



The Coal
Authority

Neath Port Talbot County Borough Council: Mine Water Heat Opportunities

July 2024



Making a **better future** for people
and the environment **in mining areas**

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Executive summary

Coal mining has taken place in the Neath Port Talbot area since the 17th century with the last mine to close being Tower in 2008. Considerable areas of the borough are underlain by coal mine workings, with multiple seams being worked in many localities. The presence of mine workings combined with knowledge (where available) of recovered mine water levels are used to provide a very high level assessment of the potential for exploring the development of open loop mine water heat projects in the borough.

The workings vary considerably in depth, being relatively shallow at the northern part of the borough where the shallowest workings in the uppermost seam are <75m BGL (below ground level) and in some areas such as Onllwyn have been exploited by surface (opencast) mining which has removed much of the workings. The strata and associated coal seams and workings dip to the south-southeast with the deepest seam workings reaching around 900m BGL to the north west of Maesteg before rising again towards the southern outcrop of the coal measures north of the M4 motorway. The presence of numerous 'gravity discharges' in the Neath Port Talbot CBC area together with the long period since the mines closed suggests that mine water has largely recovered.

The potential for accessing the mine workings by **drilling new boreholes** and extracting the 'warm' mine water is assessed by reference to criteria set out in the overarching report and classified as having 'good', 'possible' or 'challenging' potential. Good potential exists in a small number of heavily populated areas as listed as 1 to 4 in table below where a combination of viable drilling depths and mine water recovery suggest that further detailed assessment would be beneficial. The area stretching from north Neath to Bryncoch is of particular note.

There are seven Coal Authority **mine water treatment schemes** in Neath Port Talbot CBC area of which three may offer possible opportunities due to their proximity to built-up areas and potential heat loads. These are listed as 5 to 7 in table below.

There are many '**gravity discharges**' where mine water is emitting at surface. This mine water may offer potential for mine water heat without the cost and risk of drilling and pumping. A selection of the larger discharges have a heat potential of over 0.5MW_{th} however only Cymmer, listed at 8 in the table below, is included in the summary table below as it is close to a built up area and considered a realistic prospect.

Mine water heat opportunities in the Neath Port Talbot CBC area

No./ Area	Opportunity name	Opportunity type	Category	Potential MW _{th}
1	Neath north /Rhydding/Bryncoch	Borehole scheme	Good	Subject to further testing
2	Seven sisters	Borehole scheme	Good	Subject to further testing
3	Ystalfera	Borehole scheme	Possible	Subject to further testing
4	TATA	Borehole scheme	Possible	Subject to further testing
5	Glyncastle	Treatment scheme	Possible	0.3 to 0.4
6	Whitworth No.1	Treatment scheme	Possible	0.1*
7	Whitworth A and B	Treatment scheme	Possible	0.5 to 0.8*
8	Cymmer	Gravity discharge	Possible**	3 to 0.5

* Whitworth No.1 and A and B may potentially be combined to deliver 0.6 to 0.9MW_{th}.

** For gravity discharges:

- **Good** means heat potential 0.5MW and above with uncomplicated capture and uncomplicated heat transfer.
- **Possible** means heat potential 0.5MW and above with complicated capture or complicated heat transfer.
- **Challenging** heat potential 0.5MW and above with complicated capture and complicated heat transfer.

1 Introduction

The area covered in this section is the whole of the Neath Port Talbot County Borough Council (CBC) administrative boundary, within which the presence of mine workings combined with knowledge (where available) of recovered mine water levels are used to provide a very high level assessment of the potential for exploring the development of open loop mine water heat projects.

1.1 Geographic summary

Neath Port Talbot covers an area of approximately 452 km², and is approximately 30 km north-south and 18 km west-east. Urban areas within the district include; Neath, Port Talbot, Pontardaw, and urban areas along the Neath, Tawe, and Afan valleys. Elevation in Neath Port Talbot ranges from sea level up to about 450 mAOD.

2 Geological Summary

The solid and superficial geology, along with seam information has been ascertained by consultation of the available British Geological Survey records including:

- Online GeoIndex viewer;
- Online geological memoirs;
- Online geology maps (Sheets 230, 231, 247 and 248 for Neath Port Talbot area); and
- Borehole and mine shaft scans across the area of interest.

2.1 Solid geology

Virtually the whole of the Neath Port Talbot administrative area is on the exposed coalfield, the central part consisting of the South Wales Upper Coal Measures, which consists of interbedded mudstones, siltstones, sandstones and coal with some ironstone beds.

2.2 Structural geology

The general structure of the geology is in the form of a large synclinal basin which results in the extreme northern and southern fringes of the area being underlain by the South Wales Middle Coal Measures (**Figure 2.1**).

The area is heavily influenced by geological two major geological disturbances. The Neath disturbance, which trends in a southwest to northeast direction from Neath through Resolven to Glyn-neath. The Tawe Valley disturbance, also trends southwest to northeast, from Swansea through Pontrdawe to Ystradglynis. The disturbances have resulted in a zone of heavily fractured and faulted strata, with large displacements that form a clear delineation between mined areas.

A large number of faults are present which are roughly perpendicular to the main disturbances described above. These also in many cases represent a delineation between mined areas.

Regional solid geology and selected structural geology is shown in **Figure 2.2**. The stratigraphic sequence, approximate depths and noted shaft sections are shown in **Figure 2.3**.

