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Programm Abstracts

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ENVIRONMENT QUALITY ASSESSMENT IN TOWNS OF THE TYUMEN REGION (NORTH) (BY THE EXAMPLE OF MURAVLENKO)

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Ecological state of towns in the North of Western Siberia, situated in severe natural conditions near oil and gas fields recently has been more topical. Being principal centers
of intensive economic development of hydrocarbon raw stock fields, small and medium towns eventually have become focuses of ecological tension and hazard to local population's health.

One of the most typical northern towns is Muravlenko located within the West-Sutorminskoe oilfield in immediate proximity to Sutorminskoe and Muravlenkovskoye oilfields. By the reason of proximity to oil-fields the area is subject to a serious anthropogenic impact of pollution sources as well as oil and gas extraction objects.

During realization of the joint program of the town inspection, monitoring and environmental sanitation works we studied chemical pollution of basic natural spaces. In the course of research the following samples were taken: 10 free air samples, 10 snow cover samples, 108 soil samples and 4 surface water samples (about 2000 chemical analyses).

Free air analysis indicated that maximum permissible concentration (MPC) of 5 ingredients (nitrogen dioxide, dust, phenol, formaldehyde, carbon oxide) was exceeded: The primary pollution source is the motor transport and first of all heavy machines locating in the town's industrial area that every day drive to the oilfields around the town.

The springs in the nearby oilfields dramatically affect atmospheric air and snow cover pollution. This circumstance exposes the town to oil pollution (petroleum derivatives and other components accompanying oil production).

There are exceeded accepted values of aluminum, zinc, manganese, copper and iron in the surface waters. In addition, content levels of petroleum products, zinc, calcium and sodium chloride are increased. The main causes of these components high concentration are natural background (iron, manganese) and sewage disposal of the town’s industrial objects (petroleum products, phenols, aluminum, zinc, copper).

Heavy metals concentration in the soil of Muravlenko is under the level of maximum permissible concentration. On the one part, it indicates a minor level of pollution, on the other part it is a result of illuviation. Accumulation of heavy metals in the soil for the most part takes place in an organogenic horizon. Because such horizon has not formed in a short time, so heavy metals accumulation is insignificant. However, a heavy metal pollution tendency is outlining in the industrial area.

The research results were used in working out environmental restoration guidelines offered to the local authorities of Muravlenko.

Consequently, the town of Muravlenko is a part of one industrial system and the main base of surrounding territory economic development. This results in developing a specific ecological situation when consideration of the town’s natural environments condition is closely associated with study of neighboring oil-fields' natural environments condition. Composition of the pollutants, conditions of pollutants entry and distribution are practically identical. Such interdependence is typical of many (especially small) towns in the north of Western Siberia. Therefore, future more exact description of towns’ ecological state in this territory requires using of a comprehensive approach, including description of urban, oil and gas fields' environments.