EPSG Geodetic Parameter Registry
User manual
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1 Home page

GeoRepository is a cloud-based web application and API for storing, searching, and displaying geodetic parameters. The application is used for hosting the EPSG Geodetic Parameter Dataset, which is a collection of definitions of coordinate reference systems and coordinate operations which may be global, regional, national, or local in application.

This is the latest generation of the site which includes an enhanced data model compliant with the ISO 19111:2019 revision which replaces the ISO 19111:2007 version. The new data model includes the ability to describe dynamic coordinate reference systems, which are now differentiated from static coordinate reference systems. Furthermore, it includes the ability to describe geoid-based vertical coordinate reference systems, point motion models, derived coordinate reference systems and datum ensembles.

Exports of the dataset include the EPSG MS Access, Oracle SQL Scripts, MySQL Scripts, PostgreSQL Scripts and WKT compliant with the ISO 19162:2019 standard. Exports can only be performed by registered users.

The EPSG Geodetic Parameter Dataset is maintained by the Geodesy Subcommittee of the IOGP Geomatics Committee. For more information about the Geomatics Committee please visit URL: beta.epsg.org. This is a temporary address and will be replaced by www.epsg.org. The web address link will take the user to the following home page.

![GeoRepository home page](image)

*Figure 1: GeoRepository home page*

The application can be used without registration, but with functionality limited to basic searching and reporting only. Registration gives the user access to export functions, once logged in.
1.1 **Online Registration**

To gain full access to the EPSG Geodetic Parameter Dataset registry functionality through these web pages, you must register on this site. Once registered, you may also subscribe to updates and make change requests.

To register, click on the **Register** link shown in the upper right-hand corner of the home page (see Figure 1). Next, a registration form will appear like the one shown in Figure 2.

![Figure 2: Membership registration form](image)

Enter your details into the boxes shown. All boxes displayed are mandatory. Details provided (except for your password) will be visible only to IOGP and will be protected under the General Data Protection Regulations (EU) 2016/679 to which IOGP is fully compliant. This information is not used externally to this site, nor will it be passed on to any third parties.
Figure 3: Populate the boxes indicated with asterisk

Your password must be at least 8 characters long and must contain at least one upper case letter, one lower case letter, one number and one special character.

Once details have been entered, click on Register button at the bottom of the form and an email will be automatically sent to the email address you supply.

Email Activation

Dont forget to activate your account!

Thank you for registering. An activation email has been sent to martinrayson80@gmail.com

To activate your account please click on the activation link in this email.

Figure 4: Activate the account

To activate your account, open the email sent and follow the instructions.
You’ve registered for an account with IOGP GeoRepository

GeoRepository <Auth@geomaticsolutions.com>
10:18 AM

To: martinrayson80+5@gmail.com

Hello,

We’ve set up your account with email address martinrayson80+5@gmail.com. Please use this when you log in.

First you’ll need to activate your account by clicking here.

If you have any questions, or need any help, just get in touch.

Kind regards,

EPSG

Figure 5: Confirm account registration

If your account is successfully activated a message like the one shown in Figure 6 will appear.

Figure 6: Confirmation accepted; account live

1.2 User roles and privileges

Four categories of users are defined:

- Guest User
- Registry User
- Reviewer
- Registry Manager (GeoAdmin)

Which have the following definitions and privileges:

- **Guest user** is the default setting. This constitutes any user who is accessing the registry without having logged into the application.
- **Registered user** is the role assigned to anyone that has created a user account on the registry and has logged into the application.
• **Reviewer** is assigned the role by the **Registry Manager**. A Reviewer is part of the internal data QC process and the role can be assigned to any registered user at the discretion of the Registry Manager.

• **Registry Manager** has access to all systems and functionality.

This manual will address the functionality provided to **Registered users** and **Guest users** only. The privileges assigned to Registry Manager and Reviewers is outside the scope of this manual, see the GeoRepository Administration manual for these details. Table 1 describes the privileges assigned to each category of user:

**Table 1: User group privileges**

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Registry Manager</th>
<th>Reviewer</th>
<th>Registered User (logged in)</th>
<th>Guest User</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search / View / Report valid (including superseded) objects</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Submit proposals for change requests</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Search / View / Report invalid (including deprecated) objects</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Use registry export functions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>View objects in pending change requests</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QC and comment on pending change requests</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>View and comment on approved change requests</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Create change requests, add new objects, amend existing objects</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approve change request for release</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make registry release (makes public all approved change requests)</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manager user accounts</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manage report templates</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2 Registered user login

After completing online registration, follow this procedure to log into the application. Click on the **Login button** shown in the top right-hand corner of Figure 2. Next, a panel like the one shown in Figure 7 will appear.

![Login panel](image)

Enter your username and password into the boxes provided and click the blue **Login button**. If all details are successfully recognized, you will be redirected to the main home page of the site. If your details are not recognized, you will be invited to re-enter your login details.

2.1 Forgot password

In the event you have forgotten your password click on the green ‘**Forgot password**’ button and you will be re-directed to the following page:

![Forgot password panel](image)

Enter your email into the text box provided and click Submit button.
Follow the instructions; check your email inbox, and follow the link provided. A panel like the one shown in Figure 10 will appear. Enter the new password details into the boxes provided and click Reset button to confirm the new password.

Figure 9: Reset password option

Figure 10: Confirm new password
2.2 Viewing user details

Users can view their own account details by clicking on the **Menu** button shown in the top right-hand corner of Figure 11. The **Menu** option will only become available after you have successfully logged in to the application; it automatically replaces the Login/Register button (see previous Figure 2).

![User menu option](image)

**Figure 11: User menu option**

Place the cursor over the menu option and click once with the left-hand mouse button. A sub-menu will automatically appear like the one shown in Figure 12.

![View user details menu](image)

**Figure 12: View user details menu**
2.2.1 View profile
To view your own profile details, click on View Profile option and a panel like the one shown in Figure 13 will be displayed.

![My Profile](image)

*Figure 13: View own profile*

To change your details click on the Edit Profile button shown in Figure 13. As a Registered User you are permitted to change your Username and industry as shown in Figure 14. Once changes have been made click on Save Changes button.

![Edit Profile](image)

*Figure 14: Edit profile*

You will be unable to change any other details about your account such as your email address. If you require any details to be changed you have two options:

1. Contact the system administrator
2. Set up a new account – in the event you want to change the email address.

2.2.2 Profile Data Management
The General Data Protection Regulations (GDPR) enable you to have access to what personal data is stored by this application. This allows such data to be either downloaded and viewed or deleted
permanently. Use either of the options on this panel to perform these operations. Should you delete your account you can create a new one with the same details.

![Personal Data](image)

*Figure 15: Personal Data*

Select the required option from those illustrated in Figure 15.

### 2.2.3 Change Password

You do have privileges to change your password without intervention of system administrator. To change your password, click on the **Change Password** button and a panel like to the one shown in Figure 16 will appear.

