ECOLOGICAL PROBLEMS OF TERRIORIES SUFFERING FROM NEGATIVE IMPACT OF METAL MINING INDUSTRY

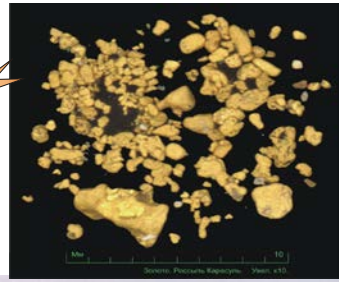


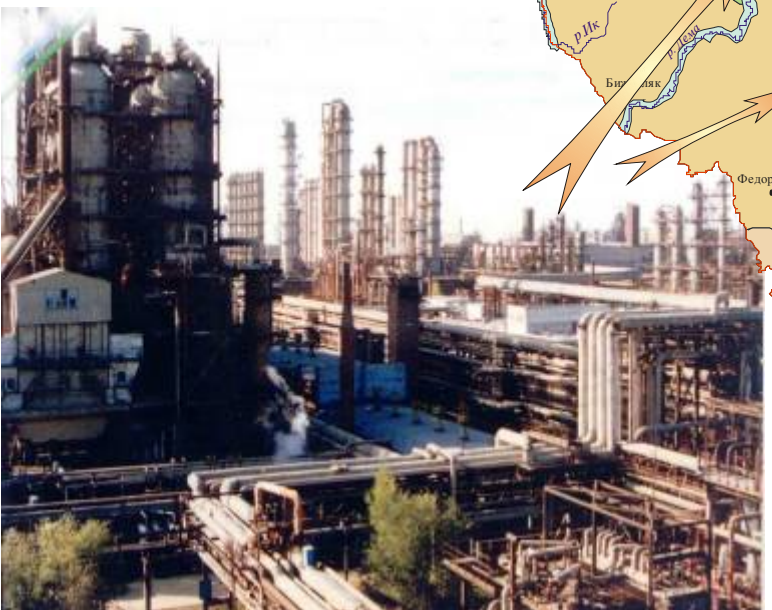
Valentina I. Safarova

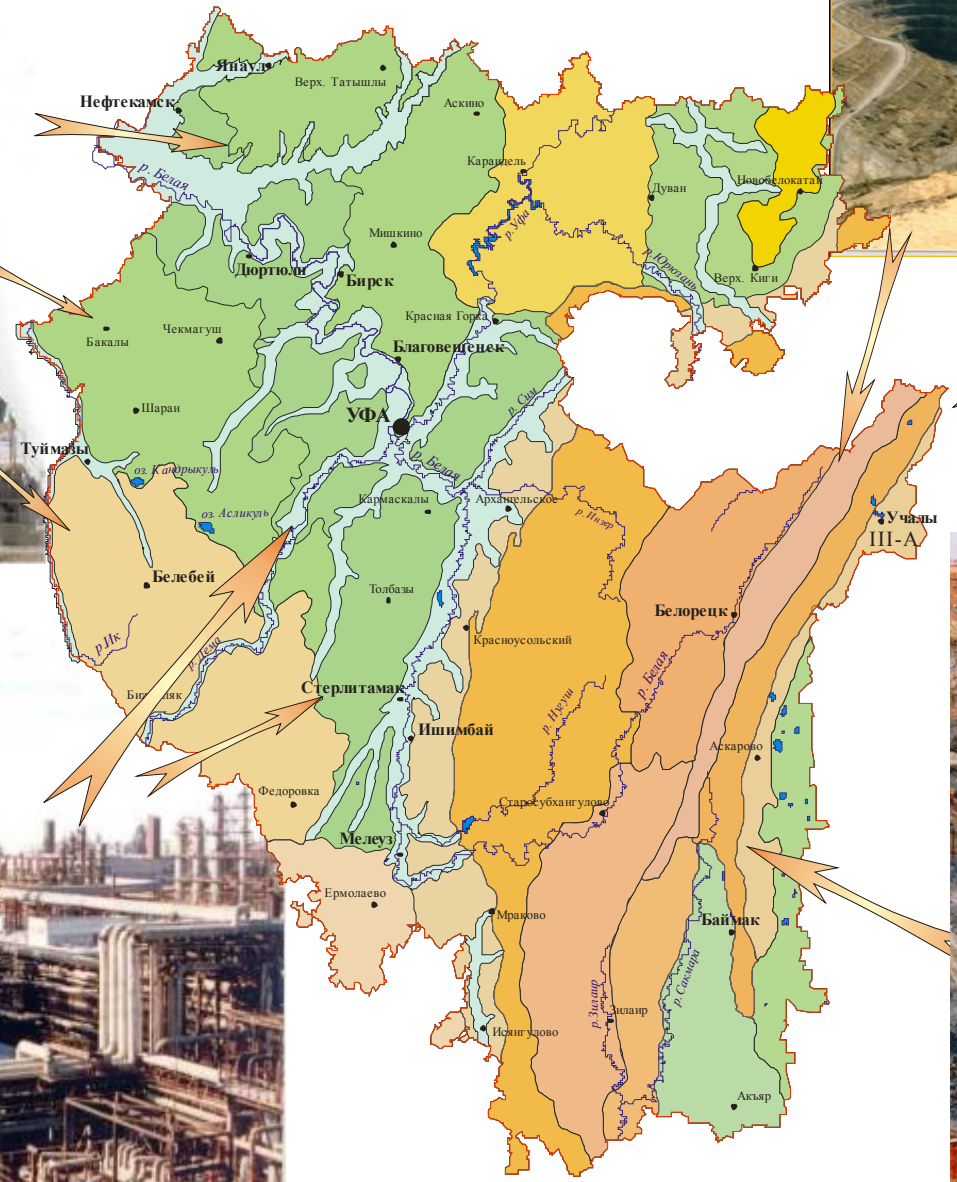
Doctor of Science, Professor
State Analytical Control Department
(of Bashkortostan Nature Management and Ecology Ministry)
RUSSIA

