

APPROVED
PARB.00046-04 98 16-AS

SOFTWARE PRODUCT

**GEOINFORMATION SYSTEM «PANORAMA»
(GIS Panorama)**

Applied tasks. Database. Part 3

PARB.00046-04 98 16

18 pages

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ANNOTATION

This document contains a manual for working with databases during the operation of the software Geoinformation system «Panorama» (GIS Panorama) PARB.00046-04.

GIS Panorama is a universal geoinformation system that has the tools for creating and editing digital maps and city plans, processing remote sensing data, performing various measurements and calculations, overlay operations, building 3D models, processing raster data, and preparing graphic documents in electronic and hard copy format, as well as tools for working with databases.

This document will help the user to master the software product Geoinformation system «Panorama» (GIS Panorama) PARB.00046-04, assess the opportunities.

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1 STRUCTURE OF THE DATABASE PROJECT «SETTLEMENTS OF NOGINSK DISTRICT»

The project «Noginsk district» (Noginsk_district_PostgreSQL.dbx) allows to learn about the possibilities to work with database tables in the mode «Base» of the software Geoinformation system «Panorama» PARB.00046-04.

This project consists of database PostgreSQL, queries, user forms, reports.

To create a project, the mode «Base – Create project» is activated.

The tables which are located in the thematic sections «Noginsk district», «Population census of Noginsk district», «List of reference books» are created using the administration and development environment for PostgreSQL – pgAdmin.

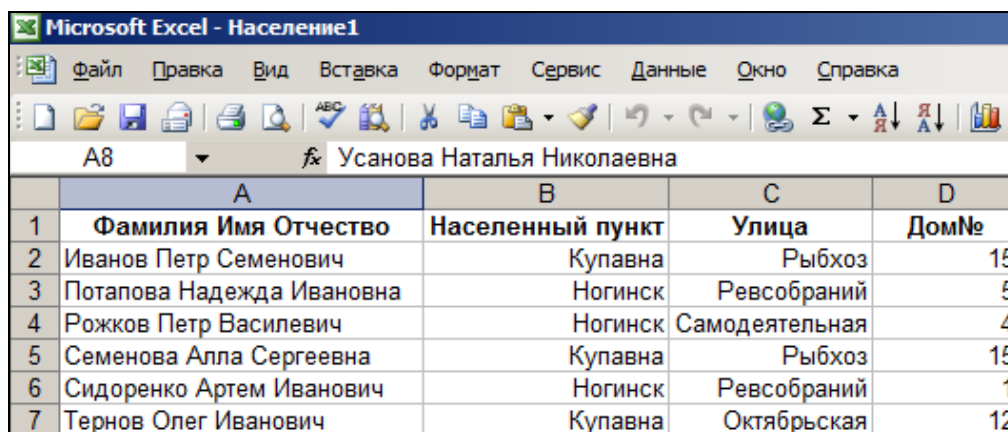
To generate reports, templates are created List of settlements.xlt, List of objects.xlt, Population.xlt, Settlement.dot.

For templates with the extension XLT, it is used MS Excel, and with the extension DOT – MS Word.

The document template consists of a descriptive part that remains in the document as it was created, and data fields (key fields) that are replaced during the report creation process with the corresponding values from the table. Data fields are the names of fields in the table in the form of a set for capital letters enclosed between the characters «#». For example, NUM1 is the name of the table field, # NUM1 # is the name of data field in the template.

Reports can be of two types (tabular report and report on the form).

The tabular report is created on the basis of the template MS Excel and it contains the data in the form of a table. The report can be created for both a single record and a group of records. To create a report on a group of records, the first line of the report template, where it is necessary to start printing data in a table format, it should list the names of the data fields. Data field names can not be repeated. As an example, a tabular report based on a template, it is shown below.



	A	B	C	D
1	Фамилия Имя Отчество	Населенный пункт	Улица	Дом№
2	Иванов Петр Семенович	Купавна	Рыбхоз	15
3	Потапова Надежда Ивановна	Ногинск	Ревсобраний	5
4	Рожков Петр Василевич	Ногинск	Самодетельная	4
5	Семенова Алла Сергеевна	Купавна	Рыбхоз	15
6	Сидоренко Артем Иванович	Ногинск	Ревсобраний	1
7	Тернов Олег Иванович	Купавна	Октябрьская	12

Figure 1 - Tabular report (MS Excel)

The report on a form (for the current record) represents the document in which names of data fields are set in any place chosen by the user, and they can be repeated. The report on a form is created on the basis of MS Word or MS Excel template. As an example, the report on a form is presented in Figure 2.

