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STUDY

ON ENVIRONMENTAL IMPACT ASSESSMENT OF THE PROJECT-RECONSTRUCTION OF PRODUCTION FACILITIES IN THE COMPANY "FIAT AUTOMOBILI SRBIJA" LOCATED AT THE CADASTRAL PARCEL. 1/1 KO KRAGUJEVAC 2, CITY OF KRAGUJEVAC

PROJECT HOLDER
"FIAT AUTOMOBILI SRBIJA"
4 Kosovska
City of Kragujevac

Kragujevac, October 2010

PROJECT HOLDER:	***"FIAT AUTOMOBILI SRBIJA" 4 Kosovska City of Kragujevac***
STUDY MADE BY:	***Agency ECOlogica Urbo Kragujevac***
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	Jasmina Radovanovic, chemist
	Ivan Blagojevic, spatial planner
	Vesna Crnoglavac, lawyer

GENERAL DOCUMENTATION

STUDY BODY

APPENDIXES

Appendixes:

- Decision on necessity of environmental impact assessment and defining scope and contents of Study on environmental impact assessment no. XVIII-501-86/10 dated 01/06/2010, City administration for spatial planning, building and environment protection – Environment protection department, City of Kragujevac,
- Decision on location license no. XVIII-353-454/10 dated 13/07/2010, City administration for spatial planning, building and environment protection – Spatial planning department, City of Kragujevac,
- Copy of plan R=1:2500,
- Conditions no. 11105/1 dated 02/07/2010, JKP "Vodovod i kanalizacija" (public communal enterprise "Water supply and sewer system") Kragujevac,
- Electrical energy consent for the location no. 1-3-8068 dated 08/07/2010, Electro energy distribution company "CENTAR" doo Kragujevac, ED Elektrosumadija Kragujevac,
- Consent no. 66.10.30.PP dated 06/07/2010, Limited Liability Company for production of energy and fluids and services "ENERGETIKA" d.o.o. Kragujevac,
- Conditions no. 12057 dated 08/07/2010, JP "Srbijagas", Belgrade Department,
- Consent no. 172/210 dated 06/07/2010, "Telekom Srbija" telecommunication company a.d., IJ Kragujevac,
- Notification on issuing of water supply conditions no. 325-05-00739/2010-07 dated 09/07/2010, Ministry of Agriculture, Forestry and Water resources, Republic water directorate, Belgrade,
- Decision on issuing of water supply conditions no. 325-05-906/2009-07 dated 17/06/2009, Ministry of Agriculture, Forestry and Water resources, Republic water directorate, Belgrade,
- Report on analyzing of waste water quality no. V10/112 dated 17/04/2010, Nuclear sciences institute "Vinca", Laboratory for chemical dynamics and permanent education, RJ Chemical dynamics (060),
- Report on analyzing of waste water quality no. V10/113 dated 17/04/2010, Nuclear sciences institute "Vinca", Laboratory for chemical dynamics and permanent education, RJ Chemical dynamics (060),
- Macro location, orthophoto image (Google),
- Set-up.

Contents:

Introductory notes

Pursuant to the agreement no. 105/10-1 dated 18/06/2010, the Project Holder **"FIAT AUTOMOBILI SRBIJA"** from Kragujevac, 4 Kosovska, has entrusted making of Study on environmental impact assessment of the Project- reconstruction of production facilities in the company "FIAT AUTOMOBILI SRBIJA" at the cadastral parcel no. 1/1 KO Kragujevac 2 , City of Kragujevac, to the Agency **ECOlogica URBO** from Kragujevac, 3/1 Save Kovacevica.

Study on environmental impact assessment is made in accordance with Environment protection Law ("Official Gazette RS" no. 135/04 and 72/09), Environmental impact assessment Law ("Official Gazette RS" no. 135/04) and Rulebook on contents of Study on environmental impact assessment ("Official Gazette RS" no. 69/05).

The aim of making of Study on environmental impact assessment is overview of all potential negative impacts to environment, analysis of compliance with the measures prescribed by competent body, organizations and companies and measures defined by the Project documentation, in order to prevent, minimize and put the potential harmful impacts to the scope stipulated and allowed by Law.

Contemporary approach to preservation and protection of environment is based on the concept of complied, namely sustainable development, which means that the acceptable are those objects and programs in the sphere of urbanization, industrialization, infrastructure and economy which provide development with long term utilization and preservation of natural resources and environment.

Characteristic of this strategy is integrated approach to preservation of environment, meaning that instead of partial analysis of influence of objects or industries to one segment of environment, we consider all aspects of interaction (direct, indirect, short term, long term) of objects and industries with environment, and only then we perform valorization of planned objects and industries.

On the basis of the above said, we can conclude that the aim of the Study on impact assessment is to, on the basis of given location, existing information on conditions of the space, environmental conditions and micro-location conditions, estimate possible influences during implementation and during regular work of the Project, in order to prevent, remove, minimize and put to scope allowed by Law.

1.0. PROJECT HOLDER

"FIAT AUTOMOBILI SRBIJA"
4 Kosovska street
City of Kragujevac

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1.1. Methodology of impact assessment and making of Study on environmental impact assessment

Methodological approach and contents of Impact assessment are defined by Environmental impact assessment Law ("Official Gazette RS" no. 135/04 and 69/05) and Rulebook on contents of Study on environmental impact assessment ("Official Gazette RS" no. 69/05).

For estimation of environmental risk, we used modified and adapted model –" Rapid Urban Environmental Assessment"- with the elements of the environmental impact assessment model. Furthermore, for assessment of risk to environment and human health, we used methods recommended and instructed by World health organization (WHO), European Fund for Chemical Engineering (EFCE), Environment Protection Agency USA (EPA-USA) and International Labor organization (ILO):

- The Risk Assessment Guidelines, EPA Washington DC, 1986;
- Environmental Impact Assessment, McGraw-Hill International edition, Singapore, 1996;
- Major Hazard Control, WHO, Geneva, 1990;
- Hazard analyzing methods, Technical instruction to hazard control, International Labor organization (ILO), Geneva, 1990;
- Risk analysis methods, European Fund for Chemical Engineering (EFCE), Rugby, England, 1985;
- Hazard analyzing methods, Technical instruction to accident management, Washington, USA-EPA, 1989;
- Environmental Impact Assessment of Urban Development Project, Guidelines and Recommendation, WHO, 1995.

1.2. Law regulations relevant for making of Study on environmental impact assessment

The following regulations are used for making of the Study on impact assessment, interpretation of the results, proposing of protection measures and environmental monitoring:

- Environment protection Law ("Official Gazette RS" no. 135/04 and 72/09);
- Environmental impact assessment Law ("Official Gazette RS" no. 135/04);
- Planning and building Law ("Official Gazette RS" no. 72/09 and 81/09);
- Water resources law ("Official Gazette RS" no. 30/10;
- Packaging material and waste packaging material Law ("Official Gazette RS" no. 36/09);
- Nature protection Law ("Official Gazette RS" no. 36/09);
- Air protection Law ("Official Gazette RS" no. 36/09);
- Waste management Law ("Official Gazette RS" no. 36/09);
- Law on chemicals ("Official Gazette RS" no. 36/09);
- Law on biocide matters ("Official Gazette RS" no. 36/09);
- Law on protection from noise in living environment ("Official Gazette RS" no. 36/09);
- Law on protection from ionizing radiation and nuclear safety ("Official Gazette RS" no. 36/09);
- Law on protection from non-ionizing radiation ("Official Gazette RS" no. 36/09);

- Fire protection Law ("Official Gazette RS" no. 111/09);
- Law on explosive matters, inflammable liquids and gases ("Official Gazette RS" no. 44/77, 45/85, 18/89, 53/93, 67/93 and 48/94);
- Rulebook on contents of Study on environmental impact assessment ("Official Gazette RS" no. 69/05);
- Rulebook on procedure of public insight, presentation and public discussion about Study on environmental impact assessment ("Official Gazette RS" no. 69/05);
- Rulebook on limiting values, emission measuring methods, criteria for setting up of measuring points, data recording ("Official Gazette RS" no. 54/92, 30/99 and 19/2006);
- Rulebook on emission limiting values, manner and time of measuring and data recording Rulebook on contents of Study on environmental impact assessment ("Official Gazette RS" no. 30/97 and 35/97);
- Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95 and 56/10);
- Rulebook on allowed level of noise in environment ("Official Gazette RS" no. 54/92);
- Rulebook on conditions and manner of selection, packing and storage of secondary raw materials("Official Gazette RS" no. 72/09 and 56/10);
- Rulebook on contents of Accident prevention policy and contents and methodology of making of Report on safety and Accident protection plan ("Official Gazette RS" no. 41/10);
- Rulebook on Dangerous matters list and their quantity and criteria for defining type of document to be made by operator of Seveso plant , namely complex ("Official Gazette RS" no. 41/10);
- Rulebook on contents of notification about new Seveso plant, namely complex, existing Seveso plan, namely complex and about permanent stoppage of work of Seveso plant, namely complex ("Official Gazette RS" no. 41/10);
- Rulebook on dangerous waste in water ("Official Gazette RS" no. 31/10);
- Rulebook on manner and minimal number of testing of waste water quality ("Official Gazette RS" no. 47/83 and 13/84);
- Decision on sanitary-technical conditions for release of waste water into public sewer system ("Official Gazette of City of Kragujevac" no. 9/93);
- Directive on water current categorization ("Official Gazette SRS" no. 5/68);
- Directive on water categorization ("Official Gazette SRS" no. 5/68);
- Directive on manners and procedures of managing waste containing asbestos ("Official Gazette RS" no. 60/08);
- Directive on conditions for monitoring and air quality requirements ("Official Gazette RS" no. 11/2010);
- Waste management strategy for the period 2010-2019 ("Official Gazette RS" no. 29/2010).

1.3. Existing documentation used for making of Study on environmental impact assessment

For the Study on environmental impact assessment, we used the following documentation:

- Decision on necessity of environmental impact assessment and defining scope and contents of Study on environmental impact assessment no. XVIII-501-86/10 dated 01/06/2010, City administration for spatial planning, building and environment protection – Environment protection department, City of Kragujevac,
- Decision on location license no. XVIII-353-454/10 dated 13/07/2010, City administration for spatial planning, building and environment protection – Spatial planning department, City of Kragujevac,
- Copy of plan R=1:2500,
- Conditions no. 11105/1 dated 02/07/2010, JKP "Vodovod i kanalizacija" (public communal enterprise "Water supply and sewer system") Kragujevac,
- Electrical energy consent for the location no. 1-3-8068 dated 08/07/2010, Electro energy distribution company "CENTAR" doo Kragujevac, ED Elektrosumadija Kragujevac,

- Consent no. 66.10.30.PP dated 06/07/2010, Limited Liability Company for production of energy and fluids and services “ENERGETIKA” d.o.o. Kragujevac,
- Conditions no. 12057 dated 08/07/2010, JP “Srbijagas”, Belgrade Department,
- Consent no. 172/210 dated 06/07/2010, “Telekom Srbija” telecommunication company a.d., IJ Kragujevac,
- Notification on issuing of water supply conditions no. 325-05-00739/2010-07 dated 09/07/2010, Ministry of Agriculture, Forestry and Water resources, Republic water directorate, Belgrade,
- Decision on issuing of water supply conditions no. 325-05-906/2009-07 dated 17/06/2009, Ministry of Agriculture, Forestry and Water resources, Republic water directorate, Belgrade,
- Report on analyzing of waste water quality no. V10/112 dated 17/04/2010, Nuclear sciences institute “Vinca”, Laboratory for chemical dynamics and permanent education, RJ Chemical dynamics (060),
- Report on analyzing of waste water quality no. V10/113 dated 17/04/2010, Nuclear sciences institute “Vinca”, Laboratory for chemical dynamics and permanent education, RJ Chemical dynamics (060),
- Urbanism solution of the project, P=1:1000;
- Macro location, orthophoto image (Google),
- Set-up.

2.0. Location and surroundings description

The subject of environmental impact assessment is reconstruction of production facilities in the company "FIAT AUTOMOBILI SRBIJA". The complex is implemented at the cadastral parcel no. 1/1 KO Kragujevac 2 and it takes an area of P=112 ha 82a 19m2.

The location of the Project is within the boundaries of General urbanism plan Kragujevac 2015, and within the work zone 3 "Zastava" , unit 2 and Detailed regulation plan "Zastava automobili", about 2.5 km south-west from the city center. The location is very well connected with the wider surroundings through the street Kneza Mihaila, which is at the same time a route Kragujevac-Kraljevo. The complex is connected to the mentioned road by the bridges "Sest Topola" and "Zvezda". It is connected to the rail road Lapovo-Kraljevo by industrial rail road.

There are residential zones in the surrounding of the location- settlements Sest topola, Palilule and Zvezda at the north, Erdec at the south-west and Belosevac at the south-east. To the south of the complex, there is an area which is not built up- agricultural land. River Zdraljica flows along the east border of the plant complex which connects the mentioned complex with the main Zastava location.

The whole production complex is located between river-beds of three currents: Lepenica river, Zdraljica river and Grosnica river. It is built up on relatively plain terrain on the height of 178-186 meters above see level.

There are no indicators of instability of the terrain, sliding, ground settling, erosion identified at the location. Bearing capacity of the terrain is satisfactory. There are no protected, registered for protection or endangered plant and animal species, corridors, migration areas and habitats, natural monuments, valuable resources from the aspect of biodiversity and preservation of autochthony at the location. No protected cultural heritage and archeological sites not detected at the location nor immediate surroundings. The infrastructure of the location is equipped and connected to the systems of power supply, water supply, sewer and TT network.

At the location, in the existing state, there are objects constructed in previous period and used to be a part of former plant "Zastava automobili", and now they belong to the company "FIAT AUTOMOBILI SRBIJA":

- 1 building for metal processing industry, technological department of phase II
- 2 building for metal processing industry, facilities of body-shop, surface protection and assembly
- 3 building for metal process. ind., facilities of mechanical processing, pressing shop with annexes
- 4 building for metal process. ind., water purification plant
- 5 building for metal process. ind., guard booth at the pressing shop
- 6 building for metal process. ind.,
- 7 building for metal process. ind., sale point (booth) at the car market
- 10 building for metal process. ind.,
- 11 building for metal process. ind., administration building
- 12 building for metal process. ind., construction-technological office
- 13 building for metal process. ind.,
- 15 building for metal process. ind.,
- 16 building for metal process. ind., traffic monitoring object,
- 17 building for metal process. ind.,
- 18 building for metal process. ind., gate II, guard booth at the suspension bridge,
- 19 building for metal process. ind,
- 20 building for metal process. ind, shop for charging and maintenance of electro carts,
- 21 building for metal process. ind, painting central object,
- 22 building for metal process. ind, water purification plant KATAK,
- 23 building for metal process. ind, water tank,
- 24 building for metal process. ind,,
- 25 building for metal process. ind, object "A" – galvanization and black painting,
- 26 building for metal process. ind, storage,
- 27 building for metal process. ind,
- 28 building for metal process. ind, finalization shop,
- 29 building for metal process. ind, additional object,
- 30 building for metal process. ind, object-parking lot for completed cars,

- 31 building for metal process. ind, ramp,

- 32 building for metal process. ind,
- 33 building for metal process. ind, constructive-developing center,
- 34 building for metal process. ind, assembly object for car designing,
- 35 building for metal process. ind, boiler room,
- 36 building for metal process. ind,
- 37 building for metal process. ind, guard booth no. 3,
- 38 building for metal process. ind, guard booth in DRP "car institute",
- 39 other buildings – guard booth at "Sest topola",
- 40 gas station building- gas station at finalization shop,
- 41 other buildings- administrative object,
- 42 electro distribution object,
- 43 electro distribution object,
- 44 other buildings- waste pressing shop,
- 45 supplementary building,
- 46 other buildings- waste storage,
- 47 supplementary building,
- 48 supplementary building,
- 49 other buildings- flammable material storage,
- 50 electro distribution building.

Certain objects are planned to be reconstructed and they are the subject matter of this Study, as well as building of two new objects, while the rest of the objects located at the complex are not the subject matter of the Study on environment impact assessment.

In the case of demolition of certain objects at the location, it is necessary to classify the waste to be generated by that activity pursuant to Waste management Law ("Official Gazette RS" no. 36/09). Non dangerous waste is to be removed from the location through competent public communal enterprise, while the waste having the features of dangerous waste is to be managed pursuant of the Rulebook on handling of waste having the features of dangerous matters ("Official Gazette RS" no. 12/95 and 56/10). Asbestos plates used as roof covering on certain objects are to be managed pursuant to Directive on manners and procedures of managing waste containing asbestos ("Official Gazette RS" no. 60/08).

Analysis of existing conditions at the location, characteristic of the Project and expected result indicates that the Project is acceptable and sustainable in relation to location and ecology. The Project Holder chose the location for the reason of spatial possibilities, good traffic connection and possibility of infrastructural equipping.

2.1. Compliance of the location with spatial and plan related documentation

Pursuant to General urbanism plan Kragujevac 2015 ("Official Gazette of City of Kragujevac" no. 7/10)and Detailed regulation plan "Zastava" ("Official Gazette of City of Kragujevac" no. 37/08), Cadastral parcel no. 1/1 KO Kragujevac 2 is located at Work zone 3- "Zastava", unit 2 with the land purpose- processing industry- production of vehicles.

The Project Holder was issued a Decision on location license no. XVIII-353-454/10 dated 13/07/2010, City administration for spatial planning, building and environment protection – Spatial planning department, City of Kragujevac.

Decision on location license defines degree of built- up and occupation, building and regulatory lines, vertical regulation, manner of connecting to infrastructural systems, manner of conduct of atmospheric water and other conditions for complying of the planned Project with spatial-planning and urbanism documentation.

General conditions of urbanism regulation:

- The parcel occupies area of 112 ha 82a 19m2.
- Gross area under objects is 31 ha 80a 19m2
- Degree (index of built up) is 2.0,
- Degree of occupation 60%, maximal technological and traffic surfaces – max. 20%.

2.2. Closeness of areas protected by international, national or local regulations

The complex of company "FIAT AUTOMOBILI SRBIJA" is located at the work zone 3 "Zastava", unit 2, so even on the basis of the location itself in relation to the surroundings (industrial zone and residential zones) and pursuant to the insight into existing documentation, it is concluded that there is no areas protected by international, national or local regulations at the location and the surroundings and therefore, there is no limiting factors.

2.3. Closeness of sanitary protection of water currents and sources of water supply

City of Kragujevac is supplied by water from the accumulations of Gruza and Grosnica. These accumulations and sanitary protection zones around them are at the great distance from the complex (Grosnica 10 km to south-west, Gruza around 20 km to west-south-west). Mentioned accumulations are located upstream in relation to the Lepenica river which drains the analyzed area, so there is no possibility for negative impact of the Project to water quality supplied to the city and surrounding area.

The north-west border of the complex is watery land of Lepenica river. Lepenica river bed is regulated and arranged in the zone bordering the complex, with built expansions suitable to accept "one-hundred-year-flood". In that way, possibility of flood as a natural disaster that might be cause to an accident at the location is minimized.

Lepenica is water current with low water flow and low water level, with high oscillations in water level (it significantly increases during rainy periods- similar to torrents). It is highly polluted, so it is not considered as significant natural resource.

Zdraljica river bed is regulated as well, while Grosnica river bed is planed to be regulated.

2.4. Population and construction of the location

Within the location, which is within the work zone 3 "Zastava", there are no residential objects. Concentration of population directly depends on number of employees and service users, as well as on work rate (number of daily shifts).

The work zone 3 "Zastava' is surrounded by zones of middle residential density (B 2.2 Gs=15-40 flats/ha) and high residential density (A 2.3 Gs=50-100 flats/ha).

Demographic features of City of Kragujevac, as general indicator of population in wider surrounding of the complex can be presented through results of the census from the year 2007.

Table 1. *Systematized list of settlements of Republic of Serbia for districts and municipalities-Statistical Office of Republic of Serbia (year 2007)*

Name of district	Name of municipality	Name of settlement	Number of citizens	Number of housholds
Sumadija district	Kragujevac		175802	59524
Sumadija district	Kragujevac	City area	146373	49969

Information on demographic features of Kragujevac are available at the web site of Statistical Office of Republic of Serbia. During the last 20 years, Kraugjevac had high demographic inflow.

As relatively young settlement, Kragujevac had fast demographic development. At the beginning of 19th century, Kragujevac had about 200 households, at he beginning of 20th century there was about 2300 households, while according to data from 2007, Kragujevac has around 50000 households.

Fast demographic development was influenced and followed by industrial development (the moment of transferring of cannon factory from Belgrade to Kragujevac, military industry starts developing, and later mechanical industry as well) which characterized contemporary appearance and status of Kragujevac. Demographic development led to fast urbanization. Kragujevac has been developing pursuant to the regulation that started in the middle of the 19th century. One of the most important planning documents is Kragujevac town regulation plan from the year 1891 made by the engineer Luka Ivanovic. Further urban development went along main traffic directions, which led to Kraljevo, Gornji Milanovac and Belgrade, together with forming of industrial zone on the left river bank of Lepenica.

Around city core of that time, residential and industrial zones have been generating during years, and therefore the existing unfavorable position of Industrial zones is a consequence of century long "organic" development of city.

Thus, mechanical industry has a long tradition in Kragujevac, as well as car manufacturing which made the company "Zastava" from Kragujevac (now "FIAT AUTOMOBILI SRBIJA") known round the world as one of the biggest brands of Kragujevac.

2.5. Types of natural resources at the location

There is no natural resources at the location and in the surroundings which might be negatively influenced by implementation and work of the Project. The location is built up building land.

For the same reasons, we can conclude that there is no underground water of good quality. Lepenica, Zdraljica and Grosnica river, taking into consideration their volume, flow and water quality, are also not important natural resources. Mineral resources and natural resources such as some bigger forest complexes are also not characteristic for the analyzed zone.

2.6. Susceptibility of the location to earthquakes, ground settling, landslides, erosion, floods, temperature differences, frequent fogs and strong winds

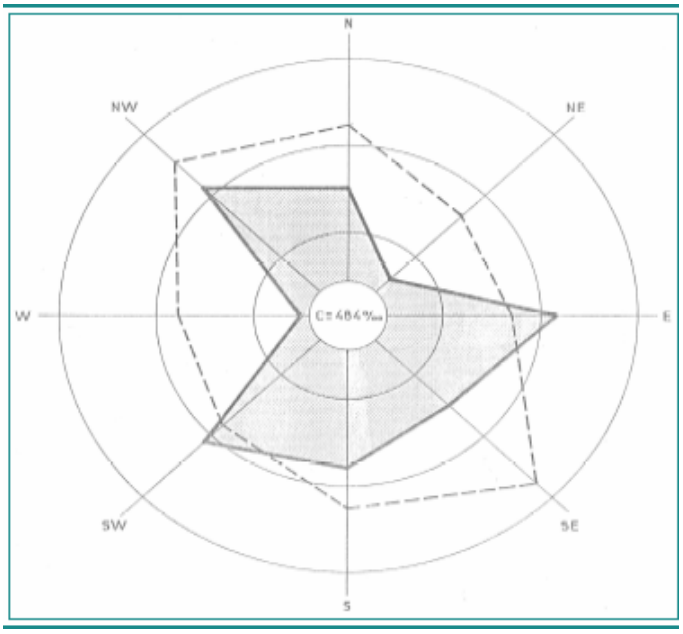
The concerned complex is located at the relatively even terrain between water currents of Lepenica, Zdraljica and Grosnica rivers.

