

Technical Report

Project K-1240

“Post-containment Management and Monitoring of Mercury Pollution in Site of Former PO “Khimprom” and Assessment of Environmental Risk Posed by Contamination of Groundwater and Adjacent Water Bodies of the Northern Industrial Area of Pavlodar”

For the 1st quarter (October-November-December, 2005)

(Tasks 1-5)

Leading institute:

Non-profit JSC “Almaty Institute of Power Engineering and Telecommunication”, BG Chair of Environmental Technology

Address: 126 Baytursynov Str, Almaty, 050013, Kazakhstan

Almaty 2006

3. Brief description of the performed work:

The main purpose of the work for the reported period was preparation of the Work specifications and Schedules (FS/S) for the Participating Institutes (see Appendixes 1-5) in accordance with Work Plan on the project, tasks 1-5 and Technical Schedule. FS/S for each Participant Institutes were discussed and approved with sub-managers of the project and have become component and integral part of sub-contracts, concluded between Participant Institutes and Leading Institute. Also there have been done corrections and approval by Participant Institutes of changes in their staff, which have happened since the time of the Proposal preparation. Because of bankruptcy of Pavlodar Chemical Plant (PCP) and ambiguity concerning employment of the staff alteration for the team of this Participant Institute was postponed till the end of March, 2006.

On the task 2 archive data were gathered on hydro-geological conditions of northern part of Northern Industrial area of Pavlodar as hard copies (schemes of wells and their description, wells' designs, data on groundwater tables and so on). Gathered data have been introduced into a computer database created using FOXPRO 6 software and to Geographic Information System (GIS) produced with help of MAPINFO 6 software. Analysis, appraisal of quality and comprehensiveness of gathered data were conducted so that they would answer the purposes of modeling. Based on the performed work the conclusion has made that it was enough evidences to create detailed local model of area of groundwater mercury contamination at PCP site. Meanwhile new evidences on mercury content in the groundwater, parameters characterizing adsorptive properties of water-bearing rocks, new data about groundwater tables and water level in a wastewater storage pond - Lake Balkyldak will be required for successful model calibration in future. These data will be obtained during field works and laboratory experiments in 2006-2007.

Furthermore on the task 4 on archive documents relating to the design of the wastewater storage pond - Lake Balkyldak the following has been prepared: (i) preliminary computer map for a plan of bottom sediment sampling and (ii) bathymetry plan of the wastewater storage pond.

Preliminary investigation of Lake Balkyldak in winter time and discussion of the problem with local experts suggested necessity to develop combined winter-summer plan of bottom sediment sampling on Lake Balkyldak. Ice depth at the storage pond is 70-150 cm depending on winter severity. In any case such depth is sufficient to do safe bottom sediment sampling from under the ice in March when strong frosts are no loner there but snow melting does not start yet. Possibility to take samples near the shore depends on ice depth and freezing through the bottom at the shallow depth. In points where water column is frozen entirely to the bot-

tom, samples of bottom sediments should be taken from the rubber boat in summer time.

In order to compare status of biota in water bodies contaminated and not contaminated with mercury, it was chosen a control non contaminated water body – Lake Shoptikol, located close to Irtysh River floodplain, 40 km upstream from Pavlodar city. This water body is similar in his hydrological characteristics and ichthyology to Lake Balkyldak.

4. Stages carried out:

Task 1, stage 3 has been fulfilled in part, task 2, stage 3 – in part, task 3, stage 1 – in part, task 4, stage 1 – in part, task 5, stage 1 – in part.

5. Important business trips:

Two business trips from Almaty to Pavlodar were paid from AIPET budget because financing on the project K-1240 had not started yet.

6. Primary equipment acquired:

No equipment was acquired during the pointed period of time.

8. Progress:

The work on the project is going with delay because of delay in both the project signing and financing start on the project K-1240.

9. Delays, problems, suggestions:

Due to bankruptcy of JSC PCP it is impossible to start its laboratory staff training and get the laboratory ready for summer field work. Because of the staff transferring to new enterprises we suggest to start the procedure of substitution of new partner/partners for Participant Institute JSC PCP, carrying negotiation with administration(s) of this/those enterprise(s).