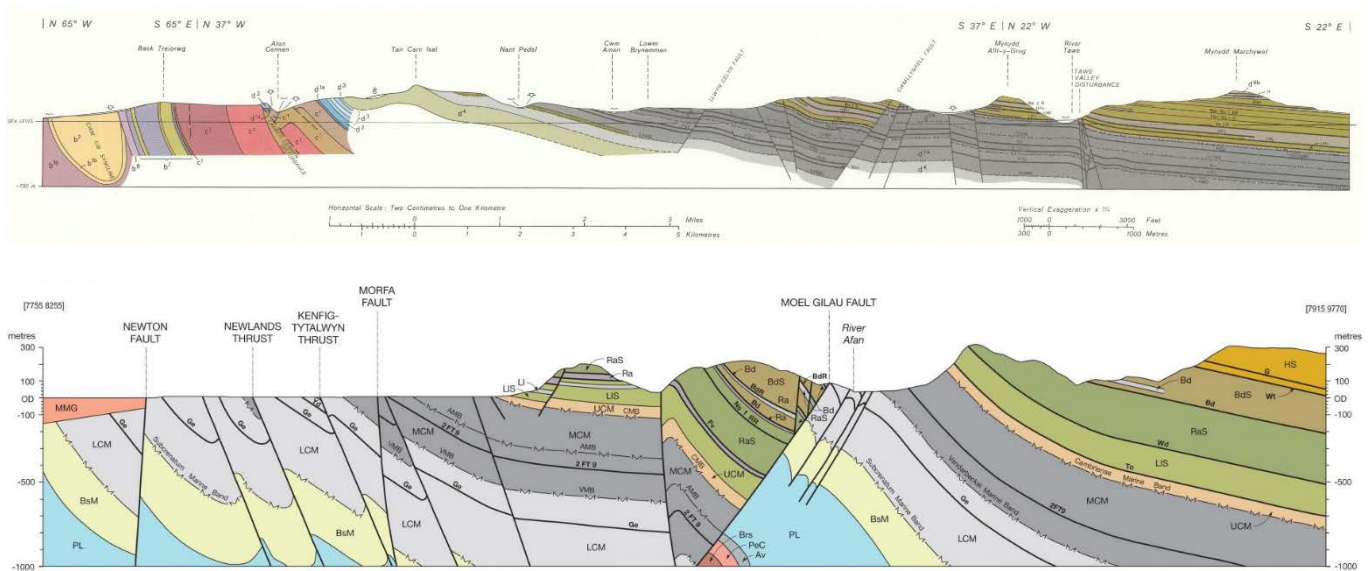


Figure 2.1. Regional geological cross sections from north to south. Sources: [Geological Sheet 230 Ammanford](#) (top) and [Geological Sheet 247 Swansea](#) (bottom)

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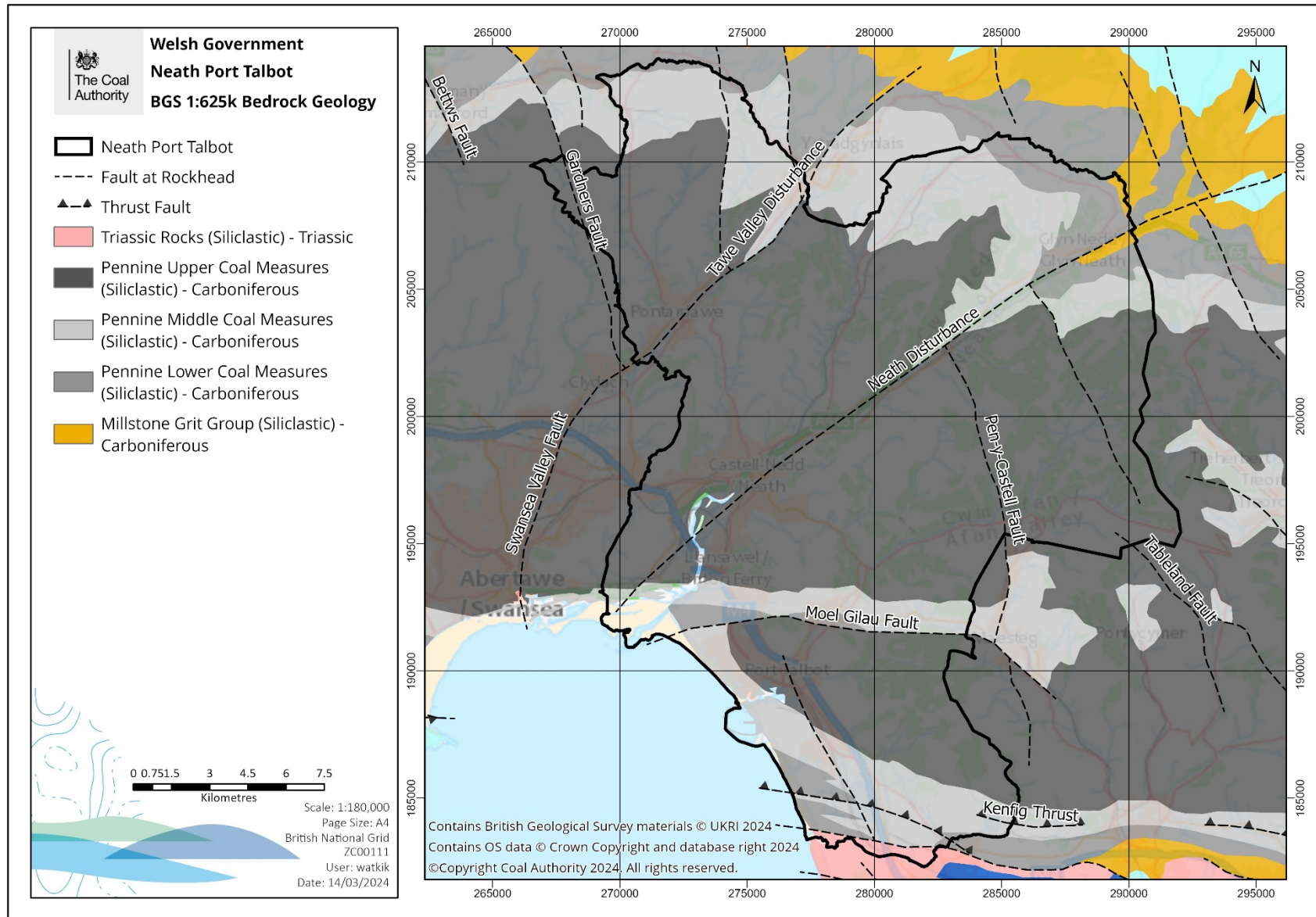
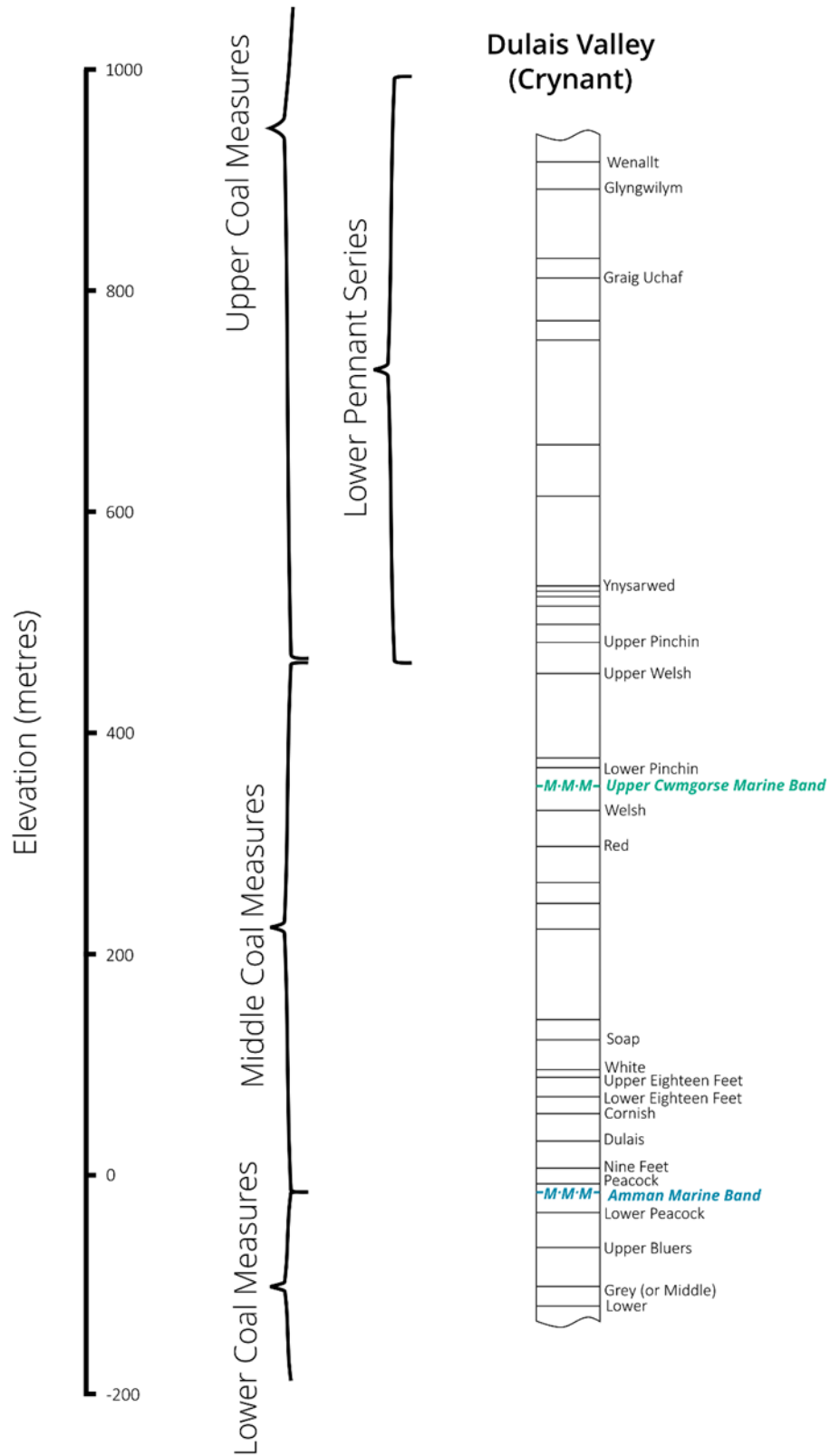