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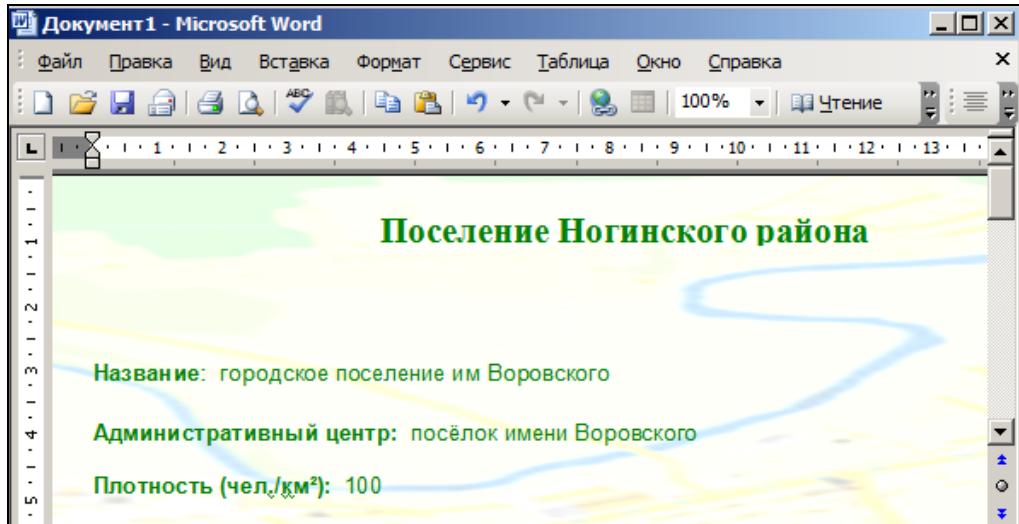


Figure 2 - The report on a form (MS Word)

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2 TABLES OF THE PROJECT

The list of project tables is generated in «Project Administrator», the bookmark «Data sources».

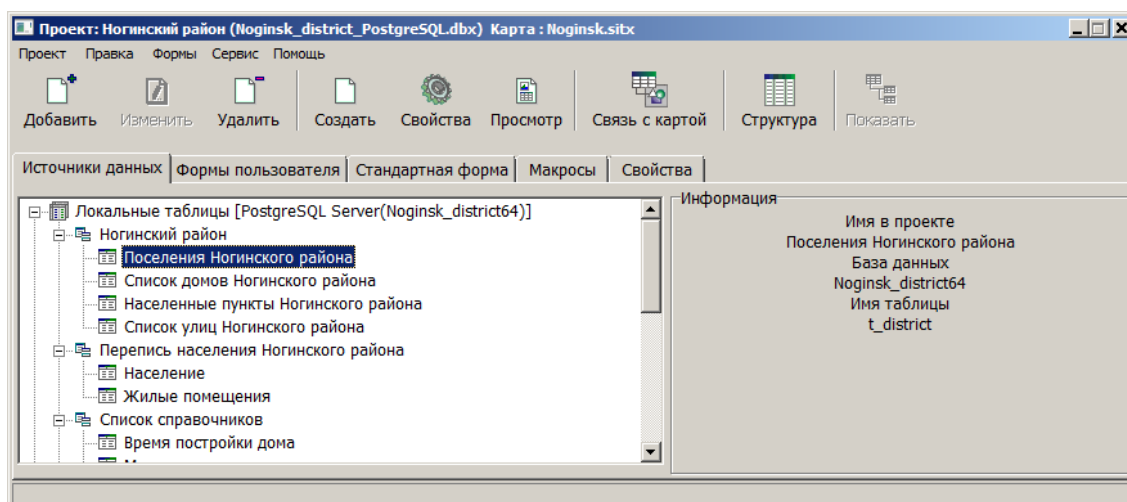


Figure 3 - DB Administrator

According to the information stored in the tables, four thematic sections are created:

1) Noginsk district – contains information about the territory of Noginsk district (towns, settlements, streets, houses).

Table 1 - Towns of Noginsk district (t_district)

Field name	Type	Description
id	integer	Record identifier
d_name	character varying(120)	Town name
d_center	character varying(50)	Name of the administrative center
d_population	integer	Population
d_density	numeric(12,2)	Density
d_square	numeric(12,2)	Area
d_emblem	bytea	Coat of arms for the settlement
d_info	character varying(500)	Information about the settlement

Table 2 - Settlements of Noginsk district (t_locality)

Field name	Type	Description
id	integer	Record identifier
district_ref	integer	Link to the table t_district
l_sem9	character varying(40)	Settlement name
l_kladr	numeric(15,0)	Classifier of addresses in Russia
linksheet	character varying(24)	Field of communication for record with the map. Name of the sheet of the map
linkobject	numeric(11,0)	Field of communication for record with the map. Number of the object for the map

Table 3 - List of Noginsk district streets (t_street)

Field name	Type	Description
id	integer	Record identifier

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Field name	Type	Description
locality_ref	integer	Link to the table t_locality
s_name	character varying(50)	Street name
s_image	bytea	Street image
linksheet	character varying(24)	Field of communication for record with the map. Name of the sheet of the map
linkobject	numeric(11,0)	Field of communication for record with the map. Number of the object of the map

Table 4 - List of Noginsk district houses (t_house)

Field name	Type	Description
id	integer	Record identifier
street_ref	integer	Link to the table t_street
s_number	character varying(50)	House number
s_image	bytea	House image
linksheet	character varying(24)	Field of communication for record with the map. Name of the sheet of the map
linkobject	numeric(11,0)	Field of communication for record with the map. Number of the object of the map

2) Population census of Noginsk district – contains information on the population and residential premises of Noginsk district.

