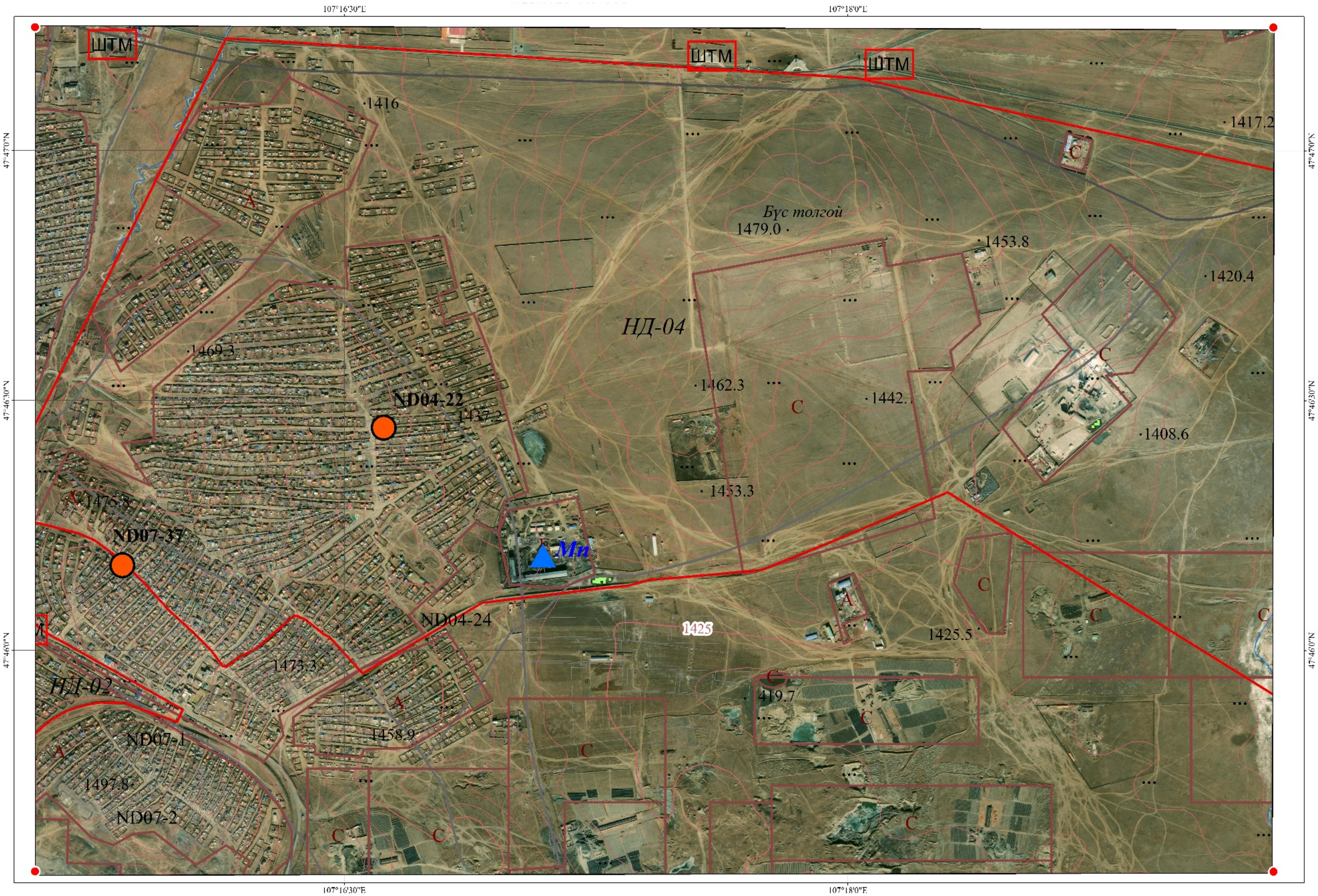
Талбайн хэмжээн дэх хөрсний дээжлэлт түүний дугаар

Хороолны хил

1942 оны солбицолын тогтолцоо
Балтийн тэнгисийн өндрийн систем

0 0.5 1 км

As exceeded area MAP OG NALAIKH AREA Scale 1 :5 000



ТАНИХ ТЭМДЭГ

Томоохон голын хөндий тодорхойлох хагарал

Жижиг цутгал голын хөндий, талцан, хажуугийн нугачаа, хөтөл тодорхойлох хагарал

Ашигт малтмалын олборлолтын улмаас ихээр эвдэрсэн газруудын хил заг

С — Үйлдвэрийн бүс (хөнгөн хүнс, эрчим хүч, барилга, уул уурхайн гм)

А — Гэр хороолол (инженерийн хангамжгүй орон сууц)

НД-04 — Хорооны хил

Хөрсний дээжин дэх хүнд элементийн MNS5850:2019 зөвшөөрөгдөх агуулгаас их

Mn — Гүний усны дээж, түүний стандартаас давсан агуулагууд (MNS0900:2005)

1942 оны солбилцолын тогтолцоо
Балтийн тэнгисийн өндрийн систем

0 0.5 1 км

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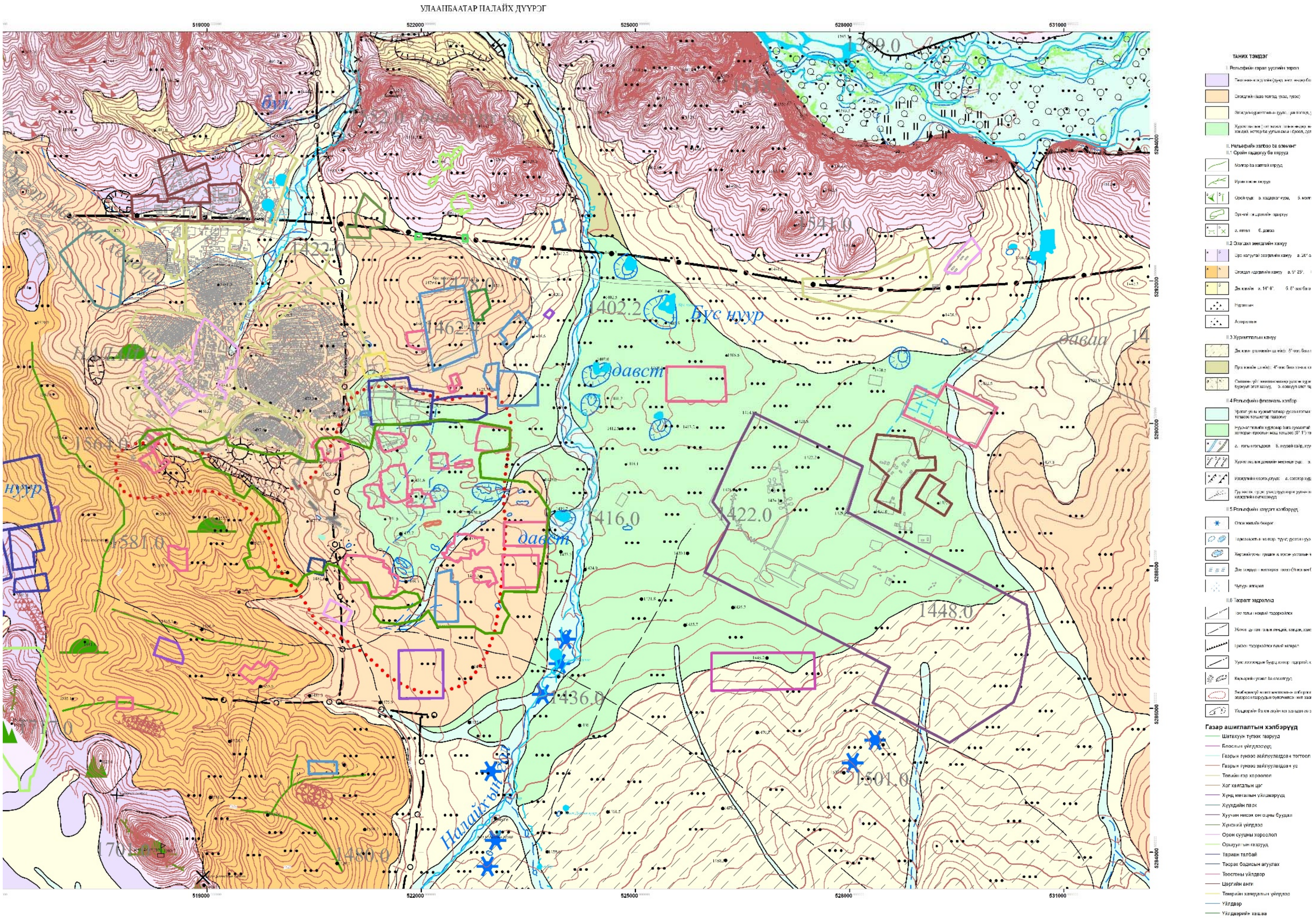
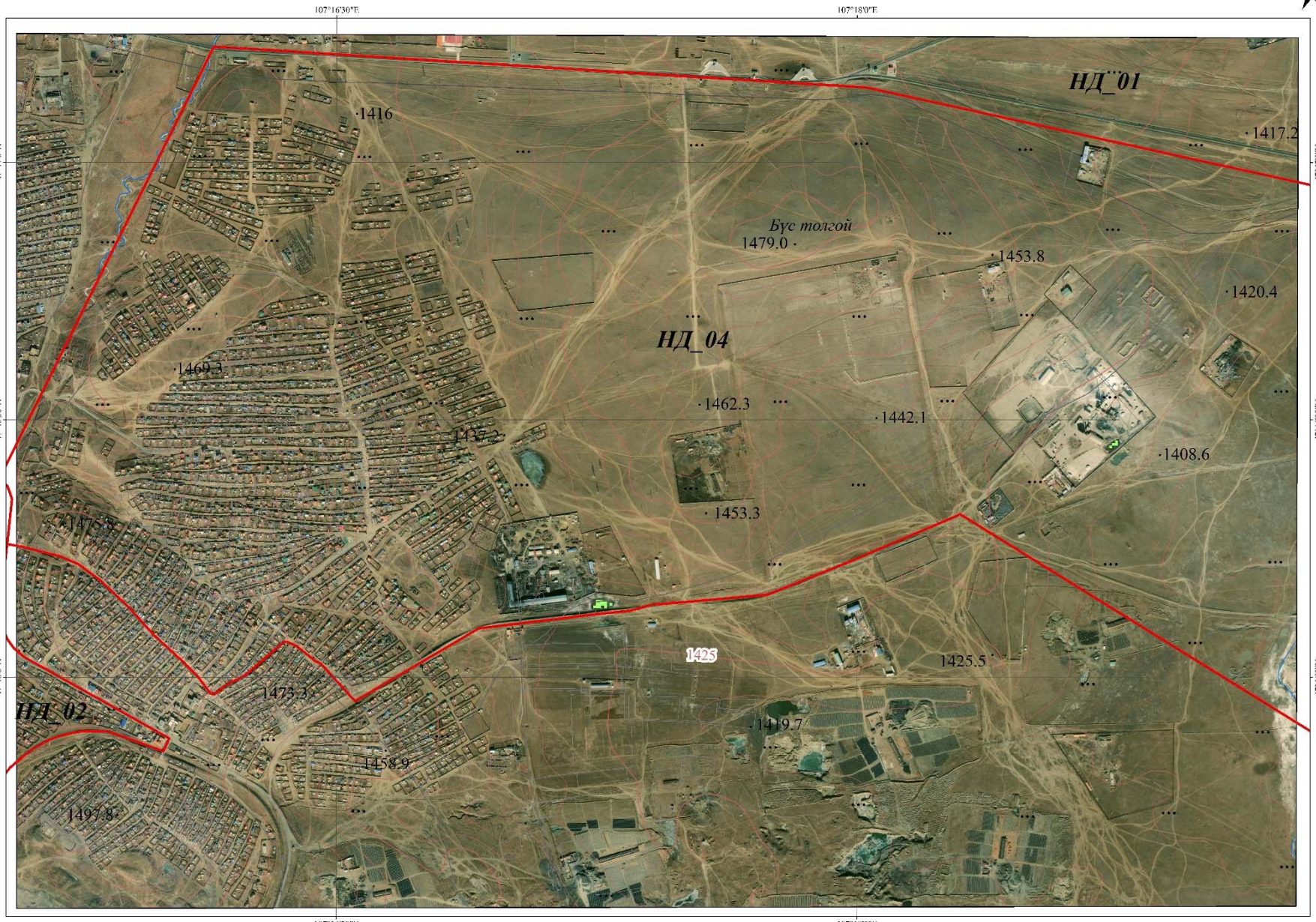
GEOMORPHOLOGICAL MAP OF NALAIKH AREA Scale 1 :5 000



SATELITE MAP OF NALAIKH AREA Scale 1 :5 000

Масштаб 1:5 000



ТАНИХ ТЭМДЭГ

Хороогоны хил

Талбайн хэмжээ			14.5 км²		
Уртраг			Өргөрөг		
107	15	34.6	47	47	14.8
107	19	16	47	47	14.8
107	19	16	47	45	33.4
107	15	34.6	47	45	33.4

1942 оны солбилцолын тогтолцоо
Балтийн тэнгисийн өндрийн систем

0 0.5 1 км

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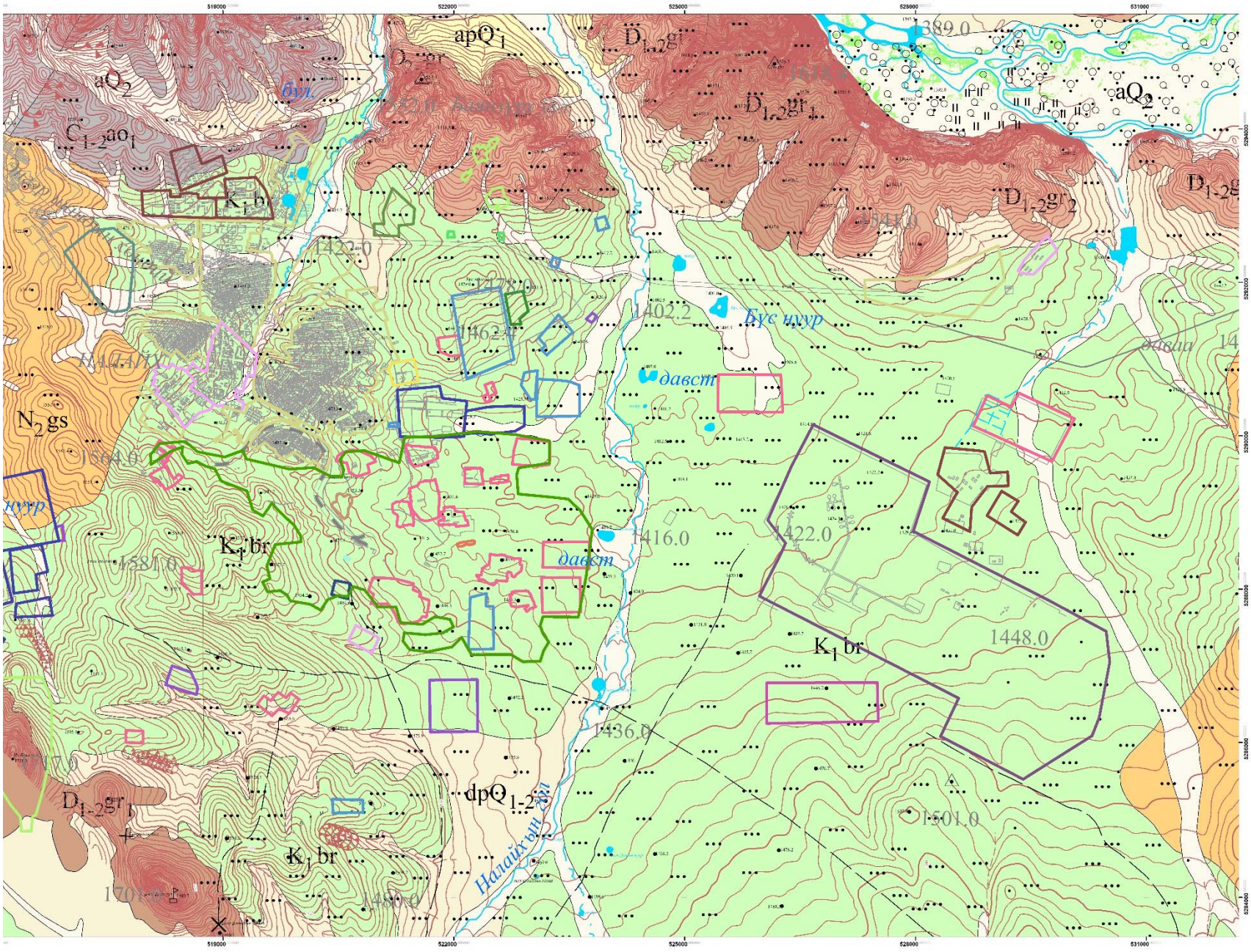
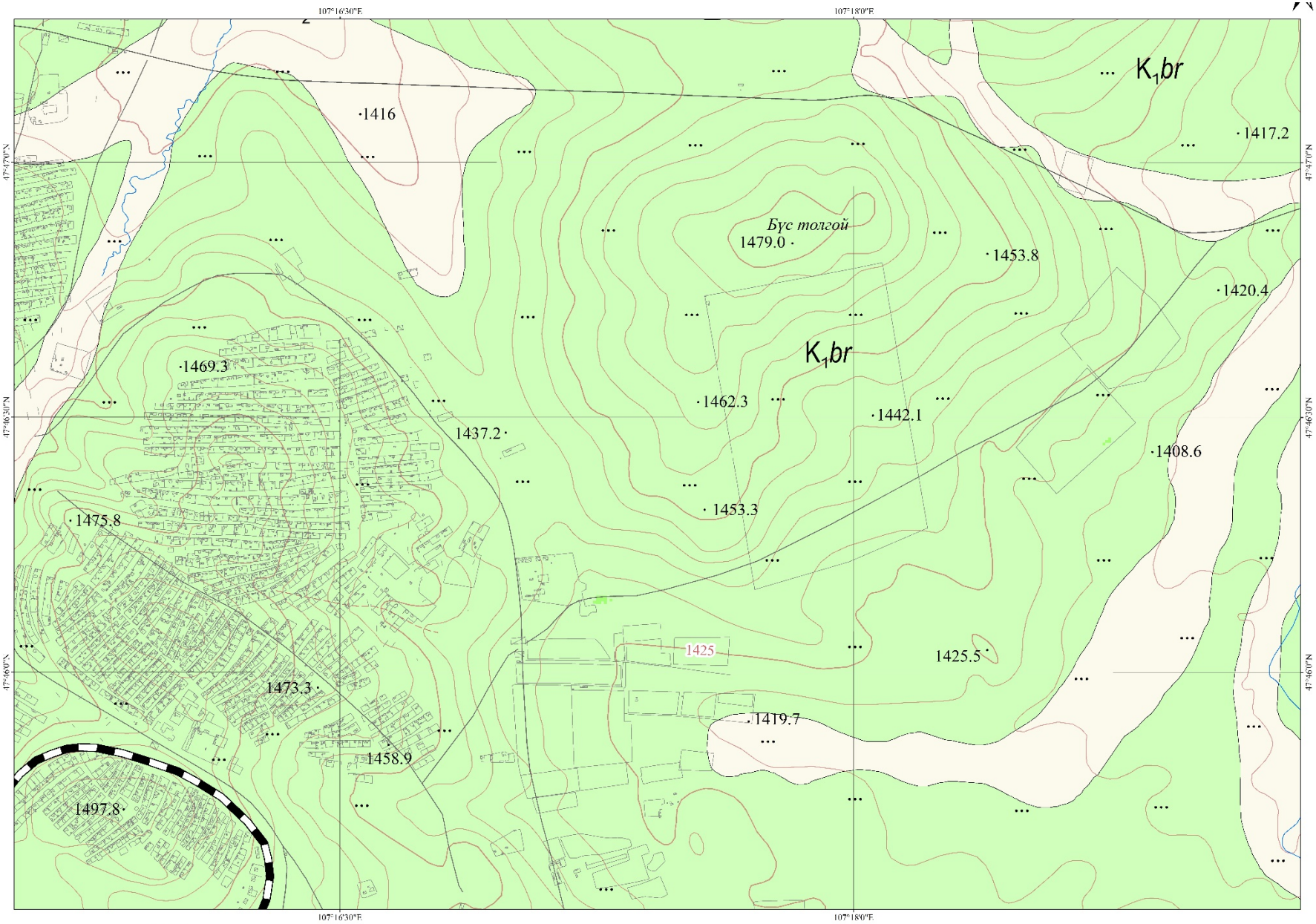
GEOLOGICAL MAP OF NALAIKH AREA Scale 1 :5 000



GEOLOGY MAP OF AREA "NALAIKH"

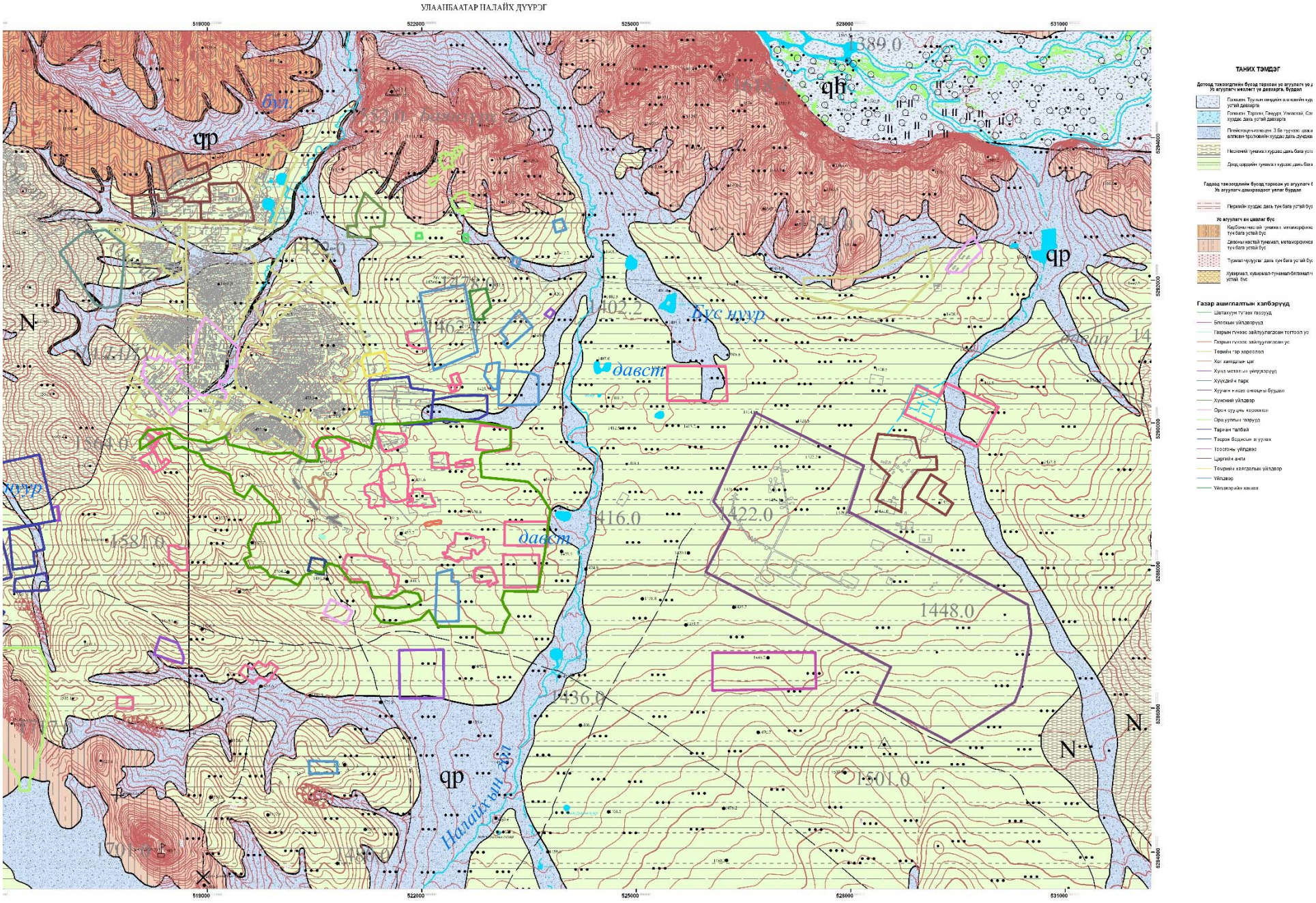
Scale 1:5 000



LEGEND

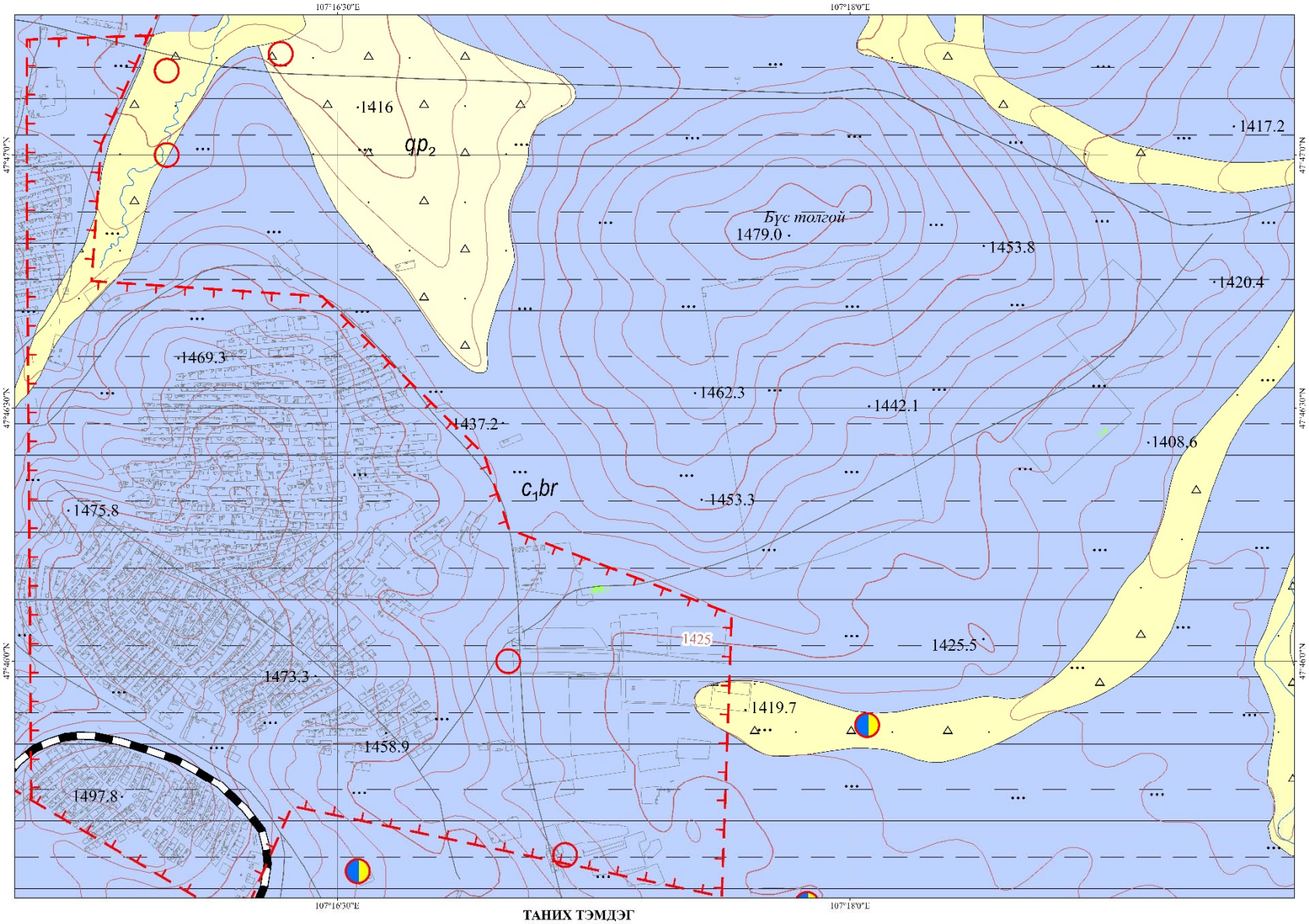
- Holocene sediment. Sand and gravel of alluvial origin
- K1br — Lower Cretaceous. Buruljuut formation. Green-gray clay, argillite, siltstone, sand
- Border khoroo