As these water current are at immediate surrounding, there is possibility of flood as a natural disaster. However, Lepenica and Zdraljica river beds in building area of Kragujevac, even in the area bordering the concerned location, are regulated and arranged, while regulation of Grosnica river is planned.

Before regulation of Lepenica river bad, there were significant floods in the analyzed zone during the longer periods of abundant precipitations.

Settling of ground, erosion, landslides and other instabilities of terrain are not characteristic for the concerned zone, but during construction of objects, bearing capacity of terrain and relatively high level of underground waters must be taken into consideration.

Strong winds are not characteristic for the area of Kragujevac, as well as frequent fogs. Great number of silent days is characteristic (484 ‰). Frequency of winds is considerably balanced, with slight domination of the winds from the North-West, Sought-West and East. The rarest are West and North-East winds.



Picture 1. *Wind rose for the area of Kragujevac*

Table 2. *Average monthly, annual and extreme values 1961-1990*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
TEMPERATURE C°													
Average maximal	3,8	6,7	11,8	17,3	22,0	25,0	27,2	27,3	23,9	18,2	11,5	5,6	16,7
Average minimal	-3,8	-1,7	1,4	5,5	10,1	13,0	14,2	13,7	10,7	6,3	2,4	-1,6	5,9
Normal value	-0,1	2,2	6,3	11,3	16,1	19,0	20,6	20,2	16,7	11,4	6,4	1,8	11,0
Absolute maximum	18,6	23,6	28,2	31,2	34,4	37,4	40,0	39,4	37,4	31,0	27,6	21,0	40,0
Absolute minimum	-27,6	-23,8	-16,0	-4,9	-0,6	2,7	7,2	4,6	-2,2	-6,0	-16,4	-20,7	-27,6
Avr. no. of cold days	22,7	16,7	10,2	1,5	0,0	0,0	0,0	0,0	0,2	2,3	8,3	17,9	79,8
Avr. no. of tropical days	0,0	0,0	0,0	0,1	0,8	4,0	8,3	9,5	3,2	0,2	0,0	0,0	26,1
RELATIVE HUMIDITY(%)													
Average	79,0	76,1	70,3	67,8	69,8	71,3	69,4	70,2	73,1	75,0	77,9	80,7	73,4
SUNSHINE TIME													
Average	71,4	89,1	137,8	175,6	224,3	242,6	285,1	268,1	205,1	162,9	93,2	60,6	2015,8
Number of sunny days	3,5	3,6	5,1	4,1	4,3	4,6	9,3	11,7	9,8	9,0	4,5	2,6	72,1
Number of cloudy days	14,8	13,0	11,5	9,3	8,7	6,3	4,8	4,1	5,8	7,5	12,2	15,6	113,6
PRECIPITATIONS (mm)													
Aver. monthly quantity	41,1	38,7	44,4	49,4	73,8	84,7	68,0	53,3	44,8	38,2	48,2	47,6	632,2
Aver. daily quantity	36,1	42,4	31,6	41,9	44,4	46,8	65,8	84,2	45,6	36,8	34,4	43,7	84,2
Aver. no. of days≥0,1mm	11,6	10,4	10,6	12,2	13,1	12,9	9,3	9,3	8,1	8,6	10,3	12,3	128,7
Aver. no. of days≥10,0mm	1,0	1,0	1,5	1,3	2,4	2,9	2,5	1,6	1,4	1,3	1,4	1,4	19,7
PHENOMENA (no. of days with ...)													
Snow	7,6	5,9	3,7	0,3	0,0	0,0	0,0	0,0	0,0	0,1	2,2	5,9	25,7
Snow layer	14,2	8,2	3,5	0,2	0,0	0,0	0,0	0,0	0,0	0,1	3,0	10,3	39,5
Fog	1,1	0,7	0,2	0,1	0,0	0,0	0,0	0,1	0,2	0,6	1,9	1,7	6,6
Hail	0,0	0,0	0,0	0,1	0,1	0,3	0,2	0,1	0,0	0,0	0,0	0,0	0,8

(www.hidmet.gov.rs/meteorologija/klimatologija)

2.7. Presence of vulnerable objects at the surrounding location

Vulnerable objects- schools, hospitals, nursery schools, sport centers, churches, cemeteries, cultural heritage objects are at the great distance- out of the area of possible negative impact.

The nearest vulnerable unit is Palilula cemetery located north of the location, at about 400m, while it is separated from the complex border by Lepenica foreland and residential objects of the near settlement.

The nearest school (Primary school “Treci kragujevacki bataljon”) is at about 800m away to the north from the complex, while the nearest nursery school is 750m to the north-west.

Planned works at the reconstruction of production facilities of the company “FIAT AUTOMOBILI SRBIJA” will have no impact to the objects located in immediate and wider surrounding.

2.8. Presence of areas at the location and in the surroundings utilizing protected, important and vulnerable species of flora and fauna

There is no area, at the location and surroundings, that utilizes important and vulnerable species of flora and fauna. Natural water ecosystem of Lepenica river is destroyed by long term polluting, while green areas in the surroundings are reduced to partial and protective greenery, squares and small parks, namely greenery consists of decorative species and species resistant to high level of air pollution, while fauna consists of small species accompanying human presence and which are well adapted to urban surrounding.

2.9. Closeness of important roads

The complex of the company “FIAT AUTOMOBILI SRBIJA” is located within the work zone 3 “Zastava” , unit 2, at about 2,5 km to south-east from the central city zone. The location is very well connected with wider surroundings through Kneza Mihaila street, which is state road level I M-23 Kragujevac-Kraljevo. Basic connection to street network goes through Tome Vucica street and intersection “Zvezda”. Road passing by “Zastava Clinic” connects Tome Vucica street and intersection “Zvezda”. Internal roads are set orthogonally for the purposes of technological process with orientation of main roads towards entrance-exit positions.

2.10. Set-up and graphical background with objects on and around the location

As mentioned previously, the concerned Project location is within the boundaries of General Urbanism plan Kragujevac 2015, within the work zone 3 ”Zastava”, unit 2 and Detailed regulation plan “Zastava automobili”. The location is very well connected with wider surroundings through Kneza Mihaila street, which is state road level I M-23 Kragujevac-Kraljevo. The concerned complex is connected with the mentioned road by the bridges “Sest Topola” and “Zvezda”. It is connected to the rail road Lapovo-Kraljevo by industrial rail road.

Picture 2. *Orthophoto image of concerned complex and immediate surroundings with existing objects planned to be reconstructed*

At the location, in the existing state, there are objects constructed in previous period and used to be a part of former plant "Zastava automobili", and now they belong to the company "FIAT AUTOMOBILI SRBIJA":

- 1 building for metal processing industry, technological department of phase II
- 2 building for metal processing industry, facilities of body-shop, surface protection and assembly
- 3 building for metal process. ind., facilities of mechanical processing, pressing shop with annexes
- 4 building for metal process. ind., water purification plant
- 5 building for metal process. ind., guard booth at the pressing shop
- 6 building for metal process. ind.,
- 7 building for metal process. ind., sale point (booth) at the car market
- 10 building for metal process. ind.,
- 11 building for metal process. ind., administration building
- 12 building for metal process. ind., construction-technological office
- 13 building for metal process. ind.,
- 15 building for metal process. ind.,
- 16 building for metal process. ind., traffic monitoring object,
- 17 building for metal process. ind.,
- 18 building for metal process. ind., gate II, guard booth at the suspension bridge,
- 19 building for metal process. ind,
- 20 building for metal process. ind, shop for charging and maintenance of electro carts,
- 21 building for metal process. ind, painting central object,
- 22 building for metal process. ind, water purification plant KATAK,
- 23 building for metal process. ind, water tank,
- 24 building for metal process. ind,,
- 25 building for metal process. ind, object "A" – galvanization and black painting,
- 26 building for metal process. ind, storage,
- 27 building for metal process. ind,
- 28 building for metal process. ind, finalization shop,
- 29 building for metal process. ind, additional object,

- 30 building for metal process. ind, object-parking lot for completed cars,
- 31 building for metal process. ind, ramp,
- 32 building for metal process. ind,
- 33 building for metal process. ind, constructive-developing center,
- 34 building for metal process. ind, assembly object for car designing,
- 35 building for metal process. ind, boiler room,
- 36 building for metal process. ind,
- 37 building for metal process. ind, guard booth no. 3,
- 38 building for metal process. ind, guard booth in DRP “car institute”,
- 39 other buildings – guard booth at “Sest topola”,
- 40 gas station building- gas station at finalization shop,
- 41 other buildings- administrative object,
- 42 electro distribution object,
- 43 electro distribution object,
- 44 other buildings- waste pressing shop,
- 45 supplementary building,
- 46 other buildings- waste storage,
- 47 supplementary building,
- 48 supplementary building,
- 49 other buildings- flammable material storage,
- 50 electro distribution building.

3.0. Project Description

The subject matter of the Study on environmental impact assessment id reconstruction of production facilities in the company "FIAT AUTOMOBILI SRBIJA" located at the cadastral parcel no. 1/1 Kragujevac 2 and construction of two new objects.

At the concerned location, there are objects constructed in the previous period and used to be a part of former plant "Zastava automobili", and now they belong to the company "FIAT AUTOMOBILI SRBIJA". There are following objects and contents at the concerned location:

- 1 building for metal processing industry, technological department of phase II
- 2 building for metal processing industry, facilities of body-shop, surface protection and assembly
- 3 building for metal process. ind., facilities of mechanical processing, pressing shop with annexes
- 4 building for metal process. ind., water purification plant
- 5 building for metal process. ind., guard booth at the pressing shop
- 6 building for metal process. ind.,
- 7 building for metal process. ind., sale point (booth) at the car market
- 10 building for metal process. ind.,
- 11 building for metal process. ind., administration building
- 12 building for metal process. ind., construction-technological office
- 13 building for metal process. ind.,
- 15 building for metal process. ind.,
- 16 building for metal process. ind., traffic monitoring object,
- 17 building for metal process. ind.,
- 18 building for metal process. ind., gate II, guard booth at the suspension bridge,
- 19 building for metal process. ind,
- 20 building for metal process. ind, shop for charging and maintenance of electro carts,
- 21 building for metal process. ind, painting central object,
- 22 building for metal process. ind, water purification plant KATAK,
- 23 building for metal process. ind, water tank,
- 24 building for metal process. ind,,
- 25 building for metal process. ind, object "A" – galvanization and black painting,
- 26 building for metal process. ind, storage,
- 27 building for metal process. ind,
- 28 building for metal process. ind, finalization shop,
- 29 building for metal process. ind, additional object,
- 30 building for metal process. ind, object-parking lot for completed cars,
- 31 building for metal process. ind, ramp,
- 32 building for metal process. ind,
- 33 building for metal process. ind, constructive-developing center,
- 34 building for metal process. ind, assembly object for car designing,
- 35 building for metal process. ind, boiler room,
- 36 building for metal process. ind,
- 37 building for metal process. ind, guard booth no. 3,
- 38 building for metal process. ind, guard booth in DRP "car institute",
- 39 other buildings – guard booth at "Sest topola",
- 40 gas station building- gas station at finalization shop,
- 41 other buildings- administrative object,
- 42 electro distribution object,
- 43 electro distribution object,
- 44 other buildings- waste pressing shop,
- 45 supplementary building,
- 46 other buildings- waste storage,
- 47 supplementary building,
- 48 supplementary building,
- 49 other buildings- flammable material storage,
- 50 electro distribution building.

The following objects, out of the above mentioned, listed together with the main construction works, pursuant to the nomenclature of the location license no. XVIII 353-454/10 dated 13/07/2010, will be included in the Study, namely in the reconstruction procedure.

Object 1a) Bumpers painting shop – (area P=35,820m2, height 9.95-14.55m)

-erection of roof,

-painting of columns,
- reconstruction of vertical and horizontal gutters,
-painting of façade,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network,
-construction of the new object, connected to the existing, with metal construction.

Object 16) Shop for anticorrosive protection of body - (area P=36,070m2, height 9.95-14.55m)

-erection of roof,
-painting of columns,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 2 Shop pressing of body elements – Press shop- (area P=54,900m2, height 9.95-23.05)

-painting of columns,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,
-renewal/painting of façade,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 3 Shop for anticorrosive protection of body - Body shop- (area P=43,380m2, height 6.75-17.70m)

-erection of roof,
-painting of columns,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,
- renewal/painting of façade,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 4 Paint shop - (area P=38,860m2, height 6.20-11.95m)

-erection of roof,
-painting of columns,
- renewal of floors,
- reconstruction of tubes and gutters,
- renewal/painting of façade,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 5 Assembly shop - Assembly- (area P=34,120m2, height 6.20-15.25m)

-erection of roof,
-painting of columns,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,

- renewal/painting of façade,

-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network,
- construction of the new object, connected to the existing, with metal construction.

Object 6 Storage- (area P=15,,230m2, height 9.40-12.30m)

-painting of columns,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,
- renewal/painting of façade,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 7 Storage- (area P=8,550m2, height 9.20-11.65m)

-painting of columns,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,
- renewal/painting of façade,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 10 Storage- (area P=4,710m2, height 10.40m)

-painting of columns,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,
- renewal/painting of façade,
-setting of new entrance door,
-setting of new inner fire protection walls,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 11- Waste sheet metal pressing plant- Baler- construction of new object, metal construction where the new baling equipment will be set up.

Object 12 Central painting shop- Painting central - (area P=2,480m2, height 10.40m)

-painting of columns and inner walls,
- renewal of floors,
- reconstruction of vertical and horizontal gutters,
- renewal/painting of façade,
-setting of new entrance door,
-renewal of electro network, illumination, ventilation, industrial water, fire extinguish system, sewer network.

Object 64- Storage for inflammable material- construction of new object (roof), metal construction where the inflammable material will be stored.

3.1. Description of physical characteristics of the Project

The objects on the concerned complex are typical industrial objects for automotive industry. The reconstruction (over building and upgrading) of existing objects, as well as building of new.

- Object 1a) Bumpers painting shop – (area P=35,820m2, height 9.95-14.55m) is a part of the object 1-2 located in the west part of the complex, marked at the copy of the plan

with number 3- mechanical processing facilities and pressing shop with an annex. It is connected with the permanent objects by internal roads and pavements. In the existing state, the manufacturing part is of the floor level Pv[1], while the annex is P+2[2]. Planned: reconstruction of the roof P, upgrading of annex on the west side P, upgrading of the annex on the north-west side P+2.

Object 16) Shop for anticorrosive protection of body - (area P=36,070m2, height 9.95-14.55m) is also part of the object 1-2 located at the west side of the complex, marked at the copy of the plan with number 3- mechanical processing facilities and pressing shop with an annex. It is connected with other objects by internal roads and pavements. This part of the object will be used for processing of plastic by pressing (bumpers plastic pressing). In the existing state, the manufacturing part is of the floor level Pv, while the annex is P+2. Planned: reconstruction of the roof P, upgrading of the annex on the north-west side P+2.

- Object 2 Shop pressing of body elements – Press shop- (area P=54,900m2, height 9.95-23.05)- also part of the object 1-2 located at the west side of the complex, marked at the copy of the plan with number 3- mechanical processing facilities and pressing shop with an annex. It is connected with other objects by internal roads and pavements, as well as the industrial rail road. In the existing state, the manufacturing part is of the floor level Pv, while the annex is up to P+2.
- Object 3 Shop for anticorrosive protection of body - Body shop- (area P=43,380m2, height 6.75-17.70m)- this object is a part of the object 3-4-5 located at the north-east part of the complex, marked at the copy of the plan as a part of the object 2- body, surface protection and assembly facility. At the north-east it borders the object 4, and on the north it borders the annex 3-4-5. It is connected with other objects in the complex by roads and pavements. In the existing state, the manufacturing part is of the floor level Pv, while the annex is P+2. Planned construction works: reconstruction of roof P, upgrading of the annex at the west side P.
- Object 4 Paint shop - (area P=38,860m2, height 6.20-11.95m)- this object is a part of the object 3-4-5 located at the north-east part of the complex, marked at the copy of the plan as a part of the object 2- body, surface protection and assembly facility. At the north-east it borders the object 4, and on the north it borders the annex 3-4-5. It is connected with other objects in the complex by roads and pavements. In the existing state, the manufacturing part is of the floor level Pv, while the annex is P+2. Planned construction works: reconstruction of roof P, upgrading of the annex at the south side P.
- Object 5 Assembly shop - Assembly- (area P=34,120m2, height 6.20-15.25m)- this object is a part of the object 3-4-5 located at the north-east part of the complex, marked at the copy of the plan as a part of the object 2- body, surface protection and assembly facility. At the north-east it borders the object 4, and on the north it borders the annex 3-4-5. It is connected with other objects in the complex by roads and pavements. In the existing state, the manufacturing part is of the floor level Pv, while the annex is P+2. Planned construction works: reconstruction of roof P, upgrading of the annex at the east side P.
- Object 6 Storage- (area P=15,,230m2, height 9.40-12.30m)- this object is marked at the copy of plan with the number 25- object "A"- galvanization and black painting, located at the south-east from the object 1-2. It is connected with other objects in the complex by roads and pavements. Entrances of the annex part are at the east side, while the entrances to the storage at the north side. The existing floor level, which is to be unchanged is (partly Po[3] + P+ partly 2).
- Object 7 Storage- (area P=8,550m2, height 9.20-11.65m)- this object is marked at the copy of plan with the number 28- finalization object, located at the south-west part of the complex. It is connected with other objects in the complex by roads and pavements. Entrances of the annex part are at the north side, while the entrances to the storage at the east and west side. The existing floor level, which is to be unchanged is (partly Po[4] + P+ partly 2).
- Object 8 Academy for education of employees- at the copy of the plan marked with the number 33- constructive-developing sector, located at the west side of the complex. Connected with other objects of the complex by roads and pavements. Existing floor level is P, and planned P+ partly 1.
- Object 10 Storage- (area P=4,710m2, height 10.40m)- at the copy of the plan marked with the number 29- supplementary object, located on the south from the objects 1-2 and to the north from object 6. It is connected with other objects in the complex by roads and pavements. The existing floor level, which is to be unchanged is P.

[1] Pv-high ground floor
[2] P+2- ground floor +2
[3] Po-basement
[4] Po-basement

- Object 11- Waste sheet metal pressing plant- Baler- new object, metal construction where the new baling equipment will be set up. At the copy of the plan marked with the number 44 and located on the south from the object 10 and to the west from the object 6. The entrances are at the east and west side. Planned floor level P.
- Object 12 Central painting shop- Painting central- (area P=2,480m2, height 10.40m)-At the copy of the plan marked with the number 4. It is connected with other objects in the complex by roads and pavements and industrial railroad. Entrance is at the north side. Floor level P.
- Object 18a and 18b- changing rooms, canteens, offices (area P=1,130m2, height 13.85m)- at the copy of the plan marked with the number 12- constructive-technological office and located north from the object 4-5. It is connected with other objects in the complex by roads and pavements, and with the object 5 through a passage. Floor level is Po+P+3. Planned for new purposes of changing rooms, toilets, canteen.
- Object 64 Inflammable material storage- new object (roof), steel construction for storage of inflammable material. Located on the south-east from the object 5. Connected with other objects by streets. The object floor level will be P.

3.2. Short overview of technological work process of the Project

Process of manufacturing of the model FIAT PUNTO takes place in the plant of "FIAT AUTOMOBILI SRBIJA" , and production of other models is under preparation. The projected capacity is 60 vehicles per hour. For production of vehicles within the concerned plant, assembly including the following operations takes place:

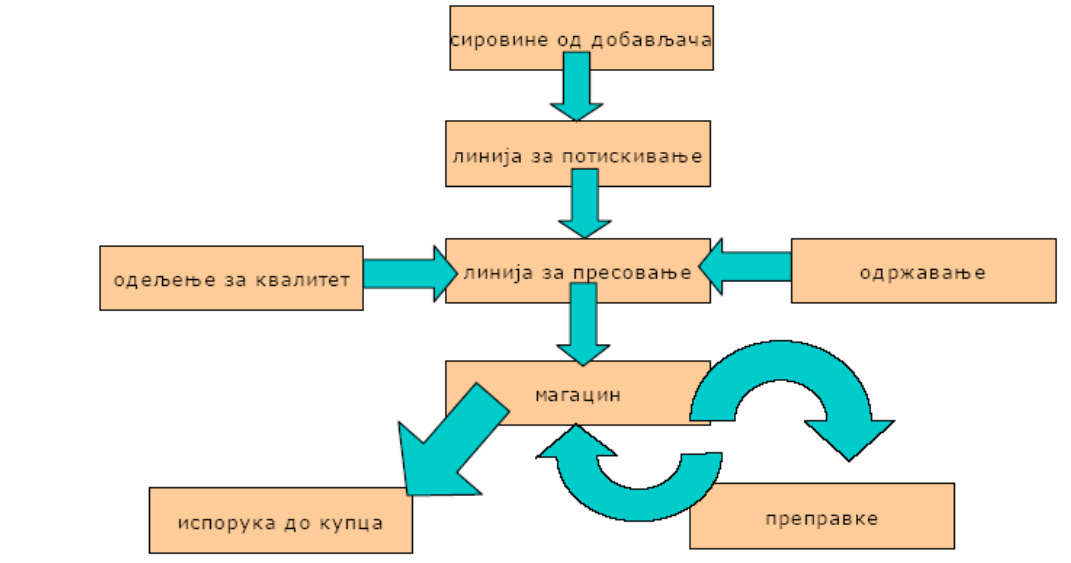
- pressing,
- making of body and welding of metal sheets- parts of body,
- painting of car body,
- set up of seats and mechanical parts of vehicle- reception- dispatch,
- final processing.

Press Shop- Within this unit, production of parts for cars (outer parts of body and frames) takes place. Repro material- metal sheets- is delivered in coils which are afterwards cut to appropriated dimensions, or as already cut into plates of appropriate dimensions by the provider. This part of the plant includes also the following units:

- Revision- additional activities, related to remediation of final parts are performed within this unit.
- Maintenance- maintenance performed at the line and, in smaller amount, beyond the line, is included in this unit.
- Product quality control- final product is submitted to dimensional and esthetic control. A range of reports is made and submitted to Operative unit, and in that way, future repeating of mistakes, namely making of inappropriate product is prevented.
- Quality department- direct and indirect materials are submitted to chemical and physical control in order to verify compliance with requirements of chemical-metallurgical laboratory. Tests on oils, emulsions, washing water are performed in order to define reuse/ disposal.
- Logistics and recharging of batteries- internal transport within operative plant unit is performed by fork lifters and trucks with power supply. Recharging of batteries is performed within this unit.

Description of work of Press Shop can be presented by the following technological chart:

Chart 1: *Technological chart of work in Press Shop*



raw materials from providers
⇓
feeding line
⇓
quality department ⇒ pressing line⇐maintenance
⇓
storage
delivery to buyer **remediation**

The following machines and equipment are used in the Press Shop:

- line for cutting (blanking),
- automatic feeding lines- presses,
- remediation lines,
- welding lines,
- battery charger,
- scraper grinder,
- quality control machines.

