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Updated National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (POPs)

Yerevan 2017



REPUBLIC OF ARMENIA

**Updated National Implementation Plan
for the Stockholm Convention
on Persistent Organic Pollutants (POPs)**

Yerevan 2017



GOVERNMENT OF THE REPUBLIC OF ARMENIA

PROTOCOL DECISION

No. 49

December 8, 2016

“On Approval of the List of Activities to be implemented in 2016-2020 within the National Program for Implementation of the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia”

PRIME MINISTER
OF THE REPUBLIC OF
ARMENIA

Karen Karapetyan

December 27, 2016
Yerevan

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ABBREVIATIONS AND ACRONYMS

a	Annual; annually
AMD	Armenian Drams
BAT	Best Available Techniques
BEP	Best Environmental Practice
CIS	Commonwealth of Independent States
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane (1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane)
EDU	Ministry of Education and Science, RoA
EEE	Electrical and electronic equipment
GDP	Gross Domestic Product
GEF	Global Environment Facility
HCB	Hexachlorobenzene
HCH	Hexachlorocyclohexane
HPP	Hydropower plant
MA, RoA	Ministry of Agriculture of the Republic of Armenia
MAC	Maximum allowable concentration
MEDI	Ministry of Economic Development and Investments, RoA
MEINR, RoA	Ministry of Energy Infrastructures and Natural Resources, RoA
MES, RoA	Ministry of Emergency Situations, RoA
MH, RoA	Ministry of Health of the Republic of Armenia
MNP, RoA	Ministry of Nature Protection of the Republic of Armenia
mln	Million
MTAD	Ministry of Territorial Administration and Development, RoA

NAS	National Academy of Science, RoA
NATO	North Atlantic Treaty Organization
NGO	Non-governmental organization
NIP	National Implementaion Plan
OCP	Organochlorine Pesticide
PBB	Polybrominated biphenyls
PBDE	Polybrominated diphenyl ethers
PCBs	Polychlorinated biphenyls
PCT	Polychlorinated terphenyls
PeCB	Pentachlorobenzene
PCDD/PCDF	Polychlorinated dibenzo- <i>p</i> -dioxins and dibenzo-furans
PFOS	Perfluorooctane sulfonic acid
POPs	Persistent Organic Pollutants
RoA	Republic of Armenia
SRCG	State Revenue Committee by the Government of RoA
SRPP	State Regional Power Plant
TEQ	Toxic equivalent
ths	Thousand
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
USSR	Union of Soviet Socialistic Republics
WEEE	Waste electrical and electronic equipment

Units

g	gram
kg	kilogram
ha	hectare
m	meter
km	kilometer
sq.km	square kilometer
L	Liter
mg	milligram
mcg/kg	microgram/kilogram
mcg/L	microgram/Liter
mg/L	milligram/Liter
ppm	part per million

EXECUTIVE SUMMARY

Persistent organic pollutants (POPs) are organic substances that possess toxic properties, resist degradation (exhibit persistence) in the environment for a long period of time; POPs are bioaccumulated and transported through air across international boundaries and deposited far from the release site. They represent a potential threat to the environment and human health; initiating global actions is necessary to eliminate POPs production, placing on the market, as well as to reduce their emissions to the environment.

The Republic of Armenia (RoA) signed the Stockholm Convention on Persistent Organic Pollutants on the 23rd of May 2001 and ratified it on October 22, 2003.

Armenia, as a Party to the Stockholm Convention, must fulfill obligations relating to the implementation of the Convention. According to the decision of the RoA Government “On implementation of the RoA obligations on Stockholm Convention signed May 23, 2001” (No. 1483-N dated October 29, 2004) the Ministry of Nature Protection of RoA is competent (authorized) national authority for the implementation of the country's obligations under the Stockholm Convention.

In accordance with Article 7 of the Stockholm Convention “National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants” (2005-2010) was prepared. After the inclusion of new POPs in the annexes to the POPs Convention a country must review and update the National Implementation Plan taking into consideration management of new POPs as well.

In this regard, by the order of the RoA Minister of Nature Protection “On Establishment of Inter-ministerial/Inter-Agency Committee for Implementation of Stockholm Convention on Persistent Organic Pollutants, Personal Membership and Working Order of the Committee” (No. 86-A dated April 22, 2015), the National Coordinating Committee (NCC) was established including representatives of relevant concerned institutions, professional organizations, the academic community (the scientists at large) and non-governmental organizations, which have the task to update, change and complement the “National Implementation Plan for Management of Persistent Organic Pollutants (POPs) in the Republic of Armenia”.

This document is an updated version of the “National Plan for the management of persistent organic pollutants (POPs) in the Republic of Armenia, 2016 – 2020”, which includes further measures and activities for the 12 initial POPs

and future measures to be carried out regarding 10 new POPs listed in the Annex to Stockholm Convention.

.The 12 initial POPs are: Aldrin, Dieldrin, DDT, Endrin, Chlordane, Heptachlor, Hexachlorobenzene (HCB), Mirex, Polychlorinated biphenyls (PCBs), Toxaphene, Polychlorinated dibenzo-*p*-dioxins and dibenzofurans (PCDD/PCDF).

The 10 new POPs are: Alpha and Beta hexachlorocyclohexane (alpha-HCH and beta-HCH), Chlordecone, Hexabromobiphenyl, Hexa- and Heptabromodiphenyl ether (hexaBDE and heptaBDE), Lindane (Gamma-HCH), Pentachlorobenzene (PeCB), Endosulfan, Perfluorooctane sulfonic acid (PFOS) and its derivatives, Tetra- and Pentabromodiphenyl ether (TetraBDE and PentaBDE).

The updated plan was drawn up in a period from January 2013 to 2015 and approved by the Protocol Decision of the RoA Government "On Approval of the List of Activities to be implemented in 2016-2020 within the National Program for Implementation of the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia" (No. 49 of December 8, 2016).

The strategic task of the updated plan is to reduce the risk towards human health and the environment due to the harmful effects of POPs, and its main objective is to improve POPs management, which will be achieved through realization of a number of practical tasks.

The “Updated National Implementation Plan for the Stockholm Convention on Persistent Organic pollutants (POPs)” consists of an Executive Summary, four main parts, and three annexes.

Part 1 “Country Baseline” provides general information about the country: geography, territory, topography, climate and natural resources, population according to the last census in 2011, the political system, as well as the administrative and territorial division.

The economic profile was updated by sectors and main economic indicators.

Part 2 “Institutional, Policy, and Regulatory Framework” describes in detail the policy on environmental protection and sustainable development, signed and ratified international conventions. This Part also provides an overview of the current national legislation on POPs management, legislative documents relevant to Stockholm Convention, Competences of State Bodies in Chemicals and Waste Management, other mechanisms and voluntary initiatives, administrative fines and sanctions related to 10 new POPs.

Part 3 “Assessment of the POPs issues in the Republic of Armenia” includes a detailed assessment of the 12 initial POPs and 10 new POPs –

pesticides, industrial chemicals (PCBs, hexabromobiphenyl, PBDEs, PFOS) and POPs emissions (dioxins/furans (PCDDs/PCDFs), PCBs, HCB, PeCB)); existing programs on monitoring, information and awareness-raising, public education, NGO activities, laboratory equipment, the chemicals management system are described.

According to available data, Armenia has never produced any pesticides or chemicals classified as industrial POPs, be it individual substances or mixtures, or in the form of plant protection products.

The prohibitions and restrictions are imposed on placing on the market and use, import and export of POPs substances in mixtures and products. The export of POPs is allowed only for environmentally sound disposal.

The status of existing POPs is traced, as the estimate also includes new POPs, namely: Lindane, Alpha - and Beta-HCH, PeCB, Chlordecone and Endosulfan.

Endosulfan is prohibited in the RoA according to

- Decision of the Government of the RoA “On approval of the List of chemicals and pesticides regulated by Rotterdam Convention and banned in the Republic of Armenia” (No. 293-N of March 17, 2005);
- Decision of the Government of the Republic of Armenia No. 930-N dated September 8, 2016 ”On amendments to the Decision of the Government of the Republic of Armenia “On approval of the List of chemicals and pesticides regulated by Rotterdam Convention and banned in the Republic of Armenia (No. 293-N of March 17, 2005)”.

Assessment of situation on industrial chemicals from the group of POPs was performed, taking into account implementation of activities related to the exploitation and utilization of inventoried PCB-containing transformers and capacitors.

In relation to new industrial chemicals belonging to POPs (Hexabromobiphenyl, PBDEs, PFOS), the results of a preliminary study on placing on the market and use were reported. Preliminary assessment was done concerning the possible PBDEs, PFOS in products and wastes of electrical and electronic equipment and their maximum permissible emissions (MPE). The implementation of a detailed inventory was foreseen to identify these compounds in products and wastes for defining the appropriate next steps and activities.

Results of monitoring on initial POPs pesticides and PCBs in environmental compartments (soil, surface water), in areas of warehouses, former pesticides shops were updated.

The estimations of Registers on POPs releases (PCDD/PCDF, PCB, and HCB) were updated.

Part 4 “Strategy and the updated Action Plan for the implementation of the National Implementation Plan (NIP)” describes the adopted national commitments for the implementation of the Stockholm Convention concerning 22 POPs, sets priorities of national importance (8 priorities, of which 5 are of high priority), principles and strategies to realize the identified goals and priorities, planned measures and actions under the updated Action Plan, as well as expected results.

The above-mentioned priority areas include the following:

- Activities in Legislative and Institutional Areas
- Activities related to PCBs, dioxins/furans, PFOS, PBDE
- Implementation of monitoring activities
- Capacity strengthening
- Activities on wastes and landfills
- Actions on remediation of contaminated sites
- Public awareness-raising, training and education, research activities
- Reporting

First-priority areas involve:

- **Activities in Legislative and Institutional Areas**
- **Activities related to PCBs, dioxins/furans, PFOS, PBDE**
- **Implementation of monitoring activities**
- **Actions on remediation of contaminated sites**
- **Activities on wastes and landfills**

Annex 1 presents the narration of elaborated and approved updated National Action Plan, in which specific action plans within the NIP (Protocol Decision of the Government of the Republic of Armenia; No. 1 dated January 13, 2005) are united in one updated Action Plan, including measures and activities for all 22 POPs: POPs pesticides, industrial chemicals belonging to POPs and POPs emissions.

The updated Action Plan contains a number of subsequent measures and activities related to the initial 12 POPs and future actions in respect of the 10 new POPs listed under the Stockholm Convention. As regards the 10 new POPs, it is foreseen to undertake a detailed audit of POPs industrial chemicals:

PBDEs and PFOS in goods, products, electrical and electronic equipment placed on the market and to identify their possible content in the waste of electrical and electronic equipment and waste due to allowable emissions.

The updated Action Plan envisages a number of measures and activities for providing conditions for the effective application of legislation in the area of POPs and for the implementation of control; disposal of existing obsolete POPs is supposed to be done abroad, likewise other existing PCB-containing equipment, and available foams for fire extinguishers containing PFOS; the improvement of laboratory infrastructure for testing and monitoring of new POPs in targeted matrices and strengthening the administrative capacity; increased public awareness on the consequences of new POPs to human health and the environment, providing public information about the risks associated with POPs.

“Updated National Implementation Plan for the Stockholm Convention on Persistent Organic pollutants (POPs)” was approved by the Protocol Decision of the RoA Government "On Approval of the List of Activities to be implemented in 2016-2020 within the National Program for Implementation of the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia" (No. 49 of December 8, 2016).

To implement these measures and activities envisaged in the frames of updated Action Plan the schedule for each year in the period of 2016-2020s is presented.

In the Action Plan all the concerned Ministries/ Agencies in the frames of their responsibilities as well as NGOs, private sector, etc. are indicated as stakeholders.

The updated NIP for POPs management cannot be implemented using only the private sector; state control by the competent authorities is required from the point of view of compliance with the prohibitions and restrictions on placing on the market and use of the 22 POPs listed in the Stockholm Convention, as well as for management of hazardous waste containing POPs.

The updated NIP for POPs management will regulate measures and activities aimed at protection of the environment and human health from all 22 POPs by reducing or preventing the harmful effects of POPs, hazardous wastes containing POPs, as well as through the management of these wastes, and as a result of recovery and/or disposal of plastic waste containing POPs flame retardants.

Annex 2 presents the “List of scientific papers published in proceedings of international conferences, periodicals (2003- 2016).

Annex 3 reflects mass-media coverage of relevant to POPs issues.

Part 1. COUNTRY BASELINE

1.1. Country Profile

1.1.1 Geography and Population

The Republic of Armenia (RoA) is situated in the western part of Asia. The country occupies the North-Eastern part of Armenian plateau – between Caucasus and Nearest Asia (the inter-river territory between the middle flows of Kur and Araks rivers).

Geographic Coordinates:

in the South: 38°50' Northern Latitude;
in the North: 41°18' Northern Latitude;
in the West: 43°27' Eastern Longitude;
in the East: 46°37' Eastern Longitude.

Neighboring Countries:

in the North: Georgia; in the East: Azerbaijan; in the South: Iran; in the South-West: Nakhijevan (Azerbaijan); in the West: Turkey.

Territory:

29.74 thousand (ths) square kilometer (km²).

The country's area comprises 29743 km², of which 69.0%* make agricultural lands, 11.2%* – forests, 11.2%* – areas of special preservation and 8.6%* – other lands. 36.4% area of RoA are mountains, plateaus and other lands.

The highest elevation of the country is the Peak of Aragats Mountain (4090 m), the earth lowest point – the underflow region of Debed river canyon (375 m). The longest extension from North-West to South-East is 360 km, and from West to East – 200 km.

Armenia is a mountainous country. The 76.5% of the republican territory is on the height of 1000-2500 m above sea level.

Mountain ranges occupy about 14 ths km² territory or 47% of the country's total surface. Plateaus comprise more than 1/3 (11 ths km²) of country surface.

The largest lake in the territory of RoA is Lake Sevan (average annual surface for 2012 – 1276.3 km²), the longest river is Araks – 192 km (total length: 1072 km).

Republican water reserves are limited and annually comprise totally 8.5 bln. m³, of which 6.54 bln. m³ – surface water flow. The rivers of Armenia are mainly mountainous with strongly expressed flows with little water.

* According to Republic of Armenia Land Balance formed by the State Committee adjunct to the Republic of Armenia Government (as of July 1, 2013)

There are freshwater lakes and reservoirs in the RoA, with about 40.0 bln. m³ total volumes, about 95% of which comprises one of the world highest mountainous lakes – Lake Sevan, which is situated at the height of 1900.3 m above sea level; in 2012 its water reserves comprised about 37.9 bln. m³.

Armenia has mountainous arid climate, which is specified by its dryness. Armenia is located in the northern latitudes of subtropical zone.

Ethnic Breakdown:

Armenians - 98.1%

Minorities: Russians, Yezidis, Kurds, Assyrians, Greeks, Ukrainians, Jews and others.

1.1.2 Political and Economic Overview

The Republic of Armenia is a sovereign, democratic, social state governed by rule of law (Article 1, Chapter 1, RoA Constitution).

The Declaration on State Sovereignty of Armenia was adopted on August 23, 1990 and the referendum on independence declaration was held on the 21st of September 1991. On December 21 of the same year, RoA became a member of the Commonwealth of Independent States (CIS), on the 2nd of March 1992 – a Member of the United Nations, on January 25, 2001 – a member of the Council of Europe and on the 5th of February 2003 – a member of the World Trade Organization.

In the Republic of Armenia the power belongs to the people (Article 2, Chapter 1, RoA Constitution). The President of the Republic of Armenia is guarantor for the country independence, territorial integrity and security of the Republic of Armenia.

In the Republic of Armenia the legislative power is implemented by the National Assembly.

The people exercise their power through free elections, referendums, as well as through state and local self-governing bodies and public officials (Article 2, Chapter 1, RoA Constitution).

The state power is implemented in conformity with the Constitution and the laws based on the principle of separation and balance of the legislative, executive and judicial powers (Article 5, Chapter 1, RoA Constitution).

The state language of the Republic of Armenia is the Armenian language (Article 12, Chapter 1, RoA Constitution). It forms a separate branch of the Indo-European language family.

The national currency of the country is the Armenia Dram (AMD), which has been circulated since November 1993 (Article 83.3, Chapter 4, RoA Constitution).

The basis of administrative territorial division of RoA are Laws “On RoA administrative territorial division” and «On local self-government in Yerevan City”, according to which the territory of RoA is divided into 10 marzes with 48 urban and 866 rural communities and Yerevan municipal community (with 12 administrative districts).

Table 1.1.2-1: **Administrative territorial division of RoA by marzes and Yerevan city as of January 1, 2014**

	Number of Communities			Number of residential areas
	total	urban	rural	
Republic of Armenia	793	49	744	1001
Yerevan city	1	1	-	1
Aragatsotn	114	3	111	120
Ararat	95	4	91	99
Armavir	97	3	94	98
Gegharkunik	92	5	87	98
Lori	107	8	99	130
Kotayk	67	7	60	69
Shirak	79	3	76	131
Syunik	72	7	65	134
Vayotz Dzor	29	3	26	55
Tavush	40	5	45	66

Armenia has been always specified by developed industry and agriculture. Here it is possible to find out almost all those rocks that comprise the earth-crust. Large part the territory is covered by stratum of different type volcanic rock and tufa. The lithosphere of RoA is rich with various useful minerals. As a result of volcanic eruptions, a big reserve of natural building materials - tufa, basalt, andesite, perlite and other materials – had been formed and was used in construction. Coal, iron, bauxite, molybdenum, copper, gold, silver, lead, zinc, different precious and semi-precious stones have been extracted in RoA.

During the 2000s sustainable economic growth patterns had been maintained in RoA. However, the global economic crisis hit the Armenian economy as well. Whereas the foundation cornerstones of economic stability, such as the low level of debt, increasing level of savings and prudent fiscal positions safeguarded the economy against the initial influence of the global recession of production and the financial crisis, the effects of the decline in external demand and capital inflows became visible since the fourth quarter of 2008, when the country experienced a 5.9% economic recession and a 6.9% annual Gross Domestic Product (GDP) growth, as opposed to the two-digit growth of GDP at 13.7% back in 2007. Investments decreased at a faster pace, whereas the sector of residential construction was the first and the most affected among those having suffered because of abrupt deterioration of the economic environment. Relevant economic indicators evidenced a deep recession of the economy in 2009. A 14.2% downturn of the GDP in that year was followed by a slow recovery since 2010 (in comparison with the previous year, GDP grew by 2.2% in 2010 and by 4.7% in 2011). There was a rather significant 7.2% growth of GDP in 2012 as well; however, it was not sufficient for achieving the level of 2008. In 2013 it was 3.3%; in 2014 –103.6%.

Nevertheless, before the crisis, due to the registered stable economic growth over the last decade RoA had joined the group of middle income economies. The economic growth brought about stabilization of employment rates, increases in real wages and consolidated budget spending on social sectors.

All of this, combined with a growing inflow of private transfers, contributed to significant reduction of poverty rates in RoA.

1.1.3. Characteristics of the Economy Branches

The Republic of Armenia industry is mainly based on the country own mineral and agricultural raw material. Fuel, ferrous metals and auxiliary raw materials are imported from abroad. The growth of gross domestic product (GDP) is due to the development of sectors such as industry, building/construction, agriculture, transport, communications, trade and catering.

In Armenia industrial products are mainly manufactured by the following branches: processing industry, mining, electricity, gas and water production and distribution.

In Industry 2008, GDP had the smallest share (in 2003-2008 the average growth amounted to 3.3%), which was the result of several factors. First, during the economy growth in 2006 the industry had decline of 2.5%, which was mainly caused by electricity, gas, water and steam production 11% decline, as well as reduction in sectors of manufacturing industry, including the chemical industry, diamond processing and tobacco production. In addition, the growth of industry sector as a whole in the same period was restricted as a result of export unfavourable pricing environment. Upon the crisis, the industry decline made 6.9%, primarily due to the reduction of global and domestic demand for food and building materials industry. After the crisis, the industry growth was due to production of food and drinks, as well as due to the growth of the mining and metallurgy, which bore the government's anti-crisis policy, tailoring favourable pricing for export and the impact of the global economic recovery.

In RoA during 2013 industrial products were manufactured to 1,240,578.7 million AMD in current prices and the cost of realized products made 1,214,412.7 million AMD. In relation to 2012 the industrial production index made 106.8%.

In 2013 the structure of industrial production according to branches of industry was as follows: processing industry – 58.6%, electricity, gas, steam and air conditioning supplies – 29.1%, mining industry and opencast mines operation – 11.2%, water supply, sewerage, waste management and treatment – 1.1%.

The processing industry included production of food (37.0%), beverages (16.9%), manufacture of basic metals (16.1%), tobacco products (6.1%), other non-metallic mineral products (6.0%), printing activity, recorded media multiplication (2.3%), production of jewelry (2.0%), manufacture of fabricated metal products (1.5%), manufacture of electrical equipment (1.1%), clothing production (1.0%), manufacture of chemicals and chemical products (0.8%), etc.

Mining industry and open mines operation mainly include metal ores excavation (96.9%).

In 2013, the main part of the industrial production (output) belongs to Yerevan (40.9%) followed by Syunik marz (16.5%), Kotayk marz (13.4%), Ararat marz (10.0%) and Lori (6.1%).

Table 1.1.3-1: The volume of industrial production according to marzes of the RoA and Yerevan city, at current prices, 2003-2013, mln AMD

<i>Marz</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
Yerevan	209633.8	239126.0	307688.8	287529.9	347399.6	362535.7	302657.9	354502.7	423435.9	450104.9	506816.1
Aragatsotn	7778.9	6323.9	7972.7	7278.0	9574.9	13040.7	12197.8	14469.8	21637.9	19554.4	25112.7
Ararat	38028.9	41783.8	46277.8	54015.8	52450.6	59431.7	57538.8	72303.1	80864.9	104759.2	123593.8
Armavir	20999.8	26792.5	28274.2	28914.1	29826.6	33087.0	34008.8	37461.3	41841.8	44471.3	50225.6
Gegharkunik	13255.3	19369.9	14835.4	11810.0	9503.4	10348.7	12155.8	11949.9	17959.5	21657.7	23665.5
Lori	18756.5	32246.3	36159.9	45997.5	42646.5	42441.1	44755.2	60044.9	73496.8	80041.7	75260.7
Kotayk	57369.5	58293.9	67160.9	65390.6	75585.5	89110.5	82334.2	85084.3	104496.5	144948.9	166063.7
Shirak	11637.8	13000.2	13437.8	13385.0	16172.5	17829.7	17888.2	25159.2	42766.8	40723.4	42628.5
Syunik	41517.1	89245.9	120357.0	121270.0	123270.0	100034.5	94420.1	150606.1	178366.5	198723.7	204911.3
Vayots Dzor	3496.6	4714.6	5059.3	5066.0	5466.3	6252.3	6253.3	7238.4	7765.0	9099.9	12002.8
Tavush	3579.3	4366.7	4695.8	4205.6	4653.4	5180.0	5188.8	5610.3	6332.1	7821.6	10298.0
Total in RoA	426053.5	535263.7	651919.6	644862.5	716549.3	739291.9	669398.9	824430.0	998963.7	1121906.7	1240578.7

Table 1.1.3-2: **Sales of finished industrial products according to marzes of the RoA and Yerevan city, at current prices, 2003-2013, mln AMD**

Marz	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Yerevan	209808.7	243777.5	302893.6	291244.1	350646.1	353763.8	302064.7	355447.9	412048.8	450947.9	493589.5
Aragatsotn	8510.8	6374.6	8038.9	7993.7	9813.0	13249.2	12044.2	14160.8	22354.3	19119.9	21217.6
Ararat	40562.5	52010.2	53500.9	59730.4	54624.5	61013.4	65160.7	78339.0	86805.4	118622.0	137513.0
Armavir	21532.1	25955.9	27725.0	29401.5	29979.0	33495.5	36060.6	38986.9	43197.3	45545.9	50891.2
Gegharkunik	5216.8	7263.1	8929.1	8524.7	9131.9	10161.0	9725.3	9350.4	11402.0	13167.8	14737.8
Lori	19063.8	32971.0	36416.4	48926.8	43496.8	41193.3	46726.7	62272.6	74516.6	78781.9	74580.5
Kotayk	55315.3	56973.0	65318.1	65061.9	75220.4	90587.8	81861.1	84479.3	103596.0	144952.2	164966.6
Shirak	11535.4	12806.2	13381.6	13353.7	16127.2	18166.0	17783.6	22169.5	31581.0	37135.0	41633.8
Syunik	41379.1	86195.6	120222.5	124729.6	120725.2	96241.4	90489.2	144776.2	169419.1	192340.3	192825.4
Vayots Dzor	3493.6	4770.4	5051.6	5178.4	5654.4	6442.7	6385.9	7477.6	8167.4	9330.5	12400.9
Tavush	3588.1	4246.8	4686.6	4221.6	4749.5	5301.2	5303.2	5557.0	6234.6	7857.8	10056.4
Total in RoA	420006.2	533344.3	646164.3	658366.4	720168.0	729615.3	673605.2	823017.2	969322.5	1117801.2	1214412.7

Table 1.1.3-3: The index of physical volumes of industrial production according to marzes of the RoA and Yerevan city, 2003-2013, %