K-1240 project manager

M. A. Ilyushchenko

Supplements

Work specifications and schedules

1. Non profit JSC Almaty Institute of Power Engineering and Telecommunication (AIPET)

Quarter/Task	Task description	Expected project results
Quarter I Task 1-5	Approval of work specification by all partners on Project and signing of sub-contracts with Kazakhstan partners. Agreement of methods of measurement, sampling and sample preparation. Help to PCP in mastering methods of determination of total mercury content in water and quality control of the determination.	Signed contracts and adjusted plans and methods of work
Quarter II Task 1,4	Help to PCP in mastering of methods of determination and quality control on determination of total mercury content in soil, bottom sediment and biological materials. Help to PSU in under-ice sampling of bottom sediments. Conducting of purchases of chemical-analytical equipment, reagents and materials.	Contract signing for delivery of chemical-analytical equipment
Quarter III Task 1,3	Help to PCP and BMP in mastering of sampling methods of surface and underground water for Hg and oil products and quality control of sampling. Together with PCP sampling both surface water, retained of spring snow melting, and ground water for Hg from existing net of observation boreholes with simultaneous changes of hydrological parameters. Help to PCP with chemical analysis of samples of water and bottom sediments for Hg.	Date base of spring measurements of Hg in ground water, and also Hg analysis results of surface water and bottom sediments.
Quarter IV Task 1,3-4	Help to PCP in mastering of soil sampling methods and determination of total mercury content in the air. Together with PCP and BMP sampling of underground water for Hg and oil products from existing net of observation boreholes with simultaneous measurement of hydro-geological parameters. Sampling from the boat of bottom sediments on waste water storage pond – lake Balkyldak together with PSU. Sampling of soil and measurement of mercury content on the air together with PCP. Help to PCP in chemical analysis of samples of water, soil, bottom sediments and biota for Hg.	Data base of summer measurements of Hg in groundwater, also results of analysis of the air, surface waters, soils, bottom sediments and biota for Hg.
Quarter V Task 1-2,4	Together with PCP sampling of groundwater for Hg from existing net of observation boreholes with simultaneous measurements of hydro-geological parameters, also chemical analysis of water samples, bottom sediments and biota for Hg. Formation of experiment plan and quality control on research of sorption behavior towards to mercury of water bearing race of North Industrial zone of Pavlodar city.	Date base of autumn measurements of Hg in groundwater, also results of analysis of soils, bottom sediments and biota for Hg. Plan of quality control in laboratory research of adsorption equilibriums.
Quarter VI Task 1-4	Help to PCP in chemical analysis samples of soils, bottom sediments and biota for Hg. Formation of plan of well-boring for monitoring of oil products. Under ice sampling of bottom sediment on Lake Balkyldak together with PSU. Carrying out of experiments on definition of adsorption	Results of analysis of soils, bottom sediments and biota for Hg. Adsorption coefficients of water-bearing rock for modeling of distribution of mercury contaminated tail area of

