QGEP Documentation

Version 0.5

The QGEP Project/OPENGIS.ch

18 May 2016

Table des matières

QGEP is a wastewater management module for QGIS based on SIA 405 (Leitungskataster) and VSA-DSS (GEP) and developed closely to the QGIS application.

This document can also be downloaded as a single PDF document : QGEP.pdf  .

Contents

1.1 QGEP Installation Guide

This will guide you through the setup of required applications and services to get your system ready for running QGEP.

Note : You also have the option of downloading a *Demo Virtual Machine* that has a working QGEP demo.

1.1.1 Setup database server

If you expect to access the data from several different workstations, you can install the database on a network accessible server. If it is just a single desktop you are working on, this can be installed on the same machine.

Required Software

Server installation

- Install PostgreSQL (>=9.3)
  - Windows download page
- Install PostGIS (>=2.1)

Note : In a single desktop environment (no network database server) you can setup your database to trust local connections.

This way, the database won't ask for a password if you're connecting from your local workstation while no password is written anywhere. You even can do with no database password at all.

This can be done by editing the database access configuration file pg_hba.conf and set the auth-options from `md5` to `trust`. A database service reload is required to activate changes.

1.1.2 Database initialization

You can use *pgAdmin* to access and manage the database server.

Note : By clicking the link you can learn how to *Install pgAdmin*

Process

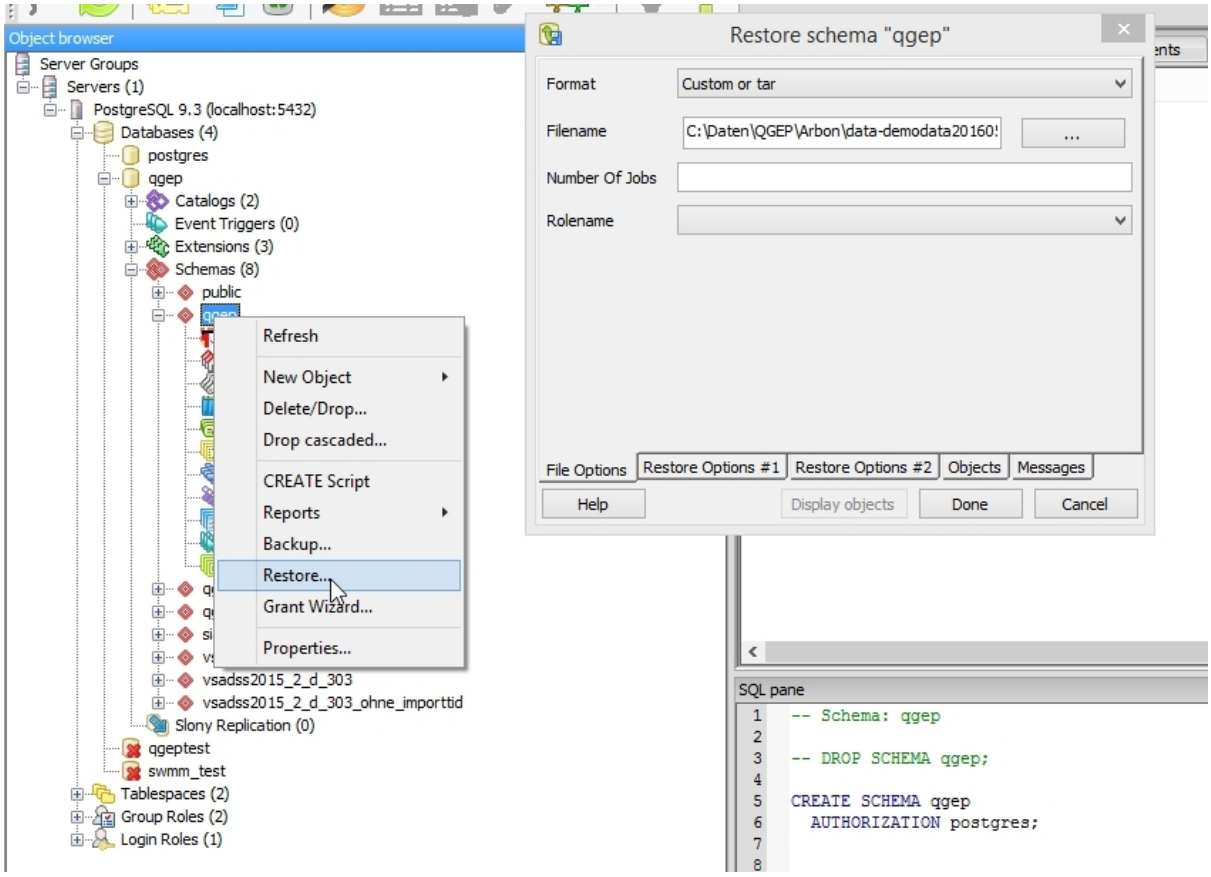
In pgAdminIII

- Connect to the database server
- Create a new group role (preferably named *qgep*, but you are free to choose)
- Create a new login role (*qgepuser* for example) and make it a member of the *qgep* group

You can do this graphically or by simply opening a pgAdminIII *SQL query* window and type the following :

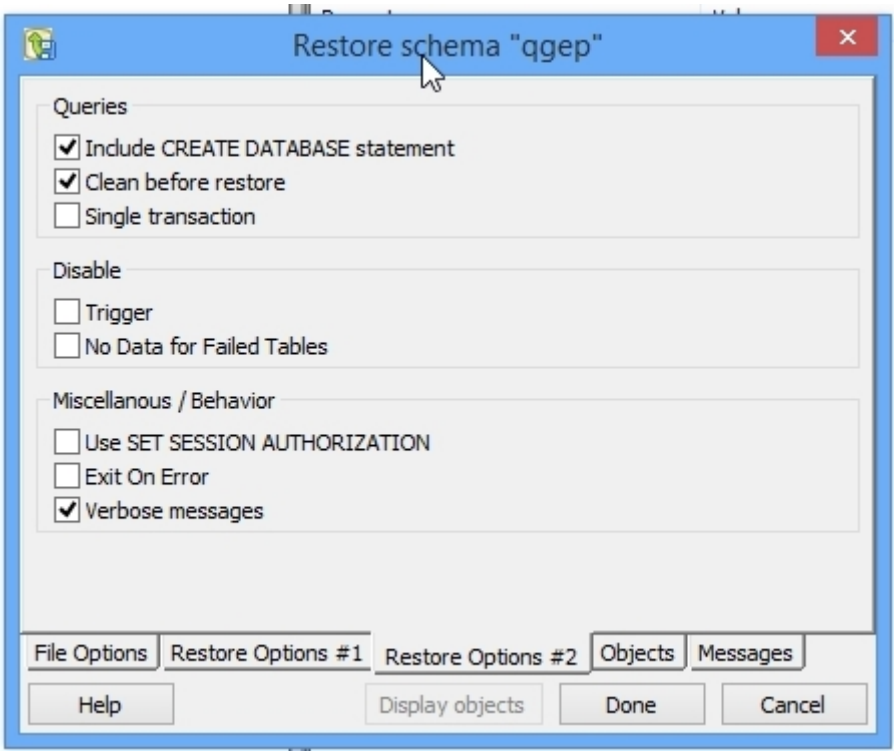
```
CREATE GROUP qgep;
CREATE ROLE qgepuser LOGIN;
GRANT qgep TO qgepuser;
```

