Coober Pedy PPSF with NT Map

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2 OUTLINE AND PURPOSE

This document is a draft manual for the online Coober Pedy PPSF with NT map available from https://maps.zgus.com/cp that is location aware and has zoom level aware.

From the perspective of a stakeholder or potential stakeholder around Coober Pedy the maps provide useful information, both offline and online. Many parts around Cobber Pedy have 4G and 3G mobile access, so even without use of an offline portable server the online map can still be used,

From the perspective of ZGUS, the purpose of the online map is to act as a demonstration that convenient, useful and high quality online map resources can still be used in the field on a mobile phone or computer without Internet access. This is because one of the basemaps and all the layers can be loaded onto an inexpensive and robust portable server. Such a portable server can also provide many useful additional services.

2.1 Document

This document is available from maps.zgus.com/cp/documents/map_coober_pedy_ppsf_nt.pdf

2.1.1 Author

ZGUS, zgus.com

2.1.2 Version History

0.1g 27 August 2018. Notes on additional software required for use with Microsoft Edge
0.1d 6 August 2018. Example notes on laptop use. Transparent layers fix for Microsoft Edge browser.
0.1 1 February 2018

2.2 Technical Summary

Currently GNSS (GPS etc) location level aware maps at maps.zgus.com/cp are rendered on selected web browsers in Android and Windows 10 if permission is granted. There is a choice of base maps that can be used, and various layers can be turned on or off that show relevant information. A mouse pointer or touch can be used to show coordinates. When location is enabled your current location coordinates are displayed. The current version does not record tracks. The maps are for all of Australia. There is additional information around the Coober Pedy area that can be selectively and transparently overlaid.

2.3 Browsers

Current tested browser for Android is Goggle Chrome. Current location aware tested browser for Windows 10 is Microsoft Edge, when a location sensor is enabled or plugged in and additional software is downloaded. While Windows legacy browser Internet Explorer will work, there are issues with display. In Windows 10 the current release version of Goggle Chrome will not work with location sensors, their most accurate locations are only determined from known locations of continually broadcast WiFi MAC hardware addresses. This is not practical in remote locations.

2.4 Location Devices with Windows

For Android a GNSS (GPS etc) location sensor must be present and enabled. In addition, a direction (compass) sensor adds convenience and stops maps rotating when stopped. However auto rotation can be turned off from map display.

In Windows 10 PCs, tablets, laptops and notebooks it is rare a GNSS (GPS etc) location sensor is included and even rarer for a direction (compass) sensor to be included. However inexpensive GNSS (GPS etc) location sensors that plug into a USB port are inexpensive, well under US$10 online. For example search under term GMOUSE in www.aliexpress.com. These devices all appear to use a u-blox 7 receiver and require u-center GNSS evaluation software to be downloaded from https://www.u-blox.com/en/product/u-center and installed. The software does not need to be run, just installed. Drivers do not need to be installed as plugging in the GMOUSE device beforehand automatically acquires the correct driver, making the extra requirement of additional software installation appear odd.

Testing with Windows 10 is recent. GNSS updates using Edge in Windows is currently not as reliable as with Chrome in Android, reloads may be required in Windows 10. The reason for this has not been investigated yet. However the Microsoft Store ‘Maps’ app is reliable with the above sensor and software. Both Edge and Internet Explorer in Windows use the windows location service. They require location services to be enabled. The additional software enables the u-

block 7 to provide its data to the location service. Google Chrome in Windows does not use this location service from Windows.

Installation of u-center software may result in unrelated odd problems. For example after installation of u-center and insertion of GMOUSE a SDHX drive mounted through VeraCrypt consistently unmounted and could not be remounted for the duration the GMOUSE was plugged in.