Planned capacity is 90.000 tones per year.

Body Shop- Welding of parts coming form Press Shop and their setting up into car body is performed within this unit. Basically, the body consists of chassis, floor, sides, roof and suspension. In order to secure assembly of subunits of body and completing of body, it is planned to install manual and automatic welding spots with automatic transport together with manual/automatic batching points.

It was also planned to install automatic lines for manufacturing of subassemblies and for completion of body with setting up of horizontally and vertically set up robots for spot welding. After that, assembly of bumpers, doors, bonnet and boot cover is performed. In order to complete body, it is taken off from the line and transported to Paint Shop.

Fumes coming from the metal welding points are conducted to the atmosphere through the vacuum system.

Paint shop – This part of the plant is used of painting of vehicle bodies transferred form the Body shop. Painting is performed by means of chemical, electro-chemical and technological procedures. The following processes are performed in the Paint shop:

- chemical preparation,
- cataphoretic protection,
- sound insulating PVC coating and
- painting of vehicle bodies with basic and covering paint.

Painting cycle includes the following procedures:
CHEMICAL PREPARATION- in this phase bodies coming from the Body shop are treated with spraying and sinking into appropriate chemical preparation. This phase includes:

- *degreasing:* consists of three phases of alternate showering and sinking into alkaline solution at the working temperature between 50 and 60°C. Its function is to remove all impurities from assembled body.
- *washing:* consists of one phase of showering and sinking with the usage of industrial water at ambient temperature. The purpose is to remove remnants after degreasing and prevention of negative impacts to the quality of further phases.
- *activation:* sinking, at ambient temperature, into mild alkaline solution containing titanium salts which are accumulating at the surface of body, making it more compact and being resource of crystallization for the next application of phosphates.
- *washing:* this washing is a combination of one phase of showering and sinking with usage of industrial water at ambient temperature. The purpose is to remove remnants from the previous procedure- namely remnants of alkaline solution and impurities.
- *phosphatization:* is a chemical process which forms metalloid coating of phosphates at the surface of sheet metal, which very well bond to the surface of sheet metal and enable good anticorrosive protection, and the same time, good application of paint. The process is performed in the following way: chemical erosion of metal by water solution of phosphoric acid, reaction between the solution and surface of metal which changes the surface structure of metal until forming of surface layer resistant to corrosion. The procedure is performed at the temperature of around 50°C.
- *washing:* is one phase of showering and then sinking with usage of industrial water of ambient temperature. The purpose is removal of remnants of phosphatization and prevention of negative impact in upcoming phases.
- *passivation:* is a phase in which body is sunk into mild acid water solution in order to achieve homogeneity of phosphate layer and to "fill in" possible uncovered zones.
- *final washing:* it is performed by entering into tub with demineralized water in recirculation, and afterwards showering with clean demineralized water. Final washing removes every trace of salts form body surface.
-

The above mentioned operations are performed within the tunnel through which bodies are transported by means of suspended sliders on the guides of transporting system. Strong air circulation secures prevention of condensation of vapors in the chamber, namely it prevents negative effects to the quality of preparation of body that might appear due to influence of condensates. Time of retention of bodies in tub must be exactly defined, and it highly important for achievement of required results, namely effective anticorrosive protection. Furthermore, necessary concentration of active matters in solutions used for sinking and treatment of bodies is maintained by constant control. Vapor generated in this phase is conducted to outer space through special emitters.

Table 3: *Materials and energy fluids applied in the phase of chemical preparation*

Chemical preparation		
Applied materials	Pre degreasing	Water solution of glycolate with corrosion inhibitor and non-ion biodegradable tensides over 90%
	degreasing	Mixture of phosphates and alkaline silicates, compounds, hygroscopic substances and non-ion biodegradable tensides over 90%
	activation	TiO_2 and sodium phosphates
	phosphatization	$Zn(H_2PO_4)_2$ and $Mg(H_2PO_4)_2$, free H_3PO_4 and various additives for phosphatization
	passivation	Water solution 1-2,5% NH_3
Energy fluids		Technological water, electric power, compressed air, industrial and demineralized water

CATAPHORESIS- electrophoresis is relatively new technique of painting and is based on migration of particles (bond substance and pigment) towards certain pole under the influence of electric power. As water is used for solution of pigments and bond substances, the emission of pollutants is significantly decreased.

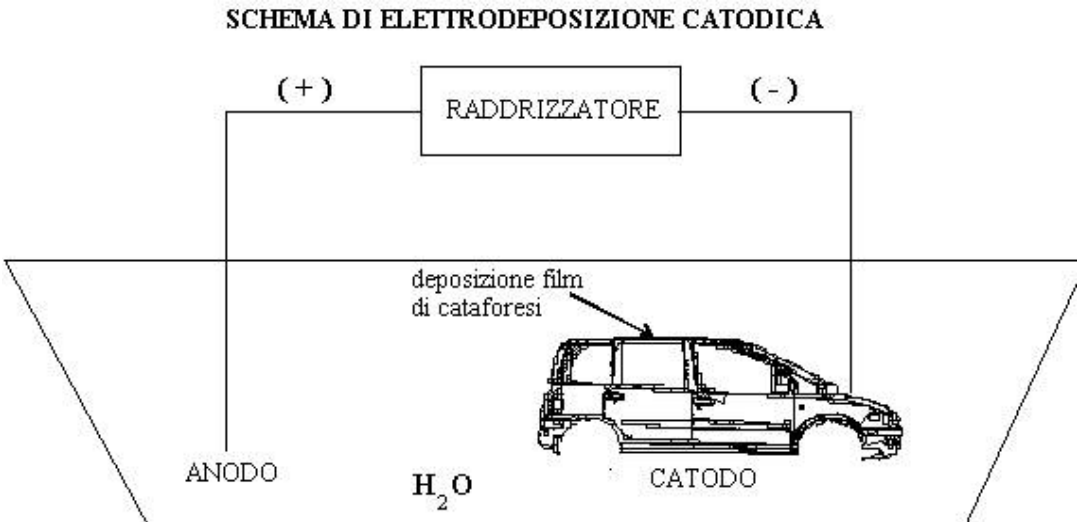
Possibility of high level of automatization and achievement of high quality and homogenous layer is significant factor in deciding about introduction of this technology. A film of protective paint is applied to body in this way.

Forming of solution requires usage of only 3% solver and content of dry matter between 15% and 20%. This means that the solution is not inflammable and that more than 90% of solution can be re-circulated in the installation which is the supplementary equipment of this unit. As this procedure is performed in a tub, it is ideal for complex items, namely, it is possible to protect even the most unavailable spots of body in this way. Generally speaking, electrophoresis forms very thin coating on objects, but with high resistance to effects of outer agents. In the process of cataphoresis, body acts as a cathode.

Electric field in water solution makes water molecules divide to ions (H+ I OH-), whereas cathode draws non-polar particles of paint and by time it forms an even layer at the surface of cathode. As, by time, it comes to attenuation of solution because pint accumulates at the body surface, at the beginning, the accumulation of paint is much faster, and then it slows down by time. This procedure achieves even layer of paint, even at the most unavailable spots such as corners, junctions and box like elements. Adhesion of paint layer to metal is excellent.

Bodies coming form chemical preparation are sunk into a tub containing solution of pigment and bond substance. When it is insulated from electric field, the pint in the tub must be continually stirred and maintained at the temperature between 28 and 30°C. Dialysis cells, which are positive pole, are made of inox steel plate supported by PVC shell (frame) and have semi-permeable membrane whose function is to insulate tub from acid released during the process. Anolit (liquid consisted of deionized water and acid generated by neutralization during coagulation of paint particles) runs through the cells.

At the tube exit, washing water curtains (ramps) are set up, where solution-ultra-filtrate from cataphoresis process is used, generated in ultra-filtering module, whose purpose is to divide solid paint particles from solvent, water and other impurities of small molecular mass through a range of semi-permeable membranes. The washing phase purpose is to remove remnants of foam and other impurities from the cataphoresis tube. Body is further washed by passing through water curtains supplied by demineralized water which remove all remnants form the previous process.



Scheme 2: *Cataphoresis*

Table 4: *Equipment, work modes, materials and fuels used for the phase of cataphoresis*

Cataphoresis	
equipment	Sinking zone length 27.3m, stainless steel anode, ultra-filtering membranes, tunnel for cataphoresis paint baking length 161.5m and cooling tunnel length 10m
Work modes	Voltage in tub 690 V DC, pH of KTL-solution ~6, sinking time 5,6 minutes, film baking temperature 160°C during 33 minutes
materials	Enviroprime L.C.-paste 543679 и Enviroprime L.C.-emulsion 543852, paste and emulsion are water soluble, lead fee, pH adjustment by acetic acid
fuels	technological water, electric energy, compressed air, industrial and demineralized water and natural gas or oil

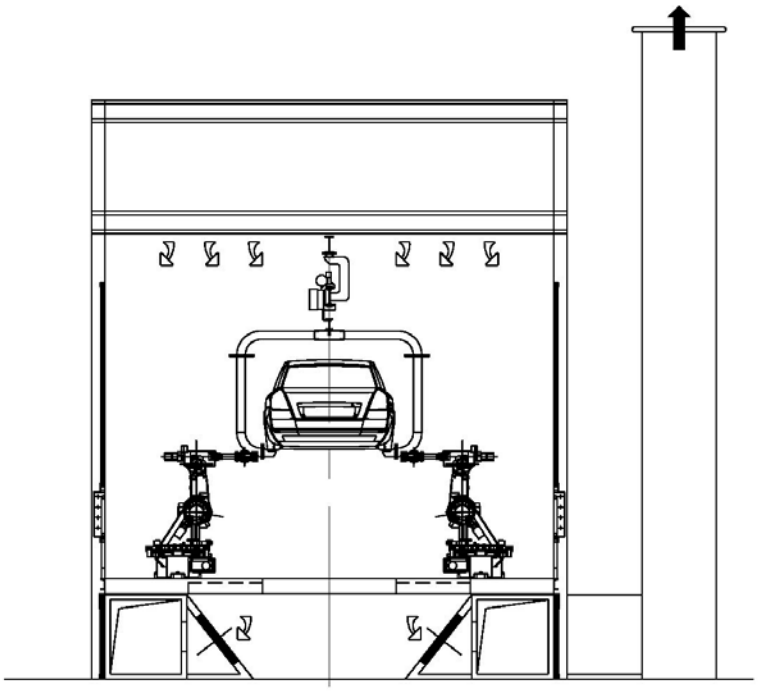
After the cataphoresis process, bodies are moved to oven for solidification of paint film. During solidification by high temperature it comes to polymerization of cataphoresis layer which makes the film compact and resistant, namely it eliminates remnants of water, solvent, vaporous matters generated by polymerization reaction. Solidification of paint film is performed at the temperature 160°÷180°C. Waste air generated in the process of solidification of paint layer is conducted to centralized device for after-combustion for the purposes of elimination of vaporous organic substances, and then released into the atmosphere. As the last point within the same phase, bodies are submitted to eventual operations of remediation in order to remove defects or existing impurities. Remediation is performed manually, by rotational polishers working on the basis of compressed air and which have the possibility of local vacuuming for eliminating of traces of dust. Air generated during vacuuming by polishers is conducted to the device for settling of dust which is equipped with a filter equipped by fiber pad, and than released into the atmosphere. If removal of a defect requires such remediation that reaches sheet metal, so removing catapheresis layer, the sheet metal is protected by one layer of the product paint which is applied with spray gun in the cabin set up for those purposes, where drying of the layer is also performed. Vapors produced in catapheresis tubs are released to the atmosphere through special emitters.

FLOOR PROTECTION is performed with the aim of protection of the bottom of body, namely protection of floor from damaging due to rock blows, corrosive impact of salt and other agents present during driving, and in order to achieve better sound insulation of the cabin inner space from traffic noise.

Floor protection is applied by robots to the inner side of splashboard and over automatized, fixed nozzles to the bottom of body – floor. To the spots unavailable for automatic application, protection is applied manually.

Both ways of protection application are performed in dedicated cabins equipped with dry dusting system.

Substances used for protection are insulating substances of high viscosity based on PVC combined with mineral matters and plastificators.



CABINA A SECCO

Air comes into the cabin for application of protection and goes from the top towards the bottom, taking the excess of the protection substance not applied to the body to the cabin bottom where the air passes through fiber filters system for catching of dry particles.

Cabins to be used in the concerned plant are equipped pursuant to the highest standards.

After application of protection, vehicle body is transferred to the oven for solidification and polymerization of the mass. Vaporous substances are released at the temperature 140°÷150°C. Vapors generated in that way are conducted by channels to the central device for after- combustion where the gases are oxidized before the purified air is released into the atmosphere through dedicated emitters.

Table 5: *Equipment, work modes, materials and fuels used for the phase of application of sound insulating PVC mass*

Application of PVC protective mass phase	
equipment	Cabin length 30m with latticed floor with a container underneath for collection of dry scattered PVC, suspended transporter
work mode	Cabin temperature 18-23°C during 33 minutes
Applied materials	Plastizol Z-140 based on PVC, DOP, mineral fillers, pigments and solvents of high boiling point

APPLICATION OF MID-COAT (BASIC PAINT) – after application of protection to vehicle body, phase of application of basic paint is performed. This procedure achieves smooth surface of vehicle body, covering smaller damages made during folding and pressing, forming homogenous, even surface and good base for application of final paint layer, which increases the quality of final product.

After manual removal of all impurities form body surface, the body is transferred to the cabin for application of basic paint.

The cabin consists of four parts:
-manual cleaning phase,
-manual application of basic paint phase,
-automatic application of base paint phase,
-drying of coat phase

Automatic application of basic paint is performed through series of electrostatic sprays for application of paint particles.

This method can be used as paint particles have electrostatic charge and they form a film at metal surface which acts as attraction pole. In that we get even paint layer of excellent quality.

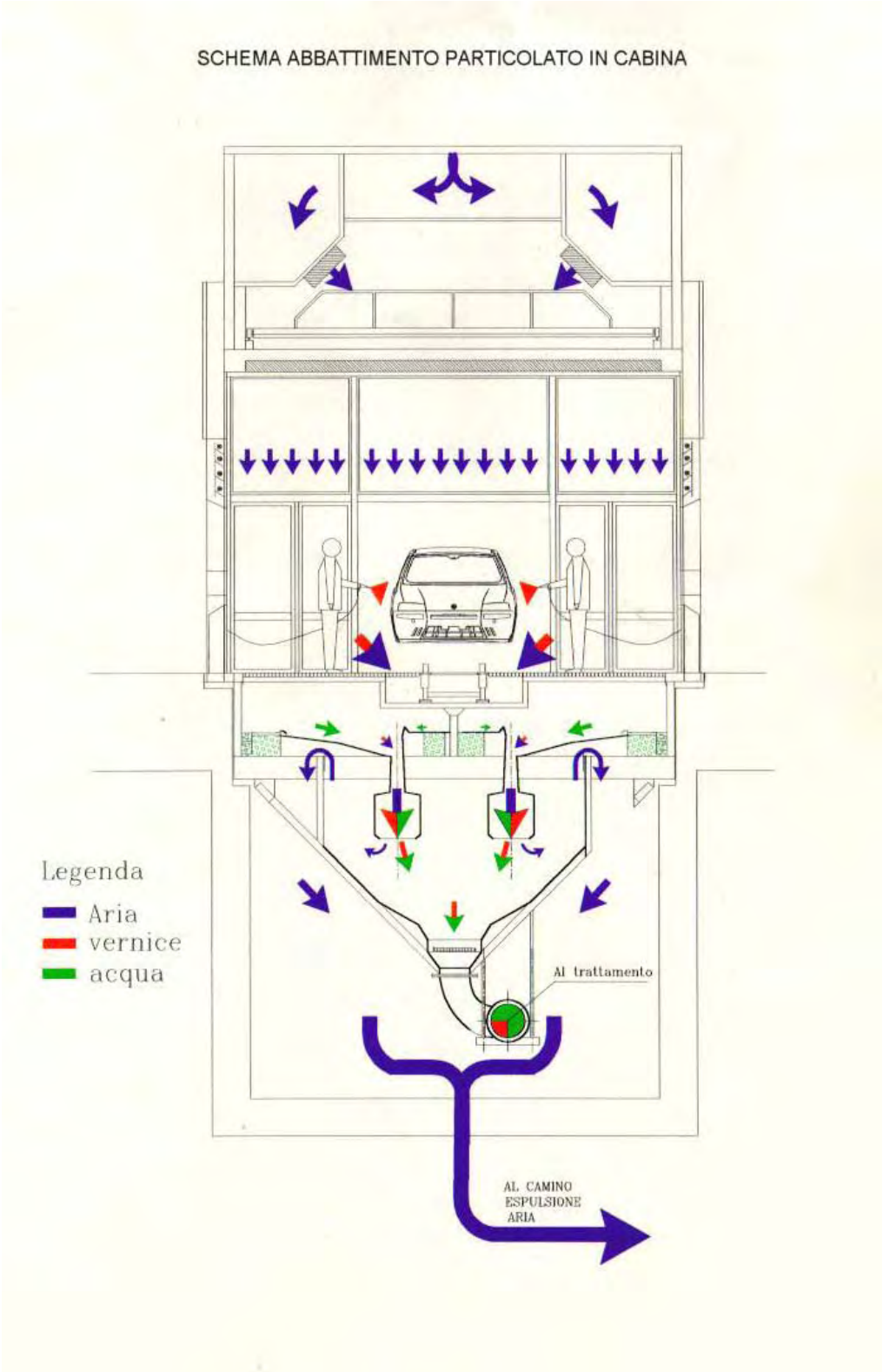
Parts which are in the body (compartments, boxes, door supports) are manually sprayed by pneumatic guns, as limited and hardly accessible space disables usage of automatic system.

When application of basic paint layer is over, body is transferred into the drying chamber, where, at the temperature of 40°C to 55°C, the paint is expanding and a part of solvent evaporates.

During application of paint in the chamber, conditions must be strictly maintained in prescribed tolerance limits related to humidity and temperature, which is significant for achievement of wanted quality, but also for achieving higher safety and health of workers:

- temperature must be constantly maintained at 23± 2°C
- relative humidity must be between 50% and 60%
- number of exchanges of air must be at least around 400 exchanges/hour in the part for manual application of paint.

Air is introduced form outer space through the device for filtering, washing and heating, which has a system for control of mentioned parameters. The air treated in that way enters the cabin and moves from the top towards the bottom, removing all excess of paint which does not stick to body surface, and taking it to the bottom of cabin where it is mixed with water which removes all impurities form the air.
When deciding, the Project Holder has chosen the most contemporary and reliable systems available today, and in that way he secured maintenance of required norms from the aspect of environment protection for a longer exploiting period. The following scheme shows the cabin and its installations.



Scheme 3- Cabin for application of basic paint

Air current form the top of cabin pushes the excess of paint towards the water curtain at the bottom of cabin. Water is directed oppositely in order to collect impurities form the air as good as possible. The cleaned air is released through a vertical emitter.

Table 6: *Equipment, work modes, materials and fuels used for the phase of application of basic paint (middle coat)*

Basic paint application phase	
equipment	Cabin length 53.213m with latticed floor with a pit underneath for collection of scattered paint, drying zone length 8m and evaporating zone length 15m, oven for film baking 180m, air cooling tunnel length 10m
work modes	Achieved over-pressure in the cabin, cabin temperature 18-23°C, relative humidity of air 45-70%, drying at 40-50°C during 1,4 min., film baking at 140°C/30мин.
Applied materials	Polyester base, solvent – mixture solesso 150(75%), butyl acetate (10%), ksilol (10%) and butyl glycol (3,5%)
fuels	Technological water (140/100°C), industrial and demineralized water, compressed air 6-7 bars, el. power (three phase) 380V/50Hz

After application of basic paint layer, body is sent to paint baking oven where the paint is solidified. During paint baking (it solidifies under the influence of heat), paint is polymerized, becoming solid and compact. During this step, remnants of water, solvents and vaporous components generated during polymerization are removed as well. The oven temperature is maintained at 140 – 165°C. Generated fumes are conducted by channels to central after-combustion device, where the VOC matters are oxidized before releasing into the atmosphere through dedicated emitter.

APPLICATION OF FINAL (SURFACE) PAINT LAYER- Besides decorative effect, such as color and shine, the final layer must be impermeable, must have necessary hardness and elasticity, must not fade away and must be resistant to reactive matters from the surroundings.

Final layer paints can be divided into two categories: “one-layer” and “two-layer” applied in different cycles. One-layer paint is applied to body as final layer, while two-layer paint requires additional application of transparent resin based polish. Application of two-layer final paint gives better shine, and polish layer increases mechanical resistance.

The final layer, same as basic layer, is applied manually at the hardly accessible spots of body, while the rest of the inside and outside of body is painted automatically. Electrostatic and pneumatic application system is used for automatic paint application.

Compressed air is used for the guns which follow body shape and apply even paint layer.

Electro-statically, paint is applied by the gun with rapid rotational sprays which apply electrified paint particles to body surface which attracts them. However, this method can not be used always, because paint must be manually applied by pneumatic guns at the hardly accessible spots.

Application of final layer is performed in the following cycle:

1. automatic blow-out in the system for removal of impurities by blowing
2. automatic cleaning of surface by rotational feather-like dusters
3. manual application of the firs layer at hardly accessible spots inside the body, with automatic application at the rest of surfaces inside the body
4. automatic application of the first layer at outer surfaces
5. automatic application of polish at outer surfaces
6. manual finalizing of transparent polish layer
7. drying

Same as in the previous phases, same conditions related to air humidity, temperature and number of changes of air must be maintained in the cabin for the purposes of protection of employees and achieving of good quality(23± 2˚C, 50-60% relative humidity, 400 changes/h).

The air from outer space is vacuumed in through the device for filtering, washing and heating of air with controlling system. The air cleaned in that way goes from the top of cabin towards the bottom and removes excess of paint particles not bonded for metal surface, where the air is thoroughly mixed with water which removes all impurities. The cabin is equipped pursuant to the same principle as the cabin for application of the basic paint phase.

Air current form the top of cabin pushes the excess of paint towards the water curtain at the bottom of cabin. Water is directed oppositely in order to collect impurities form the air as good as possible. The cleaned air is released through a vertical emitter.

After application of final layer, body is moved to drying chamber, and then to baking chamber. Purpose of the drying chamber is to enable releasing of solvent from paint and evaporating of solvent before entering of body into baking chamber, because an abrupt evaporation of solvent may cause bubbles and small cavities in paint layer. Drying chamber temperature is 50 ˚C ÷ 60 ˚C.

During paint baking final paint layer is polymerized and solidified, with elimination of remnants of water, solvents and vaporous components. Solidification of final paint layer is performed at temperature of 140 – 165˚C. Generated fumes are conducted by channels to central after-combustion device, where all VOC matters are burnt (oxidized) before releasing of cleaned air into the atmosphere through dedicated emitter.

At the end of this phase, body is subject to visual control and if necessary, eventual defects and impurities are removed. Remediation of defects is performed manually by means of polishers with abrasives.