	behavior of water bearing race towards to mercury.	underground water.
Quarter VII Task 3-4	<p>Help to PCP in chemical analysis of samples of bottom sediments for Hg.</p> <p>Boreholes drilling for monitoring of oil product with simultaneous sampling of water for oil product content together with BMP and PCP.</p>	<p>Results of analysis of the air for Hg.</p> <p>Creation of observation boreholes net for monitoring of oil products.</p>
Quarter VIII Task 1,3-5	<p>Sampling of groundwater for Hg together with PCP and sampling of oil products together with BMP from existing net with simultaneous measurement of hydro-geological parameters.</p> <p>Also sampling of soil, herbs and milk and measurement of mercury content in the air together with PCP.</p> <p>Drilling of boreholes for Hg monitoring and sampling of water for Hg at the drilling together with PCP.</p> <p>Help to PCP in chemical analysis of samples of water, soils, herbs, milk, bottom sediments and biota for Hg.</p> <p>Correction of After demercurization monitoring Program and entry of amendments on management of risk of mercury pollution for consideration of local authorities.</p>	<p>Data base of summer measurements of Hg</p> <p>in groundwater, just as analysis results of the air, surface water, soils, herbs, milk. Bottom sediments and biota for Hg.</p> <p>Proposal for correction of Program mercury monitoring of North Industrial area of Pavlodar city in 2008-2020.</p>
Quarter IX Task 3-4	<p>Sampling of groundwater for oil content from observation borehole net with simultaneous measurement of hydro geological parameters together with BMP.</p> <p>Mapping of bottom sediment contamination of Lake Balkyldak by mercury and calculation of deposits of contaminated silts and mercury.</p> <p>Determination of area of biota investigation of lake Balkyldak, requiring accurate definition, together with PSU in 10-12 quarter.</p>	<p>Data base of autumn measurements of oil products in groundwater.</p> <p>Plan of additional investigation of biota in Lake Balkyldak. Electronic map of mercury contamination of bottom sediment of Lake Balkyldak.</p>
Quarter X Task 1,5	<p>Help to PCP in chemical analysis of soils, bottom sediments and biota samples for Hg.</p> <p>Discussing with local authorities preliminary results of assessment and suggestions on oil contamination management.</p>	<p>Results of analysis of soils, bottom sediments and biota for Hg.</p>
Quarter XI Task 3	<p>Help to BMP in sampling of water for oil product content from the net of observation boreholes with simultaneous changes of hydrological parameters.</p>	<p>Data base of spring measurements of oil product in groundwater.</p>
Quarter XII Task 1-5	<p>Help to PCP and BMP with water sampling for Hg and oil products from observation boreholes net with simultaneous measurements of hydro-geological parameters. Submission of suggestion on mercury contamination management of Lake Balkyldak to consideration of local authorities.</p> <p>Development of the Program of groundwater contamination by oil products monitoring for North Industrial area of Pavlodar. Writing and adjusting final report.</p>	<p>Data base of summer measurements for Hg and oil products in groundwater.</p> <p>The Program of Monitoring of ground water contamination by oil products for North Industrial area of Pavlodar. Final report.</p>

Project manager

Ilyushchenko M.A.

Team leader

Kamberov R.I.

2. JSC “Pavlodar Chemical Plant” (PCP)

Quarter/task	Task description	Expected project results
Quarter I Task 1	Agreement of methods of measurement, sampling and sample preparation with AIPET. Mastering the methods of determination of total mercury content in water and quality control of the determination.	Getting PCP laboratory ready to do chemical analyses for mercury in water.
Quarter II Task 2	Mastering the methods of determination of total mercury content in soils, bottom sediments and biological materials and quality control of the determination. Purchase of chemico-analytical equipment, reagents and materials.	Putting PCP laboratory in readiness to do analyses for mercury on solid and biological materials. Conclusion of contracts of delivery of chemico-analytical equipment.
Quarter III Tasks 1,3	Mastering the methods of surface and ground water sampling for their analyses for Hg and oil products and the sampling quality control. Mastering the methods of determination of oil products content in water and its quality control. Sampling of both surface water remained after spring snow melting and groundwater from existing net of observation boreholes for their analysis for mercury with simultaneous measuring hydro-geological parameters. Chemical analyses of samples of water and bottom sediments for Hg content.	Database of spring measurements of Hg in groundwater and also results of analyses of surface water and bottom sediments for Hg content.
Quarter IV Tasks 1,3	Mastering the method of soil sampling and determination of total mercury content in the air. Sampling of groundwater from existing net of observation boreholes for their analysis for mercury and oil products with simultaneous measuring hydro-geological parameters. Soil sampling and determination of mercury content in the air. Chemical analysis of samples of water, soils, bottom sediments and biota for Hg content and analysis of groundwater samples for oil product.	Database of summer measurements of Hg in groundwater and also results of analyses of air, surface water, soils, bottom sediments and biota for Hg content. Database of summer measurements of oil products in groundwater.
Quarter V Tasks 1,3	Groundwater sampling from existing net of observation boreholes for their analysis for Hg content with simultaneous measuring hydro-geological parameters. Chemical analysis of samples of water, soils, bottom sediments and biota for Hg content.	Database of fall measurements of Hg in groundwater and also results of analyses of soils, bottom sediments and biota for Hg content.
Quarter VI Tasks 1,3	Chemical analyses of soils, bottom sediments and biota for Hg content.	Results of analyses of soils, bottom sediments and biota for Hg content.
Quarter VII Tasks 1,3	Analyses of air and bottom sediments for mercury content. Drilling boreholes for oil products monitoring. Water sampling during the boreholes drilling for its analysis for oil products. Chemical analyses of groundwater samples for oil products.	Results of air analysis for Hg content. Creation of observation boreholes network for oil products monitoring.
Quarter VIII Tasks 1,3	Groundwater sampling from existing net of observation boreholes for their analysis for Hg content with simultaneous measuring hydrogeological parameters. Soils, grass, cow milk sampling and air analysis for Hg. Drilling additional boreholes for Hg monitoring and water sampling during drilling for its analysis for Hg. Chemical analysis of samples of water, soils, grass, cow milk, bottom sediments and biota for Hg content.	Database of summer measurements of Hg in groundwater and also results of analyses of air, surface water, soils, grass, cow milk, bottom sediments and biota for Hg content.