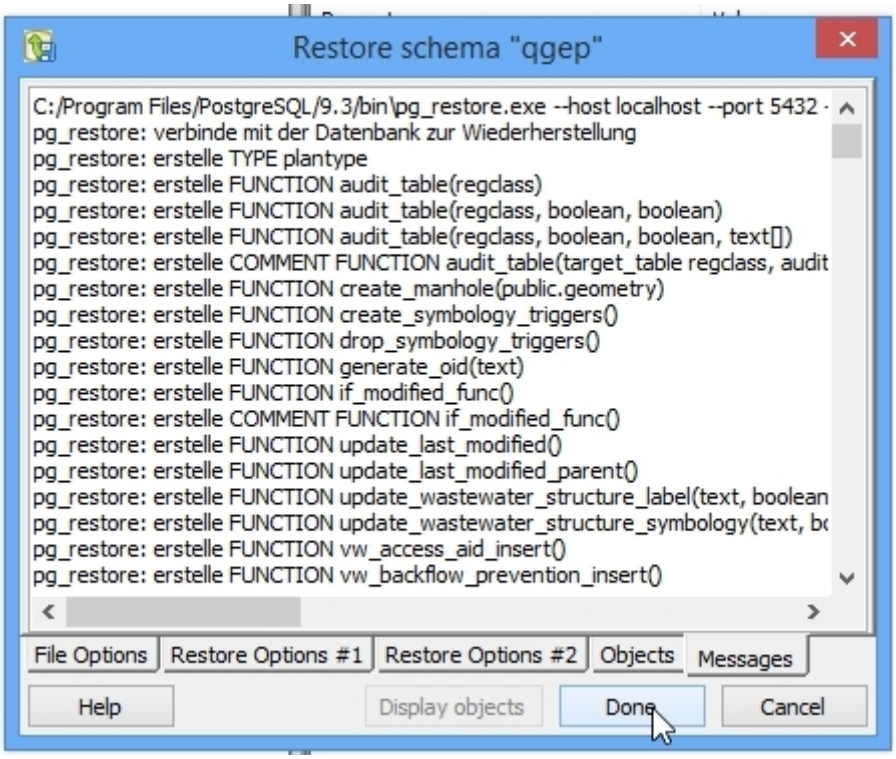
- Create a new database (preferably named *qgep*, but you are free to choose)
  - Change to this database
- Create a new schema with the name *qgep*
- Open an *SQL query* Window and create the extensions (if they're not created yet)
  - `CREATE EXTENSION hstore;`
  - `CREATE EXTENSION postgis;`
- Download demo data
  - https://github.com/QGEP/data/raw/demodata/qgep_demodata.backup
- Right click the *qgep* schema
  - Click *Restore*
  - Load your download of qgep.backup

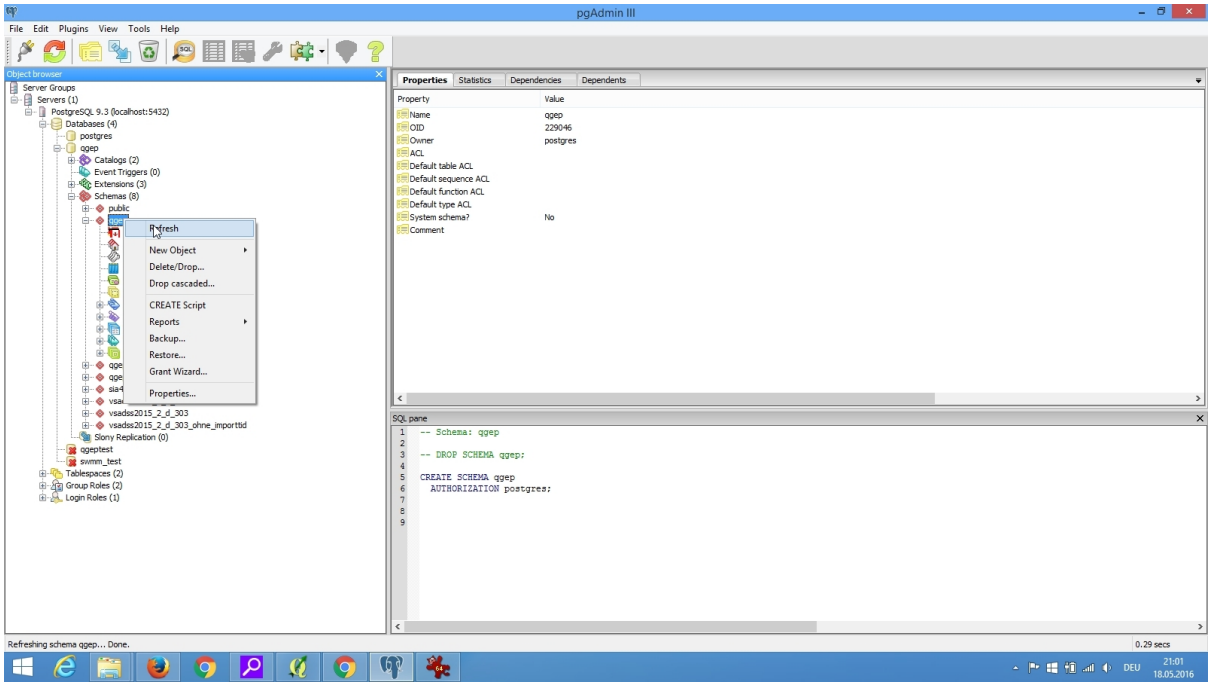


  - Restore Options #2 : Activate *Clean before restore*
  - Click *Restore*
  - Click *Cancel*
- Right click the database and click *Refresh*

- Update privileges for the database
  - Right click the *qgep* schema
  - Properties -> Privileges Tab > Grant `USAGE` to group `qgep`. You can also do this as a query : `GRANT USAGE ON SCHEMA qgep TO GROUP qgep;`
  - Click *Grant Wizard* . . .


Restore schema "qgep"
Queries
Include CREATE DATABASE statement
Clean before restore
Single transaction
Disable
Trigger
No Data for Failed Tables
Miscellanous / Behavior
Use SET SESSION AUTHORIZATION
Exit On Error
Verbose messages
File Options
Restore Options #1
Restore Options #2
Objects
Messages
Help
Display objects
Done
Cancel


Restore schema "qgep"
C:/Program Files/PostgreSQL/9.3/bin\pg_restore.exe --host localhost --port 5432 -
pg_restore: verbinde mit der Datenbank zur Wiederherstellung
pg_restore: erstelle TYPE plantype
pg_restore: erstelle FUNCTION audit_table(regclass)
pg_restore: erstelle FUNCTION audit_table(regclass, boolean, boolean)
pg_restore: erstelle FUNCTION audit_table(regclass, boolean, boolean, text[])
pg_restore: erstelle COMMENT FUNCTION audit_table(target_table regclass, audit
pg_restore: erstelle FUNCTION create_manhole(public.geometry)
pg_restore: erstelle FUNCTION create_symbology_triggers()
pg_restore: erstelle FUNCTION drop_symbology_triggers()
pg_restore: erstelle FUNCTION generate_oid(text)
pg_restore: erstelle FUNCTION if_modified_func()
pg_restore: erstelle COMMENT FUNCTION if_modified_func()
pg_restore: erstelle FUNCTION update_last_modified()
pg_restore: erstelle FUNCTION update_last_modified_parent()
pg_restore: erstelle FUNCTION update_wastewater_structure_label(text, boolean
pg_restore: erstelle FUNCTION update_wastewater_structure_symbology(text, bo
pg_restore: erstelle FUNCTION vw_access_aid_insert()
pg_restore: erstelle FUNCTION vw_backflow_prevention_insert()
File Options
Restore Options #1
Restore Options #2
Objects
Messages
Help
Display objects
Done
Cancel



— Selection, click *Check All*
— Privileges
  — Group *qgep*
  — Choose *ALL*

1.1.3 Configuration du poste de travail

Configuration de la base de données

To tell a workstation, where the database is (on the local system or on a network server) you will have to create some files initially on every device on which you will have QGIS/QGEP running. It is not required to do that on the server itself.

Ces étapes dépendent de votre système d'exploitation.

Windows

Créer un nouveau dossier où vous souhaitez enregister la configuration. Par exemple `pgconfig` dans vos documents. Ce dossier sera connu sous le nom de `PGSYSCONFDIR` dans ce guide.

Configurer la variable d'environnement `PGSYSCONFDIR` pour pointer sur le chemin de `PGSYSCONFDIR`

Dans ce dossier, vous trouverez deux fichiers
— `pg_service.conf`
— `pgpass` (si vous ne souhaitez pas entre le mot de passe à chaque connexion)

> **Attention :** On Windows, you need to save `pg_service.conf` in Unix format in order to work. One way to do it is to open it with Notepad++ and `Edit --> EOL Conversion --> UNIX Format --> File save`.