Table 5 - Population (t_people)

Field name	Type	Description
id	integer	Record identifier
p_house_ref	integer	Link to the table t_house
p_fio	character varying(100)	Surname Name Middle name
p_datebirth	timestamp without time zone	Date of birth
p_education_ref	integer	Link to the table directory t_education

Table 6 - Residential premises (t_quarters)

Field name	Type	Description
id	integer	Record identifier
house_ref	integer	Link to the table t_house
q_typehouse_ref	integer	to the table directory t_sprav_typehouse
q_datebuild_ref	integer	to the table directory t_sprav_datebuild
q_mater_ref	integer	to the table directory t_sprav_materwall

3) The list of directories – contains reference information to which the tables described above refer.

Tables-directories «Type of dwelling» (t_sprav_typehouse), «Time of the house construction» (t_sprav_datebuild), «Material of external walls for the house» (t_sprav_materwall), «Education level of the population» (t_sprav_education) have the same structure:

Table 7 - Form for reference tables

Field name	Type	Description
id	integer	Record identifier
value	character varying(100)	Value

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4) Data for geocoding – contains data about objects of the map Noginsk.sit, classifier 200T.RSC. Tables are specified as an example for the modes «Geocoding of dot objects» and «Expanded geocoding».

Table 8 - Expanded geocoding (t_anygeonk)

Field name	Type	Description
n	character varying(8)	Record identifier
object	character varying(12)	Link to the table district.dbf
subject	character varying(8)	Settlement name
point	character varying(8)	Classifier of addresses in Russia
name	character varying(32)	Object name
objectkey	character varying(16)	Object key
layer	character varying(32)	Layer
local	character varying(16)	Localization
length	numeric(20,4)	Length
square	numeric(20,4)	Area
x	numeric(20,4)	Coordinate X
y	numeric(20,4)	Coordinate Y
bgrad	character varying(16)	Width
lgrad	character varying(16)	Longitude
sem4	character varying(8)	Absolute height
sem214	character varying(8)	Font height
sem130	character varying(8)	Building location
sem9	character varying(254)	Name of own inscription text
sem45	character varying(8)	Density, building type
sem32	character varying(8)	Navigation sign
sem5	character varying(8)	Type of a waterway (reservoir)
sem250	character varying(8)	Inscription type
sem15	character varying(8)	Width on a scale
linksheet	character varying(24)	Field of communication for record with the map. Name of the sheet of the map
linkobject	numeric(11,0)	Field of communication for record with the map. Number of the object for the map

Table 9 - Geocoding of dot objects (t_pgeonk)

Field name	Type	Description
numb	character varying(8)	Record identifier
object	character varying(12)	Link to the table district.dbf
subject	character varying(8)	Settlement name
point	character varying(8)	Classifier of addresses in Russia
name	character varying(32)	Object name
layer	character varying(32)	Layer
local	character varying(16)	Localization
x	numeric(20,4)	Coordinate X
y	numeric(20,4)	Coordinate Y
bgrad	character varying(16)	Width
lgrad	character varying(16)	Longitude

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Field name	Type	Description
sem4	character varying(8)	Importance of object
linksheet	character varying(24)	Field of communication for record with the map. Name of the sheet of the map
linkobject	numeric(11,0)	Field of communication for record with the map. Number of the object for the map

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3 QUERIES TO DB TABLES

3.1 The queries created with using Designer Form components

When designing the user forms, the query «Population» was created in «Data module». Data, obtained as a result of this query, is used in several forms of the user.