Quarter IX Tasks 3	Sampling of groundwater from the existing network of observation boreholes for their analysis for oil products with simultaneous measuring hydro-geological parameters. Chemical analysis of the groundwater samples for oil products.	Database of fall measurements of oil products in groundwater.
Quarter X Task 1	Chemical analysis of soil, bottom sediment and biota samples for Hg.	Results of analyses of soils, bottom sediments and biota for Hg content.
Quarter XI Task 3	Sampling of groundwater from the existing network of observation boreholes for their analysis for oil products with simultaneous measuring hydro-geological parameters. Chemical analysis of the groundwater samples for oil products.	Database of spring measurements of oil products in groundwater.
Quarter XII Tasks 1,3	Groundwater sampling from existing net of observation boreholes for their analysis for Hg content with simultaneous measuring hydro-geological parameters. Chemical analysis of the groundwater samples for Hg and oil products. Preparation of the final report.	Database of summer measurements of Hg and oil products in groundwater. Final report.

Project manager

M.A.Ilyushchenko

Sub manager from PCP

A.D. Akhmetov

3. Institute of Hydrogeology and Hydrophysics of MSE RK (IHH)

Quarter/task	Task description	Expected project results
Quarter I Task 2	Data gathering on hydro-geological conditions of the investigated territory. The gathered evidences input into database and GIS. Analysis and appraisal of quality and comprehensiveness of the gathered information for modeling.	Hard copy of new data on hydro-geological conditions of the investigated territory. Additional database and GIS.
Quarter II Task 2	Choice of boundaries for a local model of the area with mercury contaminated groundwater. Construction of detailed hydro-geological cross sections. Schematization of hydro-geological conditions (definition of layers number for local model, their limits on hydro-geological cross sections, outer and inner boundary conditions for the local model), input cross sections and results of the schematization into GIS produced using MapInfo and the database produced with help of FoxPro. Construction of a hydro-dynamic scheme using MapInfo. Transformation of the results of schematization into formats which are used by modeling software. Purchase of GMS 5 modeling software.	Boundaries for the local model of the area with mercury contaminated groundwater. Computer copy of detailed hydro-geological cross sections. Hydro-dynamic scheme.
Quarter III Task 2	Study of characteristics of GMS 5 software system and its potential to simulate mercury transport by groundwater. Conversion of the regional model of Northern Industrial area, Pavlodar into updated version of GMS 5 software product. Formation of conceptual scheme of the local model of the area with	Conceptual scheme of the local model of the area with mercury contaminated groundwater formed by means of GMS