Linux

Sous Linux, vous pourrez placer les fichiers `.pg_service.conf` et `.pgpass` sous le dossier home (habituellement `/home/[username]`)

Tous les systèmes

Placer les lignes suivantes dans le fichier `pg_service.conf` ou `.pg_service.conf`. Vous devrez peut-être apporter des modifications selon votre configuration.

```
[pg_qgep]
host=localhost
port=5432
dbname=qgep
user=qgepuser
```

Pour enregistrer le mot de passe sur votre système, vous pouvez utiliser le fichier pgpass.

```
localhost:5432:*:qgepuser:password
```

Note : Si la base de données n'est pas sur votre poste local, remplacer toutes les occurences de `localhost` par l'adresse réseau du serveur de base de données.

Installer QGIS

- Minimum requirement 2.14
- We recommend using the latest master builds (called qgis-dev on Windows) which often offer a better experience in combination with QGEP. For Windows installation, download the OSGeo4W Installer choose *advanced installation* and install qgis-dev.

Installer le plugin QGEP

- Ouvrir QGIS
- Go to Plugins (position *1* in the image below)
  - Manage and Install Plugins
  - Settings (position *3*)
    - Ajouter...
      - Nom : QGEP
      - URL : `https://raw.githubusercontent.com/QGEP/repository/master/plugins.xml`
    - Enable *Show also experimental plugins* (position *2*)

Activate the plugin (see image below) :

- Tous
  - Chercher *QGEP*
  - Cocher la case à côté

Installation du projet de démo

- Download https://github.com/QGEP/data/archive/demodata.zip
- Extraire le ficher
- Restore the file *qgep_demodata.backup* with pgAdminIII
- Open *project/qgep_en.qgs* with QGIS

1.2 QGEP User Guide

This represents a guide on how to collect data in QGEP (digitizing), edit existing data and use various tools like length profile, network following and plan plotting.

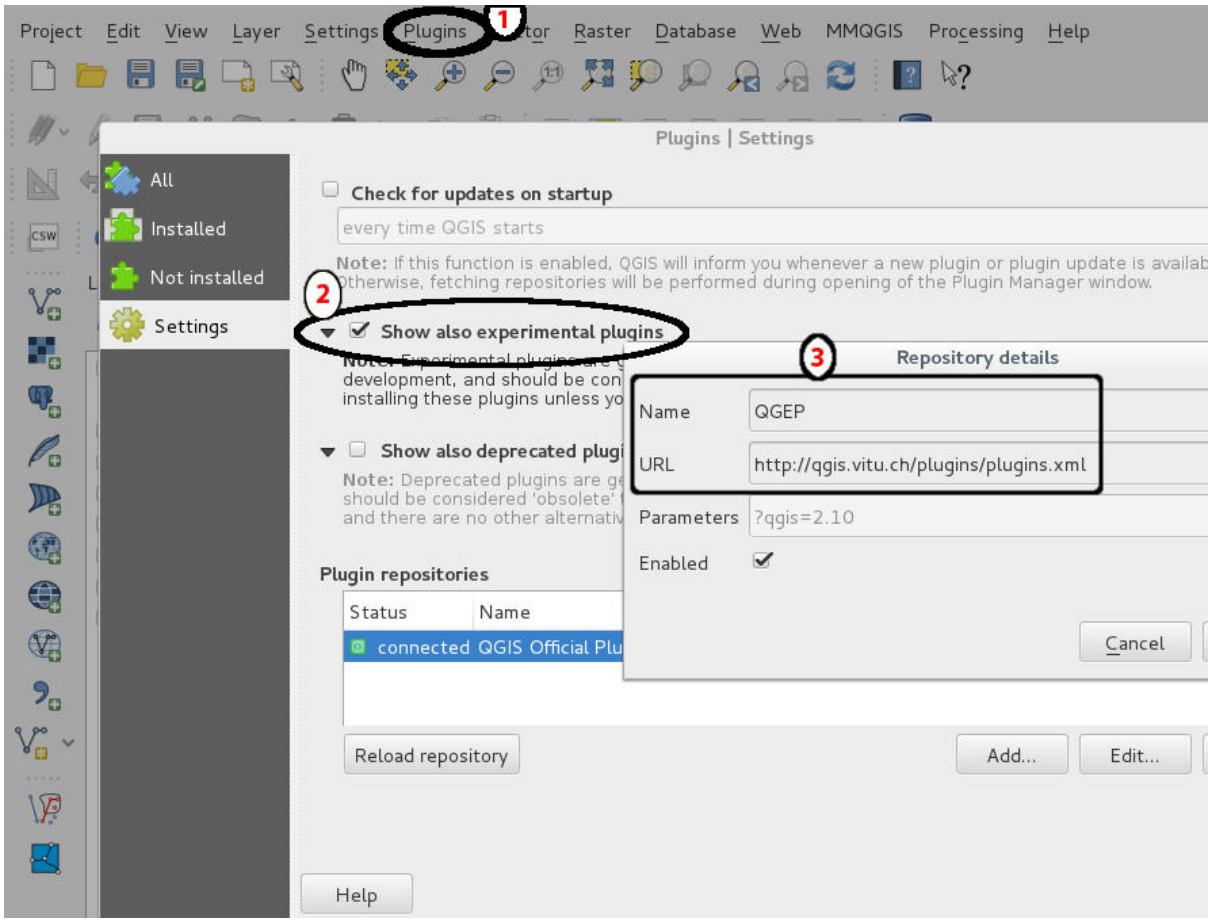


Fig. 1.1 – **Add the plugin repo**

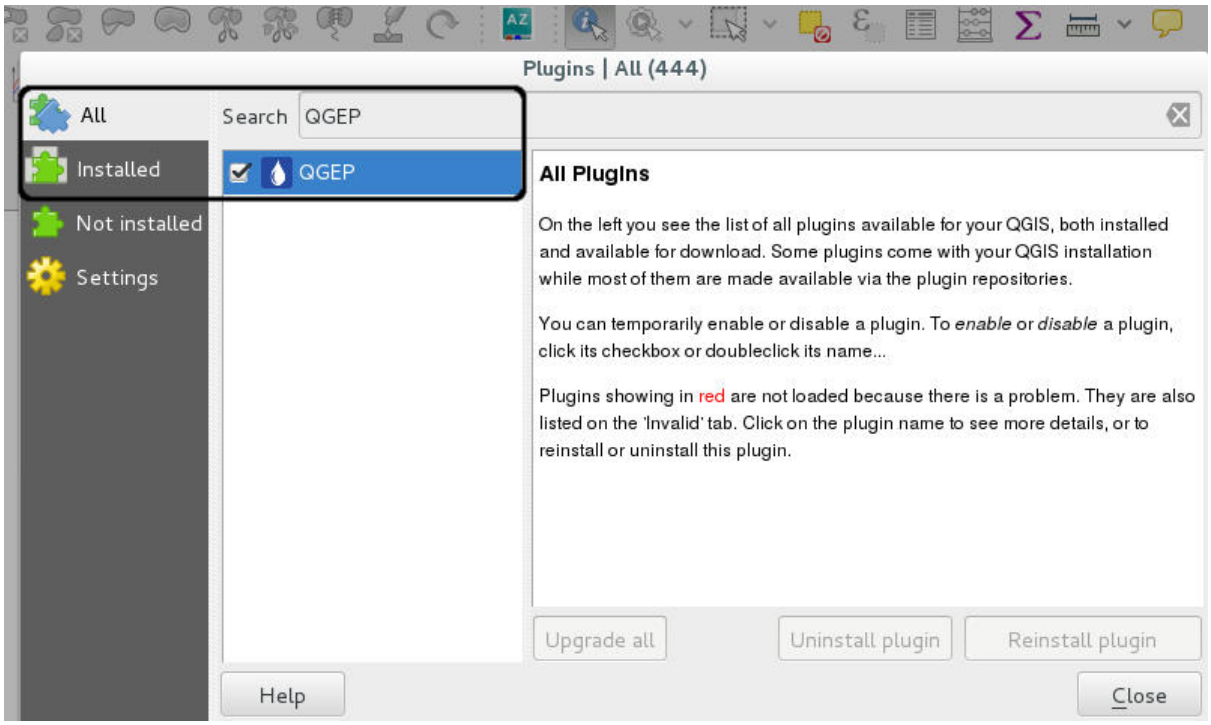


Fig. 1.2 – **Add the QGEP plugin**

1.2.1 Digitizing in QGEP

This represents a guide on how to correctly collect and digitize data of sewer networks including building the topology.