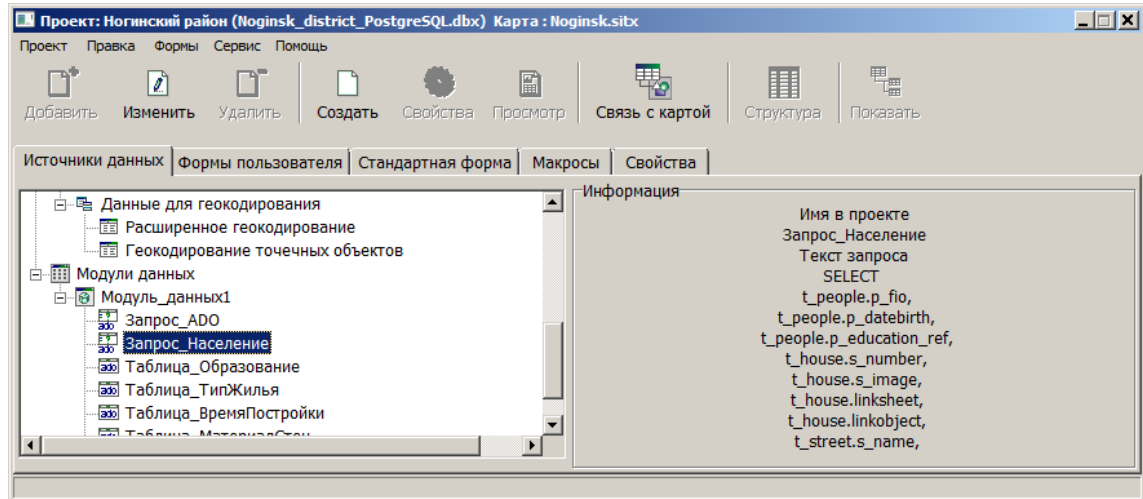


Figure 4 - DB Administrator

Query text:

```
select
  t_people.p_fio,
  t_people.p_datebirth,
  t_people.p_education_ref,
  t_house.s_number,
  t_house.s_image,
  t_house.linksheet,
  t_house.linkobject,
  t_street.s_name,
  t_locality.l_sem9,
  t_quarters.q_typehouse_ref,
  t_quarters.q_datebuild_ref,
  t_quarters.q_mater_ref
from
  public.t_people
left outer join
  t_house on t_people.p_house_ref = t_house.id
left outer join
  t_street on t_house.street_ref = t_street.id
left outer join
  t_locality on t_street.locality_ref = t_locality.id
left outer join
  t_quarters on t_quarters.house_ref = t_house.id
order by t_people.p_fio
```

The result of the query is a data set containing information from the tables «Population», «Towns of Noginsk district», «Settlements of Noginsk district», «List of Noginsk district streets», «List of houses in

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Noginsk district», «Residential premises». In the list for the inhabitant of Noginsk district, the corresponding data from different tables are specified (surname, first name, patronymic, date of birth, etc.).

p_fio	p_datebirth	s_number	s_name	p_education
Беляев Святозар Валентинович	12.12.1956	8	Октябрьская	3
Борисов Святослав Семенович	29.01.1949	55	Декабристов	7
Власов Исаак Яковлевич	17.04.1991	4	Самодеятельная	1
Галкина Иола Романовна	28.06.1945	3	Рыбхоз	3
Горшкова Заряна Антоновна	16.12.1956	3	Рыбхоз	4
Грачева Алёна Антоновна	03.04.1985	35	Октябрьская	2
Громов Владимир Петрович	09.10.1954	23	Рыбхоз	3
Гусев Анатолий Алексеевич	12.12.1970	12	Октябрьская	5
Гусева Злата Борисовна	28.08.1956	35	Октябрьская	8
Иванов Петр Семенович	15.12.1989	15	Рыбхоз	1
Калинина Анастасия Олеговна	22.08.1982	12	Октябрьская	6

Figure 5 - Result of the query execution

Parametrized queries which result data are used in specific forms will be considered when describing them.

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4 USER FORMS OF THE PROJECT

The project includes the following user forms:

- Structure of the district;
- Histogram «Population of Noginsk district»;
- Population of Noginsk district;
- Pie Chart «Population density».

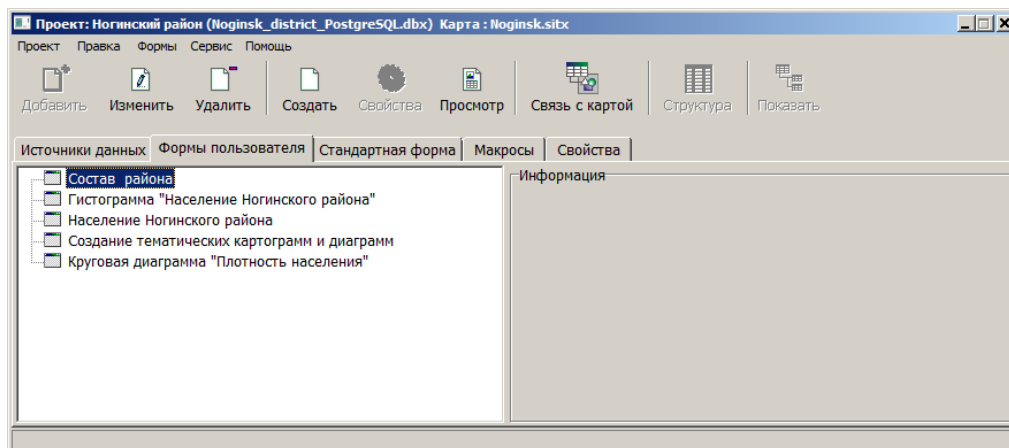


Figure 6 - DB Administrator

4.1 User form «Structure of the district»

User form «Structure of the district» displays data about the settlements of Noginsk district.