	mercury contaminated groundwater by means of GMS. Business trip to the project area to conduct reconnaissance work.	
Quarter IV Task 2	Choice of grid approximation for modeling area. Converting the conceptual model to the grid. Calibration of the local model (solution of inverse steady-state hydro-dynamic task, solution of inverse transient hydro-dynamic task of mercury transport by groundwater taking processes of soluble mercury adsorption by water-bearing rocks into consideration).	Calibrated local model of the area with mercury contaminated groundwater formed by means of GMS
Quarter V Task 2	Compiling and analysis of the results of calibration of the local model of the area with mercury contaminated groundwater. Setting 2-3 scenarios of predictive tasks of distribution of the plume of groundwater mercury contamination. Solution of the predictive tasks.	Description of the results of calibration of the local model of the area with mercury contaminated groundwater. Setting 2-3 scenarios of predictive tasks of distribution of the plume of groundwater mercury contamination. Solution of the predictive tasks.
Quarter VI Task 2	Compiling, description and analysis of the results of the modeling (construction of maps, cross sections, writing the text). Assessment of risk posed by the mercury contamination to network of water wells in Pavlodarskoe village and the Irtysh River floodplain. Appraisal of possible correlation (interconnection) of groundwater of lower-middle Pliocene deposits of the Pavlodar suit and Oligocene deposits of Nekrasovskaya series.	The results of modeling. Conclusion on assessment of risk posed by the mercury contamination to network of water wells in Pavlodarskoe village and the Irtysh River floodplain. Appraisal of possible correlation (interconnection) of groundwater lower-middle Pliocene deposits of the Pavlodar suit and Oligocene deposits of Nekrasovskaya series.
Quarter VII Task 2	Preparation of a manuscript on the result of modeling of the area with mercury contaminated groundwater for publication in some Kazakhstan scientific journal. Choice of boundaries for the local model of the area of groundwater oil products contamination. Construction of detailed hydro-geological cross sections. Schematization of hydro-geological conditions (definition of layers number for local model, their limits on hydro-geological cross sections, outer and inner boundary conditions for the local model), input of cross sections and results of the schematization into GIS produced using MapInfo and the database produced with help of FoxPro. Construction of a hydro-dynamic scheme using MapInfo. Transformation of the results of schematization into formats which are used by GMS modeling software.	The article on the results of modeling of the area of groundwater mercury contamination published in some Kazakhstan scientific journal. Boundaries for the local model of the area of groundwater oil products contamination. Detailed hydro-geological cross sections. Hydro-dynamic scheme.
Quarter VIII Task 3	Formation of conceptual local model of the area of groundwater contamination with oil products by means of GMS. Business trip to the project area to conduct reconnaissance work. Choice of grid approximation for modeling area. Converting the conceptual model to the grid. Calibration of the local model (solution of inverse steady-state hydro-dynamic task, solution of inverse transient hydro-dynamic task of oil products transport by groundwater).	Calibrated local model of the area of groundwater contamination with oil products.
Quarter IX Task 3	Compiling and analysis of the results of calibration of the local model of the area of groundwater contamination with oil products. Setting 2-3 scenarios of predictive tasks of distribution of the area of groundwater contamination with oil products. Solu-	Description of the results of calibration of the local model of the area of groundwater contamination with oil products. Setting 2-3 scenarios of predictive tasks of distribution of the area of groundwater contamination

	tion of the predictive tasks.	with oil products. Solution of the predictive tasks.
Quarter X Task 3	Compiling, description and analysis of the results of the modeling (construction of maps, cross sections, writing the text). Assessment of risk posed by groundwater oil products contamination to network of water wells in Pavlodarskoe village and the Irtysh River floodplain.	Description of the results of the modeling and assessment of the risk posed by groundwater oil products contamination to network of water wells in Pavlodarskoe village and the Irtysh River floodplain.
Quarter XI Task 3	Preparation of a manuscript on the result of modeling of the area of groundwater contamination with oil products for publication in some Kazakhstan scientific journal.	The article on the results of modeling of the area of groundwater contamination with oil products published in some Kazakhstan scientific journal.
Quarter XII Task 2,3	Preparation of the final report.	Final report.

Project manager

M.A.Ilyushchenko

Sub manager from IHH

V.Yu.Panichkin

4. Pavlodar State University named by S.Toraigyrova (PSU)

Quarter/Task	Task description	Description of expected results	Comment
Quarter I Task 4	Approval of methods of measurements and sampling and biomaterial collection; Composition of bathymetry plan of lake, definition of its morphologic parameters, choice of stations for carrying out observations for dynamic of plankton and benthos state, finding of place of fish catchments, choice of a control pond.	1. Bathymetry plan of lake; 2. Screen of control stations;	
Quarter II Task 4	Under ice sampling of bottom sediments (in case of clay deposits – 1 sample from sampling point, in case of sludge deposits - sampling by layers 50 cm. + 1 sample of clay of undercoat); Collection of early spring ichthyologic and hydro-biological materials in the lake Balkyldak and the control pond.	3. Sending frozen and marked samples of bottom sediments to PCP laboratory with attached list of samples; 4. Data of biological condition (size composition, feeding, rate of sex, fertility and finish) fish before spawning period; 5. Qualitative analysis of composition of plankton and benthos.	In period of ice cover; Not less than 50 samples of bottom sediments from 50 sampling points from different depths; It is necessarily not less than 30 specimens of fish of each species from each lake for carrying out of analysis for mercury content.
Quarter III Task 4	Collection and first treatment of ichthyological and hydro-biological	1. Data of period of fish spawning;	Definition of dominated feeding object;