HYDROGEOLOGICAL MAP OF NALAIKH AREA Scale 1 :5 000



HYDROGEOLOGICAL MAP OF AREA "NALAIKH"

SCALE 1:5 000

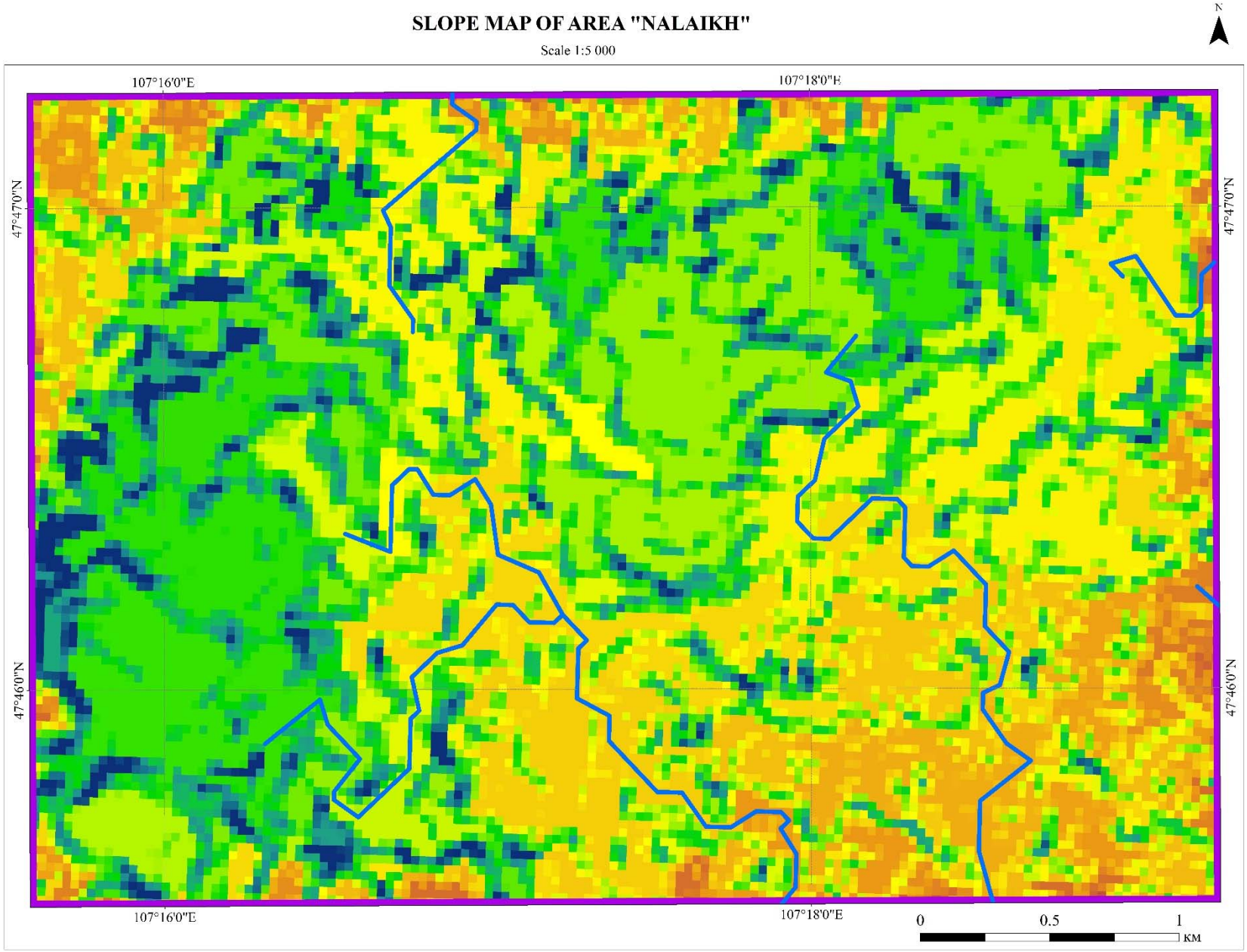


ТАНИХ ТЭМДЭГ

- Holocene sediment. Alluvial (a), deluvial-proluvial (dp), aeolian (e) and lake (l) sand, sandy loam, clay, mild clay, gravel, pebble and conglomerate
- Pleistocene sediment. Alluvial (a), lake (l), deluvial (d), and eluvial (e) pebble, conglomerate, gravel, sand, sandstone, and clay
- Lower Cretaceous. Buruljuut formation. Green-gray clay, argillite, siltstone, sand
- HCO_3-Ca
- Boreholes
- Area of man-made damage
- Border of khoroo

SLOPE MAP OF AREA "NALAIKH"

Scale 1:5 000



LEGEND

- Drainge
- Study area

DEM (by degree)

High : 16.0526

Low : 0

- Gas station
- Railway
- Road
- A damaged mine site
- Ухмал
- Technogenic objects (C- industrial area, A- ger horoolol)
- Border of khoroo

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		Soil heavy metal result of Nalaikh area									
			X	Y	As	Cd	Cr	Cu	Ni	Pb	Zn
1	S1429	17.L4811Г-в ND07-30	107.3038417	47.72899028	3.14	0.50	11.08	5.21	16.09	8.45	36.79
2	S1430	17.L4811Г-в ND07-31	107.3036433	47.72449528	8.38	0.97	15.16	10.59	29.74	14.68	64.75
3	S1431	17.L4811Г-в ND07-32	107.3076697	47.74016111	3.05	0.57	11.53	3.72	19.82	12.11	54.37
4	S1432	17.L4811Г-в ND07-33	107.3074711	47.73566611	3.83	0.69	12.46	6.28	22.75	11.39	39.62
5	S1433	17.L4811Г-в ND07-34	107.3072725	47.73117083	1.69	0.56	11.65	4.51	21.13	16.27	37.68
6	S1434	17.L4811Г-в ND07-35	107.3070736	47.72667583	4.01	0.51	13.01	7.61	21.15	27.56	67.81
7	S1435	17.L4811Г-в ND07-36	107.3110017	47.74009417	16.73	0.93	13.81	9.91	31.53	13.56	38.14
8	S1436	17.L4811Г-в ND07-37	107.3108028	47.73559889	5.06	0.70	12.08	8.67	25.14	11.36	51.42
9	S1437	17.L4811Г-в ND07-38	107.3106039	47.73110389	6.52	0.52	15.65	6.47	21.89	6.35	29.41
10	S1438	17.L4811Г-в ND07-39	107.3104047	47.72660861	5.96	11.45	11.61	22.30	32.33	12.56	58.73
11	S1439	17.L4811Г-в ND07-40	107.3102061	47.72211361	6.57	0.80	11.62	8.38	28.26	32.96	53.13
12	S1440	17.L4811Г-в ND07-41	107.3147325	47.74901722	7.93	0.89	12.46	11.09	30.05	14.22	59.34
13	S1441	17.L4811Г-в ND07-42			3.88	0.76	13.68	3.39	24.60	8.60	42.15
14	S1442	17.L4811Г-в ND07-43	107.318065	47.74895	1.63	0.43	13.78	3.16	16.82	4.43	21.50
15	S1443	17.L4811Г-в ND07-44	107.3178653	47.74445472	4.11	0.79	13.38	5.65	26.41	13.94	46.82
16	S1444	17.L4811Г-в ND07-45	107.3176656	47.73995972	1.67	0.57	10.58	2.17	19.61	8.87	34.23
17	S1445	17.L4811Г-в ND07-46	107.3174661	47.73546444	7.77	0.88	18.00	7.31	30.61	12.02	52.95
18	S1446	17.L4811Г-в ND07-47	107.3172667	47.73096944	4.16	0.61	12.71	4.55	21.59	26.88	46.69
19	S1447	17.L4811Г-в ND07-48	107.3170669	47.72647444	5.98	0.77	18.44	6.96	29.62	13.14	54.74
20	S1448	17.L4811Г-в ND07-49	107.3168675	47.72197917	6.11	0.74	16.39	7.37	27.75	12.53	67.53
21	S1449	17.L4811Г-в ND07-50	107.3209975	47.73989222	6.63	0.78	17.69	8.20	30.59	13.41	51.04
22	S1452	17.L4811Г-в ND07-53	107.3203981	47.72640694	7.10	0.82	17.19	6.24	31.60	8.94	48.16
23	S1453	17.L4811Г-в ND07-54	107.3201983	47.72191194	5.07	0.79	16.60	8.33	29.33	13.80	58.84
24	S1454	17.L4811Г-в ND07-55	107.32473	47.748815	6.69	0.85	18.29	8.53	31.06	12.56	56.78
25	S1455	17.L4811Г-в ND07-56	107.3245297	47.74432	7.71	0.55	11.35	3.00	22.28	19.44	35.79
26	S1456	17.L4811Г-в ND07-57	107.3243294	47.73982472	5.20	0.68	15.85	11.16	25.85	10.45	42.38
27	S1457	17.L4811Г-в ND07-58	107.3241294	47.73532972	3.21	0.71	13.93	4.70	25.25	13.05	64.50
28	S1228	17.L48-11-Г-а ND04-15	107.274446	47.775495	5.32		14.56	10.04	12.26	11.46	50.17
29	S1229	17.L48-11-Г-а ND04-16	107.274148	47.779370	7.79		18.89	17.99	16.01	29.77	98.65
30	S1230	17.L48-11-Г-а ND04-17	107.276768	47.781577	8.35		20.01	15.32	15.66	11.82	61.15
31	S1231	17.L48-11-Г-а ND04-18	107.278534	47.785627	4.90		17.46	12.87	13.27	14.61	56.68
32	S1232	17.L48-11-Г-а ND04-19	107.281633	47.782002	8.35		21.87	16.52	16.11	14.83	69.17
33	S1233	17.L48-11-Г-а ND04-20	107.277904	47.776101	5.91		15.05	11.51	12.31	15.39	62.05
34	S1234	17.L48-11-Г-а ND04-21	107.276438	47.774943	12.75		14.82	15.40	13.93	12.65	75.67
35	S1235	17.L48-11-Г-а ND04-22	107.276948	47.774096	24.09		20.21	19.85	18.45	15.38	78.77
36	S1236	17.L48-11-Г-а ND04-23	107.276864	47.771560	2.17		9.52	6.34	8.14	10.02	38.97
37	S1237	17.L48-11-Г-а ND04-24	107.278569	47.767189	8.18		16.50	21.44	14.82	22.47	103.94
38	S1238	17.L48-11-Г-а ND04-25	107.283104	47.771706	8.90		22.78	28.83	20.66	23.60	134.15
39	S1239	17.L48-11-Г-а ND04-26	107.281723	47.772174	3.76		12.13	7.72	9.91	14.94	95.28
40	S1240	17.L48-11-Г-а ND04-27	107.281812	47.774197	9.04		16.44	14.78	14.07	18.10	73.22
41	S1241	17.L48-11-Г-а ND04-28	107.286148	47.774768	7.23		17.23	13.62	13.65	14.93	61.75
42	S1242	17.L48-11-Г-а ND04-29	107.292985	47.785447	2.69		13.55	12.01	12.31	11.23	43.96
43	S1243	17.L48-11-Г-а ND04-30	107.316130	47.780483	2.48		7.97	3.61	6.46	5.92	17.35
44	S1244	17.L48-11-Г-а ND04-31	107.315930	47.775988	7.05		15.75	14.14	11.19	20.15	50.47
45	S1245	17.L48-11-Г-а ND04-33	107.319464	47.780416	13.52		15.42	11.08	12.55	11.35	42.01
46	S1246	17.L48-11-Г-а ND04-34	107.3192642	47.77592056	6.03		16.52	26.70	12.07	21.32	70.95
47	S1247	17.L48-11-Г-а ND04-35	107.3190642	47.77142528	7.93		20.42	14.90	15.48	16.80	61.40
48	S1248	17.L48-11-Г-а ND04-36	107.3188642	47.76693028	11.22		15.91	13.10	15.60	14.62	42.54
49	S1249	17.L48-11-Г-а ND04-37	107.3226986	47.77810056	6.66		16.59	12.91	13.59	12.75	48.20
50	S1250	17.L48-11-Г-а ND04-38	107.3224983	47.77360556	9.38		20.22	15.84	15.59	15.16	60.99
51	S1251	17.L48-11-Г-а ND04-39	107.3222981	47.76911028	7.69		15.13	12.90	15.58	12.74	44.85
52	S1252	17.L48-11-Г-а ND04-40	107.3259325	47.77578556	6.10		21.60	14.98	16.27	12.67	55.44
53	S1253	17.L48-11-Г-а ND04-41	107.3257319	47.77129028	4.28		14.42	8.92	10.86	10.67	37.07

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			X	Y	As	Cd	Cr	Cu	Ni	Pb	Zn
54	S1254	17.L48-11-Г-а ND04-42	107.3255317	47.76679528	0.89		8.79	3.71	6.13	7.31	20.56
55	S1255	17.L48-11-Г-а ND04-43	107.3292669	47.77571778	8.18		17.77	12.66	15.70	12.76	42.97
56	S1256	17.L48-11-Г-а ND04-44	107.329066	47.771223	4.79		16.39	11.32	11.47	11.06	41.84
57	S1257	17.L48-11-Г-а ND04-45	107.328865	47.766728	5.54		15.12	14.58	12.10	12.84	49.93
58	S1258	17.L48-11-Г-а ND04-46	107.328664	47.762233	7.46		16.83	13.27	13.29	13.39	46.53
59	S1259	17.L48-11-Г-а ND04-47	107.332802	47.780145	2.71		9.54	5.15	8.23	9.55	31.39
60	S1260	17.L48-11-Г-а ND04-48	107.332601	47.775650	4.39		15.06	8.45	10.62	10.18	42.62
61	S1261	17.L48-11-Г-а ND04-49	107.332400	47.771155	1.94		12.40	5.12	8.82	8.03	30.79
62	S1262	17.L48-11-Г-а ND04-50	107.3321989	47.76666	3.29		15.06	7.80	10.21	10.14	39.36
63	S1263	17.L48-11-Г-а ND04-51	107.3319978	47.762165	4.42		18.21	10.27	12.48	12.16	47.19
64	S1264	17.L48-11-Г-а ND04-52	107.3361367	47.78007722	9.32		12.53	9.69	12.10	18.74	40.22
65	S1265	17.L48-11-Г-а ND04-53	107.3359353	47.77558222	5.95		14.19	7.19	10.04	9.70	30.57
66	S1266	17.L48-11-Г-а ND04-54	107.3357339	47.77108722	0.49		11.71	4.13	6.82	8.41	25.14
67	S1267	17.L48-11-Г-а ND04-55	107.3355325	47.76659222	3.24		16.02	7.30	10.34	10.12	34.85
68	S1268	17.L48-11-Г-а ND04-56	107.3353311	47.76209722	4.07		17.50	10.41	11.92	12.16	42.38
69	S1269	17.L48-11-Г-а ND04-57	107.2669158	47.77361056	2.48		12.69	8.81	9.06	15.04	57.64
70	S1270	17.L48-11-Г-а ND05-1	107.3395719	47.78225667	1.85		11.88	5.48	8.12	7.83	23.81
71	S1271	17.L48-11-Г-а ND05-2	107.3394711	47.78000917	3.27		12.11	6.23	9.26	10.97	36.41
72	S1272	17.L48-11-Г-а ND05-3	107.3393703	47.77776167	8.30		6.71	2.58	5.51	5.30	13.36
73	S1273	17.L48-11-Г-а ND05-4	107.3392694	47.77551417	6.99		18.67	14.32	12.61	15.58	59.28
74	S1274	17.L48-11-Г-а ND05-5	107.3391686	47.77326667	4.53		16.66	9.72	12.07	10.49	41.14
75	S1275	17.L48-11-Г-а ND05-6	107.3390678	47.77101917	3.86		12.98	6.60	9.40	9.40	26.06
76	S1276	17.L48-11-Г-а ND05-7	107.3389669	47.76877167	2.17		11.30	5.02	7.87	10.17	21.47
77	S1277	17.L48-11-Г-а ND05-8	107.3388661	47.76652417	0.22		11.03	4.67	7.12	8.51	23.61
78	S1278	17.L48-11-Г-а ND05-9	107.3387653	47.76427667			12.23	6.89	8.96	11.25	30.21
79	S1279	17.L48-11-Г-а ND05-10	107.3386644	47.76202917	3.89		17.73	9.27	12.24	11.42	39.97
80	S1280	17.L48-11-Г-а ND05-11	107.3385636	47.75978167	6.85		20.35	11.87	14.88	11.76	43.37
81	S1281	17.L48-11-Г-а ND05-12	107.3430078	47.78443611	1.13		9.29	5.16	6.64	7.31	17.55
82	S1282	17.L48-11-Г-а ND05-13	107.3429067	47.78218861	0.76		9.04	3.67	6.50	6.86	17.56
83	S1283	17.L48-11-Г-а ND05-14	107.3428056	47.77994111	0.58		8.30	2.88	5.97	7.58	16.12
84	S1284	17.L48-11-Г-а ND05-15	107.3426036	47.77544611	7.65		16.77	12.57	12.36	13.42	44.10
85	S1285	17.L48-11-Г-а ND05-16	107.3424017	47.77095111	5.36		14.50	8.73	10.65	11.78	40.09
86	S1286	17.L48-11-Г-а ND05-17	107.3421997	47.76645611	9.03		15.08	10.77	15.36	12.56	38.12
87	S1287	17.L48-11-Г-а ND05-18	107.3420986	47.76420861	5.38		18.18	9.12	12.40	11.18	39.22
88	S1288	17.L48-11-Г-а ND05-19	107.3419978	47.76196111	6.00		16.85	10.23	12.61	11.93	40.66
89	S1289	17.L48-11-Г-а ND05-20	107.3417958	47.75746611	6.58		18.90	11.46	13.33	12.91	47.29
90	S1290	17.L48-11-Г-а ND05-21	107.3463425	47.78436806	8.67		17.55	15.87	13.80	17.12	103.51
91	S1291	17.L48-11-Г-а ND05-22	107.3462411	47.78212056	0.45		9.21	3.08	6.68	7.22	21.00
92	S1292	17.L48-11-Г-а ND05-23	107.34614	47.77987306	0.88		9.08	3.14	6.82	7.42	20.83
93	S1293	17.L48-11-Г-а ND05-24	107.3459378	47.77537806	0.88		11.25	6.44	7.90	8.02	30.05
94	S1294	17.L48-11-Г-а ND05-25	107.3457356	47.77088306	5.94		18.30	9.92	13.36	12.79	49.19
95	S1296	17.L48-11-Г-а ND05-27	107.3454322	47.76414056	5.26		17.42	9.19	13.62	12.07	43.80
96	S1297	17.L48-11-Г-а ND05-28	107.3453311	47.76189306	6.61		19.39	10.26	14.42	12.80	45.68
97	S1298	17.L48-11-Г-а ND05-29	107.3451289	47.75739806	6.47		19.98	11.66	14.69	12.95	50.82
98	S1299	17.L48-11-Г-а ND05-30	107.3495758	47.78205222	2.15		14.16	6.09	10.66	8.36	30.96
99	S1300	17.L48-11-Г-а ND05-31	107.3494744	47.77980472	0.87		10.82	3.67	8.36	7.40	21.13
100	S1301	17.L48-11-Г-а ND05-32	107.3493731	47.77755722	2.37		16.39	9.03	11.79	9.82	37.54
101	S1302	17.L48-11-Г-а ND05-33	107.3492719	47.77531	2.56		14.73	5.23	10.56	8.96	28.34
102	S1303	17.L48-11-Г-а ND05-34	107.3491706	47.7730625	1.68		15.33	7.60	11.01	9.65	39.47
103	S1304	17.L48-11-Г-а ND05-35	107.3490692	47.770815	0.34		16.84	7.81	12.30	10.80	45.00
104	S1305	17.L48-11-Г-а ND05-36	107.3489681	47.7685675	7.53		17.89	11.51	15.03	14.42	45.80
105	S1306	17.L48-11-Г-а ND05-37	107.3488667	47.76632	2.74		17.90	9.95	12.28	13.08	48.35
106	S1307	17.L48-11-Г-а ND05-38	107.3487656	47.7640725	3.92		19.38	8.98	13.03	11.60	46.79
107	S1308	17.L48-11-Г-а ND05-39	107.3486644	47.761825	5.61		20.00	10.00	14.05	12.43	47.50