Data entry

There are basically two ways :

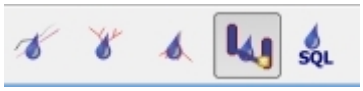
- Data entry by constructing or digitizing in the QGEP GIS itself
- Data entry in an external programm or software and then importing the position and/or technical data into QGEP e.g. :
  - coordinates from manholes from measurement
  - position and/or technical data from another GIS or CAD system
  - using data from the surveyor (e.g. property boundaries) as a basis for defining catchment borders
  - other

Data entry in QGEP needs some understanding of the underlaying data model VSA-DSS, but is supported with some great data collecting wizards and forms that link the different tables correctly together.

General

Allgemein : Reihenfolge (Schacht - Kanal, Erfassungsgrundsätze) (take more from GEPView-Howto 1.2. Chapter 3)

- To start with data entry select the button



- On the left side bottom the following window appears “QGEP Digitizing”

Link : add link

Digitizing Waste water structures

QGEP has a wizard to correctly collect manholes and special structures.

TO DO : Explain how it works

General

Allgemein : Abwasserbauwerk-Bauwerksteil-Abwassernetzelement Allgemein : Wizard und Eingabemaske mit wichtigsten Feldern / Subtabellen Bezeichnung : Default, Unique, ... Schacht (Deckel) und Abwasserknoten beim Normschacht / beim Spezialbauwerk

Digitalisierwerkzeuge Abwasserbauwerk Geometrie für Spezialbauwerke evtl. weitere Verknüpfungen erstellen

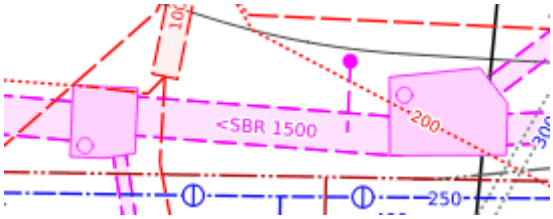
Title

Subtitle

- List
  - Subpoint

Link : add link

Add some screen shots



...

(take more from GEPView-Howto 1.2. Chapter 4.1)

Digitizing Waste channels

QGEP has a wizard to correctly build channels and connect them to the manholes / special structures and build up the topology for waste water nodes and reaches.

TO DO : Explain how it works

General

- Kanal/Haltung (Digitalisierrichtung, Schnappen)
- Weitere verknüpfte : Eigentümer, Rohrprofil, Hydraulische Geometrie, Hydraulische Einbauten
- evtl. Verknüpfungen erfassen

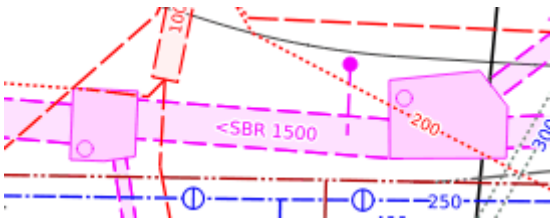
Title

Subtitle

- List
  - Subpoint

Link : add link

Add some screen shots



...

(take more from GEPView-Howto 1.2. Chapter 4.2)

Deleting objects

TO DO : Explain how it works

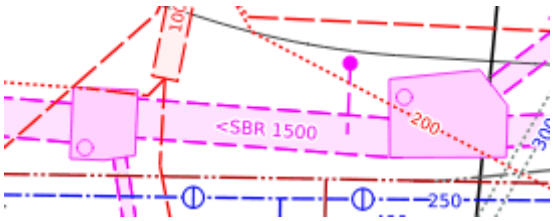
Title

Subtitle

— List
  — Subpoint

Link : add link

Add some screen shots



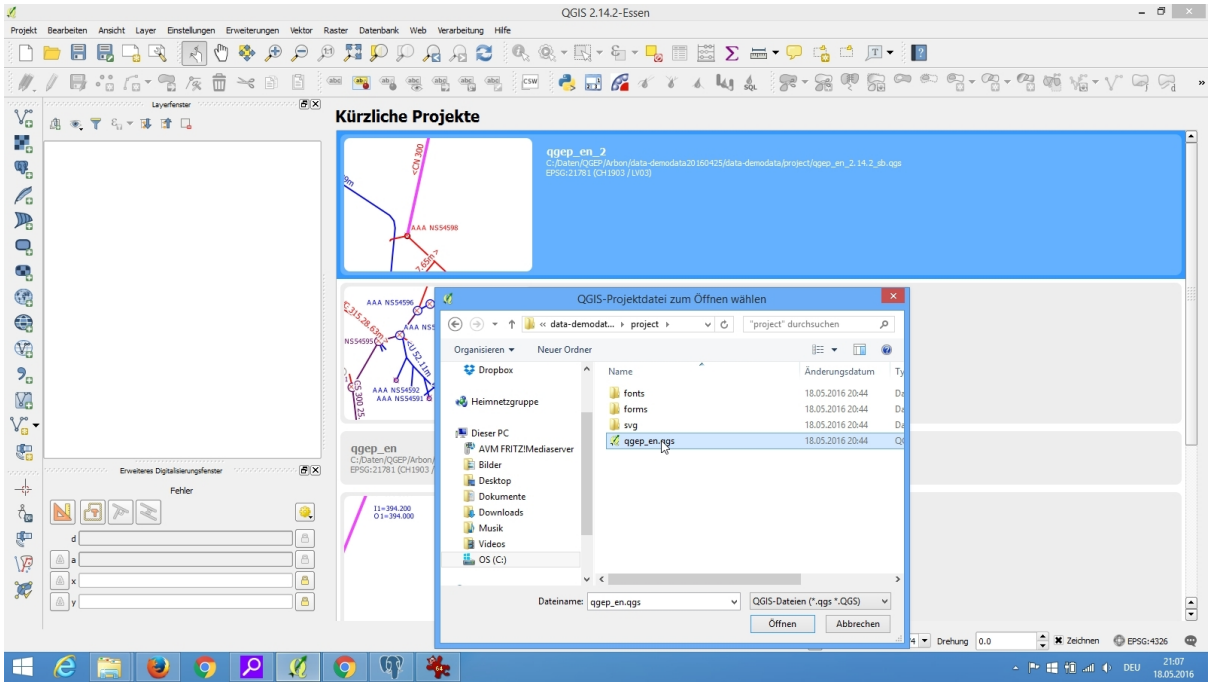
...

1.2.2 Editing of existing data

This represents a guide on how to edit existing data in QGEP.