	<p>material in spawning period on lake Bailydak and control lake*;</p> <p>Fish catchments for morphological analysis and research of fluctuating asymmetry.</p>	2. Data of fish feeding at first half of the season.	For carrying out of morphological analysis it is necessarily not less than 25 specimens of males and mates of fish of each species from each pond.
Quarter IV Task 4	<p>Sampling of bottom sediments from boat at points inaccessible during the winter time because of frost penetration of water column to the bottom;</p> <p>Treatment of echtyological materials, finding of regularity of mercury distribution in fish, search of correlation rate of mercury contamination and selectivity of feeding;</p> <p>Collection and treatment of materials for research and of qualitative composition and size index of young fish;</p> <p>Hydro-biological material collection for the period of peak development of plankton and benthos.</p>	<p>1. Data about degree of changeability of morphological sign of fish population in connection with mercury contamination;</p> <p>2. Data about characteristics of mercury accumulation by separate organ and tissue of fish;</p> <p>3. Data about degree of development and qualitative composition of plankton and benthos.</p>	<p>Mussels, liver, fish eggs and milt, brain;</p> <p>Capture of young fish by special nets from three points of each pond, not less than 3 times per quarter with definition of fisherying area (dragnet) and volume of filtering water (fish eggs net).</p>
Quarter V Task 4	<p>Collection and treatment of echtyological and hydro-biological materials at the end of finishing period;</p> <p>Report preparation and definition of stem objects for research in a next season.</p>	<p>1. Data about fish fattened;</p> <p>2. Data about fish feeding at the second period of the season;</p> <p>3. Data about fish growth at the first summer of life.</p>	Determination of domination feed objects.
Quarter VI Task 4	<p>Treatment of ichthyological and hydro-biological materials previous season, preparation and publication of materials, approval of calendar work plan for the second season and methods of both sampling and collection of biomaterials with AIPET;</p> <p>Under-ice sampling of bottom sediments (in case of clay deposits – 1 sample from one sampling point, in case of silt deposits - sampling by layers 50 cm + 1 sample of clay of undercoat).</p>	<p>1. Publications, plan of filed investigation for the second season;</p> <p>2. Sending to the laboratory of PCP frozen and marked bottom sediment samples with attached list of samples.</p>	Not less than 150 bottom sediment samples from 150 sampling points.
Quarter VII Task 4	<p>Collection and primary treatment of ichthyological and hydro-biological materials during spawning period;</p> <p>Capture of fish conduction of morphological analysis and investigation of fluctuating asymmetry;</p> <p>Determination of mercury accumulation dynamic by feed organisms.</p>	<p>1. Data about time of fish spawning in the second season;</p> <p>2. Data about feed of fish in first half of season;</p> <p>3. Data about mercury accumulation by feed organisms.</p>	Purposeful capture of plankton and benthos representatives, that is basis feed objects for fish
Quarter VIII Task 4	<p>Treatment of ichthyological materials, specification of regularity of mercury distribution in fish, search of correlation of mercury contamination degree and nutrition;</p> <p>Investigation of mercury accumulation by fish eating birds;</p>	<p>1. Data about degree of variability of morphological sign of fish population in connection with mercury contamination;</p> <p>2. Data about features of mercury accumulation by</p>	<p>Hunting of birds and analysis of organs: fat, mussels, liver, brain;</p> <p>Capture of young fish by roe net and dragnet;</p>