![Change Password](image)

*Figure 16: Change password*

To change the password associated with your account enter the details into the panel shown in Figure 16. Enter your existing password in to ‘Old Password’ text box. Next, enter your new password into the box below. Confirm your new password in the lower box. Once completed click on **Update Password** button to confirm your details. Click on **Cancel** button to cancel all this action.

### 2.2.4 Logout

To log out of the application click on the Logout menu option. Confirmation that you have been successfully logged out will be shown by the screen shot captured in Figure 17.
Logout You are now logged out

Click here to return to the GeoRepository Dev Client.

Figure 17: Confirm logout
3 Home page menu ribbon

From the home page the following menu options are provided.

![Menu ribbon options](image)

Figure 18: Menu ribbon options

3.1 EPSG Home

Click on the Home menu option to return to the home page of the site as shown in Figure 1. This can be activated from any page of the site.

3.2 EPSG Dataset

Click on this EPSG Dataset menu option and a sub-menu like the one shown in Figure 19 will appear.

![EPSG Dataset menu options](image)

Figure 19: EPSG Dataset menu options

3.2.1 Text Search

The Text Search menu option enables you to initiate non-spatial textual searches. By default, when this is first selected the search text box will be displayed along with a 'results' panel which will show all objects contained within EPSG geodetic parameter dataset in a series of tabbed pages: e.g. CRSs, Transformations, Point Motion Operations, etc. Further details of this menu item are described in section 4.1.

3.2.2 Map Search

The Map Search menu option activates the map search utility enabling you to create a search query using the graphical user interface of the map. Pan and zoom functions are offered to help specify the geographic area of interest using either a single point, bounding box, or polygon area before selecting the query. Further details on how the map search function operates are described in section 4.2.

3.2.3 Download Dataset

The Download dataset menu will provide you with a series of options to download the contents of the entire dataset or sub-sections of the dataset to an external data file: e.g. EPSG MS Access file, or Oracle. Further details of all the file formats supported by the download option are described in section 6.
3.2.4 Archive

The archive menu enables all previous versions of the Dataset that are still publicly available to be downloaded in the following formats: MS Access database, MySQL, Oracle SQL, and PostgreSQL. The current version of the Dataset contains all significant changes and there should be no necessity to go back to the archive. It is maintained as an assurance to users that old data may be recovered.

3.3 Support Documentation

This menu contains a series of documents that support / describe the functionality of the application database and web site. The options offered by this menu are shown in Figure 20.

3.3.1 Guidance Notes

The Guidance Notes menu item provides you with a series of hyperlinks allowing additional IOGP EPSG support documentation to be downloaded by you. For example, these include Guidance Note 7-1 and Guidance Note 7-2 which describe the EPSG Geodetic Parameter Dataset and Conversions and Transformation formulas, respectively. Documents available from this page may change from time to time as decided by IOGP Geomatics Committee, geodesy subcommittee. Most IOGP Guidance Notes are not solely supporting the EPSG Dataset and these others are available through the Geomatics Home menu item (see 3.6).
3.3.2 Data Model Changes

This page provides salient details to the changes between the EPSG v10 data model and its predecessor.

In addition to the main text there are also links that will enable downloads to be made of this information. These relate to: Details of data model changes to the relational tables and changes to the GML schema.
3.3.3  GML Schema
This page gives access to the EPSG GML schema.

![EPSG GML Schema](image)

Figure 23: EPSG GML Schema

3.3.4  About GeoRepository
This panel provides some basic background details to the application and the development team. The team welcomes any constructive feedback on any functionality matters that may be encountered or requests for any new features that would be considered beneficial to the application. Use the feedback link provided.
3.3.5 Features

This panel provides some high-level details of the application and its links to partners and other application providers.
Overview

GeoRepository is a powerful web application and tool for searching and displaying geodetic parameters contained within the IOGP EPSG geodetic parameter registry. All parameters available in the database can be used in geodetic calculations with a high precision Geodetic Calculator. Parameters can be accessed via the web site or through the Geodetic API.

Powerful Search Functions

GeoRepository provides a powerful suite of search tools. These search functions are designed to provide fast access to relevant data by using one of several search modes.

3.3.6 Download manual

Select this option to download a pdf version of this user manual.

3.4 About Us

This menu option contains two links to further information about IOGP and Geomatic Solutions:

https://iogp.org/about-us/
https://geomaticsolutions.com/about-us
3.5 Contact

The contact menu options are shown in Figure 27.

3.5.1 Submit Change Request

This panel provides a high-level description of the Change Request process adopted by the IOGP Geodesy Subcommittee.

Requests can be made to modify existing database objects or for the creation of new objects. A template (Excel spreadsheet) showing the minimum information required in a submission may be accessed.

![Figure 26: About Us menu](image)

![Figure 27: Contacts menu](image)

![Figure 28: Change Request instructions](image)
3.5.2 **Contact**

To send a message to the GeoRepository Team about anything other than an EPSG data change request, fill in the contact form shown in Figure 29.

![Contact panel](Figure 29: Contact panel)

Fill in the details to the text boxes provided and select the appropriate option from the drop box. Once completed click on **Send Message** button to submit the information.

### 3.6 Geomatics Home

Clicking this menu option will redirect you to the home page of the IOGP Geomatics Committee:

[https://iogp.org/geomatics/](https://iogp.org/geomatics/)

Follow any of the links on this page to access news, projects, and guidance documents.
4 Query Capabilities

Two main query capabilities are offered to perform searches (query) of the geodetic parameter database. The two modes offered are:

- Text search
- Map search

In either instance the search filter will return one or more objects based on the query submitted. This section describes how to generate the queries, which may be one mode or a nested combination of the two modes:

Either mode is accessible through the left panel of the main home page of the application as is indicated in Figure 30.

4.1 Text Search (Non-spatial)

To invoke a text query (non-spatial query) use the text box as shown in the middle of Figure 30. Enter a text query into the box based upon one of the following search criteria:

- An EPSG object code, e.g. 4326
- An object name using a text string, e.g. Timbalai 1948 (as shown)
- Text from an extent description, e.g. Angola. Wild cards are automatically prefixed and suffixed to the string entered, so Oman will return data for both Oman and Romania.
- An object type or sub-type e.g. [type]=geographic (see 4.1.4 below)
In each instance the text string(s) can be made more general by using wild cards in the text string syntax. General rules applied to text searches include:

- Search expressions are not case-sensitive. They accept both upper- and lower-case letters in the search field.
- A search can be done for an entity name ending in 2 or more digits with or without the space in the name, for example SIRGAS 2000 or SIRGAS2000.
- Guest users can search for valid objects only. It precludes them from searching for deprecated objects and searching within object remarks. The option to exclude World items is also not available. However, a Registered user who has logged in can modify these filters:
- Referring to Figure 30, logged-in registered users will see the tick boxes in figure 30. Under the text box are three additional tick boxes labelled: Include Deprecated, Include World Items and Search Remarks.
  - Place a tick in the box to the left of the text label if you wish the search to retrieve objects that include deprecated items.
  - If you do not wish objects with an extent of world to be retrieved, uncheck the World Items tick box.
  - A further option is also provided to include searching through all the Remarks associated with each of the metadata fields for the database objects. For example:

![Figure 31: Remarks field within geodetic object metadata](image)

Selecting the Search Remarks (Figure 30) tick box option will increase the number of objects returned from the search function. For the remainder of this chapter the examples shown will be for the search option invoked from the EPSG database menu item.