Demo project

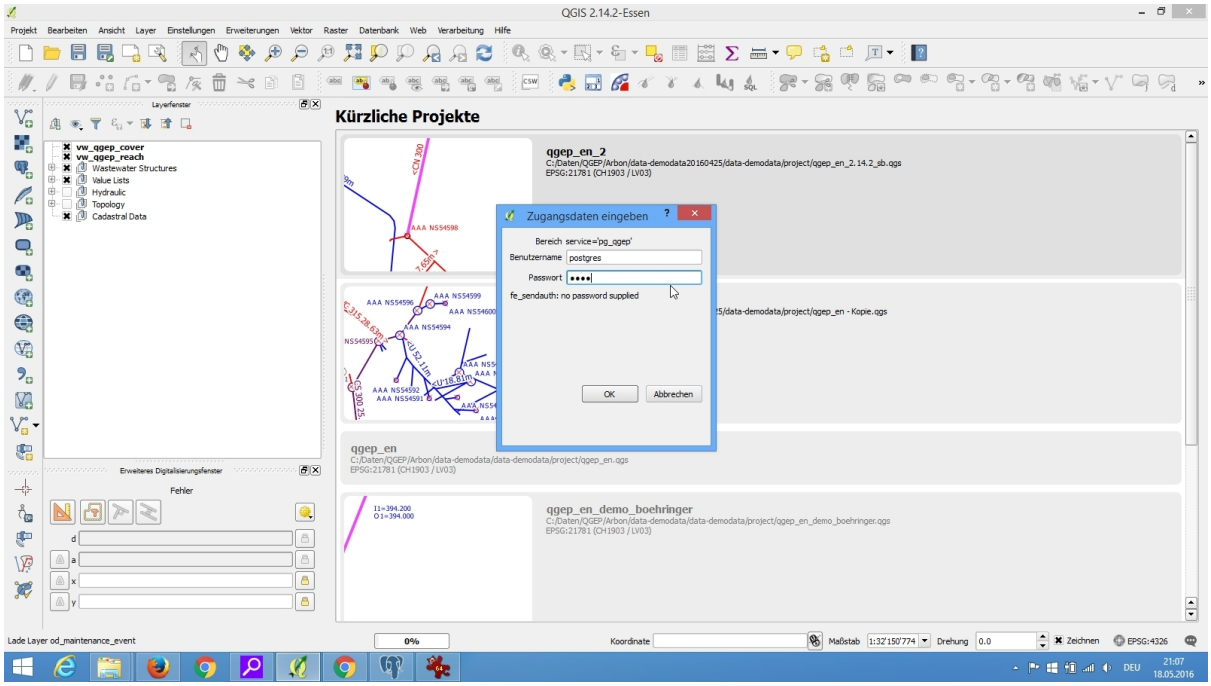
— Make sure you have imported the demo project with pgAdminIII (database-initialization)
— Open the demoproject with Menu Project/Open

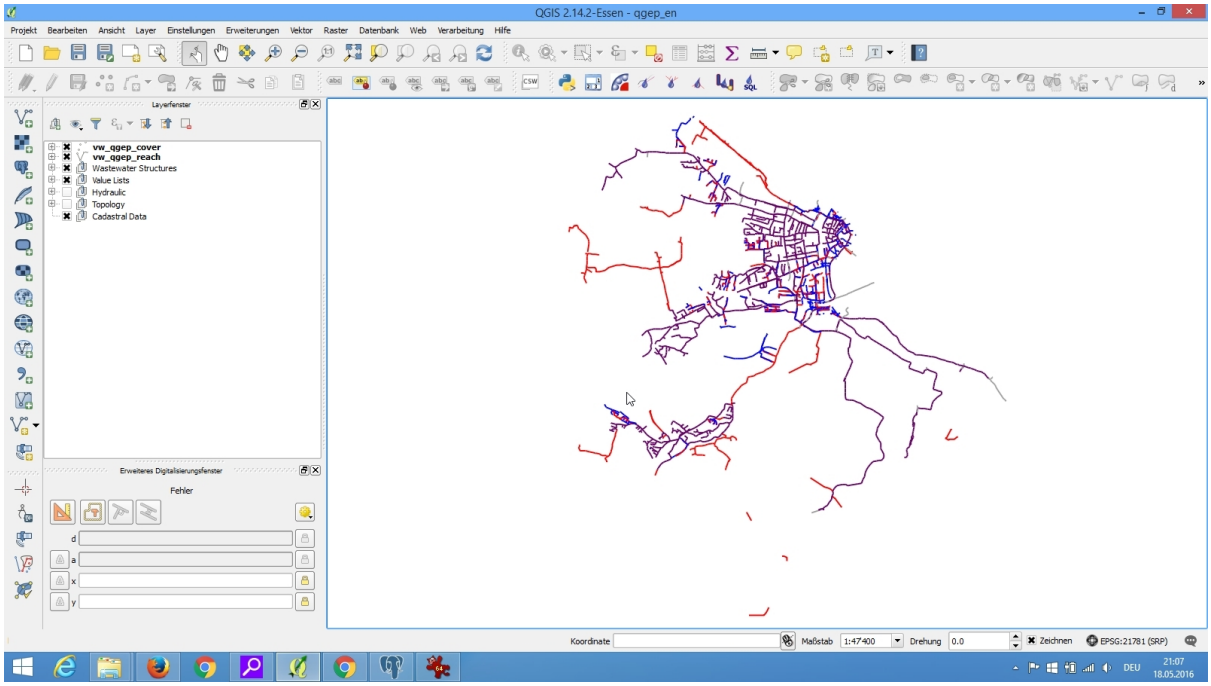


— Login to the database
— You should now have the demoproject loaded
— The project consists of different layers. Depending on your task what to edit or add you choose the layer.

Layers

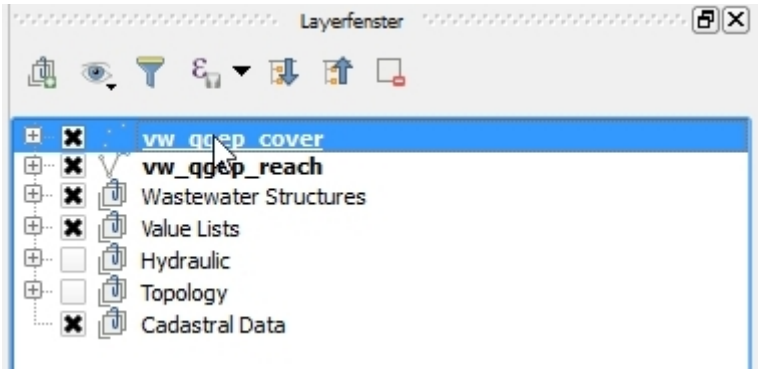
— QGEP has different predefined layers :


QGIS 2.14.2-Essen
Kürzliche Projekte
qgep_en_2
qgep_en
qgep_en_demo_boehringer
Zugangsdaten eingeben
Benutzername
postgres
Passwort
OK
Abbrechen


QGIS 2.14.2-Essen - qgep_en

Layer vw_qgep_cover

— The layer vw_qgep_cover allows to edit all point elements. This are the wastewater structures such as manholes, special structures, discharge points and infiltration installation (not supported yet are wwtp_structures, which is also a wastewater structure), but not the channels.



Layer vw_qgep_reach

— The layer vw_qgep_reach allows to edit all linear elements of the wastewater (channels).