2.5 PHONE OR LAPTOP?

Examples below are for use with a mobile phone. However on long journeys, particularly with a portable map server usable with a phone and laptop, it can be more convenient to use a laptop instead. Mobile phone displays are not designed to have their display left on for extended periods of time. Mobile phones in cars on long journeys can be troublesome in heat and batteries run down. Charging may not keep up and/or air conditioning may be required to keep a mobile phone from overheating by clipping charging phone to an air vent outlet.

2.6 GENERAL INFORMATION

We are trying to keep this manual as visually oriented as possible. This section is for information that is of a more general nature. Launching

The map URL https://maps.zgus.com/cp can be bookmarked. On a mobile phone it can be added to home screen and so launched like an app.

The documentation URL maps.zgus.com/cp/documents/map_coober_pedy_ppsf_nt.pdf is best used to download file for storage and viewing in a suitable app. The file cannot be viewed embedded in a web page on a mobile phone, but a web page can launch an app for viewing.

2.7 ZOOMING AND PANNING

There are multiple ways of zooming in and out of maps Can also zoom on a mobile phone with two fingers on a mobile phone or with scroll wheel on a mouse

Maps can be panned with one finger on a mobile phone or with left mouse button.

2.8 BASEMAPS

Basemaps are prevented from showing above the maximum zoom levels. Layers can be shown above the maximum zoom level of any basemap by turning off basemaps. If you switch to another basemap that has a lower maximum zoom level to the zoom level of basemap currently on display, then the new basemap will zoom out to its maximum zoom level. Basemaps tend to be more reliable at lower zoom levels.

2.9 SECURE URLS

Using non-secure URL http://maps.zgus.com/cp will redirect to secure URL https://maps.zgus.com/cp. Without this a mobile phone will not allow you to use location services. Most of the base maps are loaded with a secure URL. Some cannot be. Your browser may show you a warning about this.

2.10 ON SCREEN CONTROLS

On screen controls are documented visually in Screens section next. The map location of where screen is touched is shown unless a control that can be hidden is touched (clears location). For controls that are not hidden the location is not cleared, in fact it is updated to where the control is. If you are using the touch location feature you will hardly want this. Consideration will be given to removing this behavior.

2.11 Location Services

Requires use of GNSS location services to achieve accuracy under 5 meters. Typically uses GPS. May also use GLONASS, BEIDOU and GALILEO if available on your phone. Shaded accuracy circle will show which will diminish in size if a GNSS service is used. If GNSS is not used, then accuracy circle will be large and may center on a mobile phone tower location or the centre of a town. A dot also show that may not align with the centre of the accuracy circle but should always be somewhere inside the accuracy circle. This dot is based on an average and should show less drift than the centre of the accuracy circle. This manual does not demonstrate these services as the service is not much different to the experience of using typical location aware map services available on a mobile phone. This also includes the possible experience of random rotation of maps when not moving (more information below, including how to stop it).

If you do not want to be centered on your location but do want your location coordinates to be shown, then turn off 'Centre on Current Location' but turn on 'Update Current Location'.

If you press 'Coober Pedy PPSF Extent' and 'Centre on Current Location' is on, then centering will be turned off. You can turn it on again.

2.12 Mobile Phone Compass Calibration

If you phone has a compass sensor then keeping your phone in a pocket in a car where there is lots of metal as well as travelling through areas where there are magnetic anomalies is going to affect compass calibration. Unfortunately, mobile phones do not raise an alarm if the compass has lost its calibration and it can be frustrating to know why the map on your phone does not rotate evenly or is so evidently pointing in the wrong direction. Fortunately, it is easy to fix. Just get outside the car and walk a few meters away from car into a clear area. Point the phone flat (horizontal) away from your body. Rotate the phone three times around three of its orthogonal axes in turn (nine rotations in total). For convenience these orthogonal axes can be the long horizontal axis, the short horizontal axis and the vertical axis (example image to be provided). The rotations do not have to be completely accurate about an axis. Only needs to take about five seconds in total. Do a cross check with a real compass or from making an assessment where North is from the position of the sun and the time of day (the sun is East at dawn, North at midday and West at dusk) and hope you are not in an area with magnetic anomalies. If you are not still sure then start a brisk walk in a straight line so you can let the phone use GNSS location changes to determine where North is on a mobile phone map app that has access to offline maps and allows maps to rotate.