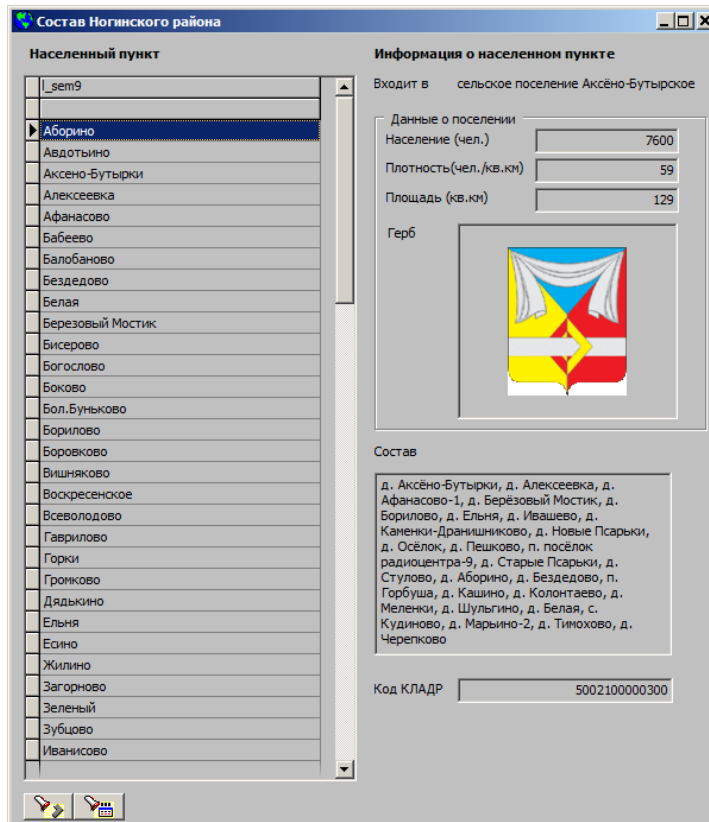


Figure 7 - User form «Structure of the district»

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The structure of the form includes the components: «DB_Text», «Bevel», «Frame», «Text», «Line», «Grid», «DB_Image», «Work panel», «Memo-field», «Button», «Connection_ADO», «Query_ADO», «List of Macros».

To retrieve information from the database tables, use the query:

```
select t_district.*,t_locality.* from t_district, t_locality where t_district.id = t_locality.district_ref
order by t_locality.l_sem9
```

The result of the query is a data set containing information from the tables of «Towns of Noginsk District» and «Settlements of Noginsk District» (see Figure 8). The list is sorted by the field «Name of settlements».

id	d_name	d_center	d_population	d_density	d_square	d_info
6	сельское поселение Аксёно-Бутырское	деревня Аксёно-Бутырки	7600	59	129	д. Аксёно-Бутырки
10	сельское поселение Ямкинское	село Ямкино	4140	22	187	с. Ямкино, д. Поч
6	сельское поселение Аксёно-Бутырское	деревня Аксёно-Бутырки	7600	59	129	д. Аксёно-Бутырки
6	сельское поселение Аксёно-Бутырское	деревня Аксёно-Бутырки	7600	59	129	д. Аксёно-Бутырки
6	сельское поселение Аксёно-Бутырское	деревня Аксёно-Бутырки	7600	59	129	д. Аксёно-Бутырки

Figure 8 - The result of executed query

4.2 User form «Population of Noginsk district»

User form «Population of Noginsk district» displays data on residents of Noginsk district: surname, name, patronymic, place of residence, date of birth, description and photo of the dwelling.

Фамилия Имя Отчество	Населенный пункт	Улица	Дом №	Номер объекта	Название карты
Галкина Иола Романовна	Купавна	Рыбхоз	3		
Горшкова Заряна Антоновна	Купавна	Рыбхоз	3		
Грачева Алёна Антоновна	Купавна	Октябрьская	35		
Громов Владимир Петрович	Купавна	Рыбхоз	23		
Гусев Анатолий Алексеевич	Купавна	Октябрьская	12		
Гусева Злата Борисовна	Купавна	Октябрьская	35		
Иванов Петр Семенович	Купавна	Рыбхоз	15		

Иванов Петр Семенович

Дата рождения: 15.12.1989

Образование: начальное общее

Дом №: 15

Тип жилья: Многоквартирный дом

Время постройки дома: ранее 1957

Материал наружных стен: панель, блок

Figure 9 - User form «Population of Noginsk district»

The structure of the form includes components: «Table», «Macro List», «Work panel», «Panel», «DB_Image», «Text», «Line», «Grid», «Drop-down list classifier».

To retrieve information from the database tables, the query is used, created in «Data module – Query_Population».

4.3 User form Histogram «Population of Noginsk district»

User form Histogram «Population of Noginsk district» graphically (in the form of a histogram) displays the ratio for the number of people living in the settlements of the district.