Marz	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Yerevan	119.9	104.3	115.8	102.6	115.7	101.7	91.3	105.8	111.4	105.0	106.1
Aragatsotn	155.1	101.4	87.8	95.2	123.0	126.3	84.9	114.7	137.5	83.3	117.1
Ararat	88.9	95.1	107.6	107.1	97.6	103.1	94.3	117.2	98.3	117.3	114.3
Armavir	98.0	121.1	114.5	97.2	105.8	100.3	99.1	105.8	107.6	99.7	104.8
Gegharkunik	149.4	159.1	95.2	82.7	74.0	101.8	107.3	92.6	144.6	118.2	105.6
Lori	104.5	115.7	97.2	93.8	92.6	99.0	105.0	111.2	115.2	113.9	102.9
Kotayk	121.5	90.8	107.4	87.6	76.2	101.1	75.7	96.9	121.0	125.0	104.7
Shirak	104.1	96.6	97.0	104.1	113.9	100.9	102.6	141.7	158.7	88.4	96.6
Syunik	104.2	105.8	96.1	107.6	105.4	100.0	107.2	124.5	113.4	110.6	108.1
Vayots Dzor	106.1	116.4	108.6	98.7	105.7	111.8	99.1	114.7	101.5	113.5	122.7
Tavush	111.8	110.6	98.4	108.8	106.5	102.2	100.3	106.0	106.6	113.2	122.1
Total in RoA	115.1	102.4	107.6	99.1	102.6	101.7	92.4	109.7	113.9	108.8	106.8

Table 1.1.3-4: The structure of industrial products according to marzes of the RoA and Yerevan city, 2003-2013, %

Marz	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Yerevan	49.2	44.7	47.2	44.6	48.5	49.0	45.2	43.0	42.4	40.2	40.9
Aragatsotn	1.8	1.2	1.2	1.1	1.3	1.8	1.8	1.8	2.2	1.7	2.0
Ararat	8.9	7.8	7.1	8.4	7.3	8.0	8.6	8.8	8.1	9.3	10.0
Armavir	4.9	5.0	4.3	4.5	4.2	4.5	5.1	4.5	4.2	4.0	4.0
Gegharkunik	3.1	3.6	2.3	1.8	1.3	1.4	1.8	1.4	1.8	1.9	1.9
Lori	4.4	6.0	5.5	7.1	6.0	5.7	6.7	7.3	7.3	7.2	6.1
Kotayk	13.5	10.9	10.3	10.1	10.5	12.2	12.3	10.3	10.5	12.9	13.4
Shirak	2.7	2.4	2.1	2.1	2.3	2.4	2.7	3.1	4.3	3.6	3.4
Syunik	9.8	16.7	18.5	18.8	17.2	13.5	14.1	18.3	17.8	17.7	16.5
Vayots Dzor	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	1.0
Tavush	0.9	0.8	0.7	0.7	0.6	0.7	0.8	0.7	0.6	0.7	0.8
Total in RoA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 1.1.3-5: **The structure of industrial production by economic activity types (according to NACE 2 classification), 2009-2013, in %.**

Branch of Industry	2009	2010	2011	2012	2013
Overall industrial production	100.0	100.0	100.0	100.0	100.0
Mining and quarrying	13.2	17.7	17.0	17.2	15.8
Metal ore mining	95.1	96.5	97.3	96.9	97.2
other branches of mining and quarrying industry	4.9	3.5	2.7	3.1	2.8
Manufacturing/processing industry	66.3	66.1	64.6	62.3	62.6
Production of food	38.3	34.5	37.0	35.8	35.4
Production of beverages	11.5	12.8	13.2	14.5	16.3
Production of tobacco goods	3.2	3.7	2.5	3.6	4.9
Production of textile	0.1	0.1	0.2	0.1	0.1
Production of clothes	0.8	0.6	0.9	0.7	0.8
Production of leather, leather goods and shoe-wear	0.2	0.2	0.2	0.2	0.2
Production of timber/wood and wooden products, wood processing, production of wood and cork, straw and plaiting materials, except furniture	0.2	0.3	0.2	0.2	0.1
Production of paper and paper-made products	0.7	0.8	0.9	1.1	1.5
Publishing/ printing activity; replication of recorded information-carrying media	2.0	1.7	1.6	1.5	1.8
Production of chemicals and chemicals-related products	2.1	1.6	1.2	1.1	1.0
Production of pharmaceuticals	0.6	0.6	0.5	0.6	0.7
Production of rubber and plastic goods	3.1	2.8	2.9	3.0	2.6
Production of other non-metallic mineral products	9.4	9.2	7.3	6.9	7.0
Manufacture of basic metals	21.4	24.8	24.9	23.5	20.5
Manufacture of fabricated metal products, except machinery and equipment	1.1	1.2	1.6	1.7	1.7
Manufacture of computers, electronic and optical equipment	0.9	0.9	0.8	0.8	0.8
Manufacture of electrical equipment	0.6	0.7	0.9	0.8	0.7

Branch of Industry	2009	2010	2011	2012	2013
Manufacture of machinery and equipment, not included in other groups	0.7	0.4	0.4	0.7	0.5
Manufacture of other transport equipment	0.0	0.0	0.0	0.0	0.0
Manufacture of furniture	0.5	0.4	0.3	0.4	0.4
Manufacture of products' types, not included in other groups	1.7	2.0	2.1	2.4	2.7
Repair and installation of machinery and equipment	0.9	0.7	0.4	0.4	0.3
Electricity, gas, steam and air conditioning supplies	18.1	14.1	16.6	18.9	20.2
Electricity, gas, steam and air conditioning supplies	18.1	14.1	16.6	18.9	20.2
Water supply, sewerage, waste management and recycling	2.4	2.1	1.8	1.6	1.4
Water collection, treatment and distribution	61.2	59.2	59.2	52.6	67.6
Sewerage	13.8	12.7	12.6	12.5	11.8
Waste collection, treatment and disposal, materials recovery	25.0	28.1	28.2	34.9	20.6

**Table 1.1.3-6: Number of Industrial Organizations by Economic Activity types
(according to NACE 2 classification),
2009-2013**

Branch of Industry	2009	2010	2011	2012	2013
Overall industrial production	2302	2484	2648	2587	2726
Mining and quarrying	63	62	65	71	75
Metal ore mining	7	7	7	8	9
other branches of mining and quarrying industry	56	55	58	63	66
Manufacturing/processing industry	2147	2241	2380	2290	2405
Production of food	716	789	847	793	801
Production of beverages	113	125	125	116	128
Production of tobacco goods	4	4	4	4	4
Production of textile	18	21	20	21	19
Production of clothes	78	69	76	74	82
Production of leather, leather goods and shoe-wear	40	45	54	50	47
Production of timber/wood and wooden products, wood processing, production of wood and cork, straw and plaiting materials, except furniture	72	70	73	65	72
Production of paper and paper-made products	34	44	52	47	54
Publishing/ printing activity; replication of recorded information-carrying media	133	115	117	121	120
Production of chemicals and chemicals-related products	54	59	65	65	76
Production of pharmaceuticals	17	13	14	15	19
Production of rubber and plastic goods	102	205	210	203	201
Production of other non-metallic mineral products	218	226	229	227	230
Manufacture of basic metals	20	27	28	28	28
Manufacture of fabricated metal products, except machinery and equipment	192	103	110	105	125
Manufacture of computers, electronic and optical equipment	44	38	38	40	43
Manufacture of electrical equipment	46	45	48	43	47

Branch of Industry	2009	2010	2011	2012	2013
Manufacture of machinery and equipment, not included in other groups	55	49	49	51	50
Manufacture of other transport equipment	1	1	2	1	1
Manufacture of furniture	100	105	116	118	151
Manufacture of products' types, not included in other groups	70	65	72	74	76
Repair and installation of machinery and equipment	20	23	31	29	31
Electricity, gas, steam and air conditioning supplies	87	105	124	144	165
Electricity, gas, steam and air conditioning supplies	87	105	124	144	165
Water supply, sewerage, waste management and recycling	5	76	79	82	81
Water collection, treatment and distribution	2	2	2	3	4
Sewerage	...	9	9	9	7
Waste collection, treatment and disposal, materials recovery	3	65	68	70	70

Part 2. Institutional, Policy and Regulatory Framework

2.1. Environmental policy, sustainable development policy and general legislative framework

The process planned in the sphere of chemicals and wastes management, including that of POPs, is determined by such global strategic documents as Agenda 21, Declaration on Sustainable Development adopted at the World Summit on Sustainable Development (Johannesburg, 2002) and by the state environmental policy of the RoA.

The problems related to environmentally sound management of chemicals and wastes, including the necessity to replace and destruct PCB-containing oils and equipment, as well as environmentally sound disposal of obsolete pesticides is of high importance and urgency for Armenia and as priority challenges are included in all strategy documents of the country, such as:

- Millennium Development Goals (2000-2015);
- Governmental Action Plan (2008 -2012);
- Republic of Armenia National Implementation Plan (NIP) for the Stockholm Convention (2005-2010);
- National Environmental Action Plan (NEAP) (2008-2012);
- National Poverty Reduction Strategy;
- Republic of Armenia Sustainable Economic Development Strategy;
- Republic of Armenia Agricultural Sustainable Development Strategy;
- European Neighborhood Policy (2009-2011);
- Republic of Armenia National Security Strategy.
- Individual Partnership Action Plan (IPAP): Armenia / NATO.

The principles of state regulation dealing with issues of environmental protection are allocated by the article 10 of Constitution of RoA, according to which “The state shall ensure the protection and reproduction of the environment and the rational utilization of natural resources”.

Despite the lack of a Law on Chemicals, problems of chemicals and waste management, including the Persistent Organic Pollutants (POPs), are governed in RoA by a number of legal acts and appropriate international conventions, regulating the area of nature protection.

One of the principles established by the Stockholm Convention “On Persistent Organic Pollutants” runs that:

“States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and

developmental policies and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States of areas beyond the limits of national jurisdiction”

and provides any sovereign State with the possibility to regulate the problems of POPs management, proceeding from national and regional peculiarities in accordance with policy drawn in this specific country and in accordance with the legislation adopted in the frames of the policy.

Major legal document in the sphere of Environmental Protection is the law adopted by the National Assembly (Parliament) of Armenia in 1991: “Fundamentals of the Republic of Armenia Legislation on Nature Protection”. Article 72 of this document states:

- Maximum allowable levels (standards) of harmful impact on environmental and human health are approved and changed by the State authoritative bodies in this branch, - Ministry of Nature Protection and Ministry of Health of RoA;
- The frames of these standards involve the applicable norms of chemical substances exerting detrimental impact on the environment, maximum allowable levels of chemical substances in foodstuffs, as well as maximum allowable levels of chemical substances used in agriculture.

Article 27 states: “expenses connected with waste decontamination are imposed on industrial, agricultural, and municipal entities, at which they were generated.

Regulation of chemical substances including POPs is also governed by a number of laws and legal acts of RoA.

2.2. International Commitments and Obligations

In various spheres, including the issues of environmental protection and human health, RoA has a close co-operation with the world community. At the World Summit on Sustainable Development (Johannesburg, 2002) great attention was devoted to discussion of problems on protection of the environment and human health. At the World Summit, Johannesburg Declaration on sustainable Development was adopted and recommendations proposed for submission to the UN Assembly General. RoA also actively participates in international organizations and agreements on management of chemicals and wastes.

A number of international environmental Conventions and Agreements were signed and ratified by RoA (see Table 2.2-1).

Table 2.2-1: Involvement of RoA in International Environmental Conventions and Agreements

No.	Conventions (dates and places of adoption)	CONVENTION STATUS		
		Date of signing	Date of ratification by the National Assembly	Date of registration at UN Secretariat
1.	"Convention on Wetlands (Ramsar, Iran, 1971)", – The Convention on Wetlands of International Importance especially as Waterfowl Habitat		acceded in 1993 as a successor	RoA acceded to Convention according to the request of November 6, 1993
2.	The Rio de Janeiro Convention on Biological Diversity, 1992	June 5, 1992	March 31, 1993	May 14, 1993
	- Cartagena Protocol to the Convention on Biological Diversity (Montreal, January 29, 2000) -		March 16, 2004	April 30, 2004
3.	Framework Convention on Climate Change (New York, 1992)	June 13, 1992	March 29, 1993	May 14, 1993
	- Kyoto Protocol (Kyoto, 1997) - -		December 26, 2002	April 25, 2003
4.	UNECE Convention on Long-range Transboundary Air Pollution (Geneva, 1979)		May 14, 1996	February 21, 1997

No.	Conventions (dates and places of adoption)	CONVENTION STATUS		
		Date of signing	Date of ratification by the National Assembly	Date of registration at UN Secretariat
	- Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP), 1984 Geneva		20.10.2013 ^{p.}	21.04.2014 ^{p.}
	- Protocol on Heavy Metals (Aarhus, 1998)	December 14, 1998		
	- Protocol on Persistent Organic Pollutants (Aarhus, 1998)	<i>December 14, 1998</i>		
	- Protocol to Abate Acidification, Eutrophication and Ground-level Ozone Formation (Göteborg)	November 30, 1999		
5.	UNECE Convention on Environmental Impact Assessment in a Transboundary Context (Espoo, 1991)		May 14, 1996	February 21, 1997
	- Protocol on Strategic Environmental Assessment (Kiev, 2003)	May 21, 2003	25.10. 2010	24.04. 2011
6.	UNECE Convention on the Transboundary Effects of Industrial Accidents (Helsinki, 1992)		May 14, 1996	February 21, 1997
	- Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents (Kiev, 2003) to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992) and Convention on Transboundary Impact of Industrial Accidents (1992)	May 21, 2003		
7.	Convention to Combat Desertification (Paris, 1994)	October 14, 1994	June 23, 1997	July 2, 1997

No.	Conventions (dates and places of adoption)	CONVENTION STATUS		
		Date of signing	Date of ratification by the National Assembly	Date of registration at UN Secretariat
8.	Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel, 1989)		March 26, 1999	September 30, 1999
9.	Convention for the Protection of the Ozone Layer (Vienna, 1985)		April 28, 1999	September 30, 1999
	Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal, 1987)		April 28, 1999	September 30, 1999
	- London Amendments to the Montreal Protocol (London, 1990)		22.10.2003	October 22, 2003
	- Copenhagen Amendments to the Montreal Protocol (Copenhagen, 1992)		22.10.2003	October 22, 2003
	- Beijing Amendments to the Montreal Protocol (Beijing, 1998) 2008		29.09. 2008	18.03. 2009
	- Montreal Amendments to the Montreal Protocol (Montreal, 2008)		29.09. 2008	18.03. 2009
10.	UNECE Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters (Aarhus, 1998)	June 25, 1998	May 14, 2001	August 1, 2001
	- Protocol on Pollutant Release and Transfer Registers (Kiev, 2003)	May 21, 2003		
11.	Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (Rotterdam, 1998)	September 10, 1998	October 22, 2003	November 26, 2003
12.	Convention on the Protection and Use of Transboundary Watercourses and International lakes (Helsinki, 1992)	June 17 , 1999		
	- Protocol on Water and Health (London, 1999)	1999		

No.	Conventions (dates and places of adoption)	CONVENTION STATUS		
		Date of signing	Date of ratification by the National Assembly	Date of registration at UN Secretariat
13.	Stockholm Convention on Persistent Organic Pollutants (Stockholm, 2001)	May 23, 2001	October 22, 2003	November 26, 2003
14.	Convention on the Prohibition of Military or any other Hostile Use of Environmental Modification Techniques (Geneva, 1976)		December 4, 2001	May 15, 2002
15.	Convention on the prohibition of the development production, stockpiling and use of chemical weapons and on their destruction (Chemical Weapons Convention) (1992)	March 19, 1993		January 27,1995
16.	Minamata Convention on Mercury	October 10, 2013	October 6, 2017	December 13, 2017

2.3 Description of existing legislation and regulations addressing POPs (manufactured chemicals and unintentionally produced POPs)

Regulation of issues on management of chemicals and wastes, including POPs in RoA is executed by a number of the following laws and other legal acts aimed at prevention of the harmful impact of chemicals and wastes to the environmental and human health:

↳ RoA Law “On Waste” (No. 159-N of November 24, 2004);

- Governmental Decision of the RoA “On the appointment of competent bodies and establishment of a focal point” for the “Convention on transboundary effects of industrial accidents” (No. 261 of March 31, 2001);
- Decision of the Government of the RoA No.121-N of January 30, 2003 “On approval of the order for licensing the activity on processing, treatment, storage, transportation, and placement of hazardous wastes in the Republic of Armenia”;
- Decision of the Prime Minister of the RoA “On approval of the membership and order of activity of inter-departmental commission on licensing of activity on recycling, treatment, storage, transportation and placement of hazardous wastes in the Republic of Armenia” (No. 46-N of February 5, 2004);
- Protocol Decision of the Government of RoA “On approval of the National Profile on Chemicals and Waste Management” (No. 26 of July 8, 2004);
- Decision of the Government of the RoA ia “On implementation of the RoA obligations on Stockholm Convention signed May 23, 2001” (No. 1483-N dated October 29, 2004);
- Decision of the Government of the RoA “On implementation of the Republic of Armenia obligations on Rotterdam Convention signed September 10, 1998” (No. 1508-N dated October 29, 2004);
- Protocol Decision of the Government of the RoA “On approval of the “List of actions implemented within the frames of the “National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia during 2005-2010” (No. 1 of January 13, 2005).
- Decision of the Government of the RoA “On approval of the List of chemicals and pesticides regulated by Rotterdam Convention and banned in the Republic of Armenia” (No. 293-N of March 17, 2005);
- RA Government Resolution of May 19, 2005 No. 599-N “On designation of the authorized body in the sphere of wastes handling”.

- Decision of the Government of the RoA “On establishment of the State non-commercial organization “Waste Research Center” (No. 670-N of May 19, 2005).
- Decision of the Prime Minister of the RoA “On Measures ensuring enforcement of the Law of the Republic of Armenia "On Wastes" (N380- A of May 30, 2005):
- Protocol Decision of the RoA Government «On approval of the Programme for development of a normative regulating document “Waste Classification according to Hazard” (No. 33 dated August 18, 2005);
- Decision of the Government of RoA “On approval of the order to approve draft standards for waste generation and placement limits” (No. 2291-N dated December 9, 2005);
- Decision of the Government of the RoA “On approval of the order for waste passportisation” (No. 47-N dated January 19, 2006);
- Decision of the RoA Government “On the order for maintenance of the Registry of wastes generation, recycling and utilization facilities” (No. 500-N dated April 20, 2006);
- “On approval of book forms for Registry maintenance and accounts for register recordings on waste generation, processing and utilization entities” (The Order of the Ministry of Nature Protection No. 359-N dated November 7, 2006; state registration at the Ministry of Justice: No. 10506391 dated November 23, 2006);
- Decision of the Government of the RoA “On approval of the order for maintenance of the Registry on waste disposal sites” (No. 1180-N dated July 13, 2006);
- Order of the Minister of Nature Protection of RoA “On approval of book forms for Registry maintenance and forms for Registry recordings on wastes disposal sites” (No. 387-N November 24, 2006; state registration at the Ministry of Justice: No. 10506407 of December 6, 2006);
- Decision of the RoA Government “On defining the order of wastes accounting in accordance to wastes generation, disposal (elimination, treatment, placement) and use” (No. 1343-N dated September 14, 2006)
- Decision of the RoA Government “On defining the order for State accounting of wastes” (No. 1739-N dated December 7, 2006)
- Decision of the RoA Government “On the order of keeping the State Cadastre on Wastes” (No. 144-N dated January 18, 2007);
- The Order of the RoA Minister of Nature Protection “On approval of the List of production and consumption wastes generated on the territory of the Republic of Armenia” (No. 342-N of October 26, 2006), which was registered at the RoA Ministry of Justice on November 3, 2006 (State registration number at the RoA Ministry of Justice: 10506373)

- Order of the Minister of Nature Protection of RoA “On approval of the “List of wastes classified by hazard“ (No. 430-N dated December 25, 2006; state registration at the Ministry of Justice: No. 10506440 of December 28, 2006);
- The Order of the RoA Minister of Nature Protection “On approval of the exemplary form for Waste Passport” (No. 19-N dated February 02, 2007; state registration at the Ministry of Justice: No. 10507037 dated February 12, 2007);
- The Order of the RoA Minister of Nature Protection “On approval of draft exemplary form for calculation of standards on waste generation and placement limits thereof” (No. 97-N of April 27, 2007), which was registered at the RoA Ministry of Justice on May 10, 2007 /State registration: No. 10507200/;
- Protocol Decision of the Government of the RoA “On approving the conditions of safe management of construction and demolition waste” (July 23, 2009; No. 30);
- Protocol Decree of the Government of the RoA “On approval of specific indicators of generation of main types of industrial and household waste and confirming the list of waste generated from different technological processes” (19 November 2009; No. 48)
- Decree of the Government of the RoA laying down “Rules for handling of obsolete pesticides” (No. 195-N; February 17, 2011);
- Protocol Decision of the Government of the RoA “On approval of the Guidance for Polychlorinated biphenyls-containing wastes management (No. 41; October 20, 2011);
- Protocol Decision of the RoA Government “On approval of the Cleaner Production Concept” (No. 49; December 15; 2011);
- Protocol Decree of the RoA Government “On approval of the Guidance on safe conditions of disposal and neutralization of industrial and household waste” (No. 16 adopted on April 26, 2012);
- Decision of the RoA Government “On amendments to the Decision of the Republic of Armenia Government “On defining the order for State accounting of wastes” No. 1739-N dated December 7, 2006 (No. 1042-N September 10, 2015)
- Protocol Decision of the RoA Government "On Approval of the List of Activities to be implemented in 2016-2020 within the National Program for Implementation of the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia" (No. 49 of December 8, 2016)
- Law of the RoA “On ratification of Minamata Convention on Mercury” (No. 130-N of October 6, 2017).

2.4. Legislative Documents Relevant to Stockholm Convention

Relevant legislative documents are presented as Table 2.4.-1.