Picture 4. *Remediation by manual polishers*

Table 7: *Equipment, work modes, materials and fuels used for the phase of application of final paint (final layer)*

Application of final paint phase	
equipment	Cabin length 61.7m with latticed floor with a pit underneath for collection of scattered paint, drying zone length 13m and evaporating zone length 15m, oven for film baking 57m, air cooling tunnel length 10m
Work modes	cabin temperature 18-23°C, relative humidity of air 45-70%, drying at 40-50°C /5 min, film baking at 130°C/30мин.
Applied materials	uni alkyd melamine paint, metallic polyester-melamine, solvent representing mixture of solesso 150(75%), butyl acetate (10%), ksilol (10%) and butyl glycol (3,5%) for covering paint
fuels	Technological water (140/100°C), technological (heated) vapor (12 бара), industrial and demineralized water, compressed air 6-7 bars, el. power (three phase) 380V/50Hz and supplement 110 V, VF el. power

Remediation of paint- if there are such defects noticed at body that they require new painting intervention, bodies are sent to boxes for remediation which include previously described phases.

It is panned to introduce new paints for final painting with small concentration of solvent, namely high quantity of dry mass.

Final processing (finalization) - if there are such defects noticed, on the completed vehicle after assembly, that they require new painting intervention, such vehicles are as well sent to paint remediation zone.

Assembly

In the Assembly shop facilities, operations of “equipping’ are performed (fitting in of all electric parts, seats, glass panes, upholstery, wheels, lights…) and “equipping” of body (setting up of mechanical sets- drive systems, transmission, suspensions and brakes) at H1 line. The following operations are performed within the object:

- setting up of parts on the line
- Fixing of glass panes
- Preparation of mechanical parts
- Assembly of engines and gearshifts
- Completing of vehicle
- Converging of wheels
- Rain test
- Remediation of mechanical parts

After completion of setting up, vehicles are submitted to thorough functional control starting at the final part of line and ending by simulated driving test in appropriate cabins, where driving wheels are relied on a pair of cylindrical rollers.
Test on a runway or road is prescribed for certain percentage of vehicles.

Final processing (finalization), after functional test, purpose is testing of vehicle state from the esthetic point of view and its preparation for dispatch, followed by delivery of vehicles to distributive network and sale.

Polishing remediation of polished bodies is performed in Assembly Shop facilities. At this moment, polishing of plastic parts is also performed on this line by the same procedure and paints used for remediation of polished body. Installed equipment includes cabin and chamber oven with infra heaters. Application of paint is performed by manual guns, while polymerization of paint is performed at 80°C. Acrylic based paints with organic and inorganic pigments requiring solvents for acryl are used- mixture of methoxy propyl acetate, butyl acetate, isobutyl acetate, ksilol, ethyl/benzol and oil solvent. Technological water, electric power and compressed air are used as energy fluids.

Making and painting of bumpers

Besides line for making, painting and assembly of vehicles, a line for making and painting of bumpers to be set up to vehicles will be installed. Line capacity is adapted to plant capacity, namely it is 60 sets of bumpers per hour.

It consists of two phases- making of bumpers and painting of bumpers. Operations of making of bumpers are simple and are performed on automatic lines for extrusion and pressing where bumper body is formed. From that line bumpers are sent to painting processing.

Introducing bumpers into surface protection process

Beginning of the process is manual setting of bumpers to special sliders that move along the guides through all phases of the process. Two parallel lines will be erected.

Washing

Washing is performed in two phases:

-**degreasing**- performed by sinking to tub with alkaline solution on the temperature of 50 ÷ 60˚C. By degreasing, impurities remained form the phase of making of bumpers are removed.

-**washing-** includes showering of bumpers by demineralized water of ambient temperature in order to remove remnants of alkaline solutions.

Above mentioned operations are performed in the tunnel, while bumpers, fitted to sliders, are passed through the tunnel along the guides. Ventilation prevents condensation and damages in later phases. It is important to precisely define length of sinking and to maintain exact concentration of alkaline solution.

Fumes generated in this tunnel are released through special emitters.

After washing, bumpers are transferred into drying ovens. Drying by means of heat removes remnants of water from the surface of bumpers. Drying is conducted at the temperature of 80 ÷ 90 ˚C.

Burning

Burning is specific process for preparation of surface of bumpers for additional application and well fixing of paint.
Cabin in which this procedure is conducted is divided into burning zone and controlling zone. Equipment for automatic burning of bumpers consists of natural gas (methane) burners mounted to robotized hands. Burning is performed by short exposure of bumpers surface to flame induced by combustion of mixture of methane and air at the temperature up to ˚C.

Application of base paint

Application of a layer of base paint covers small defects at the surface of bumpers and makes a smooth surface and good base for application and fixing of final layer.

Cabin is divided into a part for automatic application of paint and part for drying of paint. Paint is applied by series of electrostatic sprays. Temperature in cabin is strictly maintained at 23 ± 2 ˚C, relative humidity 50 ÷ 60 % and around 100 air changes/h, and if it is necessary to apply paint manually, 400 air changes/h.

The air from outer space is vacuumed in through the device for filtering, washing and heating of air. The air prepared in that way goes from the top of cabin towards the bottom and removes excess of paint, where the air is thoroughly mixed with water which removes all impurities.

After application of base paint, bumpers are entered into drying chamber where the maintained temperature is 20 ÷ 28 ˚C.

Final layer

Final layer, same as on body, has decorative and protective role, and except color and shine, it must provide resistance to active matters in air, it must be impermeable and must not fade away, it must have appropriate solidity and elasticity.
Final layer is automatically applied to bumpers. Two methods of automatic application are used:

- Electrostatic system
- Compressed air system

First, a layer of white is automatically applied, then a layer of transparent polish, so in that way made polish is dried in drying chamber. Conditions in the cabin must be maintained same as in the other cabins for application of paint previously described (temperature at 23 ± 2 ˚C, relative humidity 50 ÷ 60 %, 400 air changes/h). The air introduced the chamber is also treated in the system for filtering, washing and heating of air. Air current takes excess of paint to floor where the air is mixed with water which retains all impurities.

After application of final layer, bumpers are first introduced into drying chamber with the temperature of 40 ÷ 50˚C, where vaporous matters are released form paint, and afterwards, bumpers are introduced into baking chamber where, at the temperature of 80 ÷ 90˚C, final paint layer is solidified and polymerized. The fumes are vacuumed out and conveyed towards central system for after-combustion, where VOC matters are oxidized before release of cleaned air into the atmosphere.

After completed painting, visual control of bumpers and eventual corrections of damages are conducted and bumpers are manually taken off from sliders.

Distillation device OFRU- During washing of tube pipeline for paint and gun in the cabins, on the occasion of each change of color, great quantity of solvent gets dirty, which is collected to a reservoir and then distilled in order to clarify. Distillation is performed with usage of vacuum in order to decrease distillation temperature, while the obtained distillate is used as solvent for washing.

Plant for pre-treatment of waste water ESKA- Pre-treatment of waste water is used for dividing of waste paint from the lines of base and final painting and is located in the Painting shop under the floor level. Presently, only pit for paint recirculation of final painting line L4 is used, as the plant is not operative. Waste paint is periodically divided from the pit for recirculation, packed into barrels of 200 kg capacity and disposed in the dangerous waste storage UP8.

Technical cleaning- Cleaning of parts of equipment and lattices on the floor of cabins for base and final painting is performed in technical cleaning plant located in the object KATAK (object 30). Lattices are boiled in the solution of sodium hydroxide at 100°C for 6 hours. Then, they are taken out with lifter, washed out with water and than packed and put back to the process.

Energy fluids- Hot fluids supply necessary for the process is performed in new heating plant located at Assembly shop. Supplying with compressed air is performed in new compressing station KC1, also located at Assembly shop.

Paint central- Storage of paints and polishes is located beside the object of Painting shop.
This object consist of:

- Paints, polishes and solvents storage,
- Sanitary block,
- Offices,
- Stations for preparation and distribution of paints with pipelines,
- Non-current materials storage,
- Outer solvent decanter.

Paint is transported to this object in metal containers of 1-200 liters volume. Storage of paint is conducted in three rooms; each can accept maximally 12,000 liters of inflammable liquid. From the barrels, paint is decanted into reservoirs where its viscosity is adjusted. By pneumatic pumps, prepared paint from reservoir is entered into pipeline and is conveyed to work stations in the cabins for base and final painting (UNI and combination of METALLIC (pre-polish/polish).

Table 8: *Equipment, work modes, materials and fuels used in paint central*

Paint central	
Equipment	12 reservoirs of 10,000 liters capacity (for collection of paint) and 32 smaller reservoirs of 700 liters capacity (for preparation of paint), pneumatic pumps of 34 lit/min capacity (pressure ratio 2:1). Control center is also in the object. All rooms of the storage are equipped with stabile automatic water fire extinguisher, and paint reservoirs with carbon dioxide fire extinguisher.
Work modes	Air condition, t=20 ±2ºC
Applied materials	Mid layer (base paint) based on polyester-melamine, covers uni based on alkyd-melamine and metallic pre-polish based on polyester-melamine, transparent polish based on alkyd-melamine and solvents for preparation of base and covering paints whose ingredients are above mentioned
Energy fluids	Technological water, el. power and compressed air

3.3. Raw materials and products

3.3.1. Raw materials utilized in the technology

The basic raw material used in the concerned technology is steel sheet metal. Raw material (steel) is supplied in coils, or it is already cut by suppliers (domestic or foreign). Besides steel, sound insulators are also used, as well as various oils, greases and cooling liquids.

Other used raw materials are presented in the Table 9.

Table 9*: Raw materials used in the technological process, energy and water*

Raw materials	quantities kg/year
Steel sheet metal	90.000 t/year
Gardoclean 104	103.950
Gardoclean 704	299.025
Gardolene Z/l	65.138
Gardobond R 25/L ALIM	467.775
gardobond additive h-7000	65.138
gardobond additive h-7257	5.400
gardobond R 25/l form	103.950
gardolene D 6800/l	9.113
gardobond additive h-7204	2.025
Cataphoresis paste	472.000
emulsion Vezi	1.720.000
sealer	1.008.000
PVC	537.000
Base paint	470.400
Final paint	1.008.000
Transparent polish	638.000
solvent	520.800

Dissolver	806.400
Isopropyl alcohol	10.080

oils	Small quantities
Oils for gearshift	Small quantities
Greases	Small quantities
Cooling liquids	Small quantities
water	**Quantity m3/h**
Industrial water	35
Demineralized water	20
Compressed air 6 bar	10.000 Nm3/h
fuel	**Nm3/h**
Natural gas	900 Nm3/h
Gas	Small quantities
Diesel	Small quantities

Within the concerned Project, water is used for technological, sanitary and fire protection purposes. Objects within the plant have implemented infrastructure and connection to city water network.

Electric power is used for work of installed machines and devices in production process, as well as for illumination. Electric power will be used pursuant to conditions of competent electro energy distribution enterprise.

There is no requirement for usage and utilization of other resources for the concerned Project.

On the basis of determined facts, it can be concluded that the concerned Project has no significant requirements for usage and utilization of natural resources and energy, so from that aspect, it is not a factor of endangering of environment.

3.3.2. Waste matters produced as the consequence of technology operations of regular work

During implementation of regular work of the concerned Project it comes to generation of various types of waste matters.

In the phase of implementation, namely reconstruction of existing objects, it will come to generation of certain amount of **building waste** that will be removed from the location, through competent communal enterprise.

Communal waste is generated in small quantities as a consequence of presence of employees. Collection and removal of communal waste is organized within the complex through competent communal enterprise.

Electronic waste- Products such as computers and related computer equipment, cameras, printers and other devices has become significant portion of communal waste and therefore, flow of the electronic waste is marked as one of those recording the fastest growth in Europe, being today 4% of communal waste. Within the concerned complex, certain amount of electronic waste will be generated and it must be given over to certified legal entities for further treatment. Furthermore, used cartridges from printers will be replaced very often, and they must not be disposed to the landfill, but given over to certified entities for recycling.

Sanitary- fecal waste waters are result of presence of employees at the location. They are conducted, out of the sanitary blocks, to city sewer system through internal sewer pipeline.

Technological waste waters are produced during chemical preparation for painting and during body painting. There is a built up plant for purification of waste waters within the plant yard and is located

next to Painting Shop in the common object named “KATAK”, where plant for Technical cleaning of lattice is also located, as well as plant for assembly of trailers.

Spots of release of waste waters in the plant of Surface protection are Chemical preparation line, Base painting line, Final painting line, as well as cabin PVC.

Waste waters at the Chemical preparation line are divided to continuous and non- continuous waste waters, as well as at the line for Cataphoresis (cataphoresis- technological surface protection procedure), while at the other lines, there appear non- continuous waste waters. Only continuous waste waters appear during regular production process at the Chemical preparation line and Cataphoresis line.

In relation to initial concept of purification which was set up more than 20 years ago, certain reductions related to technology has been made. In that sense, we can say that there are no waste waters containing chrome any more, so the process is reduced for the portion of equipment used for removal of chrome, while the wet grinding process is replaced by dry grinding process. In that way, complete line used for purification and recirculation of waters coming form wet grinding is put out of usage, while the existing settling tank will be used, but with other purpose. Steel filters, positioned at the bottom of the Plant object, dedicated for final purification of waste waters will not be used in innovated concept.

Quantities and spots of generation of waste waters

- continuous waste waters- 36.15 m3/h;
- Non- continuous waste waters – 2887.5 m3/ yearly;

These waste waters are generated in the following technological processes:

- Chemical preparation with the following operations:
  - manual wiping of bodies;
  - pre-degreasing;
  - degreasing I;
  - degreasing II;
  - washing and activation;
  - phosphatization;
  - passivation;
  - washing;

- KTL- cataphoresis at the spots of generation:
  - anolit system;
  - washing with recirculated demineralized water;
  - Ultra- filtrate (UF module);

- Base and Final painting with the following objects:
  - Pit for decantation of waste waters at the Base painting line;
  - Pit for decantation of waste waters at the Final painting line;
- PVC cabins
- Finalization of bumpers in Assembly shop;
- Technical cleaning of lattice (Technical cleaning plant);

On the basis of gathered data, we can quantify quantities of continuous and non- continuous waste waters as follows:

Continuous waste waters

Chemical preparation:
- manual wiping of bodies- 10 m3/h;
- washing after degreasing- 8 m3/h;
- washing after phosphatization- 12 m3/h;
- washing after passivation- 5 m3/h;
- total from Chemical preparation- 35 m3/h;

KTL- Cataphoresis:

- Anolit system- 0.4 m3/h;
- Washing with recirculated demineralized water- 0.75 m3/h;
- Total from Cataphoresis- 1.15 m3/h:

Total amount of continuous waste waters generated in the technological procedure of Surface protection is averagely 35.15 m3/h, namely, daily 289.20 m3/day.

Non-continual waste waters

Chemical preparation:

- Pre-degreasing – 15 x yearly 3,3 m3 – 49,50 m3/year;
- Degreasing I – 12 x yearly 77 m3 – 924 m3/ year;
- Degreasing II - 2 x yearly 69 m3 – 138 m3/ year;
- Washing after degreasing - 2 x yearly 24 m3 – 48 m3/ year;
- Phosphatization - 2 x yearly 5 m3 – 10 m3/ year;
- Washing after phosphatization - 2 x yearly 27 m3 – 54 m3/ year;
- Passivation - 2 x yearly 27 m3 – 54 m3/ year;

Total amount of non- continuous waste waters generated in Chemical preparation – 1277,50 m3/ year;

KTL – Cataphoresis
- Ultra-filtrate – 2x yearly 75 m3 + 2 x yearly 6 m3 + 2 yearly 20 m3 – 202 m3 /year;

Total amount of non- continuous waste waters generated in Cataphoresis - 202 m3/year;

Basic painting and Final painting
- Basic painting - 2 x yearly 400 m3 – 800 m3/year;
- Final painting - 5 x yearly 100 m3 – 500 m3/year;

Total amount of non- continuous waste waters generated in Basic painting and Final painting - 1300 m3/year;

Technical cleaning
- Cleaning of lattice – 4 x yearly 6 m3– 24 m3 /year;

Total amount of non-continuous waste waters generated in Technical cleaning - 24 m3/ year;

Finalization of vehicles:
- Finalization of vehicles 2 x yearly 42 m3 – 84 m3/ year;

Total amount of non-continuous waste waters generated in finalization of vehicles 84 m3 / year;

Total annual amount of non-continuous waste waters generated in Surface protection process: 2887,5 m3/ year:

Upgrading of bumpers including degreasing, washing, and than painting results into generation of the following quantity of waste water:

Continuous waste water

Waste waters from washing of bumpers (preparation of bumpers for painting):
- Degrease I - 10 m3/day;
- Degrease II - 10 m3/ day;
- Washing I - 10m3/ day;
- Washing II – 10 m3/ day;
- Other waste waters:
- Washing of sliders – 0,5 m3/ day;
- Condensation form device for supplying and preparation of air– 0,5 m3/ day;

Total amount of continual waste waters generated in the technological procedure of finishing bumpers finalization is 11 m3/ day.

Non-continuous waste waters

Waste waters from washing of bumpers (preparation of bumpers for painting):
- Degrease I – 12 times per year 3.2 m3-38.4 m3;
- Degrease II - 12 times per year 6.9 m3-82.8 m3;
- Washing I - 54 times per year 2 m3-108 m3;
- Washing II – 54 times per year 2 m3-108 m3;

other waste waters:
- washing of cabins- 12 times per year 5 m3 -60 m3 ;
- cleaning of device for supply and preparation of air- 54 times per year 3m3 -12m3;

waste waters originating from application of protective paint, base and final paint layer:
- protective paint (example)- 4 times per year 20m3-80m3;
- base coat- 4 times per year 20m3-80m3;
- base coat- 4 times per year 20m3-80m3;

Total annual amount of non-continual waste waters generated in Surface protection procedure is: 799.2m3/year.

Total amount of waste water generated in final processing of bumpers is 62,674m3/year.

Summary of quantities:

Continuous waste waters

Qh = 36,15 m3/h – average flow per hour;
Qd = 289,20 m3/ day – daily quantity of waste waters;
Qg= 86.760 m3/year – annual quantity of waste waters for 300 working days;

Non-continuous waste waters

Qh = 1,20 m3/h – average flow per hour;
Qd = 9,62 m3/day – daily quantity of waste waters;
Qg= 2887,5 m3/year – annual quantity of waste waters for 300 working days;

Egalizated waste waters

Qh = 37,35 m3/h – hourly flow of egalizated waste waters;
Qd = 298,82 m3/ day – daily quantity of egalizated waste waters;
Qg= 89.647,5 m3/year – annual quantity of waste waters for 300 working days;

Egalizated waste waters are summed up waste waters, namely mutually mixed continuous and non-continuous waste waters that were in contact for sufficient period of time.

Quality of waste waters

As the Decision no. 325-05-906/2009-07 of Ministry of Agriculture, Forestry and Water resources, Republic water directorate stipulates that purified waste waters are to be released to city fecal sewer system after pre-treatment at own plant for treatment of technological waste waters KATAK, considering of quality of waste waters will be performed pursuant to norms given in the Rulebook on technical and sanitary conditions for release of waste waters JKP Vodovod i Kanalizacija of city of Kragujevac (“Official Gazette of City of kragujevac” no. 9/93).

As said in the Report on assessment of quality of waste waters, individually, majority of waters generated in technological plant of surface protection does not respond to prescribed norms for release into the city sewer system. However, these waters are not released individually, but continual waters are mixed at the collection channels, while the technology includes certain mixing and

egalizaiton, of non- continuous waters separately, but also of continuous and non- continuous waste waters to certain percentage in the procedure of purification before release into sewer system.

Waste waters purification concept

Concept of purification of waste waters originating from Surface protection plant, Assembly Shop and Technical cleaning plant is based on egalization of non-continuous with continuous waters, namely on making an average quality with mutual correction of pH number. Solution of such a concept enables even quality of out coming effluent which will meet MDK values stipulated by Rulebook on release of waste waters into city sewer system of Kragujevac.

On a daily basis, out of the total amount of waste waters to be purified, portion consisting of non-continuous waste waters is small in relation to daily amount of continual waste waters that enter the Plant on daily a basis (Qd=289.20m3/day- daily quantity of continuous waste waters; Qd=9.62m3/ day - daily quantity of non-continuous waste waters;).

All points of generation of waste waters, continuous and non- continuous, are covered by individual pump stations (PS 01-PS 07), which are used for pumping of waste water to the Plant. Pump stations PS 01 and PS 02 on Chemical preparation line and Cataphoresis line will be the only one, in the whole watering system, to work continually and every day to supply waste water for purification. The rest of the pump stations (PS 03-PS 07) will work only in the case of when it is necessary to pump non-continuous waste waters to the Plant, namely when it is necessary to empty the Pits (reservoirs) holding the water(maintenance period).

Waste waters line

Continuous waste waters originating from Chemical preparation line and Cataphoresis line are transported via pumping mechanism of Pump station 02 to collecting reservoir for continuous waste waters. Collecting reservoir for continuous waste waters is, at the same time, reservoir for egalizaiton of collective waste waters. Waste waters from the plant for Technical cleaning of lattices, before being transported to pre-treatment with non-continuous waste waters from PVC cabin and finalization of bumpers, must be previously submitted to the processes of pH value correction, dividing of grease and oils and floating matters.

Clarified water from the pre-treatment will be pumped to non-continuous waste waters reservoir, and afterwards is transported to egalization, while the mud produced during the pre-treatment is evacuated to the existing mud thickeners. Besides intensive mixing of waster in Egalization pool, blowing in of air prevents accumulation of particles, namely prevents filling of pool with mud sediment. The air is supplied by three compressor-blowers. After the performed egalization process, waste water is pumped to neutralization process by new set of centrifugal pumps (working and reserve) located nest to Egalization reservoir. Neutralization process is performed with usage of chemical for correction of pH value.

Chemicals added to coagulation and primary neutralization reservoir are milk of lime Ca(OH)2 and polyaluminum- chloride (PAC). After performed neutralization and started process of coagulation, waste water is conduced to the reservoir for coagulation and flocculation. After the process of coagulation and flocculation is finished, the water is by decanting transferred to the process of sedimentation. Purified waste water (out coming effluent) is taken out from sedimentation tank and by means of gravity conducted to reservoir for collection of purified waste water (B152), where the automatic final control will be performed ,as well as final correction of pH number (adding of base and acid NaOH; H2SO4). Then the purified water is conducted, through electromagnetic flow measuring device, to existing outgoing manhole (B153) connected with the recipient (fecal sewer system of the plant) through outgoing pipeline.

Electromagnetic flow measuring device registered current flow of waste waters, but also total amount of waste waters purified at the Plant. Metal framework and pipeline connect objects and equipment of the Plant into a functional technological unit. Managing of operation of the Plant for purification of waste waters is performed by means of appropriate software from the Controlling office.

Mud line

After the process of sedimentation in the new projected Sedimentation tank, the mud is transported by pumping mechanisms to existing Mud thickeners. The process of coagulation will be performed by application of Ca(OH)2 and slow stirring (every mud thickener has its own low speed mixer). Manner of filling of thickener is one on the other, depending of the concentration of new supplied mud.