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			X	Y	As	Cd	Cr	Cu	Ni	Pb	Zn
108	S1309	17.L48-11-Г-a ND05-40	107.3485631	47.7595775	6.06		22.23	13.01	16.52	14.05	51.77
109	S1310	17.L48-11-Г-a ND05-41	107.3484619	47.75733	6.89		22.37	13.34	16.83	15.33	56.09
110	S1311	17.L48-11-Г-a ND05-42	107.3483608	47.7550825	6.07		16.70	9.07	13.44	12.06	38.26
111	S1312	17.L48-11-Г-a ND05-43	107.3529103	47.78198389	0.80		10.34	3.37	8.45	7.51	20.44
112	S1313	17.L48-11-Г-a ND05-44	107.3528089	47.77973639	1.53		14.28	5.09	10.44	9.00	30.37
113	S1314	17.L48-11-Г-a ND05-45	107.3527075	47.77748889	1.96		14.62	5.31	11.01	8.80	30.64
114	S1315	17.L48-11-Г-a ND05-46	107.3526061	47.77524167	2.54		16.17	7.09	11.70	9.59	35.18
115	S1316	17.L48-11-Г-a ND05-47	107.3525044	47.77299417	1.60		15.97	7.28	10.93	10.56	40.41
116	S1317	17.L48-11-Г-a ND05-48	107.3524031	47.77074667	2.52		15.46	6.28	10.54	9.85	34.62
117	S1318	17.L48-11-Г-a ND05-49	107.3523017	47.76849917	2.94		14.79	5.92	10.40	9.13	28.81
118	S1319	17.L48-11-Г-a ND05-50	107.352	47.766	4.51		17.84	9.30	12.87	10.18	45.15
119	S1320	17.L48-11-Г-a ND05-51	107.352	47.764	4.97		17.82	9.60	13.16	9.30	43.37
120	S1321	17.L48-11-Г-a ND05-52	107.352	47.762	5.55		25.22	10.71	14.52	9.31	47.84
121	S1322	17.L48-11-Г-a ND05-53	107.356	47.784	2.86		15.90	7.67	12.11	6.59	34.57
122	S1323	17.L48-11-Г-a ND05-54	107.356	47.782	1.41		12.29	4.90	8.66	6.84	32.69
123	S1324	17.L48-11-Г-a ND05-55	107.356	47.780	2.70		14.67	6.09	10.89	7.76	35.47
124	S1325	17.L48-11-Г-a ND05-56	107.356	47.777	2.38		13.44	5.20	10.36	5.57	32.76
125	S1326	17.L48-11-Г-a ND05-57	107.356	47.775	2.83		14.63	6.68	11.20	7.44	35.87
126	S1327	17.L48-11-Г-a ND05-58	107.356	47.773	3.16		16.20	8.51	11.12	8.81	41.37
127	S1328	17.L48-11-Г-a ND05-59	107.356	47.771	3.10		15.82	7.62	10.92	9.08	44.42
128	S1329	17.L48-11-Г-a ND05-60	107.356	47.768	3.53		14.48	6.83	10.86	6.25	33.47
129	S1330	17.L48-11-Г-a ND05-61	107.360	47.784	4.09		11.48	4.98	9.12	6.78	34.15
130	S1331	17.L48-11-Г-a ND05-62	107.360	47.782	2.68		12.38	6.19	10.97	5.80	26.33
131	S1332	17.L48-11-Г-a ND05-64	107.359	47.773	1.61		11.52	3.92	8.58	5.22	25.13
132	S1333	17.L48-11-Г-a ND05-65	107.359	47.768	2.66		12.54	5.55	9.56	7.17	29.62
133	S1334	17.L48-11-Г-a ND05-66	107.359	47.764	2.84		12.71	4.86	9.48	6.61	29.06
134	S1335	17.L48-11-Г-a ND05-67	107.363	47.777	2.41		12.80	5.08	9.50	7.12	30.22
135	S1336	17.L48-11-Г-a ND05-68	107.363	47.773	2.42		12.42	5.11	9.21	6.45	29.53
136	S1337	17.L48-11-Г-a ND05-69	107.362	47.768	1.54		12.32	3.93	8.67	5.88	25.56
137	S1338	17.L48-11-Г-a ND05-70	107.362	47.764	3.33		13.76	6.26	10.09	7.25	31.58
138	S1339	17.L48-11-Г-a ND05-71	107.366	47.777	1.59		10.92	4.90	8.12	5.31	26.90
139	S1340	17.L48-11-Г-a ND05-72	107.366	47.775	2.47		15.18	8.58	11.28	7.44	38.12
140	S1341	17.L48-11-Г-a ND05-73	107.366	47.770	2.78		15.15	7.66	11.14	6.91	38.13
141	S1342	17.L48-11-Г-a ND05-74	107.366	47.768	1.94		13.44	5.65	9.45	7.72	33.82
142	S1343	17.L48-11-Г-a ND05-75	107.366	47.766	2.02		11.78	4.02	8.36	5.88	24.95
143	S1344	17.L48-11-Г-a ND05-76	107.365	47.761	4.31		13.82	6.89	10.62	6.92	33.21
144	S1345	17.L48-11-Г-a ND05-77	107.369	47.777	4.21		18.19	11.20	13.74	9.30	51.86
145	S1346	17.L48-11-Г-a ND05-78	107.369	47.775	4.69		18.77	11.86	14.44	9.18	51.37
146	S1347	17.L48-11-Г-a ND05-79	107.369	47.773	4.25		18.60	11.68	13.95	9.08	49.91
147	S1348	17.L48-11-Г-a ND05-80	107.369	47.770	4.17		17.69	11.37	13.38	8.66	49.20
148	S1349	17.L48-11-Г-a ND05-81	107.369	47.768	2.51		13.37	8.03	9.46	17.22	96.25
149	S1350	17.L48-11-Г-a ND05-82	107.369	47.766	2.78		14.27	8.00	10.38	13.81	77.06
150	S1351	17.L48-11-Г-a ND05-83	107.369	47.764	3.40		15.56	7.96	11.42	7.92	37.85
151	S1352	17.L48-11-Г-a ND05-84	107.373	47.777	4.32		16.18	9.31	12.01	8.65	43.16
152	S1353	17.L48-11-Г-a ND05-85	107.373	47.775	2.84		14.75	7.65	10.73	8.19	36.96
153	S1354	17.L48-11-Г-a ND05-86	107.373	47.773	2.97		14.89	7.76	10.69	11.72	40.51
154	S1355	17.L48-11-Г-a ND05-87	107.372	47.770	2.08		14.69	7.33	10.32	9.93	38.08
155	S1356	17.L48-11-Г-a ND05-88	107.372	47.768	3.20		15.27	8.07	10.84	8.21	44.40
156	S1357	17.L48-11-Г-a ND05-89	107.372	47.766	4.06		16.81	9.57	12.24	8.80	49.02
157	S1358	17.L48-11-Г-a ND05-90	107.372099	47.763592	5.60		14.29	8.36	11.35	7.19	25.47
158	S1361	17.L48-11-Г-a ND07-1	107.264	47.763	6.31		12.92	10.51	10.78	44.85	57.55
159	S1362	17.L48-11-Г-a ND07-2	107.263	47.761	6.76		11.04	14.39	11.89	49.84	52.29
160	S1363	17.L48-11-Г-a ND07-3	107.271	47.763	6.17		11.51	6.68	9.44	13.21	33.71
161	S1364	17.L48-11-Г-a ND07-4	107.271	47.758	14.14		16.36	23.79	18.27	19.13	90.06

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			X	Y	As	Cd	Cr	Cu	Ni	Pb	Zn
162	S1365	17.L48-11-Г-а ND07-5	107.277	47.763	9.33		19.44	22.54	17.50	23.33	97.57
163	S1366	17.L48-11-Г-а ND07-6	107.279	47.762	9.41		16.93	13.84	14.79	21.95	65.42
164	S1367	17.L48-11-Г-а ND07-7	107.292	47.758	13.04		20.68	15.09	21.19	12.49	44.34
165	S1368	17.L48-11-Г-а ND07-8	107.316	47.767	10.61		18.03	14.95	17.01	10.22	36.89
166	S1369	17.L48-11-Г-а ND07-9	107.315	47.763	12.17		21.61	15.43	17.82	13.17	54.39
167	S1370	17.L48-11-Г-а ND07-10	107.315	47.758	9.94		22.34	17.66	16.99	14.74	67.91
168	S1371	17.L48-11-Г-а ND07-11	107.315	47.754	12.49		23.46	17.31	17.62	14.21	63.44
169	S1372	17.L48-11-Г-а ND07-12	107.319	47.762	10.14		19.50	12.47	14.62	11.80	49.70
170	S1373	17.L48-11-Г-а ND07-13	107.318	47.758	10.91		19.89	14.48	16.26	12.91	52.78
171	S1374	17.L48-11-Г-а ND07-14	107.318	47.753	10.32		22.47	16.68	17.63	14.64	68.49
172	S1375	17.L48-11-Г-а ND07-15	107.322	47.765	4.77		12.81	4.81	9.70	7.11	18.80
173	S1376	17.L48-11-Г-а ND07-16	107.322	47.760	9.51		16.88	12.92	14.14	11.97	53.84
174	S1377	17.L48-11-Г-а ND07-17			15.60		23.73	17.54	21.12	14.95	65.45
175	S1378	17.L48-11-Г-а ND07-18	107.322	47.756	11.91	0.48	28.21	17.62	18.70	14.37	77.78
176	S1379	17.L48-11-Г-а ND07-19	107.325	47.762	8.39	0.09	14.85	8.70	11.77	13.37	26.75
177	S1380	17.L48-11-Г-а ND07-20	107.325	47.758	15.09	1.00	33.80	49.80	26.26	85.78	148.20
178	S1381	17.L48-11-Г-а ND07-21	107.325	47.753	13.61		30.14	18.44	21.00	12.59	58.65
179	S1382	17.L48-11-Г-а ND07-22	107.328	47.758	8.38		20.47	10.94	15.76	8.11	33.28
180	S1383	17.L48-11-Г-а ND07-23	107.328	47.753	14.10		30.43	18.34	20.68	13.46	60.22
181	S1384	17.L48-11-Г-а ND07-24	107.332	47.758	11.48		24.88	13.47	16.89	10.25	44.61
182	S1385	17.L48-11-Г-а ND07-25	107.332	47.753	12.51		24.89	13.30	16.69	11.03	43.13
183	S1386	17.L48-11-Г-а ND07-26	107.335	47.758	12.34		28.09	15.44	18.73	13.11	58.13
184	S1387	17.L48-11-Г-а ND07-27	107.335	47.753	12.14		26.30	14.55	17.82	13.27	48.80
185	S1388	17.L48-11-Г-а ND07-28	107.338	47.758	10.37		22.10	12.80	14.37	11.24	42.32
186	S1389	17.L48-11-Г-а ND07-29	107.338	47.755	7.86		18.91	9.14	12.45	8.88	44.02
187	S1390	17.L48-11-Г-а ND07-30	107.338	47.753	17.45		26.03	18.72	16.49	16.13	77.17
188	S1391	17.L48-11-Г-а ND07-31	107.338	47.751	14.57		24.31	14.24	18.51	10.74	39.93
189	S1392	17.L48-11-Г-а ND07-32	107.342	47.753	12.38		27.03	14.59	18.20	11.26	41.89
190	S1393	17.L48-11-Г-а ND07-33	107.341	47.751	12.32		26.70	16.10	18.72	12.16	49.30
191	S1394	17.L48-11-Г-а ND07-34	107.345	47.753	11.79		26.85	14.62	18.16	11.00	41.49
192	S1395	17.L48-11-Г-а ND07-35	107.345	47.751	13.18		26.78	15.71	18.51	12.29	45.89
193	S1396	17.L48-11-Г-а ND07-36	107.349	47.769	13.36		22.74	13.49	17.04	10.94	33.12
194	S1397	17.L48-11-Г-а ND07-37	107.349	47.766	20.16	0.08	23.43	21.48	17.15	13.44	91.96
195	S1398	17.L48-11-Г-а ND07-38	107.349	47.764	13.28	0.38	26.63	22.32	20.02	14.19	74.45
196	S1399	17.L48-11-Г-а ND07-39	107.349	47.762	6.45	0.08	15.51	16.01	10.41	17.35	62.61
197	S1400	17.L4811Г-в ND07-1	107.2528636	47.7421775	9.74	0.47	33.44	19.78	23.75	11.81	57.75
198	S1401	17.L4811Г-в ND07-2	107.2557197	47.74221139	10.32	0.14	20.79	10.46	14.82	8.90	27.44
199	S1402	17.L4811Г-в ND07-3	107.2592081	47.74205278	7.90		18.43	9.34	14.46	7.54	28.82
200	S1403	17.L4811Г-в ND07-4	107.2618803	47.74183806	12.44	0.34	25.67	23.22	21.15	12.88	73.83
201	S1404	17.L4811Г-в ND07-5	107.2653753	47.74091444	12.14	0.13	26.72	20.42	18.99	13.35	59.66
202	S1405	17.L4811Г-в ND07-6	107.2694664	47.74020361	8.26		15.98	10.27	12.01	7.47	32.10
203	S1406	17.L4811Г-в ND07-7	107.2727761	47.73931917	10.99	0.04	20.41	17.72	17.39	11.85	55.46
204	S1407	17.L4811Г-в ND07-8	107.2777794	47.74300833	12.85	0.05	27.82	21.21	22.84	12.92	61.37
205	S1408	17.L4811Г-в ND07-9	107.2810133	47.74069444	15.80	0.07	22.06	18.29	18.25	12.85	56.90
206	S1409	17.L4811Г-в ND07-10	107.2808169	47.73619917	12.51		25.78	20.80	19.41	12.11	53.64
207	S1410	17.L4811Г-в ND07-11	107.2806206	47.73170389	12.56		22.37	18.62	20.38	11.50	44.38
208	S1411	17.L4811Г-в ND07-12	107.2804242	47.72720861	9.65	0.04	26.29	22.84	19.68	12.92	73.24
209	S1412	17.L4811Г-в ND07-13	107.2843456	47.74062806	4.38		11.07	10.50	11.81	7.32	31.29
210	S1413	17.L4811Г-в ND07-14	107.2841489	47.73613278	11.52		23.71	19.34	19.14	11.46	49.70
211	S1414	17.L4811Г-в ND07-15	107.2839522	47.73163778	12.19		24.50	19.93	19.34	10.99	51.49
212	S1415	17.L4811Г-в ND07-16	107.2837556	47.7271425	9.28		24.51	19.71	18.59	12.27	59.30
213	S1416	17.L4811Г-в ND07-17	107.2874806	47.73606639	12.58		21.26	16.28	17.18	12.07	47.97
214	S1417	17.L4811Г-в ND07-18	107.2872836	47.73157139	12.68		26.62	21.43	21.96	12.17	53.37
215	S1418	17.L4811Г-в ND07-19	107.2870867	47.72707611	10.21		25.14	19.42	18.82	11.90	58.15

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			X	Y	As	Cd	Cr	Cu	Ni	Pb	Zn
216	S1419	17.L4811Г-в ND07-20	107.2941442	47.73593333	11.96		23.10	19.20	19.77	13.69	56.56
217	S1420	17.L4811Г-в ND07-21	107.2937492	47.72694306	10.12		26.09	21.25	20.90	12.82	60.67
218	S1421	17.L4811Г-в ND07-22	107.33513	47.75760194	19.76		25.26	22.77	20.79	16.59	74.58
219	S1422	17.L4811Г-в ND07-23			12.63		23.22	18.42	19.60	13.70	52.58
220	S1423	17.L4811Г-в ND07-24			12.93		26.01	19.67	20.92	13.07	53.79
221	S1424	17.L4811Г-в ND07-25	107.3349286	47.75310694	10.40		24.93	19.77	19.66	12.24	56.18
222	S1425	17.L4811Г-в ND07-26	107.3384628	47.75753417	10.82		24.51	16.39	18.73	11.65	49.99
223	S1426	17.L4811Г-в ND07-27	107.3383622	47.75528667	12.25		25.01	18.50	19.32	12.83	52.88
224	S1427	17.L4811Г-в ND07-28	107.3382614	47.75303917	15.44		27.17	28.62	26.35	17.30	71.55
225	S1428	17.L4811Г-в ND07-29	107.3381606	47.75079167	10.93		20.48	13.91	16.77	11.07	39.53
226	S1429	17.L4811Г-в ND07-30	107.3415942	47.75297111	9.34		28.21	21.74	22.21	13.61	66.29
227	S1430	17.L4811Г-в ND07-31	107.3414933	47.75072361	10.05		29.14	26.82	23.95	15.56	77.98
228	S1431	17.L4811Г-в ND07-32			10.19		17.50	18.54	19.84	9.21	34.77
229	S1432	17.L4811Г-в ND07-33	107.3449269	47.75290306	13.80		11.05	8.52	14.36	8.09	21.04
230	S1433	17.L4811Г-в ND07-34	107.3448258	47.75065556	11.84		26.16	18.50	19.57	12.84	63.80
231	S1434	17.L4811Г-в ND07-35	107.3489681	47.7685675	10.91		26.35	18.39	19.47	13.09	67.71
232	S1435	17.L4811Г-в ND07-36	107.3488667	47.76632	14.65		22.29	20.85	24.46	11.36	45.77
233	S1436	17.L4811Г-в ND07-37	107.3487656	47.7640725	12.92		20.97	16.47	18.15	11.76	50.38
234	S1437	17.L4811Г-в ND07-38	107.3486644	47.761825	11.18		25.51	18.28	19.97	12.29	61.63
235	S1438	17.L4811Г-в ND07-39	107.2528636	47.7421775	10.14		23.28	16.87	19.36	11.13	56.19
236	S1439	17.L4811Г-в ND07-40	107.2557197	47.74221139	5.34		20.38	17.41	15.19	12.07	75.06
237	S1440	17.L4811Г-в ND07-41	107.2592081	47.74205278	7.19		12.43	6.10	10.42	7.23	32.68
238	S1441	17.L4811Г-в ND07-42			8.29		24.78	16.33	18.75	12.43	55.49
239	S1442	17.L4811Г-в ND07-43			13.28		26.02	18.60	21.11	13.49	54.12
240	S1443	17.L4811Г-в ND07-44			12.50		24.15	18.01	19.59	14.47	58.72
241	S1444	17.L4811Г-в ND07-45	107.2618803	47.74183806	11.60		23.80	17.41	18.11	13.98	65.25
242	S1445	17.L4811Г-в ND07-46	107.2653753	47.74091444	10.47		23.52	16.03	18.20	10.07	51.73
243	S1446	17.L4811Г-в ND07-47	107.2694664	47.74020361	7.53		18.22	13.67	13.79	9.69	47.03
244	S1447	17.L4811Г-в ND07-48	107.2727761	47.73931917	4.74		21.08	14.75	16.13	12.34	50.91
245	S1448	17.L4811Г-в ND07-49	107.2777794	47.74300833	7.81		23.54	16.31	17.62	15.29	65.34
246	S1449	17.L4811Г-в ND07-50	107.2810133	47.74069444	11.35		22.90	16.65	18.39	12.47	57.41
247	S1450	17.L4811Г-в ND07-51	107.2808169	47.73619917	9.70		23.43	16.35	17.03	12.80	60.06
248	S1451	17.L4811Г-в ND07-52	107.2806206	47.73170389	9.06		19.50	13.22	15.04	9.63	46.88
249	S1452	17.L4811Г-в ND07-53	107.2804242	47.72720861	7.57		24.71	18.17	18.68	16.20	70.74
250	S1453	17.L4811Г-в ND07-54	107.2843456	47.74062806	5.86		23.07	15.03	17.54	14.59	58.71
251	S1454	17.L4811Г-в ND07-55	107.2841489	47.73613278	13.19		23.98	16.29	19.11	11.96	50.19
252	S1455	17.L4811Г-в ND07-56	107.2839522	47.73163778	12.82		18.44	14.76	17.59	10.82	55.34
253	S1456	17.L4811Г-в ND07-57	107.2837556	47.7271425	11.00		21.19	13.85	16.36	11.17	50.27
254	S1457	17.L4811Г-в ND07-58	107.2874806	47.73606639							
255	S1458	17.L4811Г-в ND07-59	107.2872836	47.73157139	12.64		24.96	17.04	20.07	12.10	52.17
256	S1459	17.L4811Г-в ND07-60	107.2870867	47.72707611	11.70		19.58	13.03	16.03	10.30	39.79
257	S1460	17.L4811Г-в ND07-61	107.2941442	47.73593333	11.36		17.46	20.75	13.80	12.92	53.89
258	S1461	17.L4811Г-в ND07-62	107.2937492	47.72694306	6.70		19.68	14.30	16.14	11.16	48.95
259	S1462	17.L4811Г-в ND07-63			17.37		17.62	15.50	17.14	10.93	63.90
260	S1463	17.L4811Г-в ND07-64			11.40		15.01	10.27	13.73	9.79	36.93
261	S1464	17.L4811Г-в ND07-65	107.2935517	47.72244778	13.69		24.96	18.22	18.89	14.66	64.67
262	S1465	17.L4811Г-в ND07-66	107.2974758	47.73586667	12.98	0.02	22.08	51.48	17.14	15.48	248.11
263	S1466	17.L4811Г-в ND07-67	107.2972781	47.73137167	13.92		23.24	15.18	17.78	12.86	48.82
264	S1467	17.L4811Г-в ND07-68	107.2970803	47.72687639	9.84		20.51	14.40	16.20	10.94	47.55
265	S1468	17.L4811Г-в ND07-69	107.2968825	47.72238111	13.39		20.74	13.10	17.12	9.74	34.27
266	S1469	17.L4811Г-в ND07-70	107.3003125	47.72456194	15.27		22.91	15.82	19.07	11.92	48.29
267	S1470	17.L4811Г-в ND07-71	107.3042386	47.73798056	10.44		21.80	13.79	16.83	15.35	43.95
268	S1471	17.L4811Г-в ND07-72	107.30404	47.73348556	14.33		22.70	17.03	18.93	13.12	51.65
269	S1472	17.L4811Г-в ND07-73	107.3038417	47.72899028	13.72		24.26	15.03	19.61	11.14	43.94

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			X	Y	As	Cd	Cr	Cu	Ni	Pb	Zn
270	S1473	17.L4811Г-в ND07-74	107.3036433	47.72449528	12.72		24.96	16.00	19.39	12.26	49.47
271	S1474	17.L4811Г-в ND07-75	107.3076697	47.74016111	13.50		24.42	17.41	19.66	11.75	44.70
272	S1475	17.L4811Г-в ND07-76	107.3074711	47.73566611	8.31		13.83	9.69	13.01	6.49	18.15
273	S1476	17.L4811Г-в ND07-77	107.3072725	47.73117083	12.64		22.74	14.94	18.21	10.47	39.56
274	S1477	17.L4811Г-в ND07-78	107.3070736	47.72667583	13.19		24.73	17.88	19.91	12.78	56.16
275	S1478	17.L4811Г-в ND07-79	107.3110017	47.74009417	12.77		17.72	11.03	14.31	8.78	31.71
276	S1479	17.L4811Г-в ND07-80	107.3108028	47.73559889	13.77		23.68	17.07	20.09	11.60	44.21
277	S1480	17.L4811Г-в ND07-81	107.3106039	47.73110389	15.81		23.44	16.95	19.56	12.40	45.93
278	S1481	17.L4811Г-в ND07-82	107.3104047	47.72660861	12.72		19.77	14.28	16.84	9.61	35.47
279	S1482	17.L4811Г-в ND07-83	107.3102061	47.72211361	13.78		20.08	14.58	17.48	10.66	34.88
280	S1483	17.L4811Г-в ND07-84	107.3147325	47.74901722	13.17		23.67	17.10	18.80	11.70	48.98
281	S1484	17.L4811Г-в ND07-85			15.28		24.21	17.02	19.40	12.06	47.17
282	S1485	17.L4811Г-в ND07-86			13.44		22.37	15.06	18.61	11.65	38.15
283	S1486	17.L4811Г-в ND07-87	107.318065	47.74895	13.10		23.84	16.52	18.86	11.51	45.94
284	S1487	17.L4811Г-в ND07-88	107.3178653	47.74445472	11.00		24.18	16.69	19.14	11.71	56.40
285	S1488	17.L4811Г-в ND07-89	107.3176656	47.73995972	10.19		20.84	12.84	15.34	11.06	44.37
286	S1489	17.L4811Г-в ND07-90	107.3174661	47.73546444	10.13		20.20	14.45	15.67	10.40	41.40
287	S1490	17.L4811Г-в ND07-91	107.3172667	47.73096944	12.35		22.86	14.99	17.46	11.61	44.07
288	S1491	17.L4811Г-в ND07-92	107.3170669	47.72647444	11.75		24.01	15.52	17.99	10.63	42.28
289	S1492	17.L4811Г-в ND07-93	107.3168675	47.72197917	14.14		23.84	16.56	18.88	12.24	50.32
290	S1493	17.L4811Г-в ND07-94	107.3209975	47.73989222	13.16		25.07	16.33	19.46	12.21	52.21
291	S1494	17.L4811Г-в ND07-95	107.3207978	47.73539722	12.08		24.48	15.78	17.61	12.68	58.85
292	S1495	17.L4811Г-в ND07-96	107.3205981	47.73090222	11.97		22.50	13.93	16.73	11.27	48.93
293	S1496	17.L4811Г-в ND07-97	107.3203981	47.72640694	13.28		24.06	16.17	18.08	12.37	69.31
294	S1497	17.L4811Г-в ND07-98	107.3201983	47.72191194	12.92		22.74	15.49	17.41	11.25	45.73
295	S1498	17.L4811Г-в ND07-99	107.32473	47.748815	22.86		20.15	14.81	17.14	15.37	38.47
296	S1499	17.L4811Г-в ND07-100			13.19		22.30	15.13	17.45	11.99	59.98
297	S1500	17.L4811Г-в ND07-101			11.34		24.91	16.45	19.12	10.95	54.05
298	S1501	17.L4811Г-в ND07-102	107.3245297	47.74432	9.87		21.62	12.75	15.19	10.98	44.17
299	S1502	17.L4811Г-в ND07-103	107.3243294	47.73982472	10.91		21.03	14.04	15.38	10.32	41.47
300	S1503	17.L4811Г-в ND07-104	107.3241294	47.73532972	12.13		23.52	14.57	16.79	10.96	42.47
301	S1504	17.L4811Г-в ND07-105	107.3239292	47.73083472	11.49		38.67	15.18	17.88	10.71	42.80
302	S1505	17.L4811Г-в ND07-106	107.3237292	47.72633944	14.38		28.33	16.74	19.73	11.60	49.08
303	S1506	17.L4811Г-в ND07-107	107.3235292	47.72184444	13.04		26.60	15.99	19.10	11.71	51.46
304	S1507	17.L4811Г-в ND07-108	107.3280625	47.7487475	12.58		26.20	16.59	18.52	12.44	57.60
305	S1508	17.L4811Г-в ND07-109	107.3278619	47.7442525	11.19		22.21	13.45	16.00	10.03	44.45
306	S1509	17.L4811Г-в ND07-110	107.3276614	47.73975722	12.15		25.66	16.21	18.34	11.65	50.41
307	S1510	17.L4811Г-в ND07-111	107.3274611	47.73526222	12.63		26.03	16.17	18.14	12.24	45.92
308	S1511	17.L4811Г-в ND07-112	107.3272606	47.73076722	12.53		26.91	15.08	17.64	10.85	42.47
309	S1512	17.L4811Г-в ND07-113	107.3270603	47.72627194	13.22		26.27	18.57	20.46	13.37	55.01
310	S1513	17.L4811Г-в ND07-114	107.32686	47.72177694	10.70		26.01	18.95	19.30	12.02	61.07
311	S1514	17.L4811Г-б ND05-1	107.331395	47.74867972	8.17		20.24	14.18	15.37	9.83	44.78
312	S1515	17.L4811Г-б ND05-2	107.3301908	47.72170917	8.31		19.12	14.16	14.29	10.07	51.13
313	S1516	17.L4811Г-б ND05-3	107.3309933	47.73968972	7.12		20.05	13.07	14.54	8.84	38.78
314	S1517	17.L4811Г-б ND05-4	107.3307928	47.73519444	8.04		21.57	14.98	16.06	10.11	46.01
315	S1518	17.L4811Г-б ND05-5	107.3305919	47.73069944	8.09		18.24	11.79	16.52	8.80	31.02
316	S1519	17.L4811Г-б ND05-6	107.3303914	47.72620444	8.25		18.68	11.42	13.53	8.36	33.84
317	S1520	17.L4811Г-б ND05-7			8.23		18.17	11.27	13.43	8.64	38.44
318	S1521	17.L4811Г-б ND05-8			8.72		19.49	12.71	15.85	8.17	33.78
319	S1522	17.L4811Г-б ND05-9			7.48		13.87	10.00	11.93	7.67	24.40
320	S1524	17.L4811Г-б ND05-11	107.3342247	47.73737444	12.54	0.00	23.84	14.57	16.92	11.28	42.36
321	S1523	17.L4811Г-б ND05-10	107.3340239	47.73287917	3.64	0.95	9.29	4.47	8.48	4.73	8.69
322	S1524	17.L4811Г-б ND05-11	107.3338228	47.72838417	3.68	0.95	8.96	4.40	8.32	7.87	9.28
323	S1525	17.L4811Г-б ND05-12	107.3336219	47.72388917	3.56	0.96	9.14	4.52	8.28	5.69	10.47