Table 2.4-1: List of Legislative Documents Relevant to Stockholm Convention (according to Articles)

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
Article 3; 1a, 1b; Annex A	Order of Minister of Health of the Former USSR (1970) prohibiting the use of extremely hazardous organochlorine pesticides (DDT; Aldrin; 2,4,5-T; Chlordimeform; Dieldrin; Dinoseb; Heptachlor; Pentachlorophenol)	The order prohibits the use of chemicals of Annex A
Article 3; Annex A	RoA Governmental Decision No. 57 of January 24, 2002 “On approval of the list substances, biogenic elements, heavy metals or compounds thereof and other substances having negative impact on ecosystem of Lake Sevan”	The Decision prohibits application of chemicals, including POPs in the basin (water catchment) area of Sevan Lake
Article 6, 1 a,b,c	Decision of the Prime Minister of the RoA “On setting-up the working group on regulation of the issues dealing with destruction of obsolete, inappropriate-for-use chemical plant protection substances and working-out action plan for destruction thereof” (No. 452-A dated September 22, 2003)	The Decision on setting-up the working group on regulation of the issues dealing with destruction of obsolete pesticides, including POPs reveals environmentally sound modes for POPs waste elimination
Article 6, 1 c	Decision of the Government of the RoA “On approval of measures ensuring security of obsolete pesticides burial and on assigning funds from Republic of Armenia state budget for FY 2004” (No. 526-A dated April 22, 2004)	The Governmental Decision on assigning funds of the state budget to carry out actions ensuring security of Nubarashen obsolete pesticides burial site where 250 tons of DDT and other organochlorine pesticides were buried
Article 3, 1a,b	The Governmental Decision of the RoA “Approval of the List of hazardous wastes of the RoA” (No. 874-N dated May 20, 2004)	The Decree was adopted to fulfill the obligations of the RoA within the framework of Basel and Stockholm Conventions. It lays down the list of hazardous waste in

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
		<p>the RoA</p> <p>According to the Annex of that Decree, polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polychlorinated naphthalenes, polybrominated biphenyls (PBBs), PCB-contaminated containers, different-type packaging are considered to be hazardous waste</p>
Article 3	<p>The Governmental Decision of the RoA on “Amendment to the Governmental Decision of the Republic of Armenia No. 97 on December 8, 1995 and approval of the List of Banned Hazardous Wastes of the RoA” (No. 1093-N dated July 8, 2004)</p>	<p>The Decision was adopted to fulfill the obligations of the RoA within the framework of Basel Convention. It establishes the list of prohibited hazardous waste in the RoA and amends Governmental Decree of RoA on December 8, 1995, N 97-N. The Annex of the Decree defines, that waste polluted with PCB, PCT, PBB, including waste polluted with any other similar polybrominated substance (50 mg/kg or more) are considered to be prohibited hazardous waste in RoA</p>
Article 5 a	<p>Protocol Decision of the Government of the RoA “Endorsement of the National Profile on Chemicals and Waste Management” (No. 26 dated July 8, 2004)</p>	<p>The National Profile allows to have a general overview in the area of chemicals management embracing the entire chemical life-cycle.</p> <p>The problems and challenges relevant to management on dangerous chemicals and hazardous wastes, including POPs is emphasized</p>
Article 9	<p>Decision of the Government of the RoA “On implementation of the RoA obligations on Stockholm Convention signed May 23, 2001” (No. 1483-N dated October 29, 2004)</p>	<p>In accordance with this Decision the Ministry of Nature protection was nominated as national focal point for exchange of information according to Article 9 of the Convention</p>
Articles 3, 5, 6, 10,	<p>“Law on Waste” adopted on November 14, 2004 (AL-159-N)</p>	<p>The law is aimed to regulate the legal and economic basis of the relations arising from the collection, transport, storage, disposal, recycling, re-use, reduction of waste and other</p>

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
		relations arising from above-mentioned activities and also the prevention of adverse impacts of the generation and management of waste, including POPs, towards human health and the environment
Articles 5 e, 6, 7, 11; Annex A, part II	Decision of the Government of the RoA "On approval of the List of actions to implement RoA obligations under a number of International Environmental Conventions (No. 1840-N dated December 2, 2004);	The Decision of the Government on approval of the list of actions for implementation of the RoA obligations under Stockholm Convention: <ul style="list-style-type: none"> - Establishment of POPs Analytical laboratory; - Design of Dioxins emissions registry; - Inventory of PCB-containing oils and equipment ; - Inventory of POPs obsolete pesticides; - Development of Data bank on POPs destruction technologies
Article 6; 1a	Decision of the Government of the RoA "On approval of the order for waste passportisation" (No. 47-N dated January 19, 2006)	The Order of wastes passportization presupposes that all hazardous wastes (classes 1-4), including POPs should be identified. Waste identification document (passport) is prepared for each type of hazardous waste and appears as an obligatory part of technical documents in any phase of waste life-cycle
Article 6; 1a, b, c, d, e	Decision of the RoA Government "On the order for maintenance of the Registry of wastes generation, recycling and utilization facilities" (No. 500-N dated April 20, 2006)	The Registry of facilities on waste generation, recycling and re-use operations is a data base, which contains information on waste types, quantities of generated waste, quantitative and qualitative characterization of waste, reduction of waste and reduction of hazard degree
Article 5	Decision of the Government of the RoA "On approval of the order for maintenance of the Registry on waste disposal sites" (No. 1180-N dated July 13, 2006)	The aim of the Registry is inventory taking and description of functioning, closed, abandoned waste disposal sites and burials, including burials containing hazardous waste, including POPs. It is a system that contains

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
		normative-technical, technological, environmental information on waste disposal entities
Article 5	Decision of the Government of the RoA “On approval of the order for registration of wastes generation, disposal (elimination, treatment, placement) and utilization” (No. 1343-N dated September 14, 2006)	The Decision regulates the order for registration of wastes generation, disposal (elimination, treatment, and placement) and utilization. Waste registration is a system of continuous documentary information, which contains information on waste, including POPs, management and qualitative and quantitative indicators of waste
Article 6	The Order of the RoA Minister of Nature Protection “On approval of the List of production and consumption wastes generated on the territory of the Republic of Armenia” (No. 342-N of October 26, 2006), which was registered at the RoA Ministry of Justice on November 3, 2006 (State registration number at the Republic of Armenia Ministry of Justice: 10506373);	The Order approved the List of production and consumption wastes generated on the territory of the RoA due to activity in different branches of the National Economy (mining, chemical, energy production, textile, food, pharmaceutical, etc.)
Article 6	“List of wastes classified by hazard” (The Order of the Ministry of Nature Protection No. 430-N dated December 25, 2006; state registration No. 10506440 of December 28, 2006)	<p>The Order of the Minister of Nature Protection of RoA on 25 December 2006 N 430-N “Laying Down the List of Waste Classified By Hazard” lays down the list of waste, classified by hazard. It defines four classes of waste.</p> <p>According to the Annex of the Order, used transformer and other oils, containing polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), the remains of transformer and other oils, containing polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs), polychlorinated biphenyl (PCB), polychlorinated terphenyl (PCT), polybrominated biphenyl (PBB) waste or other waste containing PCB, PCT, PBB, condensers</p>

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
		<p>processed with Trichlorobiphenyl, condensers processed with Pentachlorobiphenyl, transformemrs processed with Pentachlorobiphenyl are considered as first class hazardous waste.</p> <p>The Annex also includes other POPs, in particular, DDT, Aldrin, 2.4.5-T, Chlordiform, Dieldrin, Dinoseb, Heptachlor, Pentachlorfenol, Granozan, Mercurhexane, Mercurbenzol, Methylparation, Actiol, Zync phosphite, Chlordane, Endrine, Hexachlorbenzol, Myrex, Toxaphen, Captafol, Chlordiform, Chlorbenzilate, 1,2-dibrommetane, Ftoracetamide, HCH, Lindane, Metamedophos, Fufamidon</p>
Article 6	Decision of the RoA Government “On the order of keeping the State Cadastre on Wastes” (No. 144-N dated January 18, 2007)	The establishment and management of Waste State Cadastre is based on information that includes data on generation, type, composition, qualitative and quantitative characterization of waste, including POPs, class of hazard, disposal sites, the use and treatment of waste
Articles 5, 6	The Order of the RoA Minister of Nature Protection “On approval of draft exemplary form for calculation of standards on waste generation and placement limits thereof” (No. 97-N of April 27, 2007), which was registered at the RoA Ministry of Justice on May 10, 2007 /State registration: No. 10507200/	
Article 5 a	Protocol Decision of the RoA Government «On amendment to Protocol Decision No.26 of July 8, 2004” (No. 8 dated February 19, 2009);	The Protocol Decision approved the National Profile that involves renewed/ updated data of the initial National Profile of 2004
Article 5	Protocol Decree of the Government of the RoA on 19	The RoA Government approved the concept of ‘Cleaner

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
	November 2009 No. 48 “Confirming specific indicators of generation of main types of industrial and household waste and confirming the list of waste generated from different technological processes”	<p>Production', a comprehensive environmental strategy to be used in continuous environmental preventive processes, regarding products and services, and in order to increase production efficiency and reduce their adverse impacts towards human health and the environmental</p> <p>The policy embodied in the concept is aimed at sound management of chemicals and wastes, including POPs</p>
Article 6; 1 a, b, c, d, e	Decree of the Government of the RoA laying down “Rules for the handling of obsolete pesticides” (No. 195-N; February 17, 2011);	These rules regulate handling of inappropriate-for-use pesticides, including POPs, at the territory of the RoA, in particular: requirements are laid down on POPs use, accounting, inventory, identification, re-packaging, storage, transportation and treatment/decontamination
Annex A; Part II	Protocol Decision of the Government of the RoA approving the Guidance on Polychlorinated biphenyls-containing wastes management (No. 41; October 20, 2011);	Guidance on Polychlorinated biphenyls (PCBs)-containing wastes management is applicable to collection, storage, handling, transportation, treatment and disposal of PCB-containig wastes generated as a result of economic activity
Article 5	Protocol Decision of the RoA Government “On approval of the Cleaner Production Concept” (No. 49; December 15; 2011);	<p>The RoA Government approved the concept of 'Cleaner Production', a comprehensive environmental strategy to be used in continuous environmental preventive processes, regarding products and services, and in order to increase production efficiency and reduce their adverse impacts towards human health and the environmental</p> <p>The policy embodied in the concept is aimed at sound management of chemicals and wastes, including POPs</p>
Article 5	Governmental Protocol Decree No.16 “Guidance on safe	The Guidance sets forth safe conditions for placement (disposal)

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
	<p>conditions of disposal and neutralization of industrial and household waste” (adopted on April 26, 2012). Annex 1 of the Decree lays down the abovementioned guidance; in general it describes disposal and neutralization of production and household waste, gives methods of disposal, joint disposal and its actions. The Guidance also contains provisions on management of landfills. The 2nd Annex defines the list of waste groups and the methods of disposal.</p>	<p>and treatment/neutralization of production and consumption waste, including POPs</p>
	<p>Administrative Offences’ Code of the RoA</p> <p>Article 85.1 “Industrial and household wastes burning in environmental and inhabited settings”</p>	<p>The Code provides for administrative liability for burning the production and consumption wastes, including POPs wastes, in environmental and inhabited settings</p>
	<p>The Criminal Code of the RoA</p> <p>Article 284 “Violation of safety rules at hazardous chemical and biological substances and wastes handling”</p>	<p>The Code provides for criminal liability for violation of safety rules when handling hazardous chemicals and wastes, including POPs</p>
	<ul style="list-style-type: none"> - The law of the RoA “On sanitary – antiepidemiologic safety of the population” adopted December 12, 1992 (ho – 43, hhgkht 1992/23) - clause 4 “Sanitary rules and hygienic standards” ; - clause 23 “Sanitary - hygienic examination” - clause 24 “State hygienic and anti-epidemiological control” 	
<p>Articles 5,6</p>	<p>Sanitation rules and norms of the RoA Minister entitled: Hygienic requirements to the utilization of hazardous chemical waste and shipment and storage of hazardous chemical materials” (October 29, 2009; No. 2.1.7.001-09</p>	<p>The Order approved hygienic requirements set forth to the use of hazardous waste, including POPs waste, as well as hygienic requirements on storage and shipment of hazardous chemicals, including POPs</p>

Obligation under the Stockholm Convention	Relevant national legislation	Assessment
Article 5	Decision of the RoA Government “On approval of the maximum allowable concentrations of substances polluting the atmospheric air of inhabited settlements” (February 2, 2006; No. 160-N);	The decision defines standards on maximum allowable concentrations of atmospheric air polluting substances, including POPs
Article 10	RoA Law “On freedom of information”. 2003.	
Article 3	Decision of the Government of the RoA “On approval of the List of chemicals and pesticides regulated by Rotterdam Convention and banned in the RoA” (No. 293-N dated March 17, 2005);	The List involves POPs chemicals and pesticides, including Endosulfan
	Decision of the Government of the Republic of Armenia No. 930-N dated September 8, 2016 “On amendments to the Decision of the Government of the Republic of Armenia “On approval of the List of chemicals and pesticides regulated by Rotterdam Convention and banned in the Republic of Armenia (No. 293-N of March 17, 2005)”.	
Article 5	Law of the RoA “On Payments for Nature Use and Nature Protection”;	Under the law, according to the established order, environmental charges were set forth the placement of production and consumption wastes, including POPs wastes
Article 5	Law of the RoA “On Rates of Environmental Fees”.	The law defines, according to the established order, the rates of environmental fees set forth for placement of production and consumption waste, including POPs wastes, in the environment

Table 2.4-2: The Persistent Organic Pollutants listed in Annex A of the Stockholm Convention prohibited in the Republic of Armenia in accordance with the Governmental Decision No. 930-N dated September 2016

NN	Name	Relevant CAS number (s)	Category
1.	2, 4, 5-T, its salts and ethers	93-76-5	Pesticide
2.	Alachlor	15972-60-8	Pesticide
3.	Aldrin	309-00-2	Pesticide
4.	Chlordane	57-74-9	Pesticide
5.	1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane (DDT)	50-29-3	Pesticide
6.	Dieldrin	60-57-1	Pesticide
7.	Endosulfan	115-29-7	Pesticide
8.	Hexachlorocyclohexane (mixed isomers)	608-73-1	Pesticide
9.	Heptachlor	76-44-8	Pesticide
10.	Hexachlorobenzene	118-74-1	Pesticide
11.	Lindane	58-89-9	Pesticide
12.	Mercury compounds, including inorganic mercury compounds, alkyl mercury compounds and alkyloxyalkyl and aryl mercury compounds		Pesticide
13.	Toxaphene	8001-35-2	Pesticide
14.	Polybrominated biphenyls (PBB)	36355-01-8 (hexa-) 27858-07-7 (octa-) 13654-09-6 (deca-)	Industrial chemical
15.	Polychlorinated biphenyls (PCB)	1336-36-3	Industrial chemical
16.	Polychlorinated terphenyls (PCT)	61788-33-8	Industrial chemical

2.5 Competences of State Bodies in Chemicals and Waste Management

2.5.1. Competences of the Government of the Republic of Armenia in Chemicals and Wastes Management

Competences of the Government of RoA in the sphere of waste are set forth mainly in RoA Law “On Waste”.

According to Article 7 of RoA Law “On Waste”, competences of the Government of the RoA in waste management are as follows:

- development and implementation of state policy in waste management;
- coordination of state governance bodies in waste management;
- introduction of low-waste technologies, promotion of economic mechanisms for waste management;
- defining the procedure for waste accounting, generation, disposal (liquidation, decontamination and placement) and utilization;
- defining the licensing procedure for hazardous-waste recycling, treatment, storage, transportation and placement;
- defining the inventories of hazardous and banned waste;
- defining the procedure for transboundary waste movement and disposal;
- establishment of facilities for placement of decontaminated and unusable waste;
- international cooperation in waste management.

2.5.2. Competences of Republic of Armenia Ministry of Nature Protection in Chemicals and Wastes Management

According to Article 8, paragraph 1 of RoA Law “On Waste”, the competences of the state governance authorized body in charge of nature protection are as follows:

- participation in the formulation of state waste management policy;
- drafting targeted programs in waste management;
- state accounting of waste;
- approval of waste placement limits for legal entities and private entrepreneurs;
- defining the inventories of hazardous and banned waste;
- establishment of waste inventories based on hazard classification;

- proposals on issuance of permits for transboundary shipment of hazardous waste;
- approval of the sites for waste management facilities;
- approval of waste certificates as compiled by waste generators;
- creation of a Data Bank for the amounts of generated waste;
- maintaining the State Cadastre of Waste;
- sharing information with other agencies about low-waste and wasteless technologies;
- compilation, maintaining and monitoring of Registers for waste generation, recycling and utilization facilities and landfills;
- signing international cooperation agreements on waste management and international inter-agency agreements on transboundary waste shipment;
- sharing information on waste utilization with international organizations and competent states.

2.5.3. Competences of Republic of Armenia Ministry of Health in chemicals and wastes management

According to Article 9 of RoA Law “On Waste”, the competences of the authorized healthcare governance body in waste management are as follows:

- the development of safety requirements for human health in the secondary legislation related to waste management, and the development of sanitation and anti-epidemic regulations and norms to rule out dangerous impacts on the human body during waste generation, collection, shipment, storage, recycling, utilization, disposal, decontamination and burial, and supervision over the implementation of these requirements;
- development of priority measures in protecting human health from hazardous waste impact and submitting the latter to the Government of the RoA;
- approval of the sites for waste management facilities;
- sanitation and hygiene requirements to products manufactured from waste and issuance of hygiene conclusions.

According to Annex 1, paragraph 7 of Resolution of the Government of RoA dated August 15, 2002, No.1300-N “On the establishment of the state governance agency “Republic of Armenia Health Ministry Staff and approval of the charter and staff structure of the Health Ministry of the Republic of Armenia”, the goals of RoA Health Ministry are the protection of human and public health, improvement of the population’s health, sanitation and hygiene safety of public health and population, etc. which as we can see directly or indirectly are related to chemicals and wastes management.

According to article 18, paragraph 2 of RoA Law “On sanitation and epidemic safety of RoA population” of December 12, 1992, HO-43, enterprises, institutions, organizations, citizens during collection, recycling, utilization, decontamination and burial of industrial and household waste shall observe sanitation rules. State hygiene and anti-epidemic supervision is delegated to RoA Ministry of Health.

2.5.4. Competences of Republic of Armenia Ministry of Emergency Situations in chemicals and wastes management

Article 4 of the Law of the RoA “On the protection of population in emergency situations” of December 2, 1998, HO 265 provides that the preventive measures for the protection of the population are as follows:

- monitoring and supervision of the radiological, chemical and bacteriological contamination of the environment, territory and facilities.
- Article 7 of the same law provides that in emergency situations the basic measures of population protection are as follows:
- population protection from radiological, chemical and bacteriological substances.

Governmental Decision No. 861 of 8 July 2010 has laid down:

- 1) the plan of protection of the population in case of accident or chemical hazard of the chemical objects of the RoA;
- 2) emergency-response operations in case of an accident in a chemical hazardous facility.

2.5.5. Competences of Republic of Armenia Ministry of Transport, Communications and Information Technologies in chemicals and wastes management

According to the Law of the RoA “On the shipment of hazardous cargo and undecontaminated containers by automobile transport” of February 27, 2012, HO 30-N, Article 8, part 1, paragraph 4, RoA Ministry of Transport and Communication shall issue a permit for the shipment of hazardous cargo.

2.5.6. Competences of Republic of Armenia Ministry of Agriculture in chemicals and wastes management

The RoA Ministry of Agriculture has no competences in chemicals and wastes management either in RoA Law “On Waste”, or in the ministerial charter.

The Ministry of Agriculture develops and implements state policy in the field of food safety, phytosanitary.

2.5.7. Competences of local self-government bodies in chemicals and wastes management

According to Article 11 of RoA Law “On Waste”, the community leader within the limits of the administrative boundary of community:

- supervises garbage collection;
- compiles the schemes of sanitary cleaning of territories;
- liquidates uncontrollable and unauthorized garbage dumps.
- organizes the participation of the population in the collection of not hazardous waste that is a valuable resource.

2.5.8. Competences of regional government bodies in chemicals and wastes management

According to Article 10 of RoA Law “On Waste”, the competences of local government bodies in the management of chemicals and waste are as follows:

1. participation in state policy formulation in waste management;
2. participation in the drafting of state programs in waste management;
3. within their administrative territory, drafting local programs in waste management and coordination of implementation thereof;
4. within their administrative territory, issuance of permits in coordination with the authorized state body for waste disposal;
5. within their administrative territory, drafting sanitary cleaning schemes and supervision over garbage collection;
6. compilation and maintaining of logs for waste generation, recycling, disposal and utilization facilities;
7. accounting of waste generation, decontamination, utilization and disposal and certification thereof;
8. liquidation of uncontrollable and unauthorized garbage dumps within their administrative territory;
9. within their administrative territory, engaging the population in the collection of not hazardous waste that is a valuable resource.

Part 3. Assessment of the POPs Issue in the Republic of Armenia

3.1. Assessment of persistent organic pollutants (POPs) pesticides, including Endosulfan (Annex A, Part I chemicals): historical, current, and projected future production, use, import, and export; existing policy and regulatory framework; summary of available monitoring data (environment, food, humans) and health impacts

Chemical substances included in the Annex A, Part I of the Stockholm Convention have never been produced in Armenia. Some of the listed chemicals, for example, such as Mirex and Toxafen have never been used in agriculture of the republic in the fight against pests and plant diseases (Table 3.1-1).

Only officially registered substances and those included in the “List of chemical and biological means of plant protection” are allowed for application in RoA and can be imported and sold. The List involves 185 chemicals and biological plant protection products, amongst which there are no chemicals included in Annex A, Part I of Stockholm Convention.

Organochlorine pesticides were widely used in Armenia until 1986. Armenia was always characterized by its well-developed agricultural production. Till 1980s, the republic was amongst the regions with intense pesticide application. Total area load of pesticides averaged 9 - 35.5 kg per hectare; this value manifold exceeded average all former Soviet Union levels of pesticide application.

In Armenia since 1960s the problems arose in concern of environmental pollution by persistent organic pollutants, as persistent organochlorine pesticides (OCPs) were in all-round, extensive use. The reason for such large scale application of OCPs was conditioned by the universal, multipurpose character of these compounds.

Endosulfan was never produced or used at the territory of Armenia.

Table 3.1-1: **Status of Annex A POPs in Armenia**

Name	Production	Use	Import	Export	Date of banning
Aldrin	No production	Prohibited	Prohibited	Prohibited	1970, 2005
Alpha hexachlorocyclohexane	No production	Prohibited	Prohibited		2005

Name	Production	Use	Import	Export	Date of banning
Chlordane	No production	Prohibited	Prohibited		2005
Chlordecone	No production	Prohibited			
Dieldrin	No production	Prohibited	Prohibited		1985, 2005
Endosulfan	No production	Prohibited	Prohibited		2005
Endrin	No production	Prohibited			
Heptachlor	No production	Prohibited			1986, 2005
Hexachlorobenzene	No production	Pending legislation			2005
Lindane	No production	Prohibited	Prohibited		2005
Mirex	No production	Prohibited			
Pentachlorobenzene	No production	Pending legislation			1986
Toxaphene	No production	Prohibited			
DDT	No production	Prohibited	Prohibited	Prohibited	1970, 2005

Monitoring studies on POPs in water, bottom sediment, hydrobionts, soil, were carried out in 1970s-1980s, when organochlorine pesticides were intensively applied, then – in 2002-2003 or 20 years after their ban, and in 2012: 30 years after their ban. In the past 30 years significant decrease were observed in the residual amounts of POPs in the environment of RoA.

According to the data available for 1970s-1980s, the levels of DDT and HCH were as follows:

- in soils: 0.2-0.06 mg/kg,
- in samples of water from open reservoirs the level was at 0.021 mg/L and 0.01 mg/L,
- in water from artesian wells: 0.11 mg/L and 0.07 mg/L,
- in formula feeds: 0.38 mg/kg and 0.25 mg/kg,
- in foodstuffs of animal origin: 0.44 mg/kg and 0.1 mg/kg,
- in foodstuffs of plant origin: 0.21 mg/kg and 0.14 mg/kg.

Studies held in 1960s in different regions of the Soviet Union in concern of OCP pollution of various environmental media became the basis for decision-making on banning application of DDT as an agricultural pesticide in USSR, including Armenia, since 1970.

Since 1980 the area for HCH application was narrowed in the sphere of prevention and fight against pests and diseases of food crops. The decision was also adopted in 1980 to stop application of HCH in the area of water collection basin around the lake Sevan.

After the above mentioned actions the content of DDT and HCH in water of Sevan Lake, tilt/sludge and in muscle tissues of fish reduced as follows:

- According to data available for 1980, DDT was determined in Sevan water averagely at 0.0004 mg/L (Small Sevan) and 0.0003 mg/L (Bigger Sevan).
- In the tilt (bottom sediment) DDT was determined at 0.01-0.037 mg/kg, HCH at 0.57-1.46 mg/kg (as of 1980-1983).
- In muscle tissues of white-fish (*Coregonus* or “syg”) DDT was detected at 0.2 mg/kg, DDE at 0.1 mg/kg and HCH at 0.2 mg/kg (as of 1980-1983).
- In muscle tissues of khramulya fish (*Varicorhinus*) that is fattier than white-fish DDT was revealed at 0.006 mg/kg, DDE at 0.027 mg/kg and HCH at the level of 0.001 mg/kg (as of 1980-1983).

Monitoring studies in 2002-2003 on residual amounts of Annex A, Part I chemicals revealed that Hexachlorobenzene (HCB) in waters of open reservoirs was in the range of 0.005-0.056 mcg/L. Average content of this substance was found to be 0.006-0.036 mcg/L. In bottom sediments no HCB residues were detected. In soils around the transformer stations HCB was revealed at 0.018 mcg/kg in one sample. In waste waters from sewage collectors HCB was found at 0.016mcg/L in one sample.

Data obtained in the monitoring program of 2002-2003 on HCB residual amounts in foodstuffs from different marzes (regions) of RoA showed the presence of HCB:

- HCB content in eggs was within the range of 0.008-4.54 mcg/kg. Average content made 0.26-4.54 mcg/kg.
- In samples of meat HCB ranged 0.028-9.16 mcg/kg (on the average: 0.0072-2.73 mcg/kg).
- HCB residues in samples of milk leveled to 0.009-0.74 mcg/L (average: 0.025-0.21 mcg/L).
- In samples of cheese the compound was revealed at 0.1-15.65 mcg/kg, making on the average 0.1-11.09 mcg/kg.

In 2002-2003, monitoring was also carried out in order to determine residual amounts of Heptachlor in surface waters and food stuffs (eggs, meat, milk and cheese) from different marzes of RoA. It was found that in surface waters Heptachlor ranged 0.034-0.17 mcg/L (on average: 0.074 mcg/L). Heptachlor residues in samples of food were as follows: in eggs the residues made

0.023-0.12 mcg/kg (average: 0.0064-0.06 mcg/kg), in meat at 0.024-4.23 mcg/kg (average 0.024-3.31 mcg/kg); in samples of milk Heptachlor was revealed in the range of 0.023-0.12 mcg/L (average content made 0.06-0.097 mcg/L). In samples of cheese Heptachlor was not measured except for one sample, in which its concentration was 0.153 mcg/kg.

In 2012 twelve samples of water were analyzed in order to investigate the concentration of OCPs in surface waters of RoA using Gas-Chromatography for 15 pesticides, including: DDT and metabolites, HCH isomers, Heptachlor, Hexachlorbenzene, Aldrin, Dieldrin, Endrin, and Mirex. The study involved rivers Masrik, Martuni, Gavaraget, Hrazdan, as well as Sevan Lake and water reservoirs (storage ponds) "Yerevanyan" and "Akhpara".

In 2012 the studies performed for POPs determination in water from the Lake Sevan and rivers flowing into it and the comparison of research results with earlier data demonstrated that the level of organochlorine pesticides in studied samples have decreased. Concentrations of the pollutants in bottom sediment and surface water of open reservoirs were 2 orders of magnitude higher than levels in water samples.

Soil samples near former pesticides shops and storehouses, as well as arable lands in the vicinity of mentioned sites have been also taken from Armavir, Aragatsohn, Ararat marzes (provinces) and Yerevan. The sites of former pesticides storehouses were considered as polluted areas. These sites were also considered visually as polluted areas.