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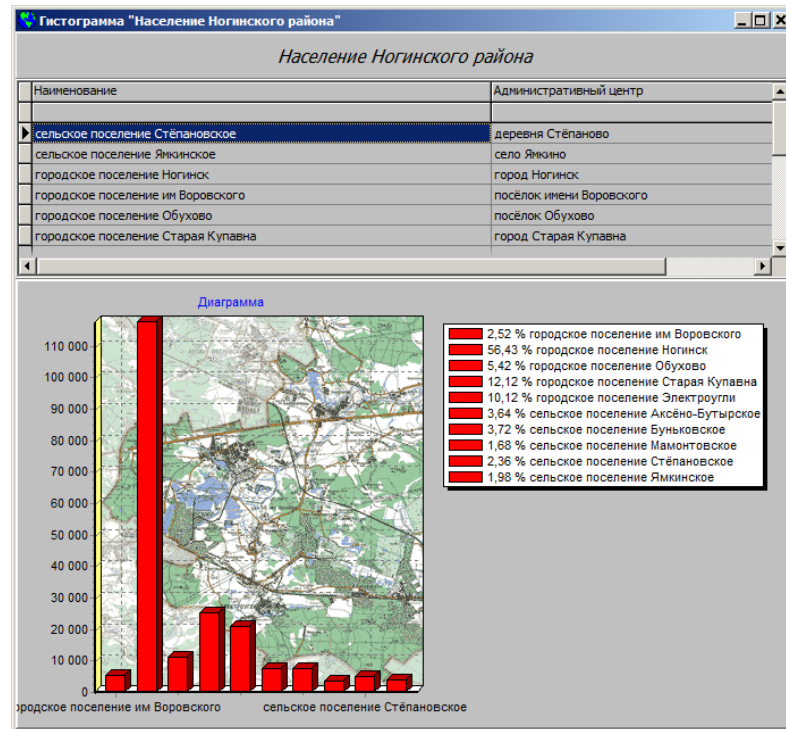


Figure 10 - User form Histogram «Population of Noginsk district»

The structure of a form includes components: «Connection_ADO», «Table_ADO», «Panel», «Grid», «Chart».

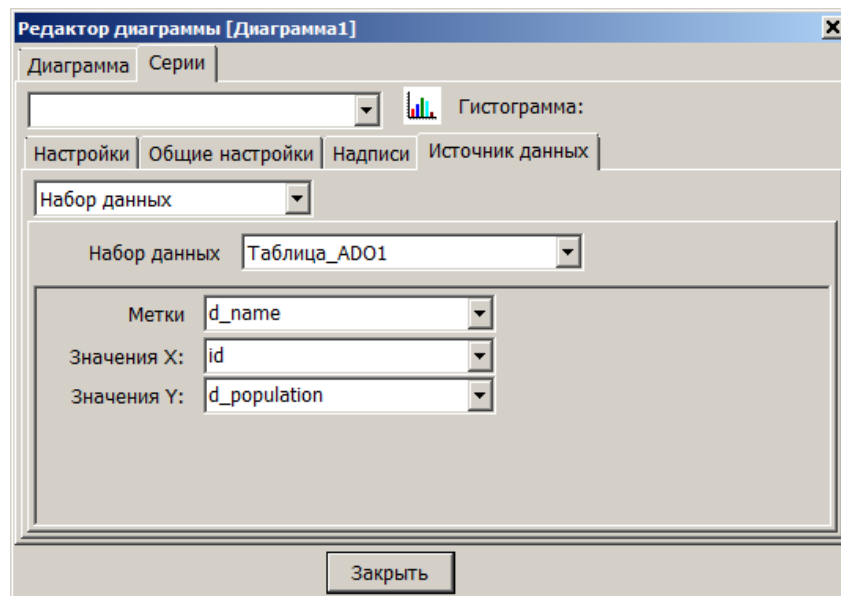


Figure 11 - Chart Editor

The component «Chart» is configured to the data source – the table «Settlements of Noginsk district» (t_district).

4.4 User form Circular chart «Population density of Noginsk district»

User form Circular chart «Population density of Noginsk district» graphically (in the form of a diagram) displays the ratio for population density in the settlements of the district.