Figure 2.2. Bedrock Geology in the Neath Port Talbot area



Adapted from Figure 2 from "Overview of the South Wales Coalfield" report reference A031899-2 by White Young Green 2007

Figure 2.3. Summary stratigraphy and geological sequence for the study area

3 Mining situation

The coal mining geometry in Neath Port Talbot is complex with at least 43 recorded seams being worked within the area, albeit not all seams throughout all of the area. The presence of major geological disturbances and faulting has resulted in many discrete areas of mining which are referred to as mining blocks (which are also referred to as mine water blocks, which are covered in more detail including the hydrogeological connotations in **section 4.1**).

While 43 seams were worked in the area, only a few of these became the mainstays of coal production in the area, due to their thickness and coal quality. These main worked seams were often very extensively worked in localised areas rather than across the whole of the administrative area.

The most extensively worked areas are:

- Two bands of workings in multiple seams are present at the western extremity of the administrative area, one extending from Neath town to northeast of Pontardawe.
- A large area of multi-seam working in the north-eastern part of the borough. This area is to the north of the A465 highway and extends from Glyn-neath in the east to Treforgan and Creunant in the west.
- A further large area of multi seam working at the eastern extremity of the borough to the south of the A465.

Following colliery closures and end of mines in the 1980/90s, several mines were lost due to flooding. With the exception of Aberpergwm Colliery which re opened in 2018, the final collieries (some of which had merged to become complexes) to close are set out in **Table 3.1**.

Table 3.1: List of most recent colliery closures

Colliery	Closure date	Connected underground to
Treforgan	1985	Not confirmed
Blaenant	1990	Cefn Coed, Ynysarwed via strata
Tower	2008	Maerdy; Fernhill
Garw/Ffaldau	1985	Wyndham/Western; International; St John's (with stopping); Avon
St Johns	1985	Coegnant; Garw (with stopping)
Western/Wyndham	1984	Garw / Ffaldau

Note: a detailed assessment of underground mining connections is required to confirm the mining hydrogeological conceptual model(s)

4 Mine water regime

4.1 Description of mine water blocks

Workings in the South Wales Coalfield were previously studied and divided into a number of blocks where workings, due to the presence of significant geological disturbances, tend to be in discrete or quasi discrete areas which act independently from a hydrogeological perspective.

Nine blocks are relevant to this study, blocks 8a, 8b and 8c being totally located within the Neath Port Talbot boundary. Blocks 4, 5, 6, 7, 8, 9 and 9a are partially within the boundary and extend into the neighbouring boroughs of Swansea, Bridgend and Rhondda Cynon Taf, Carmarthenshire and Powys. The blocks are shown in **Figure 4.1**.

The status of these blocks in terms of mine water recovery and the level of interconnectivity with adjacent blocks is not well known and requires more in depth study. However information from the very limited number of monitoring points, and the fact that mine water is discharging at surface (and in many cases has been for some time) in many locations which is an indication that recovery may be complete in each of the blocks.

4.2 Monitoring data

4.2.1 Mine water levels

Mine water level monitoring data are available at only 7 points for the Neath Port Talbot area with information shown at **Table 4.1** and locations at **Figure 4.2**. Though limited, the monitoring data together with the very wet nature of the coalfield and the time elapsed (>30 years) since colliery closures, and the presence of numerous gravity discharges suggests mine water recovery is likely to be complete or at least well advanced. The degree of connection between workings in the deeper South Wales Middle Coal Measures / Lower Coal Measures seams and the shallower South Wales Upper Coal Measures seams is unclear and will require further more detailed site specific study.

4.2.2 Mine water temperature

A study into mine water temperatures at various depths around the UK coalfields was published in 2020 ([Farr et al, 2020](#)). This study used historic underground water and strata temperatures along with data from mine water pumping where available.