Sampling from inhabited settlements, orchards and fields were randomly performed. These areas were considered visually non-polluted. Average samples were subject to laboratory analysis. These samples were formed from at least 5 point samples taken using "envelope" method.

The results of analyses of collected samples is presented in Table 3.1-.2 and Figure 3.1-1.

Table 3.1-2: **Mean concentrations of POPs pesticides revealed in the environment of RoA (2012)**

Pesticides	Water (mcg/l)	Sediment (mcg/kg)	Soil (mcg/kg)	Biomedica (mcg/kg)
α-HCH	0,123	8,798	2,824	107,000
HCB	0,054	14,797	3,014	62,000
β-HCH	0,203	33,181	13,138	187,000
γ-HCH	0,065	22,823	5,590	99,000
Heptachlor	0,545	54,868	19,071	889,000
Aldrin	0,059	11,824	6,338	247,000
o.p'-DDE	0,080	15,084	7,948	563,000
p.p'-DDE	0,020	7,208	103,090	6,000
Dieldrin	0,004	1,252	0,248	-
o.p'-DDD	0,040	6,571	5,443	21,000

Pesticides	Water (mcg/l)	Sediment (mcg/kg)	Soil (mcg/kg)	Biomedica (mcg/kg)
Endrin	0,033	6,163	2,924	-
p.p'-DDD	0,004	8,399	2,205	6,000
o.p'-DDT	0,230	4,031	14,600	7,000
p.p'-DDT	0,040	7,767	51,857	48,000
Mirex	0,101	4,410	4,148	14,000

Concentration of HCH isomers in water samples varied in the range of 0.00013-0.0014 mg/L, while DDT and its metabolites were in the range of 0.00002-0.0015 mg/L. DDT was determined only in Masrik and Gavaraget rivers. In other water basins only DDE and DDD were detected. This was also confirmed in the bottom sediment samples where the same declining trend was observed.

Data also show that the sediment samples have approximately hundred times higher concentration of POPs than the water samples. In most cases the concentration in sediment samples was higher than soil samples but in the same order of magnitude.

Biological samples however had generally one order of magnitude higher concentration than soil or sediment samples. Analytical results of soil samples were compared with the appropriate maximum allowed concentrations (MACs), which were approved by Sanitary Rules and Standards No.2.1.7.003-10 "Hygienic requirements to soil quality".

The concentrations of all samples were below the MACs, except the sample taken from an arable land in the area of Masis, in which o,p-DDE was 0.346 mg/kg. None of the Hexachlorocyclohexane concentrations have exceeded the MAC.

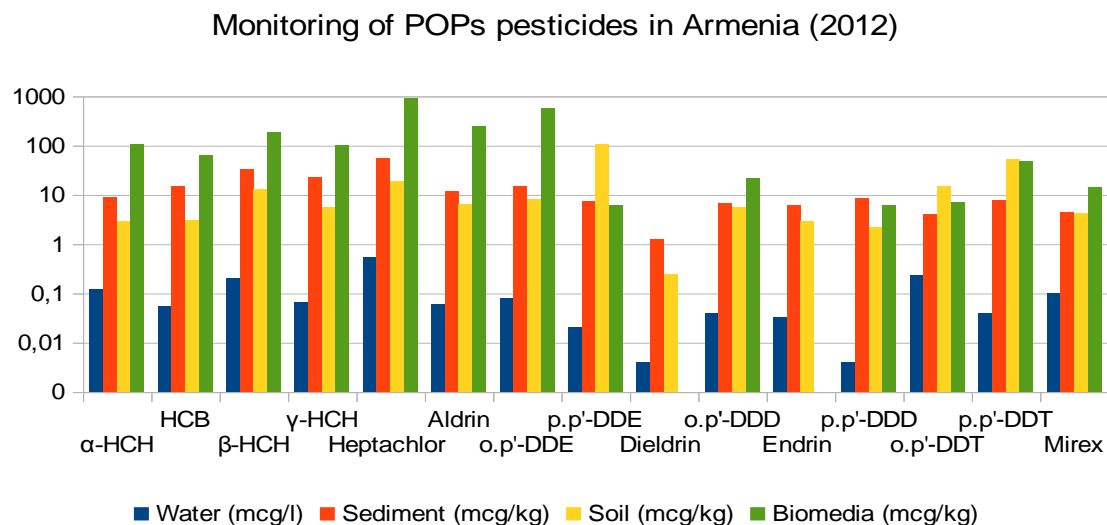
The content of DDT and its metabolites in the studied samples taken from the sites of pesticides shops were as follows: in Artashat: 0.3 mg/kg; in Masis: 0.66 mg/kg; in Mkhchan: 0.196 mg/kg, in Nor Kharberd: 0.023 mg/kg; in Armavir: 0.74 mg/kg.

At the site of former pesticides store-house in Armavir the residual POPs pesticides concentration was 0.8 mg/kg, which exceeded the MAC.

Summary content of DDT and its metabolites in samples of arable land taken from Masis (0.66 mg/kg) and Mkhchyan (0.196 mg/kg) exceeded MAC levels. The conclusion of our investigation is that we can suspect that DDT is used in the Ararat Valley.

Despite the fact that the comparative analysis of available data for the residual amounts of organochlorine pesticides in environmental media in 1970-1980s – the period of pesticides intense application – and in 30 years after their prohibition, i.e. in 2002-2003, shows that residual content of these substances decreased hundredfold, we still believe that regular monitoring on POPs residues in the surface waters, soil and food-stuff is necessary.

Figure 3.1-1: Average concentration of OCPs in water, sediment, soil and biota, 2012



3.2. Assessment of PCBs (Annex A, Part II chemicals)

Energy sector is one of the main sources of environmental pollution by polychlorinated biphenyls (PCBs). PCBs have been widely used in electrical equipment of various types (power transformers, capacitors, greasing/lubricating systems; rectifiers, high voltage switches and breakers, compressors, etc.).

Energy generation is one of the leading economic sectors in RoA and, as the first NIP has pointed out, a major stock of POPs, particularly PCBs. The problem of environmental assessment in connection with the use of electrical equipment with oils probably containing PCBs remains to be important.

The first preliminary PCB inventory was undertaken in 2002-2003 and concluded that in the energy sector there were approximately 17,000 tons of oils in power facilities of State Distribution Power Stations and HPPs (power transformers, rectifiers/converters, high voltage switches and breakers, compressors, etc.). The inventory used visual inspections and field test kits for PCB identification and as such was not conclusive.

The first NIP PCB inventory identified 16 254.5 tons of transformer oils, 773.9 tons of turbine oils and 1.4 tons of compressor oils. Maintenance of these equipment required 1 278.36 tons of transformer oils, 151.2 tons of turbine oils and 3.3 tons of compressor oils annually. The inventory further stated that 3 582 transformers were in private ownership; which included 2 552 pieces in industrial facilities; 500 in inhabited settlements; 352 in public catering sector; 75 in technical service enterprises and 103 in other organizations (Table 3.2-1). The total weight of transformer oils in these sectors were 1 624 tons.

Table 3.2-1: Transformers in private ownership (Inventory, 2002-2003)

	Number of transformers	Weight of oil (ton)
Power generation and distribution	9 867	16 754
Industrial facilities	2 552	1 157
Settlements	500	226
Catering sector	352	241
Technical services enterprises	75	not known
Other organizations	103	not known
Total	13 449	18 378

The first NIP inventory developed through applying field test kits has not found any PCB containing (PCB > 50ppm) equipment.

In order to present a realistic inventory the Government of RoA has requested the financial support of the GEF and the technical assistance of UNIDO to develop a more detailed inventory of PCBs. The project “Technical Assistance for Environmentally Sustainable Management of PCBs and other POPs Waste in the Republic of Armenia” has developed a detailed inventory.

The Government has also requested assistance from NATO on “Inventory, Monitoring and Analysis of Obsolete Pesticides in Armenia for Environmentally Sound Disposal” (NATO Project ESP.EAP.SfPP 982812) which together with the assistance of the Brazilian Government have allowed the establishment of a POPs laboratory. This laboratory was used to provide analytical back-up of the PCB inventory exercise.

The detailed PCB inventory included the following:

- Energy sector, including electricity production and distribution enterprises;
- Industrial sector, involving the companies, at the premises of which there are transformers of different capacity and volume, as well as capacitors and oil switches.

The first step was to identify the amount of oil-containing equipment in each stakeholder. Table 3.2-2 presents the power generation sector stakeholders. In the power sector 9 867 transformers and 2 574 switch gears have been identified. During the inventory exercise sampling was done for 1833 transformers and 470 oil switches all of them belonging to the power generation, transmission and distribution sectors.

Table 3.2-2: **Scope of inventory (oil containing equipment)**

Companies	Transformers (pcs)	Oil switches (pcs)	Amounts of T-1500 type transformer oils (ton)	Oil samples taken and Identification Forms filled out	
				from transformers	from oil switches
Energy generation sector					
Energy generation and distribution (Power plants and High-Voltage Electric Network)	335	1 288	6 307	202	470
Electric Networks of Armenia CJSC	9 014	1 286	10 447	1 601	0
Provinces	518			30	
Total:	9 867	2 574	16 754	1 833	470
Power sector					

Laboratory investigation of the samples was undertaken with DEXSIL L2000 DX Analyzer. As part of the inventory exercise labels with identification numbers have been attached to all the transformers, oil switches and other containers. After laboratory analysis all sampled equipment were labeled to provide information on PCB content. 442 samples have been analyzed of which 299 samples were found to contain less than 50 ppm PCBs, in 133 samples the PCB concentration was 50-500ppm, in 6 samples it was 500-2000ppm and in 4 samples the PCB concentration exceeded 2000ppm (Table 3.2-3).

Table 3.2-3: **Analytical result of the transformer and switch gear samples**

Analyzed Transformer & Switch Gear Samples					
PCB contamination, ppm	<50	50-500	500-2000	>2000	Total
Number of equipment	299	133	6	4	442

It means that 67% samples were PCB negative. Among the PCB positive samples 133 samples (93%) were in the range of 50-500 ppm, while the remaining part was approximately evenly distributed between the range of 500-2000 ppm and > 2000 ppm.

Among the 313 transformer samples 179 turned to be PCB negative <50 ppm, 126 were 50-500 ppm, and 4-4 samples were in the range of 500-2000ppm and >2000ppm (Table 3.2-4).

Table 3.2-4: Analytical results of the transformer samples and extrapolation of the whole energy sector of RoA

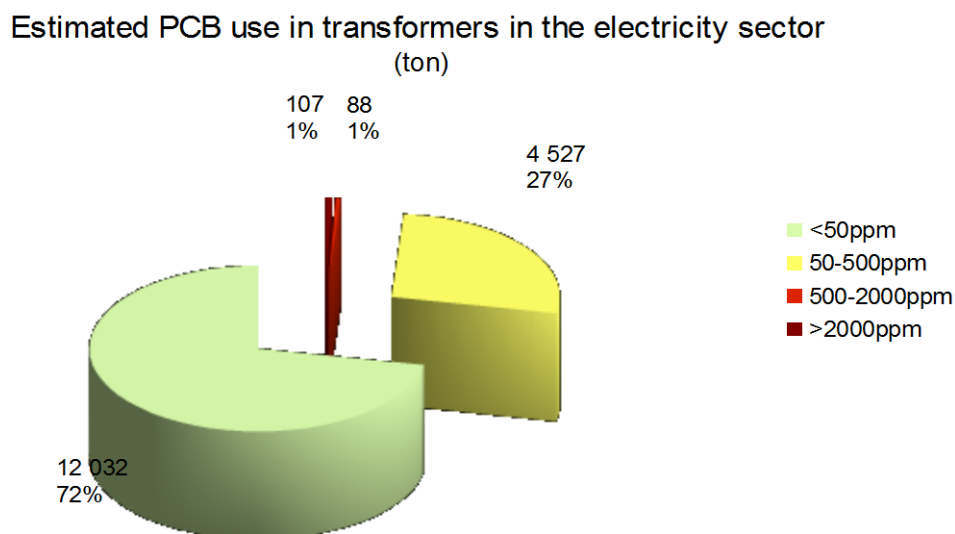
Analyzed transformer samples					
PCB contamination	<50 ppm	50 - 500 ppm	500 -2000 ppm	>2000 ppm	Total
Number of equipment	179	126	4	4	313
Weight of carcass (kg)	636 650	227 311	5 380	6 685	876 026
Weight of oil (kg)	254 470	95 740	1 860	2 265	354 335
Total weight (kg)	891 120	323 051	7 240	8 950	1 230 361
Extrapolation to the whole energy sector of RoA					
PCB contamination	<50 ppm	50 - 500 ppm	500-2000 ppm	>2000 ppm	Total
Number of equipment	5 643	3 972	126	126	9 867
Weight of carcass (ton)	30 103	10 748	254	316	41 421
Weight of oil (ton)	12 032	4 527	88	107	16 754
Total weight (ton)	42 135	15 275	342	423	58 175

Based on the number of transformers and the total weight of transformer oils in the electrical sector an extrapolation was made for the whole energy sector to map its PCB problem (Figure 3.2-1). According to estimation approximately 72% of transformers are free of PCBs which represents 12032 tons transformer oils. Approximately 4527 tons of transformer oil is contaminated with PCBs in the range of 50-500ppm. For these transformers the replacement of the oils would probably solve the PCB contamination.

Approximately 88 tons of transformer oil are contaminated with PCB between 500-2000ppm. For these transformers either several times oil replacement is needed or the transformers need to be decontaminated. Finally approximately 107 tons of transformer oil is contaminated with PCBs above 2000 ppm. These transformers may need to be replaced.

The contaminated oils, roughly 4614 tons, plus approximately 126 transformers (423 tons) need to be disposed of in an environmentally sound manner. This would cost approximately (5037 * 5000 USD = 25 185 000 USD) 25 million USD. This does not include the cost of new transformers and transformer oil.

Figure 3.2-1: **Estimated PCB use in transformers in the electricity sector of RoA**



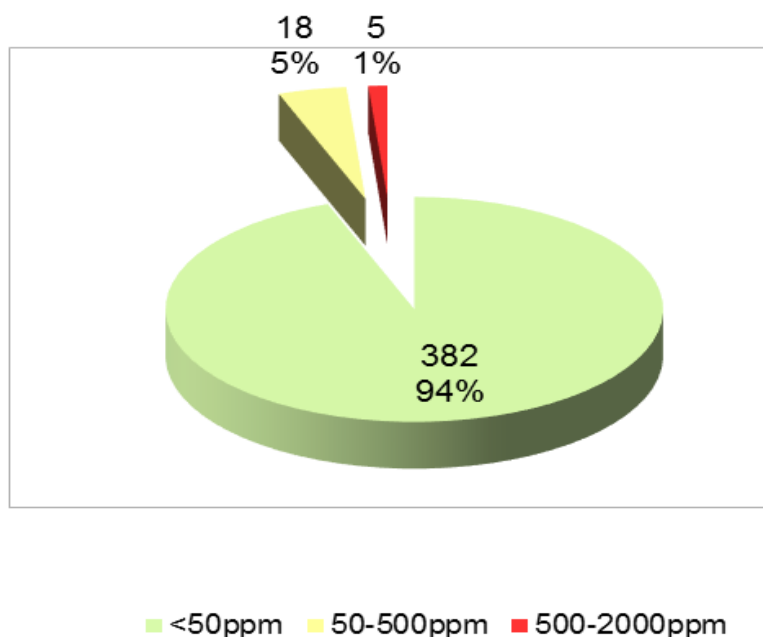
The inventory further analyzed 126 switch gears and 3 containers. The result of analyzes is presented in Table 3.2.-5. In the case of oil containers none of the three containers were found to be PCB positive. This may be due to the dilution of PCBs in the containers. In case of oil switches 117 equipment out of the 126 (94%) were found to be PCB negative (<50ppm) (Figure 3.2-2).

Seven switches with a total weight of 18 ton (4%) were found to contain 50-500ppm PCBs while 1%, 5 tons of the switches have been contaminated with PCBs in the range of 500-2000ppm. In the case of switches and containers extrapolation of the whole country has not been undertaken as the oil weight and carcass weight of the equipment could not always be recorded.

Table 3.2-5: **Analytical results of the switch gear and oil container samples**

Analyzed oil switches					
PCB contamination	<50ppm	50 - 500 ppm	500 - 2000 ppm	>2000 ppm	Total
Number of equipment	117	7	2	0	126
Total weight (ton)	382	18	5	0	405
Analyzed oil containers					
PCB contamination	<50ppm	50-500ppm	500-2000ppm	>2000ppm	Total
Number of containers	3	0	0	0	3
Amounts of oil (m ³)	100				100

Figure 3.2-2: PCB use in oil switches (tons, %)



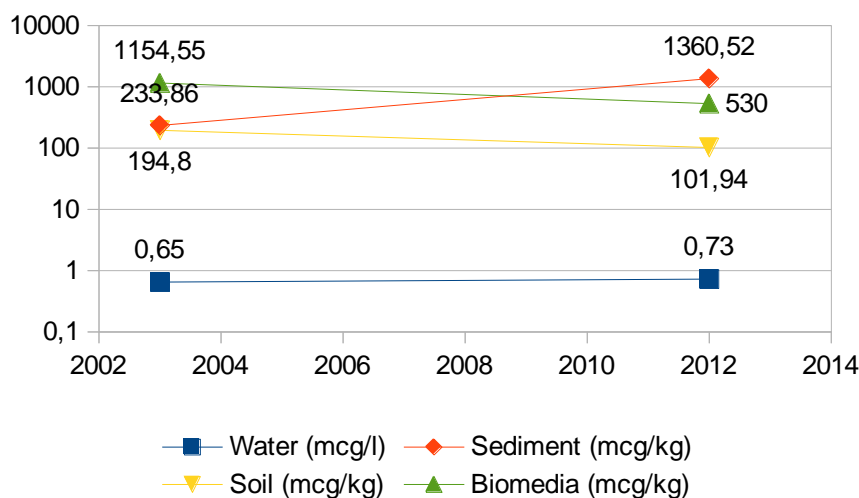
The scope of the inventory have not included capacitors because these are closed equipment mainly within the industrial sector.

3.2.1. PCB Monitoring

In order to study the trend of environmental pollution by PCBs, a monitoring study was performed in surface waters, bottom sediment, food-stuffs and soil samples in 2003 and 2012 (Figure 3.2.1-1). Samples were mostly taken at Sevan Lake water catchment area, while soil samples were taken in the vicinity of electrical equipment. Monitoring data show that in the nine years soil concentration of PCBs declined, water concentration increased slightly, but the sediment concentration increased approximately six times. The reason for the increase in PCB concentration of the biological samples is that most of the samples have been taken in close proximity to transformer installations, while in the earlier study in 2002-2003 the PCB were analyzed from the samples that were collected for POPs pesticides analysis. In this regard it is recommended that the sampling point be registered by GPS which would enable that samples can be taken from the same locations.

Figure 3.2.1-1: **Time trend analysis of PCB presence in the environment between 2003 and 2012**

Change in PCB concentration between 2003 and 2012



Based on the PCB inventory it is recommend that

- the inventory of PCB should be further continued with identification of transformers with industrial ownership, registration of capacitors and PCB wastes;
- self accounting/registration of PCB containing equipment has to be implemented by law;
- guidelines for environmentally sound management of PCBs should be developed and their use shall be obligatory;
- phase-out plans should be developed for the identified PCB-containing equipment, particularly for those that cannot be cleaned, retrofilled and further used;
- enforcement of the PCB related new regulatory measures should be strengthened;
- monitoring frequency of PCB presence in the environment should be increased.

3.3. Assessment of POP-PBDEs (Annex A, Part IV and Part V chemicals) and HBB (Annex A, Part I chemicals)

The first PBDE inventory was developed according to the "Guidance on inventory of polybrominated diphenyl ethers (PBDEs) included in the Stockholm Convention on Persistent Organic Pollutants". The inventory estimated the PBDE amount in polymers used in cathode ray tube (CRT) televisions and computer monitors produced before 2005. The inventory also assisted identifying the stakeholders and industrial sectors related to PBDEs.

In order to determine the availability of data on electrical and electronic equipment (EEE) and waste electronic and electric equipment (WEEE) in the country a decision was made to conduct an initial assessment. The Working Group members contacted representatives of relevant ministries and requested information. Since it was established that the inventory of above mentioned EEE devices was not carried out previously, it was decided to establish the minimum possible amount of PBDEs through calculation method using statistical data on availability of EEE devices per capita, data on import of appropriate types of equipment, demographic data, etc. For a more accurate assessment the calculations were done using two different approaches. The data obtained by the two assumption methods were comparable (the discrepancy was insignificant).

3.3.1. Assessment of PBDEs in CRT TV and computer monitors

According to statistics, in 2000 there were 90 televisions per 100 families. The number of PC monitors in families was 1% in 2000. The average number of members in the family was 4 people. The population figure for RoA in 2000 was 3,221,100 people. According to the statistical data for the period of 2001-2005 the following quantity of CRT monitors was imported to RoA:

2001	38,737 pcs.
2002	69,854 pcs.
2003	36,589 pcs.
2004	44,900 pcs.
2005	45,121 pcs.
TOTAL:	235,201 pcs.

Based on the following data the PBDE inventory is presented in Table 3.3.1-1. The estimated total PBDE quantity is between 6.316 and 21.598 tons with a mean value of 18.44 tons. In our further analysis we used the mean PBDE figure. According to the inventory guidance in CRT sets mostly commercial p-octa BDE was mostly used. It is a mixture of 11% hexa-, 43% hepta- and 35% octa BDEs. The cumulative PBDE quantities are presented in Table 3.3.1-1, where the slow accumulation of PBDEs can be observed.

Consequently to the PBDE content in CRTs, where recycling and final disposal activities have not been estimated, we can conclude that PBDE is present in the EEE and WEEE. Its amount is declining in the in-use equipment and vehicles, but probably increasing in the wastes.

Table 3.3.1-1: **PBDE content of CRT monitors and TV sets in RoA**
(historical up to 2000, import between 2001-2005)

Year / (kg)	Historical (up to 2000)	2001	2002	2003	2004	2005	Total
M min PBDE (kg)	4 781.52	252.76	455.80	238.74	292.97	294.41	6 316.21
M max PBDE (kg)	13 959.84	737.94	1 330.72	697.02	855.35	859.56	18 440.42
M mean PBDE (kg)	16 350.61	864.32	1 558.62	816.39	1 001.83	1 006.76	21 598.53
M min hepta-BDE (kg)	2 056.05	108.69	195.99	102.66	125.98	126.60	2 715.97
M max hepta-BDE (kg)	6 002.73	317.31	572.21	299.72	367.80	369.61	7 929.38
M mean hepta-BDE (kg)	7 030.76	371.66	670.21	351.05	430.79	432.91	9 287.37
M min hexa-BDE (kg)	525.97	27.80	50.14	26.26	32.23	32.39	694.78
M max hexa-BDE (kg)	1 535.58	81.17	146.38	76.67	94.09	94.55	2 028.45
M mean hexa-BDE (kg)	1 798.57	95.08	171.45	89.80	110.20	110.74	2 375.84
M min octa-BDE (kg)	1 673.53	88.47	159.53	83.56	102.54	103.05	2 210.67
M max octa-BDE (kg)	4 885.95	258.28	465.75	243.96	299.37	300.84	6 454.15
M mean octa-BDE (kg)	5 722.71	302.51	545.52	285.74	350.64	352.37	7 559.48

Plastic recycling activities could not be thoroughly investigated in the first preliminary inventory of PBDEs, thus it is premature to decide whether there is a need for registering an exemption for the use of PBDE in recycling activities.

It is recommended that

- the PBDE inventory is developed in detail, including chemical analysis to confirm the presence of PBDEs in EEE, WEEE, vehicles and recycling activities;
- the national laboratory capacity for the analysis of PBDEs is strengthened.

3.4 Assessment with respect to Annex B chemicals (DDT)

Until 1980 Chlorobenzene was manufactured in “Nairit” industrial plant and was mainly used as a solvent. Production capacity was 6,000 tons annually. Chlorobenzene was used as raw material for production of DDT. Limited amounts were manufactured until 1962 at “Khimreactiv” (“Chemical Reagents”) plant for application in Armenia. They produced approximately 50 tons per year. DDT was mainly used in the agriculture until 1970, when in the former USSR and in Armenia as well DDT application was prohibited in the agriculture.

DDT has been banned since 1971 and its last batches arrived in 1978. Some of the former stocks may still be found in former storage locations. For further information on obsolete stocks, please consult chapter 3.7.

DDT has formerly been used for malaria vector control (against malaria carriers). Ministry of Health used to have stocks of DDT for spraying and for a security reserve for outbreaks. The use of DDT for malaria vector control has stopped and all stocks have been removed. Currently, Ministry of Health does not have emergency stocks of DDT for use in case of malaria outbreaks

As DDT is not used for Malaria vector control in RoA, the country has not filed for any exemptions to the Stockholm Convention in this regard.

Despite the prohibitive actions taken, the residual amounts of DDT continue to be revealed in environmental media (soil, surface water, water of Sevan Lake), foodstuffs and humans. The concentration of DDT and DDT derivatives continue to decline. More detailed information on monitoring of DDT is presented in chapter 3.1.

The focus of the DDT related interventions of this NIP is as follows:

- ↳ Continuous monitoring of DDT and its metabolites in the environment and humans,
- ↳ Removing the stocks of obsolete pesticides from the former warehouses and remediation of the contaminated sites.