### 4.1.1 Retrieve objects by specifying object codes

Enter an object code into the text box. The object code number must adhere to the following criteria:

- Object code must be strictly numerical
- Object code must be within the protected EPSG code range
Enter the object code into the text box provided and then press the **Enter** key.

4.1.2 **Retrieve objects by specifying an object name**
Enter a text string into the text box provided that describes the object name (see Figure 30). General rule is:

- Object name can be alphanumeric, e.g. ETRS89

Enter the object name into the text box provided and then either press the carriage return key or click on the blue GO button to commence the object retrieval.

*Note:* Misspelling the object name will affect the objects retrieved from the query.

4.1.3 **Using wildcards to retrieve objects**
Wildcards can be used to enhance the text query created to retrieve objects. The wildcard options that are supported can be displayed by clicking on the blue information button shown to the right of the text box (Figure 51).

Descriptions of the wildcard options supported are shown in Table 2. Note, when wildcards are included within the search string it will invariably increase the number of objects retrieved from the database as the filter parameters are more general and less specific.
Table 2: Wildcard features

<table>
<thead>
<tr>
<th>Wildcard</th>
<th>Example</th>
</tr>
</thead>
</table>
| % or *   | ![Search Database](image)  
Using the % or * symbol as a postfix will return all objects that have text starting with 'ba', 'Ba' or 'BA' within the name or alias fields of the objects followed by any other multiple letters and numbers. 
Alternatively, the symbol can be used as a prefix as shown:  
![Search Database](image)  
Using the symbol in this fashion will return all objects whose name or alias commences with any letters and numbers but will also end in 'ba', 'Ba' or 'BA'.  
Finally, the symbols can be used as prefix and postfix simultaneously to give a combined solution from the previous descriptions. |
| ? or _   | ![Search Database](image)  
Using either ? or _ symbol performs a search by assuming there is only one missing letter or number represented by the wildcard symbol.  
For example, in this instance the filter will return results with a text string containing any combination of alphanumeric strings that contains in part a sub-string that starts with A and ends with D, with other letter or number between. E.g. AGD84, Ain el Abd, Astra Minas Grid. |
| [ - ]    | ![Search Database](image)  
Using the syntax provided: The search filter will return all geodetic objects that start with the letter 'N' or 'n' followed by any of the letters contained within the range within the square bracket, e.g. letters a, b and c. |
| !        | ![Search Database](image)  
Using the syntax provided: The search filter will return all geodetic objects that start with the letter E(e), ends with the letter M(m) and also contain either the letter a or letter e. |
Conditioning the search string

When the wildcard search has been created the text string is automatically prefixed and suffixed by the % wildcard. For example, ba* will become %ba*%.

4.1.4 Retrieving objects by specifying object type

A search string can be created to retrieve objects by specifying object type or sub-type, based on the following:

- Name
- Code
- Type

What follows are the syntax required for their use along with some examples of how they are expected to operate.

4.1.4.1 Name

An object type of name must be entered into the text box using the following syntax:

[name]=xxxxxxxxx…n

Where xxxxxxx….n is a text string that will become the search parameter upon which objects are retrieved.

With this object type the following basic rules apply:

- The text string can be alphanumeric
- There is no limit to the length of the text string that can be submitted to the search.
- The text string is not case sensitive

For example:

[name]=Hartebeesthoek94

4.1.4.2 Code

An object type of code can be used in three modes:

- = (equals)
- > (greater than)
- < (less than)

The syntax for each is as follows:

[code]=xxxxx
Where xxxxx is a numeric string with a minimum length of one digit and a maximum length of five digits.

The following basic rules apply:

- The string must be numeric only
- The objects returned will only be for objects whose codes match the query and not a subsection thereof.

For example:

[code]=1024
[code]<23030

4.1.4.3  **Type**

An object type of **Type** is used to search and retrieve objects that matches one of the specific object types recognized within the EPSG geodetic parameter dataset. The object types recognized include:

- 3D
- 2D
- Geodetic
- Projected
- Geocentric
- Vertical
- Derived
- Engineering
- Compound

The following basic rules apply:

- The text is not case sensitive
- The type must be spelt correctly for the search to operate as expected

4.1.5  **For example: Combined searches**

Combinations of wildcards and types can be used to create a more advanced text search.

For example:

[name]=NAD??

This will retrieve all objects that contain name NAD with two additional characters added to the end of the text string.
Any combinations of types and wildcards can be submitted to generate a search. However, when wildcards are used the text string is automatically prefixed and suffixed by the % wildcard.

### 4.2 Graphical queries (Spatial searches)

Map Search retrieves database objects associated with a bounding box (BBOX). Only CRS, datum, and coordinate operations (transformations and conversions, including map projections) have this association. Other items, such as ellipsoids and units of measure cannot be found through the map search, although when they are included as part of a CRS, datum, or coordinate operation their descriptions will be provided. To activate the map search, two options are provided. First, click on the search button shown in Figure 33.

![Figure 33: Activate map search](image)

Second, click on the EPSG Dataset from the main menu and select **Map Search** from the sub-menu.

![Figure 34: Active map search from main menu](image)

In either case a user interface like the one shown in Figure 35 will be displayed.
The main features of the user interface are as follows:

**Pan and Zoom**
Prior to conducting a spatial query, it is often more convenient to narrow the geographic window within the user interface to a more localized area, rather than showing a world view. The pan and zoom features enable these changes to be made.

**Search By**
The map interface can be used to create three categories of spatial searches, namely: Point, Box or Polygon. To select a search mode, click on the down arrow within the drop box and a series of options will appear like the ones shown in box opposite. By default, None is the setting, which allows you to pan and zoom the map interface.

**Map rotation**
By default, the map is orientated to geographic north. However, the map orientation can be modified to a reference other than north by using the map rotation option.
Reset rotation
If the map rotation has changed the default orientation of the map this icon will appear in the top right corner of the map interface. To return the orientation of the map to geographic north click on this icon.

Toggle full screen
Click on the icon shown on the left to change the map view to a full screen view. To return to the default view panel click on icon in the top right corner.

4.2.1 Geo-spatial search by Box and Polygon
Spatial searches based upon the use of a rectangular box or an irregular polygon form an integral part of the search criteria when using the map interface. Although the creation of these entities will be described in later sections some important aspects of their definitions and usage are described here.

Box is a simple geometric shape specified by two corner points: upper left-hand corner and lower right-hand corner (shown by the two red circles) to create the regular blue rectangle as shown in Figure 36. Note, the red circles will not appear on the user interface, they are used here for clarity.