Over-mud water from the thickener is, by means of gravity, transported to reservoir for collection of filtrate and over-mud water, that is located next to the press, from which it is again transported to the beginning of the treatment process. Thickened mud is taken out from the cone of thickener by pneumatic pumps and transported to the Chamber filter press which presses the coagulated mud and makes press-mud cake, namely filtrate which is returned to the beginning of purification process. Press-mud cake, collected under the press, is removed out of the Plant object (PPOV, KATAK) by conveyor belt to the container located on the outer side of the wall.

Mud filleting process is conducted at the chamber filtering press. This is, in fact, process of dehydrating, namely removal of water from the mud by pressing it, and press-mud cake is formed within the press. The principle of removal of waster form mud in chamber filtering press is based on separation of solids and liquids due to pressure impact. After filling the chambers with formed mud cakes (dehydrated mud), the chambers open and press-mud cakes fall out to the belt conveyor, than to a container and than are transported to the storage of FAS where they are temporarily disposed until handing over to a company which is hired and authorized for transport of dangerous waste (company DEKONTA). Taking over of the waste will be performed on a monthly basis.

Filtrate produced by the process of removing of water from the mud, as already mentioned, is transported to the reservoir for collection of filtrates and over-mud water and which is located next to the pres.

The container is located out of the Plant object, as already mentioned.

Chemicals used in the technological process of purification:

- milk of lime solution;
- coagulant PAC (polyaluminum- chloride);
- Polyelectrolyte- Flocculant Anioinc polyacrylamide;
- Sodium hydroxide;
- Sulfuric acid;

Annual consumption of chemicals:

On the basis of the following adopted criteria:

Qh = 37.35 m3/h – hourly flow of egalizated waste waters;
Qd = 298.82 m3/day – daily quantity of egalizated waste waters;
Qg= 89647.50 m3/god – annual quantity of waste waters for 300 working days;

Overall consumption of chemicals on an annual basis can be calculated:

• lime – 7.920 kg;
• PAC – 13.5 m3 10% solution;
• PE – 90 kg;
• NaOH – 36 m3 30% soltuion;
• H2SO4 – 12 m3 conc. 96%.

Technological waste waters generated during regular work of the concerned project will be presented in Table 10. Waste waters generated in final phase of finalization of bumpers are given in Table 11.

Table 10: *Waste waters in Painting Shop*

process	continuous	Non-continuous		Total per year (m3)	Products to be entered in process
	daily (m3)	(m3)	Each year		
Pre-treatment					
sinking	1	40	24	6.585	Alkali phosphates + non-ionic surface active substance
degreasing	-	200	4	800	Alkali phosphates + non-ionic surface active substance
washing	6	80	24	35.670	water + phosphates
regeneration	1	80	12	6.585	Alkali phosphates
Phosphatization	-	200	-	-	Zink -phosphate, nickel, magnesium, Nitrates and nitrites
washing	6	80	24	35.670	water + phosphates
Passivation	1	10	12	5.745	Zink + fluorides
washing	6	80	24	35.670	water
Catalysis					
Catalytic tub	-	200	-		-
washing	6	80	24	35.670	water
Anolit	1	1	1	5.626	water
Primary/final painting					
primary	1	150	4	6.225	water + paint
Final L1+L2	1	500	4	7.625	water + paint
Total annually (m3) 181.871					

***Table 11**. Waste waters generated during finalization- painting of bumpers*

process	continuous	Non-continuous		Total per year (m3)	Products to be entered in process
	daily (m3)	(m3)	Each year		
Washing of bumpers					
Degreasing I	10	3,2	12	14101	Alkali phosphates + non-ionic surface active substance
Degreasing II					
Washing I		6,9	12	14145	Alkali phosphates + non-ionic surface active substance
Washing II		2	54	14171	water
		2	54	14171	water
Other waste waters					
Washing of sliders	0,5	0	0	2813	water
Condensation form the device for preparation of air	0,5	0	0	2813	water + paint
Cleaning of cabins	0	5	12	60	water
Cleaning of device for preparation of air	0	3	54	162	water
primary/final painting					
Protective coat	0	20	4	80	water + paint
Base paint	0	20	4	80	water + paint
Final coat	0	20	4	80	water + paint
Total annually (m3) 62.674					

Waste sheet metal – generated in Press Shop during processing of steel sheet metal at on the cutting and pressing lines. Waste sheet metal is collected and transported to the "baler shop" (special unit where this waste is baled), and then it is handed over to competent bodies for further utilization.

Dangerous waste- Mud generated during the process of phosphatization and painting of bodies in the Painting Shop is the waste of dangerous waste features, as well as waste paint, solvents, packaging sealing mass. Management of such waste must be in compliance with Rulebook on

management of waste of dangerous waste features ("Official Gazette RS" no. 12/95 and 56/10). Waste generated in this way is temporarily stored in appropriate packaging (impermeable barrels with covers) which is stored at the concrete ground in roofed space, with proper marking, monitoring and registering, until handing over to competent body for further treatment, with compulsory keeping of records. Dangerous waste storage will be built pursuant to every and all terms of the Rulebook on management of waste of dangerous waste features ("Official Gazette RS" no. 12/95 and 56/10) and new location license will be obtained for this object. The Project Holder "FIAT AUTOMOBILI SRBIJA" has executed agreement no. 10442-10 on 12th of July 2010 with the company "DEKONTA" assigned for management of dangerous waste generated at the company "FIAT AUTOMOBILI SRBIJA" .

Emission to air and aero-pollution are possible at the location due to the traffic. Traffic produces emission of specific atmosphere pollutants as products of complete and incomplete combustion of oil derivates in internal combustion engines. Analysis of traffic frequency at the location, frequency and presence of vehicles indicates that the traffic intensity at the location is low, and as it is related to internal roads without priority, the traffic of the location is not a factor that endangers quality of environment and does not require special analysis and environmental impact assessment.

The concerned technology, at certain lines and phases of performing of certain operations, produces increased emission of particles that might be potential air polluters. Processes taking place in the Painting Shop, namely processes of paint application have the highest impact to air. Decrease of aero-pollutants emission is secured by using the most contemporary cabins for painting which are equipped with water scrubbers. The air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air is mixed with water retains all solid particles.

Aero-pollutants emission is also present with the processes of paint baking, as well as welding processes.

Aero-pollutants emission background is presented in tables 12, 13, 14, 15 and 16.

***Table 12**: Background of emission in the Painting Shop processes*

Press Shop												
Emission points	**origin**	**Air flow(m 3 /h 0°C) 0,101 Mpa**	**Emission time (h/gg)**	**Emission frequency**	**Temperature °C**	**pollutants**	**Pollutants concentration (mg/ m3 a 0°C**	**Mass flow(kg/ h)**	**Emission factor (kg/t g /m 2)**	**The highest point of emission (m)**	**Emitter diameter (m)**	**Emission decrease system (B)**
PS1	remediation	43,000	24	continual	20	dust	2,00	0.086	Not determined	16	0,7	Not determined
PS2	remediation	43,000	24	continual	20	dust	2,00	0.086	Not determined	16	0,7	Not determined
PS3	Welding device	9,500	16	intermittent	20	dust	1,50	0.014	Not determined	16	0,6	Not determined
PS4	Battery charging	7,800	24	continual	20	H2SO4	0,11	0.001	Not determined	16	0,5	Not determined

***Table 13**: Background of emission in the Body Shop processes*

Body Shop												
Emission points	origin	Air flow(m 3 /h 0°C) 0,101 Mpa	Emission time (h/gg)	Emission frequency	Temperature °C	pollutants	Pollutants concentration (mg/ m3 a 0°C	Mass flow(kg/ h)	Emission factor (kg/t g /m 2)	The highest point of emission (m)	Emitter diameter (m)	Emission decrease system (B)
B1-1	Welding	35.000	24	1	25	dust	10,00	0,350	-	17	1,1	-
B1-2	Welding	35.000	24	1	25	dust	10,00	0,350	-	17	1,1	-
B1-3	Welding	35.000	24	1	25	dust	10,00	0,250	-	17	0,9	-
B1-4	Welding	25.000	24	1	25	dust	10,00	0,250	-	17	0,9	-
B1-5	Welding	25.000	24	1	25	dust	10,00	0,250	-	17	1,1	-
B1-6	Welding	35.000	24	1	25	dust	10,00	0,250	-	17	0,9	-
B1-7	Welding	25.000	24	1	25	dust	10,00	0,300	-	17	1,0	-
B1-8	Welding	30.000	24	1	25	dust	10,00	0,350	-	17	1,1	-
B1-9	Welding	35.000	24	1	25	dust	10,00	0,350	-	17	1,1	-
B1-10	Welding	35.000	24	1	25	dust	10,00	0,350	-	17	1,1	-
B1-11	Welding	30.000	24	1	25	dust	10,00	0,300	-	17	1,0	-
B1-12	Welding	30.000	24	1	25	dust	10,00	0,300	-	17	1,0	-
B1-13	Welding	25.000	24	1	25	dust	10,00	0,250	-	17	0,9	-
B1-14	Welding	25.000	24	1	25	dust	10,00	0,250	-	17	0,9	-
B1-15	Welding	20.000	24	1	25	dust	10,00	0,200	-	17	0,8	-
B1-16	Welding	20.000	24	1	25	dust	10,00	0,200	-	17	0,8	-
B1-17	Welding	20.000	24	1	25	dust	10,00	0,200	-	17	0,8	-
B1-18	Welding	20.000	24	1	25	dust	10,00	0,200	-	17	0,8	-
B1-19	Welding	20.000	24	1	25	dust	10,00	0,200	-	17	0,8	-
B2-20	Welding	20.000	24	1	25	dust	10,00	0,200	-	15	0,8	-
B2-21	Welding	20.000	24	1	25	dust	10,00	0,200	-	15	0,8	-
B2-22	Welding	25.000	24	1	25	dust	10,00	0,250	-	15	0,9	-
B2-23	Welding	25.000	24	1	25	dust	10,00	0,250	-	15	0,9	-
B2-24	Welding	30.000	24	1	25	dust	10,00	0,300	-	15	1,0	-
B2-25	Welding	30.000	24	1	25	dust	10,00	0,300	-	15	1,0	-
B2-26	Welding	30.000	24	1	25	dust	10,00	0,300	-	15	1,0	-
B2-27	Welding	25.000	24	1	25	dust	10,00	0,250	-	15	0,9	-
B2-28	Welding	25.000	24	1	25	dust	10,00	0,250	-	15	0,9	-
B2-29	Welding	20.000	24	1	25	dust	10,00	0,200	-	15	0,8	-
B2-30	Welding	20.000	24	1	25	dust	10,00	0,200	-	15	0,8	-
B2-31	Welding	20.000	24	1	25	dust	10,00	0,200	-	15	0,8	-
B2-32	Welding	20.000	24	1	25	dust	10,00	0,200	-	15	0,8	-

***Table 14**: Background of emission in the Assembly Shop processes*

Assembly Shop												
Emission points	origin	Air flow(m 3 /h 0°C) 0,101 Mpa	Emission time (h/gg)	Emission frequency	Temperature °C	pollutants	Pollutants concentration (mg/ m3 a 0°C 0,101 Mpa) (A)	Mass flow(kg/ h)	Emission factor (kg/t g /m 2)	The highest point of emission (m)	Emitter diameter (m)	Emission decrease system (B)
A1	Glass panes assembly	45,000	24	1	25	Vaporous organic matters 45g/m2	20,00	0.90 0	-	14÷16	1.1	-
A2	Fuel charging	45,000	24	1	25	Vaporous organic matters 45g/m2	20,00	0.90 0	-	9÷12	1.1	-
A3	First start	45,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.1	-
A4	Wheel balancing	11,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	0.6	-
A5	Wheel balancing	11,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	0.6	-
A6	Wheel balancing	11,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	0.6	-
A7	Wheel balancing	11,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	0.6	-
A8	Rollers test	45,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.1	-
A9	Rollers test	45,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.1	-
A10	Rollers test	45,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.1	-
A11	Rollers test	45,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.1	-
A12	Rain test in "rainy cabin"	11,000	24	1	25	Water fume	-	-	-	14÷16	0.6	-
A13	Rain test in "rainy cabin"	11,000	24	1	25	Water fume	-	-	-	14÷16	0.6	-
A14	Remediation zone	30,000	24	1	25	Emission of exhaust gases from vehicles			-	14÷16	0.9	-
A15	Vehicle transit	80,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.4	-
A16	Vehicle transit	80,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.4	-
A17	Vehicle transit	80,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.4	-
A18	Vehicle transit	80,000	24	1	25	Emission of exhaust gases from vehicles			-	9÷12	1.4	-

***Table 15**: Background of emission in the application of correction paint phase within Assembly Shop*

Correction of paint phase in Assembly Shop												
Emission points	**origin**	**Air flow(m 3 /h 0°C) 0,101 Mpa**	**Emission time (h/gg)**	**Emission frequency**	**Temperature °C**	**pollutants**	**Pollutants concentration (mg/ m3 a 0°C 0,101 Mpa) (A)**	**Mass flow(kg/ h)**	**Emission factor (kg/t g /m 2)**	**The highest point of emission (m)**	**Emitter diameter (m)**	**Emission decrease system (B)**
P134	Place of remediation Preparing-Zone 1	10,000	24	1	25	Dust total	3.00	0.030		17	0.6	Filter
P135	Place of remediation Preparing-Zone 2	10,000	24	1	25	Dust total	3.00	0.030		17	0.6	Filter
P136	Place of remediation desk– H1	60,000	24	1	25	Dust total	Vaporous org. matt. 45g/m2			17	1.5	Paint collection filter
						Vaporous org. matt. 45g/m2	3.00	0.180		17	1.5	
P137	Place of remediation desk – H 2	60,000	24	1	25	Dust total	Vaporous org. matt. 45g/m2			17	1.5	Paint collection filter
						Vaporous org. matt. 45g/m2	3.00	0.180		17	1.5	
P138	Place of remediation desk – H 3	60,000	24	1	25	Dust total	Vaporous org. matt. 45g/m2			17	1.5	Paint collection filter
						Vaporous org. matt. 45g/m2	3.00	0.180		17	1.5	
P139	Place of remediation desk – H 4	60,000	24	1	25	Dust total	Vaporous org. matt. 45g/m2			17	1.5	Paint collection filter
						Vaporous org. matt. 45g/m2	3.00	0.180		17	1.5	

***Table 16**: Background of emission in the phase of painting of bumpers*

Bumpers shop												
Emission points	origin	Air flow(m 3 /h 0°C) 0,101 Mpa	Emission time (h/gg)	Emission frequency	Temperature °C	pollutants	Pollutants concentration (mg/ m3 a 0°C 0,101 Mpa) (A)	Mass flow(kg/ h)	Emission factor (kg/t g /m 2)	The highest point of emission (m)	Emitter diameter (m)	Emission decrease system (B)
B001	Washing of bumpers	10.000	24	1	40	Phosphorous compounds (PO4-)	5,00	0,050	-	30	0,6	-
B002	Washing of bumpers	10.000	24	1	40	Phosphorous compounds (PO4	5,00	0,050	-	30	0,6	-
B003	Draying oven line 1	5.000	24	1	60	Phosphorous compounds (PO4	5,00	0,025	-	30	0,4	-
B004	Draying oven line 2	5.000	24	1	60	Phosphorous compounds (PO4	5,00	0,025	-	30	0,4	-
B005	Burner at washing line 1	3.000	24	1	100	Carbon monoxide(CO)	100,00	0,300	-	30	0,3	-
						Nitrogen oxides (NO2)	150,00	0,450	-			
B006	Burner at washing line 2	3.000	24	1	100	Carbon monoxide(CO)	100,00	0,300	-	30	0,3	-
						Nitrogen oxides (NO2)	150,00	0,450	-			
B007	Burning chamber	50.000	24	1	25	V.O.C. presented as total carbon	5,00	0,250	-	30	1,3	-
B008	Application of protection chamber line 1	10.000	24	1	25	V.O.C. presented as total carbon		0,000	-	30	0,6	T.A.
B009	Application of protection chamber line 2	10.000	24	1	25	V.O.C. presented as total carbon		0,000	-	30	0,6	T.A.
B010	Dryer (example) line 1	2.000	24	1	50	V.O.C. presented as total carbon		0,000	-	30	0,3	T.A.
B011	Dryer (example) line 2	2.000	24	1	50	V.O.C. presented as total carbon		0,000	-	30	0,3	T.A.
B012	Application of base paint chamber line 1	10.000	24	1	25	V.O.C. presented as total carbon		0,000	-	30	0,6	T.A.
B013	Application of base paint chamber line 2	10.000	24	1	25	V.O.C. presented as total carbon		0,000	-	30	0,6	T.A.
B014	Dryer (base coat) line 1	2.000	24	1	80	V.O.C. presented as total carbon		0,000	-	30	0,3	T.A.
B015	Dryer (base coat) line 2	2.000	24	1	80	V.O.C. presented as total carbon		0,000	--	30	0,3	T.A.
B016	Application of transparent polish chamber line 1	12.000	24	1	25	V.O.C. presented as total carbon		0,000	-	30	0,7	T.A.
B017	Application of transparent polish chamber line 2	12.000	24	1	25	V.O.C. presented as total carbon		0,000	-	30	0,7	T.A.
B018	Dryer of transparent polish	2.000	24	1	80	V.O.C. presented as total carbon		0,000	-	30	0,3	T.A.
B019	Final coat oven line 1	2.500			200	V.O.C. presented as total carbon		0,000		30	0,3	T.A.
B020	Final coat oven line 2	2.500	24	1	200	V.O.C. presented as total carbon		0,000	-	30	0,3	T.A.
B021	Final coat oven burner line 1	3.000	24	1	100	Carbon monoxide(CO)	100,00	0,300	-	30	0,3	-
						Nitrogen oxides (NO2)	150,00	0,450	-			
B022	Final coat oven burner line 2	3.000	24	1	100	Carbon monoxide(CO)	100,00	0,300	-	30	0,3	-
						Nitrogen oxides (NO2)	150,00	0,450	-			
B023	Remediation chamber	30.000	24	1	25	V.O.C. presented as total carbon	20,00	0,600	-	30	1,0	P.S.F.
						Total dust matters	3,00	0,090	-			
B024	Paint preparation room	125.000	24	1	25	V.O.C. presented as total carbon	15,00	0,875	-	16	2,1	
B025	Paint storage within paint preparation room	45.000	24	1	25	V.O.C. presented as total carbon	10,00	0,450	-	16	1,3	
B026	Solvent storage	12.000	24	1	25	V.O.C. presented as total carbon	3,00	0,360	-	16	0,7	
B027	Paint preparation small room	7.000	24	1	25	V.O.C. presented as total carbon	15,00	0,105	-	16	0,5	
B028	Chemical laboratory	3.000	24	1	25	V.O.C. presented as total carbon	10,00	0,030	-	16	0,3	
						Total dust matters	3,00	0,009	-			
B029	Chemical laboratory	4.000	24	1	25	V.O.C. presented as total carbon	10,00	0,030	-	16	0,4	
						Total dust matters	3,00	0,009	-			
B030	Washing of equipment	1.000	24	1	25	V.O.C. presented as total carbon	5,00	0.005	-	30	0,2	P.S.F.
						Total dust matters	3,00	0.003	-			
B031	Washing of equipment	1.000	24	1	25	V.O.C. presented as total carbon	5,00	0.005	-	30	0,2	P.S.F.
						Total dust matters	3,00	0.003	-			
B032	Washing of sliders	30.000	24	1	25	Water vapor	-	-	-	30	1,0	
						Total dust matters	3,00	0,090	-			
B033	Waste gases afterburner	60.000	24	1	180	V.O.C. presented as total carbon	20,00	1,200		12	1,5	T.A.

T.A. – Thermal Afterburner
P.S.F. –Paint Stop Filter

3.3.3. Manner of collection and treatment of waste matters produced by regular work

Planned procedures of treatment of waste matters generated by performing of the concerned technology will secure efficient protection from pollution of working and living environment due to projected technical protection measures and defined control procedures, monitoring and waste management.

Gases generated during the welding process- fumes- are conducted to the atmosphere through local vacuum systems.

“Washing of waste air” will be performed in painting process. Painting of positions (parts) will be performed in the most contemporary cabins equipped with water scrubbers. The air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air is mixed with water retains all solid particles.

The planed management of waste waters, liquid and solid waste includes the following:

Waste waters generated in the Painting Shop will be directed to the waste waters purification plant KATAK. The concept of purification of waste waters coming from Surface protection shop, Assembly Shop and Technical cleaning shop is based on egalization of non-continuous with continuous waste waters, namely on making of an average quality with mutual correction of pH number. The solution based on this concept achieves equalizing of quality of outgoing effluent that will meet MDK values stipulated by Rulebook on release of waste waters into city sewer system of Kragujevac.

Oily waste waters form the other plants- generated by maintenance of the objects, also conducted, by channel system, to the plant for waste water treatment within the complex.

Sanitary-fecal waste waters- will be collected from sanitary blocks by separate fecal sewer and through revision manhole released to the city fecal sewer collector.

Atmospheric waters from plateaus and internal roads will be collected and conducted by channels and gutters to the oil and grease separator of atmospheric sewer and further to city atmospheric water collector.

Waste oils form the shop for maintenance of mechanization (motor and hydraulic oils) will be collected and stored in impermeable containers until handing over to competent organizations for further treatment.

Waste mud generated at the waste waters treatment- Mud filleting process is conducted at the chamber filtering press. This is, in fact, process of dehydrating, namely removal of water from the mud by pressing it, and press-mud cake is formed within the press. The principle of removal of waster form mud in chamber filtering press is based on separation of solids and liquids due to pressure impact. After filling the chambers with formed mud cakes (dehydrated mud), the chambers open and press-mud cakes fall out to the belt conveyor, than to a container and than are transported to the storage of FAS where they are temporarily disposed until handing over to a company which is hired and authorized for transport of dangerous waste. Taking over of the waste will be performed on a monthly basis.

Waste matters collected in filters of purification bathroom will be collected to impermeable containers and stored in dedicated space of the storage for chemicals and dangerous waste, which is an integral part of the Painting Shop, until handing over to competent legal entity for further treatment. Used toners (cartridges) form printers, which have dangerous waste features, must be handed over to accredited recycling companies, as well as electronic waste (computer equipment, printers) which appears occasionally.

Waste sheet metal generated in Press Shop during processing of steel sheet metal at on the cutting and pressing lines is collected and transported to the “baler shop” and then it is handed over to competent collectors for further utilization.

All types of liquid or solid waste generated in regular work must be inspected and defined as hazardous, dangerous or it is non-dangerous waste, namely the Project Holder is obligated to perform characterization of every type of waste. Waste with dangerous matter feature and waste with characteristics of secondary raw material must not be disposed to sanitary landfill, but must be handed over to competent legal entity for further treatment- recycling, neutralization, burning or final disposal. Waste management must be compliant with legal regulation related to waste management: Waste management Law (“Official Gazette RS” no. 36/09), Packaging material and waste packaging material Law (“Official Gazette RS” no. 36/09), Rulebook on handling of waste having the features of dangerous waste (“Official Gazette RS” no. 12/95 and 56/10) and Rulebook on conditions and manner of selection, packing and storage of secondary raw materials (“Official Gazette RS” no. 72/09 and 56/10). The Project Holder is obligated to make Waste management plan.