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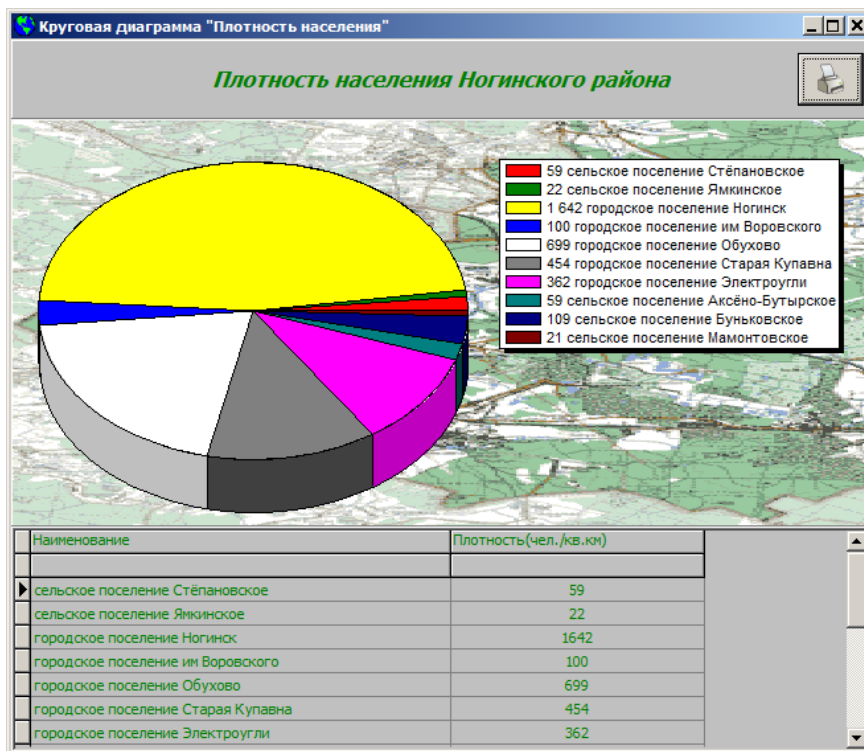


Figure 12 - User form Circular chart «Population density of Noginsk district»

The structure of a form includes components: «Table», «Panel», «Grid», «Chart», «List of Macros», «Button».

The form component «Chart» is configured to the data source – Data_Module1.Table_t_district.

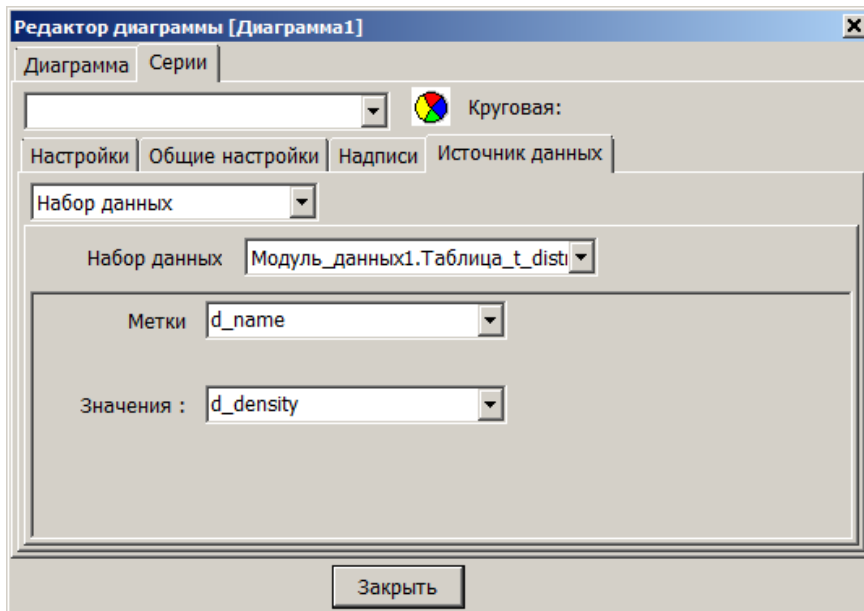


Figure 13 - Chart Editor

The button «Report» is designed to generate a document in Microsoft Word for the current record based on the template Settlement.dot.

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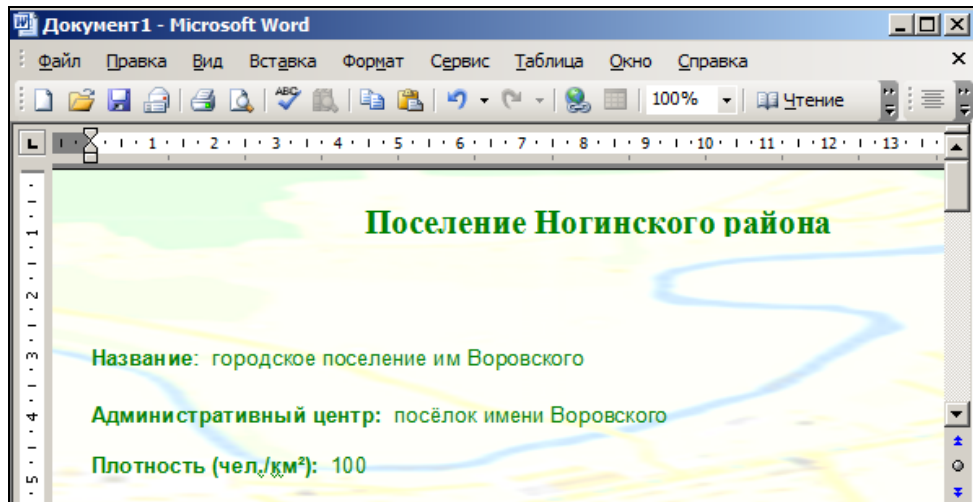


Figure 14 - The example of report (Microsoft Word)

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5 STANDARD FORM TO VIEW TABLES

The standard form is designed to display and to edit the data of the database tables. In this mode, it is possible to set one-to-many relationships between several tables. Two tables can be linked together by a key. One of these linked tables is the master or control, and the other is the auxiliary, detailing.