3 Glossary

Most new terminology is explained in visual section alongside images of maps with controls overlaid.

Openlayers: Software library, that downloads to your browser, used to display maps, layers and controls with additional code written by ZGUS

OSM or OpenStreetMap: The source of raw data for the OSM Local Server Maps as well as the provider of some of external maps services

SA Government: South Australia Government

NNTT: National Native Title Tribunal. an independent statutory body established under s 107 Part 6 of the Native Title Act to assist people to resolve native title issues. The Tribunal has a number of powers and functions under the Act with regard to mediation, to arbitration and to ILUA negotiation.

AusTopo: Australian Topographic basemap provided by Geoscience Australia.

Google Map: Provider of map service with satellite imagery

Opal: a gemstone consisting of a quartz-like form of hydrated silica, typically semi-transparent and showing many small points of shifting colour against a pale or dark ground.

Mullock: waste material generated while searching for minerals or while mining, such as when sinking a shaft. Appears white in satellite imagery of Coober Pedy PPSF. Appears on the ground in heaps near abandoned shafts that are rarely covered.

PPSF: Proclaimed Precious Stones Fields. A legislative term defining an area around Coober Pedy where there are comparatively straightforward and administratively simple rules to govern Opal prospecting and mining

Coober Pedy: Coober Pedy is a town in northern South Australia, 846 km (526 mi) north of Adelaide on the Stuart Highway. According to the 2011 census, its population was 1,695 (953 males, 742 females, including 275 indigenous Australians). The town is sometimes referred to as the "opal capital of the world". Coober Pedy is renowned for its below-ground residences, called "dugouts". Coober Pedy has a desert climate.

NT: Native Title. A difficult term to grasp. Despite much scholarly analysis the origin and so subsequent practice of NT in an Australian law context is firmly rooted in common law legal process where law and how law is practiced at an administrative level is difficult to separate, something which is difficult for legal scholars to recognise and accept. NT legislation was enacted because of findings of fact by judges that overthrew 200 hundred years of assumed fact and legislative process that failed to follow due common law process (essentially the Crown cannot just claim land by a one-sided declaration and then record nothing). See also 'Native Title Rights and Interests' term below.

Native Title Rights and Interests: The communal, group or individual rights and interests of Aboriginal peoples and Torres Strait Islanders in relation to land and waters, possessed under traditional law and custom, by which those people have a connection with an area which is recognised under Australian law (s 223 NTA).

ILUA: Indigenous land use agreement, a voluntary, legally binding agreement about the use and management of land or waters, made between one or more native title groups and others (such as miners, pastoralists or governments).

Native Title Determination: A decision by an Australian court or other recognised body that native title does exist or does not exist. A determination is made either when parties have reached an agreement after mediation (consent determination) or following a trial process (litigated determination).

AMYAC: Refers both to AMYAC Corporation and to Antakirinja Matu-Yankunytjatjara People. Signatories to ILUA referred to by SA Government as providing "certainty for opal mining operations in Coober Pedy and meant it was business as usual for opal miners". Extract of ILUA with relevant maps are available online.

Arabana: Arabana people, traditional owners east of PPSF.

Breakaways: Kanku-Breakaways Conservation Park, owned and co-managed by AMYAC people. Covers almost 15,000 hectares and includes flat-topped mesas and landscape features identified as other planetary in appearance. The area is home to almost 60 native flora species and a variety of wildlife.

WPA: Woomera Prohibited Area. Under Dept of Defence control. Covers most of PPSF. Additional permission required to access for Opal prospecting and mining purposes. The WPA Coordination Office is aware the WPA is highly prospective (not just for Opal) and expects potential development in excess of $35 billion in next decade.