			X	Y	As	Cd	Cr	Cu	Ni	Pb	Zn
324	S1526	17.L4811Г-6 ND05-13	107.3379592	47.74629667	5.29	1.46	12.68	7.59	11.19	5.64	23.33
325	S1527	17.L4811Г-6 ND05-14	107.3377578	47.74180167	4.47	1.45	12.64	7.48	11.82	8.78	24.93
326	S1528	17.L4811Г-6 ND05-16	107.3375567	47.73730639	4.16	0.99	9.54	4.46	8.45	4.21	10.20
327	S1529	17.L4811Г-6 ND05-17	107.3373553	47.73281139	4.51	1.51	11.50	6.97	11.50	5.29	17.74
328	S1530	17.L4811Г-6 ND05-18	107.3371539	47.72831639	4.50	1.24	9.68	5.66	8.99	8.51	21.27
329	S1531	17.L4811Г-6 ND05-19			22.36	2.27	16.83	12.02	16.89	8.71	38.14
330	S1532	17.L4811Г-6 ND05-20	107.3369528	47.72382139	4.20	1.21	11.27	4.54	9.76	5.00	11.12
331	S1533	17.L4811Г-6 ND05-21	107.3413925	47.74847611	4.90	1.43	13.14	6.29	11.91	5.99	14.86
332	S1534	17.L4811Г-6 ND05-22	107.3412917	47.74622861	3.37	1.19	10.27	4.96	8.93	9.22	22.61
333	S1535 shi	17.L4811Г-6 ND05-23			7.18	1.18	4.42	10.88	11.00	9.57	
334	S1536	17.L4811Г-6 ND05-24			13.35	2.18	14.59	12.60	13.43	9.82	51.76
335	S1537	17.L4811Г-6 ND05-25	107.3411908	47.74398111	8.31	2.00	15.87	10.70	14.23	7.44	28.51
336	S1538	17.L4811Г-6 ND05-26	107.34109	47.74173361	28.07	1.92	12.39	10.22	11.53	9.79	31.31
337	S1539	17.L4811Г-6 ND05-27	107.3409892	47.73948611	5.30	1.67	12.99	9.10	12.74	81.94	46.10
338	S1540 shi	17.L4811Г-6 ND05-28	107.3408883	47.73723861	9.84	1.64	3.42	11.90	10.26	12.21	
339	S1541	17.L4811Г-6 ND05-29	107.3407875	47.73499111	7.43	2.01	11.98	11.31	17.14	7.18	27.42
340	S1542	17.L4811Г-6 ND05-30	107.3406867	47.73274361	6.30	1.83	14.27	9.14	12.48	6.66	26.90
341	S1543	17.L4811Г-6 ND05-31	107.3405858	47.73049583	5.53	1.97	13.12	9.22	11.21	11.44	47.62
342	S1544	17.L4811Г-6 ND05-32	107.3404853	47.72824833	3.29	1.11	8.02	3.60	7.41	6.88	10.59
343	S1545	17.L4811Г-6 ND05-33	107.3403844	47.72600083	4.57	1.55	11.81	6.80	11.37	8.22	21.31
344	S1546	17.L4811Г-6 ND05-34	107.3402836	47.72375333	3.44	1.45	9.99	5.29	9.67	7.67	16.29
345	S1547	17.L4811Г-6 ND05-35	107.3401831	47.72150583	5.25	1.94	13.30	9.25	12.27	8.95	34.61
346	S1548	17.L4811Г-6 ND05-36	107.3447247	47.74840806	4.63	1.75	12.46	6.78	11.33	6.23	24.75
347	S1549	17.L4811Г-6 ND05-37	107.3446239	47.74616056	5.66	2.27	14.06	9.44	14.57	8.06	38.34
348	S1550	17.L4811Г-6 ND05-38	107.3445228	47.74391306	5.73	2.01	14.36	9.72	13.29	10.71	45.60
349	S1551	17.L4811Г-6 ND05-39	107.3444219	47.74166556	6.57	2.01	15.52	10.05	14.73	7.37	36.59
350	S1552	17.L4811Г-6 ND05-40	107.3443208	47.73941806	2.94	1.15	9.10	3.38	8.52	4.28	8.58
351	S1553	17.L4811Г-6 ND05-41	107.34422	47.73717056	3.41	1.13	10.01	4.40	8.94	4.67	13.58
352	S1554	17.L4811Г-6 ND05-42	107.3441192	47.73492306	2.50	1.23	8.57	2.96	7.96	4.80	7.15
353	S1555	17.L4811Г-6 ND05-43	107.3440181	47.73267556	4.51	1.68	11.86	6.45	10.44	5.88	30.62
354	S1556	17.L4811Г-6 ND05-44	107.3439172	47.73042806	5.75	1.62	11.11	6.62	12.26	6.09	16.98
				sample quantity	352	77	353	353	353	353	351
				min	0.22	0.00	3.42	2.17	5.51	4.21	7.15
				max	28.07	11.45	38.67	51.48	32.33	85.78	248.11
				average	7.98	1.12	18.14	12.15	15.37	11.89	46.29
				median	7.61	0.89	17.69	11.79	15.19	11.35	44.70

		Soil heavy metal result of Nalaikh area				Soil heavy metal result of Nalaikh area							
			X	Y	pH	Pb	Se	As	Hg	Zn	Cu	Ni	Cr
1	S1429	17.L4811Г-в ND07-30	107.3038417	47.72899028	6.57	0	0	10.16	0	93.84	0	74.65	45.51
2	S1430	17.L4811Г-в ND07-31	107.3036433	47.72449528	6.65	0	0	15.6	13.03	94.91	0	73.22	0
3	S1431	17.L4811Г-в ND07-32	107.3076697	47.74016111	7.31	0	0	0	0	63.25	0	0	0
4	S1432	17.L4811Г-в ND07-33	107.3074711	47.73566611	5.73	0	0	14.12	0	36.48	0	0	0
5	S1433	17.L4811Г-в ND07-34	107.3072725	47.73117083	5.61	0	0	13.7	0	88.95	0	0	0
6	S1434	17.L4811Г-в ND07-35	107.3070736	47.72667583	5.39	12.55	0	11.78	0	100.81	0	83.52	0
7	S1435	17.L4811Г-в ND07-36	107.3110017	47.74009417	7.15	0	0	14.28	0	80.85	0	75.54	0
8	S1436	17.L4811Г-в ND07-37	107.3108028	47.73559889	6.39	17.17	0	23.1	0	127.33	0	70.33	0
9	S1437	17.L4811Г-в ND07-38	107.3106039	47.73110389	5.57	0	0	14.68	0	69.37	0	67.03	0
10	S1438	17.L4811Г-в ND07-39	107.3104047	47.72660861	5.33	0	0	14.87	0	66.79	0	57.68	0
11	S1439	17.L4811Г-в ND07-40	107.3102061	47.72211361	7.23	12.11	0	9.51	0	93.01	0	0	0
12	S1440	17.L4811Г-в ND07-41	107.3147325	47.74901722	8.12	0	0	19.11	0	65.91	0	58.7	0
13	S1441	17.L4811Г-в ND07-42											
14	S1442	17.L4811Г-в ND07-43	107.318065	47.74895	5.49	0	0	18	0	75.86	0	0	0
15	S1443	17.L4811Г-в ND07-44	107.3178653	47.74445472	6.1	0	0	27.84	0	96.32	0	0	0
16	S1444	17.L4811Г-в ND07-45	107.3176656	47.73995972	5.81	17.72	0	13.03	0	100.8	0	0	0
17	S1445	17.L4811Г-в ND07-46	107.3174661	47.73546444	6.51	0	0	0	0	39.51	0	51.06	0
18	S1446	17.L4811Г-в ND07-47	107.3172667	47.73096944	8.44	0	0	0	0	75.94	0	0	0
19	S1447	17.L4811Г-в ND07-48	107.3170669	47.72647444	5.24	0	0	0	0	65.15	0	0	0
20	S1448	17.L4811Г-в ND07-49	107.3168675	47.72197917	7.89	12.49	0	0	0	89.27	0	0	0
21	S1449	17.L4811Г-в ND07-50	107.3209975	47.73989222	6.03	0	0	11.26	0	77.26	0	0	0
22	S1452	17.L4811Г-в ND07-53	107.3203981	47.72640694	7.43	0	0	11.51	0	96.11	0	75.64	0
23	S1453	17.L4811Г-в ND07-54	107.3201983	47.72191194	7.06	0	0	13.56	0	85.87	0	0	0
24	S1454	17.L4811Г-в ND07-55	107.32473	47.748815	7.57	0	0	12.8	0	76.31	0	0	0
25	S1455	17.L4811Г-в ND07-56	107.3245297	47.74432	7.46	0	0	13.71	0	88.3	0	60.31	0
26	S1456	17.L4811Г-в ND07-57	107.3243294	47.73982472	5.94	0	0	16.64	0	82.17	0	0	0
27	S1457	17.L4811Г-в ND07-58	107.3241294	47.73532972	7.21	27.03	0	87.43	0	75.51	139.05	67.55	0
28	S1228	17.L48-11-Г-а ND04-15	107.274446	47.775495	6.97	12.32	0	11.36	0	82.86	0	0	0
29	S1229	17.L48-11-Г-а ND04-16	107.274148	47.779370	6.48	14.41	0	14.46	0	79.8	0	0	0
30	S1230	17.L48-11-Г-а ND04-17	107.276768	47.781577	6.49	0	0	15.43	0	85.34	0	0	0
31	S1231	17.L48-11-Г-а ND04-18	107.278534	47.785627	6.26	13.46	0	0	0	74.88	0	0	0
32	S1232	17.L48-11-Г-а ND04-19	107.281633	47.782002	6.53	0	0	13.93	0	90.81	0	0	0
33	S1233	17.L48-11-Г-а ND04-20	107.277904	47.776101	5.92	0	0	12.23	0	84.99	0	0	0
34	S1234	17.L48-11-Г-а ND04-21	107.276438	47.774943	7.05	0	0	10.6	0	48.03	0	62.64	0
35	S1235	17.L48-11-Г-а ND04-22	107.276948	47.774096	7.23	15.87	0	19.43	0	89.25	0	78.63	0
36	S1236	17.L48-11-Г-а ND04-23	107.276864	47.771560	7.43	0	0	9.82	0	56.01	0	70.65	0
37	S1237	17.L48-11-Г-а ND04-24	107.278569	47.767189	7.13	0	0	20.71	0	82.6	0	56.56	0
38	S1238	17.L48-11-Г-а ND04-25	107.283104	47.771706	7.05	22.28	0	15.85	0	104.81	0	0	0
39	S1239	17.L48-11-Г-а ND04-26	107.281723	47.772174	7.12	25.59	0	11.38	0	86.65	0	57.82	0
40	S1240	17.L48-11-Г-а ND04-27	107.281812	47.774197	6.65	16.52	0	18.09	0	101.8	0	0	0
41	S1241	17.L48-11-Г-а ND04-28	107.286148	47.774768	6.82	12.43	0	20	0	98.07	0	74.31	0
42	S1242	17.L48-11-Г-а ND04-29	107.292985	47.785447	7.07	0	0	12.26	0	68.13	0	0	0
43	S1243	17.L48-11-Г-а ND04-30	107.316130	47.780483	7.6	0	0	8.73	0	30.89	0	0	0
44	S1244	17.L48-11-Г-а ND04-31	107.315930	47.775988	7.27	24.01	0	12.22	0	72.95	0	62.28	0
45	S1245	17.L48-11-Г-а ND04-33	107.319464	47.780416	6.95	0	0	24.28	0	51.24	0	0	0
46	S1246	17.L48-11-Г-а ND04-34	107.3192642	47.77592056	7.22	18.49	0	11.11	0	127.11	0	0	0
47	S1247	17.L48-11-Г-а ND04-35	107.3190642	47.77142528	7.15	0	0	14.17	0	94.33	0	69.28	0
48	S1248	17.L48-11-Г-а ND04-36	107.3188642	47.76693028	7.28	0	0	17.55	0	57.9	0	0	0
49	S1249	17.L48-11-Г-а ND04-37	107.3226986	47.77810056	6.91	0	0	14.12	0	81.76	0	67.65	0
50	S1250	17.L48-11-Г-а ND04-38	107.3224983	47.77360556	7.34	0	0	13.27	0	93.21	0	0	0
51	S1251	17.L48-11-Г-а ND04-39	107.3222981	47.76911028	7.51	0	0	12.31	0	76.01	0	0	0
52	S1252	17.L48-11-Г-а ND04-40	107.3259325	47.77578556	6.3	11.28	0	14.69	0	89.26	0	0	0
53	S1253	17.L48-11-Г-а ND04-41	107.3257319	47.77129028	6.72	0	0	11.44	10.83	69.47	0	0	0

			X	Y	pH	Pb	Se	As	Hg	Zn	Cu	Ni	Cr
54	S1254	17.L48-11-Г-a ND04-42	107.3255317	47.76679528	7.56	0	0	0	0	35.27	0	0	0
55	S1255	17.L48-11-Г-a ND04-43	107.3292669	47.77571778	6.32	11.55	0	0	0	73.31	0	0	0
56	S1256	17.L48-11-Г-a ND04-44	107.329066	47.771223	7.25	0	0	11.15	0	60.9	0	84.77	0
57	S1257	17.L48-11-Г-a ND04-45	107.328865	47.766728	7.33	0	0	11.13	0	76.06	0	68.5	0
58	S1258	17.L48-11-Г-a ND04-46	107.328664	47.762233	7.56	14.36	0	0	0	67.04	0	86.66	0
59	S1259	17.L48-11-Г-a ND04-47	107.332802	47.780145		0	0	10.28	0	50.91	0	0	0
60	S1260	17.L48-11-Г-a ND04-48	107.332601	47.775650	6.57	0	0	13.15	0	66.44	0	65.17	0
61	S1261	17.L48-11-Г-a ND04-49	107.332400	47.771155	7.2	0	0	0	0	59.61	0	53.69	0
62	S1262	17.L48-11-Г-a ND04-50	107.3321989	47.76666	5.75	0	0	12.14	0	56.99	0	0	0
63	S1263	17.L48-11-Г-a ND04-51	107.3319978	47.762165	6.81	15.55	0	10.71	0	82.04	0	0	0
64	S1264	17.L48-11-Г-a ND04-52	107.3361367	47.78007722	7.12	0	0	13.17	0	81.53	0	57.58	0
65	S1265	17.L48-11-Г-a ND04-53	107.3359353	47.77558222	6.83	12.95	0	0	0	82.63	0	66.43	0
66	S1266	17.L48-11-Г-a ND04-54	107.3357339	47.77108722	6.92	13.73	0	0	0	38.21	0	0	0
67	S1267	17.L48-11-Г-a ND04-55	107.3355325	47.76659222	7.24	15.89	0	13.85	0	86.91	0	75.86	0
68	S1268	17.L48-11-Г-a ND04-56	107.3353311	47.76209722	7.16	0	0	16.87	0	69.01	0	64.25	0
69	S1269	17.L48-11-Г-a ND04-57	107.2669158	47.77361056	7.68	0	0	13.66	0	85.28	0	0	0
70	S1270	17.L48-11-Г-a ND05-1	107.3395719	47.78225667	6.98	0	0	12.86	0	80.24	0	0	0
71	S1271	17.L48-11-Г-a ND05-2	107.3394711	47.78000917	6.15	0	0	0	0	65.73	0	71.57	0
72	S1272	17.L48-11-Г-a ND05-3	107.3393703	47.77776167	6.23	12.25	0	9.84	0	60.87	0	0	0
73	S1273	17.L48-11-Г-a ND05-4	107.3392694	47.77551417	5.12	13.55	0	16.95	9.12	93.13	0	69.66	0
74	S1274	17.L48-11-Г-a ND05-5	107.3391686	47.77326667	6.01	0	0	11.17	0	69.56	0	0	0
75	S1275	17.L48-11-Г-a ND05-6	107.3390678	47.77101917	6.75	0	0	8.73	0	58.67	0	83.53	0
76	S1276	17.L48-11-Г-a ND05-7	107.3389669	47.76877167	7.21	0	0	10.08	11.5	73.2	0	67.54	0
77	S1277	17.L48-11-Г-a ND05-8	107.3388661	47.76652417	8.54	0	0	10.61	9.12	59.6	0	0	0
78	S1278	17.L48-11-Г-a ND05-9	107.3387653	47.76427667	8.1	0	0	9.09	0	63.74	0	60.36	0
79	S1279	17.L48-11-Г-a ND05-10	107.3386644	47.76202917	8.05	0	0	10.23	0	37.39	0	95.84	0
80	S1280	17.L48-11-Г-a ND05-11	107.3385636	47.75978167	7.2	0	0	11.94	0	56	0	0	0
81	S1281	17.L48-11-Г-a ND05-12	107.3430078	47.78443611	6.65	0	0	0	0	39.91	0	0	0
82	S1282	17.L48-11-Г-a ND05-13	107.3429067	47.78218861	6.88	0	0	10.04	0	69.9	0	69.4	0
83	S1283	17.L48-11-Г-a ND05-14	107.3428056	47.77994111	7.3	11.46	0	9.25	0	57.69	0	0	0
84	S1284	17.L48-11-Г-a ND05-15	107.3426036	47.77544611	7.3	0	0	0	0	73.52	0	71.74	0
85	S1285	17.L48-11-Г-a ND05-16	107.3424017	47.77095111	7.18	12.11	0	10.43	0	78.64	0	0	37.83
86	S1286	17.L48-11-Г-a ND05-17	107.3421997	47.76645611	6.94	15.96	0	0	0	88.76	0	67.54	0
87	S1287	17.L48-11-Г-a ND05-18	107.3420986	47.76420861	6.65	0	0	0	0	50.1	0	0	0
88	S1288	17.L48-11-Г-a ND05-19	107.3419978	47.76196111	6.57	0	0	34.7	0	84.43	0	78.3	0
89	S1289	17.L48-11-Г-a ND05-20	107.3417958	47.75746611	6.35	0	0	10.51	0	49.27	0	0	0
90	S1290	17.L48-11-Г-a ND05-21	107.3463425	47.78436806	7.59	0	0	14.23	0	127.28	0	0	0
91	S1291	17.L48-11-Г-a ND05-22	107.3462411	47.78212056	6.64	0	0	0	0	60.14	0	0	0
92	S1292	17.L48-11-Г-a ND05-23	107.34614	47.77987306	7.92	0	0	8.55	0	26.67	0	52.96	0
93	S1293	17.L48-11-Г-a ND05-24	107.3459378	47.77537806	7.12	22.78	0	0	0	121.72	0	0	0
94	S1294	17.L48-11-Г-a ND05-25	107.3457356	47.77088306	7.1	0	0	9.74	0	70.51	0	0	0
95	S1296	17.L48-11-Г-a ND05-27	107.3454322	47.76414056	6.37	0	0	40.66	0	63.87	0	0	0
96	S1297	17.L48-11-Г-a ND05-28	107.3453311	47.76189306	6.56	10.35	0	17.74	0	67.13	0	0	0
97	S1298	17.L48-11-Г-a ND05-29	107.3451289	47.75739806	6.06	0	0	12.98	0	66.54	0	65.04	0
98	S1299	17.L48-11-Г-a ND05-30	107.3495758	47.78205222	6.45	11.26	0	13.07	0	72.29	0	0	0
99	S1300	17.L48-11-Г-a ND05-31	107.3494744	47.77980472	4.9	0	0	15.84	0	81.13	0	0	0
100	S1301	17.L48-11-Г-a ND05-32	107.3493731	47.77755722	6.44	0	0	0	0	46.1	0	71.11	0
101	S1302	17.L48-11-Г-a ND05-33	107.3492719	47.77531	6.52	0	0	8.81	8.34	64.14	0	0	0
102	S1303	17.L48-11-Г-a ND05-34	107.3491706	47.7730625	7.47	12.81	0	0	0	44.05	0	63.08	0
103	S1304	17.L48-11-Г-a ND05-35	107.3490692	47.770815	7.32	0	0	9	8.94	75.26	0	0	0
104	S1305	17.L48-11-Г-a ND05-36	107.3489681	47.7685675	6.74	14.91	0	12.6	9.07	82.06	0	76.53	0
105	S1306	17.L48-11-Г-a ND05-37	107.3488667	47.76632		0	0	10.2	0	81.58	0	67.75	0
106	S1307	17.L48-11-Г-a ND05-38	107.3487656	47.7640725	7.23	0	0	10.28	0	64.97	0	77.47	0
107	S1308	17.L48-11-Г-a ND05-39	107.3486644	47.761825	6.4	0	0	13.02	0	83.23	0	0	0