	<p>Collection and treatment of materials for investigation of qualitative content and dimension of young fish;</p> <p>Collection of hydro-biological materials in the period of maximum development of plankton and benthos;</p> <p>Collection of higher water vegetation and algae during its maximum development for definition of content of mercury in it.</p>	<p>separate organs and tissue of fish eating birds;</p> <p>3. Data about degree of development and qualitative content of plankton and benthos;</p> <p>4. Data about degree of mercury contamination of macrophytes and colonial algae.</p>	<p>Basis macrophytes of water reservoir, colonial algae from 4 points of polluted reservoir.</p>
Quarter IX Task 4	<p>Collection and treatment of ichthyological and hydro-biological materials at the end of the finishing period;</p> <p>Report preparation and determination of round of problems of the research, requiring specification at next season.</p>	<p>1. Date about fish fattened;</p> <p>2. Date about fish feeding during second half of the season;</p> <p>3. Date about growth of young fish in the first summer of its life.</p>	<p>Determination of dominant feeding object.</p>
Quarter X Task 4	<p>Treatment of ichthyological and hydro-biological materials of the previous season, preparation and publication of materials, approval of calendar work plan for the 3 season and methods of sampling and collection of biomaterials;</p> <p>Under-ice sampling of bottom sediments for the accurate definition and data verification for the previous years.</p>	<p>1. Publications, plan of field research for the third season;</p> <p>2. Sending of frozen and marked samples of bottom sediments with attached list of samples to the PCP laboratory.</p>	<p>Not less than 20 samples of bottom sediments from 20 sampling points.</p>
Quarter XI Task 4	<p>Up-dating of information about biological condition of fish population and particular it's feeding in ware reservoir.</p>	<p>Up dating of information on all investigated directions;</p>	
Quarter XII Task 4	<p>Up-dating of information about biological condition of fish population and particular it's feeding in ware reservoir. Preparation and submission of the final report.</p>	<p>Up dating of information on all investigated directions;</p> <p>Publications, final report.</p>	
<p>*control lake – lake in vicinity of lake Balkyldak, not contaminated by mercury, having in fauna composition the same type of fish, plankton and benthos organisms.</p>			

Project manger

Ilyushchenko M.A.

Sub manager from PSU

Bazarbekov K. U.

5. JSC “Biomedpreparat –Engineering centre”, Laboratory of monitoring (BMP)

Quarter/task	Task description	Expected project results
Quarter I Task 3	Approval of methods of measurements, sampling and samples preparation with AIPET.	Drafts of methods and Standards operational procedures
Quarter II-III	Request preparation of purchasing of chemical-analytical equipment, reagents and materials.	Request for an equipment, materials and reagents.

Task 3	Mastering and teaching PCP laboratory to sampling groundwater methods for oil products and quality control at sampling. Also teaching of PCP laboratory to methods of definition and quality control at definition of content of oil product in water.	Certificates of probation and teaching for PCP personnel.
Quarter IV Task 3	Delivery and installation of purchasing equipment in framework of this project. Contouring the area of oil products underground lens distribution with help of hand soil auger. Sampling groundwater from observation boreholes existing net for oil products with simultaneous measurements of hydro-geological parameters. Chemical analysis of ground water samples for oil products.	Service report on installation of new equipment Data base of summer measurements of ground water for oil products.
Quarter V Task 3	Generalization of results of field work and report writing for the research period	Theme report for the reporting period
Quarter VI Task 3	Planning of field work for the 2007 season. Work out plan of well-boring for oil product monitoring. Correction of field procedures and SOP on sample preparation and oil products.	Corrected versions of documented and standard procedures. Plan of observation borehole net for oil product monitoring. Report for the period.
Quarter VII-VIII Task 3	Participation in drilling of boreholes for oil product monitoring. Water sampling at well-boring for oil product content. Chemical analysis of ground water samples for oil product.	Creation of observation boreholes for oil product monitoring.
Quarter IX Task 3	Water sampling from observation borehole net for oil product content with simultaneous measurement of hydro-geological parameters. Chemical analysis of ground water samples for oil products.	Data base of autumn measurements of ground water for oil content.
Quarter X Task 3	Planning of field work for 2007 season	Report for the period
Quarter XI-XII Task 3	Water sampling from observation borehole net for oil product content with simultaneous measurement of hydro-geological parameters. Chemical analysis of ground water samples for oil products. Writing and compiling of final report.	Data base of spring and summer measurements of ground water for oil content. Final report.

Project manager

Ilyushchenko M. A.

Sub manager from BMP

Kosinov A.N.