4 SCREENS

Information is overlaid on the map.

4.1 OPENING SCREEN

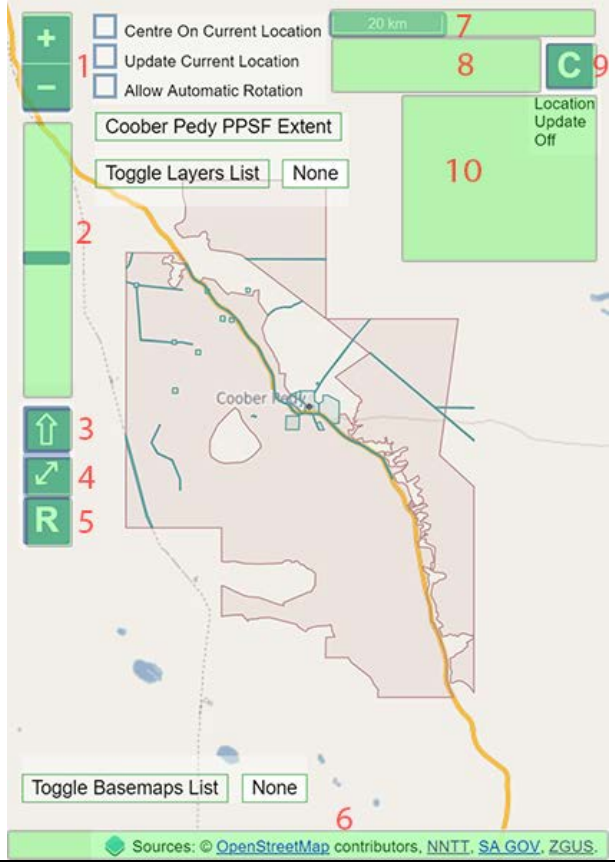
This is the screen that shows in a web browser on

1. Using URL maps.zgus.com/cp
2. Refreshing web page
3. Clicking on refresh button 'R'. This button also requests browser to bypass browser cache

Below is information on the controls displayed, how to display more controls and how to hide controls

4.2 OPENING CONTROLS THAT CANNOT BE HIDDEN

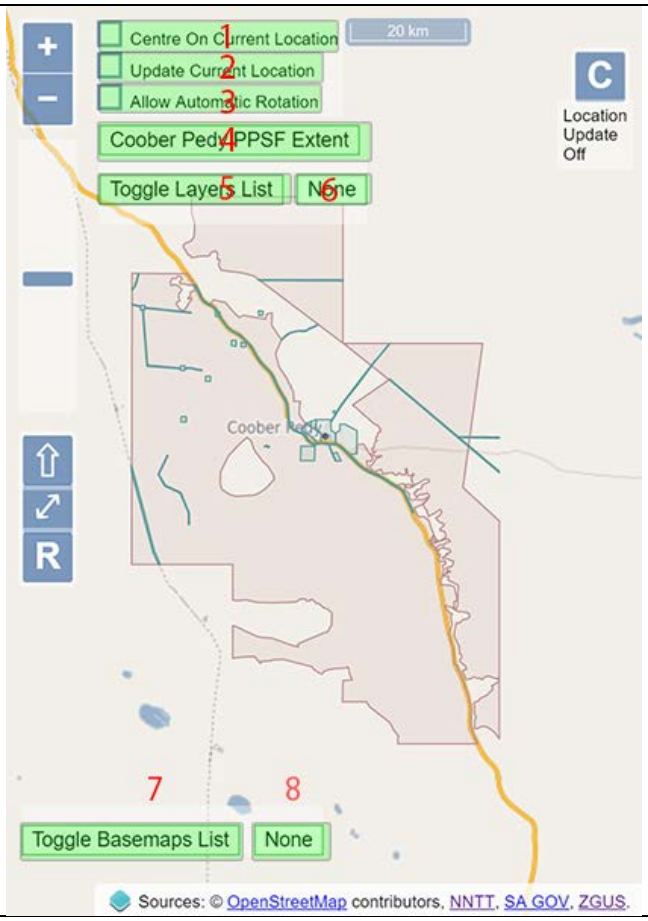
1. Press **+** to zoom in, **-** to zoom out
2. Zoom slider control that can use finger or mouse. Highest zoom at top, You can glance at this slider to see if a new basemap has a higher zoom range. If so the zoom slider thumb will shift down slightly
3. Rotates map to North vertically if you shifted rotation manually with two fingers or if there was automatic rotation
4. Maximise screen. Press again to reverse
5. **'R'**. Reset or refresh, reloads as if map URL just entered, Bypasses browser cache
6. Source information. URLs can be clicked
7. Map scale
8. Location coordinates where screen touched appear here (unless at area of control that can be hidden).
9. **'C'**. Hide the controls that can be hidden. Press again to make them reappear
10. When location services are tuned on location information appears here