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			X	Y	pH	Pb	Se	As	Hg	Zn	Cu	Ni	Cr
108	S1309	17.L48-11-Г-a ND05-40	107.3485631	47.7595775	6.35	0	0	11.96	0	80.86	0	0	0
109	S1310	17.L48-11-Г-a ND05-41	107.3484619	47.75733	6.6	13.74	0	11.54	0	84.44	0	0	0
110	S1311	17.L48-11-Г-a ND05-42	107.3483608	47.7550825	6.66	0	0	10.97	0	62.03	0	65.67	0
111	S1312	17.L48-11-Г-a ND05-43	107.3529103	47.78198389	7.36	15.67	0	0	0	106.75	0	71.83	0
112	S1313	17.L48-11-Г-a ND05-44	107.3528089	47.77973639	6.18	0	0	9.85	0	58.66	0	68.67	0
113	S1314	17.L48-11-Г-a ND05-45	107.3527075	47.77748889	6.14	0	0	0	0	59.21	0	0	0
114	S1315	17.L48-11-Г-a ND05-46	107.3526061	47.77524167	7	0	0	12.52	0	61.85	0	63.06	0
115	S1316	17.L48-11-Г-a ND05-47	107.3525044	47.77299417	7.21	0	0	9.76	0	65.33	0	57.21	0
116	S1317	17.L48-11-Г-a ND05-48	107.3524031	47.77074667	6.51	12.22	0	0	0	81.51	0	61.78	0
117	S1318	17.L48-11-Г-a ND05-49	107.3523017	47.76849917	7.39	0	0	10.99	0	71.77	0	71.34	0
118	S1319	17.L48-11-Г-a ND05-50	107.352	47.766	7.09	0	0	0	0	62.42	0	0	0
119	S1320	17.L48-11-Г-a ND05-51	107.352	47.764	7.1	0	0	0	0	67.99	0	70.02	0
120	S1321	17.L48-11-Г-a ND05-52	107.352	47.762	6.79	16.86	0	0	0	55.59	0	0	0
121	S1322	17.L48-11-Г-a ND05-53	107.356	47.784	6.41	0	0	8.1	0	58.88	0	75.15	0
122	S1323	17.L48-11-Г-a ND05-54	107.356	47.782	5.92	0	0	0	0	58.11	0	0	0
123	S1324	17.L48-11-Г-a ND05-55	107.356	47.780	6.09	0	0	0	0	49.19	0	0	0
124	S1325	17.L48-11-Г-a ND05-56	107.356	47.777	6.47	0	0	0	0	76.14	0	63.91	0
125	S1326	17.L48-11-Г-a ND05-57	107.356	47.775	5.95	0	0	14	0	63.77	0	0	0
126	S1327	17.L48-11-Г-a ND05-58	107.356	47.773	6.5	15.48	0	0	12.01	78.95	0	0	0
127	S1328	17.L48-11-Г-a ND05-59	107.356	47.771	7.6	0	0	9.6	0	63.83	0	97.97	0
128	S1329	17.L48-11-Г-a ND05-60	107.356	47.768	6.46	0	0	0	0	60.11	0	73.05	38.09
129	S1330	17.L48-11-Г-a ND05-61	107.360	47.784		0	0	18.12	0	91.31	0	0	0
130	S1331	17.L48-11-Г-a ND05-62	107.360	47.782	7.32	20.11	0	11.95	0	74.75	0	0	0
131	S1332	17.L48-11-Г-a ND05-64	107.359	47.773	6.6	0	0	0	0	23.24	0	0	0
132	S1333	17.L48-11-Г-a ND05-65	107.359	47.768	6.73	0	0	0	0	57.09	0	0	0
133	S1334	17.L48-11-Г-a ND05-66	107.359	47.764	6.54	0	0	0	0	47.59	0	75.61	0
134	S1335	17.L48-11-Г-a ND05-67	107.363	47.777		0	0	0	0	48.92	0	0	0
135	S1336	17.L48-11-Г-a ND05-68	107.363	47.773	6.31	0	0	8.3	0	44.31	0	0	0
136	S1337	17.L48-11-Г-a ND05-69	107.362	47.768	6.74	0	0	0	0	51.94	0	0	0
137	S1338	17.L48-11-Г-a ND05-70	107.362	47.764	6.73	0	0	8.81	0	63.07	0	57.15	0
138	S1339	17.L48-11-Г-a ND05-71	107.366	47.777	6.55	0	0	0	0	51.53	0	77.81	0
139	S1340	17.L48-11-Г-a ND05-72	107.366	47.775	6.05	0	0	0	0	62.71	0	0	0
140	S1341	17.L48-11-Г-a ND05-73	107.366	47.770	6.09	13.46	0	0	0	67.76	0	55.86	0
141	S1342	17.L48-11-Г-a ND05-74	107.366	47.768	7.91	0	0	0	0	53.76	0	94.73	0
142	S1343	17.L48-11-Г-a ND05-75	107.366	47.766	6.6	0	0	0	0	46.72	0	0	0
143	S1344	17.L48-11-Г-a ND05-76	107.365	47.761	6.69	0	0	0	0	52.88	0	0	0
144	S1345	17.L48-11-Г-a ND05-77	107.369	47.777	6.3	0	0	13.86	0	83.08	0	64.52	0
145	S1346	17.L48-11-Г-a ND05-78	107.369	47.775	6.73	12.99	0	19.93	0	86.84	0	0	0
146	S1347	17.L48-11-Г-a ND05-79	107.369	47.773	6.07	0	0	13.89	0	78.22	0	75.87	0
147	S1348	17.L48-11-Г-a ND05-80	107.369	47.770	6.06	11.88	0	0	0	129.66	0	69.15	0
148	S1349	17.L48-11-Г-a ND05-81	107.369	47.768	6.07	0	0	10.07	9.09	86.96	0	59.25	0
149	S1350	17.L48-11-Г-a ND05-82	107.369	47.766	6.27	16.75	0	0	0	107.14	0	93.86	0
150	S1351	17.L48-11-Г-a ND05-83	107.369	47.764	6.51	0	0	0	0	56.34	0	87.08	0
151	S1352	17.L48-11-Г-a ND05-84	107.373	47.777	5.12	0	0	0	0	63.6	0	63.75	0
152	S1353	17.L48-11-Г-a ND05-85	107.373	47.775	5.08	0	0	0	0	51.23	0	0	0
153	S1354	17.L48-11-Г-a ND05-86	107.373	47.773	7.38	12.01	0	10.65	0	61.55	0	90.16	0
154	S1355	17.L48-11-Г-a ND05-87	107.372	47.770	6.3	0	0	14.4	0	65.26	0	71.14	0
155	S1356	17.L48-11-Г-a ND05-88	107.372	47.768	6.66	0	0	10.29	0	69.05	0	0	0
156	S1357	17.L48-11-Г-a ND05-89	107.372	47.766	7.47	0	0	0	0	64.65	0	76.79	41.05
157	S1358	17.L48-11-Г-a ND05-90	107.372099	47.763592	5.62	0	0	11.2	0	50.74	0	64.59	0
158	S1361	17.L48-11-Г-a ND07-1	107.264	47.763	6.89	23.89	0	0	12.13	96.75	0	0	0
159	S1362	17.L48-11-Г-a ND07-2	107.263	47.761	7.43	21.05	0	16.28	0	86.31	0	53.71	0
160	S1363	17.L48-11-Г-a ND07-3	107.271	47.763	7.1	14.08	0	0	8.75	55.01	0	67.07	0
161	S1364	17.L48-11-Г-a ND07-4	107.271	47.758	7.53	13.08	0	16.9	0	106.22	0	0	0

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			X	Y	pH	Pb	Se	As	Hg	Zn	Cu	Ni	Cr
162	S1365	17.L48-11-Г-а ND07-5	107.277	47.763	7.18	12.07	0	0	0	66.68	0	0	0
163	S1366	17.L48-11-Г-а ND07-6	107.279	47.762	6.82	15.08	0	15.46	0	100.26	0	0	0
164	S1367	17.L48-11-Г-а ND07-7	107.292	47.758	6.42	13.04	0	14.7	0	89.96	0	71.83	0
165	S1368	17.L48-11-Г-а ND07-8	107.316	47.767	7.68	0	0	14.21	0	70.07	0	92.3	0
166	S1369	17.L48-11-Г-а ND07-9	107.315	47.763	7.3	0	0	15.96	0	83.02	0	73.77	0
167	S1370	17.L48-11-Г-а ND07-10	107.315	47.758	6	12	0	12.44	0	73.82	0	66.96	0
168	S1371	17.L48-11-Г-а ND07-11	107.315	47.754	6.15	0	0	16.41	0	84.59	0	57.99	0
169	S1372	17.L48-11-Г-а ND07-12	107.319	47.762	7.5	0	0	12.19	12.64	79.59	0	69.46	0
170	S1373	17.L48-11-Г-а ND07-13	107.318	47.758	6.2	13	0	14.46	0	96.14	0	70.28	0
171	S1374	17.L48-11-Г-а ND07-14	107.318	47.753	6.01	14.5	0	18.55	0	89.86	0	0	0
172	S1375	17.L48-11-Г-а ND07-15	107.322	47.765	7.41	0	0	0	0	67.76	0	0	0
173	S1376	17.L48-11-Г-а ND07-16	107.322	47.760	6.73	0	0	9.3	0	72.18	0	97.58	0
174	S1377	17.L48-11-Г-а ND07-17											
175	S1378	17.L48-11-Г-а ND07-18	107.322	47.756	5.78	0	0	17.53	0	103.02	0	0	0
176	S1379	17.L48-11-Г-а ND07-19	107.325	47.762	9.82	12.74	0	0	0	45.9	0	73.51	0
177	S1380	17.L48-11-Г-а ND07-20	107.325	47.758	6.15	0	0	10.17	0	95.85	0	60.91	0
178	S1381	17.L48-11-Г-а ND07-21	107.325	47.753	6.21	0	0	11.78	0	73.11	0	59.7	0
179	S1382	17.L48-11-Г-а ND07-22	107.328	47.758	8.05	0	0	0	0	46.81	0	62.43	0
180	S1383	17.L48-11-Г-а ND07-23	107.328	47.753	6.26	0	0	16.93	0	73.66	29.13	101.08	0
181	S1384	17.L48-11-Г-а ND07-24	107.332	47.758	6.9	13.08	0	9.4	0	70.52	0	0	0
182	S1385	17.L48-11-Г-а ND07-25	107.332	47.753	5.91	0	0	11.2	0	76.89	0	0	0
183	S1386	17.L48-11-Г-а ND07-26	107.335	47.758	6.05	0	0	13.61	0	68.8	0	0	0
184	S1387	17.L48-11-Г-а ND07-27	107.335	47.753	8.02	15.23	0	9.55	0	75.17	0	0	0
185	S1388	17.L48-11-Г-а ND07-28	107.338	47.758	6.89	0	0	15.69	0	78.94	0	0	0
186	S1389	17.L48-11-Г-а ND07-29	107.338	47.755	6.78	16.6	0	10.16	0	70.11	0	90.65	0
187	S1390	17.L48-11-Г-а ND07-30	107.338	47.753	7.47	12.09	0	11.23	0	88.32	0	0	0
188	S1391	17.L48-11-Г-а ND07-31	107.338	47.751	6.27	11.68	0	14.65	0	78.64	0	60.45	0
189	S1392	17.L48-11-Г-а ND07-32	107.342	47.753	6.23	13.73	0	17.59	0	91.05	0	0	0
190	S1393	17.L48-11-Г-а ND07-33	107.341	47.751	6.12	0	0	12.38	0	81.63	0	68.27	0
191	S1394	17.L48-11-Г-а ND07-34	107.345	47.753	6.4	11.44	0	13.89	0	97.63	0	79.52	0
192	S1395	17.L48-11-Г-а ND07-35	107.345	47.751	6.19	0	0	9	8.94	75.26	0	0	0
193	S1396	17.L48-11-Г-а ND07-36	107.349	47.769	6.1	0	0	9.28	0	45.86	0	68.65	0
194	S1397	17.L48-11-Г-а ND07-37	107.349	47.766	6.7	14.55	0	19.07	0	80.66	0	0	0
195	S1398	17.L48-11-Г-а ND07-38	107.349	47.764	7.2	12.06	0	15.14	0	95.25	0	0	0
196	S1399	17.L48-11-Г-а ND07-39	107.349	47.762	7.48	0	0	13.07	0	81.36	0	75.45	0
197	S1400	17.L4811Г-в ND07-1	107.2528636	47.7421775									
198	S1401	17.L4811Г-в ND07-2	107.2557197	47.74221139	6.85	0	0	13.02	0	48.55	0	78.11	0
199	S1402	17.L4811Г-в ND07-3	107.2592081	47.74205278	6.54	0	0	9.42	0	56.02	0	64.44	0
200	S1403	17.L4811Г-в ND07-4	107.2618803	47.74183806	6.6	0	0	16.1	0	88.61	0	0	0
201	S1404	17.L4811Г-в ND07-5	107.2653753	47.74091444	6.89	0	0	17.91	0	102.54	0	0	0
202	S1405	17.L4811Г-в ND07-6	107.2694664	47.74020361	6.58	0	0	12.2	0	55.81	0	0	0
203	S1406	17.L4811Г-в ND07-7	107.2727761	47.73931917	6.85	13.04	0	14.7	0	89.96	0	71.83	0
204	S1407	17.L4811Г-в ND07-8	107.2777794	47.74300833	7.43	0	0	14.21	0	70.07	0	92.3	0
205	S1408	17.L4811Г-в ND07-9	107.2810133	47.74069444	6.06	0	0	15.96	0	83.02	0	73.77	0
206	S1409	17.L4811Г-в ND07-10	107.2808169	47.73619917	5.68	0	0	12.76	0	96.4	0	0	0
207	S1410	17.L4811Г-в ND07-11	107.2806206	47.73170389	5.98	0	0	22.2	0	92.79	0	61.54	0
208	S1411	17.L4811Г-в ND07-12	107.2804242	47.72720861	6.02	0	0	12.19	12.64	79.59	0	69.46	0
209	S1412	17.L4811Г-в ND07-13	107.2843456	47.74062806	7.32	13	0	14.46	0	96.14	0	70.28	0
210	S1413	17.L4811Г-в ND07-14	107.2841489	47.73613278	5.45	0	0	17.82	0	82.33	0	83.12	0
211	S1414	17.L4811Г-в ND07-15	107.2839522	47.73163778	6.11	0	0	12.18	0	95.74	0	0	0
212	S1415	17.L4811Г-в ND07-16	107.2837556	47.7271425	6.39	0	0	9.3	0	72.18	0	97.58	0
213	S1416	17.L4811Г-в ND07-17	107.2874806	47.73606639	6.16	17.58	0	11.34	0	102.33	0	73.45	0
214	S1417	17.L4811Г-в ND07-18	107.2872836	47.73157139	5.81	0	0	17.53	0	103.02	0	0	0
215	S1418	17.L4811Г-в ND07-19	107.2870867	47.72707611	5.28	12.74	0	0	0	45.9	0	73.51	0

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			X	Y	pH	Pb	Se	As	Hg	Zn	Cu	Ni	Cr
216	S1419	17.L4811Г-в ND07-20	107.2941442	47.73593333	5.7	0	0	10.17	0	95.85	0	60.91	0
217	S1420	17.L4811Г-в ND07-21	107.2937492	47.72694306	5.74	15.66	0	10.46	0	96.49	0	86.08	0
218	S1421	17.L4811Г-в ND07-22	107.33513	47.75760194	5.85	15.95	0	20.12	0	99.51	0	70.09	0
219	S1422	17.L4811Г-в ND07-23			5.55	0	0	16.93	0	73.66	29.13	101.08	0
220	S1423	17.L4811Г-в ND07-24			5.86	14.26	0	0	0	63.09	0	0	42.22
221	S1424	17.L4811Г-в ND07-25	107.3349286	47.75310694	5.78	0	0	13.47	0	86.8	0	61.69	0
222	S1425	17.L4811Г-в ND07-26	107.3384628	47.75753417	6.15	12.79	0	13.56	0	75.65	0	0	0
223	S1426	17.L4811Г-в ND07-27	107.3383622	47.75528667	6.14	0	0	13.98	10.54	92.28	0	83.69	0
224	S1427	17.L4811Г-в ND07-28	107.3382614	47.75303917	6.13	0	0	19.1	0	102.03	0	60.11	71.06
225	S1428	17.L4811Г-в ND07-29	107.3381606	47.75079167	5.97	0	0	13.65	9.37	72.7	0	78.58	0
226	S1429	17.L4811Г-в ND07-30	107.3415942	47.75297111	6.57	0	0	10.16	0	93.84	0	74.65	45.51
227	S1430	17.L4811Г-в ND07-31	107.3414933	47.75072361	6.65	0	0	15.6	13.03	94.91	0	73.22	0
228	S1431	17.L4811Г-в ND07-32			7.31	0	0	0	0	63.25	0	0	0
229	S1432	17.L4811Г-в ND07-33	107.3449269	47.75290306	5.73	0	0	14.12	0	36.48	0	0	0
230	S1433	17.L4811Г-в ND07-34	107.3448258	47.75065556	5.61	0	0	13.7	0	88.95	0	0	0
231	S1434	17.L4811Г-в ND07-35	107.3489681	47.7685675	5.39	12.55	0	11.78	0	100.81	0	83.52	0
232	S1435	17.L4811Г-в ND07-36	107.3488667	47.76632	7.15	0	0	14.28	0	80.85	0	75.54	0
233	S1436	17.L4811Г-в ND07-37	107.3487656	47.7640725	6.39	17.17	0	23.1	0	127.33	0	70.33	0
234	S1437	17.L4811Г-в ND07-38	107.3486644	47.761825	5.57	0	0	14.68	0	69.37	0	67.03	0
235	S1438	17.L4811Г-в ND07-39	107.2528636	47.7421775	5.33	0	0	14.87	0	66.79	0	57.68	0
236	S1439	17.L4811Г-в ND07-40	107.2557197	47.74221139	7.23	12.11	0	9.51	0	93.01	0	0	0
237	S1440	17.L4811Г-в ND07-41	107.2592081	47.74205278	8.12	0	0	19.11	0	65.91	0	58.7	0
238	S1441	17.L4811Г-в ND07-42											
239	S1442	17.L4811Г-в ND07-43			5.49	0	0	18	0	75.86	0	0	0
240	S1443	17.L4811Г-в ND07-44			6.1	0	0	27.84	0	96.32	0	0	0
241	S1444	17.L4811Г-в ND07-45	107.2618803	47.74183806	5.81	17.72	0	13.03	0	100.8	0	0	0
242	S1445	17.L4811Г-в ND07-46	107.2653753	47.74091444	6.51	0	0	0	0	39.51	0	51.06	0
243	S1446	17.L4811Г-в ND07-47	107.2694664	47.74020361	8.44	0	0	0	0	75.94	0	0	0
244	S1447	17.L4811Г-в ND07-48	107.2727761	47.73931917	5.24	0	0	0	0	65.15	0	0	0
245	S1448	17.L4811Г-в ND07-49	107.2777794	47.74300833	7.89	12.49	0	0	0	89.27	0	0	0
246	S1449	17.L4811Г-в ND07-50	107.2810133	47.74069444	6.03	0	0	11.26	0	77.26	0	0	0
247	S1450	17.L4811Г-в ND07-51	107.2808169	47.73619917	7.39	12.35	0	0	0	69.27	0	0	0
248	S1451	17.L4811Г-в ND07-52	107.2806206	47.73170389	7.95	0	0	10.55	0	67.28	0	68.11	0
249	S1452	17.L4811Г-в ND07-53	107.2804242	47.72720861	7.43	0	0	11.51	0	96.11	0	75.64	0
250	S1453	17.L4811Г-в ND07-54	107.2843456	47.74062806	7.06	0	0	13.56	0	85.87	0	0	0
251	S1454	17.L4811Г-в ND07-55	107.2841489	47.73613278	7.57	0	0	12.8	0	76.31	0	0	0
252	S1455	17.L4811Г-в ND07-56	107.2839522	47.73163778	7.46	0	0	13.71	0	88.3	0	60.31	0
253	S1456	17.L4811Г-в ND07-57	107.2837556	47.7271425	5.94	0	0	16.64	0	82.17	0	0	0
254	S1457	17.L4811Г-в ND07-58	107.2874806	47.73606639	7.21	27.03	0	87.43	0	75.51	139.05	67.55	0
255	S1458	17.L4811Г-в ND07-59	107.2872836	47.73157139	5.98	0	0	0	0	63.83	0	0	0
256	S1459	17.L4811Г-в ND07-60	107.2870867	47.72707611	7.13	0	0	9.63	0	68.33	0	63.08	0
257	S1460	17.L4811Г-в ND07-61	107.2941442	47.73593333	6.86	13.58	0	10.57	0	77.58	0	0	0
258	S1461	17.L4811Г-в ND07-62	107.2937492	47.72694306	7.36	0	0	8.44	0	71.55	0	0	0
259	S1462	17.L4811Г-в ND07-63			7.18	0	0	10.55	0	66.59	0	72.63	0
260	S1463	17.L4811Г-в ND07-64			6.48	0	0	14.24	0	62.96	0	0	0
261	S1464	17.L4811Г-в ND07-65	107.2935517	47.72244778	5.11	0	0	12.77	0	85.77	0	74.05	0
262	S1465	17.L4811Г-в ND07-66	107.2974758	47.73586667	7.21	14.38	0	15.77	0	198.29	29.59	59.84	0
263	S1466	17.L4811Г-в ND07-67	107.2972781	47.73137167	5.44	0	0	13.33	0	82.05	0	77.55	0
264	S1467	17.L4811Г-в ND07-68	107.2970803	47.72687639	6.72	12.55	0	0	0	72.76	0	63.98	0
265	S1468	17.L4811Г-в ND07-69	107.2968825	47.72238111	7.38	0	0	13.69	0	60.16	0	64.49	0
266	S1469	17.L4811Г-в ND07-70	107.3003125	47.72456194	6.15	0	0	18.59	0	70.94	0	0	0
267	S1470	17.L4811Г-в ND07-71	107.3042386	47.73798056	6.27	12.61	0	0	0	78.38	0	0	0
268	S1471	17.L4811Г-в ND07-72	107.30404	47.73348556	6.16	0	0	13.24	0	73.78	0	0	0
269	S1472	17.L4811Г-в ND07-73	107.3038417	47.72899028	6.02	0	0	21.29	0	89.93	0	80.45	0

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			X	Y	pH	Pb	Se	As	Hg	Zn	Cu	Ni	Cr
270	S1473	17.L4811Г-в ND07-74	107.3036433	47.72449528	5.9	16.71	0	11.56	0	79.7	0	74.82	0
271	S1474	17.L4811Г-в ND07-75	107.3076697	47.74016111									
272	S1475	17.L4811Г-в ND07-76	107.3074711	47.73566611									
273	S1476	17.L4811Г-в ND07-77	107.3072725	47.73117083									
274	S1477	17.L4811Г-в ND07-78	107.3070736	47.72667583	5.88	15.41	0	14.97	0	91.17	0	71.88	0
275	S1478	17.L4811Г-в ND07-79	107.3110017	47.74009417	6.4	0	0	8.67	0	52.61	0	0	0
276	S1479	17.L4811Г-в ND07-80	107.3108028	47.73559889	5.59	0	0	11.59	0	73.11	0	70.73	0
277	S1480	17.L4811Г-в ND07-81	107.3106039	47.73110389	5.75	0	0	18.98	0	68.67	0	63.78	0
278	S1481	17.L4811Г-в ND07-82	107.3104047	47.72660861	6.62	0	0	0	0	76.1	0	0	0
279	S1482	17.L4811Г-в ND07-83	107.3102061	47.72211361	6.47	0	0	11.51	0	81.27	0	0	0
280	S1483	17.L4811Г-в ND07-84	107.3147325	47.74901722	6.03	0	0	15.36	0	73.04	0	0	0
281	S1484	17.L4811Г-в ND07-85			6.58	12.32	0	16.26	0	94.47	0	0	0
282	S1485	17.L4811Г-в ND07-86				0	0	11.62	0	66.91	0	0	0
283	S1486	17.L4811Г-в ND07-87	107.318065	47.74895	6.34	15.02	0	13.33	0	79.6	0	82.47	0
284	S1487	17.L4811Г-в ND07-88	107.3178653	47.74445472	6.01	0	0	12.8	0	86.69	0	0	0
285	S1488	17.L4811Г-в ND07-89	107.3176656	47.73995972	6.28	18.83	0	10.1	0	79.25	0	89.57	0
286	S1489	17.L4811Г-в ND07-90	107.3174661	47.73546444	5.97	0	0	14.56	0	92.68	0	70.85	0
287	S1490	17.L4811Г-в ND07-91	107.3172667	47.73096944	5.99	0	0	8.93	0	71.63	0	0	0
288	S1491	17.L4811Г-в ND07-92	107.3170669	47.72647444	5.96	11.77	0	11.34	0	77.86	0	0	0
289	S1492	17.L4811Г-в ND07-93	107.3168675	47.72197917	5.93	0	0	15.9	0	93.59	0	0	0
290	S1493	17.L4811Г-в ND07-94	107.3209975	47.73989222	6.36	0	0	16.85	0	86.83	0	84.19	0
291	S1494	17.L4811Г-в ND07-95	107.3207978	47.73539722	5.93	0	0	15.9	0	72.13	0	59.42	0
292	S1495	17.L4811Г-в ND07-96	107.3205981	47.73090222		0	0	11.51	0	82.08	0	0	0
293	S1496	17.L4811Г-в ND07-97	107.3203981	47.72640694	6.14	0	0	13.75	8.52	83.42	0	0	0
294	S1497	17.L4811Г-в ND07-98	107.3201983	47.72191194	6.01	16.01	0	10.77	0	94.94	0	0	0
295	S1498	17.L4811Г-в ND07-99	107.32473	47.748815	6.05	0	0	11.03	0	79.57	0	62.72	0
296	S1499	17.L4811Г-в ND07-100			5.69	0	0	13.15	0	89.43	0	0	0
297	S1500	17.L4811Г-в ND07-101			6.08	0	0	17.02	0	91.28	0	68.5	0
298	S1501	17.L4811Г-в ND07-102	107.3245297	47.74432	5.97	0	0	12.78	10.04	78	0	0	0
299	S1502	17.L4811Г-в ND07-103	107.3243294	47.73982472	6.2	12.48	0	0	0	82.29	0	63.09	0
300	S1503	17.L4811Г-в ND07-104	107.3241294	47.73532972	5.74	0	0	12.26	0	71.74	0	59.9	0
301	S1504	17.L4811Г-в ND07-105	107.3239292	47.73083472	5.59	13.84	0	16.14	10.68	78.52	0	0	0
302	S1505	17.L4811Г-в ND07-106	107.3237292	47.72633944	6.05	11.75	0	10.8	8.58	95.15	0	0	0
303	S1506	17.L4811Г-в ND07-107	107.3235292	47.72184444	6.26	0	0	14.4	0	99.5	0	61.15	0
304	S1507	17.L4811Г-в ND07-108	107.3280625	47.7487475	6.72	14.27	0	12.9	0	88	0	0	0
305	S1508	17.L4811Г-в ND07-109	107.3278619	47.7442525	6.26	15.39	0	9.27	0	82.06	0	63.18	0
306	S1509	17.L4811Г-в ND07-110	107.3276614	47.73975722	5.94	0	0	13.98	0	86.51	0	61.78	0
307	S1510	17.L4811Г-в ND07-111	107.3274611	47.73526222	7.13	0	0	17.21	0	79.29	0	0	0
308	S1511	17.L4811Г-в ND07-112	107.3272606	47.73076722	5.97	11.83	0	14	0	71.02	0	0	0
309	S1512	17.L4811Г-в ND07-113	107.3270603	47.72627194	5.89	15.32	0	13.21	0	84.1	0	0	0
310	S1513	17.L4811Г-в ND07-114	107.32686	47.72177694	5.7	16.22	0	11.06	0	85.11	0	59.31	0
311	S1514	17.L4811Г-б ND05-1	107.331395	47.74867972	5.92	0	0	12.86	0	80.24	0	0	0
312	S1515	17.L4811Г-б ND05-2	107.3301908	47.72170917	5.83	0	0	0	0	76.74	0	78.74	0
313	S1516	17.L4811Г-б ND05-3	107.3309933	47.73968972	5.87	0	0	10.58	0	85.63	0	0	0
314	S1517	17.L4811Г-б ND05-4	107.3307928	47.73519444	5.85	0	0	0	0	66.31	0	72.71	0
315	S1518	17.L4811Г-б ND05-5	107.3305919	47.73069944	7.21	0	0	0	0	63.09	0	53.9	0
316	S1519	17.L4811Г-б ND05-6	107.3303914	47.72620444	6.12	0	0	14.63	0	66.67	0	65.51	0
317	S1520	17.L4811Г-б ND05-7			6.25	0	0	10.08	11.5	73.2	0	67.54	0
318	S1521	17.L4811Г-б ND05-8			7.37	0	0	10.38	0	75.18	0	77.25	0
319	S1522	17.L4811Г-б ND05-9			7.56	0	0	11.49	0	46.76	0	61.3	0
320	S1524	17.L4811Г-б ND05-11	107.3342247	47.73737444	7.56	12.57	0	0	0	56.94	0	67.26	0
321	S1523	17.L4811Г-б ND05-10	107.3340239	47.73287917	7.3	0	0	10.23	0	37.39	0	95.84	0
322	S1524	17.L4811Г-б ND05-11	107.3338228	47.72838417									
323	S1525	17.L4811Г-б ND05-12	107.3336219	47.72388917	7.56	12.01	0	0	0	79.68	0	69.43	0