3.4 Manner of utilization of natural resources and energy

Taking into consideration the mentioned characteristics of the Project and industry, the concerned Project can be categorized as rational capacity from the aspect of requirements for consumption of restorable and non-restorable resources.

The land of the concerned cadastral parcel is urban building land which was, in the past, converted from agricultural land.

As the concerned land is located within the work zone 3 “Zastava”, it has been exposed to negative impacts for years and odes not represent agricultural land of good quality appropriate for usage.

Regular work of the Project does not require consumption of natural non-restorable (hardly restorable) resources out of the scope of norms and standards set up for the concerned industry.

Electric power is used for work of machines and devices included in the Project pursuant to existing conditions approved by competent electro energy distribution company.

Water will be used for technological, sanitary and fire protection purposes. The waster supply is provided by connection to city water pipeline.

Natural gas will be consumed in the quantity of 900 Nm3/h, while gas and diesel will be consumed in very law amounts.

3.5. Occurrence of noise, vibrations, emission of light, heat, bad smells electromagnetic emissions

Sources of noise in the complex can be divided on the following way:

- Outer sources of noise
  - Mobile sources
    - supply and dispatch transportation vehicles
    - internal transport- fork lifters
    - cars
  - stationary sources
    - ventilation devices

- internal sources of noise
  - machines in Press Shop- presses, sheet metal shears
  - tooling machines- welding equipment, grinders, polishers, assembly devices
  - other equipment- compressors and mechanisms
  - manipulation with raw materials and final products (bodies)

Emission of noise is phenomenon characteristic for the concerned technology. Noise may be changeable broadband and periodical such as the noise emitted during internal transport or as noise of work of mechanisms and compressors. Impulsive noise originating from work of presses is not of high intensity, as the presses work on the basis of hydraulics.

Intensity and time of noise are different form the source and time of operation that produces it. Tooling machines, compressors, mechanisms produce noise ranging from 70-75 dB (A) at the spot of source, hard transportation vehicles produce noise even up to 80 db (A), while certain operations performed at presses, shears and during manipulation with raw materials may produce short impulses with peaks that may exceed 90 dB (A).

Presses induce local vibrations which differentiates in relation to intensity, amplitude and frequency, but because of obligatory anti-vibration founding of machines, there is no possibility of transferring of vibrations out of the objects, namely out of the working complex onto environment, nor it can come to destabilizing of ground in the complex. Vibrations can be felt only locally- next to the working station and they are subject of the Projects related to work safety, not to environment protection.

Emission of light and electro-magnetic emissions are not characteristic for he concerned Project.

The substances and products of work in the complex with intensive smell are solvents, namely paint used in the Painting Shop. Smells which appear during painting originate from aromatic and aliphatic hydrocarbons emitted by evaporation of solvents. Fractions which are not absorbed by water of purification bathroom may be emitted out of the Painting Shop object as vapors through forced ventilation. Taking into consideration distance of residential objects from Painting Shop object, possibility of appearance of bad smells and upsetting of citizens in wider surrounding is very low.

3.6. Potential cumulative effects with existing activities in the complex

“FIAT AUTOMOBILI SRBIJA” ia, in fact, late company “Zastava automobili”, one of the biggest complexes in Serbia and at the territory of ex Yugoslavia wit the tradition longer than five decades.

The location of the Project is within the work zone 3 “Zastava” and at the moment, manufacturing of FIAT PUNTO is being reestablished, and it is also planned to introduce manufacturing of other models. The Project envisages reconstruction of existing production facilities with better infrastructural equipping.

The concerned location borders a part of mother company on the east side, which is also engaged in mechanical industry. Cumulative effects may be expected through production of waste iron and steel, oily waste waters, communal waters and noise emission. Setting up of oil separator for atmospheric and technological waters will prevent additional pollution of surface waters, and execution of the Contract on taking over of waste will prevent significant cumulative impacts to environment. There is no significant noise source in the Project’s complex, nor in the neighboring complexes, so is it scarcely possible that the noise emitted in the complex will increase existing noise level of environment.

3.7. Direct impacts of the Project to human health

The aim of the impact assessment is to prevent impacts to human health. Impacts to health of employees in the concerned complex are regulated by special procedure pursuant to Safety and health protection at work Law ("Official Gazette RS" no. 101/05).

Direct impact to human health can be induced by inhalation of air pollutants appearing in the painting and painting preparation processes.

Aromatic hydrocarbons – products of combustion of thermal oil appear as powder like matters and as small crystals (benzo-pyren, anthracene, benzo- anthracene, pyren, etc.). Mentioned matters appear in very low concentration and are very often bonded to cinder particles. They are matters considered to have cancerogenous impact to humans and that long term exposure may influence reproduction (teratogens and carcinogens). They are characteristic for stability and bio-accumulativeness. Traffic also causes emission of those matters (incomplete combustion of oil derivates- mostly diesel). For this reason, it is necessary to set up efficient filters for collection of powdery matters from waste gases at the exits of local vacuum system above chambers.

During painting with acrylic, alkyd- melanine and epoxide paints one part of solvents evaporates and, by general forced ventilation, it is conducted out of cabins for application of paint and cabins for drying. The most important components of solvents for these paints are xylol, methyl-ethyl- ketone and toluol. Fumes of these liquids are inflammable and toxic. Exposure of humans to these matters may be by inhalation, which causes irritable impact. Ingestion of liquid solvents may cause chemical pneumonitis, while permanent contact with skin can lead to dermatitis. The population out of the complex can inhale these matters in the case of high concentration, not diluted in sufficient extent in order to go below GVI (7.5mg/m3). Besides irritable influence to lungs, long term exposure to the concentrations over 150mg/m3 may lead to impact to nervous system and cause nausea, dizziness, vomiting.

For this reason, it is necessary to measure emissions at the emitters of the Painting Shop and to apply the system of eliminating, namely minimization of emission of VOC matters and other organic polluters, namely to set them below GVE.

Emission of dust (iron oxides- corrosion) may appear during welding processes. Mechanical influences of dust particles have a irritating effect, and in the case of prolonged, long term inhalation, it can cause illnesses such as silicoses, or siderosis (accumulation of iron in organism).

Dust emission is of low scope and can not lead to some significant emission and negative effects to population out of the concerned object, but emission in sanding shop is more significant and therefore it is planned to set up patron filters- dry dusters.

Mechanical processing of metal produces noise, but as they are performed in closed space and the residential objects are at considerable distance, the noise, which is the consequence of work of the complex, can not upset population in the surroundings.

4.0. Review of the main alternatives and reason for selection of adopted solution

4.1. Alternative location

The concerned Project was planned as the reconstruction of existing production facilities within the yard of the company “FIAT AUTOMOBILI SRBIJA”, so the Project Holder has not taken into consideration any other alternatives for selection of location.

As the location has, pursuant to general plan of Kragujevac 2015 located in the work zone 3 “Zastava”, equipped infrastructure, good connection with surrounding, residential objects at safe distance form the border of the complex, the alternative of it keeping the existing location was selected.

Car manufacturing technology does not require consumption and storage of significant amounts of dangerous matters and does not lead to significant overload of environment in the form of emission of high amount of toxic and hazardous matters. Waste waters and waste generated during regular work can be collected and treated in an organized manner, so these activities do not stand for factor of risk to surrounding contents and from that aspect, there are no limiting factors.

4.2. Alternative technological procedure

Choice of technology is based on many years of experience within this field and on continuation of traditional production which has been taking place in this plant over more than 5 decades, with improvement of working conditions, environment protection and achievement of better energy efficiency. For manufacturing of cars within the concerned plant, assembly including the following operations is performed:
- pressing,
- setting and welding of sheet metal- body assembly,
- painting of vehicle bodies,
- setting up of seats and mechanical parts of vehicle- reception-dispatch,
- final processing.

Process of application of paint, manual and automatic, is performed in dedicated cabins for spraying, equipped with the system for dry collection of particles. The air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air passes through the system of filters of Paint Stop type that retain solid particles or through scrubbers. Producers of cabins have improved the efficiency of particles collection of such systems over years, and the one to be used in the plant in Kragujevac is of the best technology available at the moment.

The basic change in comparison to the existing state is reconstruction of production facilities with significantly improved working conditions related to illumination, heating, ventilation, fire protection and environment protection.

4.3. Alternatives to management of waste matters generated during the Project work

The following waste matters will be generated during regular work of the Project:

- Waste sheet metal,
- Waste mud from the waste water treatment plant,
- Waste material collected in the filters of purification bathroom in Painting Shop,
- Waste packaging material of oils, paints and solvents,
- Oily matters from grease and oil separator for atmospheric waters and from the oil separator for waste waters of other production objects,

Besides the above mentioned waste matters, the following also generate:

- Technological waste waters,
- Atmospheric waste waters,
- Sanitary- fecal waste waters.

Gas matters that generate are:

- Fumes from the paint preparation process (chemical preparation),
- Vaporous components of solvents in the Paint Shop,
- Dust generated during welding processes in the Body Shop.

Taking into consideration the characteristics and spatial capacity of the complex, there are no conditions for storage of significant amounts and treatment of solid waste, mud at the location, so the Project Holder is obligated to execute a Contract on taking over of mentioned waste matters by competent legal entity, to perform characterization of all types of waste and to fill in Document on waste movement, pursuant to the terms of Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95 and 56/10) and Rulebook on conditions and manner of selection, packing and storage of secondary raw materials ("Official Gazette RS" no. 72/09 and 56/10). The Project Holder "FIAT AUTOMOBILI SRBIJA" has executed the Contract no. 10442-10 on that day of 12th of July 2010 with the company "DEKONTA" appointed for permanent disposal of dangerous waste generated in the company "FIAT AUTOMOBILI SRBIJA".

Pursuant to the terms of Packaging material and waste packaging material Law ("Official Gazette RS" no. 36/09), the Supplier or manufacturer is obligated to take over waste packaging material from the final user, so in that way an organized management of this category of waste will be performed, and there is no alternative to it.

Taking the quantities and features of waste waters into consideration, the Project Holder did not have any alternative but to envisage and project manner of treatment of these waste waters. Waste water treatment plant is intended for this process, which will perform separation of oily matters from oily water, as well as processes of egalization, flocculation, coagulation, filtering and mud pressing in the process of acid waters treatment.

Taking the type and features of air polluters into consideration, the Project Holder is obligated to perform purification of waste air above the chambers of baking ovens, where polymerization of cataphoresis layer and PVC takes place, at the painting chambers and at the emitters of the general Painting Shop ventilation.

Painting device will be structured on the basis of technical solution pursuant to the best technology that can be applied. Namely, emission of gases into atmosphere will be limited by introduction of products with lower content of solvents called "high solid remnant" and in that way will comply with limiting values stipulated by European regulations CE 1999/13, namely 45g/m2 (in grams of solvent (C.O.V.) per square meter of treated product).

Processes of application of protection paint are performed by AIRLESS method in dry ventilated cabin equipped with system for dry collection of particles. The air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air passes through the system of filters of Paint Stop type that retain solid particles. Principles of application of base and final cover is similar, with that difference that the

air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air mixes with water which retains solid particles.

Treatment of sanitary-fecal waste waters is not envisaged, because the connection to city fecal pipeline exists, and treatment of atmospheric wasters at the oil and grease separator for atmospheric wasters will be a standard solution. As the amount of atmospheric waters depends on precipitations quantity, these waters mustn't be conducted and treated in the oily waters separator, because there is a risk of overload.

5.0. Overview of existing state of environment at the location and in the surroundings (micro and macro location

The fact that the location is within the existing work zone 3 “Zastava”, unit 2, and that it is a part of big industrial complex of the late plant “Zastava automobile” to big extent defines state of existing environment at the micro-location level.

The complex exists, it is built, with production, supplementary and administrative objects. The infrastructure of location is set up. Besides the objects, the major part of the complex is covered by internal roads, so we can say that the greenery is scarce. Objects are typical, industrial and have no landscape or architectural value. Reconstruction of existing objects, namely production facilities is planned.

The location is very well connected with the wider surroundings through the street Kneza Mihaila, which is at the same time a route Kragujevac-Kraljevo. The complex is connected to the mentioned road by the bridges “Sest Topola” and “Zvezda”. It is connected to the rail road Lapovo-Kraljevo by industrial rail road.

There are residential zones in the surrounding of the location- settlements Sest topola, Palilule and Zvezda at the north, Erdec at the south-west and Belosevac at the south-east. To the south of the complex, there is an area which is not built up- agricultural land. River Zdraljica flows along the east border of the plant complex which connects the mentioned complex with the main Zastava location.

The whole production complex is located between river-beds of three currents: Lepenica river, Zdraljica river and Grosnica river. It is built up on relatively plain terrain on the height of 178-186 meters above see level.

River Lepenica flows along the north-west border of the complex.

This surface current is characterized by hard pollution with organic matters and chemicals. Rom its source to Kragujevac, Lepenica is categorized as IIa current, and from Kragujevac to the mouth at Velika Morava as IIB category (pursuant to the decree on water current categorization “Official gazette RS” no. 5/68). Fecal sewer of the settlement with almost 150.00 citizens is released into Lepenica, as well as technological waste waters, as the majority of manufacturing and industrial complexes does not have waste waters treatment plant, or it is not efficient and maintained. As Lepenica is not a river with significant flow (only during the periods with abundant precipitations and at the period of abrupt snow melting it can have strong current) it does not have ability of self-purification. After arrangement of Lepenica riverbed for protection of floods, the whole minor and major riverbed was tiled and this prevented establishing of natural ecosystems and aquatic vegetation, which would, as natural filter and accumulator of hazardous matters, help to decrease pollution of this surface water current.

Zdraljica and Grosnica rivers are not considered as significant natural resources in accordance with their size, flow and water quality.

On the basis of organoleptic and microbiological examinations of water quality at the springs at the territory of Kragujevac and surrounding it has been found that the underground waters, especially waters from phreatic springs which are fed by atmospheric precipitations, are of inappropriate quality and can not be used as drinking water.

As the location is at the urbane city and industrial area, there are no autochthonous ecosystems, rare and endangered flora species and natural monuments.

There are no protected cultural heritage at the location and the surroundings.

5.1. Analysis of the location from the aspect of environment protection and advantages of the selected location for work and implementation of the Project

The location of is within the work zone 3 “Zastava, unit 2. The location is built and its infrastructure built. Besides the objects, there are manipulative surfaces and internal roads. Green areas are scarce- there is only partial greenery. There is no protected natural resources, rare and endangered flora and fauna species, ambient units, natural ecosystems at the location and the surroundings, so from that point of view, there is no limiting factors.

As the location is in the city, building area, namely typical urban city area, it is nit characterized by significant esthetic value.

On the basis of information about air quality and noise at the location, and on the basis of the conditions at the field and identification of the source of pollution, it has been concluded that the location is characterized by decreased environmental capacity. The environment of the location and of the immediate surroundings is exposed to the negative effects of:

- Air pollutants emission as the consequence of frequent traffic,
- Emission of air pollutants released from boiler rooms and individual boilers,
- Specific polluters emission from industrial complexes,
- Noise emission as the consequence of traffic and significantly lower noise as consequence of work in working complexes of industrial zone,
- Surface water polluting- pollution of water of Lepenica river by releasing of untreated technological water, oily atmospheric water and sanitary-fecal waste water from work complexes, roads and residential zones,
- production of waste with features of dangerous matters and other non-dangerous waste.

The closest collective residential objects are at the distance of about 200m from the border of the complex.

Vulnerable objects- schools, hospitals, nursery schools, sport centers, churches, cemeteries, cultural heritage objects are at the great distance- out of the area of possible negative impact. The nearest vulnerable unit is Palilula cemetery located north of the location, at about 400m, while it is separated from the complex border by Lepenica foreland and residential objects of the near settlement. The nearest school (Primary school “Treci kragujevacki bataljon”) is at about 800m away to the north from the complex, while the nearest nursery school is 750m to the north-west.

Positive aspects of selection of the concerned location for implementation and work of the Project are distance of vulnerable objects and units, lack of natural values and significant ecosystems that might endanger work of the Project. The complex exists, there is no consumption of the land as natural resource, nor significant requirements for further equipping of infrastructure. The traditional industry will be still performed at the location, so from that aspect, there will be no upsetting or insecurity of the population in the surroundings. The conditions at the micro-location level will be significantly improved by implementation of planned requirements for better equipping, introduction of ecologically more acceptable fuels, putting into operation the system for waste water and waste air treatment and replacement of old objects and installations.

Therefore, implementation and work of the Project at the concerned location is possible, ecologically acceptable and sustainable, but under the condition of projecting and implementation of technical protection measures related to minimization of air pollutants emission, purification of technological waste water and oily atmospheric water from manipulative and road surfaces in the complex and to decrease of noise level emitted by internal traffic, ventilation and other external noise sources.

It is also necessary to organize collection, selection, storage and evacuation of all types of waste generated during regular work, as well as to categorize waste with features of dangerous matters, pursuant to terms of Waste management law (“Official Gazette RS” no. 36/09), Packaging material and waste packaging material Law (“Official Gazette RS” no. 36/09), Rulebook on handling of waste having the features of dangerous waste (“Official Gazette RS” no. 12/95 and 56/10) and Rulebook on conditions and manner of selection, packing and storage of secondary raw materials(“Official Gazette RS” no. 72/09 and 56/10).

During the work, namely existence of the Project at the location, it is necessary to control quantities and concentrations of waste matters released to environment, through pollution monitoring (ecological monitoring), measuring and researches by competent organizations and laboratories pursuant to legal acts that more closely define methods of sampling and measuring of significant pollution parameters.

6.0. Possible harmful impacts of regular work of the Project to environment

On the basis of the above presented analyses of characteristics of the location and surroundings, identification of pollution sources, estimation of existing environment conditions, characteristics and specific features of adopted industry, possible negative effects to environment can be projected and estimated.

6.1. Analysis of direct, indirect, secondary, cumulative, short-term, middle-term, long-term, permanent, occasional, positive and negative effects to environment (qualitative and quantitative overview of possible changes) that might occur during the Project

Taking into consideration the basic features of the concerned Project, it can be concluded that, during the regular work of the complex, the following waste matters and pollutants, potential environment pollutants, are generated:

- gases:
  - emission of products of combustion of fuel in the engines of transporting vehicles,
  - emission of pollutants in different phases of Body painting,
- waste sheet metal;
- solid waste of communal character;
- waste from offices;
- dangerous waste;
- technological waste waters;
- sanitary-fecal waste waters;
- noise.

6.1.1. Emission to air

Emission of hazardous pollutants to air in small amount originates form the internal traffic. Traffic produces emission of specific atmosphere pollutants as products of complete and incomplete combustion of oil derivates in internal combustion engines. Analysis of traffic frequency at the location, frequency and presence of vehicles indicates that the traffic intensity at the location is low, and as it is related to internal roads without priority, the traffic of the location is not a factor that endangers quality of environment and does not require special analysis and environmental impact assessment.

The concerned technology, at certain lines and phases of performing of certain operations, produces increased emission of particles that might be potential air polluters. Processes taking place in the Painting Shop, namely processes of paint preparation and processes of paint application which produce fumes containing aromatic compounds, have the highest impact to air.

Processes of application of protection paint are performed by AIRLESS method in dry ventilated cabin equipped with system for dry collection of particles. The air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air passes through the system of filters of Paint Stop type that retain solid particles. Principles of application of base and final cover is similar, with that difference that the air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air mixes with water which retains solid particles.

Painting device will be structured on the basis of technical solution pursuant to the best technology that can be applied. Namely, emission of gases into atmosphere will be limited by introduction of

products with lower content of solvents called “high solid remnant” and in that way will comply with limiting values stipulated by European regulations CE 1999/13, namely 45g/m2 (in grams of solvent (C.O.V.) per square meter of treated product).

Aero-pollutants emissions also result from paint baking processes, as well as from welding processes, namely processes of bodies assembly which produce powder matters emissions.

6.1.2. Release of waste waters

Detailed description of process of generation and treatment of waste waters generated within concerned Project is in the chapter 3.3.2.

Technological waste waters are produced in Painting Shop phases of body painting. There is a built up plant for purification of waste waters within the plant yard and is located next to Painting Shop in the common object named “KATAK”, where plant for Technical cleaning of lattice is also located, as well as plant for assembly of trailers.

Spots of release of waste waters in the plant of Surface protection are Chemical preparation line, Base painting line, Final painting line, as well as cabin PVC.

Waste waters at the Chemical preparation line are divided to continuous and non- continuous waste waters, as well as at the line for Cataphoresis (cataphoresis- technological surface protection procedure), while at the other lines, there appear non- continuous waste waters. Only continuous waste waters appear during regular production process at the Chemical preparation line and Cataphoresis line.

Concept of purification of waste waters originating from Surface protection plant, Assembly Shop and Technical cleaning plant is based on egalization of non-continuous with continuous waters, namely on making an average quality with mutual correction of pH number. Solution of such a concept enables even quality of out coming effluent which will meet MDK values stipulated by Rulebook on release of waste waters into city sewer system of Kragujevac.

Chemicals used in the technological process of purification:

- milk of lime solution;
- coagulant PAC (polyaluminum- chloride);
- Polyelectrolyte- Flocculant Anioinc polyacrylamide;
- Sodium hydroxide;
- Sulfuric acid;

Annual consumption of chemicals:

On the basis of the following adopted criteria:

Qh = 37.35 m3/h – hourly flow of egalizated waste waters;
Qd = 298.82 m3/day – daily quantity of egalizated waste waters;
Qg= 89647.50 m3/god – annual quantity of waste waters for 300 working days;

Overall consumption of chemicals on an annual basis can be calculated:

• lime – 7.920 kg;
• PAC – 13.5 m 3 10% solution;
• PE – 90 kg;
• NaOH – 36 m3 30% solution;
• H2SO4 – 12 m3 conc. 96%.

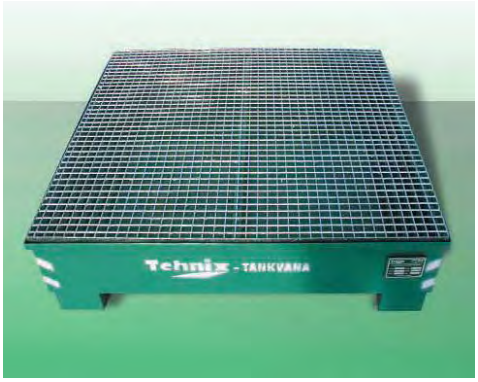
Sanitary- fecal waste waters are result of presence of employees at the location. They are conducted, out of the sanitary blocks, to city sewer system through internal sewer pipeline.

Atmospheric waters from manipulative surfaces and wasters originating form washing and maintenance of those surfaces, must be, by special network, conducted through settling tank for mechanical impurities and oil and grease separator, and afterwards released to the final recipient.

Besides waste water generated in regular work, liquid and solid matters having features of dangerous matters will be also generated:

- **Waste used oils-** mechanical, engine, hydraulic, generated in the shop for regular maintenance of machines and mechanization- its dangerous and inflammable waste, occasionally generated in small quantities (expected quantity 200l annually). They are eco-toxic matters which, when released, pollute water and soil. This impact can be considered as occasional.
- Oily matters from separators- will be collected during occasional cleaning of oil and grease separators- they are eco-toxic matters which- pollute water and soil.