Temperature typically increases with depth but there are localised variations between mine water blocks. Data published in the study is shown in **Table 4.2**.

Table 4.1: Mine water monitoring points

Monitoring point name	Type	MW Block	Surface (mAOD)	MW level (mAOD)	Comments
Blaen Llwyd (Ynysarwed)	Borehole	6	189	19	>100m BGL; Recovered
Cefn Coed	Shaft	6	95	88	<75m BGL; Discharging
Coed Derwen	Borehole	5			Skewen Level
Glyncastle	Borehole	8a	62.6	41.9	<75m BGL; Recovered
Grange Farm	Borehole	5			Skewen Level
Stanley Woods	Borehole	5			Skewen Level
Treforgan	Borehole	6	131.6	103	<75m BGL; Discharging

Table 4.2: Anticipated mine water temperature at various depths

Depth (m BGL)	Mean(°C)	Max. (°C)	Min. (°C)
100	11	12.3	10.3
200	13.2	15.5	11.6
300	15.5	18.8	12.9
400	17.6	22.1	14.2
500	19.8	25.4	15.5
600	21.7	28.6	16.8
700	23.2	31.9	21.2
800	26.4	35.2	22.9

4.2.3 Mine water chemistry

Mine water chemistry can be highly variable depending on specific location and would not normally form part of any initial high level opportunity scoping considerations guided by this study. The matter would be included in any more detailed, site specific, studies which may be commissioned in future.