Layer Waste water structures

— TO DO Add description

Layer Value lists

— TO DO Add description

Layer Hydraulic

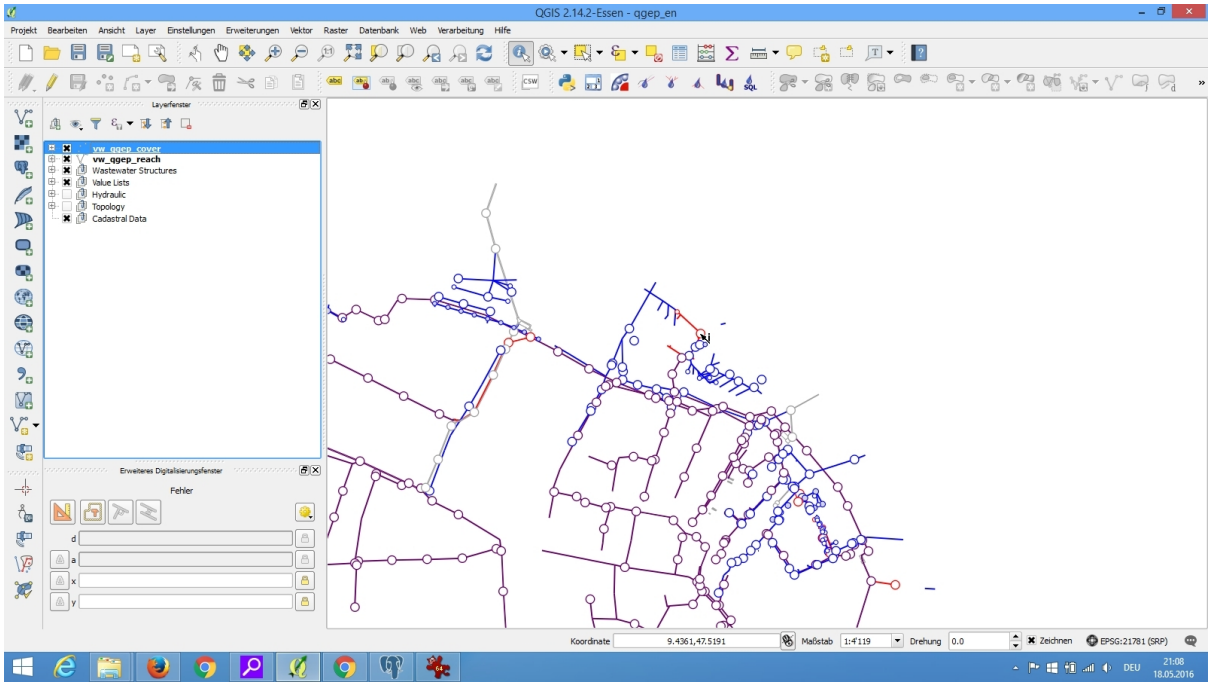
— TO DO Add description

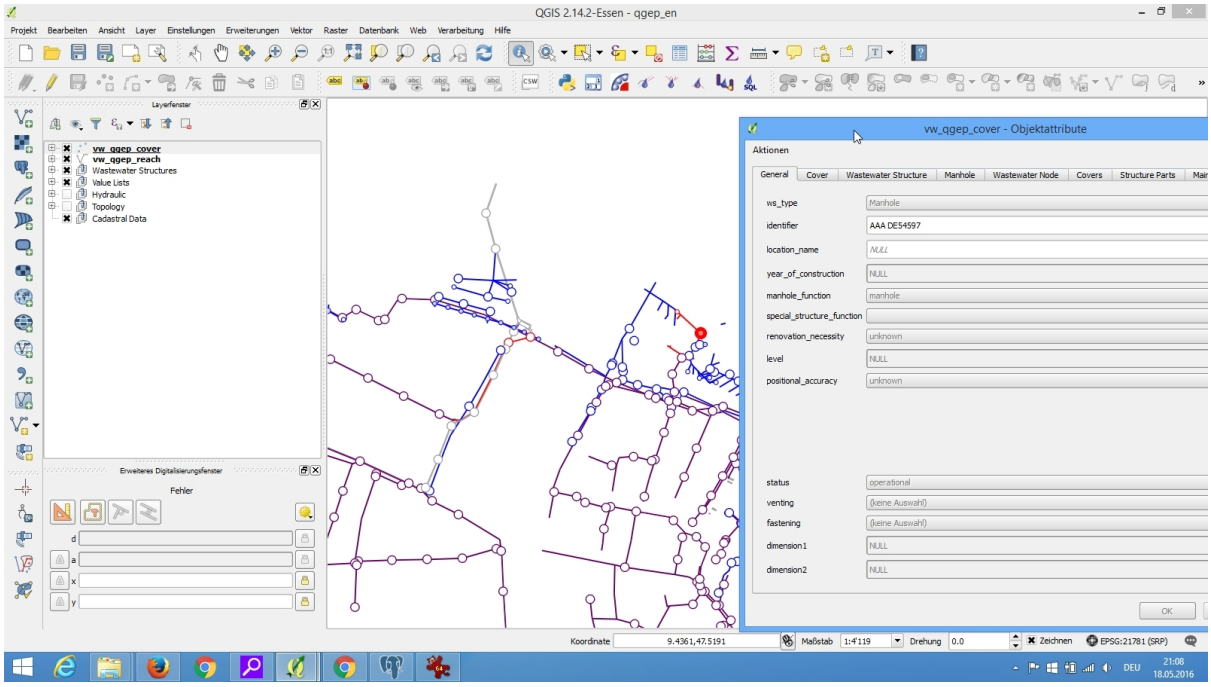
Layer Topology

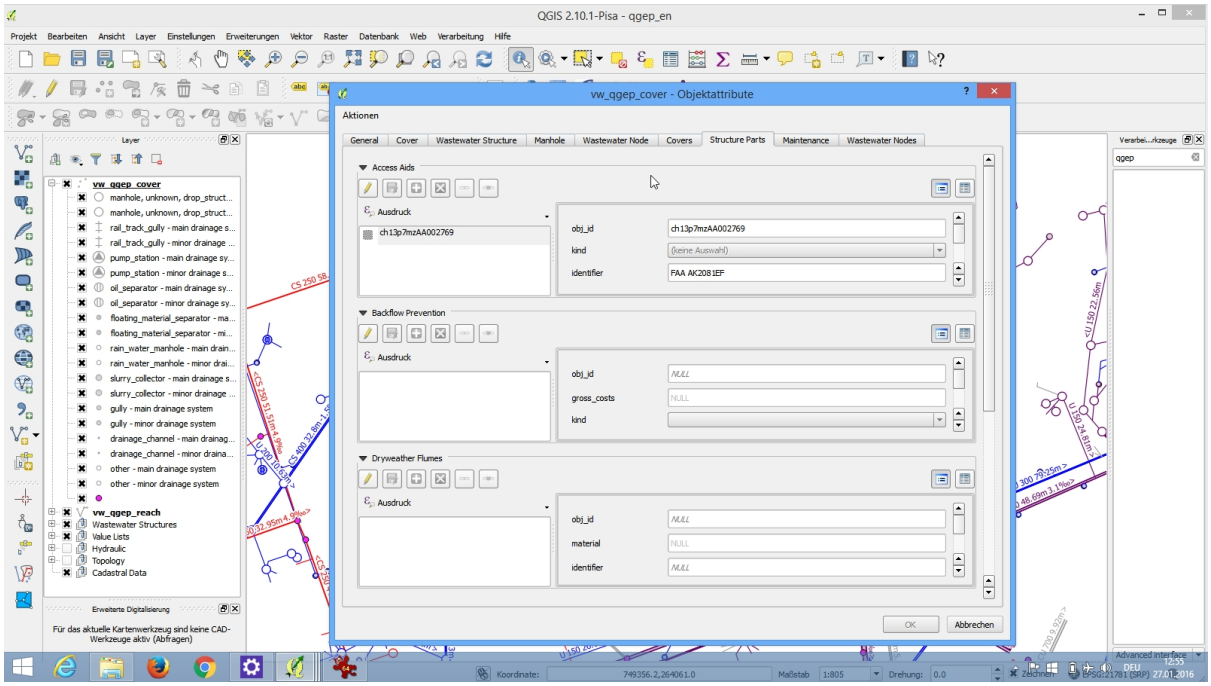
— TO DO Add description

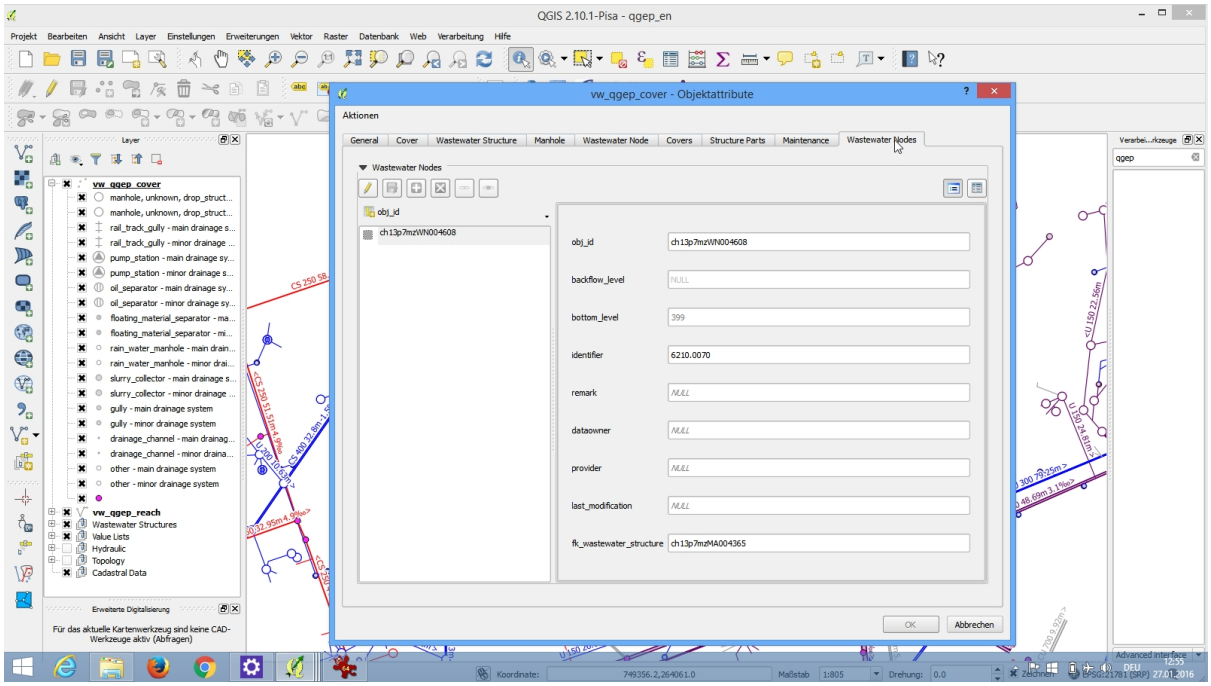
Changing attributes of point elements (manholes / special structures)