3.5. Assessment of PFOS, its salts and PFOSF (Annex B, Part III chemicals)

Because of their unique lipophobic and hydrophobic properties perfluorooctane-sulfonate, perfluorooctane-sulfonylfluoride and related chemicals have been widely used in the production of different industrial and consumer goods. Due to their widespread use and extreme resistance to environmental breakdown, these chemicals can be found practically everywhere. Scientific research proved their persistence, toxicity and bioaccumulation, therefore they have been added to the list of Annex B of The Stockholm Convention in 2009.

In RoA PFOS and related chemicals have never been produced. PFOS inventory includes the estimation of the PFOS content of locally produced, imported and exported goods. The sum of imported and locally produced goods minus the exported goods provides the amount of PFOS containing goods that were used in the country. The inventory estimated the PFOS content of the raw materials. These chemicals appear in the final products of the supply chain, such as in different consumer goods (paints, varnishes, washing detergents, furniture, electric and electronic equipment etc.), some industrial products (electric and electronic parts and raw materials, fire extinguisher additives etc.) typically in a concentration of 0.01 – 0.05 %. Due to the economic and industrial situation of the country, most part of these products are imported. The following table shows the rate of import, export, production and use of PFOS between 1998 and 2012 (Table 3.5-1).

It should be noted that the PFOS content of locally produced consumer goods is also based on statistical data and assumptions. It does not mean that PFOS have been imported to RoA and used during the manufacture of these goods, rather that PFOS might have already been in the raw material the Armenian industry uses to produce these goods.

Table 3.5-1: PFOS content of locally produced, imported and exported goods between 1998 and 2012

Year	PFOS content of locally produced goods (tons)	PFOS content of imported goods (tons)	PFOS content of exported goods (tons)	PFOS content of remaining goods (Use) (tons)
1998	0.2	5.39	0.52	5.07
1999	0.5300	n.d.	n.d.	0.5300
2000	0.2220	11.3700	2.0950	9.4950
2001	0.2900	3.2900	1.5500	3.1350
2002	0.5467	9.6780	0.3520	9.9047
2003	0.4830	4.8880	0.2720	5.0990
2004	0.5030	9.4280	0.3050	9.6260
2005	0.7790	15.3890	0.3460	15.8220
2006	0.9850	17.8470	0.6440	18.1880
2007	1.8400	11.8930	0.3600	13.3730
2008	1.2400	16.9000	0.4450	17.6950
2009	1.3100	14.4400	0.6800	15.0700
2010	1.3500	19.8200	0.6600	20.5100
2011	2.2000	17.5800	0.4600	19.3200
2012	1.3900	19.2200	1.3600	19.2500

A steady growth can be observed in the use of PFOS, which in the past decade more than doubled (Figure 3.5-1). The import and the use trend lines follow each other representing that most of the PFOS used in RoA is imported. Production and export remained steady, approximately 1-2 tons annually, over the past decade.

Analysis of the sectors that use PFOS and its salt shows that 70% (13 tons) of PFOSs is used in the textile and upholstery sector such as furniture, mattresses, pillows and similar products (Figure 3.5-2, Table 3.5-2).

The second largest user of PFOSs is the coating and additive industry with 13% (2.5 tons) and the third largest user of PFOSs is the other sector which mainly includes consumer goods like washing detergents, sanitary and household items, and antioxidants. The use of PFOSs in the latter sector is not allowed as per Part III of Annex B of the SC.

Figure 3.5-1: Time trend of Import, export, production and use of PFOS in RoA

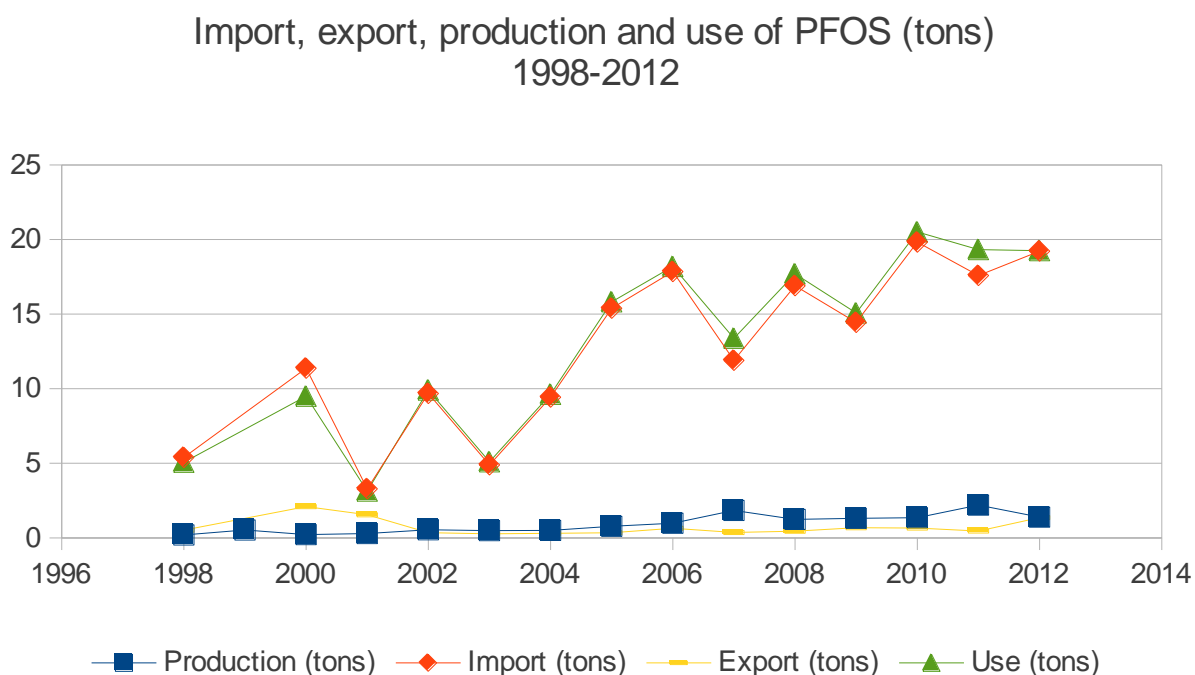


Figure 3.5-2: PFOS use in 2012 in different sectors

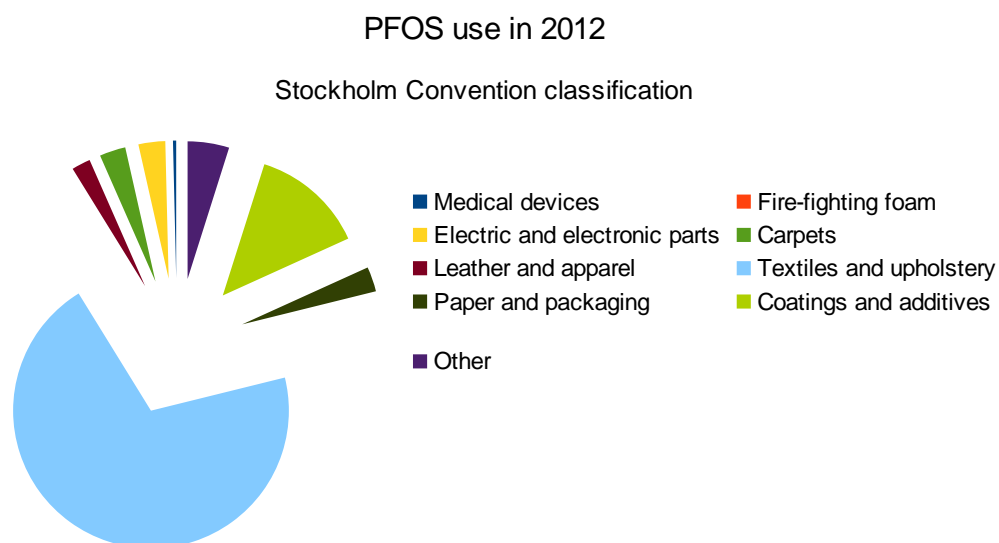


Table 3.5-2: PFOS use in 2012 in different sectors

Source sector	Use (tons)	Use (%)
Photo-imaging	0,03	0,15
Medical devices	0,07	0,38
Fire-fighting foam	0,00001	0,00
Electric and electronic parts	0,6	3,14
Carpets	0,58	3,06
Leather and apparel	0,42	2,20
Textiles and upholstery	13,32	69,96
Paper and packaging	0,56	2,92
Coatings and additives	2,53	13,31
Other	0,93	4,87
Total	19,04	100

The PFOS inventory exercise also estimated the generation of the PFOS containing wastes. Time trend analysis of the most significant sectors is presented in the Table 3.5-3 and Figure 3.5-3. The most prevalent disposal in RoA is dumping, therefore the PFOS content of the disposed of articles and consumer goods can easily be available for environmental transport.

Table 3.5-3: **Disposal of PFOS containing goods in RoA between 1997 and 2012 (tons)**

Year	Artificial paints and varnishes	Washing detergents (except soaps)	Carpets and other floor covering products	Coats and jackets of textile	Electrical generators and motors	Electric transducers (changers)	Furniture, matrasses, pillows	Total
1997		0.11	0.39		0.05	0.01	0.65	1.21
1998	0.11	0.05	0.27		0.04	0.54	2.45	3.45
1999	0.14	0.17	0.25		0.25		0.45	1.26
2000	0.03	0	0.27		0.01	0.71	3	4.02
2001	0.88	1.02	0.25		0	0.84	8	10.99
2002	2.16	0.97	0.22		0	0.09	6.75	10.2
2003	2.7	0.54	0.4		0	0.16	5	8.8
2004	2.9	1.3	0.4		0	0.11		4.72
2005	3.07	6.43	0.37		0	0.08		9.95
2006	4.13	7.06	0.38		0.16	0.78		12.51
2007	14	5.5	0.1	0.6	0.5	0.5	0.4	21.6
2008	18	4.1	0.5	1.1	0.4	0.2	0.8	25.1
2009	19	4.3	0.8	0.9	0.2	0.2	0.7	26.1
2010	20.5	4	0.2	1.7	0.3	0.05	1.4	28.15
2011	20.7	3.9	0.3	2	0.5	0.01	1.1	28.51
2012	19.7	3.5	0.2	1.5	0.4	0.07	2.9	28.27

Since 2004 the disposed amount of PFOS containing goods and articles has increased from nearly 5 to 28 tons annually. This is approximately 500% increase in eight years. The most significant increase happened from 2004 to 2008, then the growth has slowed down probably because of the global economic crises.

In 2012 approximately 80% of the PFOS waste stream was paints and varnishes. The second most prevalent PFOS waste stream is detergents, and since 2011 furniture and upholstery items have also been disposed of in higher and higher amounts.

Looking at the PFOS content of the wastes which were disposed of between 1997 and 2012 (Table 3.5-4; Figure 3.5-4) we can observe the same trend what we could see in the case goods and articles.

Since 2004 there is a steady growth in the PFOS amount that was landfilled. The share of paints have dramatically increased. Since 2009 the share of PFOS of upholstery origin is also increasing. These are the two sectors that would require attention and actions from the government.

Figure 3.5-3: Disposal of PFOS containing goods in RoA between 1997 and 2012

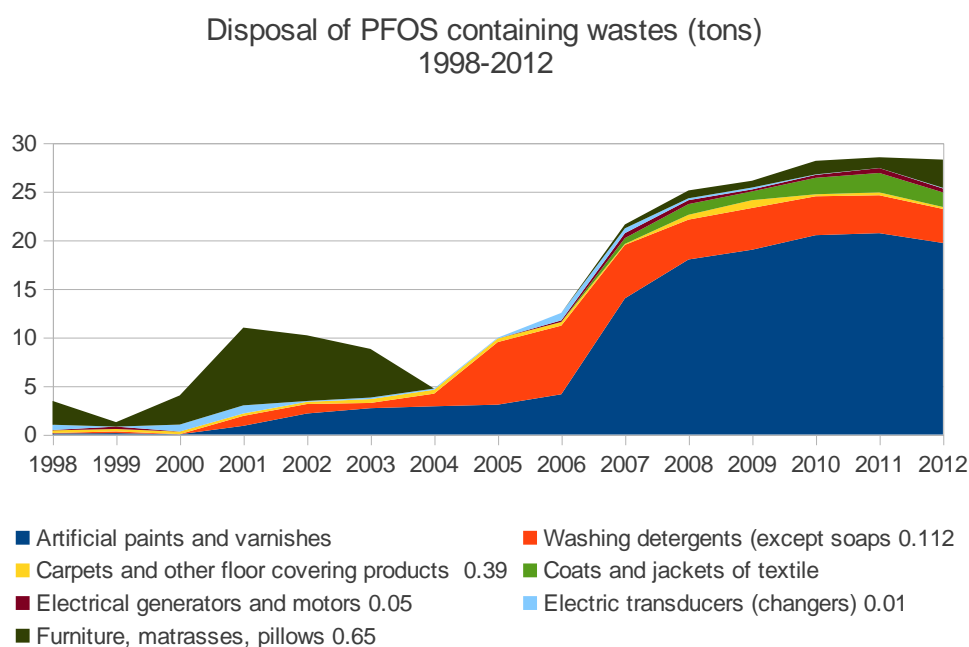
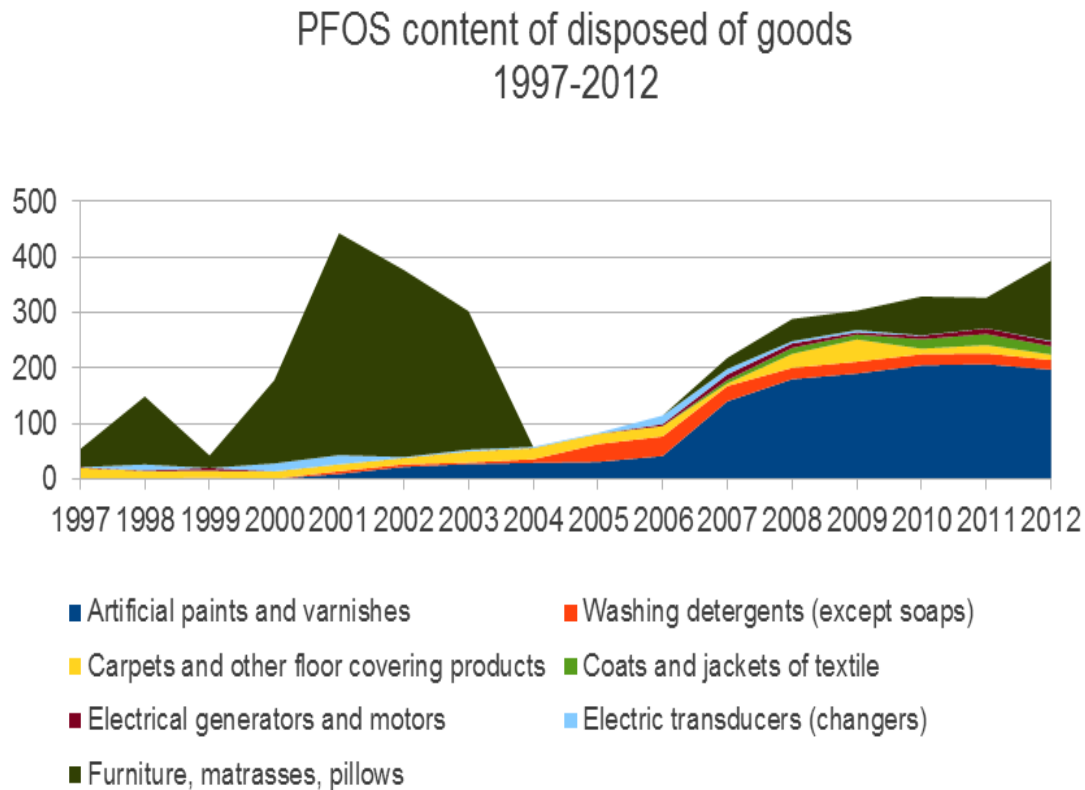


Table 3.5-4: PFOS content of disposed of goods between 1997 and 2012 (in kg)

Year	Artificial paints and varnishes	Washing detergents (except soaps)	Carpets and other floor covering products	Coats and jackets of textile	Electrical generators and motors	Electric transducers (chargers)	Furniture, mattresses, pillows	Total
1997	0	0.56	19.5	0	1	0.2	32.5	53.76
1998	1.05	0.25	13.3	0	0.82	10.8	122.5	148.72
1999	1.38	0.87	12.6	0	5	0	22.5	42.35

Year	Artificial paints and varnishes	Washing detergents (except soaps)	Carpets and other floor covering products	Coats and jackets of textile	Electrical generators and motors	Electric transducers (changers)	Furniture, mattresses, pillows	Total
2000	0.25	0.02	13.3	0	0.26	14.2	150	178.03
2001	8.84	5.09	12.5	0	0.02	16.7	400	443.15
2002	21.58	4.86	11.2	0	0.08	1.74	337.5	376.96
2003	27	2.7	20	0	0.04	3.1	250	302.84
2004	29	6.5	20	0	0.08	2.24	0	57.82
2005	30.66	32.17	18.5	0	0.02	1.63	0	82.98
2006	41.3	35.3	18.9	0	3.26	15.6	0	114.36
2007	140	27.5	5	6	10	10	20	218.5
2008	180	20.5	25	11	8	4	40	288.5
2009	190	21.5	40	9	4	4	35	303.5
2010	205	20	10	17	6	1	70	329
2011	207	19.5	15	20	10	0.2	55	326.7
2012	197	17.5	10	15	8	1.4	145	393.9

Figure 3.5-4: **PFOS content of disposed of goods between 1997 and 2012**



The recent inventory shows that the most part of PFOS and PFOS containing products are imported to RoA mostly as consumer goods. Considering the increasing demands of the population as well as the existing industrial capacities, without specific regulatory measures no significant changes are expected in this trend. It can also be concluded that regulatory measures are necessary to investigate whether PFOS and related chemicals are present in consumer goods people use regularly like washing detergents and reduce, where feasible eliminate, the import of PFOS containing products.

Based on the use of PFOSs in 2012 (Figure 3.5-2) the following exemptions should be requested for PFOS under the Stockholm Convention:

- acceptable purposes: photo imaging, medical devices; aviation fluids;
- specific exemptions should be requested for electric and electronic parts, carpets, leather and apparel, textiles and upholstery, paper and packaging, coatings and additives sectors.

The use of PFOS can realistically be stopped/banned in fire-fighting foams, the paper and packaging and carpets sectors. Measures should be implemented to reduce the use of PFOSs in the textile and upholstery industries as they are the largest consumers of PFOSs. The use of PFOSs in the “other sector” such as consumer goods, detergents, antioxidants, etc, should be banned in case further analytical investigations confirm the use of these chemicals.

PFOS related measures should:

1. Start with development of a detailed inventory including analytical confirmation of PFOS and related chemicals use in RoA;
2. File for acceptable purpose and specific exemption for the use of PFOS in identified sectors;
3. Introduce regulatory control on the import and export of PFOS containing products and chemicals;
4. Ban the use of PFOSs in detergents, beauty products, household chemicals and antioxidants;
5. Develop a phase-out plan for PFOSs from fire-fighting foams, paper and packaging applications and the carpet sector;
6. Provide public awareness on the environmental and health risks of PFOS and related chemicals;
7. Strengthen enforcement bodies, such as customs, environment and health inspectorates; and
8. Strengthen monitoring bodies including laboratories for the PFOS related duties.

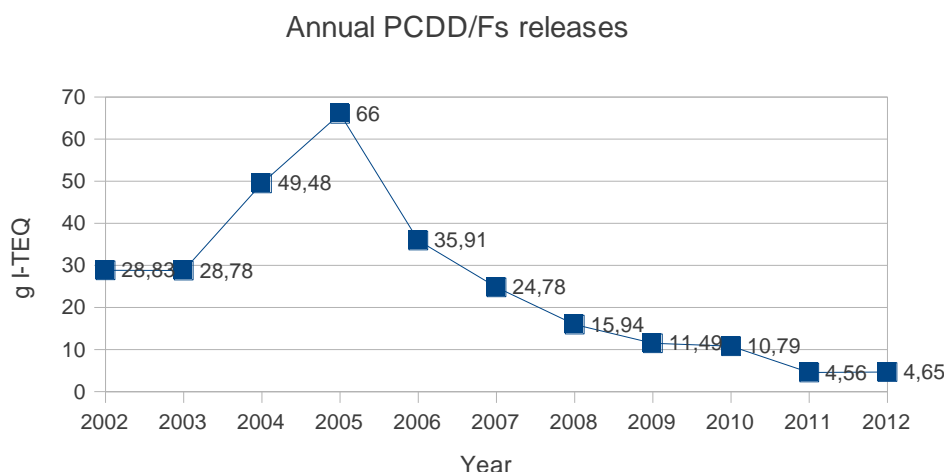
3.6. Assessment of releases from unintentional production of Annex C chemicals (PCDD/PCDF, HCB, PCBs and PeCB)

The release of Annex C chemicals is generated by thermal processes in the presence of organic materials and chlorine at appropriate temperature or in alkaline chemical reactions involving elemental chlorine. Since the first NIP published in 2005 the Parties to the Stockholm Convention have added Pentachlorobenzene to the list of Annex C chemicals. This inventory uses the methodology of the „Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases” prepared by UNEP Chemicals – further referred to as the toolkit - to identify and quantify sources of Annex C POPs releases. The inventory uses the dioxin and furan releases to indicate the releases of all Annex C POPs such as polychlorinated dibenzo-*p*-dioxins (PCDD) and dibenzofurans (PCDF), Hexachlorobenzene (HCB), and polychlorinated biphenyls (PCB) and Pentachlorobenzene (PeCB).

Since the first NIP was published the Toolkit has been revised several times and the emission factors have been changed insignificantly for many sectors. This inventory is based on the January 2013 edition of the Toolkit and presents the release pattern and trend of Annex C chemicals in RoA since 2002.

Dioxin and furan and other Annex C POPs releases have increased from 2002 to 2006. Since 2006 there is a steady decline in their releases. It is probably due to the global economic crisis and the shutdown of the incinerator of the rubber facility “Nairit” (Figure 3.6-1, Table 3.6-1). The highest release was observed in 2005, when it reached to 66 g I-TEQ. From 2006 to 2012 the estimated UPOPs releases have been reduced by 93% to 4.65g I-TEQ.

Figure 3.6-1: PCDD/Fs release trend between 2002 and 2012



The most significant source group was initially, up to 2011, waste incineration. Since 2011 open burning processes became the second most important source of UPOPs releases as waste incineration has stopped in RoA.

Table 3.6-1: Release trend of PCDD/Fs since 2002

	Source Groups	Annual Releases (g TEQ/a)										
		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Waste Incineration	15.91	7.99	19.33	41.06	16.46	19.80	12.54	7.39	6.16	0.00	0.00
2	Ferrous and Non-Ferrous Metal Production	9.41	9.07	13.86	14.39	0.01	1.02	0.06	0.02	0.01	0.02	0.01
3	Heat and Power Generation	0.06	0.06	0.06	0.07	1.20	1.24	1.27	1.21	1.26	1.45	1.55
4	Production of Mineral Products	2.27	1.97	2.55	3.12	0.24	0.29	0.21	0.27	0.26	0.29	0.03
5	Transportation	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	Open Burning Processes	1.13	9.62	13.59	7.29	17.13	2.07	1.46	2.24	2.22	2.55	2.27
7	Production of Chemicals and Consumer Goods	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	Miscellaneous	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	Disposal	0.05	0.08	0.09	0.07	0.87	0.37	0.39	0.36	0.88	0.25	0.78
10	Identification of Potential Hot-Spots	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1-10	Total	28.8	28.8	49.5	66.0	35.9	24.8	15.9	11.5	10.8	4.6	4.7

Further investigation of the source groups concluded that the second highest PCDD/Fs source is disposal operations. It has increased by 12% in six years, roughly 2% per annum (Figure 3.6-2). The most likely reason behind it is the increase of the population. PCDD/Fs releases from waste incineration has declined since 2007 and since 2011 it has been estimated as “0” because the rubber factory “NAIRIT” that operated the incinerator slowly declined its activities and finally stopped their operation. The RoA has significant mining industry and several ferrous and non-ferrous small and medium scale industries are present. This inventory exercise could not collect detailed information on the production specifications and technologies of these industries between 2006 and 2012. The contribution of other source groups to the PCDD/Fs releases is negligible.

The most significant PCDD/Fs release route is via air emission which is followed by releases to residues; the third is water and fourth is land depositions. Releases to products were found to be negligible (Figure 3.6-3).

Approximately 79% of the Annex C POPs is released to the air. Because air can transport pollutants large distances this release route requires strong attention in future planning. The inventory also concluded that 18% of the releases is to residues. These two release routes show strong decline as waste incineration has stopped in RoA. Releases to water increased in the past six years mainly due to increased sewage generation and better statistical reporting (Figure 3.6-4).