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			X	Y	pH	Pb	Se	As	Hg	Zn	Cu	Ni	C
324	S1526	17.L4811Г-6 ND05-13	107.3379592	47.74629667	7.05	0	0	11.46	0	53.51	0	59.87	0
325	S1527	17.L4811Г-6 ND05-14	107.3377578	47.74180167	7.28	11.46	0	9.25	0	57.69	0	0	0
326	S1528	17.L4811Г-6 ND05-16	107.3375567	47.73730639	7.27	13.87	0	9.48	0	67.23	0	0	0
327	S1529	17.L4811Г-6 ND05-17	107.3373553	47.73281139	7.54	0	0	10.47	0	53.26	0	82.46	0
328	S1530	17.L4811Г-6 ND05-18	107.3371539	47.72831639	7.45	0	0	0	0	50.1	0	0	0
329	S1531	17.L4811Г-6 ND05-19			7.3	0	0	34.7	0	84.43	0	78.3	0
330	S1532	17.L4811Г-6 ND05-20	107.3369528	47.72382139	6.05	0	0	10.51	0	49.27	0	0	0
331	S1533	17.L4811Г-6 ND05-21	107.3413925	47.74847611	6.94	0	0	0	0	56.47	0	0	0
332	S1534	17.L4811Г-6 ND05-22	107.3412917	47.74622861		15.14	0	11.6	0	59.81	0	60.96	0
333	S1535 shi	17.L4811Г-6 ND05-23			5.3	0	0	15.05	0	77.01	0	0	0
334	S1536	17.L4811Г-6 ND05-24			7.74	0	0	0	0	74.74	0	56.74	0
335	S1537	17.L4811Г-6 ND05-25	107.3411908	47.74398111	5.98	0	0	15.08	0	86.95	0	0	0
336	S1538	17.L4811Г-6 ND05-26	107.34109	47.74173361	6.51	128.3	0	0	0	82.07	0	67.74	0
337	S1539	17.L4811Г-6 ND05-27	107.3409892	47.73948611	4.27	12.08	0	0	9.19	66.58	0	63.13	0
338	S1540 shi	17.L4811Г-6 ND05-28	107.3408883	47.73723861	5.45	10.35	0	17.74	0	67.13	0	0	0
339	S1541	17.L4811Г-6 ND05-29	107.3407875	47.73499111	7.41	0	0	12.98	0	66.54	0	65.04	0
340	S1542	17.L4811Г-6 ND05-30	107.3406867	47.73274361	5.93	11.26	0	13.07	0	72.29	0	0	0
341	S1543	17.L4811Г-6 ND05-31	107.3405858	47.73049583	7.08	0	0	15.84	0	81.13	0	0	0
342	S1544	17.L4811Г-6 ND05-32	107.3404853	47.72824833									
343	S1545	17.L4811Г-6 ND05-33	107.3403844	47.72600083		0	0	8.81	8.34	64.14	0	0	0
344	S1546	17.L4811Г-6 ND05-34	107.3402836	47.72375333	7.05	12.81	0	0	0	44.05	0	63.08	0
345	S1547	17.L4811Г-6 ND05-35	107.3401831	47.72150583	6.95	0	0	10.62	0	64.9	0	0	0
346	S1548	17.L4811Г-6 ND05-36	107.3447247	47.74840806	6.8	0	0	0	0	59.77	0	64.35	0
347	S1549	17.L4811Г-6 ND05-37	107.3446239	47.74616056	7.4	0	0	10.2	0	81.58	0	67.75	0
348	S1550	17.L4811Г-6 ND05-38	107.3445228	47.74391306	6.23	11.75	0	10.47	0	83.56	0	0	0
349	S1551	17.L4811Г-6 ND05-39	107.3444219	47.74166556		17.67	0	13.66	0	128.02	0	68.79	0
350	S1552	17.L4811Г-6 ND05-40	107.3443208	47.73941806	5.75	0	0	0	0	49.94	0	0	0
351	S1553	17.L4811Г-6 ND05-41	107.34422	47.73717056	5.71	11.17	0	0	9.61	52.99	0	61.86	0
352	S1554	17.L4811Г-6 ND05-42	107.3441192	47.73492306	6.04	0	0	0	0	50.81	0	0	0
353	S1555	17.L4811Г-6 ND05-43	107.3440181	47.73267556	7.83	0	0	0	0	68.84	0	0	0
354	S1556	17.L4811Г-6 ND05-44	107.3439172	47.73042806	7.1	0	0	9.85	0	58.66	0	68.67	0
				sample quantity	336	345	345	345	345	345	345	345	345
				min	4.27	-	-	-	-	23.24	-	-	-
				max	9.82	128.30	-	87.43	13.03	198.29	139.05	101.08	71.06
				average	6.61	5.02	-	10.71	0.77	75.08	1.06	36.36	0.93
				median	6.57	-	-	11.49	-	75.51	-	53.90	-

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No.	Sample ID	Sample location	Standard permission (20ppm)	Point value (ppm)	Geo-accumalation index	Source index (1.3)	Pollution index	Cf	Point ecological risk	Ecological risk line
1	S1429	17.L4811Г-в ND07-30	20	3.1376	0.24	1.3	40	0.3648372	3.65	40
2	S1430	17.L4811Г-в ND07-31	20	8.379523	0.65	1.3	40	0.9743631	9.74	40
3	S1431	17.L4811Г-в ND07-32	20	3.048568	0.24	1.3	40	0.3544847	3.54	40
4	S1432	17.L4811Г-в ND07-33	20	3.83078	0.30	1.3	40	0.4454395	4.45	40
5	S1433	17.L4811Г-в ND07-34	20	1.68939	0.13	1.3	40	0.1964407	1.96	40
6	S1434	17.L4811Г-в ND07-35	20	4.014232	0.31	1.3	40	0.4667712	4.67	40
7	S1435	17.L4811Г-в ND07-36	20	16.727324	1.30	1.3	40	1.9450377	19.45	40
8	S1436	17.L4811Г-в ND07-37	20	5.057918	0.39	1.3	40	0.58813	5.88	40
9	S1437	17.L4811Г-в ND07-38	20	6.523255	0.51	1.3	40	0.758518	7.59	40
10	S1438	17.L4811Г-в ND07-39	20	5.963468	0.46	1.3	40	0.6934265	6.93	40
11	S1439	17.L4811Г-в ND07-40	20	6.571432	0.51	1.3	40	0.76412	7.64	40
12	S1440	17.L4811Г-в ND07-41	20	7.927625	0.61	1.3	40	0.9218169	9.22	40
13	S1441	17.L4811Г-в ND07-42	20	3.875245	0.30	1.3	40	0.4506099	4.51	40
14	S1442	17.L4811Г-в ND07-43	20	1.628849	0.13	1.3	40	0.189401	1.89	40
15	S1443	17.L4811Г-в ND07-44	20	4.109307	0.32	1.3	40	0.4778264	4.78	40
16	S1444	17.L4811Г-в ND07-45	20	1.668499	0.13	1.3	40	0.1940115	1.94	40
17	S1445	17.L4811Г-в ND07-46	20	7.774142	0.60	1.3	40	0.90397	9.04	40
18	S1446	17.L4811Г-в ND07-47	20	4.162173	0.32	1.3	40	0.4839736	4.84	40
19	S1447	17.L4811Г-в ND07-48	20	5.981374	0.46	1.3	40	0.6955086	6.96	40
20	S1448	17.L4811Г-в ND07-49	20	6.112261	0.47	1.3	40	0.710728	7.11	40
21	S1449	17.L4811Г-в ND07-50	20	6.634957	0.51	1.3	40	0.7715066	7.72	40
22	S1452	17.L4811Г-в ND07-53	20	7.095406	0.55	1.3	40	0.8250472	8.25	40
23	S1453	17.L4811Г-в ND07-54	20	5.065592	0.39	1.3	40	0.5890223	5.89	40
24	S1454	17.L4811Г-в ND07-55	20	6.690807	0.52	1.3	40	0.7780008	7.78	40
25	S1455	17.L4811Г-в ND07-56	20	7.708059	0.60	1.3	40	0.8962859	8.96	40
26	S1456	17.L4811Г-в ND07-57	20	5.197682	0.40	1.3	40	0.6043816	6.04	40
27	S1457	17.L4811Г-в ND07-58	20	3.205888	0.25	1.3	40	0.3727777	3.73	40
28	S1228	17.L48-11-Г-а ND04-15	20	5.317	0.41	1.3	40	0.6182558	6.18	40
29	S1229	17.L48-11-Г-а ND04-16	20	7.790488	0.60	1.3	40	0.9058707	9.06	40
30	S1230	17.L48-11-Г-а ND04-17	20	8.354365	0.65	1.3	40	0.9714378	9.71	40
31	S1231	17.L48-11-Г-а ND04-18	20	4.8992	0.38	1.3	40	0.5696744	5.70	40
32	S1232	17.L48-11-Г-а ND04-19	20	8.346323	0.65	1.3	40	0.9705027	9.71	40
33	S1233	17.L48-11-Г-а ND04-20	20	5.912002	0.46	1.3	40	0.6874421	6.87	40
34	S1234	17.L48-11-Г-а ND04-21	20	12.751375	0.99	1.3	40	1.482718	14.83	40
35	S1235	17.L48-11-Г-а ND04-22	20	24.089464	1.87	1.3	40	2.8011005	28.01	40
36	S1236	17.L48-11-Г-а ND04-23	20	2.170168	0.17	1.3	40	0.2523451	2.52	40
37	S1237	17.L48-11-Г-а ND04-24	20	8.176025	0.63	1.3	40	0.9507006	9.51	40
38	S1238	17.L48-11-Г-а ND04-25	20	8.898847	0.69	1.3	40	1.0347497	10.35	40
39	S1239	17.L48-11-Г-а ND04-26	20	3.761512	0.29	1.3	40	0.4373851	4.37	40
40	S1240	17.L48-11-Г-а ND04-27	20	9.03887	0.70	1.3	40	1.0510314	10.51	40
41	S1241	17.L48-11-Г-а ND04-28	20	7.225192	0.56	1.3	40	0.8401386	8.40	40
42	S1242	17.L48-11-Г-а ND04-29	20	2.689578	0.21	1.3	40	0.3127416	3.13	40
43	S1243	17.L48-11-Г-а ND04-30	20	2.484747	0.19	1.3	40	0.2889241	2.89	40
44	S1244	17.L48-11-Г-а ND04-31	20	7.053948	0.55	1.3	40	0.8202265	8.20	40
45	S1245	17.L48-11-Г-а ND04-33	20	13.518664	1.05	1.3	40	1.5719377	15.72	40
46	S1246	17.L48-11-Г-а ND04-34	20	6.025535	0.47	1.3	40	0.7006436	7.01	40
47	S1247	17.L48-11-Г-а ND04-35	20	7.934769	0.62	1.3	40	0.9226476	9.23	40

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48	S1248	17.L48-11-Г-а ND04-36	20	11.219636	0.87	1.3	40	1.3046088	13.05	40
49	S1249	17.L48-11-Г-а ND04-37	20	6.664627	0.52	1.3	40	0.7749566	7.75	40
50	S1250	17.L48-11-Г-а ND04-38	20	9.382778	0.73	1.3	40	1.0910207	10.91	40
51	S1251	17.L48-11-Г-а ND04-39	20	7.6864	0.60	1.3	40	0.8937674	8.94	40
52	S1252	17.L48-11-Г-а ND04-40	20	6.096	0.47	1.3	40	0.7088372	7.09	40
53	S1253	17.L48-11-Г-а ND04-41	20	4.2776	0.33	1.3	40	0.4973953	4.97	40
54	S1254	17.L48-11-Г-а ND04-42	20	0.889146	0.07	1.3	40	0.1033891	1.03	40
55	S1255	17.L48-11-Г-а ND04-43	20	8.178863	0.63	1.3	40	0.9510306	9.51	40
56	S1256	17.L48-11-Г-а ND04-44	20	4.78756	0.37	1.3	40	0.556693	5.57	40
57	S1257	17.L48-11-Г-а ND04-45	20	5.544915	0.43	1.3	40	0.6447576	6.45	40
58	S1258	17.L48-11-Г-а ND04-46	20	7.46361	0.58	1.3	40	0.8678616	8.68	40
59	S1259	17.L48-11-Г-а ND04-47	20	2.710866	0.21	1.3	40	0.315217	3.15	40
60	S1260	17.L48-11-Г-а ND04-48	20	4.388778	0.34	1.3	40	0.510323	5.10	40
61	S1261	17.L48-11-Г-а ND04-49	20	1.9379	0.15	1.3	40	0.2253372	2.25	40
62	S1262	17.L48-11-Г-а ND04-50	20	3.294611	0.26	1.3	40	0.3830943	3.83	40
63	S1263	17.L48-11-Г-а ND04-51	20	4.423784	0.34	1.3	40	0.5143935	5.14	40
64	S1264	17.L48-11-Г-а ND04-52	20	9.323174	0.72	1.3	40	1.08409	10.84	40
65	S1265	17.L48-11-Г-а ND04-53	20	5.949373	0.46	1.3	40	0.6917876	6.92	40
66	S1266	17.L48-11-Г-а ND04-54	20	0.487525	0.04	1.3	40	0.056689	0.57	40
67	S1267	17.L48-11-Г-а ND04-55	20	3.236425	0.25	1.3	40	0.3763285	3.76	40
68	S1268	17.L48-11-Г-а ND04-56	20	4.068522	0.32	1.3	40	0.473084	4.73	40
69	S1269	17.L48-11-Г-а ND04-57	20	2.478598	0.19	1.3	40	0.2882091	2.88	40
70	S1270	17.L48-11-Г-а ND05-1	20	1.848493	0.14	1.3	40	0.214941	2.15	40
71	S1271	17.L48-11-Г-а ND05-2	20	3.272377	0.25	1.3	40	0.380509	3.81	40
72	S1272	17.L48-11-Г-а ND05-3	20	8.300437	0.64	1.3	40	0.9651671	9.65	40
73	S1273	17.L48-11-Г-а ND05-4	20	6.986302	0.54	1.3	40	0.8123607	8.12	40
74	S1274	17.L48-11-Г-а ND05-5	20	4.530693	0.35	1.3	40	0.5268248	5.27	40
75	S1275	17.L48-11-Г-а ND05-6	20	3.857542	0.30	1.3	40	0.4485514	4.49	40
76	S1276	17.L48-11-Г-а ND05-7	20	2.167803	0.17	1.3	40	0.2520701	2.52	40
77	S1277	17.L48-11-Г-а ND05-8	20	0.218832	0.02	1.3	40	0.0254456	0.25	40
78	S1278	17.L48-11-Г-а ND05-9	20		-	1.3	40	0	-	40
79	S1279	17.L48-11-Г-а ND05-10	20	3.894439	0.30	1.3	40	0.4528417	4.53	40
80	S1280	17.L48-11-Г-а ND05-11	20	6.852901	0.53	1.3	40	0.796849	7.97	40
81	S1281	17.L48-11-Г-а ND05-12	20	1.129456	0.09	1.3	40	0.1313321	1.31	40
82	S1282	17.L48-11-Г-а ND05-13	20	0.755745	0.06	1.3	40	0.0878773	0.88	40
83	S1283	17.L48-11-Г-а ND05-14	20	0.576932	0.04	1.3	40	0.0670851	0.67	40
84	S1284	17.L48-11-Г-а ND05-15	20	7.648573	0.59	1.3	40	0.889369	8.89	40
85	S1285	17.L48-11-Г-а ND05-16	20	5.361371	0.42	1.3	40	0.6234152	6.23	40
86	S1286	17.L48-11-Г-а ND05-17	20	9.030828	0.70	1.3	40	1.0500963	10.50	40
87	S1287	17.L48-11-Г-а ND05-18	20	5.382658	0.42	1.3	40	0.6258905	6.26	40
88	S1288	17.L48-11-Г-а ND05-19	20	5.999517	0.47	1.3	40	0.6976183	6.98	40
89	S1289	17.L48-11-Г-а ND05-20	20	6.58137	0.51	1.3	40	0.7652756	7.65	40
90	S1290	17.L48-11-Г-а ND05-21	20	8.671783	0.67	1.3	40	1.0083469	10.08	40
91	S1291	17.L48-11-Г-а ND05-22	20	0.448735	0.03	1.3	40	0.0521785	0.52	40
92	S1292	17.L48-11-Г-а ND05-23	20	0.882523	0.07	1.3	40	0.102619	1.03	40
93	S1293	17.L48-11-Г-а ND05-24	20	0.878739	0.07	1.3	40	0.102179	1.02	40
94	S1294	17.L48-11-Г-а ND05-25	20	5.937547	0.46	1.3	40	0.6904124	6.90	40
95	S1296	17.L48-11-Г-а ND05-27	20	5.259192	0.41	1.3	40	0.611534	6.12	40
96	S1297	17.L48-11-Г-а ND05-28	20	6.613537	0.51	1.3	40	0.7690159	7.69	40
97	S1298	17.L48-11-Г-а ND05-29	20	6.466891	0.50	1.3	40	0.7519641	7.52	40

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98	S1299	17.L48-11-Г-а ND05-30	20	2.154084	0.17	1.3	40	0.2504749	2.50	40
99	S1300	17.L48-11-Г-а ND05-31	20	0.867859	0.07	1.3	40	0.1009138	1.01	40
100	S1301	17.L48-11-Г-а ND05-32	20	2.367904	0.18	1.3	40	0.2753377	2.75	40
101	S1302	17.L48-11-Г-а ND05-33	20	2.564693	0.20	1.3	40	0.2982201	2.98	40
102	S1303	17.L48-11-Г-а ND05-34	20	1.676776	0.13	1.3	40	0.194974	1.95	40
103	S1304	17.L48-11-Г-а ND05-35	20	0.342299	0.03	1.3	40	0.0398022	0.40	40
104	S1305	17.L48-11-Г-а ND05-36	20	7.525107	0.58	1.3	40	0.8750124	8.75	40
105	S1306	17.L48-11-Г-а ND05-37	20	2.738776	0.21	1.3	40	0.3184623	3.18	40
106	S1307	17.L48-11-Г-а ND05-38	20	3.919984	0.30	1.3	40	0.4558121	4.56	40
107	S1308	17.L48-11-Г-а ND05-39	20	5.612088	0.44	1.3	40	0.6525684	6.53	40
108	S1309	17.L48-11-Г-а ND05-40	20	6.059594	0.47	1.3	40	0.704604	7.05	40
109	S1310	17.L48-11-Г-а ND05-41	20	6.886488	0.53	1.3	40	0.8007544	8.01	40
110	S1311	17.L48-11-Г-а ND05-42	20	6.073313	0.47	1.3	40	0.7061992	7.06	40
111	S1312	17.L48-11-Г-а ND05-43	20	0.795955	0.06	1.3	40	0.0925529	0.93	40
112	S1313	17.L48-11-Г-а ND05-44	20	1.534861	0.12	1.3	40	0.1784722	1.78	40
113	S1314	17.L48-11-Г-а ND05-45	20	1.963445	0.15	1.3	40	0.2283076	2.28	40
114	S1315	17.L48-11-Г-а ND05-46	20	2.540094	0.20	1.3	40	0.2953598	2.95	40
115	S1316	17.L48-11-Г-а ND05-47	20	1.600142	0.12	1.3	40	0.186063	1.86	40
116	S1317	17.L48-11-Г-а ND05-48	20	2.521172	0.20	1.3	40	0.2931595	2.93	40
117	S1318	17.L48-11-Г-а ND05-49	20	2.936984	0.23	1.3	40	0.3415098	3.42	40
118	S1319	17.L48-11-Г-а ND05-50	20	4.508764	0.35	1.3	40	0.5242749	5.24	40
119	S1320	17.L48-11-Г-а ND05-51	20	4.967754	0.39	1.3	40	0.5776458	5.78	40
120	S1321	17.L48-11-Г-а ND05-52	20	5.545607	0.43	1.3	40	0.644838	6.45	40
121	S1322	17.L48-11-Г-а ND05-53	20	2.855667	0.22	1.3	40	0.3320543	3.32	40
122	S1323	17.L48-11-Г-а ND05-54	20	1.411036	0.11	1.3	40	0.164074	1.64	40
123	S1324	17.L48-11-Г-а ND05-55	20	2.70389	0.21	1.3	40	0.3144058	3.14	40
124	S1325	17.L48-11-Г-а ND05-56	20	2.376562	0.18	1.3	40	0.2763444	2.76	40
125	S1326	17.L48-11-Г-а ND05-57	20	2.830066	0.22	1.3	40	0.3290774	3.29	40
126	S1327	17.L48-11-Г-а ND05-58	20	3.157394	0.24	1.3	40	0.3671388	3.67	40
127	S1328	17.L48-11-Г-а ND05-59	20	3.09522	0.24	1.3	40	0.3599093	3.60	40
128	S1329	17.L48-11-Г-а ND05-60	20	3.532267	0.27	1.3	40	0.4107287	4.11	40
129	S1330	17.L48-11-Г-а ND05-61	20	4.093661	0.32	1.3	40	0.4760071	4.76	40
130	S1331	17.L48-11-Г-а ND05-62	20	2.680117	0.21	1.3	40	0.3116415	3.12	40
131	S1332	17.L48-11-Г-а ND05-64	20	1.610359	0.12	1.3	40	0.187251	1.87	40
132	S1333	17.L48-11-Г-а ND05-65	20	2.656345	0.21	1.3	40	0.3088773	3.09	40
133	S1334	17.L48-11-Г-а ND05-66	20	2.83921	0.22	1.3	40	0.3301407	3.30	40
134	S1335	17.L48-11-Г-а ND05-67	20	2.414964	0.19	1.3	40	0.2808098	2.81	40
135	S1336	17.L48-11-Г-а ND05-68	20	2.422278	0.19	1.3	40	0.2816602	2.82	40
136	S1337	17.L48-11-Г-а ND05-69	20	1.544528	0.12	1.3	40	0.1795963	1.80	40
137	S1338	17.L48-11-Г-а ND05-70	20	3.32563	0.26	1.3	40	0.3867012	3.87	40
138	S1339	17.L48-11-Г-а ND05-71	20	1.593901	0.12	1.3	40	0.1853373	1.85	40
139	S1340	17.L48-11-Г-а ND05-72	20	2.466166	0.19	1.3	40	0.2867635	2.87	40
140	S1341	17.L48-11-Г-а ND05-73	20	2.777036	0.22	1.3	40	0.3229112	3.23	40
141	S1342	17.L48-11-Г-а ND05-74	20	1.943173	0.15	1.3	40	0.2259503	2.26	40
142	S1343	17.L48-11-Г-а ND05-75	20	2.023633	0.16	1.3	40	0.2353062	2.35	40
143	S1344	17.L48-11-Г-а ND05-76	20	4.31127	0.33	1.3	40	0.5013105	5.01	40
144	S1345	17.L48-11-Г-а ND05-77	20	4.212523	0.33	1.3	40	0.4898283	4.90	40
145	S1346	17.L48-11-Г-а ND05-78	20	4.686143	0.36	1.3	40	0.5449003	5.45	40
146	S1347	17.L48-11-Г-а ND05-79	20	4.250925	0.33	1.3	40	0.4942936	4.94	40
147	S1348	17.L48-11-Г-а ND05-80	20	4.166807	0.32	1.3	40	0.4845124	4.85	40