Nature Management and Ecology Ministry of Bashkortostan

Petrochemical and mining industry in the Republic of Bashkortostan







Bashkortostan meal mining districts

Среднесрочная комплексная программа экономического развития Зауралья на 2011-2015 годы

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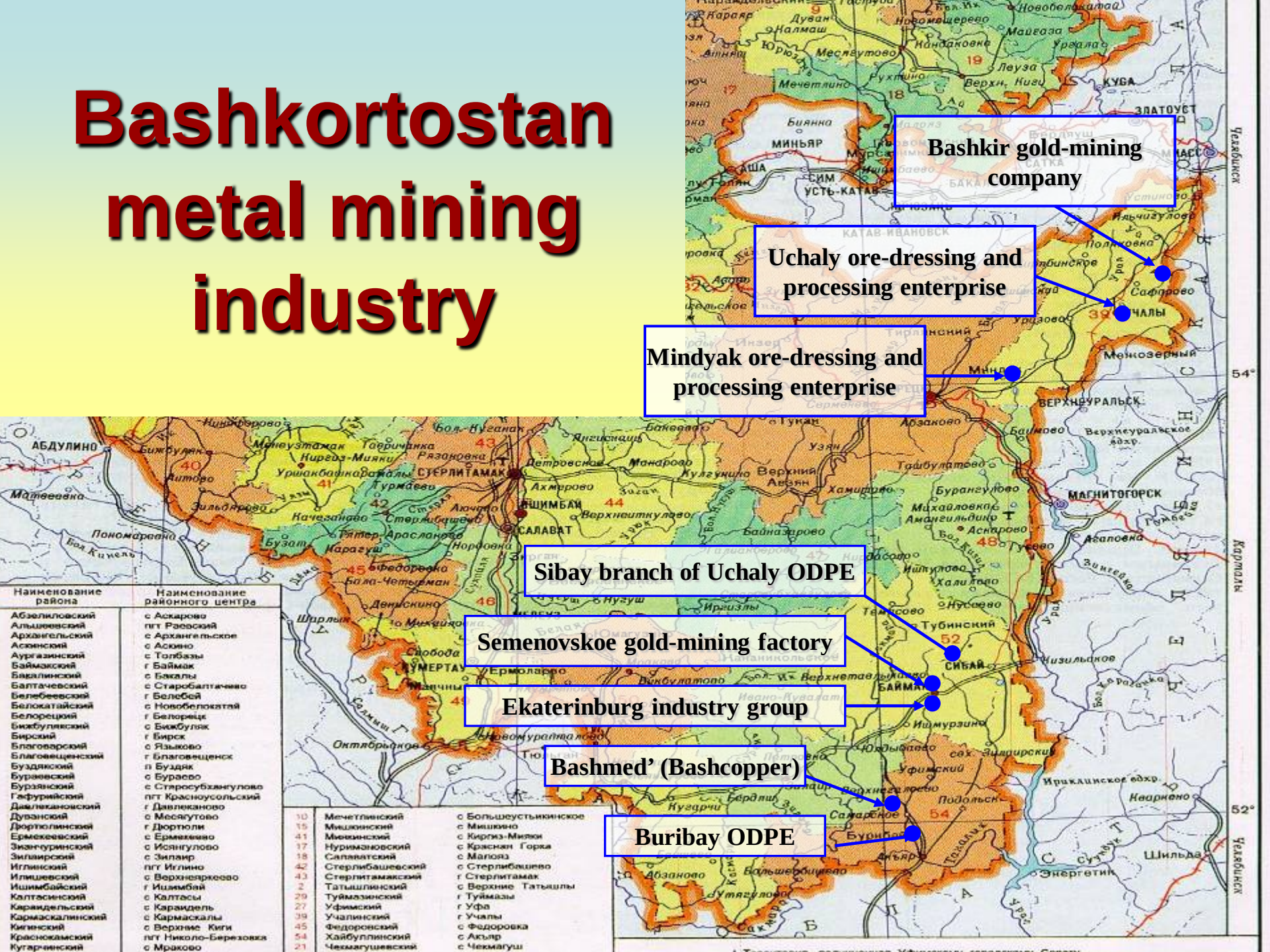
г. Уфа
2011