![Figure 36: Bounding box and bounding polygon](image)

The upper left-hand corner will always be labelled as Maximum Latitude and Minimum Longitude and the coordinates of the lower right-hand corner will always be known as Minimum Latitude and
Maximum Longitude. This will be regardless of whether the box is contained exclusively within one quadrant or the box crosses the equator and / or the 180° meridian (see Figure 37 and Figure 38).

For the example shown in Figure 36 the upper left hand will be given by:

- Maximum Latitude 47.81°
- Minimum Longitude 5.96°

And the lower right-hand corner will be given by:

- Minimum Latitude 45.82°
- Maximum Longitude 10.49°

When specifying the coordinate of the box they will always be quoted to two decimal places in the decimal degree format.

*Figure 37: Box in different quadrants*
For each scenario shown in Figure 36 and Figure 38 the same relationship holds, whereby Max Lat > Min Lat and Max Long > Min Long.

Two other definitions required for geo-spatial queries include:

A **Point** is defined as an entity where the two corners of the BBOX are equivalent. Therefore, the search geometry acts as a single point.

A **Polygon** is a geometric shape comprising a minimum of three straight line segments (a triangle) connected to form a closed polygonal circuit. The bounding polygon can have any number of sides and can perform an irregular shape.
Intersecting polygons such as the one shown in Figure 40 will not be accepted as a search filter.

Figure 40: Intersecting polygons are not accepted

4.2.2 Zooming and panning
Before any zooming or panning can be applied to the map the Search mode must be set to None as shown within Figure 35. To change the scale of the map the following functions are provided:

- Use the scale bar displayed on the left-hand side of the map. To either increase or decrease the scale of the map place the cursor on + or – button and click once with the left-hand mouse button.
- Place the cursor over blue button on the scale bar. Click and hold down the left-hand mouse button. Move the cursor up the scale bar to decrease map scale and down the scale bar to increase map scale.
- Place the cursor over the map. If your mouse contains a wheel push the wheel forward to decrease the map scale or pull the wheel backwards to increase the map scale.

To pan around the map the following option is provided:

- Place the cursor over the map. Click the left-hand mouse button and keep it pressed down. Move the mouse up, down, right, and left to move the map north, south, east, and west respectively.

Once the map view has been modified to the geographic area required select one of the three search modes that are shown in Figure 35, e.g. Point, Box or Polygon.

The drop box can be hidden clicking the icon shown above the menu box. To redisplay the menu box, click on the icon and it will reappear.

4.2.3 Query with a point
Querying with a Point will generate a database query comprising the coordinates of a single point (Latitude and Longitude) and it will retrieve all objects whose bounding boxes contains the user-defined point.
Three methods are provided to select a single point coordinate:

- Placing the cursor on the map interface and click with the left-hand mouse button
- Enter coordinates in the text boxes provided
- Using the Geo Location service

4.2.3.1 Select single point from map
To select a single point from the map interface, place the cursor over the map and click once with the left-hand mouse button.

Next, a light blue circle will appear on the map interface where the point selection was made. The coordinates of that point will also be displayed in the latitude and longitude text boxes shown above the map view. Using this option, the coordinates will be displayed in the degrees, minutes and seconds format with the seconds given in one decimal place. The coordinates can be manually edited before submitting the query and the number of decimal places for seconds is unlimited.

If the values of latitude and longitude are dramatically altered the modification will be reflected as a new search circle will be drawn on the map interface.

Click on Search button to activate the query.
4.2.3.2 **Enter coordinates in text box**

Using the two text boxes provided type coordinates for latitude and longitude as shown in Figure 42. The format for the coordinates can be either:

- Decimal degrees
- Degrees, minutes, and seconds

![Coordinates in text box](image)

*Figure 42: Coordinates in text box*

The format for **decimal degrees** must comply as follows:

- Latitudes north of equator will be assigned a positive number, e.g. 4.2376823
- Latitudes south of equator will be assigned a negative number, e.g. -34.2672345
- Longitudes east of Greenwich meridian will be assigned a positive number, e.g. 113.4672374
- Longitudes west of Greenwich meridian will be assigned a negative number, e.g. -93.4672341

The input format for decimal degrees does not permit the submission of a letter to designate hemisphere. Therefore, E, W, N and S are not recognized.

The format for **degrees, minutes and seconds** must comply as follows:

![Degrees, Minutes and Seconds format](image)

*Figure 43: Degrees, Minutes and Seconds format*

There must be a space between degrees and minutes, minutes and seconds, and seconds and hemisphere

- Latitudes north of the equator must have the letter N after seconds
- Latitudes south of the equator must have the letter S after seconds
- Longitudes east of Greenwich meridian must have the letter E after seconds
- Longitudes west of Greenwich meridian must have the letter W after seconds
Where the entry of either format has been performed incorrectly a warning message will be displayed indicating the coordinates were invalid. When the coordinates are invalid the Search button will be disabled until the entries have been corrected.

The precision (number of decimal places) to which the coordinates are quoted is the decision of the user and the coordinate values will only be used within the query at the precision with which they were quoted.

Once entered click on the Search button to activate the query.

Alternatively, if the point was selected by first clicking on the map interface the latitude and longitude displayed within these two text boxes can be manually edited as shown in Figure 45.
4.2.3.3 GeoLocation Service

The Geo Location Services will automatically assign coordinates to the latitude and longitude text boxes based upon the current location of the user. The coordinates that appear on these boxes represent the central location of the map view shown (See Figure 46).

![Figure 46: Geo Location Service](image)

Note, the coordinates shown in the lower right side of the panel represent those of the cursor and will not necessarily coincide with the GeoLocation service. The coordinates taken from the GeoLocation Service will be shown in the two text boxes provided. The format of the coordinates will always be Degrees, Minutes and Seconds.

To activate the search, click once on the blue Search button. This option will only work if the location of the user can be identified.

4.2.4 Query with a rectangular box

To create a query with a rectangular box, click on the drop-down menu shown in Figure 35 and click the Box option. This will allow you to draw a rectangular box directly on the map interface.

To create the box, place the cursor at the upper left corner of the required box and click once on the left-hand mouse button. Drag the cursor to the lower right-hand corner of the box and click once with
the left-hand mouse button. A rectangle like the one shown in Figure 47 will be superimposed on top of the map interface.

The coordinates for upper left and lower right points will be displayed in the latitude and longitude boxes in the top left of the user interface. If required, the coordinates shown within the text boxes can be manually edited to change the coordinate values.

Once completed, click on the Search button on map interface to search the registry for all objects whose bounding boxes and shape polygons fall within or intersect the box specified.

**Search Database by Location**

![Figure 47: Query by box](image)

4.2.5 **Query with a polygon**

To create a query with a polygon first click on the drop menu shown in Figure 35 and click polygon option from the menu. This will enable a multi-sided (multi-segmented) polygon to be drawn on the map interface.