Figure 3.6-2: PCDD/Fs release trends in source groups

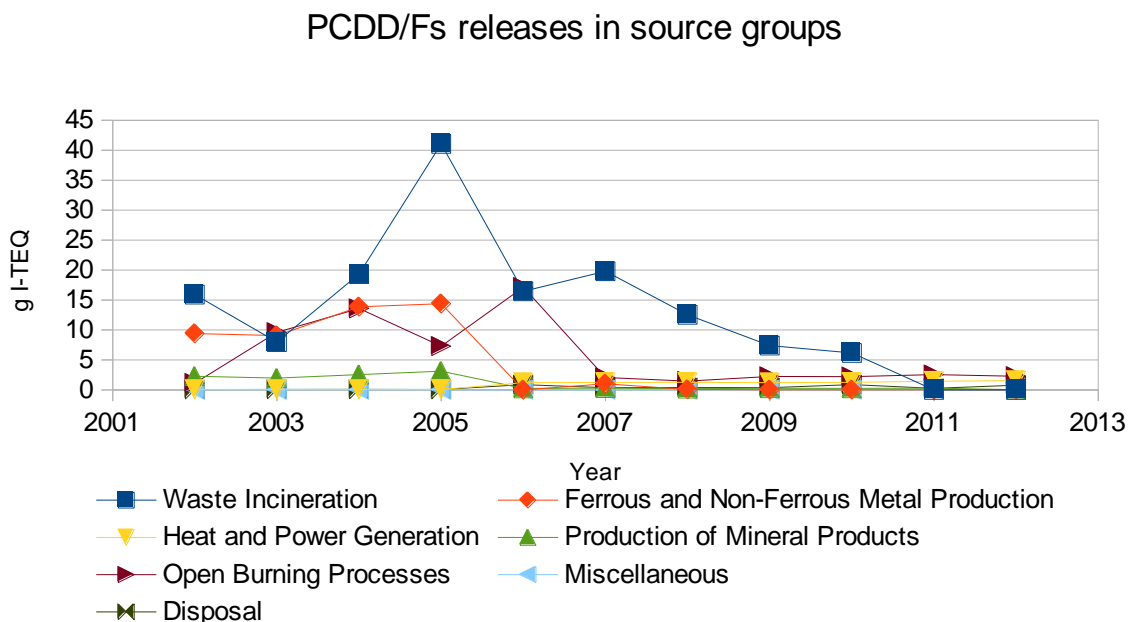


Figure 3.6-3: PCDD/Fs releases into various environmental matrices

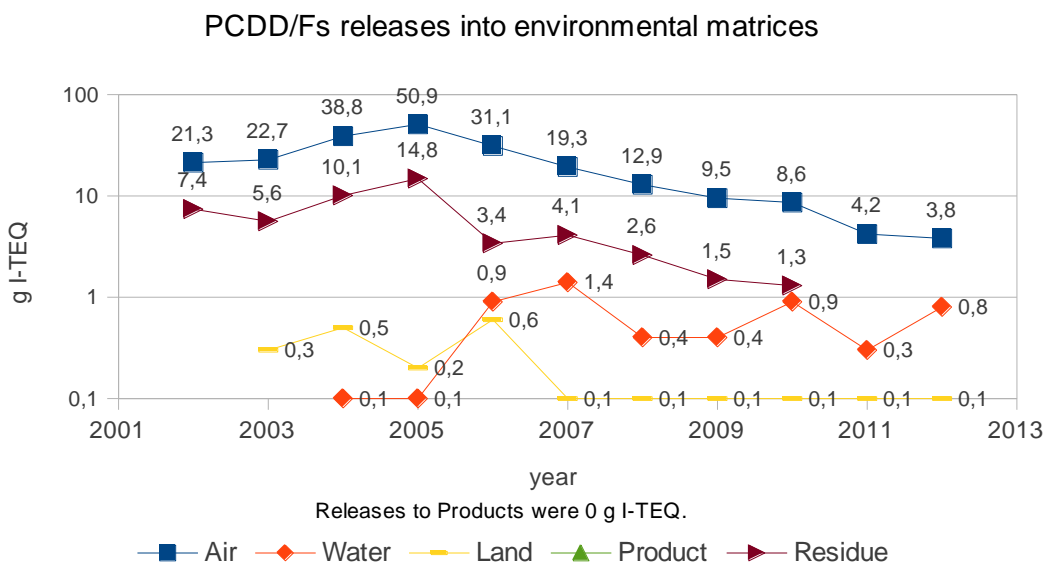
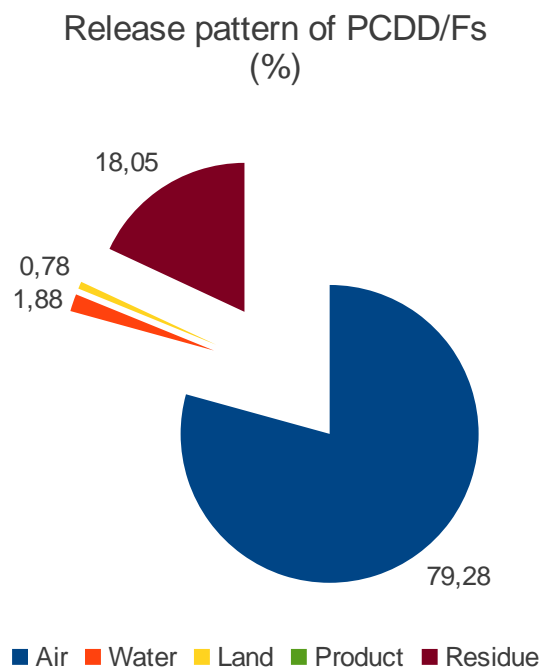


Figure 3.6-4: Release pattern of Annex C POPs



Within the open burning source group fires at waste dumps is the most important source for PCDD/Fs releases.

Other important sources are:

- agricultural residues burning in the field;
- forest/bush fires;
- open burning of household wastes.

➤ Fires at dumpsites

Fires happen commonly in both municipal landfills and on illegal waste dumpsites. This is the main sources of dioxin and furan pollution. Deep fires occur constantly at almost all dumpsites, and practically it is impossible to extinguish them. These landfills regularly contain significant amounts of polyvinyl-chloride as well as PCB-s. The concentration of PCBs in different dumpsites varies from 22.3 to 369.9 mcg/kg of waste. During the burning of these chemicals dioxins and other hazardous compounds may be generated, polluting various environmental media, mostly air. From the polluted areas migration of hazardous compounds take place into underground and surface waters, plants, agricultural products. These pollutants can enter and bio-magnify in the food chain and subsequently expose wildlife and humans.

Table 3.6-2 demonstrates that PCDD/Fs releases continuously increase from dumpsite burning. Some fluctuation in the amount of waste and therefore the Annex C POPs load can be observed. Due to the recent modification in the emission factors of the toolkit release estimates in this sector has changed significantly. In order to better understand the pollutant release trends release estimates of the first NIP has been recalculated with the new emission factors. The table demonstrates the release estimates with both the old emission factors of the first NIP and the new emission factors.

Table 3.6-2: Dioxin emission caused by fires at dumpsites

Year	Amount of waste, t	Emissions, g TEQ/year	
		According to UNEP Toolkit	
		2013	
		air	land
2002	2 756	0,827	0,028
2003	30 203	9,261	0,302
2004	42 893	12,868	0,429
2005	22 369	6,711	0,224
2006	54 072	16,222	0,541
2007	5 569	1,671	0,056
2008	3 767	1,130	0,038
2009	6 418	1,925	0,064
2010	6 376	1,913	0,064
2011	7 494	2,248	0,075
2012	6 546	1,964	0,065

The second most significant source of PCDD/PCDF releases in open burning sector is the forest and bush fires. The figures vary considerably, probably

due to drier or rainy summers, but since 2010 a steady decline is observed which might be due to better fire response measures.

Table 3.6-3: PCDD/PCDF releases of forest/bush fires (calculated with UNEP Toolkit 2013 emission factors)

Indicator	2006	2007	2008	2009	2010	2011	2012
Amount of burnt biomass, (t)	3680	125	228	299	9077	5240	3082
Dioxins release to air TEQ/year	3.68	0.125	0.228	0.299	9.077	5.240	3.082
Dioxins release to soil TEQ/year	0.552	0.0187	0.0342	0.0448	1.362	0.768	0.462

➤ **Agricultural residue burning in the field**

In the past six years there has been no significant changes in the amount of burned agricultural residues, therefore the releases are in the same range (Table 3.6-4.). This is due to the fact that the size of agricultural land and farming practices has not changed. The inventory assumed that burnings happen on approximately 56-57% of the cultivated area and the amount of burned biomass is 2.5 t/ha. The contribution of this sector to the total PCDD/Fs releases is less important.

Table 3.6-4: PCDD/PCDF releases in agricultural residue burning (calculated with UNEP Toolkit 2013 emission factors)

Indicator	Values						
	2006	2007	2008	2009	2010	2011	2012
Area covered by agricultural residue burning, ha (56%)	173.6	171.36	170.52	168.0	158.82	160.55	170.35
Burnt biomass, thousand tons	434.0	428.4	426.3	420.0	397.05	401.37	425.88
Emission, mg TEQ/ year, air	217.0	214.2	213.15	210.0	198.52	200.68	212.94
Emission, mg TEQ/ year, land	21.70	21.42	21.315	21.0	19.85	20.07	21.294

➤ **Open burning of household (domestic) wastes**

Open burning is the most inexpensive, easy-to-implement and fastest mean to destroy household wastes. This is especially true for people who live in remote areas, where waste collection is scarce or for those, who still live a traditional farm life-style. Nevertheless, open burning of household wastes is an environmentally unacceptable way of waste disposal, at which chemicals listed in Annex C of the Stockholm Convention, as well as other pollutants are generated. Particularly when plastics have reached even the most remote locations on earth.

Of course, when sanitary-hygienic removal of wastes is required in order to fight diseases or pests then open burning is necessary provided there are no alternative ways of disposal. Household wastes should not be burned in household conditions like in kitchen stoves, fireplaces, ovens or furnaces. Despite the character of burnt materials open burning is always accompanied by smoke and unpleasant smells, odours, irritation and might be hazardous for human health.

Dioxins generation at household wastes burning depends on wastes composition and combustion conditions. These factors might vary to a very wide extent. For estimating the releases those emissions factors were selected which are closest to the composition of waste and burning conditions.

In RoA, as a rule, unsorted wastes are burnt which includes combustible (flammable) materials and glass, ceramics, food waste, tins and aluminum cans, different types of plastics, packaging materials, paper, cardboard (carton), textile fabrics and other combustible wastes.

The inventory is based on the data from the National Statistical Service. As a rule, in RoA household wastes are not recycled and are entirely burnt in bonfires at random places, sometimes near the residential buildings. Therefore, open burning should be minimized or eliminated, where possible. The reason for this decline is due urbanization, when citizens move from villages to cities where they cannot burn their waste at the backyards.

Still the inventory estimate observed a steady decline of the pollutant releases from this sector. It has roughly been reduced by one order of magnitude, which is a success (Table 3.6-5).

The Annex C POPs inventory concluded that UPOPs releases are increasing in RoA which is contradictory to the obligations under the Stockholm Convention. The most important source of UPOPs releases is still open burning activities particularly open burning of wastes at dumpsites. It has approximately doubled in the past six years, while other corresponding sectors, such as waste incineration, have declined. Open burning of waste at dumpsites is responsible for more than 90% of the total Annex C POPs releases in RoA.

The 96% of the POPs pollutants are released into the air and thus are available for long range and transboundary movement. At present, the pollution generation of industrial and point sources is still shifting towards non-industrial, diffuse pollution sources. These sources can only be efficiently

controlled if coherent regulatory, enforcement and investment schemes are put in place.

Table 3.6-5: **PCDD/PCDF releases in domestic waste burning (calculated with UNEP Toolkit 2005 and 2013 emission factors)**

Year	Amount of waste	Emissions, mg TEQ/year			
		air		land	
		UNEP 2005	UNEP 2013	UNEP 2005	UNEP 2013
2006	2284.1	685.23	91.364	1370.40	2.284
2007	2513.6	754.08	100.544	1508.16	2.514
2008	1462.4	438.72	58.496	877.44	1.462
2009	463.1	138.93	18.524	277.86	0.463
2010	300.3	90.09	12.012	180.18	0.300
2011	17.3	5.19	0.692	10.38	0.0173
2012	167.4	50.22	6.696	100.44	0.1674

Taking into consideration the results of the previous inventory (NIP 2005) and the current inventory findings our conclusion is that the measures RoA has been undertaking for the release reduction of UPOPs are inefficient.

In order to continue the release reduction trend, we have observed, it is recommended to introduce measures to achieve further release reduction in open burning of dumpsites. These measures may include but not limited to

- introducing new regulatory measures for municipal waste management and banning open burning;
- promoting investments for improved municipal waste management infrastructures;
- providing incentives, benefits aimed at reducing the volume of wastes exposed to open burning, supporting recycling activities;
- implementing better municipal waste management practices and undertake pilot studies;
- strengthening enforcement;
- introducing increased fines for open burning; and
- providing trainings, and awareness-raising for the public at large to discourage open burning.

3.7. Information on the state of knowledge on POPs stockpiles, contaminated sites and wastes, identification, likely numbers, relevant regulations, guidances, remediation measures, and data on releases from sites

Obsolete pesticides, PCB and other industrial POPs stocks pose serious and long-term threat for human health and the environment at both local level and on the global scale. The problem of obsolete pesticides stocks and waste industrial POPs is aggravated by the lack of necessary financial resources, absence of efficient and environmentally sound technologies, and capacities for their destruction in RoA.

3.7.1. POPs pesticides

According to research performed by public health (sanitary) service of Armenia in 1960s OCPs as DDT and HCH, including Lindane (γ -HCH), were found in many food samples, especially those of animal origin. The percent of detection and the concentration of the samples were high. Both soil and surface water of open reservoirs were polluted.

DDT and other OCPs of POPs group exert toxic effects to practically all living organisms and at each level of the food chain a 10-fold magnification was observed.

Despite the 40-year period of prohibition to apply OCPs from Persistent Organic Pollutants (POPs) group in agriculture, they are still present in environmental media (matrices) and in foodstuff. This latter is explained by their long persistence, preservation in soil and secondary pollution of the ground layer of air followed by their subsequent air-transfer to considerable distances.

In RoA the areas contaminated by organochlorine pesticides are former warehouses and storehouses of pesticides and the surrounding sites. Former pesticides warehouses were intended to store pesticides used for plant pests' control. Until 1985 Armenia received DDT, HCH, Hexachlorobenze among the organochlorine pesticides. These products were stored in warehouses of the former administrative areas and regions. Each region had central and rural warehouses. At that time 550 warehouses were functioning in the Republic. Accumulation of organochlorine pesticides in warehouses begun after the ban of their use.

DDT was prohibited for use since 1971, but Armenia received this pesticide up to 1978. In 1978, Aragatsotn, Ararat, Vayots Dzor, Syunik, and Gegharkunik provinces received the last batches of DDT. The use of HCH was banned from 1980, but the import and storage continued up to 1985. In 1985 the last batches of HCH were delivered to all provinces with the exception of Lori and Shirak. Unused pesticides imported after the ban accumulated and over time became unfit for use.

The first NIP requested the Identification/ clarification of the amounts of obsolete pesticides stocks on the territory of RoA. In the NIP update process detailed investigation was undertaken to identify and quantify POPs stocks. All of the 550 former storage facilities, which have been used to store POPs or other hazardous pesticides, have been revisited. The condition of these storages were found to be substandard. At many locations the storages are used as cattle sheds, or storages for grains. At some locations the pesticides are still there spilled out on the ground with contaminated soils or construction materials. It is highly probable that the buildings of these storages and the surrounding environment, where the pesticides were loaded or mixed, are potential contaminated sites. This poses significant threat to the environment and humans.

Table 3.7.1-1 presents the distribution of the storage locations in RoA including the stocks of the obsolete pesticides and other potentially contaminated materials.

Table 3.7.1-1: Former pesticide storage locations and identified stocks

Regions and communities by provinces		Number of storehouses	Approximate amount of pesticides, kg	Locality
Kotayk Province		39		
1	Abovyan region	14		
2	Nairi region	13		
3	Hrazdan region	7		
4	Charentsavan region	5		
Aragatsotn Province		48	8 200	
1	Aparan region	19	2 000	Aparan
2	Aragats region	1		
3	Ashtarak region	22	6 200	Ashtarak + Oshakan
4	Talin region	6		
Gegharkunik Province		33	3 250	
1	Vardenis region	1	2 500	Vardenis 'Berriutyun'
2	Kamo region	15		
3	Krasnoselsk region	15		
4	Martuni region	1	500	Martuni + Vardenik
5	Sevan region	1	250	Gagarin
Lori Province		40	18 550	

1	Gugark region	10		
2	Kalinino region	1		
3	Noyemberian region	16		
4	Spitak region	1	100	Spitak
5	Tumanian region	3	18 450	Shnogh + Odzun
6	Stepanavan region	9		
Vayots Dzor Province		37	1 000	
1	Eghegnadzor region	23	1 000	Eghegnadzor
2	Azizbekov region	14		
Shirak Province		89	2 750	
1	Amasia region	-		
2	Ani region	15	600	Ani
3	Artik region	23	850	Artik + Anushavan
4	Akhuryan region	28	1 300	Akhuryan
5	Ghukasian region	18		
6	Gyumri region	5		
Syunik Province		41	2 750	
1	Goris region	11		
2	Kapan region	16	250	Kapan
3	Meghri region	13	500	Meghri
4	Sisian region	1	2 000	Sisian
Tavush Province		48	5 500	
1	Ijevan region	14	5 000	Ijevan
2	Noyemberian	16	500	Ayrum
3	Shamshadin region	15		
4	Dilijan region	3		
Ararat Province		89	28 700	
	Masis region	24	2 200	Masis
	Artashat region	41	6 500	Artashat
	Ararat region	24	20 000	Ararat
Armavir Province		86	69 500	
	Etchmiadzin region	45	66 500	Etchmiadzin + Jrarat
	Hoktemberyan region	35	3 500	Armavir
	Baghramyan region	6		
TOTAL:		550	140 700	

The inventory on obsolete pesticides concluded that approximately 140 700 kg obsolete pesticides are stored in various storage facilities (Table 3.7.1-2). Relatively large quantities of organochlorine pesticides were received and used in Armavir, Aragatsotn, Ararat, Lori, Syunik, and Tavush provinces.

Table 3.7.1-2: **Obsolete pesticides stocks inventory of 2012**

Province	Locality	Approximate amount of pesticides, kg	Note
Aragatsotn Province	Ashtarak	5000	
	Oshakan	1200	
	Aparan	2000	mixed pesticides
Gegharkunik Province	Vardenis "Berriutyun"	500	Pesticides mixed with construction/demolition wastes
	"Agrospasarkum" (Agroservice)	2000	Pesticides mixed and in separate bags
	Vardenik	250	grey-whitish wastes
	Gagarin	250	
	Martuni	250	
Tavush Province	Ijevan	5000	Inappropriate for use pesticides are separated
	Ayrum	500	
Shirak Province	Akhuryan	1300	
	Artik	350	Labels are unreadable
	Anushavan	500	Piles of pesticides mixed with soil
	Ani	600	
Syunik Province	Meghri	500	Pesticides mixed with construction/demolition wastes
	Kapan	250	

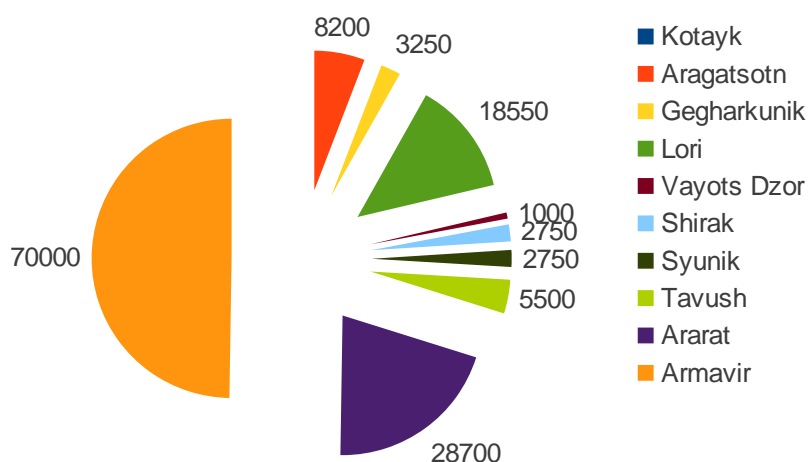
	Sisian	2000	Piles of mixed pesticides
Vayots Dzor Province	Eghegnadzor	1000	
Lori Province	Spitak	100	Pesticides mixed with construction/demolition wastes
	Shnogh	450	Mixed state
	Odzun	18000	Piles of pesticides; assortment unknown
Ararat Province	Masis	2200	
	Artashat	6500	
	Ararat	20000	
Armavir Province	Jrarat	62000	
	Armavir	3500	
	Etchmiadzin	4500	
TOTAL:		140 700	

In order to better demonstrate the distribution of the stocks in the country Figure 3.7.1-1 presents the obsolete pesticides stocks distribution in the provinces. In Armavir province alone half of the total stocks is stored, approximately 70 tons. The second most affected province is Ararat, the third is Lori province. These three provinces are still the most important agricultural regions in RoA.

The RoA lacks capacities for the final disposal of accumulated POPs in an environmentally sound manner, such as incineration or other chemical means. The elimination of these stocks through export disposal would approximately cost 4-5 USD/kg including packaging and transportation. Therefore, the elimination of these stocks, including the packaging materials, would cost approximately $150\,000 \times 5 \text{ USD} = 750\,000 \text{ USD}$.

Figure 3.7.1-1: **Obsolete pesticides stocks in different provinces in RoA**

Obsolete pesticides stocks in different provinces (kg)



3.7.2. Detailed information on obsolete pesticide stocks

In **Syunik Province** out of former 41 warehouses 26 are currently community-governed areas, 9 sites were privatized and 23 warehouses were destroyed. The areas of 7 storages are used for different purposes. For example, in Goris region Mashtun community the storehouse operates as a consumer services centre, in Vardanadzorum former pesticides storage is used as poultry yard, in Vahravar – first aid medical station, in Lichk – cattle shed. In Vaghatur community of Goris region former pesticides storehouse operates as a cattle shed.

Currently in Meghri region at the warehouse of “Berriutyun” scientific industrial association up to 450-500 kg pesticides are available being covered with building wastes of the destroyed (dilapidated) warehouse. In Kapan region at the tumble-down warehouse of “Berriutyun” scientific industrial association there are empty pesticide containers and about 850 kg grey-whitish pesticides. In Sisian region at the warehouse of “Berriutyun” scientific industrial association there are piles of approximately 2,000 kg of pesticide mixtures. Actually, in **Syunik Province** there are remaining no less than 3,350 kg of obsolete pesticides.

Formerly in **Vayots Dzor Province** there were 37 pesticide storages: 23 were in communities of Eghegnadzor region and 14 regional communities of Vayq. Eghegnadzor central warehouse was privatized and currently operates as a furniture and Eurodoors and windows factory, while the pesticides storehouse of Vayq after privatization is used as spare parts warehouse of “Vayq Group LLC”. Former warehouses are mostly destroyed, and residents of some communities find it difficult to clearly demonstrate the sites of warehouses. In

Eghegnadzor economy (“sovkhov”) warehouses there are about 1,000 kg pesticides, which are stored in bags.

Aragatsotn Province had 48 sites of pesticides storage, of which 19 were located in Aparan, 1 – in Aragats, 22 – in Ashtarak, 6 – in Talin regions. Central warehouses of Ashtarak, Aparan, Talin, Aragats are privatized. A portion of a warehouse in Ashtarak is used as a cattle shed, and the other part as a pesticide storage warehouse. There are about 4,000-5,000 kg of pesticides, but the labels are unreadable. The integrity of the pesticide bags is violated; at the warehouse there are empty metallic containers for pesticides storage. Aparan central storehouse is in a dilapidated condition and is not used. At this storage the available 1,500-2,000 kilograms of pesticides are mixed together. Aragats central storage building is destroyed, there are small quantities of pesticides piled at the storage area. In communities the storehouses are mostly privatized, but are in destroyed or dilapidated condition. For example, in Mastara, Partizak, Oshakan storehouses are dilapidated.

At Oshakan dilapidated warehouse about 1,000-1,200 kg of pesticides remain accumulated and stored in bags; the integrity of some bags is violated.

Kotayk Province had 39 storehouses: 14 in Abovyan, 13 in Nairi, 7 in Hrazdan, and 5 in Charentsavan regions. The areas of storehouses are privatized; the bulk of them are destroyed. For example, in Garni, Goght, Nor Geghi. In Kotayk province after the privatization some warehouses and their surrounding areas serve other purposes. For example, in Solak community the storehouse operates as a feed storage. In Arzakan the storehouse was reconstructed as a new building, in Abovyan the storage was refurbished and used as a manufacturing site (of metallic lids), the storehouse in Zoravan after the renovation became spare parts warehouse, in Nairi – machines-and-tractors station.

Gegharkunik Province had 33 pesticides storehouses, of which 15 were in Kamo region, 15 in Krasnoselsk and by 1 storehouse had Vardenis, Martuni, Sevan regions. In Vardenis, Martuni, and Sevan regions there were functioning by 1 central storehouses, because agricultural activities aimed at plant protection were carried out in a centralized manner by special teams. In Vardenis the warehouse belonging to “Berriutyun” scientific industrial association is privatized though being in a dilapidated condition. At this warehouse about 500 kg of pesticides are mixed with the construction waste. In Vardenis “Agrospasarkum” (Agroservice) branch, at the former agricultural/farming equipment warehouse there are totally 2,000 kg of pesticides accumulated both as certain pesticides and their mixtures; according to labeling, there are Endobactrin, Krotilin, Tur (Chlorocholine chloride - CCC). The storehouse in Vardenis and the adjacent area are privatized, the walls of storage are broken. There are about 250 kg grey-whitish pesticides wastes in this storage. The storehouse of Yeranos community is privatized; a mansion (private house) is built on the site.