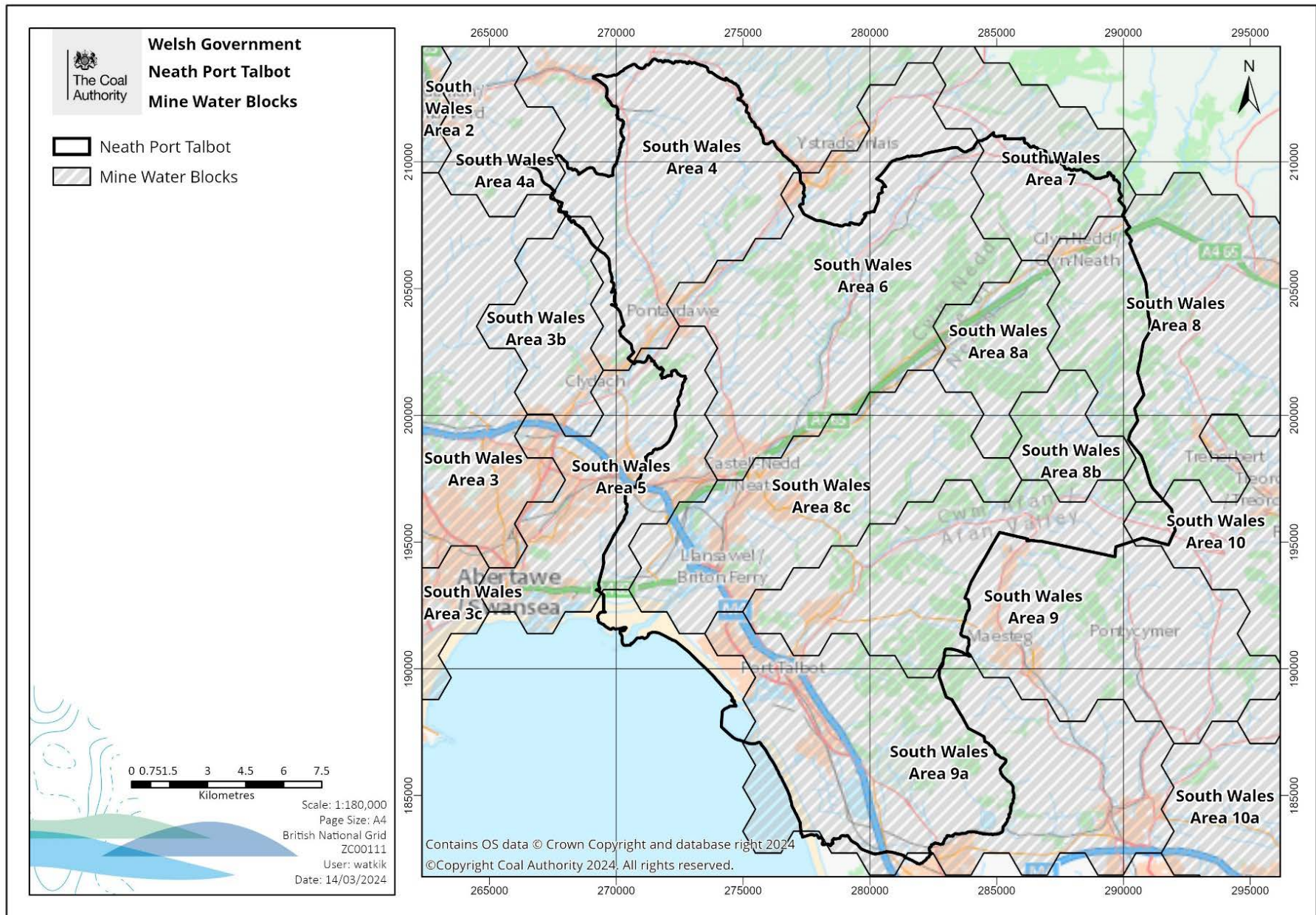


Figure 4.1: Mine water blocks in Neath Port Talbot

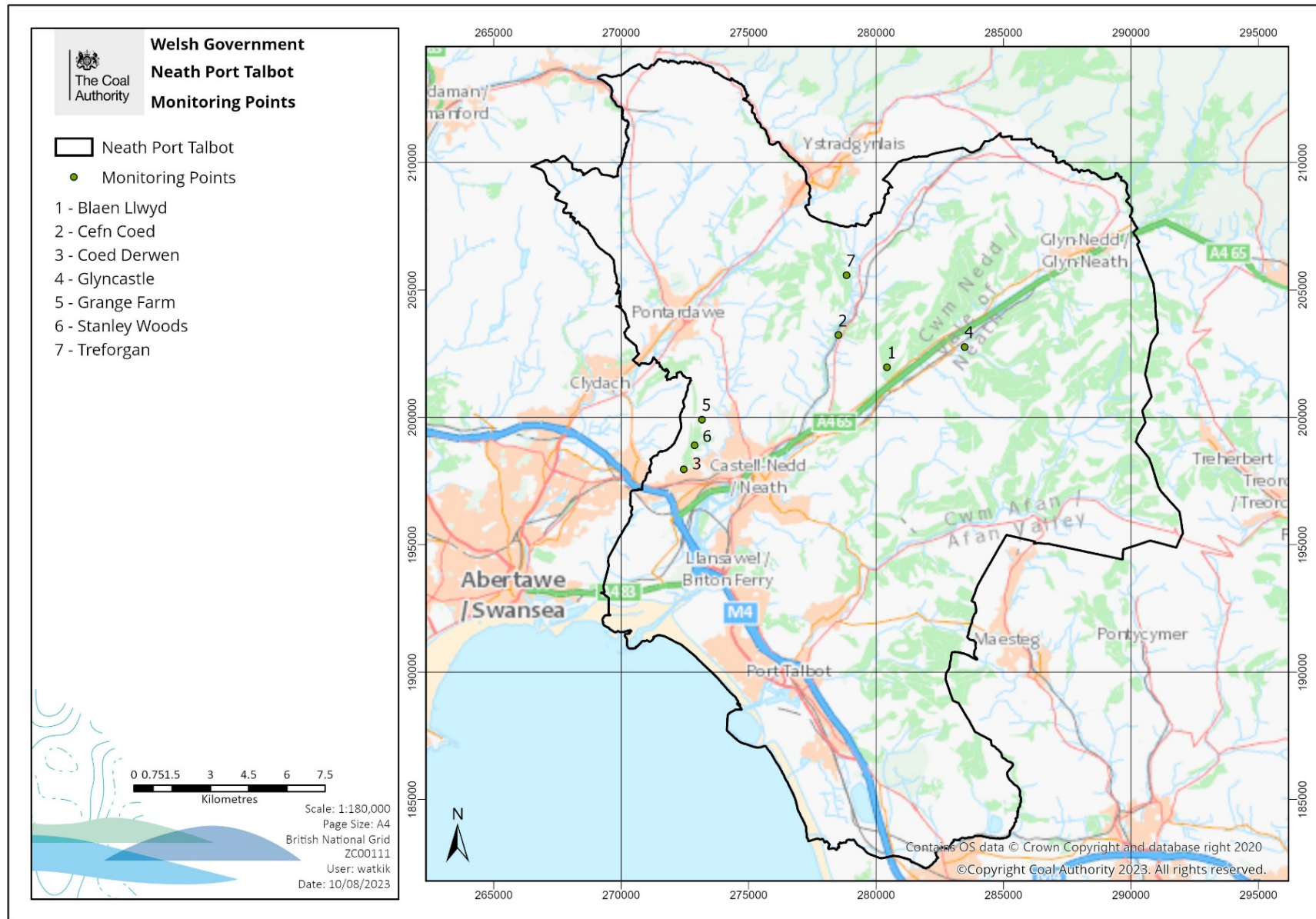


Figure 4.2: Mine water monitoring points in Neath Port Talbot

5 Mine water heat opportunities

5.1 Borehole schemes

The prospects for progressing a mine water heat scheme based on drilling boreholes to access and return the mine water are assessed on a 'tier' basis. Three tiers have been adopted for the purposes of this study, the methodology and assessment criteria being set out in the over-arching report for Welsh Government.

The tiers are:

Good opportunities – shown coloured **dark orange**

Possible opportunities – shown coloured **mid orange**

Challenging opportunities – shown coloured **light orange**

Any areas where no opportunity exists, mainly due to absence of mine workings are shown uncoloured. Some areas in the northern parts of the borough have been subject to surface (opencast) mining and are classified as challenging due to the partial removal of workings and challenge of drilling through opencast backfill.

The opportunity areas within Neath Port Talbot CBC boundary are outlined below and are illustrated on the map at **Figure 5.1**.

5.1.1 Good borehole opportunities

While good opportunity areas in respect of the mining parameters exist in the north eastern part of the borough, these are largely in areas devoid of surface development and heat demand.

However some good opportunity areas do exist in developed areas:

- The northern part of **Neath** town (north of the A465) extending through **Rhydding** as far as the northern extremity of **Bryn-coch**.
 - Of particular note in the south of the area is the presence of Neath College, Dwr yr Felin School and Neath Sports Centre which collectively may have a significant heat demand which could be served by mine water heat.
- The village of **Seven Sisters** lies in the centre of a good opportunity area in the north east of the borough although the heat demand is likely to be relatively small and consist of largely residential properties.

5.1.2 Possible opportunities

- Workings exist near to **Ystalfera** to the north-west of the A4067 highway. The locality is largely residential but some commercial/public buildings exist just to the south of the worked area, which may be served for mine water heat.
- Workings from the former Morfa Colliery exist in the locality of the **TATA steel plant at Margam**.

5.1.3 Challenging opportunities

Opportunities are normally classified as challenging if the workings are very deep (with associated high drilling costs) or other complications are present which may lead to higher cost and risk. In some circumstances the presence of very high head loads may make such opportunities worth pursuing as the techno-economic position may still be viable. However in the Neath Port Talbot CBC area the challenging opportunity areas are largely in unpopulated areas with little heat demand so are unlikely to be worth any further investigation.