To draw the bounding polygon, place the cursor at the first point (vertex) of the polygon and click once with the left-hand mouse button. Drag the cursor to the next point and repeat the left-hand mouse click. Repeat the process for all points that comprise the polygon. To complete the polygon, place the cursor back over the first point of the polygon and click once with the left-hand mouse button. These steps are shown graphically in Figure 48.
The final polygon is shown in Figure 49. In this example, the polygon will comprise five points, where the first and the last point are repeated.

**Search Database by Location**

Click on the map to select coordinates or use the GeoLocation service.

Figure 50 shows another more complex example for a bounding polygon representing the approximate outline of the State of Texas. During the construction, the vertices are selected to represent the key turning points defining the polygon, which again appears with a blue outline with a light blue fill colour.
Search Database by Location
Click on the map to select coordinates or use the GeoLocation service

Figure 50: Specify the polygon on the map

To redraw the polygon, place the cursor at the new starting point of the polygon and click with left-hand mouse button. This will automatically delete the previous polygon from the screen. Once the polygon is drawn to your satisfaction the query can be performed. Click on the blue Search button to activate the search. What will be retrieved from the database will be all objects whose bounding boxes are contained within or overlap the user-defined polygon.

4.3 Nested Searches
Upon completing the first non-spatial (text) or spatial (map) search the results of the panel will appear like the example given in Figure 51. The lower part of the panel shows the table of objects that were returned from the initial search query being submitted. However, to add further power to the search function we can create a search that comprises multiple elements. These we refer to as nested searches, where nested searches comprise a group of search commands linked together in a chain. This creates a series of AND links, which can be a combination of both spatial and non-spatial entities, for example:

Here the search comprises two components. The first was text search using the name: Timbalai 1948 and the second was a non-spatial text string UTM. Each time another element is added the results returned from the search in theory get lesser and lesser, which helps target the desired object(s). The results of this query are shown within the lower panel of Figure 51 and comprise two objects returned from the database.
To clear any of the components of the nested search, place the cursor over the object and click once with the left-handed mouse button. That item will then be removed from the list. In this instance the UTM object was removed. Notice that the number of returned objects now increases from the previous list.

To remove all components of the nested search, click on the **Clear All** button and all items will be deleted within the adjacent blue boxes.
5 Query results panels

Once the query is performed all objects that match the criteria of the search query will be retrieved from the geodetic parameter database and displayed within the tables of the results panel. In Figure 52 a point search was performed, with the coordinates of the point shown in the text boxes provided.

![Image of point search](image)

*Figure 52: Conduct the search - point search*

For this point query the results panel is shown on Figure 54. The basic layout of the results panel will comprise, from top to bottom and left to right, the following:

The top part of the panel will display the query that was made. In this instance a query of type = point. This is shown in Figure 53.

![Image of search criteria](image)

*Figure 53: Search criteria*

When nested searches are conducted the number of entries shown within the blue boxes will increase. See section 5.2 for further details.
The results panel will comprise a series of tabbed pages, which are shown above the main table. By default, the six tabbed pages displayed will be:

- CRS
- Transformations
- Point Motion Operations
- Concatenated Operations
- Conversions
- Datums

Note that the tabbed page shown with a red background is the one currently displayed, in this instance the CRS tabbed page. The number shown to the right of each tab label indicated the number of objects associated with each category, e.g. 12 objects returned for CRS category. The total number of objects returned for the four tabbed pages combined is shown by the number to the right of the label Search Results (22 objects found). This value excludes objects on other currently hidden tabs (see 5.2).

For each tabbed page, the following eight columns are displayed:

- Report: Select an object(s) whose details will be presented within a report.
- Name: The name of the CRS as stored in the registry.
- Code: The EPSG code associated with the CRS specified in the name column.
- Type: The Type of CRS as specified within the EPSG data model. The following CRS types are recognized:
  - Geodetic (Geocentric, Geographic 3D CRS, Geographic 2D CRS)
  - Derived geodetic
- EXTENT: World (by country)
- DATA SOURCE: EPSG
- REMARKS: Used for products from the Int...
- REVISION DATE: April 30, 2020
In summary, the user interface features on the Results panel include:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Search Results for 'ed50' (124 Objects Found)</strong></td>
<td>Total number of objects returned from the submitted query for those object tabs displayed.</td>
</tr>
<tr>
<td><strong>Transformations (72)</strong></td>
<td>The number in brackets within each tabbed page name refer to the number of objects found for each of these categories.</td>
</tr>
<tr>
<td><strong>Items per page:</strong> 5 ▼</td>
<td>This refers to the number of objects displayed on one page. To increase or decrease the number of objects included click on the drop box and select one of numbers listed. Where the number of objects exceeds the item per page number the results will be spread over multiple pages. The following functions are used to navigate between these pages.</td>
</tr>
<tr>
<td><strong>First</strong></td>
<td>Display objects on page 1 of the list.</td>
</tr>
<tr>
<td><strong>&lt; Previous</strong></td>
<td>Display objects on the previous page, e.g. 2 to 1.</td>
</tr>
<tr>
<td><strong>2</strong></td>
<td>The current page number is highlighted blue with white number.</td>
</tr>
<tr>
<td><strong>Next &gt;</strong></td>
<td>Advance to the next page in the list, e.g. 2 to 3.</td>
</tr>
<tr>
<td><strong>Last</strong></td>
<td>Display objects on the last page in the list.</td>
</tr>
</tbody>
</table>

### 5.1 Search examples

Consider some of the examples shown in section 4, for searches by name, code, and type:

For example, submit the following search text string:

[name]=Hartebeesthoek94
This search should retrieve the following objects and display them in the results table as follows:

![Search Database](image)

**Figure 55: Search type of [name]=**

There are a series of tabbed pages associated with the retrieved results. The one coloured red is the one currently being viewed. Click on any of the other tabbed pages to show details of other retrieved object types listed.

For example, enter code 1024 as the search string:

[code]=1024

This search should retrieve the following results pages:

![Search Database](image)

**Figure 56: Search type of [code]=**

Likewise, if a search is made as follows:

[code]<5000
This search filter should retrieve the following objects to populate the results pages:

### Figure 57: Search type of [code]<

For example, submit a query using type equals compound:

[type]=compound

This search should retrieve the following results pages:

### Figure 58: Search type of [type]=

<table>
<thead>
<tr>
<th>NAME</th>
<th>CODE</th>
<th>TYPE</th>
<th>EXTENT</th>
<th>DATA SOURCE</th>
<th>REMARKS</th>
<th>REVISION DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRS92 / RD New + NAP height</td>
<td>4715</td>
<td>compound</td>
<td>Netherlands - onshore</td>
<td>EPSG</td>
<td>With geoid model and gravity</td>
<td>March 19, 2018</td>
</tr>
<tr>
<td>Astro DOS 71 / UTM zone 30S + Jamaica 1971 height</td>
<td>7954</td>
<td>compound</td>
<td>St Helena - St Helena Island</td>
<td>EPSG</td>
<td></td>
<td>November 25, 2016</td>
</tr>
<tr>
<td>Belga 1972 / Belgian Lambert T2 + Ostend height</td>
<td>6190</td>
<td>compound</td>
<td>Belgium - onshore</td>
<td>EPSG</td>
<td></td>
<td>March 29, 2013</td>
</tr>
<tr>
<td>CR-SRGA/S / CRNM5 + DACR82 height</td>
<td>8912</td>
<td>compound</td>
<td>Costa Rica - onshore</td>
<td>EPSG</td>
<td></td>
<td>March 9, 2019</td>
</tr>
<tr>
<td>DB_REF / 3-degree Gauss-Krüger zone 2 (E-N) + DHHN52 height</td>
<td>5832</td>
<td>compound</td>
<td>Germany - West Germany - west.</td>
<td>EPSG</td>
<td></td>
<td>March 25, 2012</td>
</tr>
<tr>
<td>DB_REF / 3-degree Gauss-Krüger zone 3 (E-N) + DHHN52 height</td>
<td>5833</td>
<td>compound</td>
<td>Germany - onshore 7.5'E to 16...</td>
<td>EPSG</td>
<td></td>
<td>March 25, 2012</td>
</tr>
<tr>
<td>DB_REF / 3-degree Gauss-Krüger zone 4 (E-N) + DHHN52 height</td>
<td>5834</td>
<td>compound</td>
<td>Germany - onshore 10.5'E to 13...</td>
<td>EPSG</td>
<td></td>
<td>March 25, 2012</td>
</tr>
<tr>
<td>DB_REF / 3-degree Gauss-Krüger zone 5 (E-N) + DHHN52 height</td>
<td>5835</td>
<td>compound</td>
<td>Germany - onshore east of 13.5...</td>
<td>EPSG</td>
<td></td>
<td>March 25, 2012</td>
</tr>
</tbody>
</table>
5.2 **Object display ordering**

The order in which the objects on each tabbed page are shown are (by default) alphabetical based upon the Name column.

5.2.1 **Sort by Name**

Modifications to the object ordering can be made by clicking on the column labels shown in the blue bar of Figure 59. For example:

![Figure 59: Change object ordering](image)

To re-order the CRS names place the cursor over the **Name** column label and a label will be underlined. Click once with the left-hand mouse button and the CRS names will be re-ordered reverse alphabetically.

5.2.2 **Sort by Code**

Similar modifications can be made to the other column header labels. For example, click on the **Code** header label. This will re-order all the entries from smallest EPSG code to largest EPSG code. Clicking on the **Code** header label a second time will reverse the order from largest EPSG code to smallest EPSG code.

5.2.3 **Sort by Type**

Likewise, to re-order the objects based upon **Type** place the cursor over **Type** column label and click once with the left-hand mouse button.

![Figure 60: Re-ordering based on Type](image)
The re-ordering is also nested in its approach. In the example shown in Figure 60, the objects were first re-ordered by Code and then by Type. Hence, within the Type column each object is grouped by CRS type (e.g. geocentric, geographic 2D, geographic 3D and projected), but also within each type the ordering is also determined by their EPSG Codes, with the smallest EPSG code number first within each group. In this example, those of type = projected are clearly ordered according to EPSG code number from smallest to largest.

5.2.4 Sort by Extents
This re-orders the objects alphabetically or reverse alphabetically if clicked again.

5.2.5 Sort by Data Source
To re-order the objects based upon Data Source place the cursor over the Data Source column header and click once with the left-hand mouse button. The objects will be listed by data authority in alphabetical order, e.g. IOGP and then OGP. At the same time, the order in which the objects are listed within each ‘group’ will be based upon EPSG Code number, ranging from smallest code to largest code.

5.2.6 Sort by Revision Date
To re-order the objects based upon Revision Date place the cursor over the Revision Date column header and click once with the left-hand mouse button. The objects will be listed by their release date or revision date from oldest to newest. At the same time, the order in which the objects are listed also takes in to account the EPSG code, being written from smallest to largest on the date of their release / revision.

5.3 Displaying ‘more’ tabbed pages
A seventh tab label – ‘More’ is also shown in Figure 61. Clicking on this tab will expand the number of tabbed pages available for viewing as shown in Figure 61. These additional pages include:

- Coordinate Systems
- Ellipsoids
- Prime Meridians
- Extents
- Units

![Figure 61: Additional tabbed pages](image)
To view the contents of any of the additional tabbed pages click on the text of the tabbed page. It will turn red and the contents will be displayed within the table below (see Figure 62).

![Table of Prime Meridians](image)

**Figure 62: Prime Meridian tabbed page**

The order in which the objects are displayed is initially given by the EPSG code, from smallest to largest. This is against the trend applied to many of the other pages where the initial object ordering is given alphabetically. The special case of the ordering in this instance is because of the number of objects within the category is less than one reporting page (e.g. items per page <50).

5.3.1 **Even ‘more’ tabbed pages**

Notice that within Figure 60 that the last tab on the lower line is another tabbed page labelled ‘More’. Clicking on this tab reveal the remaining tabbed pages for viewing the latter classes of geodetic objects.

![Table of CRSs](image)

**Figure 63: remaining tabbed pages**

- Coordinate Operation Methods
- Coordinate Operation Parameters
- Coordinate Axis Name
- Scope
- Naming Systems
- Change Requests
- Version History

To view any of the newly displayed tabbed pages click on that tabbed page and the contents will be automatically displayed within the table below. Figure 64 shows an example for the Naming Systems page.

![Figure 64: Naming System tabbed page](image)

### 5.3.2 Fewer tabbed pages

To reduce the number of tabbed pages displayed click on the ‘Fewer’ button and the pages displayed will be reduced back to the original six.

### 5.4 Nested searches

Following on from section 4.3: A nested search is described as a search that comprises more than one filter to create the criteria for object retrieval. The current syntax uses AND to link the elements of the nested search together. For example:

- NAD27 AND UTM AND [code]>26915

A nested search can be constructed using one or all the search techniques described in section 4, e.g. a text string (with or without wildcards) and a polygon, or a coordinate system type and a bounding box. Some examples of this are given:
5.4.1 Example One
The following example uses the text string search criteria only.

Enter the string into the box provided and click Go button to commence the first part of the search. The first search request will appear in the blue box as shown in Figure 66.

Enter a second text string into the box provided as is shown in Figure 67, e.g. UTM

After entering the second part of the search criteria click the GO button again and a search of the database will be conducted to find objects that match both parts of the search. Finally, the second search criteria will be added to the search list, e.g. Europe and UTM.

If required a third search criteria can be added to complement the two existing parameters. The example shown here uses the [code] search option.
Figure 69: Third search criteria

In this instance EPSG codes that are less than 23030.

Figure 70: Three search criteria used simultaneously

In this example the geodetic objects returned from the search criteria are shown in Figure 71.