Aims of Medium term complex program of Trans-Urals economic development for 2011 – 2015 years

- to build refuse dumps for hard domestic waste, to recycle and disinfect industrial and consumption waste;
- to develop a network of highly protected nature reserves and to maintain existing reserves, to protect rare species of animals and plants;
- to build and reconstruct sewage-purification facilities in towns and cities;
- to repair hydraulic facilities and to clean riverbeds;
- to introduce purification facilities at nonferrous metal industry, to resoil contaminated and anthropogenically disrupted land 26

Bashkortostan metal mining industry



State Analytical Control Department

Chromatography-mass spectrometer GC-MS QP-2010

Fluid chromatograph LC-10ADvp with electro-chemical detector PROCEDE

Atomic absorption spectrometer AA-6800

Atomic absorption spectrophotometer AA-6200

Metal mining industry

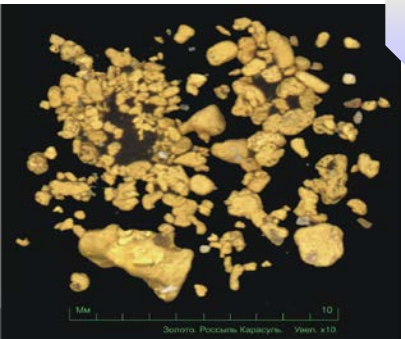
Ore extracting

Ore and finished products transportation

Ore reduction

Ore dressing

Wastes disposal



Tailing dump of Uchaly ODPE

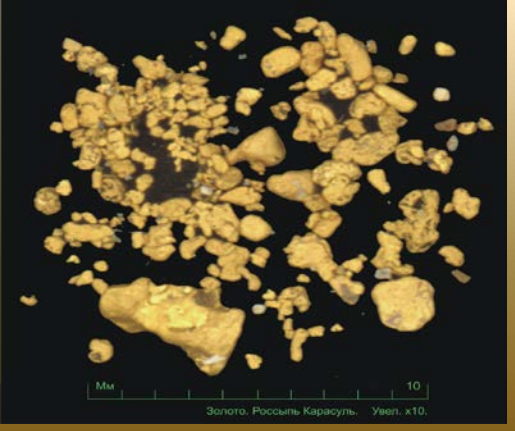
Technical pond of Uchaly ODPE

Bashkortostan ODPE under spoil water composition

Enterprise	Content of basic contaminants mgr/decimeter3					
	pH	Fe	Mn	Cu	Zn	SO_4^{2-}
Public corporation Uchaly ODRE	3-4	194-371	117-144	28-88	477-769	5500-14400
Close corporation Buribay ODPE	2-3	420	171	131	123	17200