— To change an attribut first select the vw_qgep_cover layer and switch to the edit mode
— Then click on the info button and choose the element you want to edit by double-clicking
— The form of the vw_qgep_cover will open
— On the first tab you can change the most common attributes
— To change attributes of related tables such as the cover select that tab. Depending on the kind of wastewater structure you can edit additional attributs in the respective tab (special structure, manhole).
— The tab “covers” allows you to add additional covers.
— In “Structure parts” you can add also further parts such as acces aids, backflow prevention, dryweather flume etc.
— In “Wastewater nodes parts” you can edit or add all attributes of this class or add a second element


QGIS 2.14.2-Essen - qgep_en
Projekt Bearbeiten Ansicht Layer Einstellungen Erweiterungen Vektor Raster Datenbank Web Verarbeitung Hilfe
Layerfenster
vw_qgep_cover
vw_qgep_reach
Wastewater Structures
Value Lists
Hydraulic
Topology
Cadastral Data
Erweiteres Digitalisierungsfenster
Fehler
Koordinate 9.4361,47.5191
Maßstab 1:4'119
Drehung 0.0
Zeichnen
EPSG:21781 (SRP)
DEU
21:08
18.05.2016


QGIS 2.14.2-Essen - qgep_en
Projekt Bearbeiten Ansicht Layer Einstellungen Erweiterungen Vektor Raster Datenbank Web Verarbeitung Hilfe
Layerfenster
vw_qgep_cover
vw_qgep_reach
Wastewater Structures
Value Lists
Hydraulic
Topology
Cadastral Data
Erweiteres Digitalisierungsfenster
Fehler
vw_qgep_cover - Objektattribute
Aktionen
General
Cover
Wastewater Structure
Manhole
Wastewater Node
Covers
Structure Parts
ws_type
Manhole
identifier
AAA DE54597
location_name
NULL
year_of_construction
NULL
manhole_function
manhole
special_structure_function
renovation_necessity
unknown
level
NULL
positional_accuracy
unknown
status
operational
venting
(keine Auswahl)
fastening
(keine Auswahl)
dimension1
NULL
dimension2
NULL
OK
Koordinate 9.4361,47.5191
Maßstab 1:4'119
Drehung 0.0
Zeichnen
EPSG:21781 (SRP)
DEU
21:08
18.05.2016


QGIS 2.10.1-Pisa - qgep_en
vw_qgep_cover - Objektattribute
Aktionen
General
Cover
Wastewater Structure
Manhole
Wastewater Node
Covers
Structure Parts
Maintenance
Wastewater Nodes
Access Aids
Ausdruck
ch13p7mzAA002769
obj_id
kind
(keine Auswahl)
identifier
FAA AK2081EF
Backflow Prevention
gross_costs
Dryweather Flumes
material
OK
Abbrechen


QGIS 2.10.1-Pisa - qgep_en
vw_qgep_cover - Objektattribute
Aktionen
Wastewater Nodes
ch13p7mzWN004608
backflow_level
bottom_level
399
6210.0070
remark
dataowner
provider
last_modification
fk_wastewater_structure
ch13p7mzMA004365
OK
Abbrechen

Changing attributes of linear elements (channels)

- To change an attribut first select the vw_qgep_reach layer and switch to the edit mode
- Then click on the info button and choose the element you want to edit by double-clicking a channel
- The form of the vw_qgep_reach will open
- On the first tab you can change the most common attributes
- To change attributes of related tables such as reaches select that tab.

TO DO : add image

- TO DO :
- Changing relations (Verknüpfungen ändern)
- Change ws_type (Subklasse eines Abwasserbauwerkes ändern (ObjektID ändert dann auch !))
- Split channels into different reaches (Kanäle unterteilen)

Link to the Homepage of the Swiss Waste Water Association - Datamodel VSA-DSS : add link

1.2.3 Length profiles

This represents a guide on how to choose a section and display a length profile.

TO DO : Explain how it works

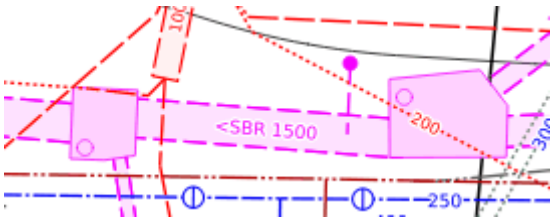
Title

Subtitle

- List
  - Subpoint

Link : add link

Add some screen shots



1.2.4 Network following tools

This represents a guide on how to use the network following tools in QGEP.

TO DO : Explain how it works

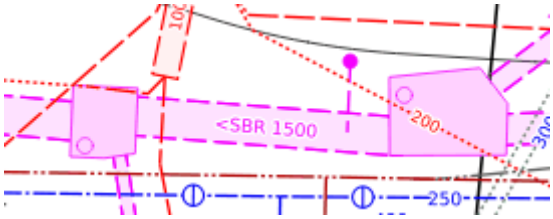
Title

Subtitle

- List
  - Subpoint

Link : add link

Add some screen shots



1.2.5 Plan plotting

This represents a guide on how to do plan plotting in QGEP.

TO DO : Explain how it works

General

- Titelblatt und Legende
- Rahmenpläne erstellen / verwalten / drucken

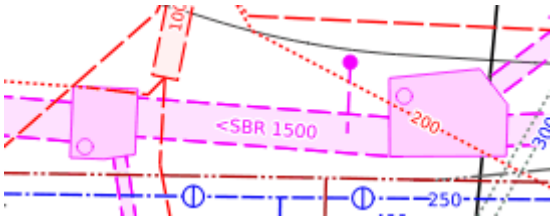
Title

Subtitle

- List
  - Subpoint

Link : add link

Add some screen shots



1.3 Admin Guide

This represents a guide on how to collect data in QGEP (digitizing), edit existing data and use various tools like length profile, network following and plan plotting.

1.3.1 pgAdmin

PgAdminIII is a Desktop tool that permits to access and manage the database server. This chapter represents a guide on how to do basic PostgreSQL management using pgAdmin.

Install pgAdmin

Windows

pgAdmin should be automatically installed if you used the EnterpriseDB installer.

Linux

Debian/Ubuntu based distros You can install pgAdmin by running the following command :

```
sudo apt-get install pgadmin3
```

Fedora based distros `sudo yum install pgadmin3`

Suse based distros `sudo zypper install pgadmin3`

Note : All the commands presented above assume that you are logged in as a user with sudo (admin) privileges. On certain systems it may be required to use the command `su` to become the *root* user and then issue the above command without the `sudo` prefix.

Using Pgadmin

SQL query

```
.. figure:: images/001_roles.jpeg
```

Running SQL commands in PgAdminIII

Note :
- Clicking the highlighted icon at location *1* opens the SQL Window. The SQL icon is active only when you're connected to a database.
- Clicking the icon at *2* runs the written SQL commands.