4.3 Opening Controls that can be hidden

These controls can be toggled on or off by pressing **'C'**.

1. Use location services and centre on your location.
2. Show location information but do not centre on location.
3. Allow automatic rotation. Even if your phone does not have a compass it is useful to turn on when moving. If you are stopped and your phone has a calibrated compass then may work. If your phone does not have a compass, then leave this off when stopped to stop map randomly rotating
4. Resets map to initial included Coober Pedy PPSF extent. PPSF is the SA Government legislatively defined 'Proclaimed Precious Stones Fields'.
5. Toggle layers list on or off
6. Stop all layers from showing and show list of available layers
7. Toggle basemaps list on or off
8. Turn off all basemaps and show basemaps list



4.4 Screen display when controls that can be hidden are hidden

These controls can be toggled on or off by pressing **'C'**.

Note that layer controls are now invisible, the layers that the controls turned on are visible

Same applies to basemaps. The turned on basemap still shows but its control for switching is not visible.

When controls that can be hidden are touched the touch location below the scale bar is cleared

When controls that are not hidden are touched, such as the **'C'** button, currently the location underneath the map (of where the button was pressed) is shown. If you are using this touch location feature, then you need to be aware of this.

4.5 LAYERS LIST TURN ON

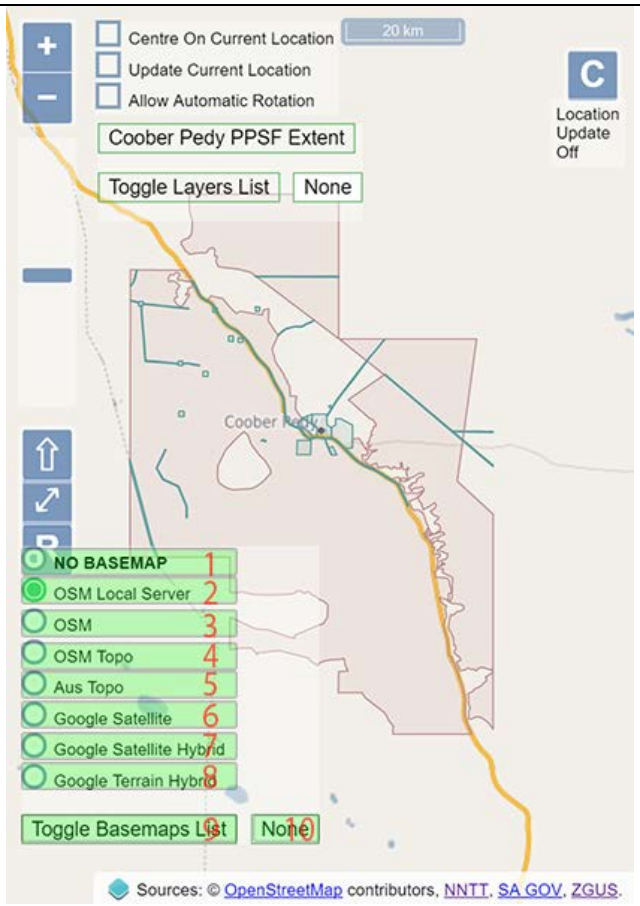
1. Use button to toggle the list of layers on and off
2. Use to turn all layers off and to display the list of layers to turn on a new set of layers. After turning on the what layers you want you can press the layers list toggle button to make the list invisible or press **'C'** to make the list invisible
3. Turn on or off the SA Government legislatively defined 'Proclaimed Precious Stones Fields' (PPSF) layer. The area includes a small excluded inner area in the south.
4. Turns on or off SA Government legislatively defined 'Main Working Area' (MWA) that restricts claims to individual miners (no corporations), restricts size, restrict types of claims and numbers of claims compared to outside the MWA but inside the enclosing PPSF
5. Turn on or off the SA Government defined 'Mining Act Reserved' area layer. The largest bulk is Coober Pedy town, but it includes areas all over the PPSF.
6. Turns on or off the Australian Federal Government legislatively defined 'Woomera Prohibited Area' (WPA). Formal permission is required to do anything other than travel through this area.