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148	S1349	17.L48-11-Г-а ND05-81	20	2.51371	0.19	1.3	40	0.2922919	2.92	40
149	S1350	17.L48-11-Г-а ND05-82	20	2.777036	0.22	1.3	40	0.3229112	3.23	40
150	S1351	17.L48-11-Г-а ND05-83	20	3.398775	0.26	1.3	40	0.3952064	3.95	40
151	S1352	17.L48-11-Г-а ND05-84	20	4.320413	0.33	1.3	40	0.5023736	5.02	40
152	S1353	17.L48-11-Г-а ND05-85	20	2.844695	0.22	1.3	40	0.3307785	3.31	40
153	S1354	17.L48-11-Г-а ND05-86	20	2.972701	0.23	1.3	40	0.3456629	3.46	40
154	S1355	17.L48-11-Г-а ND05-87	20	2.08215	0.16	1.3	40	0.2421105	2.42	40
155	S1356	17.L48-11-Г-а ND05-88	20	3.204939	0.25	1.3	40	0.3726673	3.73	40
156	S1357	17.L48-11-Г-а ND05-89	20	4.062574	0.31	1.3	40	0.4723923	4.72	40
157	S1358	17.L48-11-Г-а ND05-90	20	5.599523	0.43	1.3	40	0.6511073	6.51	40
158	S1361	17.L48-11-Г-а ND07-1	20	6.31419	0.49	1.3	40	0.7342081	7.34	40
159	S1362	17.L48-11-Г-а ND07-2	20	6.755115	0.52	1.3	40	0.7854785	7.85	40
160	S1363	17.L48-11-Г-а ND07-3	20	6.174563	0.48	1.3	40	0.7179724	7.18	40
161	S1364	17.L48-11-Г-а ND07-4	20	14.135108	1.10	1.3	40	1.6436172	16.44	40
162	S1365	17.L48-11-Г-а ND07-5	20	9.327181	0.72	1.3	40	1.0845559	10.85	40
163	S1366	17.L48-11-Г-а ND07-6	20	9.413529	0.73	1.3	40	1.0945964	10.95	40
164	S1367	17.L48-11-Г-а ND07-7	20	13.038306	1.01	1.3	40	1.5160821	15.16	40
165	S1368	17.L48-11-Г-а ND07-8	20	10.613215	0.82	1.3	40	1.2340948	12.34	40
166	S1369	17.L48-11-Г-а ND07-9	20	12.168882	0.94	1.3	40	1.4149863	14.15	40
167	S1370	17.L48-11-Г-а ND07-10	20	9.944477	0.77	1.3	40	1.1563345	11.56	40
168	S1371	17.L48-11-Г-а ND07-11	20	12.49266	0.97	1.3	40	1.4526349	14.53	40
169	S1372	17.L48-11-Г-а ND07-12	20	10.142894	0.79	1.3	40	1.1794063	11.79	40
170	S1373	17.L48-11-Г-а ND07-13	20	10.907165	0.85	1.3	40	1.268275	12.68	40
171	S1374	17.L48-11-Г-а ND07-14	20	10.317427	0.80	1.3	40	1.1997008	12.00	40
172	S1375	17.L48-11-Г-а ND07-15	20	4.772787	0.37	1.3	40	0.5549752	5.55	40
173	S1376	17.L48-11-Г-а ND07-16	20	9.509063	0.74	1.3	40	1.105705	11.06	40
174	S1377	17.L48-11-Г-а ND07-17	20	15.603023	1.21	1.3	40	1.814305	18.14	40
175	S1378	17.L48-11-Г-а ND07-18	20	11.912108	0.92	1.3	40	1.3851288	13.85	40
176	S1379	17.L48-11-Г-а ND07-19	20	8.388377	0.65	1.3	40	0.9753927	9.75	40
177	S1380	17.L48-11-Г-а ND07-20	20	15.08861	1.17	1.3	40	1.7544895	17.54	40
178	S1381	17.L48-11-Г-а ND07-21	20	13.609672	1.06	1.3	40	1.58252	15.83	40
179	S1382	17.L48-11-Г-а ND07-22	20	8.377354	0.65	1.3	40	0.9741109	9.74	40
180	S1383	17.L48-11-Г-а ND07-23	20	14.100202	1.09	1.3	40	1.6395584	16.40	40
181	S1384	17.L48-11-Г-а ND07-24	20	11.484043	0.89	1.3	40	1.3353538	13.35	40
182	S1385	17.L48-11-Г-а ND07-25	20	12.512869	0.97	1.3	40	1.4549848	14.55	40
183	S1386	17.L48-11-Г-а ND07-26	20	12.340173	0.96	1.3	40	1.4349038	14.35	40
184	S1387	17.L48-11-Г-а ND07-27	20	12.141757	0.94	1.3	40	1.4118322	14.12	40
185	S1388	17.L48-11-Г-а ND07-28	20	10.372543	0.80	1.3	40	1.2061097	12.06	40
186	S1389	17.L48-11-Г-а ND07-29	20	7.864778	0.61	1.3	40	0.9145091	9.15	40
187	S1390	17.L48-11-Г-а ND07-30	20	17.445725	1.35	1.3	40	2.0285727	20.29	40
188	S1391	17.L48-11-Г-а ND07-31	20	14.568685	1.13	1.3	40	1.6940331	16.94	40
189	S1392	17.L48-11-Г-а ND07-32	20	12.382429	0.96	1.3	40	1.4398173	14.40	40
190	S1393	17.L48-11-Г-а ND07-33	20	12.318127	0.95	1.3	40	1.4323403	14.32	40
191	S1394	17.L48-11-Г-а ND07-34	20	11.794528	0.91	1.3	40	1.3714567	13.71	40
192	S1395	17.L48-11-Г-а ND07-35	20	13.177932	1.02	1.3	40	1.5323177	15.32	40
193	S1396	17.L48-11-Г-а ND07-36	20	13.357977	1.04	1.3	40	1.5532531	15.53	40
194	S1397	17.L48-11-Г-а ND07-37	20	20.161092	1.56	1.3	40	2.344313	23.44	40
195	S1398	17.L48-11-Г-а ND07-38	20	13.275303	1.03	1.3	40	1.5436399	15.44	40
196	S1399	17.L48-11-Г-а ND07-39	20	6.451979	0.50	1.3	40	0.7502301	7.50	40
197	S1400	17.L4811Г-в ND07-1	20	9.738712	0.75	1.3	40	1.1324084	11.32	40

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198	S1401	17.L4811Г-в ND07-2	20	10.319264	0.80	1.3	40	1.1999144	12.00	40
199	S1402	17.L4811Г-в ND07-3	20	7.903359	0.61	1.3	40	0.9189952	9.19	40
200	S1403	17.L4811Г-в ND07-4	20	12.443056	0.96	1.3	40	1.446867	14.47	40
201	S1404	17.L4811Г-в ND07-5	20	12.136245	0.94	1.3	40	1.4111913	14.11	40
202	S1405	17.L4811Г-в ND07-6	20	8.2561	0.64	1.3	40	0.9600116	9.60	40
203	S1406	17.L4811Г-в ND07-7	20	10.991676	0.85	1.3	40	1.2781019	12.78	40
204	S1407	17.L4811Г-в ND07-8	20	12.845401	1.00	1.3	40	1.4936513	14.94	40
205	S1408	17.L4811Г-в ND07-9	20	15.803277	1.23	1.3	40	1.8375903	18.38	40
206	S1409	17.L4811Г-в ND07-10	20	12.514706	0.97	1.3	40	1.4551984	14.55	40
207	S1410	17.L4811Г-в ND07-11	20	12.564311	0.97	1.3	40	1.4609664	14.61	40
208	S1411	17.L4811Г-в ND07-12	20	9.650527	0.75	1.3	40	1.1221543	11.22	40
209	S1412	17.L4811Г-в ND07-13	20	4.375954	0.34	1.3	40	0.5088319	5.09	40
210	S1413	17.L4811Г-в ND07-14	20	11.524461	0.89	1.3	40	1.3400536	13.40	40
211	S1414	17.L4811Г-в ND07-15	20	12.185849	0.94	1.3	40	1.4169592	14.17	40
212	S1415	17.L4811Г-в ND07-16	20	9.281252	0.72	1.3	40	1.0792153	10.79	40
213	S1416	17.L4811Г-в ND07-17	20	12.58452	0.98	1.3	40	1.4633163	14.63	40
214	S1417	17.L4811Г-в ND07-18	20	12.680054	0.98	1.3	40	1.4744249	14.74	40
215	S1418	17.L4811Г-в ND07-19	20	10.207196	0.79	1.3	40	1.1868833	11.87	40
216	S1419	17.L4811Г-в ND07-20	20	11.959875	0.93	1.3	40	1.3906831	13.91	40
217	S1420	17.L4811Г-в ND07-21	20	10.11901	0.78	1.3	40	1.1766291	11.77	40
218	S1421	17.L4811Г-в ND07-22	20	19.758747	1.53	1.3	40	2.2975287	22.98	40
219	S1422	17.L4811Г-в ND07-23	20	12.634124	0.98	1.3	40	1.4690842	14.69	40
220	S1423	17.L4811Г-в ND07-24	20	12.933586	1.00	1.3	40	1.5039053	15.04	40
221	S1424	17.L4811Г-в ND07-25	20	10.401938	0.81	1.3	40	1.2095277	12.10	40
222	S1425	17.L4811Г-в ND07-26	20	10.824491	0.84	1.3	40	1.2586617	12.59	40
223	S1426	17.L4811Г-в ND07-27	20	12.253825	0.95	1.3	40	1.4248634	14.25	40
224	S1427	17.L4811Г-в ND07-28	20	15.437676	1.20	1.3	40	1.7950786	17.95	40
225	S1428	17.L4811Г-в ND07-29	20	10.932886	0.85	1.3	40	1.2712658	12.71	40
226	S1429	17.L4811Г-в ND07-30	20	9.340042	0.72	1.3	40	1.0860514	10.86	40
227	S1430	17.L4811Г-в ND07-31	20	10.045523	0.78	1.3	40	1.1680841	11.68	40
228	S1431	17.L4811Г-в ND07-32	20	10.185149	0.79	1.3	40	1.1843197	11.84	40
229	S1432	17.L4811Г-в ND07-33	20	13.797065	1.07	1.3	40	1.6043099	16.04	40
230	S1433	17.L4811Г-в ND07-34	20	11.836783	0.92	1.3	40	1.3763701	13.76	40
231	S1434	17.L4811Г-в ND07-35	20	10.909002	0.85	1.3	40	1.2684886	12.68	40
232	S1435	17.L4811Г-в ND07-36	20	14.653196	1.14	1.3	40	1.70386	17.04	40
233	S1436	17.L4811Г-в ND07-37	20	12.922563	1.00	1.3	40	1.5026236	15.03	40
234	S1437	17.L4811Г-в ND07-38	20	11.177232	0.87	1.3	40	1.2996781	13.00	40
235	S1438	17.L4811Г-в ND07-39	20	10.141057	0.79	1.3	40	1.1791927	11.79	40
236	S1439	17.L4811Г-в ND07-40	20	5.344153	0.41	1.3	40	0.6214131	6.21	40
237	S1440	17.L4811Г-в ND07-41	20	7.190529	0.56	1.3	40	0.836108	8.36	40
238	S1441	17.L4811Г-в ND07-42	20	8.294681	0.64	1.3	40	0.9644978	9.64	40
239	S1442	17.L4811Г-в ND07-43	20	13.282652	1.03	1.3	40	1.5444944	15.44	40
240	S1443	17.L4811Г-в ND07-44	20	12.498172	0.97	1.3	40	1.4532758	14.53	40
241	S1444	17.L4811Г-в ND07-45	20	11.597949	0.90	1.3	40	1.3485987	13.49	40
242	S1445	17.L4811Г-в ND07-46	20	10.469914	0.81	1.3	40	1.2174319	12.17	40
243	S1446	17.L4811Г-в ND07-47	20	7.528572	0.58	1.3	40	0.8754153	8.75	40
244	S1447	17.L4811Г-в ND07-48	20	4.73788	0.37	1.3	40	0.5509163	5.51	40
245	S1448	17.L4811Г-в ND07-49	20	7.807825	0.61	1.3	40	0.9078866	9.08	40
246	S1449	17.L4811Г-в ND07-50	20	11.346254	0.88	1.3	40	1.3193319	13.19	40
247	S1450	17.L4811Г-в ND07-51	20	9.703805	0.75	1.3	40	1.1283494	11.28	40

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248	S1451	17.L4811Г-в ND07-52	20	9.057115	0.70	1.3	40	1.0531529	10.53	40
249	S1452	17.L4811Г-в ND07-53	20	7.570828	0.59	1.3	40	0.8803288	8.80	40
250	S1453	17.L4811Г-в ND07-54	20	5.864078	0.45	1.3	40	0.6818695	6.82	40
251	S1454	17.L4811Г-в ND07-55	20	13.185281	1.02	1.3	40	1.5331722	15.33	40
252	S1455	17.L4811Г-в ND07-56	20	12.817843	0.99	1.3	40	1.4904469	14.90	40
253	S1456	17.L4811Г-в ND07-57	20	11.004536	0.85	1.3	40	1.2795972	12.80	40
254	S1457	17.L4811Г-в ND07-58	20		-	1.3	40	0	-	40
255	S1458	17.L4811Г-в ND07-59	20	12.641473	0.98	1.3	40	1.4699387	14.70	40
256	S1459	17.L4811Г-в ND07-60	20	11.704506	0.91	1.3	40	1.3609891	13.61	40
257	S1460	17.L4811Г-в ND07-61	20	11.362788	0.88	1.3	40	1.3212544	13.21	40
258	S1461	17.L4811Г-в ND07-62	20	6.701837	0.52	1.3	40	0.7792834	7.79	40
259	S1462	17.L4811Г-в ND07-63	20	17.3704	1.35	1.3	40	2.019814	20.20	40
260	S1463	17.L4811Г-в ND07-64	20	11.403206	0.88	1.3	40	1.3259542	13.26	40
261	S1464	17.L4811Г-в ND07-65	20	13.692345	1.06	1.3	40	1.5921331	15.92	40
262	S1465	17.L4811Г-в ND07-66	20	12.975841	1.01	1.3	40	1.5088187	15.09	40
263	S1466	17.L4811Г-в ND07-67	20	13.923831	1.08	1.3	40	1.6190501	16.19	40
264	S1467	17.L4811Г-в ND07-68	20	9.839758	0.76	1.3	40	1.1441579	11.44	40
265	S1468	17.L4811Г-в ND07-69	20	13.392883	1.04	1.3	40	1.557312	15.57	40
266	S1469	17.L4811Г-в ND07-70	20	15.272329	1.18	1.3	40	1.7758522	17.76	40
267	S1470	17.L4811Г-в ND07-71	20	10.444193	0.81	1.3	40	1.214441	12.14	40
268	S1471	17.L4811Г-в ND07-72	20	14.331688	1.11	1.3	40	1.6664753	16.66	40
269	S1472	17.L4811Г-в ND07-73	20	13.719903	1.06	1.3	40	1.5953376	15.95	40
270	S1473	17.L4811Г-в ND07-74	20	12.720472	0.99	1.3	40	1.4791247	14.79	40
271	S1474	17.L4811Г-в ND07-75	20	13.504952	1.05	1.3	40	1.5703433	15.70	40
272	S1475	17.L4811Г-в ND07-76	20	8.31489	0.64	1.3	40	0.9668477	9.67	40
273	S1476	17.L4811Г-в ND07-77	20	12.635961	0.98	1.3	40	1.4692978	14.69	40
274	S1477	17.L4811Г-в ND07-78	20	13.194467	1.02	1.3	40	1.5342403	15.34	40
275	S1478	17.L4811Г-в ND07-79	20	12.766402	0.99	1.3	40	1.4844653	14.84	40
276	S1479	17.L4811Г-в ND07-80	20	13.773182	1.07	1.3	40	1.6015328	16.02	40
277	S1480	17.L4811Г-в ND07-81	20	15.805114	1.23	1.3	40	1.837804	18.38	40
278	S1481	17.L4811Г-в ND07-82	20	12.724146	0.99	1.3	40	1.4795519	14.80	40
279	S1482	17.L4811Г-в ND07-83	20	13.782368	1.07	1.3	40	1.6026009	16.03	40
280	S1483	17.L4811Г-в ND07-84	20	13.166909	1.02	1.3	40	1.5310359	15.31	40
281	S1484	17.L4811Г-в ND07-85	20	15.283352	1.18	1.3	40	1.777134	17.77	40
282	S1485	17.L4811Г-в ND07-86	20	13.44065	1.04	1.3	40	1.5628663	15.63	40
283	S1486	17.L4811Г-в ND07-87	20	13.097	1.02	1.3	40	1.522907	15.23	40
284	S1487	17.L4811Г-в ND07-88	20	10.9972	0.85	1.3	40	1.2787442	12.79	40
285	S1488	17.L4811Г-в ND07-89	20	10.187	0.79	1.3	40	1.1845349	11.85	40
286	S1489	17.L4811Г-в ND07-90	20	10.1282	0.79	1.3	40	1.1776977	11.78	40
287	S1490	17.L4811Г-в ND07-91	20	12.3456	0.96	1.3	40	1.4355349	14.36	40
288	S1491	17.L4811Г-в ND07-92	20	11.7468	0.91	1.3	40	1.365907	13.66	40
289	S1492	17.L4811Г-в ND07-93	20	14.1442	1.10	1.3	40	1.6446744	16.45	40
290	S1493	17.L4811Г-в ND07-94	20	13.1596	1.02	1.3	40	1.530186	15.30	40
291	S1494	17.L4811Г-в ND07-95	20	12.0756	0.94	1.3	40	1.4041395	14.04	40
292	S1495	17.L4811Г-в ND07-96	20	11.9708	0.93	1.3	40	1.3919535	13.92	40
293	S1496	17.L4811Г-в ND07-97	20	13.2754	1.03	1.3	40	1.5436512	15.44	40
294	S1497	17.L4811Г-в ND07-98	20	12.9244	1.00	1.3	40	1.5028372	15.03	40
295	S1498	17.L4811Г-в ND07-99	20	22.8602	1.77	1.3	40	2.6581628	26.58	40
296	S1499	17.L4811Г-в ND07-100	20	13.1944	1.02	1.3	40	1.5342326	15.34	40
297	S1500	17.L4811Г-в ND07-101	20	11.3444	0.88	1.3	40	1.3191163	13.19	40

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303	S1506	17.L4811Г-в ND07-107	20	13.0402	1.01	1.3	40	1.5163023	15.16	40
304	S1507	17.L4811Г-в ND07-108	20	12.5808	0.98	1.3	40	1.4628837	14.63	40
305	S1508	17.L4811Г-в ND07-109	20	11.192	0.87	1.3	40	1.3013953	13.01	40
306	S1509	17.L4811Г-в ND07-110	20	12.1546	0.94	1.3	40	1.4133256	14.13	40
307	S1510	17.L4811Г-в ND07-111	20	12.6342	0.98	1.3	40	1.469093	14.69	40
308	S1511	17.L4811Г-в ND07-112	20	12.5294	0.97	1.3	40	1.456907	14.57	40
309	S1512	17.L4811Г-в ND07-113	20	13.2202	1.02	1.3	40	1.5372326	15.37	40
310	S1513	17.L4811Г-в ND07-114	20	10.6958	0.83	1.3	40	1.2436977	12.44	40
311	S1514	17.L4811Г-б ND05-1	20	8.168	0.63	1.3	40	0.9497674	9.50	40
312	S1515	17.L4811Г-б ND05-2	20	8.3076	0.64	1.3	40	0.966	9.66	40
313	S1516	17.L4811Г-б ND05-3	20	7.1152	0.55	1.3	40	0.8273488	8.27	40
314	S1517	17.L4811Г-б ND05-4	20	8.0374	0.62	1.3	40	0.9345814	9.35	40
315	S1518	17.L4811Г-б ND05-5	20	8.089	0.63	1.3	40	0.9405814	9.41	40
316	S1519	17.L4811Г-б ND05-6	20	8.245	0.64	1.3	40	0.9587209	9.59	40
317	S1520	17.L4811Г-б ND05-7	20	8.2304	0.64	1.3	40	0.9570233	9.57	40
318	S1521	17.L4811Г-б ND05-8	20	8.721	0.68	1.3	40	1.0140698	10.14	40
319	S1522	17.L4811Г-б ND05-9	20	7.4752	0.58	1.3	40	0.8692093	8.69	40
320	S1524	17.L4811Г-б ND05-11	20	12.535	0.97	1.3	40	1.4575581	14.58	40
321	S1523	17.L4811Г-б ND05-10	20	3.637634	0.28	1.3	40	0.4229807	4.23	40
322	S1524	17.L4811Г-б ND05-11	20	3.684047	0.29	1.3	40	0.4283776	4.28	40
323	S1525	17.L4811Г-б ND05-12	20	3.564444	0.28	1.3	40	0.4144702	4.14	40
324	S1526	17.L4811Г-б ND05-13	20	5.288872	0.41	1.3	40	0.6149851	6.15	40
325	S1527	17.L4811Г-б ND05-14	20	4.465038	0.35	1.3	40	0.5191905	5.19	40
326	S1528	17.L4811Г-б ND05-16	20	4.158443	0.32	1.3	40	0.4835399	4.84	40
327	S1529	17.L4811Г-б ND05-17	20	4.511898	0.35	1.3	40	0.5246393	5.25	40
328	S1530	17.L4811Г-б ND05-18	20	4.498063	0.35	1.3	40	0.5230306	5.23	40
329	S1531	17.L4811Г-б ND05-19	20	22.357758	1.73	1.3	40	2.5997393	26.00	40
330	S1532	17.L4811Г-б ND05-20	20	4.201733	0.33	1.3	40	0.4885736	4.89	40
331	S1533	17.L4811Г-б ND05-21	20	4.899715	0.38	1.3	40	0.5697343	5.70	40
332	S1534	17.L4811Г-б ND05-22	20	3.373883	0.26	1.3	40	0.392312	3.92	40
333	S1535 sl	17.L4811Г-б ND05-23	20	7.176216	0.56	1.3	40	0.8344437	8.34	40
334	S1536	17.L4811Г-б ND05-24	20	13.354025	1.04	1.3	40	1.5527936	15.53	40
335	S1537	17.L4811Г-б ND05-25	20	8.31019	0.64	1.3	40	0.9663012	9.66	40
336	S1538	17.L4811Г-б ND05-26	20	28.071932	2.18	1.3	40	3.2641781	32.64	40
337	S1539	17.L4811Г-б ND05-27	20	5.297797	0.41	1.3	40	0.6160229	6.16	40
338	S1540 sl	17.L4811Г-б ND05-28	20	9.844973	0.76	1.3	40	1.1447643	11.45	40
339	S1541	17.L4811Г-б ND05-29	20	7.433695	0.58	1.3	40	0.8643831	8.64	40
340	S1542	17.L4811Г-б ND05-30	20	6.297465	0.49	1.3	40	0.7322634	7.32	40
341	S1543	17.L4811Г-б ND05-31	20	5.534326	0.43	1.3	40	0.6435263	6.44	40
342	S1544	17.L4811Г-б ND05-32	20	3.285073	0.25	1.3	40	0.3819852	3.82	40
343	S1545	17.L4811Г-б ND05-33	20	4.570807	0.35	1.3	40	0.5314892	5.31	40
344	S1546	17.L4811Г-б ND05-34	20	3.442163	0.27	1.3	40	0.4002515	4.00	40
345	S1547	17.L4811Г-б ND05-35	20	5.254062	0.41	1.3	40	0.6109374	6.11	40
346	S1548	17.L4811Г-б ND05-36	20	4.626145	0.36	1.3	40	0.5379238	5.38	40
347	S1549	17.L4811Г-б ND05-37	20	5.658392	0.44	1.3	40	0.6579526	6.58	40
348	S1550	17.L4811Г-б ND05-38	20	5.732474	0.44	1.3	40	0.6665667	6.67	40
349	S1551	17.L4811Г-б ND05-39	20	6.571482	0.51	1.3	40	0.7641258	7.64	40
350	S1552	17.L4811Г-б ND05-40	20	2.939652	0.23	1.3	40	0.34182	3.42	40
351	S1553	17.L4811Г-б ND05-41	20	3.41137	0.26	1.3	40	0.3966709	3.97	40
352	S1554	17.L4811Г-б ND05-42	20	2.49828	0.19	1.3	40	0.2904977	2.90	40