Ecological problems of metal mining districts

- Pollution of natural waters (surface and subsurface) in the area where there are waste and tailing dumps, technical ponds and other hydraulic facilities not keeping contemporary ecological requirements which were built in the middle of last century.
- Pollution of air when dust rises in opencast mines, waste dumps and drained beaches of tailing dumps.
- Hyperconcentration of priority components at mines (high-density metals and sulphates) in depositing natural environment (water reservoirs and courses bottom depositions in soil and vegetation).



Ecological dangers of gold-mining technology

- use of high-toxic reactants (cyanides, chlorine, hypochlorides);
- formation of high-density metals' water-soluble complexes;
- dispersion in environment gold-bearing ore's toxic additives – mercury and arsenic;
- dangerous secondary processes.

Mercury diffuse halo in soil and bottom depositions in Uchaly district

1 – places of soil sampling;

2 – places of bottom deposits sampling;

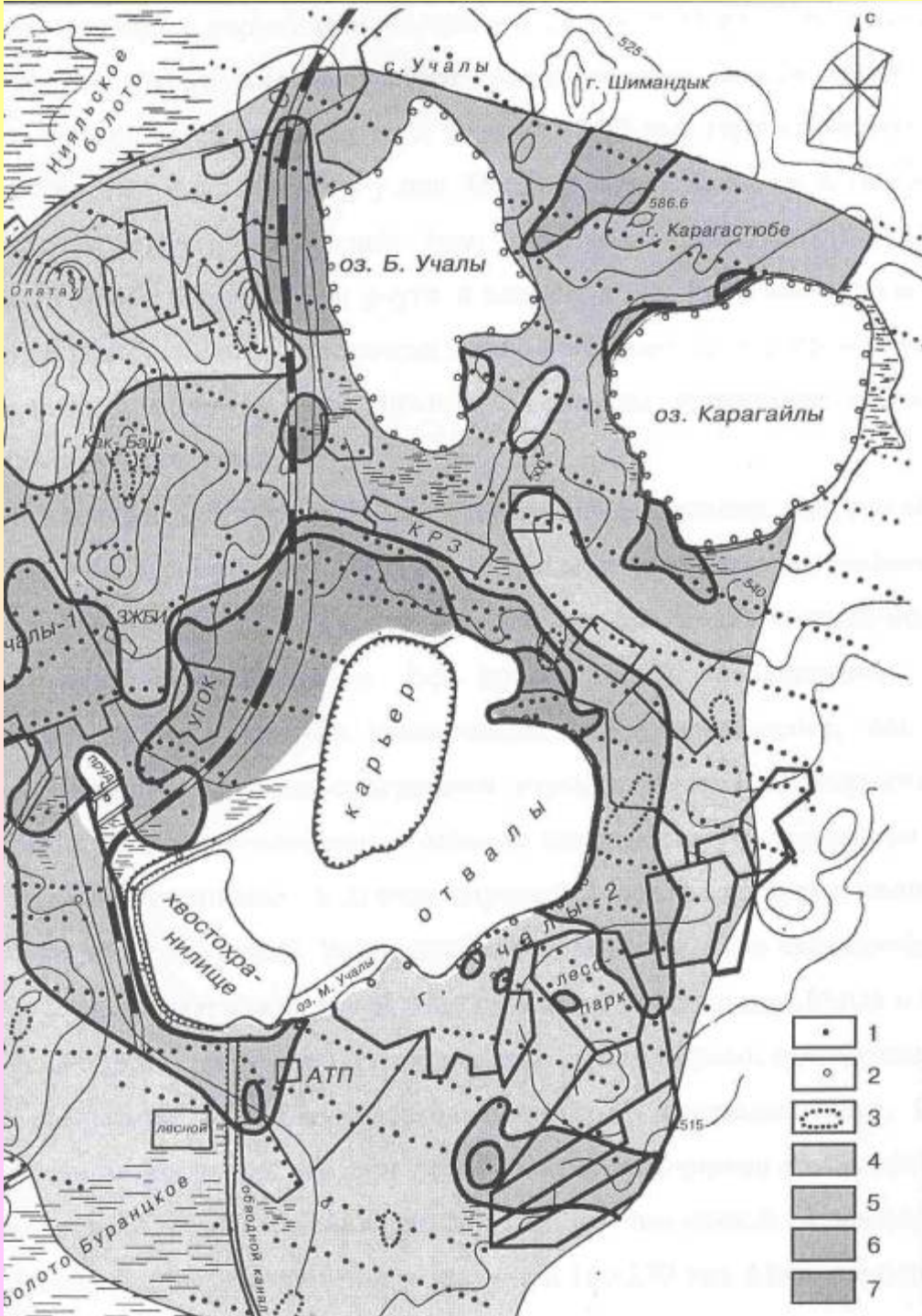
3 – mercury abnormality in root fruits;