7. Turns on or off AMYAC Native Title Indigenous Land Use Area A layer. Within this area mining operations may be carried out unless Aboriginal objects or remains are identified. Processes in section 7 of the Acceptance Deed must then be followed.
8. Turns on or off AMYAC Native Title Indigenous Land Use Area B layer. No mining operations may be carried out in this area.
9. Turns on or off AMYAC Native Title Indigenous Land Use Breakaways layer. This is now a co-managed Conservation Park. No mining operations may be carried out here.
10. Turns on or off part of Arabana Native Title Indigenous Land Use layer that is included within PPSF. There are no specific mining clauses in the agreement.
11. Some tracks around traditionally more popular areas. Incomplete. Areas west of Stuart Highway tend to be kinder to tires due to absence of dried up and sharp tree and bush stumps. Tracks can be observed on satellite basemaps. Trying to take short cuts through areas without tracks is not advised as they can be boggy.
12. Paved roads, not including Coober Pedy town.
13. Historically significant, informally named (no legislative definition) Opal Surface Working Areas. More informally known as opal fields. Names appear when map zoomed in sufficiently
14. Force all names of opal fields to appear, no matter what zoom area is when opal fields layer is turned on
15. Dog fence within PPSF
16. Renewable energy area defined within an ILUA for solar cell arrays and wind towers. Currently two towers erected.

4.6 BASEMAPS LIST TURN ON

On a mobile phone It can be confusing if both the layers list and basemaps lists are turned on together as they overlap. Just turn one of the lists off if necessary with its toggle button

On field portable server version, when there is no Internet access, only 'OSM Local Server' basemap is available

1. No basemap shown. Can keep zooming in on layers if on and can hide confusing detail from base maps
2. OSM Local Server. Australia only basemap served from same server as maps.zgus.com that serves layers. Used to simulate a portable server in field when there is no Internet access.
3. OSM. Normal OpenStreetMap sourced basemap
4. OSM Topographically themed version of OpenStreetMap
5. AusTopo: Geoscience Australia Australian Topographic Map service. Some opal fields are outlined. Possibly generated from larger collections mullock heaps visible from satellites.
6. Google Satellite. A usually reliable service.
7. Google Satellite Hybrid
8. Google Terrain Hybrid
9. Use button to toggle list of basemaps on and off
10. Same effect for item 2 in page above for basemaps