The above mentioned liquid waste may lead to contamination of soil and pollution of underground wasters because they degrade slowly. Release of these matters into water and soil is forbidden, so it is necessary to organize management of this type of waste pursuant to Rulebook on handling of waste having the features of dangerous matters ("Official Gazette RS" no. 12/95) and Rulebook on conditions and manner of selection, packing and storage of secondary raw materials ("Official Gazette RS" no. 55/01). The project Holder is obligated to categorize waste matters. Collected used oils will be stored separately (engine oil separately, hydraulic oil separately) in closed steel barrels of 200l capacity in the space within the dangerous matters storage intended for storage of dangerous waste, on steel retention tanks with grid (picture 6.1.3.).



***Picture 5**. One type of metal retention tank for storage of dangerous waste*

6.1.3. Possible impacts to environment due to occurrence of waste, its storage or removal

During the regular work of the Project, the following types of waste generated:

- **Waste sheet metal** – solid waste and filings -generated by mechanical processing of metal in the process of manufacturing of body parts. Waste sheet metal is collected and transported to the baler shop, and then it is handed over to competent bodies for further treatment.
- **Waste mud from the waste waters purification plant**- After the process of sedimentation in the new projected Sedimentation tank, the mud is transported by pumping mechanisms to existing Mud thickeners. The process of coagulation will be performed by application of Ca(OH)2 and slow stirring (every mud thickener has its own low speed mixer). Manner of filling of thickener is one on the other, depending of the concentration of new supplied mud. Over-mud water from the thickener is, by means of gravity, transported to reservoir for collection of filtrate and over-mud water, that is located next to the press, from which it is again transported to the beginning of the treatment process. Thickened mud is taken out from the cone of thickener by pneumatic pumps and transported to the Chamber filter press which presses the coagulated mud and makes press-mud cake, namely filtrate which is returned to the beginning of purification process. Press-mud cake, collected under the press, is removed out of the Plant object (PPOV, KATAK) by conveyor belt to the container located

on the outer side of the wall. Mud filleting process is conducted at the chamber filtering press. This is, in fact, process of dehydrating, namely removal of water from the mud by pressing it, and press-mud cake is formed within the press. The principle of removal of waster form mud in chamber filtering press is based on separation of solids and liquids due to pressure impact. After filling the chambers with formed mud cakes (dehydrated mud), the chambers open and press-mud cakes fall out to the belt conveyor, than to a container and than are transported to the storage of FAS where they are temporarily disposed until handing over to a company which is hired and authorized for transport of dangerous waste. The dangerous waste storage must be constructed all in compliance with Rulebook on handling of waste having the features of dangerous matters ("Official Gazette RS" no. 12/95 and 56/10). Taking over of the waste will be performed on a monthly basis. Filtrate produced by the process of removing of water from the mud, as already mentioned, is transported to the reservoir for collection of filtrates and over-mud water and which is located next to the pres.

- **Waste packaging material:**

- Plastic and metal packaging material for transport and storage of paints and solvents for processes of surface protection by painting- this packaging material was used for transport of dangerous matters so, according to its origin, it is considered as dangerous waste. It is continually generated at the location. It is stored in the space of dangerous matters storage dedicated for storage of dangerous waste pursuant to Rulebook on handling of waste having the features of dangerous matters ("Official Gazette RS" no. 12/95 and 56/10).
- Metal barrel used for waste oil- barrels of 200l capacity used for transport and storage of mineral oils are, according to their origin, dangerous waste. It is stored in the space of dangerous matters storage dedicated for storage of dangerous waste pursuant to Rulebook on handling of waste having the features of dangerous matters ("Official Gazette RS" no. 12/95 and 56/10).
- Plastic and cardboard packing material- is non-dangerous waste. It is collected within the objects where it is utilized, and then handed over to competent companies for further treatment.

Powdery matters collected in the sanding shop filter:

- Dry dusting will be applied for treatment of waste air in the chamber for application of protective paint. During this process, the corrosion removed by this process from the parts which are being prepared for painting accumulates at the filter. These powdery matters are metal oxides which are treated- iron oxides. Filter bags which collect corrosion particles are emptied into polyethylene bags or closed containers, and than the waste is characterized and handed over to the body accredited for further treatment of such waste. Mechanical influence of dust particles has an irritating effect to respiratory system, and in the case of long term exposure, it can cause illnesses such as siderosis and different types of fibroses.
- Communal waste – non-dangerous generated in small quantities as a consequence of presence of employees will be collected to the containers set up for this purpose by JKP "Cistoca". The same public communal enterprise will remove this waste category.
- Electronic waste- Within the concerned complex, certain amount of electronic waste will be generated and it must be handed over to certified legal entities for further treatment. Furthermore, used cartridges from printers will be replaced very often, and they must not be disposed to the landfill, but given over to certified entities for recycling.

Storage of waste in an improper manner or its improper disposal to ground may lead to scattering of powdery fractions by air current, washing of hazardous constituents by precipitations, which directly leads to pollution of soil, surface and underground wasters. Besides mentioned impacts, improper storage and disposal of waste undermines visual qualities of the location and obstructs traffic, namely transport.

Pollution of soil, surface and underground waters during long period of time may lead to assimilation of consistent matters in plants through bioaccumulation. Using of plants and food of animal origin which accumulated dangerous matters for nutrition may cause carcinomas or teratogenic effects.

For above mentioned reasons, waste management must be organized pursuant to the terms of Waste management Law ("Official Gazette RS" no. 36/09), Packaging material and waste packaging material Law ("Official Gazette RS" no. 36/09), Rulebook on handling of waste having the features of dangerous matters ("Official Gazette RS" no. 12/95 and 56/10) and Rulebook on conditions and manner of selection, packing and storage of secondary raw materials ("Official Gazette RS" no. 72/09 and 56/10).
The Project Holder, as the waste generator, is obligated to perform characterization of dangerous waste generated at the location and to make Waste management plan.

6.1.4. Possible impacts to environment as the consequence of noise, vibrations and emissions

Sources of noise in the complex can be divided on the following way:

- Outer sources of noise
  - Mobile sources
    - supply and dispatch transportation vehicles
    - internal transport- fork lifters
    - cars
  - stationary sources
    - ventilation devices

- internal sources of noise
  - machines in Press Shop- presses, sheet metal shears
  - tooling machines- welding equipment, grinders, polishers, assembly devices
  - other equipment- compressors and mechanisms
  - manipulation with raw materials and final products (bodies)

Emission of noise is phenomenon characteristic for the concerned technology. Noise may be changeable broadband and periodical such as the noise emitted during internal transport or as noise of work of mechanisms and compressors. Impulsive noise originating from work of presses is not of high intensity, as the presses work on the basis of hydraulics.

Intensity and time of noise are different form the source and time of operation that produces it. Tooling machines, compressors, mechanisms produce noise ranging from 70-75 dB (A) at the spot of source, hard transportation vehicles produce noise even up to 80 db (A), while certain operations performed at presses, shears and during manipulation with raw materials may produce short impulses with peaks that may exceed 90 dB (A).

Presses induce local vibrations which differentiates in relation to intensity, amplitude and frequency, but because of obligatory anti-vibration founding of machines, there is no possibility of transferring of vibrations out of the objects, namely out of the working complex onto environment, nor it can come to destabilizing of ground in the complex. Vibrations can be felt only locally- next to the working station and they are subject of the Projects related to work safety, not to environment protection.

Emission of light and electro-magnetic emissions are not characteristic for he concerned Project.

6.1.5. Possible impacts to environment from the aspect of utilization of natural resources

Implementation of the Project does not require utilization of land as a natural resource, as the planned contents will implement in the existing industrial complex in work zone 3 "Zastava".

Water supply for the needs of the work of Project is provided by connection to city water supply system. Water consumption is significant, but by using water in recirculation and waste waters purification systems, the negative aspects are decreased.
Natural gas will be used as fuel, in the quantity of 900 Nm3/h.

Above mentioned natural resources in the complex must be consumed rationally. In accordance with the given capacities, the planned complex is considered to be a project with middle consumption of resources. Supplying with natural resources will be performed in a controlled manner, so the supply of the complex and surrounding residential zones will not be obstructed.

6.1.6. Negative impacts to environment in the case of natural disasters

On the basis of analysis of spatial-positioning characteristics of the location, immediate and wider surroundings, as well as on the basis of data available in the documentation and literature, it is concluded that the analyzed zone is not subject to devastating natural disasters that would cause significant physical damages of the objects used for the concerned industry.

Settling of ground, erosion, land sliding or other instability phenomena were not noticed or recorded on the location and surroundings. Area of City of Kragujevac is an area with maximal noticed seismic intensity of 8°MCS, for reversible period of 50 years, namely the concerned location is on the ground not susceptible to devastating earthquakes.

Lepenica river flows along the north border of the complex, which occasionally used to flood the zone of the complex, until arrangement of the riverbed and construction of minor and major riverbeds, stabilized and wide enough to receive one-hundred-year flood.

6.1.7. Possible negative impacts as a consequence of fault in pollution control system

The project Holder is obligated to, during the regular work, through competent laboratories, perform pollution control, namely to perform “ecological monitoring” which must include the following:

- periodical measuring of the emission at the following emitters:
  - ventilation exhaust at the Painting Shop object,
  - emitter of the system for vacuuming of vapors from the tunnel for chemical preparation of painting,
- periodical control of waste water quality after the treatment:
  - at the outlet of the system for waste water treatment,
  - at the outlet of the oil and grease separator for atmospheric sewer;
- characterization of dangerous waste generated in the Project work.

Besides mentioned controls, the Project Holder must regularly control suitability of work devices, installations, especially control of installations for dangerous matters (solvents, paints, oils), as well as the control of the state of packing material used for transport to the location and storage of oils and waste with dangerous matters features.

Failure to perform above mentioned controls might lead to long term, namely repeated emission of hazardous matters to environment, cumulative and synergic consequences impacting air quality and additional pollution of water of Lepenica and underground water of surface sources fed directly by atmospheric precipitations.

Quantities of dangerous matters at the location are not such that they can jeopardize health and lives of the employees in the neighboring objects and of the citizens in the wider surroundings.

Failure to perform regular controls of installations for dangerous matters and state of containers for storage of dangerous matters and waste with dangerous matters features may lead to accidents and

incidents – fire, explosion, liking and scattering of hazardous and corrosive matters onto storage surfaces and manipulative surfaces, with local pollution of soil and water.

7.0. Environmental impact assessment in the case of accident

Methodology for hazard assessment, namely risk of chemical accident and environmental pollution, is prescribed by Rulebook on contents of Accident prevention policy and contents and methodology of making of Report on safety and Accident protection plan("Official Gazette RS" no. 41/10), Rulebook on Dangerous matters list and their quantity and criteria for defining type of document to be made by operator of Seveso plant , namely complex ("Official Gazette RS" no. 41/10) and Rulebook on contents of notification about new Seveso plant, namely complex, existing Seveso plan, namely complex and about permanent stoppage of work of Seveso plant, namely complex ("Official Gazette RS" no. 41/10).

A chemical accident which may lead to significant negative impacts to environment is not possible for the concerned Project, taking into consideration the quantity of dangerous, explosive and inflammable matters, manner of usage and features of the technological process.

However, occurrence of incidents and accidents is not impossible, considering types of fuels, raw materials, dangerous matters, number of installations and human factor, namely faults in internal transport, manipulation, technological operations and omissions in control system.

7.1. Possible accidents in the complex of "FIAT AUTOMOBILI SRBIJA"

On the basis of analysis of type, quantity and manner of storage of dangerous matters used and generated in the concerned complex the following accidents can be projected:

1. fire

1. fire in the inflammable matters storage
2. fire as the consequence of breakdown on installations for gas distribution
3. spreading from other complexes
4. breakdowns on electric installations and equipment

2. release of toxic gases

1. consequence of release from packing materials in which organic solvents are stored

3. spills of dangerous liquids

1. spill of paints and organic solvents in the dangerous matters storage
2. spill of oil due to damaging of original packing material used for delivery and storage of oil
3. spill of liquid waste matters- used oil, waste matters collected in the oil and grease separator and waste matters collected in the purification bathrooms due to damaging of containers they are stored in.

The consequence of the fire in the object of Painting Shop and dangerous matters storage will be combustion of inflammable dangerous matters and evaporation of toxic gas matters of a range of hydrocarbons. The quantities of stored dangerous matters (paints, solvents, dangerous waste, oils) are small, however we can expect irritability, acute poisoning without fatal outcome or permanent consequences and irritability due to emission of bad smells.

Spills of oils, waste oils, solvents, paints, waste from separators and purification bathroom may occur due to damaging of containers where these matters are stored due to corrosion or human factor. As above mentioned matters will be kept in close space of dangerous matters storage, in the containers of maximal capacity of 200l and on retention tanks with grid, there is no possibility of releasing into environment. This prevents these matters to reach underground water and soil and long-term and irreversible effects to environment. If during the transportation these matters spill to roads or manipulative surfaces, they will be conducted to oil and grease separator. The quantities that might be

spilled are small, considering capacity of the containers, and can be easily collected with sand as universal sorbent.

Spill of solvent may lead to evaporation of vaporous components, but, taking into consideration capacity of packaging for storage and delivery, there can not be significant impacts.

8.0. Measures of prevention, decrease and removal of harmful impacts to environment

With the aim of prevention of major consequences to environment, life and health of population, spatial conflicts, cumulative and synergic negative interrelation with contents and complexes of the surrounding during regular work, in the case of accident or permanent discontinuation of work, it is necessary to prescribe measures of prevention, removal, avoidance, minimization and setting to lawful scope of all potentially negative impacts to environment and population by the concerned Study.

8.1. Measures stipulated by law and other regulations, norms, standards and deadlines for their implementation

The Project Holder is obligated to, during regular work, comply with and implement measures directly related to protection of environment or are in indirect relation with protection of environment, stipulated by the following Laws and acts:

- Environment protection Law ("Official Gazette RS" no. 135/04 and 72/09);
- Environmental impact assessment Law ("Official Gazette RS" no. 135/04);
- Planning and building Law ("Official Gazette RS" no. 72/09 and 81/09);
- Water resources law ("Official Gazette RS" no. 30/10;
- Packaging material and waste packaging material Law ("Official Gazette RS" no. 36/09);
- Nature protection Law ("Official Gazette RS" no. 36/09);
- Air protection Law ("Official Gazette RS" no. 36/09);
- Waste management Law ("Official Gazette RS" no. 36/09);
- Law on chemicals ("Official Gazette RS" no. 36/09);
- Law on biocide matters ("Official Gazette RS" no. 36/09);
- Law on protection from noise in living environment ("Official Gazette RS" no. 36/09);
- Law on protection from ionizing radiation and nuclear safety ("Official Gazette RS" no. 36/09);
- Law on protection from non-ionizing radiation ("Official Gazette RS" no. 36/09);
- Fire protection Law ("Official Gazette RS" no. 111/09);
- Law on explosive matters, inflammable liquids and gases ("Official Gazette RS" no. 44/77, 45/85, 18/89, 53/93, 67/93 and 48/94);
- Rulebook on contents of Study on environmental impact assessment ("Official Gazette RS" no. 69/05);
- Rulebook on procedure of public insight, presentation and public discussion about Study on environmental impact assessment ("Official Gazette RS" no. 69/05);
- Rulebook on limiting values, emission measuring methods, criteria for setting up of measuring points, data recording ("Official Gazette RS" no. 54/92, 30/99 and 19/2006);
- Rulebook on emission limiting values, manner and time of measuring and data recording Rulebook on contents of Study on environmental impact assessment ("Official Gazette RS" no. 30/97 and 35/97);
- Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95 and 56/10);
- Rulebook on allowed level of noise in environment ("Official Gazette RS" no. 54/92);
- Rulebook on conditions and manner of selection, packing and storage of secondary raw materials("Official Gazette RS" no. 72/09 and 56/10);
- Rulebook on contents of Accident prevention policy and contents and methodology of making of Report on safety and Accident protection plan ("Official Gazette RS" no. 41/10);
- Rulebook on Dangerous matters list and their quantity and criteria for defining type of document to be made by operator of Seveso plant , namely complex ("Official Gazette RS" no. 41/10);

- Rulebook on contents of notification about new Seveso plant, namely complex, existing Seveso plan, namely complex and about permanent stoppage of work of Seveso plant, namely complex ("Official Gazette RS" no. 41/10);
- Rulebook on dangerous waste in water ("Official Gazette RS" no. 31/10);
- Rulebook on manner and minimal number of testing of waste water quality ("Official Gazette RS" no. 47/83 and 13/84);
- Decision on sanitary-technical conditions for release of waste water into public sewer system ("Official Gazette of City of Kragujevac" no. 9/93);
- Directive on water current categorization ("Official Gazette SRS" no. 5/68);
- Directive on water categorization ("Official Gazette SRS" no. 5/68);
- Directive on manners and procedures of managing waste containing asbestos ("Official Gazette RS" no. 60/08);
- Directive on conditions for monitoring and air quality requirements ("Official Gazette RS" no. 11/2010);
- Waste management strategy for the period 2010-2019 ("Official Gazette RS" no. 29/2010).

8.2. Plans and technical solutions to environment protection

8.2.1. Technical measures of decrease, minimization and prevention of air pollution provided by Project proposal

2. Fumes generated at the spots of welding during welding process in the Body Shop will be conducted out of the working area by local vacuuming system.

3. Process of chemical preparation of body will be performed in close tunnel where it is possible to prevent condensation of fumes by adjusting of ventilation, humidity and temperature.

4. Baking of the cover applied by the means of cataphoresis (protective paint), baking of PVC-soundproof insulation, baking of mid-layer and final paint layer are the processes to be performed in close ovens with system of vacuuming of waste air into central system for after-combustion of VOC matters, with it own emitter.

5. Application of PVC insulation will be performed in close cabin equipped with dry dusting system, with blowing in of air in the upper zone (overspray) and filter system for dry dusting (stop paint device).

6. Application of base paint will be performed by the means of cataphoresis in cataphoresis tub with diluted paint.

7. Application of mid-layer and final paint layer will be performed in special chambers with adjustable humidity and temperature, dusting by blowing in of air in the upper zone (overspray), while the purification of air will be performed through water scrubbers.

8. Manual polishers require local vacuuming of dust which is conducted to filtering system with filter bag and fiber fitting for settling of dust.

9. The paints made on the principle "high solid remnants" will be used in the production, in compliance with European decree CE 1999/13- utilization of paints and polishes with low consumption of solvents, namely with VOC matters emission below 45 g/m2 of the surface of treated product.

8.2.2. Additional measures of decrease, minimization and prevention of air pollution

10. After implementation of the Project, setting up of equipment and installations, it is necessary to conduct, through competent laboratories, during maximal engagement pursuant to the terms of Rulebook on emission limiting values, manner and time of measuring and data recording ("Official Gazette RS" no. 30/97 and 35/97) and Directive on conditions for monitoring and air quality requirements ("Official Gazette RS" no. 11/2010),warranty control of quality of vacuumed air at all emitters: outlet of local vacuuming above paint baking oven, and outlet of

forced general ventilation for vacuuming of air from painting chambers, draying chambers in the Painting Shop and at the emitters for vacuuming of air from welding zone.

11. Treatment of air at the emitters that were found to exceed GVE for any of measured parameters should be projected on the basis of obtained results by separate project.

12. An efficient device for purification of air, capable to set the emission to lawful scope, should be installed at the emitters that were found to exceed GVE for any of measured parameters.

13. After installation of device of purification of air, measuring of emission (warranty measure) is to be repeated through competent organization and pursuant to the terms of Rulebook on emission limiting values, manner and time of measuring and data recording ("Official Gazette RS" no. 30/97 and 35/97) and Directive on conditions for monitoring and air quality requirements ("Official Gazette RS" no. 11/2010) in order to check efficiency of the device for purification of air.

14. Waste dust collected in the filters and devices for purification of air must be kept in closed containers until handing over to further processing to competent bodies.

15. Filter bag with collected corrosion particles are emptied into polyethylene bags or closed containers, and than the waste is characterized and handed over to the body accredited for further treatment of such waste.

16. Waste sediments, mud, must be kept in closed containers and bins until handing over to competent legal entities for further treatment, pursuant to Waste management law ("Official Gazette RS" no. 36/09).

8.2.3. Technical measures of decrease, minimization and prevention of water pollution provided by Project proposal

17. Within the complex "FIAT AUTOMOBILI SRBIJA", waste waters will be conducted by separating sewer system for sanitary-fecal, technological, oily atmospheric waters.

18. There is an object of the plant for treatment of technological waste waters (KATAK) within the complex: waste waters from Painting Shop and oily waste waters, which is to be reduced and adapted to the new technology.

19. It is projected to conduct oily atmospheric water from internal roads and plateaus by channels and gutters into atmospheric sewer.

20. It is projected to install oil and grease separator for treatment of atmospheric waste waters at the spot before release into collector of precipitation sewer.

21. Sediment collected by cleaning of oil and grease separator is considered to be the waste with dangerous matters features and it must be managed pursuant to the Rulebook on handling of waste having the features of dangerous matters ("Official Gazette RS" no. 12/95 and 56/10).

22. Oily waste waters generated by maintenance of other plants will be collected in collecting manholes in floors and conducted by separating sewer to the waste water purification plant.

23. By mixing and egalization of non-continuous and continuous waste water will be performed in the waste water purification plant before treatment and release into city sewer, quality of waters will be averaged and Ph value corrected. Purification of waste water will be preformed by processes of neutralization with application of solution of sodium hydroxide and sulfuric acid, milk of lime, while the settling will be performed by application of coagulators, namely poly-electrolytes.

24. System for conduction and dehydration of waste mud from the water purification system based on chamber filter presses and system for transport and storage of pressed- mud cakes will be installed.

25. Waste waters purified in waste waters treatment plant will be released into city fecal sewer collector through controlling manhole with flow measuring device.

26. Sanitary-fecal water from all sanitary blocks will be conducted by internal fecal sewer and released into city fecal sewer collector through controlling manhole with flow measuring device.

27. Dangerous waste storage will be built pursuant to every and all terms of the Rulebook on management of waste of dangerous waste features ("Official Gazette RS" no. 12/95 and 56/10) and new location license will be obtained for this object.

28. Within the space for storage of dangerous waste, a room for storage of liquid dangerous waste will be constructed pursuant to the terms of the Waste management Law ("Official Gazette RS" no. 36/09), Packaging material and waste packaging material Law ("Official Gazette RS" no. 36/09), Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95 and 56/10) and Rulebook on conditions and manner of selection, packing and storage of secondary raw materials ("Official Gazette RS" no. 72/09 and 56/10).

29. Pursuant to the conditions of JKP "Vodovod i kanalizacija", the connection to city water supply system will be performed through controlling manhole and flow measuring device.

8.2.4. Additional measures of decrease, minimization and prevention of water pollution

30. It is forbidden to release untreated technological waste waters into city sewer, Lepenica, Zdraljicka and Grosnicka river, to free surfaces of the complex and into atmospheric sewer.

31. It is forbidden to release liquid dangerous waste into city sewer, Lepenica, Zdraljicka and Grosnicka river, to free surfaces of the complex and into atmospheric sewer.