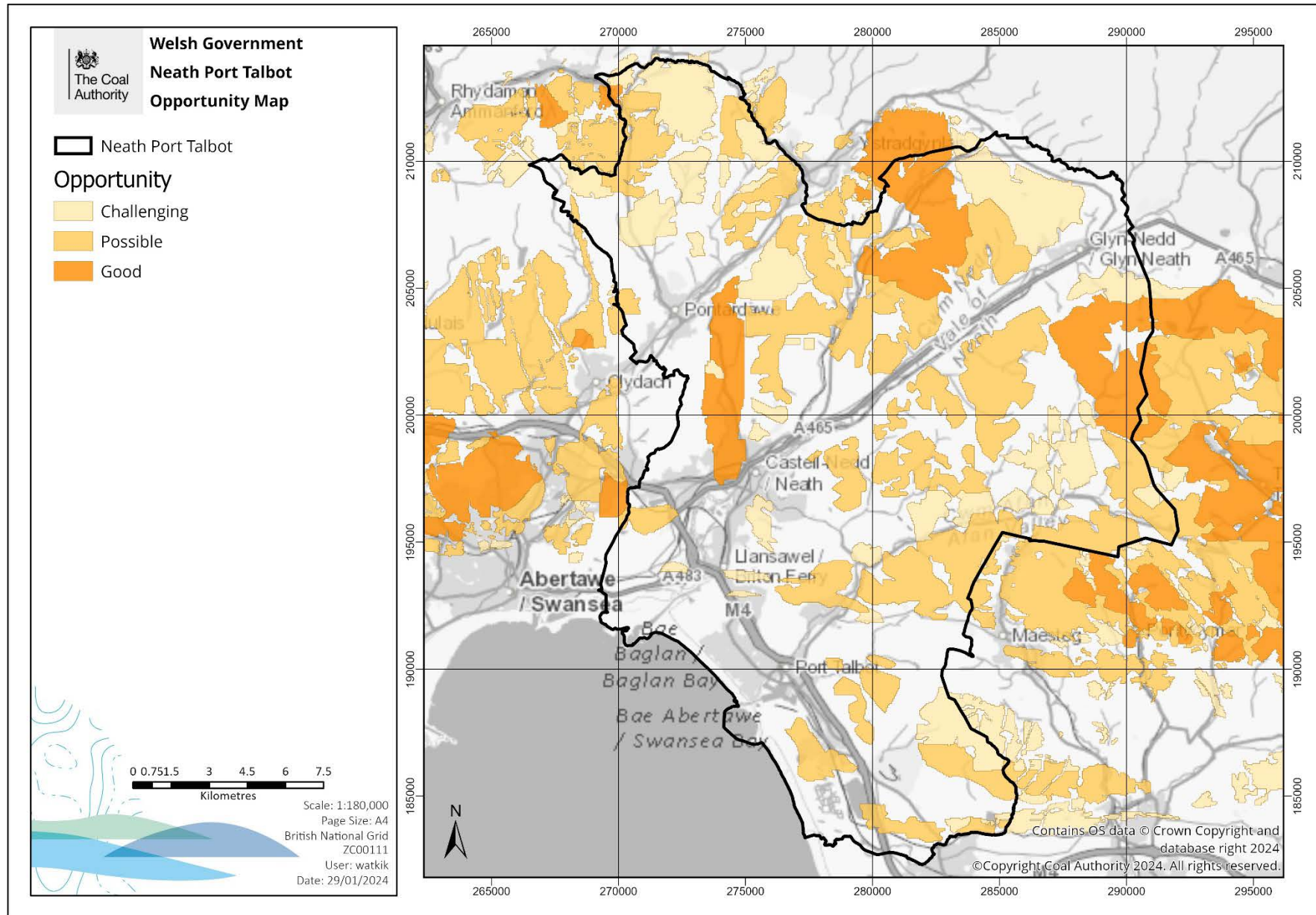


Figure 5.1: Mine water heat opportunities - borehole scheme

5.2 Mine water treatment schemes

Existing Coal Authority mine water treatment schemes where mine water is already either pumped or flowing may in some circumstances potentially offer a lower risk approach to developing mine water heat projects as new drilling and testing of boreholes would not be required.

Proximity to surface development/heat loads will be a dictating factor as to whether the concept is technically and commercially viable for any particular scheme.

This section is only to record that the treatment schemes are there and provide information on the potential and does not imply any guarantee that a heat scheme may be connected to the mine water treatment scheme. Should there be a desire to investigate the potential it is recommended that an early dialogue is opened with the Coal Authority as owners and operators of the mine water treatment schemes.

Details of the mine water treatment schemes in the Neath Port Talbot CBC area are shown in **Table 5.1** and their locations in **Figure 5.3**.

Table 5.1: Mine water treatment schemes

Name	Average flow average (L/s)	Flow range (L/s)	Typical temperature (°C)	Estimated potential heat (MW _{th})
Glyncorrwg	16	<5 to >50	11 (est)	0.4
Glyncastle	14	<5 to >40	12.5	0.3 to 0.4
Gwynfi	5	<5 to 15	9.1	0.1
Garth Tonmawr	15	<5 to 50	11.1	0.3 to 0.4
Whitworth No1	4	<2 to 10	11 (est)	0.1
Gwenffrwd / Whitworth A & B	35	<5 to >50	10.5	0.5 to 0.8
Ynysarwed	24	<10 to 30	13.5	0.5 to 0.7

Note: Potential heat will vary with flow rate, which varies with rainfall. Potential heat at a site may be above or below the estimated value at different stages of the year

5.2.1 Glyncorrwg

The Glyncorrwg scheme is a gravity fed passive treatment scheme situated off Norton Terrace, **Glyncorrwg**. The average flow is commensurate with a heat capacity of about 0.4MW_{th} but as the discharge is over 1Km from the nearest potential heat load it is considered unlikely to be suitable for playing a part in a mine water heat scheme.

5.2.2 Glyncastle

The Glyncastle scheme is a gravity fed passive treatment scheme situated approximately 100m from the northeast extremity of the built up area of **Resolven**. The average flow is commensurate with a heat capacity of about $0.35\text{MW}_{\text{th}}$.

5.2.3 Gwynfi

The Gwynfi scheme is located approximately 0.5Km to the north of the village of **Blaengwynfi**. The small size of the scheme (the average flow being commensurate with a heat capacity of about 0.1MW_{th}) and the distance from the nearest potential heat loads in the small village suggests a viable mine water heat scheme is likely to be unviable.

5.2.4 Garth Tonmawr

The Garth Tonmawr scheme is situated off Fforch-dwm Road approximately 1Km to the north east of the village of **Tonmarw**. Although having a heat capacity of about 0.4MW_{th} the distance from the nearest heat loads in the small village suggests a heat scheme is likely to be unviable.

5.2.5 Whitworth No.1

The Whitworth No.1 scheme is a gravity fed passive treatment scheme situated 100m to the west of Johnson Terrace at the northern extremity of **Tonmawr** village. The average flow is commensurate with a heat capacity of about 0.1MW_{th} . Being relatively close to the built up area the scheme may offer potential for inclusion in a mine water heat scheme.

5.2.6 Gwenffrwd / Whitworth A and B

The Whitworth A and B / Gwenffrwd scheme is also gravity fed passive and is approximately 150m to the north of Whitworth no.1 near **Tonmawr**. The average flow is commensurate with a heat capacity of about 0.7MW_{th} but it may be possible to combine with Whitworth No.1 to deliver about 0.8MW_{th} to the nearby community.

5.2.7 Ynysarwed

The Ynysarwed scheme is gravity fed scheme on Neath Road approximately 600m to the south west of **Abergarwed**. The treatment consists of lime dosing and a high density sludge (HDS) process to remove the precipitated iron from the mine water. The average flow is commensurate with a heat capacity of about 0.6MW_{th} but the distance to any significant heat loads suggests a mine water heat scheme is likely to be unviable.