Figure 71: Returned results

5.4.2 Example Two

This example will combine both the graphical search criteria and text criteria. First, select the Map Search function and then select from the point, box, or polygon search options. In this instance the polygon option is selected. Pan and zoom to the geographic area required and draw the polygon on to the background map as shown in Figure 72. When zooming and panning the search option must be set to None.
Once the polygon has been drawn click on Search button shown in upper left had part of user interface. The results of the search will be shown and at the same time notice that the first search option (polygon) will be displayed within the nested search list as shown in Figure 73.

Next, a text search will be added to the map search already defined. Into the text search box is added the second search criteria, e.g. India Zone.
To activate the search, click on the GO button once the text has been entered. The second search criteria will then be added to the search list as is shown in Figure 75.

Finally, a third search criteria is added as is shown in Figure 76, e.g. IIIa

As previously, click the GO button after entering the required text and the third search criteria will be added to the list as shown in Figure 77.

Once the search criteria have be run with the three items submitted the following results will be displayed in this instance.
5.4.3 **Reset search criteria**

The search criteria shown within the search database list can be reset in two ways:

1. To clear any of the individual items, click on that item with left hand mouse button and it will be deleted from the list, leaving the other two remaining. When an item is deleted the search criteria will be re-run using just the items that remain.

2. To clear all items within the list, click on the Clear all button shown in any of the recent figures and the cookie list will be deleted leaving no items in the search criteria.

5.5 **Data mining**

All the objects listed in the first column of the results panel act as hyperlinks and can be expanded to reveal further details of any of the retrieved objects in the table. An example is given for CRS Kalianpur 1880 / India zone IIIa. The details can be viewed in one of two ways:
1. In Figure 78 there is the following icon to the right of the object name: - if you click on this icon it will open the details of that object in a new window.

2. Alternatively, clicking on the object name the details of the object will be displayed in the current window, as shown in Figure 81.

![Figure 81: Open the object to view parameters and metadata](image)

The viewing panel has several key features:

- All text shown in blue can be further expanded to display additional parameters and parameter values associated with the sub-objects, e.g. Usage Details, Coordinate Systems, etc.
- Direct access to Change Request ID used to create or modify the object.
- Alias details.
- The provision of an on-line calculator, not available to Guest users (temporarily disabled).
- Export options to WKT and GML (see section 7 for further details).

To expand any of the data links place cursor over the blue underlined text and click once with the left-hand mouse key. For example, select the Base Geographic CRS, Kalianpur 1880.
As is shown in Figure 82, the expansion process with the various sub-objects can be continued as desired. Figure 83 displays the expanded details for the geodetic datum.

The Usage link is the new term introduced within the ISO 19111:2019 data model which now combines scope and extent. Scope is used to describe the expected usage of CRS. In this instance, it is Topographic mapping. Extent (formerly Area) is displayed using two polygons. The first, shown in dark blue in Figure 84, is known as the bounding box and is simply a four-point rectangle. The second is a more complex polygon shown by the orange area. Each extent contained within the database is given an EPSG code which is shown adjacent to the code label: 1307.
Finally, expand the Ellipsoid definition to show the parameters of the ellipsoid, as shown in Figure 85.

- To hide / collapse any of the sub-object definitions click on the red cross in the right-hand corner of the expanded panel.
- Also note that the metadata that accompanies each data level is displayed at the base of each of the panels.
Figure 86: Projection parameter definition, India zone IIIa

One further example is given for the projection parameters associated with this projected 2D CRS. To view these parameters and parameter values click on the conversion link shown in Figure 86.

Likewise, the details can be expanded to show information concerning the conversion method and units of measure associated with the parameter values. The Change ID link describes details of the changes of modifications made to the objects contained within the geodetic parameter registry.

Figure 87: Change ID details

The details within the Change Request are defined as follows:
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change ID</td>
<td>Unique identification given to the Change Request. Syntax is year number followed by the sequential Change Request made that calendar year. Therefore, this is the 18th request made in 2019.</td>
</tr>
<tr>
<td>Report Date</td>
<td>Date the request was made</td>
</tr>
<tr>
<td>Date Closed</td>
<td>Date the Change Request was completed</td>
</tr>
<tr>
<td>Reporter</td>
<td>Which person or entity reported the request</td>
</tr>
<tr>
<td>Request</td>
<td>Details of the request – what needs to be done in this Change Request</td>
</tr>
<tr>
<td>Action</td>
<td>What actions were conducted as part of the Change Request</td>
</tr>
<tr>
<td>Tables Affected</td>
<td>Any EPSG tables affected by the Change Request</td>
</tr>
<tr>
<td>Codes Affected</td>
<td>The EPSG codes of objects directly affected by the Change Request implementation.</td>
</tr>
</tbody>
</table>
6  Export functionality
Export functions are available for both individual objects and collection of objects.

6.1  Individual objects
To export data at an individual object level two file formats can be used, either WKT adhering to the ISO 19162:2019 specification or GML using the EPSG schema. In Figure 88 there are three icons in the upper right-hand corner.

![Figure 88: Export for individual objects](image)

Select the appropriate icon to export either the WKT or GML file formats. Examples of these file formats are given in Figure 89 and Figure 84, respectively.

<table>
<thead>
<tr>
<th>File type</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>WKT</td>
<td>2</td>
</tr>
<tr>
<td>GML</td>
<td>3.2.1</td>
</tr>
</tbody>
</table>
**WKT Version 2**

```
PROCRS["Timbalai 1948 / RSG Borneo (Tb4)",
  BAGEEGEOCS["Timbalai 1948",
    DATUM["Timbalai 1948",
      ELLIPSOID["Everest 1830 (1967 Definition)",0.377298.556,300.0017,
        LENGTHUNIT["metre",1,ID["EPSG",9001]],
        ID["EPSG",2062]],
      PRIMEM["Greenwich",0],
      ANGLEUNIT["degree",0.0174532925199432951589772,1,ID["EPSG",9100]],
      ID["EPSG",9020]],
    ID["EPSG",1234]],
  METHOD["Rectified Oblique Mercator (variant 8)",
    PARAMETER["Latitude of projection centre",4],
    ANGLEUNIT["degree",0.0174532925199432951589772,1,ID["EPSG",9100]],
    PARAMETER["Longitude of projection centre",135],
    ANGLEUNIT["degree",0.0174532925199432951589772,1,ID["EPSG",9100]],
    PARAMETER["False easting of initial line",53.310206472],
    ANGLEUNIT["degree",0.0174532925199432951589772,1,ID["EPSG",9100]],
    PARAMETER["False northing of initial line",1];5.99984,0,
    AXES["Unity",1],[ID["EPSG",9201]],
    PARAMETER["Easting at projection centre",1097263.64],
    LENGTHUNIT["metre",1],[ID["EPSG",9001]],
    PARAMETER["Northing at projection centre",1452947.58],
    LENGTHUNIT["metre",1],[ID["EPSG",9001]],
    ID["EPSG",1234]],

GML Document