4 – gross mercury content in soil <0,05 mgr/kg (<0,02 MCL);

5 – gross mercury content in soil 0,05-0,25 mgr/kg (0,02 – 0,1 MCL);

6 – gross mercury content in soil 0,25-0,5 mgr/kg (0,1 – 0,2 MCL);

7 – gross mercury content in soil 0,5 – 0,3 mgr/kg (0,2 – 1 MCL).



Mercury pollution level of environment in Semenovskoe GEF impact zone

Drinking water

2 – 20 MCL

Ambient air

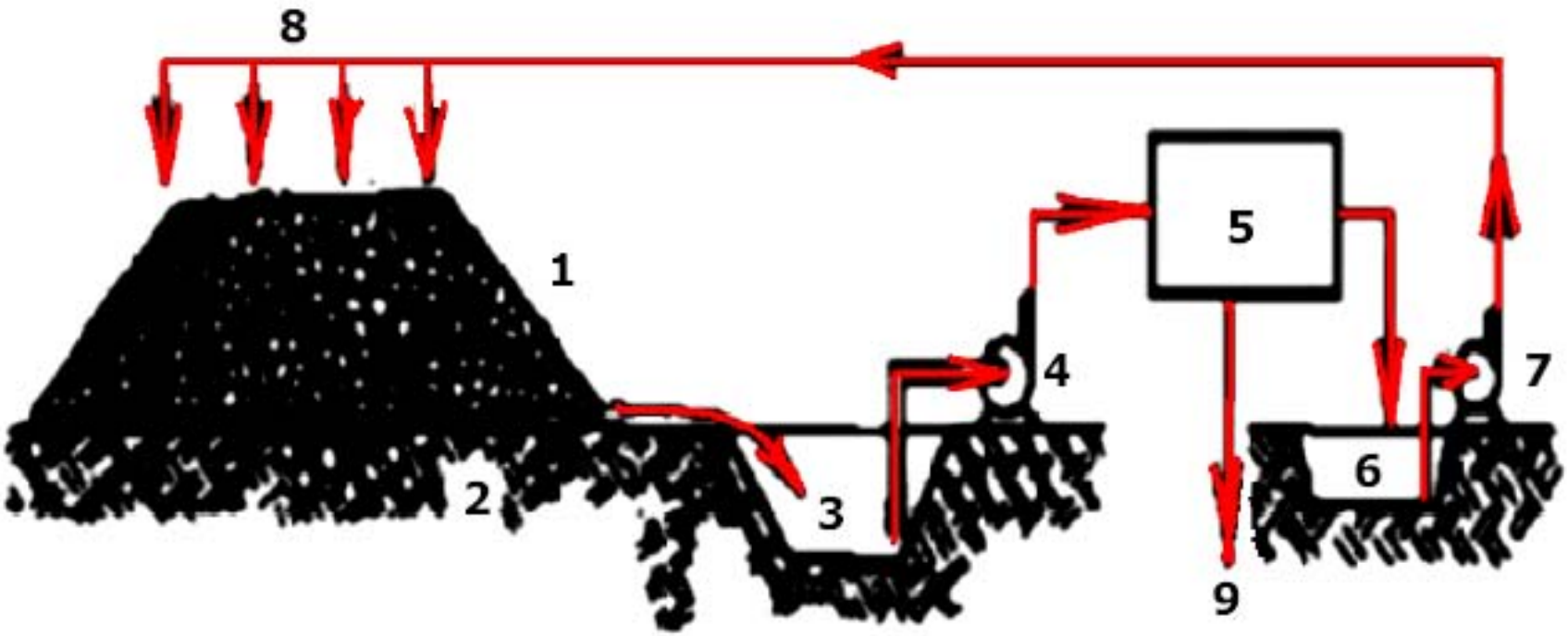
2 – 2,5 higher than background

Farmland

6 – 42 higher than background

Industry area soil