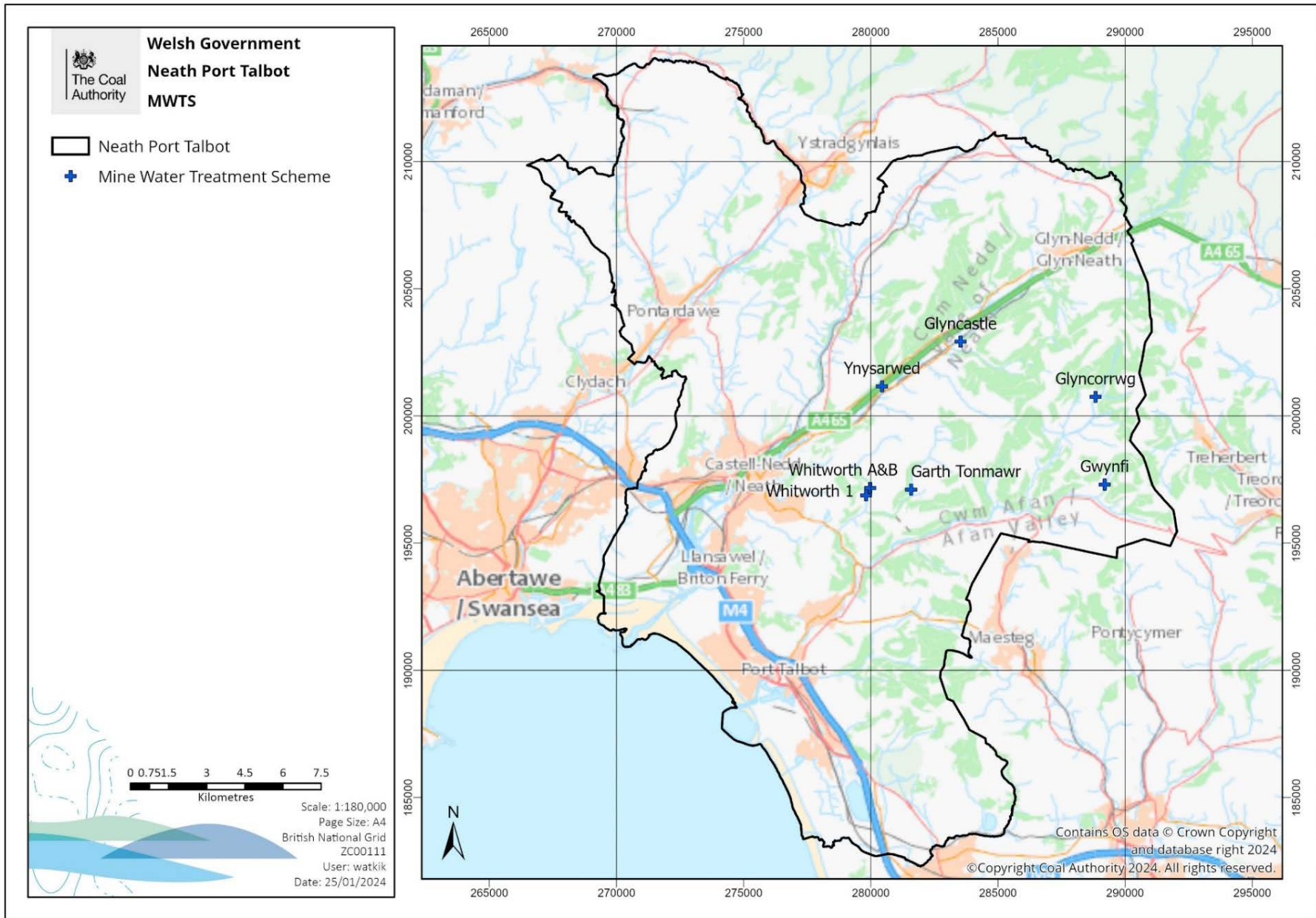


Figure 5.2: Mine water treatment schemes in Neath Port Talbot

5.3 Gravity-fed discharge schemes

Numerous gravity mine water discharges exist in the Neath Port Talbot area, but many are not monitored for flow rate, water quality, or temperature. These discharges generally occur when mine workings connect with the surface, typically via mine entries and boreholes.

The nature of gravity-fed discharges will be dependent upon different mining and geological factors; rainfall; and hydrogeological system of the mine workings. Some discharges are likely to be more variable in flow rates and temperatures than some discharges that could have more stable flow and temperature.

Discharges in Neath Port Talbot that have potential heat $>0.5\text{MW}_{\text{th}}$ ($>20\text{-}25\text{ L/s}$) are plotted on **Figure 5.3**.

Table 5.2 shows a number of selected gravity-fed mine water discharges. Sites are selected based on those with the greatest mine heat potential (e.g. $>0.5\text{ MW}_{\text{th}}$).

Table 5.2: Summary of selected gravity-fed discharges for mine water heat potential

Name	Flow average L/s	Flow range L/s	Typical temperature °C	Estimated potential heat MW_{th}
Brynteg No.1 Slant	45 (further testing required)	Spot reading	11 (est)	0.9 to 1.3
Brynteg Top Level	19 (further testing required)	Spot reading	11 (est)	0.4 to 0.5
Cymmer	20 (further testing required)	Spot reading	9.7	0.3 to 0.5
Cynon	35 (further testing required)	20 to 50	11.4	0.7 to 1.0
Duffryn Rhondda	35 (further testing required)	20 to 50	10.6	0.7 to 1.0
Garwed Brook	25 (further testing required)	Spot reading	11.9	0.5 to 0.7
Llwyn 2 Discharges	40 (further testing required)	Spot reading	11 (est)	0.8 to 1.1
Nant y Fedw Discharges	20 (further testing required)	Spot reading	10 (est)	0.2 to 0.4

Note: Potential heat is based on spot readings and / or average flow rate. Potential heat will vary with flow rate, which varies with rainfall. Potential heat at a site may be above or below the estimated value at different stages of the year

Should a potential heat demand be identified close to one of these discharges (shown in **Table 5.2** and **Figure 5.3**) or any other discharge in the area, then a more detailed study would be required. Additional investigation and data gathering will likely be required to establish its potential.

5.3.1 Brynteg discharges

The discharges are above and to the east of **Nant-y-cafn** village, some 0.5Km to the south of **Seven Sisters**. Further investigations would need to be undertaken to confirm flow rate, temperature, chemistry. Potential heat users and feasibility of transferring the water will also need to be confirmed by a future study.