```xml
<?xml version="1.0" encoding="utf-8"?>
<xml xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance" xmlns:gx="http://www.opengis.net/gml32">
  <gml:MultiSurface>
    <gml:properties>
      <gml:SimpleFeatureProperty>
        <gml:featureMember>
          <wkt:MultiSurface>
            <wkt:Polygon>
              <wkt:Ring>
                <wkt:LineString>
                  <wkt:Coordinate>
                    <wkt:Point/>
                  </wkt:Coordinate>
                </wkt:LineString>
                <wkt:LineString>
                  <wkt:Coordinate>
                    <wkt:Point/>
                  </wkt:Coordinate>
                </wkt:LineString>
                <wkt:LineString>
                  <wkt:Coordinate>
                    <wkt:Point/>
                  </wkt:Coordinate>
                </wkt:LineString>
                <wkt:LineString>
                  <wkt:Coordinate>
                    <wkt:Point/>
                  </wkt:Coordinate>
                </wkt:LineString>
              </wkt:Ring>
            </wkt:Polygon>
          </wkt:MultiSurface>
        </gml:featureMember>
      </gml:SimpleFeatureProperty>
    </gml:properties>
  </gml:MultiSurface>
</xml>
```

**Figure 89: WKT version 2**

**Figure 90: GML file format**
6.2 Multiple objects

Data can be exported from the database from the following location:

![Download datasets](image1)

*Figure 91: Download datasets*

Select the Download Dataset option from the menu shown in Figure 91.

6.3 Download Dataset

Currently, the entire database can be exported to the following formats. Having clicked on the Export Database button a panel like the one shown in Figure 92 will appear.

![EPSG Dataset Download](image2)

The files downloadable from here are for the latest full release and do not include any subsequent interim updates that may have been included in the online registry.

- **EPSG MS Access**
  - EPSG_v10.9.0_3.zip

- **Oracle SQL Scripts**
  - EPSG-ORACLE_SQL-export-9.8.3.zip

- **MySQL Scripts**
  - EPSG-MySQL-export-9.8.3.zip

- **PostgreSQL Scripts**
  - EPSG-PGSQL-export-9.8.3.zip

- **GML 3.2.1 with EPSG metadata**
  - EPSG-GML-Dictionary-9.8.3.zip

- **WKT (CRS and Transformations)**
  - EPSG-WKT-export-9.8.3.zip

The SQL scripts are in UTF encoding, as well as Well-known Text (WKT) in compliance with ISO 19115, are available from the online registry rather than this page.

**Previous Releases**

Previous release of the EPSG dataset and supporting files can be obtained from the Archives section.

**Notes regarding download of zip files**

1. The files are zipped using WinZIP. If the default decompressor on your computer is WinRAR instead of WinZip, then you may have to manually change the name of the database from "epsg_v8_0" to "epsg_v8_0.zip" in order to subsequently unzip it to an mdb. Or you could right-click the "I agree" link on the web page instead of left-click, and then to "save target as", and then it will save as a .zip.
2. If you use Internet Explorer and are told that the downloaded ZIP file is corrupt, please follow the instructions at [http://kb.winzip.com/kb/entry/150](http://kb.winzip.com/kb/entry/150) to change your Internet settings to disable HTTP 1.1 and delete temporary Internet files, then download the file again.

*Figure 92: Export the database*
In each instance the exported file will be compressed into a zipped format.

### 6.3.1 EPSG MS Access

This download will allow users to work with the EPSG Microsoft Access database. Simply open the zipped file to access the file EPSG_v_10.000beta, in this instance the 30th April 2020 release.

![Figure 93: EPSG MS Access database file](image)

### 6.3.2 Oracle export

From the menu provided select the Oracle option (Figure 92). The application will return a zipped file, which when completed will show an icon like the one in Figure 94.

![EPSG-ORACLE_SQL...ZIP](image)

**Figure 94: Oracle database zipped file**

The downloaded file must be unzipped using one of the standard zipper applications. Once unzipped the following four files should automatically appear within the selected sub-directory.
6.3.3 **MySQL Scripts**

From the menu provided select the MySQL Scripts option. The application will return a zipped file to the directory selected. When the zipped file is opened the following four files should be available.

![Figure 95: Oracle database files](image)

![Figure 96: MySQL script files](image)

An example from the top SQL file is shown in Figure 97.

```sql
```

![Figure 97: MySQL script example](image)

6.3.4 **PostgreSQL scripts**

From the menu provided select the PostgreSQL Scripts option. The application will return a zipped file to the directory selected. When the zipped file is opened the following four files should be available.
An example of the data file is shown in Figure 99.

```sql
INSERT INTO epsg_coordoperation VALUES ( 1171, 'WAD89 to WGS 84 (2)', 'transformation', 4267, 4326, 'OMA-Gem Am', 3, 2419, 'For military purposes only. Accuracy 8m, 3m and 5m in X, Y and Z axes.', 10, 9603, Null, Null, 'Derived at 19 stations.', 'U.S. Defense Mapping Agency TR8350.2 September 1987.', 'OGP', '2014-11-19', '2005.200 2014.058', 1, 0 );
```

Figure 99: PostgreSQL script data file

## 6.4 Archive

Previous versions of the EPSG Dataset remain publicly available in the four different formats indicated. MS Access versions are available from EPSG v5.3, MySQL versions from EPSG v6.4, and Oracle and PostgreSQL versions from EPSG v6.7. To download an archived version, click on its link.
Each release has associated release notes. To view these, click on the link shown within Figure 100.

Figure 100: Archive file available

Figure 101: Release Information History
6.5 Printing reports

To print reports for specific objects shown within the results panel, place a tick in the box to the left of the object name(s). Next, click on the Report Selected Results button (shown in the red ellipse).

![Figure 102: Print report for specific object](image)

When completed a panel like the one in Figure 103 will appear.

![Figure 103: Report panel](image)

Two options are provided to create either a summary report or a detailed report. The summary report omits aliases and metadata. Click on the appropriate radial button, e.g. Summary Report. Next, enter a title into the text box provided (an entry is required). Finally click on the Generate button to create the report. The report is generated within a separate window to the website.
Use the standard Windows options to either Save or Print the report. To access this menu right click within the page area.

Repeat the process to generate the Detailed Report as required.
6.5.1 Printing from object view

When viewing the object panel from the results table (e.g. Figure 88) there is another print option shown within the upper right-hand corner of that panel (Figure 107).

Click on the print icon on the right side and a new panel will appear with the Summary Report being displayed.
On the right-hand side of the panel select the parameters required to print the report. This includes file type (e.g. PDF), pages, page layout, page size etc.

6.5.2 Export to spreadsheet
The results panel provides another export function where details of the objects displayed within the tabbed pages can be exported to an Excel spreadsheet. Click on the Export button to the right of Search Results (xx objects found).
An example of an exported spreadsheet is given in Figure 109. The columns shown in the spreadsheet are identical to those within the application.

**Figure 109: Export results to Excel Spreadsheet**

![Export results to Excel Spreadsheet](image)

**Figure 110: Exported spreadsheet**

![Exported spreadsheet](image)
END OF DOCUMENT