Inter-regional base in Gagarin – pesticides allocated to **Gegharkunik Province** were stored in warehouses of this former base, wherefrom pesticides were moved to regional warehouses. Warehouses are privatized. About 250 kg of pesticides are available in stock. Martuni pesticides warehouse is destroyed. At the site there are about 250 kg of pesticides. Noraduz pesticide storage is privatized and the building is in a dilapidated

condition, there are no traces of pesticides in stock. In Krasnoselsk and Chambarak pesticides storehouses are dilapidated. There are no pesticides in those storehouses.

Tavush Province: Formerly in this area 48 pesticide storehouses operated, including 14 in Idjevan, 16 in Noyemberian, 15 in Shamshadin, and 3 in Dilijan regions. Idjevan inter-regional base located in Digavan is privatized. In pesticide storage adjacent area there are 4,500-5,000 kg of pesticides. In Achajur community pesticides were stored under the shelter. Currently, the area is privatized, there are small piles of remaining pesticides. The pesticide storage at Ayrum station is privatized, the building is in dilapidated condition. There are about 450-500 kg of pesticides, some of which are in bags. There are mixtures of different pesticides, as well as pesticides piles mixed with building materials. In Touz community of Tavush province store was destroyed. The main part of pesticides was burned. The area is community property. The storehouse space in Voskevan community is privatized; currently it is used as a vegetable garden.

Shirak Province: In the past 89 pesticide storages were functioning in this area; there were 15 storehouses in Ani, 23 in Artik, 28 in Akhuryan, 18 in Ghukasyan, and 5 storages in Gyumri. In Akhuryan pesticide storage was in a shed (hangar)-like building, which was privatized. In a part of storage there are nearly 1,300 kg of pesticides, and the remaining area is used as a spare parts warehouse. Artik pesticide storage warehouse is privatized and used as a workshop, with about 350 kg of pesticides accumulated in a corner. Panik community warehouse is privatized and used as a cattle shed. Anushavan community storage of pesticides is destroyed. In the stock some 500 kg of soil-mixed pesticides are available. At Ani storehouse of “Berriutyun” scientific industrial association there are approximately 600 kg of pesticides.

Lori Province: In this area 40 pesticide storehouses were functioning, including 10 in Gugark, 16 in Noyemberian, 3 in Tumanyan, 9 in Stepanavan, by 1 in Kalinino and Spitak regions. The former warehouses of Lori province are mainly destroyed. In some destroyed warehouses pesticides remain; for example, at Spitak branch of “Berriutyun” Scientific-industrial association about 100 kg of pesticides are mixed with construction debris. In destroyed warehouse of Shnogh there are approximately 450 kg of mixed pesticides. The storehouse of Tumanyan branch of “Berriutyun” Scientific-industrial association is located in Odzoun community, the walls of storage are demolished. In the warehouse there are piles of torn bags of pesticides. At the storage space near 15,000-18,000 kg of pesticides are available; the assortment of pesticides not known, because the labels are unreadable. Stepanavan storage of pesticides is under dilapidated condition, there still remain small quantities of pesticides.¹

3.7.3. Potential Pesticides Contaminated Sites

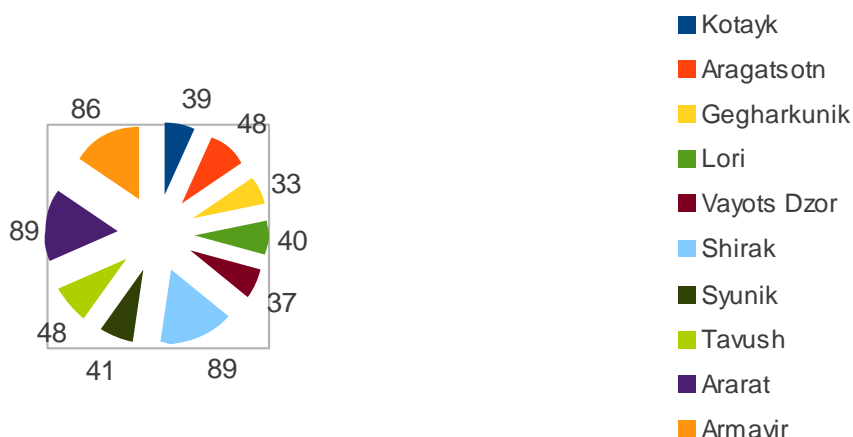
The previous chapter provided detailed information on the former pesticide storage locations and on their condition. Because the inventory exercise could

¹ Inventory was taken within FAO GCP/RER/ 040/ EC Project “Improving capacities to eliminate and prevent recurrence of obsolete pesticides as a model for tackling unused hazardous chemicals in the former Soviet Union”

not collect samples from and around these storages, all of these locations have been classified as potential contaminated sites. Figure 3.7.3-1 presents the distribution of the contaminated pesticides locations in RoA by marzes (provinces). The largest number of potential contaminated sites with pesticides are in Ararat (89), Shirak (89) and Armavir (86). In each of the other provinces there are approximately 40 contaminated sites.

Figure 3.7.3-1: **Distribution of potential POPs pesticide contaminated sites in provinces of RoA**

Number of potentially contaminated sites with POPs pesticides
sub-title



As it was stated in the first NIP, large amounts of obsolete pesticides have been collected and buried near Nubarashen in the 1980's. Obsolete DDT and other organochlorine pesticides are still buried there. This location is considered the most urgent problem and therefore it is discussed in a separate section below.

3.7.4. Potential PCB Contaminated Sites

The first NIP inventory has identified potential PCB contaminated sites. In the past ten years despite all efforts of the Government these locations have not been mapped and characterised. The territories of the enterprises of energy and power sectors (SRPPs, HPPs) and adjoining sites are the most important candidate locations.

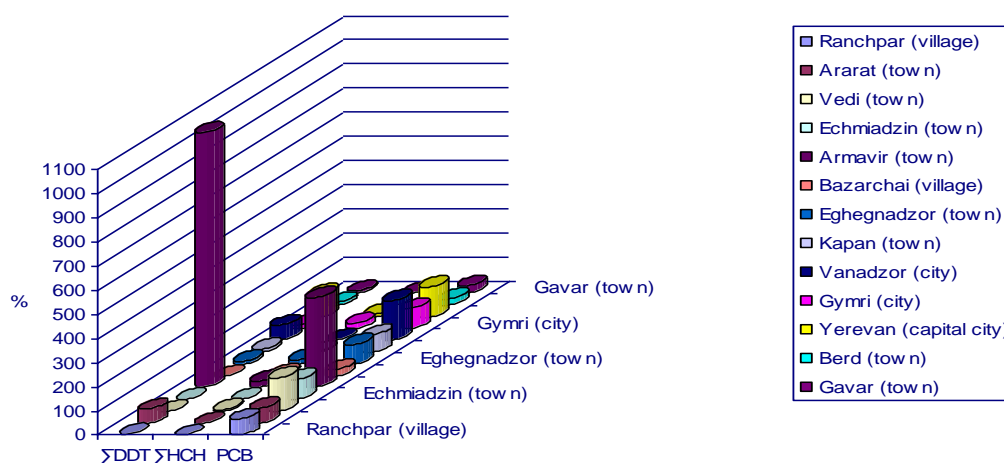
Territories of urban and village dump sites are also expected to be polluted. The number of such dumps are 474 (excluding illegal waste dumps). According to data of the Ministry of Health, in RoA there were 45 urban and 429 village waste dumps in 2002-2003. In the majority, these locations still exist and not correspond to the sanitary requirements.

Table 3.7.4-1: PCBs in soils of waste dumps (2002-2003, mcg/kg)

No.	Location of the dump site	PCB levels (mcg/kg)
1.	Ranchpar (village)	63.327
2.	Ararat (town)	59.404
3.	Vedi (town)	137.863
4.	Etchmiadzin (town)	84.623
5.	Armavir (town)	369.877
6.	Bazarchai (village)	25.817
7.	Eghegnadzor (town)	79.362
8.	Kapan (town)	72.354
9.	Vanadzor (city)	163.643
10.	Gyumri (city)	81.821
11.	Yerevan (capital city)	123.292
12.	Berd (town)	22.340
13.	Gavar (town)	29.384

The results of soil monitoring performed at waste dumps located in different regions of RoA confirmed the presence of PCB residues, which vary between 22.3 - 369.9 mcg/kg (Table 3.7.4-1, Figure 3.7.4-1).

Figure 3.7.4-1: POPs residual amounts in soils of waste dumps, mcg/ kg



At present the state of contaminated sites (areas of enterprises of energy complex, waste dump sites, former pesticide storehouses) are of high importance for RoA. Both organized and illegal waste dump sites, which are scattered all over RoA, present threat to the environment and humans. Constant burning of the waste at low-temperature and smoldering favors the generation of dioxins/furans and other UPOPs. From contaminated areas POPs penetrate to different environmental media (ground and surface waters, air), plants, agricultural produce, and then by trophic chains POPs residues penetrate into human organism.

3.7.5 Priority contaminated site: Nubarashen obsolete pesticides burial site

The problem of banned and obsolete pesticides became urgent since late 1970s, when accumulation of obsolete pesticides started. Ten years later in 1980s a special place was approved to bury them near Bardzrashen village. Now this place is called the Nubarashen obsolete pesticides burial site.

Approximately 500 tons of obsolete pesticides were buried, of which 250 tons were organochlorine pesticides, mostly DDT.

After thirty years of storage it was discovered that the burial is located in the zone of active landslides, which can damage the containers and obsolete pesticides may be released from the site.

Handling the problem of Nubarashen pesticides burial site, in particular, its environmentally sound elimination was planned in the first NIP. Later there was a secondary pollution, as some of the cells have been opened. In 2010 the Ministry of Nature Protection provided finances for conservation, remediation of the burial site. They have covered the pesticides burial site, repaired the drainage system and built a fence. The rehabilitation measures included: collection and centralization of scattered organochlorine pesticides and polluted soil; leveling the area; collection and landfilling of sharp objects, articles in situ; covering of the top of landfill with a waterproof layer of ruberoid (3,500m²); covering the layer of roofing with clay (not less than 50 cm) and ramming; cleaning and reconstruction of the drainage system; construction of a new segment (150 x150m in the Northern part) for leachate collection; construction of a new drainage system; placement fence and warning signs and construction of a sentry box for the guards.

Figure 3.7.5-1 presents the Nubarashen landfill before the rehabilitation and after.

Figure 3.7.5.-1: **Nubarashen landfill before (a, b) and after (c, d) rehabilitation**



The rehabilitation measures of the Nubarashen obsolete pesticides burial site were discussed with the stakeholders and taking into account that in RoA there aren't any capacity for treatment or destruction of hazardous waste the following long term measures were proposed:

1. Determine the state of pesticides buried at the site, including the degree of their degradation;
2. Solve the issues related to pesticides packaging, identification, storage and export.
3. Export pesticides to any other country, where specialized facilities are in place for safe destruction of those chemical compounds;
4. Remediate Nubarashen obsolete pesticides burial site after disposal of the wastes.

The Government of RoA requested the assistance of GEF through UNDP to undertake the following measures at Nubarashen obsolete pesticides burial site:

- Excavation, packaging and removal of obsolete pesticides burial cells and other associated POPs pesticides wastes involving estimated 900 tons Category 1 POPs pesticide wastes;
- -excavation, packaging and removal of 7 000 tons Category 2 POPs wastes (high POPs contaminated wastes);
- on site final containment of 12 700 tons Category 3 POPs wastes. It will further assist in rehabilitating the location.

NIP measures will need to consider the contamination at Nubarashen as the top priority. After it is resolved measures need to concentrate on remediating other polluted areas and wastes dump sites. The problem is more than serious due to the fact that these stocks are spread all over the country, obsolete pesticides are many times in critical condition, some places are used now as cattle sheds. The solution of this problem requires long time and significant financial resources.

Conclusions of the inventory on pesticides former storehouses and their surrounding areas indicate that:

- 1.The main part of pesticides storehouses and their surrounding areas are privatized;
- 2.Certain quantities of obsolete pesticides are still stored at the warehouses;
- 3.Pesticide storage areas, as well as their surroundings are contaminated and pose threat to the environment and human health.
- 4.In most of the warehouses pesticides are stored in bags whose labels are unreadable, bags are torn, and sometimes there are no packaging materials, – only piles of pesticides mixed with soil and construction/demolition debris.
5. Obsolete pesticides need to be repacked.
- 6.The presence of pesticides at studied storehouses shows that it is necessary to continue the inventory of contaminated areas, especially around these locations.

3.7.6. Summary of future production, use and releases of POPs – requirements for exemptions

At present, manufacture of chemical substances listed in Annexes A and B of the Stockholm Convention is not undertaken and it is not planned in RoA. No import and export are planned for Annex A part I and part II POPs.

In the case of chemicals listed under Annex A Part III. The RoA may allow recycling of articles that contain or may contain these chemicals, and the use and final disposal of articles manufactured from recycled materials that contain or may contain these chemicals as per the provisions of Annex A Part IV and V of the SC. Because the PBDE inventory could not investigate the recycling sector thoroughly and thus informed decision could not be made concerning the need for such an exemption, the Government of RoA does not intend to register such an exemption. The RoA may request such exemptions in the future if information on this sector becomes available.

In the case of Annex B Part I chemicals RoA does not import, export, use or produce DDT. No exemption has been filed for the SC in this regard.

Perfluorooctane sulfonic acid (PFOS), its salts and perfluorooctane sulfonyl fluoride (PFOSF) have never been produced in RoA. There is no need to request an exemption for the production of these chemicals under the SC. The RoA only imports these chemicals with raw materials, products, and consumer goods.

Based on the preliminary PFOS inventory RoA intends to register acceptable use of **PFOS, its salts and PFOSF pursuant to paragraph 1 of part III of annex B of the Stockholm Convention. Based on the detailed inventory this notification may be changed.**

Production notifications		Use		Acceptable purpose activities	Remarks
Ongoing	Planned	Ongoing	Planned		
-	-	x	-	<i>photo imaging, medical devices; aviation fluids;</i>	<i>Based on the detailed PFOS inventory RoA will update information when available.</i>

Based on the PBDE and PFOS inventories discussed above the following table lists the specific uses of Annex A part IV, V and Annex B part I chemicals in RoA. Registration of specific exemption shall be filed at the Stockholm Convention. Based on the detailed inventories of these chemicals this notification may be changed.

Chemical	Activity	Purpose(s) of use	Reason(s) for exemption	Remarks
Perfluorooctane sulfonic acid and perfluorooctane sulfonyl fluoride	Use	<ul style="list-style-type: none"> - <i>electric and electronic parts,</i> - <i>carpets,</i> - <i>leather and apparel,</i> - <i>textiles and upholstery,</i> - <i>paper and packaging,</i> - <i>coatings and additives</i> 	Phase out of PFOS and PFOS salts in the requested sectors may take more than five years as current use is quite significant.	<i>Based on the detailed PFOS inventory RoA will reconsider this exemption.</i>
Hexabromodiphenyl ether and heptabromodiphenyl ether	Use	Articles in accordance with provisions of part IV of Annex A of the Convention	No exemption is required until information on recycling activities of these chemicals indicate the need for an exemption	
Tetrabromodiphenyl ether and pentabromodiphenyl ether	Use	Articles in accordance with the provisions of Part V of Annex A	No exemption is required until information on recycling activities of these chemicals indicate the need for an exemption	

3.7.7. Existing programmes for monitoring releases of POPs and environmental and human health impacts

Monitoring of the impact of various chemicals, including POPs on human health and the environment is requested by law. Ministry of Nature Protection, Ministry of Health and a number of research institutes are authorized to monitor the releases of pollutants.

Due to complicated socio-economic conditions of the transition period, as well as lack of financial and technical resources monitoring of pollutant releases has extremely narrowed down to carrying-out projects or programs aimed at monitoring or study the fate of certain chemicals in the environment.

Due to lack of finances and deteriorating analytical/technical basis, the scope of enforcement was strongly limited – in the case of persistent organic pollutants – to residues of organochlorine pesticides and their metabolites and PCBs.

During the last years as part of a PCB inventory project POPs pesticides and PCBs presence in the environment have been re-investigated. The results of these studies have been included in chapters 3.1. and 3.2. These studies confirmed the presence of residual amounts of POPs in water, surface water, soil, bio-media in the ecosystem of Lake Sevan and various agricultural lands. The residual amounts of POPs in the collected samples were below the respective MACs; however, chronic long-term exposure to and intake by humans and wildlife may have significant negative effects. The biomagnification of these pollutants up the food chain has been confirmed in the latest studies as well. Time trend analysis of the earlier studies and the investigation in 2012 concluded that the concentration of POPs pesticides, pesticides residues and PCBs have been declining. The standards have been violated only in a few cases. At one location fresh application of DDT was suspected, thus further investigation is required.

The national legal infrastructure is based on the former Soviet Union system which introduced the maximum allowable Concentrations (MAC) for certain chemicals. These pieces of legislations have been kept and are still in place. Table 3.7.7-1 presents the standards for POPs pesticides as per N 2.1.7.005-14 sanitary rules and norms. For lindane and its isomers and for DDT and its isomers specific standards apply which are presented in Table 3.9-2.

Table 3.7.7-1: **Sanitary-epidemiological and hygienic requirements for POPs pesticides and agrochemicals No 2.1.7.005-14 sanitary rules and norms**

Pesticide	soil	water	atmospheric air
DDT	0.1 mg/kg	0.1 mg/dm ³	0.001 mg/m ³
HCH	0.1 mg/kg	0.002 mg/dm ³	0.001 mg/m ³
Hexachlorobenzene	0.03 mg/kg	0.001 mg/dm ³	0.013 mg/m ³
Heptachlor	0.05 mg/kg	0.001 mg/dm ³	No norm established

Aldrin	No norm established	0.002 mg/dm ³	0.0005 mg/m ³
Hexachlorobutadiene	0.5 mg/kg	0.002 mg/dm ³	0.0002 mg/m ³
Endosulfan	0.1 mg/kg	No norm established	0.017 mg/m ³

Table 3.7.7-2: **MACs for HCH and DDT and their metabolites**

Media	∑ HCH isomers	∑ DDT metabolites
MACs for atmospheric air, mg/m³		
maximum single	0.005	0.005
average daily	0.001	0.001
MAC for the workplace air, mg/m³	0.05	0.1
MACs for water: mg/L (dm³)		
sanitary – household water	0.02	0.1
potable (drinking) water	0.002	0.002
fishery related water	not allowed	not allowed
MAC for soil, mg/kg	0.1	0.1

The following MACs have been set for PCBs:

In atmospheric air	1 mcg/m ³ ;
In workplace air	1 mg/m ³ ;
In water (water bodies of the economic and tap water)	1 mcg/L
In water (fishery related facilities)	not allowed
Soil	0.1 mg/kg;

Currently none of the Annex C POPs chemicals are monitored in RoA; consequently, MACs have not been established either. The inventories of PFOS and PBDE confirmed that these chemicals are probably extensively used in the country. In order to better understand the environmental and human health related aspects of these chemicals it is important that their presence in the environment and humans are studied. Currently the monitoring of these chemicals is not requested by law. MACs for PBDEs and PFOs and related chemicals have not been established.

Recommendations

Because there are significant stocks of POPs pesticides and PCBs in RoA and because new POPs have been added to the Stockholm Convention for which no monitoring have been undertaken, it is recommended that regular monitoring of POPs is intensified. Fresh application of DDT has also been suspected in one case, which also needs further investigation.

It is also important to develop a national strategy to eliminate the POPs stocks including the allocation of the necessary human and financial resources as they present an immense risk for fresh contamination.

Monitoring of POPs pesticides and PCBs need to be intensified and consequently the National POPs Analytical Laboratory and other enforcement authorities should be strengthened.

It is also recommended that a monitoring study is undertaken to identify the presence of UPOPs, PBDEs and PFOS and related chemicals in various environmental media and in humans. Based on these studies a decision can be made concerning the introduction of MACs for the newly added POPs.

According to Article 11 of the Stockholm Convention “Research, development and monitoring shall be undertaken by Parties within their capabilities», the RoA – due to its limited financial resources – will strongly rely on international technical and financial assistance.

Part 4. STRATEGY AND ACTION PLAN ELEMENTS ON THE NATIONAL IMPLEMENTATION PLAN

4.1. Policy Statement

The RoA, through the ratification of the Stockholm Convention on Persistent Organic Pollutants (POPs), is committed to fulfil the obligations of the Convention.

The National Implementation Plan (NIP) represents the officially approved approach to meet the obligations of the Stockholm Convention. It also details the how the government is going to manage POPs at the country level.

This is the second NIP addressing the Stockholm Convention and POPs and this is the first time when the first newly added nine POPs chemicals (Alpha hexachlorocyclohexane, Beta hexachlorocyclohexane, Chlordecone, Hexabromobiphenyl, Hexabromodiphenyl ether and heptabromodiphenyl ether, Lindane, Pentachlorobenzene, Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride, Tetrabromodiphenyl ether and pentabromodiphenyl ether) have been included in the implementation process. The inventories of these chemicals are preliminary.

Where it was possible the NIP presents time trend analysis of these chemicals to better demonstrate changes over time which facilitates science based decision making. Actions of the NIP strongly rely on the currently available information and as new information on POPs becomes available it may trigger modifications in action plans.

Aware of the toxic properties of POPs and their impacts on human health and the environment, and recognizing that persistent organic pollutants accumulate in the environment and can be transported and deposited far from their place of release,

Taking into account the sensitivity of RoA ecosystem and natural resources to the impacts of POPs,

Recalling provisions of relevant International conventions to which RoA is party to and recalling the provisions of the Rio Declaration on Environment and Development and Agenda 21,

Recognising that the NIP is the outcome of close consultation between relevant government bodies, the public and private sector as well as NGOs,

Recognising that the successful implementation of the Convention and the NIP will depend on technical and financial assistance from international, national including non-governmental and private partners,

The government of RoA endorses the National Implementation Plan (NIP), and provides adequate resources for its implementation. The endorsement letter is attached as Annex 1.

4.2. Implementation strategy

4.2.1. Overview

The Republic of Armenia ratified the Stockholm Convention on Persistent Organic Pollutants (POPs) in 2003. The Convention's objective is to protect human health and the environment from persistent organic pollutants. Ratification of the Stockholm Convention was a statement of RoA that it fully shares the vision of the Convention.

The NIP concept has been embodied well into the long term vision of the country, its Agenda 21 goals and its Millennium Development Goals for sustainable and green development.

4.2.2. NIP Implementation Objectives

The main objective of the NIP is protect human health and the environment from POPs consistent with the obligation of the Stockholm Convention. Each action plan within the NIP details the actions RoA is planning to undertake and the necessary timeframe and financial needs. The NIP document also defines commitments and responsibilities of the various government agencies and the actions they plan to undertake in respect of POPs. The specific objectives of NIP implementation are: -

- To have capacity at the national level for the cost-efficient management of POPs,
- To have broad participation during the implementation process,
- To assure sustainable economic and social development while phasing out POPs,
- To integrate POPs related measures within the national policies on chemicals management, environmental protection, public health,
- To facilitate efforts of dealing with broader environmental issues such as pollution and hazardous wastes control and overall pollutant releases and the development and strengthening of national sustainable development strategies; and
- To facilitate country's overall efforts in coordinating national approaches to other chemical related Regional and International Agreements; specifically, the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal.

Implementation of chemical related programs falls within the mandate of several government departments within different Ministries. Ministry of Nature Protection (MNP) is responsible for coordinating Multilateral Environmental Agreements including the Stockholm Convention on POPs and therefore the MNP is responsible for the coordination of the implementation of this NIP.

The implementation process of the NIP is continuous. This NIP includes measures for five years up to 2020. Overarching activities such as legislative review and development are continuous as well. Most of the capacity building investments and activities are anticipated to end within 5 years. Certain activities e.g. PCB phase-out will continue until the deadline stipulated in the Stockholm Convention.

4.2.3. General outcomes of the NIP Implementation

The expected outcomes of the NIP Implementation are as follows:

- POPs related information is available and used for decision making,
- Economic growth and environment is steadily growing, while UP-POPs releases are continuously reduced,
- Human health and the environment related effects of POPs are appropriately mapped;
- PBDEs and HBB and PFOSs related assumptions in the NIP are accurate;
- PCB and PCB-containing equipment are gradually phased-out and disposed of,
- Institutional and legal capacity is available within the government to the level required for POPs management;
- Active stakeholder participation from the NGO sector.

4.2.4. Implementation Principles

NIP implementation is based on the following principles:

- Protecting human health and the environment,
- Transparency in information sharing and exchange,
- Adherence to the polluter – pays and precautionary principles,
- Adherence to international standards and guidelines,
- Promoting BAT and BEP,
- Commitment to public awareness and education and
- Inclusion of public into decision making through NGOs,

4.2.5. Priorities and Conditionality

Priorities for NIP implementation are listed below (Table 4.2.5-1.). Measures addressing the priority areas are reflected in the action plans developed under different chapters of the NIP.