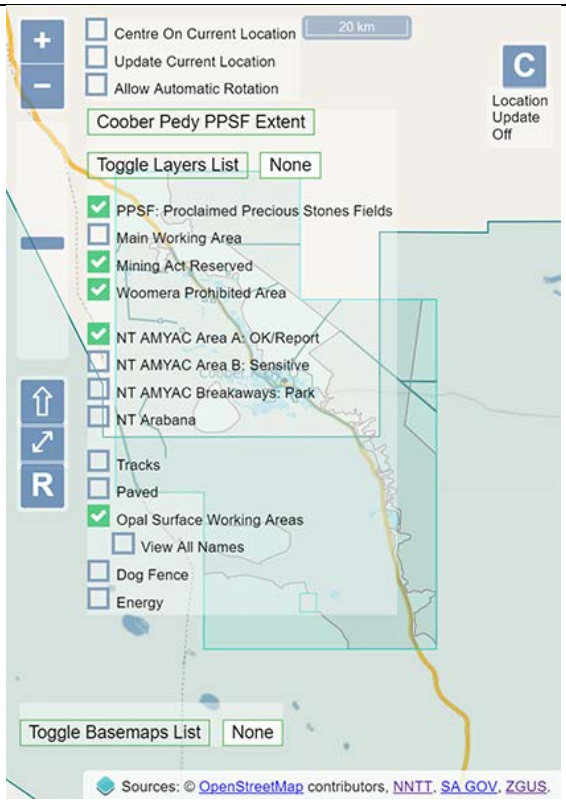


4.7 EXAMPLE WITH FIVE LAYERS TURNED ON

Five layers are shown turned on: PPSF, Mining Act Reserved, AMYAC A, opal fields.

The layers can be turned on or off one by one to immediately identify where each layer covers.

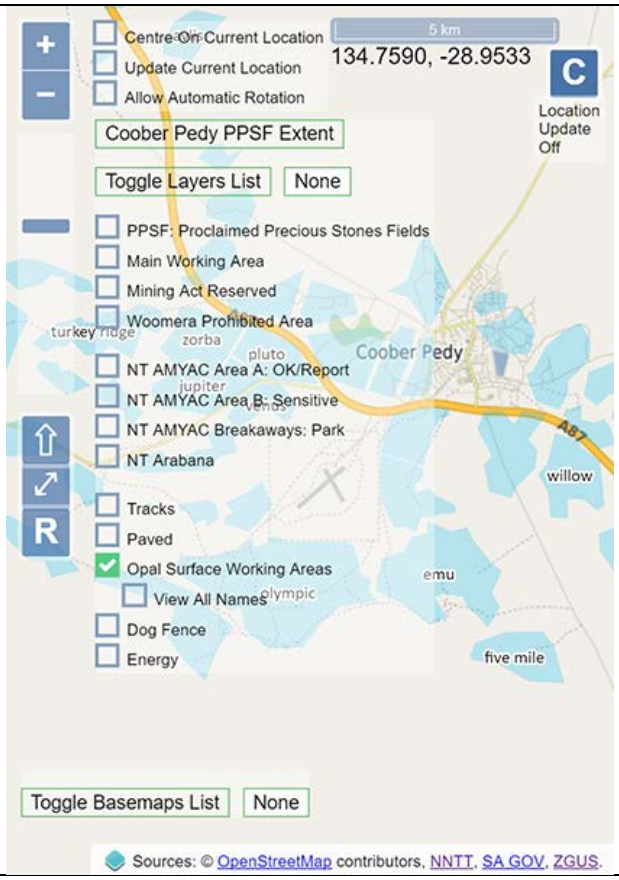
Remember the layer list can be hidden with the toggle layer list button or with **'C'** button.



4.8 EXAMPLE OF HOW TO JUST SHOW CENTRAL OPAL FILEDS

Zooming into around Cobber Pedy and turning on 'Opal Surface Working Areas' shows where most of the opal fields are concentrated in blue.

Names of fields are shown within fields, if they fit. All names can be shown at once if 'View All Names' is clicked.



4.9 EXAMPLE AS ABOVE SHOWING CENTRAL OPAL FIELDS WITH CONTROLS HIDDEN

Pressing **'C'** button excludes most controls. Press again to reshow.