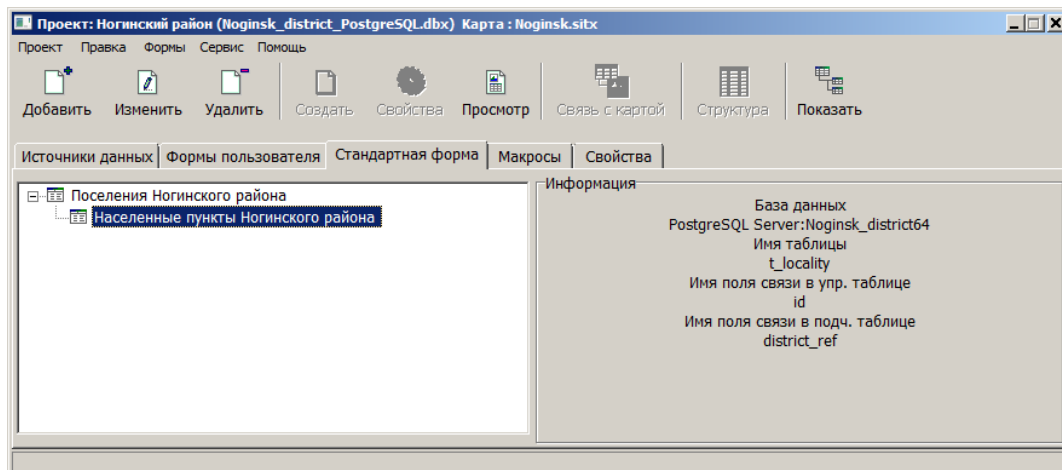


Figure 15 - Database administrator (DB Administrator)

For example, the table «Towns of Noginsk district» (t_district) is the main table, the table «Settlements of Noginsk district» (t_locality) – subordinate. During view, it is displayed data from two tables (see Figure 16).

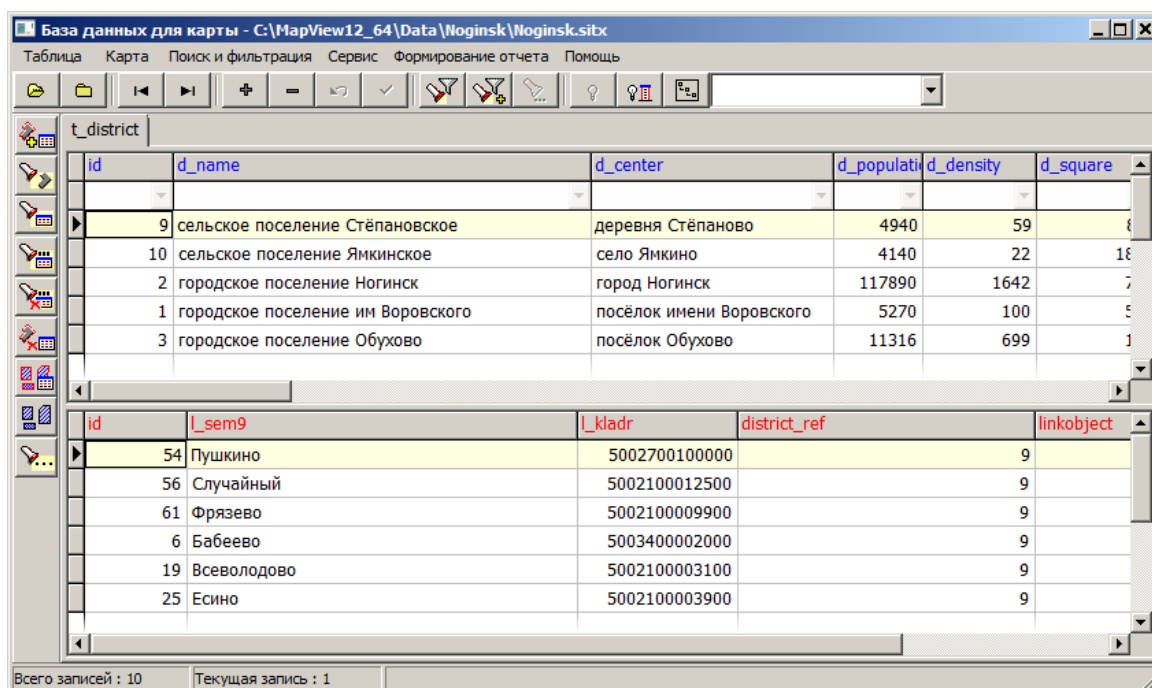


Figure 16 - Viewing data from two tables

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