32. Capacity of oil and grease separator and channels for atmospheric water should be dimensioned in accordance to hydrological calculation which considered the area of surfaces covered by asphalt and concrete from which the oily waters are conducted, as well as data of Republic Hydro-meteorological Agency (RHMZ) for twenty-minute two-percent precipitations at the territory of Kragujevac. It is allowed to set up more small settling tanks- separators for partial purification of oily atmospheric waters from several divided surfaces.

33. After implementation of the Project, it is necessary to conduct, through competent laboratories, during maximal engagement control of quality of waste water at the point of outlet form the plant for treatment of waste water and at the point of outlet form the oil and grease separator for atmospheric waters, in order to check operability and efficiency of projected plant for treatment of waste waters and oil and grease separator.

34. Necessary chemicals (coagulant, flocculants, acids and bases for neutralization) are to be kept in impermeable bins in separated space in storage of waste water treatment plant under controlled conditions.

8.2.5. Technical measures included in Project proposal for collection, storage and organized management of waste generated in the object

35. In the case of demolition of objects at the location, it is required to classify the waste generated pursuant to Waste management Law ("Official Gazette RS" no. 36/09).

36. Non-dangerous waste is to be removed from the location through competent public communal enterprise, while the waste having the features of dangerous waste is to be managed pursuant to Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95 and 56/10).

37. Asbestos plates of the roof of certain objects are to be managed pursuant to Directive on manners and procedures of managing waste containing asbestos ("Official Gazette RS" no. 60/08).

38. Metal crates for collection of waste material (iron, steel) will be set up in the shops for mechanical processing of iron, steel, at the spot of generating, out of transport and fire protection roads. All collected metal waste will be transported to the baler pant to be compacted, namely to be baled for easier storage and transport.

39. Waste packaging material of paints, polishes, solvents, etc. will be stored in the space of dangerous matters storage, all pursuant to the Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95 and 56/10).

40. During cleaning of settling tanks for oily waters, the collected mud will, after dehydration-pressing, be directly transferred to steel container and transported to the space for storage of dangerous waste, until handing over to the competent organization for further processing. Position of the storage for waste with the features of dangerous matters will be defined by new location license.

41. Filtrate generated by the process of removal of water from mud, as already mentioned, is conducted to the reservoir for collection of filtrate and over-mud water which is located next to the press and then is returned to the system for treatment of technological water.

42. The containers with covers for communal waste will be set up in the complex and emptied by JKP "Cistoca".

8.2.6. Additional measures for management of waste generated in the object

43. The Project Holder is obligated to perform characterization of every type of waste generated during the regular work of the Project through competent organization pursuant to the Article 23 of Waste management Law ("Official Gazette RS" no. 36/09).

44. The Project Holder is obligated to collect and store each type of waste separately, in an organized and controlled manner, pursuant to the terms of Waste management Law ("Official Gazette RS" no. 36/09), Packaging material and waste packaging material Law ("Official Gazette RS" no. 36/09), Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95) and Rulebook on conditions and manner of selection, packing and storage of secondary raw materials ("Official Gazette RS" no. 55/01).

45. Waste matters collected from oil separators and by decantation of purification bathroom filter will be stored in closed metal barrels in the space dedicated for storage of dangerous waste, pursuant to the Rulebook on handling of waste having the features of dangerous waste ("Official Gazette RS" no. 12/95).

46. Collected used oils, separately, engine oil and hydraulic oil), will be stored in closed metal barrels of 200l capacity in the space within the dangerous matters storage intended for storage of dangerous waste until handing over to the competent organization for further processing.

47. All waste packaging material generated during regular work is to be handed over to the supplier or manufacturer pursuant to the terms of the Packaging material and waste packaging material Law ("Official Gazette RS" no. 36/09).

48. The packaging material can be returned only if it was not used for any other matter except of those which was packed and transported in the packaging material.

49. Every handing over of any type of waste must be accompanied by Document on waste movement which is filled in and provided pursuant to the terms of the Rulebook on conditions and manner of selection, packing and storage of secondary raw materials ("Official Gazette RS" no. 72/09 and 56/10) and the Rulebook on form of Waste movement document and instructions for filing in ("Official Gazette RS", no. 72/2009).

50. It is forbidden to dispose nay type of waste out of the space dedicated and marked for that purpose.

51. It is forbidden to dispose or spill waste matters on internal roads, manipulative space, green surfaces or in the Lepenica riverbed and water currents of Zdraljica and Grosnicka river.

52. Waste characterized as the waste with dangerous matter features must not be disposed to sanitary (communal) landfill, but must be handed over, with compulsory recording, to competent legal entity for further treatment pursuant to the Waste management Law ("Official Gazette RS" no. 36/09).

53. The Project Holder is obligated to manage the waste with dangerous matters features pursuant to the Environment protection law ("Official Gazette RS" no. 135/04, 36/09 and 72/09).

8.2.7. Technical measures of the Project proposal for decrease of noise and vibrations

54. Compressors, mechanisms and pumps will be placed in separate objects.

55. During foundation of equipment and machines, measures of protection from vibrations transmitting to the working environment will be applied.

56. Ventilators that perform necessary exchange of air with lower number of rotations are projected and in that way noise emission is reduced.

8.3. Other measures that might decrease or prevent harmful impacts to environment

57. The Project Holder is obligated to cover all free areas with greenery and thus improve visual quality of the location. It is recommended to use tree species, if not forbidden by other conditions. Use deciduous and evergreen species resistant to air pollution. Besides taking in to consideration decorative factors when deciding, it is important to orient to autochthony and non-invasive forms.

8.4. Measures for prevention, precaution and responsibility for an accident

58. The objects of the complex are projected pursuant to the terms of Fire protection Law ("Official Gazette RS" no. 111/09), Law on explosive matters, inflammable liquids and gases ("Official Gazette RS" no. 44/77, 45/85, 18/89, 53/93, 67/93 and 48/94).

59. The objects are constructed of steel – fire resistant construction with the fire resistant roof covering.

60. Walls of the rooms with installations for storage of inflammable matters and liquids are projected as fire resistant.

61. The storage objects are projected pursuant to the terms of the Rulebook on technical norms for protection of storages from fires and explosions ("Official Gazette SFRJ" no. 24/87).

62. The complex has inner and outer hydro-network projected pursuant to the Rulebook on technical norms for hydro-network for fire extinguishing ("Official Gazette SFRJ" no. 30/91).

63. The Project Holder is obligated to make the Fire protection elaboration.

64. The Project Holder is obligated to obtain a Consent on technical documentation and Consent confirming compliance with projected fire protection measures from the competent fire protection police department.

65. The complex must have appropriate fire protection roads securing safe access to all objects.

66. Access to hydrants and fire protection roads must not be blocked.

67. Access to fire extinguishing devices must be free of obstacles.

68. Objects, machines, installations must have proper grounding.

69. The obligation of the Project Holder is to store and keep dangerous matters on dedicated and secured place with supervision, keeping of records and regular control.

70. The obligation of the Project Holder is to regularly control installations, measuring and controlling devices, safety valve and other safety systems in the complex.

71. The obligation of the Project Holder is to regularly control devices for fire extinguishing, hydro-network, protective equipment.

72. The obligation of the Project Holder is to regularly train his employees and introduce them with measures and procedures in the case of fire, explosion, spill of gases and liquids from the bins they are stored in.

73. Pipelines for gas distribution and pipelines for distribution of waste water must be protected from damaging.

74. Repair of installations for storage and distribution of gases can be performed only by trained persons certified and licensed for performance of these operations.

75. Storage, installations, equipment, fire extinguishing devices must be appropriately marked.

76. Paints and solvents used in the Painting Shop must be kept in original packaging within marked space of the dangerous matters storage.

77. Waste used oils, oily matters and emulsions collected in the oil separator and waste matters collected by decanting in purification bathroom must be kept in a marked room dedicated for this purpose within the dangerous matters storage in closed barrels of capacity up to 200l on metal retention tank with grid.

78. The bin for storage e of dangerous waste must be marked.

79. Metal retaining tank must be of capacity sufficient to collect contents of one barrel (minimally 200l)

80. Packaging material must be stored in dedicated room of the waste matters storage- packaging of dangerous matters until handing over to the supplier or manufacturer.

81. Dangerous matters storage must have good ventilation, detection devices and fire alarms.

82. Daily control of state of bins for keeping of dangerous matters and dangerous waste is mandatory.

83. Oxidizing and corrosive substances must not be kept in the dangerous matters storage.

84. The Project Holder is obligated to maintain equipment, machines and installations in all objects in good condition and to control work methods regularly.

85. Devices for automatic stoppage of work in the case of breakdown or fault must be installed at the burners and other devices used with inflammable matters.

86. Personal protection equipment for the case of emergency interventions must be set at the points of increased risk of fire, explosion or spill of dangerous liquids or gases.

87. Projected storage for inflammable matters must be projected pursuant to the Fire protection Law ("Official Gazette RS" no. 111/09) and other acts related to fire protection. Technical documentation for the mentioned object must include Elaboration (Project) of fire protection, and the object must have the Consent on technical documentation issued by competent police department.

8.5. Measures for response and removal of an accident's consequences

88. In the case of explosion or fire, or spill of inflammable or toxic liquid and gas matters at the location, employees who do not participate in fire extinguishing or response to accident, must be evacuated.

89. Competent persons in the complex and on the company level, protection and rescue department of the Inner affairs mints and emergency service and public must be informed.

90. If possible, to give first aid and evacuate the injured to the safe distance.

91. To check other installations and objects not impacted by the accident.

92. To close feeding lines of inflammable liquids and gases, electric energy, to move mechanization, remove fire sources and inflammable matters.

93. If possible to prevent further spreading of liquids and gases.

94. To cool bins under pressure exposed to the impact of heat with water.

95. To use sorbent for collection of spilt matters.

96. To estimate damage.

97. To estimate cause of accident.

9.0. Program of monitoring of conditions and impacts to Project's environment – Environment monitoring

Study analysis of possible impacts- consequences that might occur during the regular work of the Project to environment and population in the surroundings has been conducted in previous chapters.

The most significant potential negative impacts to environment are defined:

- aero-pollutants emission,
- production of technological waste waters,
- potential negative impacts in the case of fire as potential accident.

With the aim of prevention, removal, avoidance, minimization and setting to lawful scope of all potentially negative impacts to environment and population, the environment protection measures described in the chapter 8.0. have been prescribed.

Besides prescribed environment protection measures, there is one more mechanism of prevention and protection- **ecological monitoring,** namely program of monitoring of impacts to environment. The Project Holder must implement the prescribed measures of ecological monitoring during work of the Project, complying with all applicable regulations.

Accredited laboratories will be assigned for implementation of the monitoring. Reports on the results of monitoring must be submitted to the competent ecological commission.

9.1. Monitoring of quantities and types of matters released into environment

Air quality monitoring

In relation to air monitoring, it is required to perform measuring of emission.

- To perform control measuring of emission at all sources of emitters, on a quarterly basis, through competent laboratory pursuant to Rulebook on emission limiting values, manner and time of measuring and data recording ("Official Gazette RS" no. 30/97 and 35/97) and Directive on conditions for monitoring and air quality requirements ("Official Gazette RS" no. 11/2010). All parameters monitored must be below prescribed GVE.

Water quality monitoring

To perform control of waste waters quality at the outlet of waste water treatment plant where purified waste waters are released into the fecal sewer, on a quarterly basis, through competent laboratory. The quality of waste waters must comply with the quality prescribed for release into city fecal sewer system stipulated by Decision on sanitary-technical conditions for release of waste water into public sewer system ("Official Gazette of City of Kragujevac" no. 9/93) and Rulebook on manner and minimal number of testing of waste water quality ("Official Gazette RS" no. 47/83 and 13/84).

- To keep regular records about consumption of water in the complex, quantities of released waste waters from the waste waters treatment plant out of total quantity of waste waters released into the city fecal sewer system.

Monitoring of features and quantities of waste matters generated in the complex

- Pursuant to the Rulebook on conditions and manner of selection, packing and storage of secondary raw materials ("Official Gazette RS" no. 72/09 and 56/10), the Project Holder is obligated to, as a waste generator, perform characterization of all liquid and solid waste matters generated in the complex, and having dangerous matters features according to their physical-chemical features and compound or origin and to make Waste management plan.
- To keep regular records about quantities and treatment of all categories of waste generated during regular work, about legal entity to which the waste is handed over and about the quantity of waste that is handed over.
- Taking over of waste must be always accompanied by Waste movement document.

Note:

Monitoring of noise level in environment and emission is covered by city monitoring.

10.0. Non-technical summary of relevant data

The subject matter of the Study on environmental impact assessment is the Project of reconstruction of production facilities in the company "FIAT AUTOMOBILI SRBIJA" and construction of two new objects. The complex is implemented at the cadastral parcel no. 1/1 Kragujevac 2 of the area P= 112ha 82a 19m2.

The location of the Project is within the boundaries of General urbanism plan Kragujevac 2015, and within the work zone 3 "Zastava" , unit 2 and Detailed regulation plan "Zastava automobili", about 2.5 km south-west from the city center. The location is very well connected with the wider surroundings through the street Kneza Mihaila, which is at the same time a route Kragujevac-Kraljevo. The complex is connected to the mentioned road by the bridges "Sest Topola" and "Zvezda". It is connected to the rail road Lapovo-Kraljevo by industrial rail road.

The Project Holder was issued the Decision on location license for reconstruction with over building and upgrading of existing objects no. XVIII-353-454/10 dated 13/07/2010, City administration for spatial planning, building and environment protection – Spatial planning department, City of Kragujevac.

Decision on location license defines degree of built- up and occupation, building and regulatory lines, vertical regulation, manner of connecting to infrastructural systems, manner of conduct of atmospheric water and other conditions for complying of the planned Project with spatial-planning and urbanism documentation.

The infrastructure of the location is equipped and connected to the systems of power supply, water supply, sewer and TT network.

At the location, in the existing state, there are objects constructed in previous period and used to be a part of former plant "Zastava automobili", and now they belong to the company "FIAT AUTOMOBILI SRBIJA":

- Bumpers painting zone,
- Body shop- making of subassembly parts,
- Press shop,
- Paint shop,
- Assembly shop,
- Storage,
- Storage,
- Academy,
- Storage,
- Baler shop,
- Painting central,
- Changing rooms,
- Administrative building,
- Barracks,
- Gas station,
- Waste waters treatment,
- Guard booth,
- Helicopter hangar,
- Water tank,
- Inflammable materials storage,
- Car sale,
- Outer park lot,
- Inner park lot.

Certain objects are planned to be reconstructed and they are the subject matter of this Study, as well as building of two new objects, while the rest of the objects located at the complex are not the subject matter of the Study on environment impact assessment.

Process of manufacturing of the model FIAT PUNTO takes place in the plant of "FIAT AUTOMOBILI SRBIJA", and production of other models is under preparation. The projected capacity is 60 vehicles per hour. For production of vehicles within the concerned plant, assembly including the following operations takes place:

- pressing,
- making of body and welding of metal sheets- parts of body,
- painting of car body,
- set up of seats and mechanical parts of vehicle- reception- dispatch,
- final processing.

Press Shop- Within this unit, production of parts for cars (panels and frames) and internal parts is performed. Raw material- steel is delivered in coils or as already cut into plates of appropriate dimensions by the provider. This part of the plant includes also the following units:

- Revision- additional activities, related to remediation of final parts are performed within this unit.
- Maintenance- maintenance performed at the line and, in smaller amount, beyond the line, is included in this unit.
- Product quality control- final product is submitted to dimensional and esthetic control. A range of reports is made and submitted to Operative unit, and in that way, future repeating of mistakes, namely making of inappropriate product is prevented.
- Quality department- direct and indirect materials are submitted to chemical and physical control in order to verify compliance with requirements of chemical-metallurgical laboratory. Tests on oils, emulsions, washing water are performed in order to define reuse/ disposal.
- Logistics and recharging of batteries- internal transport within operative plant unit is performed by fork lifters and trucks with power supply. Recharging of batteries is performed within this unit.

Body Shop- Welding of parts coming form Press Shop and their setting up into car body is performed within this unit. Basically, the body consists of chassis, floor, sides, roof and suspension. In order to secure assembly of subunits of body and completing of body, it is planned to install manual and automatic welding spots with automatic transport together with manual/automatic batching points.

It was also planned to install automatic lines for manufacturing of subassemblies and for completion of body with setting up of horizontally and vertically set up robots for spot welding. After that, assembly of bumpers, doors, bonnet and boot cover is performed. In order to complete body, it is taken off from the line and transported to Paint Shop.

Fumes coming from the metal welding points are conducted to the atmosphere through the vacuum system.

Paint shop – This part of the plant is used of painting of vehicle bodies transferred form the Body shop. Painting is performed by means of chemical, electro-chemical and technological procedures. The following processes are performed in the Paint shop:

- chemical preparation,
- cataphoretic protection,
- sound insulating PVC coating and
- painting of vehicle bodies with basic and covering paint.

Assembly

In the Assembly shop facilities, operations of "equipping' are performed (fitting in of all electric parts, seats, glass panes, upholstery, wheels, lights…) and "equipping" of body (setting up of mechanical sets- drive systems, transmission, suspensions and brakes) at H1 line. The following operations are performed within the object:

- setting up of parts on the line
- Fixing of glass panes
- Preparation of mechanical parts
- Assembly of engines and gearshifts
- Completing of vehicle
- Converging of wheels
- Rain test
- Remediation of mechanical parts

During implementation of regular work of the concerned Project it comes to generation of various types of waste matters.

In the phase of implementation, namely reconstruction of existing objects, it will come to generation of certain amount of **building waste** that will be removed from the location, through competent communal enterprise.

Communal waste is generated in small quantities as a consequence of presence of employees. Collection and removal of communal waste is organized within the complex through competent communal enterprise.

Electronic waste-. Within the concerned complex, certain amount of electronic waste will be generated and it must be given over to certified legal entities for further treatment. Furthermore, used cartridges from printers will be replaced very often, and they must not be disposed to the landfill, but given over to certified entities for recycling.

Sanitary- fecal waste waters are result of presence of employees at the location. They are conducted, out of the sanitary blocks, to city sewer system through internal sewer pipeline.

Technological waste waters are produced during chemical preparation for painting and during body painting. There is a built up plant for purification of waste waters within the plant yard and is located next to Painting Shop in the common object named “KATAK”, where plant for Technical cleaning of lattice is also located, as well as plant for assembly of trailers. Purified waste waters of appropriate quality will be released into the city sewer system.

Waste sheet metal –is collected and transported to the “baler shop” (special unit where this waste is baled), and then it is handed over to competent bodies for further utilization.

Dangerous waste- Mud generated during the process of chemical preparation and painting of bodies in the Painting Shop is the waste of dangerous waste features, as well as waste paint, solvents, packaging sealing mass. Management of such waste must be in compliance with Rulebook on management of waste of dangerous waste features (“Official Gazette RS” no. 12/95 and 56/10). Waste generated in this way is temporarily stored in appropriate packaging (impermeable barrels with covers) which is stored at the concrete ground in roofed space, with proper marking, monitoring and registering, until handing over to competent body for further treatment, with compulsory keeping of records. Dangerous waste storage will be built pursuant to every and all terms of the Rulebook on management of waste of dangerous waste features (“Official Gazette RS” no. 12/95 and 56/10). Position of this object will be defined by new location license. The Project Holder “FIAT AUTOMOBILI SRBIJA” has executed agreement no. 10442-10 on 12th of July 2010 with the company “DEKONTA” assigned for management of dangerous waste generated at the company “FIAT AUTOMOBILI SRBIJA”.

Emission to air and aero-pollution are possible at the location due to the traffic. Traffic produces emission of specific atmosphere pollutants as products of complete and incomplete combustion of oil derivates in internal combustion engines. Analysis of traffic frequency at the location, frequency and presence of vehicles indicates that the traffic intensity at the location is low, and as it is related to internal roads without priority, the traffic of the location is not a factor that endangers quality of environment and does not require special analysis and environmental impact assessment.

The concerned technology, at certain lines and phases of performing of certain operations, produces increased emission of particles that might be potential air polluters.

Processes taking place in the Painting Shop, namely processes of paint application have the highest impact to air. Decrease of aero-pollutants emission is secured by using the most contemporary cabins for painting which are equipped with water scrubbers. The air comes into the cabin and moving from top to bottom, settles all remnants of spraying (overspray) that are not accumulated to body, taking them to the bottom of cabin where the air is mixed with water retains all solid particles.

Aero-pollutants emission is also present with the processes of paint baking, as well as welding processes. Emitted organic matters (VOC) are conveyed to the central system for after-combustion with separate emitter.

On the basis of analysis of type, quantity and manner of storage of dangerous matters used and generated in the concerned complex, we can predict the following accidents:

- **Fire**
  - Fire in inflammable matters storage
  - Fire as a consequence of breakdown of the installations for gas distribution
  - Transmission form other complexes
  - Breakdowns of electric installations and of equipment

- **Release of toxic gases**
  - Damaged packaging for storage of organic solvent

- **Spill of dangerous liquids**
  - Spill of paints and organic solvents in dangerous matters storage
  - Spill of oil due to damaging of original packaging for supply and storage
  - Spill of liquid waste matters- used oil, waste matters collected in oil and grease separator and waste matters collected in purification bathrooms due to damaging of bins they are stored in

On the location and the surroundings, there are no protected or recorded for protection natural and cultural resources, no valuable contents of flora, jeopardized and protected plant and animal species, units of high ambient value that might be jeopardized by implementation and work of the Project.

Regular work of the Project does not intersect with directions of migration and does not jeopardize temporary and permanent habitats of animal forms.

On the basis of all above mentioned, it can be concluded that, with implementation of measures of prevention, avoiding and removal of potential events that might cause risk of accidents, the concerned Project is acceptable and ecologically sustainable, while the risk of accident is decrease to a minimum with low possibility of occurrence.

Besides prescribed measures for prevention, decrease and removal of hazardous impacts, the obligation of the Project Holder is application of ecological monitoring measures.

Program of environment protection monitoring must be in compliance with requirements of monitoring of conditions at the location for the purposes of prevention and application of measures for avoidance and removal of potentially hazardous impacts and implementation of environment protection measures.

Monitoring and supervision of potential impact of the Project to environment must be in accordance with applicable legal regulations and acts, norms and standards.

By application of protection measures- legal, technical-technological and organizational during the regular work of the Project, as well as in the case of accident at the location, potential degradation and pollution of environment will be minimized, i.e. reduced to limits of ecological acceptability and sustainability stipulated by law. On the basis of the above mentioned, we can conclude that, from the aspect of ecological acceptability and sustainability, the concerned Project – reconstruction of production facilities in the company “FIAT AUTOMOBILI SRBIJA” is acceptable and ecologically sustainable, with strict application of projected measures of protection and ecological monitoring, as well as measures for prevention, removal, minimization and reduction of negative impacts to environment to legal frame.

11.0. Data on technical faults or lack of certain expert knowledge and skills

During preparation of the concerned Study on environmental impact assessment, the author of the Study had all necessary documentation and information at disposal, so it can be concluded that there is no identified faults, lack of expert knowledge or skills, and that the Study is made in accordance with Environment protection Law ("Official Gazette RS" no. 135/04 and 72/09) and Environmental impact assessment Law ("Official Gazette RS" no. 135/04).