Table 4.2.5-1: Implementation priorities

Priority areas
Elimination of Nubarashen pesticide burial site and remediation of the site
Environmentally sound management, phase-out and disposal of PCBs, preferably using non-combustion technologies
Promotion of BAT/BEP for the reduction of UPOPs
Strengthen POPs Analytical Laboratory to perform monitoring of UPOPs, PBDE and PFOS and other new POPs on environmental media (atmospheric air, surface waters, soil and biota)
Improvement on the reporting system for POPs related information, monitoring data and human health impacts
Institutional strengthening for enforcement of chemicals related legislation
Minimizing/ elimination of POPs releases into the environment; minimizing POPs impacts on human health
Disposal of the obsolete POPs pesticides stocks
Assessment, characterization and remediation of POPs contaminated sites
Facilitate inter-ministerial cooperation and information exchange on POPs
Development of detailed inventories of newly added POPs
Public awareness on POPs

The implementation of the National Implementation Plan requires certain conditions to be fulfilled. The implementation of the NIP action plans can only be successful if the following conditions are assured:

- Government commitment and support in providing the adequate financial and human resources for NIP implementation,
- Commitment among stakeholders, who participate in the implementation process,
- The availability of international assistance,
- No unexpected events occur.

In this context commitment not only means political and financial commitments, but also the necessary time allocations for those, who will

participate in the NIP implementation process. It is equally important that the responsible authorities act in time.

4.2.6. Institutional/Organisational Arrangements and Responsibility

The NIP implementation process will be coordinated by the Ministry of Nature Protection of the Republic of Armenia as a responsible body designated by the RoA Government for implementation of Stockholm Convention on Persistent Organic Pollutants. Each action plan has its own coordinating organization which will be responsible for the implementation of that particular action plan.

The National Inter-Ministerial/Interagency Committee on implementation of the Stockholm Convention on Persistent Organic Pollutants (POPs) that was re-established according to Order of the Minister of Nature Protection of the Republic of Armenia "On Establishment of Inter-ministerial/Inter-Agency Committee for Implementation of Stockholm Convention on Persistent Organic Pollutants, Personal Membership and Working Order of the Committee" (No. 86-A dated April 22, 2015), will be the key decision making entity during the NIP implementation. This committee will oversee the process through the review and approval of performed activities.

The committee assures transparency and inclusion of state and research institutions, as well as NGO stakeholders in the implementation process as is required in Article 7 of the SC.

Performance monitoring indicators will be used to assess the effectiveness of the implementation.

The NIP was approved by the Protocol Decision of the RoA Government "On Approval of the List of Activities to be implemented in 2016-2020 within the National Program for Implementation of the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia" (No. 49 of December 8, 2016).

Annually, the Ministry of Nature Protection of the Republic of Armenia submits to the RoA Government Report on activity performed by different stakeholders within different sections of the NIP. The Annual Report is also discussed at the Meeting Steering Committee Meeting in order to indicate to what degree this or that phase of NIP realization is completed or implemented.

The NIP coordinating body performs monitoring of different activities of the action plan implementation process to ascertain that the objectives have been achieved.

LIST OF ANNEXES

Annex 1.

National Programme of Activities to be implemented under the “National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia, 2016-2020”

Annex 2

List of scientific papers published in proceedings of international conferences, periodicals (2005-2014)

Annex 3.

MASS-MEDIA COVERAGE

National Programme

of Activities to be Implemented under the “National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants in the Republic of Armenia, 2016-2020”

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
1. Legislative improvements	Improvement of the legislative basis for chemicals and wastes, including persistent organic pollutants (hereinafter: POPs) management according to requirements of Stockholm and Basel Conventions	Development of draft legal acts on chemicals and waste sound management, including: <ul style="list-style-type: none"> • Elaboration of the Draft Law “On Chemicals” • Working-out draft regulations for establishment of the Registers on POPs and POPs-containing wastes; • Updating the National Profile on assessment of the national infrastructure for management of chemicals and wastes, including POPs, • Improvement of the existing legislation on chemicals and waste in order to eliminate gaps 	2017-2020	MNP, RoA	Elaboration of the Draft Law “On Chemical” and development of a number of draft by-laws (legislative acts) regulating POPs and wastes (including POPs-containing wastes)
				MH, RoA	
			2017	MA, RoA	
				MES, RoA	
			2017-2018	MEINR, RoA	
				MEDI, RoA	
			2016-2017	MTAD, RoA	
	SRCG of RoA				
		2016-2018			

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
		<p>in the area of POPs management;</p> <ul style="list-style-type: none"> • Envisaging administrative responsibility for violation of regulations at POPs handling: through amendments to the relevant RA Code on Administrative Offences; • Legislative regulation on restriction of the use of new POPs in products • Development of legislation to control the import and export of PFOS (perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride) and PBDE (polybromodiphenyl ethers) containing products and chemicals 	<p>2017</p> <p>2018-2020</p> <p>2018-2020</p>		
2. Institutional Improvements	<p>Institutional regulation of chemicals sound management</p> <p>Coordination and monitoring of POPs</p>	<p>Arrangement of activity of the Inter-Ministerial/ Inter-Agency Council for implementation of commitments under the Stockholm Convention on POPs, implementation of policy on POPs and decision-making relevant to POPs</p>	2016-2020	MNP, RoA	Coordination and monitoring of POPs related activities

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	related activities Establishing synergies between Stockholm, Basel and Rotterdam Conventions	Improvement of coordination and cooperation in the implementation of Stockholm, Basel and Rotterdam Conventions for chemicals and wastes management	2016-2020	MNP, RoA MH, RoA MA, RoA	
	Establishment of Centre for Stockholm Convention implementation	Information exchange between the Republic of Armenia and Secretariats of the Stockholm, Basel and Rotterdam Conventions for the fulfillment of commitments under those conventions; implementation of the National Implementation Plan (NIP), dissemination of information on POPs; studies on the best available technology (BAT) and best environmental practice (BEP) for the introduction of clean technologies	2016-2020	MNP, RoA	Establishment of Centre for Stockholm Convention implementation
	Improvement of the process for reporting data management in the	Up-date of information system on chemicals and wastes, including new POPs • Register of Wastes	2016-2018	MNP, RoA	Creation of POPs Register, Cadastre, and Data Bank on Technologies

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	area of chemicals and wastes management	<ul style="list-style-type: none"> Register of Chemicals, including POPs 	2016-2018		
3. Development of regulatory and incentive mechanisms	Preparation of Guidances and Manuals	Preparation of Instructions, Guidelines, Technical Specifications for POPs handling	2017-2020	MNP, RoA MH, RoA MEDI, RoA	Arrangement of conditions for environmentally sound handling of POPs
	Creation of incentive mechanisms for implementation of measures to reduce the harmful impacts of POPs	Ensuring incentives, privileges for environmentally sound disposal of wastes containing, consisting of or contaminated by POPs	2017-2020		Support to actions on safe destruction/ treatment or re-use of POPs-containing wastes
		Support to actions aimed at re-use (secondary use) of wastes	2017-2019		
		Introduction of the principle of extended producer responsibility through amendments/ changes to the RoA Law “On Waste” or drafting a new law	2017		
4. Strengthening the legislative and regulatory system by practical Guidances on	Improvement of the system for reporting and analysis of data on POPs	Correction and up-dating of information presented in the Register on POPs: polychlorinated biphenyls (PCBs) containing oils and equipment, obsolete POPs-	2016-2020	MNP, RoA MH, RoA MA, RoA	Creation of Data Base on POPs, PCBs, obsolete POPs-pesticides, dioxins, furans, PFOS and PBDE

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome	
POPs		pesticides, emissions of dioxins/furans	2017-2020.	MES, RoA		
		Collection of information on methods/ modes of environmentally sound destruction of POPs-containing wastes		MEINR, RoA		
		Legislative regulation necessary for decontamination/ treatment of contaminated areas		2016-2017		MTAD, RoA
		Assessment of needs, preparation of methodic guidelines and counselling for personnel working with POPs and concerned parties		2017-2019		EDU, RoA
5. Improvement of PCBs management system	Development of legislative basis for collection and storage of PCB-containing wastes and PCB-containing equipment	Creation and regular up-date of electronic Data Base on PCB-containing equipment (transformers and oil switches)	2016-2020	MNP, RoA	Inventory and labeling of PCB-containing oils and equipment; implementation of technologies on treatment and destruction of mentioned oils	
		Legislative regulation regarding mandatory self-reporting /registration of PCB-containing	2017	MEINR, RoA MH, RoA Energy sector enterprises		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	Verification of data on sources of PCBs and their quantitative indicators	equipment Preparation of Guidelines and Manuals on environmentally sound management of PCBs (equipment, oils, wastes)	2017	(by consent)	
	Development of proposals on phasing-out of PCB-containing oils and equipment	Development of Plan for stage-by-stage phasing out of certain types of identified PCB-containing equipment with the special focus on devices that are not subject for further cleaning, re-filling or use Inventory, collection and generalization of information on equipment in use, as well as phased-out equipment Wash-up and treatment of PCB-containing appropriate-for-use equipment in order to further refill them with PCB-free oils Treatment of oils containing not high concentrations of PCB-s for further	2019-2020 2019-2020 2019-2020 2019-2020	MNP, RoA MEINR, RoA Private sector (by consent) Energy sector enterprises (by consent)	

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
		use thereof			
	Development of a system for permanent collection, treatment recycling, decontamination, and disposal of PCB-containing oils and PCB-containing equipment, including PCB-contaminated, damaged and leaking equipment	Implementation of technologies on treatment and destruction of PCB-containing oils and equipment	2019-2020	Private sector (by consent) Energy sector enterprises (by consent)	
6. Capacity strengthening in energy sector for identification of PCB-containing equipment	Raising the awareness on knowledge and skills on sampling, identification, labelling, reporting	Preparation of educational manuals, methodical guidelines on sampling and studies and arrangement of training courses	2017-2020	MNP, RoA MEINR, RoA	Creation of safe conditions for PCBs disposal, treatment or destruction; arrangement of trainings for relevant specialists
		Verification and up-date of information presented in the Register on POPs (PCB-containing oils and PCB-containing equipment)	2017-2020 2017-2018		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
		Preparation of programmes on application of analytical methods for PCBs inventory, sampling, and identification			
7. Inventory of PCBs in equipment and oils of energy sector	Determination of existing PCB concentrations in equipment and oils of energy sector	<p>Sampling, assessment of PCBs presence and labelling</p> <p>Identification of “hot spots”, risk assessment, reporting on the results obtained</p>	<p>2017-2020</p> <p>2017-2020</p>	<p>MNP, RoA</p> <p>Private sector (by consent)</p> <p>Energy sector enterprises (by consent)</p>	Carrying out analyses of oils in energy sector for PCBs identification
8. Widening the scope of inventory on PCBs sources	Identification of PCBs existing in other branches of the national economy: industry, services sector, etc.	<p>Inventory of PCBs in industrial sector through identification of transformers, registration of capacitors and PCB-containing wastes</p> <p>PCBs inventory taking in industry, services sector and other branches of the national economy</p>	<p>2017-2020</p> <p>2017-2020</p>	MNP, RoA	<p>PCBs inventory in industry, services sector, and other branches</p> <p>Carrying-out studies on PCBs content in different environmental media (water, soil) and foodstuffs</p>

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
		Preparation of instructions for PCBs determination in equipment, foodstuffs, environmental media and products Studies on PCBs content in different media (water, soil), and foodstuffs	2017-2020		
9. Reduction of dioxins/ furans emissions	Inventory of dioxins/ furans emissions to the environment	Data collection in order to up-date Register on dioxins/ furans emissions	2016-2020	MNP, RoA MH, RoA Private sector (by consent)	Inventory of dioxins/ furans emissions from different sources Implementation of pilot projects aimed at reduction of dioxins/ furans emissions
		Creation and regular up-date of the Register on dioxins/ furans emissions in different sectors of industry Inventory of dioxins/ furans emissions generated due to open burning and regular data up-date Carrying-out pilot project on	2016-2020 2016-2020 2016-2018		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
		<p>implementation of Best Available Technologies/ Best Environmental Practice for prevention of open burning at waste-dumps</p> <p>Elaboration of proposals on implementation of existing Best Available Technologies/ Best Environmental Practice in metallurgical sector (carrying-out the pilot project for reduction of dioxins/furans emissions)</p>	2017-2019		
	Measures to reduce dioxins/ furans emissions	<p>Introduction of new regulating measures on household and other wastes management, including prohibition of open burning</p> <p>Promotion of investments aimed to prevent open burning and support wastes recycling operations</p> <p>Raising awareness among the public at large in order to prevent open burning</p>	<p>2017-2020</p> <p>2017-2020</p> <p>2016-2020</p>		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	Preparation of methodic guidelines on reduction and elimination of dioxins/ furans emissions to the environment Analysis of possibility to apply alternative technologies for reduction of dioxins/ furans emissions	Decision-making on methods for environmentally sound disposal/ destruction of dioxins /furans containing wastes Comprehensive analysis of data on implementation of alternative technologies for dioxins / furans emissions reduction and assessment of possibilities for their application	2017-2018 2017-2019		
9.1. Reduction of PFOS and PBDE emissions	Up-date of regulating legislation in the area of chemicals and wastes in order to control articles containing POPs, including PFOS and PBDE, which are placed on the	Inventory of PFOS applying the analytical methods of identification Inventory of PBDE, including chemical analysis for verification of PBDE presence in electro- and electronic equipment (EEE) and EEE wastes, vehicles, etc. Establishing control on export and	2017-2020 2017-2020	MNP, RoA MH, RoA MEDI, RoA SRCG of RoA NAS, RoA (by consent)	Reduction of PFOS and PBDE emissions through promotion of substances considered to be their alternatives; environmentally sound destruction or treatment of PFOS- and PBDE-containing wastes

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	market	import of products PFOS-containing articles and chemicals	2016-2020		
	To carry out studies on determination of unintentionally produced POPs, PBDE, PFOS and related chemicals in different environmental media and human organism	Implementation of monitoring studies in order to determine and verify the presence of unintentionally produced POPs, PBDE, PFOS and related chemicals in different environmental media and human organism	2017-2019		
	Awareness raising on PFOS and PBDE	Improvement of reference laboratories for analytical determination of PFOS and PBDE			
	Promotion of materials that are considered as alternatives for PFOS and used for acceptable purposes	Ensure public awareness on environmental and health hazards of PFOS, PBDE and related substances	2017-2019		
	Management of PFOS/PBDE	Training for relevant bodies (e.g., customs and border control authorities) and provision of equipment, which will allow them to control, monitor, identify and, if necessary, to prevent movements/ transportation of wastes containing	2017-2020		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	containing wastes	<p>brominated diphenyl ethers</p> <p>Develop a project/ programme on stage-by-stage phasing out of PFOS from the use in firefighting foams, paper and packaging, as well as in carpet manufacturing</p> <p>Implementation of actions on safe storage of PFOS / PBDE containing wastes, in case destruction technologies are not available</p> <p>Destruction of PFOS / PBDE containing wastes in current production and implementation of best available technology and best environmental practice for industrial use of PFOS / PBDE</p>	<p>2017-2020</p> <p>2018-2020</p> <p>2018-2020</p>		
10. Strengthening the national capacity on POPs monitoring	Widening the monitoring studies on POPs in environmental media	Preparation of POPs monitoring strategies according to sources of POPs types and environmental media	<p>2016-2020</p> <p>2017</p>	MNP, RoA MH, RA MA, RoA MEDI, RoA NAS, RoA (by consent)	Collection of data on monitoring of POPs (PCBs, obsolete POPs pesticides, PFOS, PBDE) based on studies carried out on mentioned substances in
	Legal regulation on	Development of POPs monitoring			

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	establishment of POPs monitoring system	programmes and sampling procedures Inter-laboratory information exchange on POPs monitoring related data	2017-2020		different environmental media (water, soil, air)
	Improvement of the Central Analytical Laboratory on POPs	Procurement of equipment and reagents, obtaining international accreditation, approval of standard procedures for POPs determination in soil, water, biomedica, foodstuffs and imported/exported products	2016-2020		
11. Capacity strengthening in the area of unintentionally produced POPs	Increasing knowledge on sources of unintentionally produced POPs	Collection and analysis of data on POPs unintentional generation and sources of POPs emissions POPs emissions and risks assessment, priority setting on emission sources	2016-2020 2017	MNP, RoA	Identification of dioxins and furans emission sources, carrying-out analytical studies, risk assessment

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	Inventory of dioxins and furans emission sources (quantitative and qualitative)	<p>Sampling and analytical studies at internationally accredited laboratories</p> <p>Analysis of results and preparation of recommendations for further actions</p>	2016-2017		
12. Transfer of the Best Available Technologies and Best Environmental Practice	<p>Acquiring knowledge on application of Best Available Techniques and Best Environmental Practice existing in the area of POPs management</p> <p>Formulation of affordable options for the Republic of Armenia</p>	<p>Compilation of existing Best Available Techniques and Best Environmental Practice in the area of POPs management for the Republic of Armenia</p> <p>Preparation of thematic plans for training courses and arrangement of workshops</p>	<p>2017-2020</p> <p>2017-2020</p>	MNP, RoA	Adaptation and implementation of Best Available Technologies and Best Environmental Practice in the area of POPs handling for the Republic of Armenia
	Preparation and publishing of	Preparation of methodic manuals on PCBs, PFOSs and PBDEs	2017-2019		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	methodic manuals on PCBs, PFOSs and PBDEs management	management for different target groups			
13. Improvement of the wastes management system	Economic evaluation of POPs-containing wastes management	Evaluation of specific technologies for destruction of POPs-containing wastes and analysis of their efficiency from the environmental and economic points of view	2016-2020	MNP, RoA MH, RoA NAS, RoA (by consent) Private sector (by consent)	Treatment, recycling, destruction of POPs-containing wastes
	Treatment or destruction of POPs-containing wastes generated in industry sector	Analysis of technologies on treatment/ destruction of POPs-containing wastes generated in industry sector	2017-2020		
	Evaluation of possibilities to apply alternative methods for wastes recycling	Based on the technical and economic analysis to prepare substantiation of the country's possibility to apply in practice alternative methods of wastes recycling Tailoring and adaptation of wastes destruction methods according to national capacities	2017-2020 2017-2018		
14. Strengthening	Strengthening	Holding training courses for	2016-2018	MNP, RoA	Environmentally sound

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
capacity for efficient management of obsolete pesticides	capacity of local authorities for safe and environmentally sound management of landfills	territorial administration and local self-government bodies		MTAD, RoA MH, RoA	destruction of obsolete and inappropriate-for-use pesticides piled-up at the pesticides burial, former warehouses and shops
	Environmentally sound liquidation of obsolete pesticides burial	Implementation of actions on destruction of obsolete and inappropriate-for-use pesticides Transportation, packaging, and environmentally sound destruction of obsolete pesticides from the obsolete pesticides burial	2016-2018 2016-2018	MNP, RoA MH, RoA MA, RoA MES, RoA MTAD, RoA NAS, RoA (by consent)	
	Destruction of obsolete pesticides present at other sites (former warehouses and shops) and prevention of their future accumulation	Inventory of obsolete pesticides present at former warehouses and shops Organized destruction of obsolete pesticides at existing storages in different areas	2016-2018		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	Environmental and economic evaluation of impacts of obsolete pesticides towards the environment	Analysis of impacts and implications of obsolete pesticides towards the environment and human health	2017		
15. Strengthening the management of POPs-contaminated sites	Elaboration of mechanisms for identification of POPs-contaminated sites	Development of risk assessment methodology, formulation of criteria for sites contaminated by POPs to a different degree Decontamination of the area contaminated by POPs in the vicinity of obsolete pesticides burial	2016-2019	MNP, RoA MES, RoA MH, RoA MA, RoA Ministry of Defence, RoA	Carrying out identification, assessment, decontamination of POPs-contaminated sites
	Development of a plan for assessment of POPs-contaminated sites	Mapping of POPs contaminated sites Creation and maintenance of the Register on POPs contaminated sites Assessment of identified sites, implementation of analytical investigations	2017-2018 2017-2018 2017-2018		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	Implementation of decontamination/ remediation measures at POPs-contaminated sites	Development of projects/ programmes on modern, environmentally sound, and profitable use of resources for decontamination/ remediation of contaminated sites; arrangement of workshops Working-out measures on decontamination/ remediation of contaminated sites	2016-2020 2017-2019		
16. Support to research activities related to the POPs challenges	Support, stimulation and strengthening cooperation in activities of research institutes related to the POPs challenges	Support to research activities on challenges related to POPs (organochlorine pesticides, PCBs, dioxins, PFOS, PBDE): monitoring, risk assessment, impacts assessment towards human health and the environment	2016-2020	MNP, RoA MH, RoA MA, RoA MES, RoA NAS, RoA (by consent)	Implementation of research works on challenges related to POPs (PCBs, organochlorine pesticides, dioxins, PFOS, PBDE), assessment of their impacts on human health and the environment
17. Communication system improvements at the national level	Information and skills exchange/ sharing between decision-makers, specialists and different layers of	Placement of current information on POPs at the Ministry website; publishing Publishing popular of brochures and information materials on properties,	2016-2020 2017-2019	MNP, RoA MH, RoA MA, RoA MES, RoA	Increased knowledge on POPs, information exchange

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	public on POPs	<p>characteristics and environmental impacts of new POPs towards the environment and human health</p> <p>Jointly with environmental NGOs – arrangement and holding informative Workshops and Round Table discussions on impacts of new POPs towards the environment and human health</p> <p>Training for representatives of inspection bodies and industry</p> <p>Trainings for specialists and experts from other concerned institutions engaged in further activities and events envisaged in line with implementation of the up-dated NIP in POPs management area</p> <p>Introduction of activities/ actions on POPs envisaged by the up-dated NIP to industry representatives</p>	<p>2017-2019</p> <p>2016-2020</p> <p>2017</p>	NGOs (by consent)	
	Development of a system on	Creation of the operational system for gathering and exchange of	2017		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	information gathering and exchange	information on POPs			
18. Implementation of the integrated process for joint solution of POPs problem	Arrangement of active and efficient involvement of concerned parties in decision-making on issues related to POPs	<p>Arrangement of meetings on POPs issues</p> <p>Arrangement of meetings and Workshops on POPs impacts risk assessment</p> <p>Development of the procedures for joint solution of POPs challenges</p>	2016-2020	<p>MNP, RoA</p> <p>MH, RoA</p> <p>MA, RoA</p> <p>MES, RoA</p> <p>MTAD, RoA</p> <p>Ministry of Defense, RoA</p> <p>NAS, RoA (by consent)</p> <p>NGOs (by consent)</p>	Approval of partnership /cooperation between concerned parties for solution of POPs management issues
19. Information exchange at country and international levels	Public awareness-raising on POPs problems, risks, as well as implications and actions for their reduction	<p>Dissemination of POPs relevant information in mass-media and affordable publications</p> <p>Participation in international conferences</p>	2016-2020	<p>MNP, RoA</p> <p>MH, RoA</p> <p>MA, RoA</p> <p>MES, RoA</p> <p>MTAD, RoA</p> <p>NAS, RoA (by consent)</p>	Public awareness-raising on problems relevant to POPs and actions aimed at their elimination

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
				NGOs (by consent)	
20. Education	Preparation of educational programmes embracing POPs problems and chemical safety problems	Preparation and dissemination of educational materials among different groups of population: students, employees, farmers, workers of industry and energy related sectors, medical doctors Establishment of Regional Centers for Environmental Education in marzes (provinces) of the country	2017-2018 2017-2020	MNP, RoA MH, RoA MTAD, RoA EDU, RoA NAS, RoA (by consent) NGOs (by consent)	Preparation and dissemination of Programmes for public awareness-raising on hazardous impacts of POPs towards human health and the environment
	Elaboration and implementation of educational programmes (curricula) on POPs in the system of higher and postgraduate education	Preparation of educational programmes (curricula) aimed at awareness raising on POPs hazards, threats posed to the human health and the environment Development of the website on POPs issues	2017-2018 2017-2018		
21.Up-dating and verification of information on POPs at the	Activities aimed at implementation of Stockholm, Basel, and Rotterdam	Preparation and and submission of reports on implementation of conventions to the Secretariats of relevant Conventions	2016-2020	MNP, RoA	Preparation and submission of regular reports on implementation of the Republic of Armenia

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
national level	conventions				obligations under Stockholm and Basel Conventions to the Secretariats of relevant Conventions Regular review and updating of the National Implementation Plan for implementation of Stockholm Convention
	Regular updating of the National Implementation Plan (NIP) and its effectiveness evaluation as proposed by the Conference of the Parties	Preparation of Review on achievements of activities undertaken at the national level	2017		
	Updating and verification of NIP, proceeding from decisions of the Conference of	Regular review and updating of NIP in compliance with decisions of the Conference of Parties to the Stockholm Conventi	2016-2020		

Area	Goal	Description of the Activity	Time Frame	Leading and Implementing Body	Expected Final Outcome
	Parties to the Stockholm Convention				
	Regular updating and revision of policy and strategy relevant to POPs management	Regular revision and updating of schedule for implementation of actions envisaged by NIP under Stockholm Convention	2016-2020		

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