75,3 – 838500 higer than background

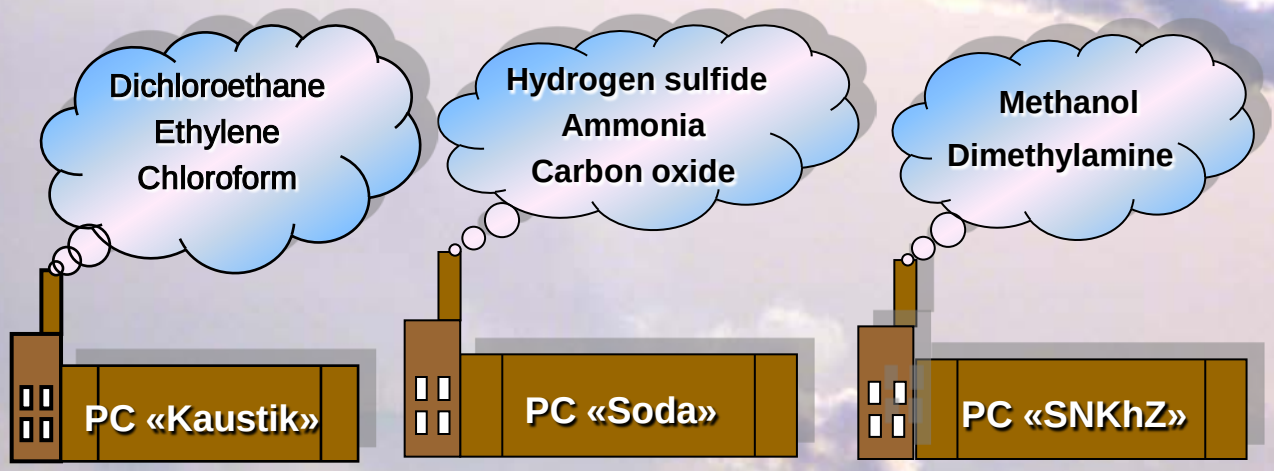


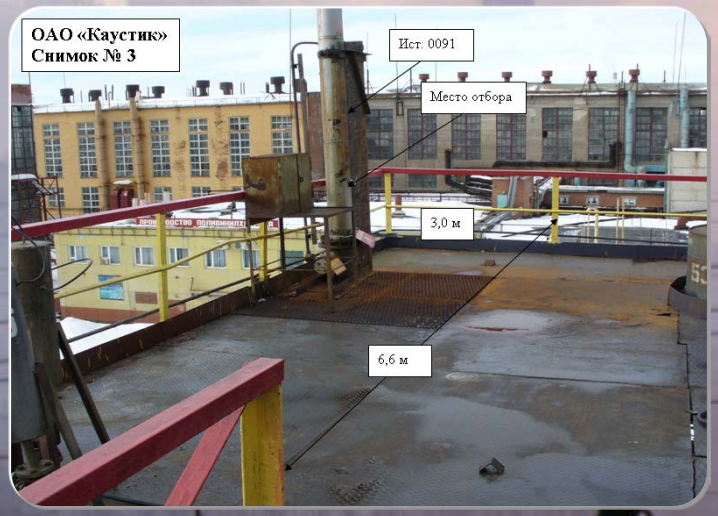
Heap leaching process scheme:

1 – heap, 2 – soil surface, 3 – pond for collecting production solutions, 4 – pump, 5 – grouting ditches, 6 – pond for worked-out solution, 7 – pump, 8 – opencast mine flushing system, 9 - metal

Saxon State Ministry of Ecology and Agriculture – Bashkortostan‘s Ministry of Natural Management, Forest Resources and Environment Protection: Cooperation strategy