Database dump

Note :
- Open pgAdminIII and connect to the database
- Right click the Schema that you want to backup (in the tree structure below "Schemas")
- Enter the filename where the dump should be stored
- Check the following options

```
.. figure:: images/Screenshot-from-2015-01-22-102152.png
.. figure:: images/Screenshot-from-2015-01-22-102155.png
.. figure:: images/Screenshot-from-2015-01-22-102159.png
.. figure:: images/Screenshot-from-2015-01-22-102218.png
```

Note :
- After running the process, the exit code 0 indicates that everything went ok

```
.. figure:: images/Screenshot-from-2015-01-22-102222.png
```

1.3.2 Demo Virtual Machine

This represents a guide on how to download and install a virtual machine (VM) that has a working QGEP installation with a preinstalled demo dataset.

About

The VM is based on Debian Jessie with Cinnamon Desktop.

Installed software :
- PostgreSQL 9.4.4 with Postgis 2.1.7
- QGIS Master 2.11

Settings that are changed from a default software install :
- `pg_hba.conf` has **trust** for local connections
- QGIS is setup with multithreaded rendering enabled
- QGIS is setup with postgres server side expression compiler enabled

---

Note : The users `web` and `root` have the password `qgis`

Note : If you decide to use the VM in production, it is recommended to :
- change the passwords
- regenerate the ssh keys by running in a terminal `sudo rm /etc/ssh/ssh_host_* && sudo dpkg-reconfigure openssh-server`

Install

Download

Download the vm from here

Note : The size of the VM is around 2GB compressed and around 7GB uncompressed.

Extract

The virtual disk is archived using XZ compression.

To extract the archive :
- **Windows :** you can use 7-Zip to extract the archive.
- **Linux :** cd to the download directory and run `xz -d qgisplatform.vdi.xz`

You can run the VM as you would do with any VirtualBox VM.

Note : As the VM is based on Linux it is fairly simple to convert the image to a raw disk and put it on a USB stick (minimum 8GB) or a faster storage. This would enable you to run the app without the virtualization penalty and enjoy the full speed of your hardware.

QGIS Server

The VM has working installations of QGIS Server and QGIS Web Client (QWC).

Access the Web Services

The Apache server is setup to respond to requests pointing to the *http ://qgisplatform.demo*. Accessing the above link with the Internet Browser of the VM will take you to the starting page of QWC depicted in the above image.

If you want to access the web services outside the VM, you need to edit the `hosts` file on your machine and point `qgisplatform.demo` to the IP of the VM.

Note : If you've setup the VM with the network adapter in NAT mode only the VM host will be able to access the services. If you want all the devices on your LAN to do it, you need to setup the network adapter in bridge mode.

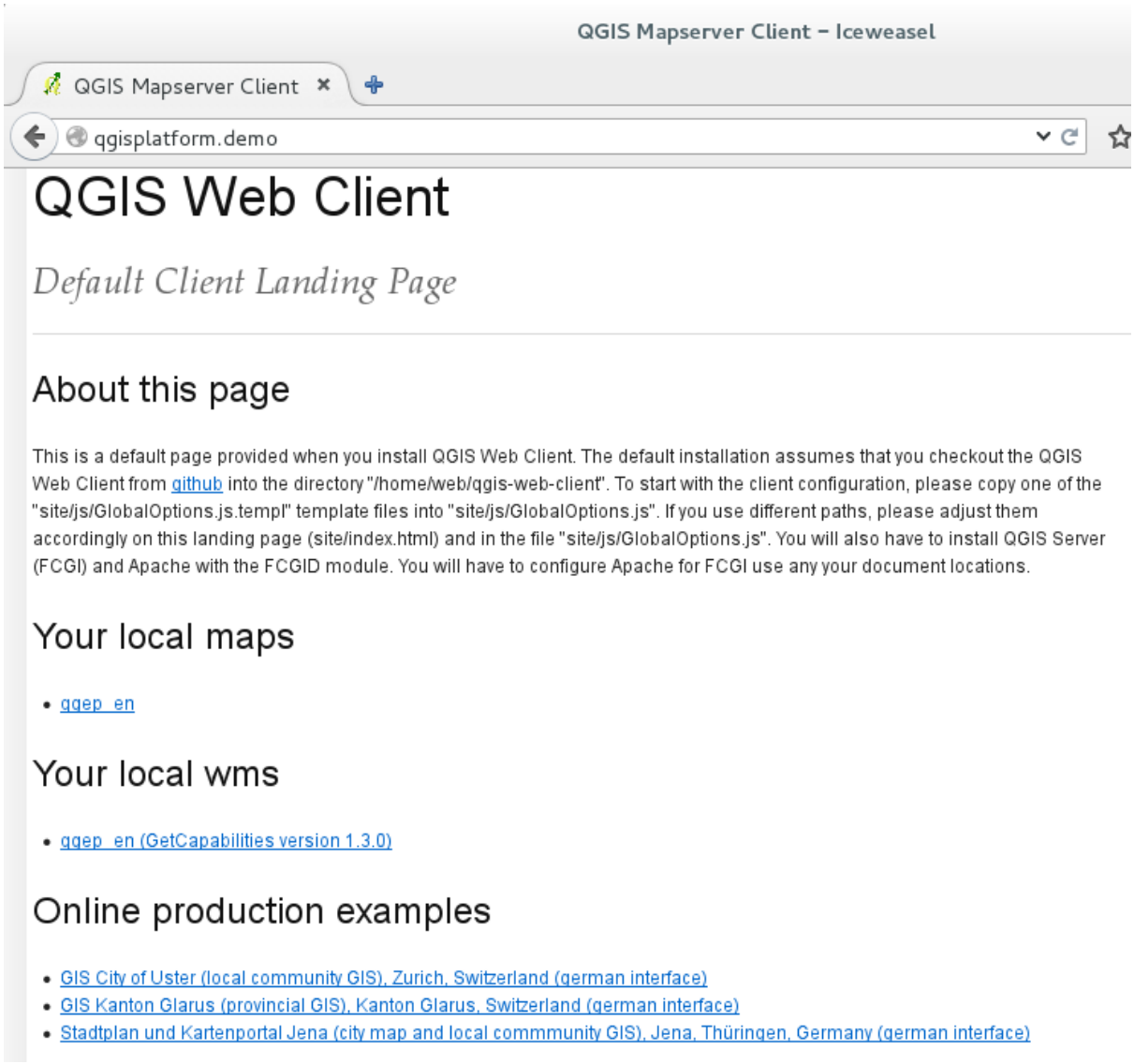


Fig. 1.3 – **QGIS Web client starting page**

1.3.3 Data import

This represents a guide on how to import data into QGEP.

- INTERLIS
- dxf
- Shape
- Text
- MOUSE / MikeUrban
- other

TO DO : Explain how it works

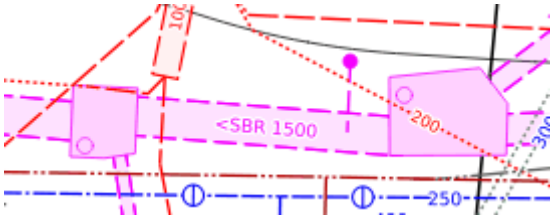
Title

Subtitle

- List
  - Subpoint

Link : add link

Add some screen shots



1.3.4 Data export

This represents a guide on how to export data from QGEP.

TO DO : Explain how it works

- INTERLIS
- dxf
- Shape
- MOUSE / MikeUrban
- other

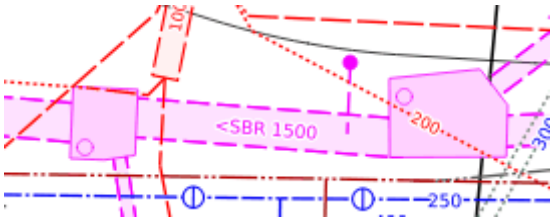
Title

Subtitle

- List
  - Subpoint

Link : add link

Add some screen shots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CHAPITRE 2

Indices and tables

— genindex
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