	Soil heavy metal POLLUTION INDEX of Nalalikh area									
QR_CODE	X	Y	Sr_PI	Pb_PI	As_PI	Zn_PI	Cu_PI	Ni_PI	Cr_PI	Ba_PI
18.L4811Г-a ND03-01	107.272	47.7547	1.28	0.51	1.77	0.81	0.89	0.67	0.93	0.08
18.L4811Г-a. ND1-85	107.34	47.7907	0.92	0.51	0.32	0.54	0.89	0.67	0.93	1.59
18.L4811Г-a. ND1-111	107.31	47.7926	0.85	6.07	0.32	0.93	0.89	5.19	0.93	2.72
18.L4811Г-a. ND1-112	107.299	47.792	0.89	0.51	1.83	1.08	0.89	0.67	0.93	1.62
18.L4811Г-a. ND4-100	107.291	47.7817	1.09	0.51	2.67	1.00	0.89	0.67	0.93	1.13
18.L4811Г-a. ND4-101	107.301	47.7812	1.09	0.51	1.41	0.83	0.89	0.67	0.93	1.48
18.L4811Г-a. ND4-102	107.309	47.7819	1.13	0.51	1.77	1.16	0.89	0.67	0.93	1.33
18.L4811Г-a. ND4-103	107.308	47.7736	1.07	0.51	1.41	1.10	0.89	4.87	0.93	1.52
18.L4811Г-a. ND4-104	107.299	47.7758	1.13	0.51	0.32	1.10	0.89	4.66	0.93	1.19
18.L4811Г-a. ND4-105	107.291	47.775	1.02	0.51	2.09	1.23	0.89	0.67	0.93	1.00
18.L4811Г-a. ND4-106	107.284	47.7786	1.11	0.51	1.58	1.00	0.89	0.67	0.93	1.00
18.L4811Г-a. ND3-100	107.29	47.7674	1.00	0.51	3.21	1.61	0.89	0.67	0.93	1.36
18.L4811Г-a. ND3-101	107.297	47.7673	1.12	6.39	1.90	0.78	0.89	5.21	0.93	1.16
18.L4811Г-a. ND3-102	107.304	47.7709	1.03	0.51	2.09	1.26	0.89	0.67	0.93	1.70
18.L4811Г-a. ND3-103	107.308	47.7653	1.06	0.51	3.03	1.22	0.89	4.60	0.93	1.39
18.L4811Г-a. ND3-104	107.308	47.7593	1.12	0.51	2.17	1.25	0.89	4.51	0.93	1.04
18.L4811Г-a. ND3-105	107.309	47.7541	1.37	0.51	3.49	1.36	0.89	0.67	0.93	0.99
18.L4811Г-a. ND3-106	107.303	47.7522	0.85	0.51	0.32	0.90	0.89	0.67	0.93	1.31
18.L4811Г-a. ND3-107	107.299	47.7571	0.84	0.51	0.32	0.84	0.89	0.67	0.93	1.53
18.L4811Г-a. ND3-108	107.299	47.763	0.85	0.51	0.32	0.93	0.89	0.67	0.93	1.51
18.L4811Г-a. ND3-109	107.286	47.7598	0.95	0.51	2.05	0.95	0.89	0.67	0.93	0.92
18.L4811Г-a. ND3-110	107.291	47.756	0.82	0.51	1.66	1.49	0.89	0.67	0.93	1.11
18.L4811Г-a. ND3-112	107.281	47.7562	1.28	10.24	4.26	1.50	0.89	0.67	0.93	0.90
18.L4811Г-a. ND3-115	107.261	47.7538	0.92	0.51	2.20	1.11	0.89	0.67	0.93	1.17
17.L4811Г-a ND01-16	107.26	47.7929	1.31	0.51	5.56	0.88	0.89	4.92	0.93	2.70
17.L4811Г-a ND01-18	107.263	47.7928	1.30	0.51	4.10	0.90	0.89	3.72	0.93	2.53
17.L4811Г-a ND01-19	107.263	47.7905	1.39	0.51	7.04	1.02	0.89	0.67	0.93	2.71
17.L4811Г-a ND01-20	107.263	47.7883	1.41	0.51	8.72	0.91	0.89	0.67	0.93	3.27
17.L4811Г-a ND01-22	107.267	47.7927	1.26	6.60	2.57	1.20	0.89	0.67	0.93	2.75
17.L4811Г-a ND01-23	107.267	47.7905	1.71	6.99	2.83	0.96	0.89	4.21	0.93	2.38
17.L4811Г-a ND01-24	107.266	47.7882	1.31	13.12	2.09	1.56	0.89	0.67	0.93	2.39

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	Soil heavy metal POLLUTION INDEX of Nalalikh area									
QR_CODE	X	Y	Sr_PI	Pb_PI	As_PI	Zn_PI	Cu_PI	Ni_PI	Cr_PI	Ba_PI
17.L4811Г-a ND01-26	107.27	47.7927	1.01	0.51	2.66	0.85	0.89	5.49	0.93	2.13
17.L4811Г-a ND01-27	107.27	47.7904	1.34	0.51	2.11	1.19	0.89	4.81	0.93	2.15
17.L4811Г-a ND01-28	107.27	47.7882	1.41	0.51	1.97	1.01	0.89	3.91	0.93	2.50
17.L4811Г-a ND01-30	107.273	47.7926	1.09	0.51	1.46	1.00	0.89	5.06	0.93	2.20
17.L4811Г-a ND01-31	107.273	47.7903	1.54	6.95	2.32	0.96	0.89	3.86	0.93	4.48
17.L4811Г-a ND01-32	107.273	47.7881	1.55	7.82	1.82	1.13	0.89	3.50	0.93	2.04
17.L4811Г-a ND01-33	107.277	47.7925	1.18	0.51	5.64	1.04	0.89	4.08	0.93	2.57
17.L4811Г-a ND01-34	107.277	47.7903	1.07	0.51	1.67	1.17	0.89	4.02	0.93	1.87
17.L4811Г-a ND01-36	107.28	47.7902	1.04	0.51	0.32	0.96	0.89	4.36	0.93	2.04
17.L4811Г-a ND01-37	107.28	47.788	1.28	6.92	1.66	1.07	0.89	3.47	0.93	2.26
17.L4811Г-a ND01-38	107.283	47.7879	1.26	0.51	1.65	1.07	0.89	0.67	0.93	2.53
17.L4811Г-a ND01-39	107.287	47.7923	1.02	5.53	1.36	0.96	0.89	3.39	0.93	2.69
17.L4811Г-a ND01-40	107.29	47.7923	1.01	0.51	2.68	1.20	0.89	0.67	0.93	1.94
17.L4811Г-a ND01-41	107.29	47.7864	1.29	7.42	3.01	1.28	0.89	0.67	0.93	2.13
17.L4811Г-a ND01-42	107.293	47.7877	1.16	0.51	2.07	0.78	0.89	5.58	0.93	2.85
17.L4811Г-a ND04-29	107.293	47.7854	1.18	0.51	1.94	0.89	0.89	0.67	0.93	2.21
17.L4811Г-a ND07-7	107.292	47.7585	1.02	6.65	2.33	1.18	0.89	4.39	0.93	2.16
17.L4811Г-a ND01-43	107.303	47.7875	0.97	0.51	2.77	0.79	0.89	0.67	0.93	2.01
17.L4811Г-a ND01-44	107.306	47.7874	0.79	0.51	2.02	0.63	0.89	0.67	0.93	2.20
17.L4811Г-a ND01-45	107.31	47.7874	0.85	0.51	2.42	0.73	0.89	3.64	0.93	2.92
17.L4811Г-a ND01-46	107.313	47.7873	0.85	0.51	0.32	0.52	0.89	3.12	0.93	2.55
17.L4811Г-a ND01-47	107.316	47.7872	0.85	6.92	0.32	0.47	0.89	3.50	0.93	2.01
17.L4811Г-a ND04-30	107.316	47.7805	0.91	0.51	1.38	0.40	0.89	0.67	0.93	2.57
17.L4811Г-a ND04-31	107.316	47.776	0.99	12.25	1.93	0.96	0.89	3.80	0.93	2.14
17.L4811Г-a ND04-32	107.316	47.7715	1.13	22.23	2.07	3.63	0.89	0.67	70.65	2.78
17.L4811Г-a ND07-8	107.316	47.767	1.18	0.51	2.25	0.92	0.89	5.63	0.93	2.00
17.L4811Г-a ND07-9	107.315	47.7625	1.31	0.51	2.53	1.09	0.89	4.50	0.93	2.41
17.L4811Г-a ND07-10	107.315	47.758	1.08	6.12	1.97	0.97	0.89	4.09	0.93	1.84
17.L4811Г-a ND07-11	107.315	47.7535	1.13	0.51	2.60	1.11	0.89	3.54	0.93	2.13
17.L4811Г-a ND01-48	107.32	47.7872	0.85	0.51	3.34	0.74	0.89	0.67	0.93	2.12
17.L4811Г-a ND04-33	107.319	47.7804	0.82	0.51	3.84	0.67	0.89	0.67	0.93	4.00

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	Soil heavy metal POLLUTION INDEX of Nalalikh area									
QR_CODE	X	Y	Sr_PI	Pb_PI	As_PI	Zn_PI	Cu_PI	Ni_PI	Cr_PI	Ba_PI
17.L4811Г-a ND04-34	107.319	47.7759	1.04	9.43	1.76	1.67	0.89	0.67	0.93	2.21
17.L4811Г-a ND04-35	107.319	47.7714	0.92	0.51	2.24	1.24	0.89	4.23	0.93	2.25
17.L4811Г-a ND04-36	107.319	47.7669	1.08	0.51	2.78	0.76	0.89	0.67	0.93	2.59
17.L4811Г-a ND07-12	107.319	47.7624	1.20	0.51	1.93	1.04	0.89	4.24	0.93	2.31
17.L4811Г-a ND07-13	107.318	47.7579	1.05	6.63	2.29	1.26	0.89	4.29	0.93	1.80
17.L4811Г-a ND07-14	107.318	47.7534	1.15	7.40	2.94	1.18	0.89	0.67	0.93	1.62
17.L4811Г-a ND01-49	107.323	47.7938	1.74	0.51	0.32	0.89	0.89	0.67	0.93	2.49
17.L4811Г-a ND01-50	107.323	47.7916	1.16	0.51	0.32	0.78	0.89	4.11	0.93	2.44
17.L4811Г-a ND01-51	107.323	47.7893	1.11	9.05	2.40	1.24	0.89	4.67	0.93	1.45
17.L4811Г-a ND01-52	107.323	47.7871	0.92	6.23	4.01	1.14	0.89	3.97	0.93	1.73
17.L4811Г-a ND01-58	107.323	47.7826	1.20	6.73	2.00	0.96	0.89	5.06	0.93	1.63
17.L4811Г-a ND04-37	107.323	47.7781	1.10	0.51	2.23	1.07	0.89	4.13	0.93	2.34
17.L4811Г-a ND04-38	107.322	47.7736	0.95	0.51	2.10	1.22	0.89	0.67	0.93	2.04
17.L4811Г-a ND04-39	107.322	47.7691	2.45	0.51	1.95	1.00	0.89	0.67	0.93	2.43
17.L4811Г-a ND07-15	107.322	47.7646	1.05	0.51	0.32	0.89	0.89	0.67	0.93	2.22
17.L4811Г-a ND07-16	107.322	47.7601	1.09	0.51	1.47	0.95	0.89	5.96	0.93	2.39
17.L4811Г-a ND07-18	107.322	47.7556	0.99	0.51	2.77	1.35	0.89	0.67	0.93	2.16
17.L4811Г-a ND01-53	107.327	47.7938	0.97	0.51	0.32	0.50	0.89	3.94	0.93	2.07
17.L4811Г-a ND01-55	107.327	47.7893	1.27	6.34	0.32	1.11	0.89	0.67	0.93	2.07
17.L4811Г-a ND01-56	107.326	47.787	1.13	0.51	1.53	0.91	0.89	0.67	0.93	2.60
17.L4811Г-a ND01-57	107.326	47.7848	1.08	0.51	1.37	0.78	0.89	0.67	0.93	2.39
17.L4811Г-a ND04-40	107.326	47.7758	1.27	5.76	2.32	1.17	0.89	0.67	0.93	2.10
17.L4811Г-a ND04-41	107.326	47.7713	1.06	0.51	1.81	0.91	0.89	0.67	0.93	2.00
17.L4811Г-a ND04-42	107.326	47.7668	0.85	0.51	0.32	0.46	0.89	0.67	0.93	2.40
17.L4811Г-a ND07-19	107.325	47.7623	1.31	6.50	0.32	0.60	0.89	4.49	0.93	2.21
17.L4811Г-a ND07-20	107.325	47.7578	1.33	0.51	1.61	1.26	0.89	3.72	0.93	2.33
17.L4811Г-a ND07-21	107.325	47.7533	1.10	0.51	1.86	0.96	0.89	3.64	0.93	2.32
17.L4811Г-a ND01-59	107.33	47.787	1.14	7.22	1.55	0.84	0.89	4.03	0.93	0.49
17.L4811Г-a ND01-60	107.33	47.7847	1.00	0.51	2.60	0.98	0.89	0.67	0.93	2.06
17.L4811Г-a ND04-43	107.329	47.7757	0.95	5.89	0.32	0.96	0.89	0.67	0.93	2.02
17.L4811Г-a ND04-44	107.329	47.7712	0.93	0.51	1.76	0.80	0.89	5.18	0.93	2.52

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	Soil heavy metal POLLUTION INDEX of Nalalikh area									
QR_CODE	X	Y	Sr_PI	Pb_PI	As_PI	Zn_PI	Cu_PI	Ni_PI	Cr_PI	Ba_PI
17.L4811Г-a ND04-45	107.329	47.7667	0.92	0.51	1.76	1.00	0.89	4.18	0.93	2.01
17.L4811Г-a ND04-46	107.329	47.7622	1.10	7.33	0.32	0.88	0.89	5.29	0.93	2.45
17.L4811Г-a ND07-22	107.328	47.7577	1.70	0.51	0.32	0.61	0.89	3.81	0.93	3.03
17.L4811Г-a ND07-23	107.328	47.7532	0.99	0.51	2.68	0.97	8.67	6.17	0.93	2.55
17.L4811Г-a ND01-62	107.333	47.7869	0.98	8.05	0.32	1.12	0.89	3.68	0.93	1.75
17.L4811Г-a ND01-63	107.333	47.7846	2.37	0.51	0.32	0.97	0.89	6.45	0.93	2.34
17.L4811Г-a ND01-64	107.333	47.7824	1.16	7.12	1.56	1.10	0.89	0.67	0.93	1.98
17.L4811Г-a ND04-47	107.333	47.7801	1.02	0.51	1.63	0.67	0.89	0.67	0.93	2.61
17.L4811Г-a ND04-48	107.333	47.7757	0.93	0.51	2.08	0.87	0.89	3.98	0.93	2.28
17.L4811Г-a ND04-49	107.332	47.7712	1.01	0.51	0.32	0.78	0.89	3.28	0.93	2.66
17.L4811Г-a ND04-50	107.332	47.7667	1.04	0.51	1.92	0.75	0.89	0.67	0.93	1.74
17.L4811Г-a ND04-51	107.332	47.7622	1.21	7.93	1.69	1.08	0.89	0.67	0.93	1.81
17.L4811Г-a ND07-24	107.332	47.7577	0.96	6.67	1.49	0.92	0.89	0.67	0.93	2.62
17.L4811Г-a ND07-25	107.332	47.7532	1.04	0.51	1.77	1.01	0.89	0.67	0.93	2.03
17.L4811Г-a ND01-65	107.336	47.7846	1.01	0.51	0.32	0.86	0.89	4.89	0.93	2.31
17.L4811Г-a ND01-66	107.336	47.7823	1.11	0.51	2.08	0.92	0.89	5.11	0.93	2.11
17.L4811Г-a ND04-52	107.336	47.7801	1.27	0.51	2.08	1.07	0.89	3.52	0.93	2.36
17.L4811Г-a ND04-53	107.336	47.7756	1.10	6.61	0.32	1.08	0.89	4.06	0.93	1.91
17.L4811Г-a ND04-54	107.336	47.7711	0.94	7.01	0.32	0.50	0.89	0.67	0.93	3.92
17.L4811Г-a ND04-55	107.336	47.7666	1.14	8.11	2.19	1.14	0.89	4.63	0.93	1.52
17.L4811Г-a ND04-56	107.335	47.7621	1.14	0.51	2.67	0.90	0.89	3.92	0.93	2.12
17.L4811Г-a ND07-26	107.335	47.7576	1.09	0.51	2.15	0.90	0.89	0.67	0.93	2.06
17.L4811Г-a ND07-27	107.335	47.7531	1.08	7.77	1.51	0.99	0.89	0.67	0.93	2.22
17.L4811Г-a ND01-67	107.34	47.7845	0.90	0.51	0.32	0.75	0.89	3.33	0.93	2.75
17.L4811Г-a ND05-1	107.34	47.7823	0.90	0.51	2.03	1.05	0.89	0.67	0.93	2.20
17.L4811Г-a ND05-2	107.339	47.78	1.11	0.51	0.32	0.86	0.89	4.37	0.93	2.30
17.L4811Г-a ND05-3	107.339	47.7778	0.88	6.25	1.56	0.80	0.89	0.67	0.93	3.25
17.L4811Г-a ND05-4	107.339	47.7755	1.06	6.91	2.68	1.22	0.89	4.25	0.93	0.93
17.L4811Г-a ND05-5	107.339	47.7733	0.99	0.51	1.77	0.91	0.89	0.67	0.93	2.68
17.L4811Г-a ND05-6	107.339	47.771	0.95	0.51	1.38	0.77	0.89	5.10	0.93	2.12
17.L4811Г-a ND05-7	107.339	47.7688	0.89	0.51	1.59	0.96	0.89	4.12	0.93	2.21

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	Soil heavy metal POLLUTION INDEX of Nalalikh area									
QR_CODE	X	Y	Sr_PI	Pb_PI	As_PI	Zn_PI	Cu_PI	Ni_PI	Cr_PI	Ba_PI
17.L4811Г-a ND05-8	107.339	47.7665	1.98	0.51	1.68	0.78	0.89	0.67	0.93	1.91
17.L4811Г-a ND05-9	107.339	47.7643	1.93	0.51	1.44	0.84	0.89	3.68	0.93	2.18
17.L4811Г-a ND05-10	107.339	47.762	0.82	0.51	1.62	0.49	0.89	5.85	0.93	2.06
17.L4811Г-a ND05-11	107.339	47.7598	0.97	0.51	1.89	0.73	0.89	0.67	0.93	2.47
17.L4811Г-a ND07-28	107.338	47.7575	1.11	0.51	2.48	1.03	0.89	0.67	0.93	1.64
17.L4811Г-a ND07-29	107.338	47.7553	1.16	8.47	1.61	0.92	0.89	5.53	0.93	2.43
17.L4811Г-a ND07-30	107.338	47.753	1.31	6.17	1.78	1.16	0.89	0.67	0.93	2.31
17.L4811Г-a ND01-12	107.26	47.7848	1.50	0.51	3.10	1.03	0.89	0.67	0.93	2.42
17.L4811Г-a ND01-11	107.26	47.7842	1.34	6.36	0.32	1.22	0.89	0.67	0.93	2.54
17.L4811Г-a ND04-21	107.276	47.7749	0.92	0.51	1.68	0.63	0.89	3.82	0.93	1.95
17.L4811Г-a ND07-37	107.264	47.7695	1.13	7.42	3.02	1.06	0.89	0.67	0.93	1.89
17.L4811Г-a ND04-1	107.261	47.7736	1.32	8.63	2.13	1.18	0.89	5.30	0.93	2.14
17.L4811Г-a ND04-4	107.265	47.7738	1.42	0.51	3.59	1.36	0.89	0.67	0.93	1.89
17.L4811Г-a ND04-13	107.27	47.774	1.02	0.51	2.14	0.96	0.89	3.63	0.93	2.02
17.L4811Г-a ND04-14	107.274	47.774	1.45	10.35	1.73	1.19	0.89	0.67	0.93	2.41
17.L4811Г-a ND04-22	107.277	47.7741	1.37	8.10	3.07	1.17	0.89	4.80	0.93	1.72
17.L4811Г-a ND04-27	107.282	47.7742	1.43	8.43	2.86	1.33	0.89	0.67	0.93	2.06
17.L4811Г-a ND04-28	107.286	47.7748	1.21	6.34	3.16	1.29	0.89	4.54	0.93	0.96
17.L4811Г-a ND04-11	107.271	47.7768	1.29	0.51	2.34	1.19	0.89	0.67	0.93	2.05
17.L4811Г-a ND04-20	107.278	47.7761	1.29	0.51	1.94	1.11	0.89	0.67	0.93	2.49
17.L4811Г-a ND04-15	107.274	47.7755	1.38	6.29	1.80	1.09	0.89	0.67	0.93	2.42
17.L4811Г-a ND04-12	107.27	47.7756	1.55	10.02	0.32	0.82	0.89	3.54	0.93	2.67
17.L4811Г-a ND04-5	107.265	47.7761	1.36	8.38	1.71	1.05	0.89	0.67	0.93	2.85
17.L4811Г-a ND01-10	107.261	47.7771	1.30	0.51	0.32	0.93	0.89	6.43	0.93	2.65
17.L4811Г-a ND04-7	107.269	47.7868	1.40	0.51	1.86	0.96	0.89	4.44	0.93	2.62
17.L4811Г-a ND04-8	107.274	47.7863	1.55	9.69	0.32	1.22	0.89	4.33	0.93	2.23
17.L4811Г-a ND04-18	107.279	47.7856	1.14	6.87	0.32	0.98	0.89	0.67	0.93	2.07
17.L4811Г-a ND04-19	107.282	47.782	1.38	0.51	2.20	1.19	0.89	0.67	0.93	2.41
17.L4811Г-a ND04-17	107.277	47.7816	1.17	0.51	2.44	1.12	0.89	0.67	0.93	1.62
17.L4811Г-a ND04-9	107.271	47.7811	1.18	0.51	1.91	1.18	0.89	4.88	0.93	2.15
17.L4811Г-a ND04-6	107.266	47.7826	1.55	0.51	2.35	1.21	0.89	0.67	0.93	2.34

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	Soil heavy metal POLLUTION INDEX of Nalalikh area									
QR_CODE	X	Y	Sr_PI	Pb_PI	As_PI	Zn_PI	Cu_PI	Ni_PI	Cr_PI	Ba_PI
17.L4811Г-a ND04-10	107.269	47.7787	1.60	0.51	2.23	0.91	0.89	0.67	0.93	2.64
17.L4811Г-a ND04-16	107.274	47.7794	1.49	7.35	2.29	1.05	0.89	0.67	0.93	2.44
17.L4811Г-a ND04-2	107.263	47.7731	1.23	7.77	2.14	1.27	0.89	0.67	0.93	1.91
17.L4811Г-a ND07-38	107.263	47.77	1.48	6.15	2.40	1.25	0.89	0.67	0.93	2.33
17.L4811Г-a ND07-39	107.264	47.7673	1.56	0.51	2.07	1.07	0.89	4.61	0.93	3.07
17.L4811Г-a ND02-11	107.264	47.7653	1.37	8.91	2.98	1.38	0.89	0.67	0.93	1.66
17.L4811Г-a ND07-1	107.264	47.7632	1.48	12.19	0.32	1.27	0.89	0.67	0.93	2.14
17.L4811Г-a ND07-2	107.263	47.7606	1.35	10.74	2.58	1.13	0.89	3.28	0.93	1.74
17.L4811Г-a ND07-3	107.271	47.7626	1.38	7.18	0.32	0.72	0.89	4.09	0.93	3.04
17.L4811Г-a ND07-4	107.271	47.758	0.96	6.67	2.67	1.39	0.89	0.67	0.93	0.95
17.L4811Г-a ND04-3	107.266	47.7717	1.51	0.51	1.72	1.03	0.89	0.67	0.93	2.32
17.L4811Г-a ND04-23	107.277	47.7716	1.36	0.51	1.55	0.73	0.89	4.31	0.93	2.74
17.L4811Г-a ND04-26	107.282	47.7722	1.49	13.06	1.80	1.14	0.89	3.53	0.93	3.94
17.L4811Г-a ND04-25	107.283	47.7717	1.33	11.37	2.51	1.37	0.89	0.67	0.93	2.99
17.L4811Г-a ND04-24	107.279	47.7672	1.73	0.51	3.28	1.08	0.89	3.45	0.93	1.61
17.L4811Г-a ND07-5	107.277	47.7628	1.08	6.16	0.32	0.87	0.89	0.67	0.93	2.44
17.L4811Г-a ND07-6	107.279	47.7619	1.33	7.69	2.45	1.31	0.89	0.67	0.93	2.35
17.L4811Г-a ND01-68	107.327	47.7939	0.84	0.51	1.99	0.66	0.89	0.67	0.93	2.70
17.L4811Г-a ND03-4	107.263	47.7584	1.37	0.51	1.49	0.61	0.89	0.67	0.93	2.25
17.L4811Г-a ND03-5	107.263	47.7563	1.01	0.51	2.70	0.70	0.89	0.67	0.93	0.08
17.L4811Г-a ND04-57	107.267	47.7736	1.51	0.51	2.16	1.12	0.89	0.67	0.93	2.46
19.L4811Г-a ND04-1	107.316	47.7654	0.89	0.51	2.22	0.93	0.89	4.84	0.93	1.00








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