Monitoring of toxic pollutants from industry emitters





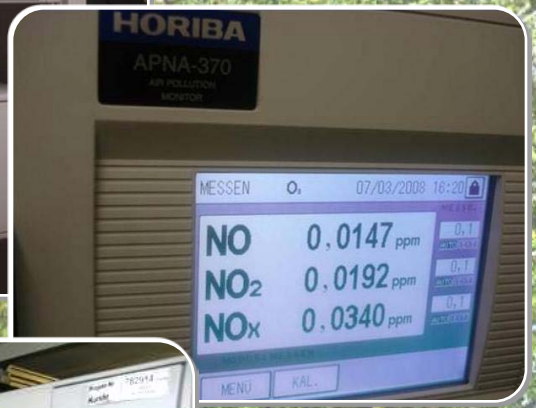
List of components monitored at ASCAW

Components	Measuring range, mgr\m^3
Ammonia	0,012 – 0,76
Amilen	0,00015 – 30,0
Benzene	0,0002 – 6,0
Suspension particles	0,04 – 100,0
Vinyl chloride	0,00014 – 1,4
Hydrochloride	0,18 – 5,0
Dimethylamine	0,00008 – 0,8
Nitrogen dioxide	0,004 – 20,5
Sulfur dioxide	0,006 – 21,0
1,2 Dichloroethane	0,0002 – 60,0
m,p – Xylene	0,0002 – 2,4
o – Xylene	0,0002 – 2,4
Methanol	0,00007 – 20,0
α – Methylsterol	0,0003 – 2,6
Ozon	0,1 – 2,0
Nitric oxide	0,0027 – 13,0
Carbon oxide	0,25 – 100,0
Pentane	0,0002 – 1000,0
Hydrogen sulfide	0,003 – 14,2
Toluene	0,0002 – 12,0
Phenol	0,0002 – 2,1
Chlorine	0,15 – 5,0
Chloroform	0,00026 – 3,0
Ethylbenzene	0,0002 – 2,4
Ethylene	0,0006 – 6,0

STATION EQUIPMENT

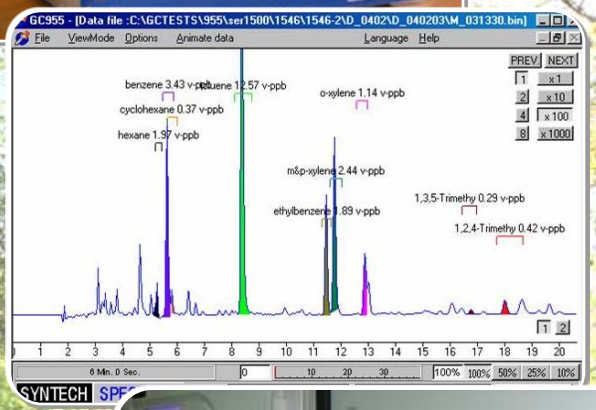
HORIBA

Gas analyzer
APNA-370



Synspec

Gas chromatograph
Syntech Spectrals
GC 955




SEQ47/50
LECKEL GmbH

Processed ASCAW monitoring results

	A	B	C	D	E	F	G	H	I
1	**Результаты автоматизированного контроля загрязняющих веществ (З.В.) в атмосферном**								
2	**воздухе с АСКАВ по ул. Фурманова, 33**								
3		с	07.10.2010 7:00		по	08.10.2010 7:00			
4	Ингредиент	с.с. Концентрация з.в. мг/м^3	ПДК$_{с.с.}$ мг/м^3	Превышение в долях ПДК$_{с.с.}$ ≥ 1	м.р. Концентрация з.в. мг/м^3	ПДК$_{м.р.}$ мг/м^3	Превышение в долях ПДК$_{м.р.}$ ≥ 1	Время max выброса м.р. концентрации з.в.	
5	Углерод оксид	0,641	3,000		0,792	5		08.10.2010 0:00	
6	Азота оксид	0,033	0,060		0,157	0,4		07.10.2010 21:30	
7	Азота диоксид	0,023	0,040		0,046	0,2		07.10.2010 21:30	
8	Аммиак		0,040			0,2			
9	Озон	0,015	0,030		0,042	0,16		07.10.2010 18:00	
10	Сера диоксид	0,012	0,050		0,036	0,5		08.10.2010 0:00	
11	Сероводород	0,003	0,008		0,005	0,008		08.10.2010 1:00	
12	Бензол	0,001	0,100		0,003	0,3		08.10.2010 1:30	
13	Хлороформ	0,008	0,030		0,025	0,1		08.10.2010 1:30	
14	Фенол	0,010	0,003	**3,3**	0,036	0,01	**3,6**	08.10.2010 1:30	
15	Толуол	0,004	0,600		0,011	0,6		07.10.2010 23:00	
16	Альфа-метилстирол		0,040		0,004	0,04		07.10.2010 23:00	
17	м,р-Ксилол	0,001	0,040		0,007	0,2		08.10.2010 1:30	
18	о-Ксилол		0,300		0,004	0,2		08.10.2010 1:30	
19	1,2-Дихлорэтан	0,030	1,000		0,073	3		07.10.2010 15:00	
20	Этилен	0,152	3,000		0,596	3		07.10.2010 22:30	
21	Изопентан	0,001	25,000		0,019	100		07.10.2010 21:30	
22	Амилены		1,500		0,003	1,5		07.10.2010 20:30	
23	Пропилен	0,002	3,000		0,004	3		08.10.2010 1:00	
24	Винилхлорид		0,010		0,002			08.10.2010 4:30	
25	Пентан	0,030	25,000		0,196	100		08.10.2010 2:00	
26	Пыль		0,150			0,5			
27	Этилбензол		0,020			0,02			

Лист1 / База / Таблица / Полный формат / **Сжатый формат** / Лист3

Excess of pollutants MCLc.c, MCLм.р in ambient air from ASCAW on Furmanov str., 33 for the period from 15.02.10 till 04.03.10

№	Дата	Время превышения $ПДК_{м.р}$	Наименование ингредиента	Превышение ПДК, раз		Направление ветра
				$ПДК_{мр}$	$ПДК_{сс}$	
1	15.02.10 7.00 - 16.02.10 7.00		Озон		2,73	Северный
2	16.02.10 7.00 - 17.02.10 7.00		Озон		2,6	Восточный
3	17.02.10 7.00 - 18.02.10 7.00	00.00-00.20	Озон Сера диоксид	1,4	2,4	Юго-Вост
4	18.02.10 7.00 - 19.02.10 7.00		Озон		1.98	Восточный
5	19.02.10 7.00 - 20.02.10 7.00	8.40-7.00	Озон Метанол	1,2	2,26	Сев-Воет
6	20.02.10 7.00 - 21.02.10 7.00		Озон		2,53	Восточный
7	21.02.10 7.00 - 22.02.10 7.00		Озон		1,98	Юго-Зап
8	22.02.10 7.00 - 23.02.10 7.00		Озон		2,07	Сев-Зап
9	23.02.10 7.00 - 24.02.10 7.00		Озон		2,43	Западный
10	24.02.10 7.00- 25.02.10 7.00	00.20	Озон Сера диоксид	1.3	2.4	Западный
11	25.02.10 7.00- 26.02.10 7.00	1.20-3.20	Озон Фенол	1.0-1.2	2.0	Северный Сев-Зап.
12	26.02.10 7.00- 27.02.10 7.00	12.40-13.40	Азота диоксид Озон Сероводород	1.1-1.5	1.4 1.4	Северный Сев-Воет.
13	27.02.10 7.00- 28.02.10 7.00	13.00-14.00; 17.40	Азота диоксид Озон Сероводород	1.0-1.5	1.1 2.0	Северный Сев-Воет.
14	28.02.10 7.00- 01.03.10 7.00		Азота диоксид Озон		1.3 1.7	
15	01.03.10 7.00- 02.03.10 7.00	16.00 23.20- 00.20	Азота диоксид Сероводород Фенол	1.0 1.0-1.2	2.1 1.9	Северный Севрный
16	02.03.10 7.00- 03.03.10 7.00	8.20-11.40	Озон Азота диоксид Фенол	1.1-1.9	2.3 1.0 1.4	Северный Восточный
17	03.03.10 7.00-	00.20 10.00-	Озон Сера	1.22 1.2-1.5	2.4	Сев-Воет.