5.3.2 Cymmer

The discharge is from a shaft pipe to the north bank of the River Afon at **Cymmer**. The village is on the south side of the river. There are some community buildings within Cymmer including, swimming pool, health centre, and tea rooms (owned by Neath Port Talbot). Further investigations would need to be undertaken to confirm flow rate, temperature, chemistry. Potential heat users and feasibility of transferring the water will also need to be confirmed by a future study.

5.3.3 Cynon

The discharge is from an adit on the south bank of River Afan some 200m north of **Cynonville** and approximately 1km to the south west of **Duffryn**, where the Duffryn Rhondda discharge (5.3.4 below) is located. Further investigations would need to be undertaken to confirm flow rate, temperature, chemistry. Potential heat users and feasibility of transferring the water will also need to be confirmed by a future study.

5.3.4 Duffryn Rhondda

The discharge is from No2 Slant (adit) on the south bank of River Afan 300m east of **Duffryn**. The Cynon and Duffryn Rhondda discharges may potentially be combined to give an overall heat capacity of approaching 2MW_{th} but the distance to and limited heat load from the small villages nearby suggests a mine heat scheme is likely to be challenging.

Further investigations would need to be undertaken to confirm flow rate, temperature, chemistry. Potential heat users and feasibility of transferring the water will also need to be confirmed by a future study.

5.3.5 Garwed Brook Discharges

There are three known discharges along the east bank of Garwed Brook, approximately 500m north-northwest of **Abergarwed** village. Access to the discharge may be difficult due to steep sided valley and possible unstable ground around the discharges. The discharges are on the priority list for mine water remediation. Further investigations will be required to confirm potential for co-beneficial mine heat and mine water treatment scheme. Potential

heat users and feasibility of transferring the water will also need to be confirmed by a future study.

5.3.6 Llwyn Discharges

There are two known discharges along the west bank of River Dulais approximately 400m west of **Crynant**. There are nearby community building that could utilise the mine heat. Further investigations will be needed to confirm if there are any other potential heat users. Additional information will also be needed to confirm flow rate, chemistry and water temperature. In addition to Llwyn discharges, there are other (possibly smaller) discharges to the east of Crynant.

5.3.7 Nant y Fedw Discharges

There are three known discharges to the Nant y Fedw, approximately 500m to 1km east-northeast of **Croeserw**. There may be potential heat users close to the discharges. Further investigations would need to be undertaken to confirm flow rate, temperature, chemistry. Potential heat users and feasibility of transferring the water will also need to be confirmed by a future study.

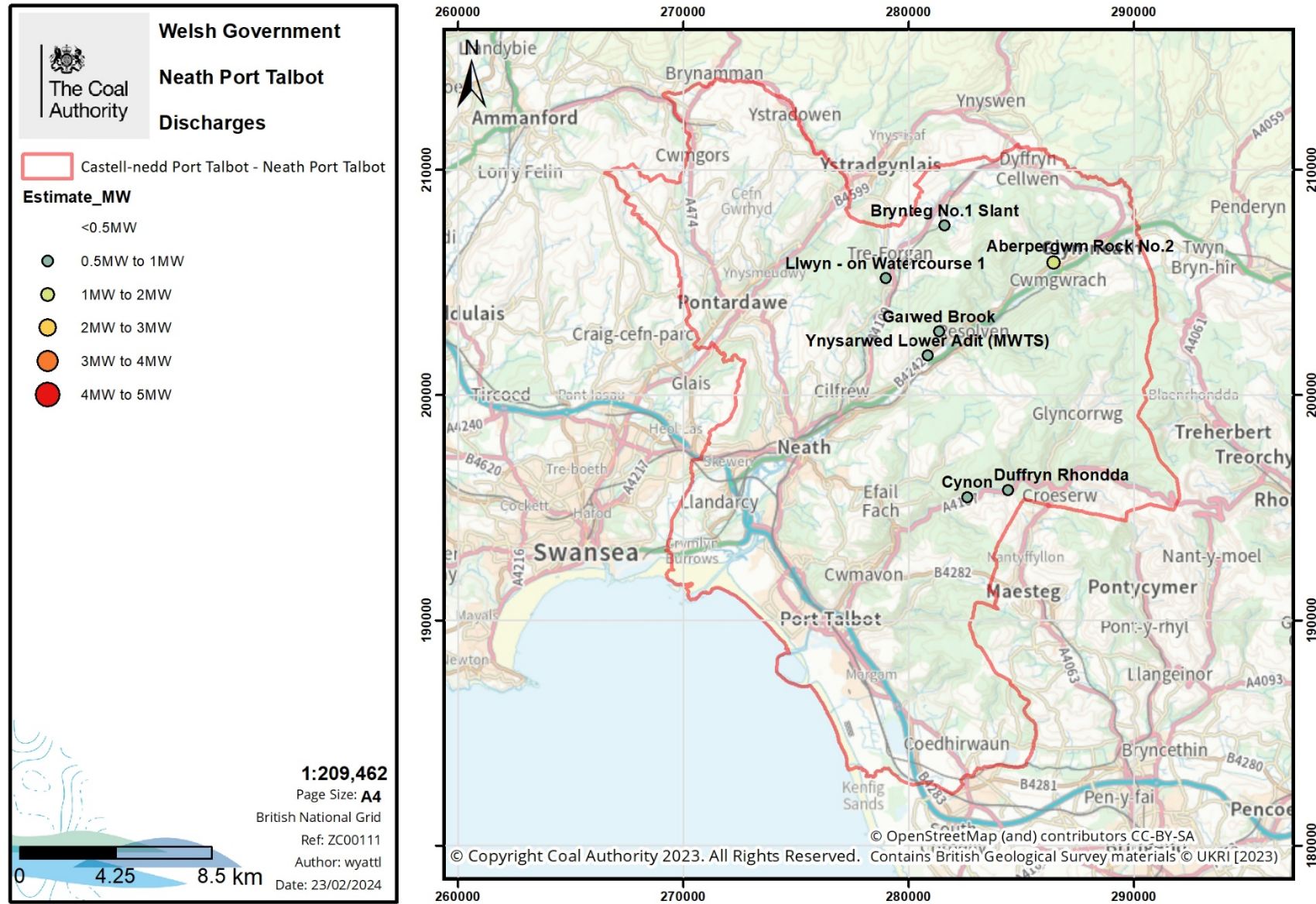


Figure 5.3: Mine water heat opportunities - gravity discharges

6 Summary

Considerable areas of the Neath Port Talbot CBC administrative area are underlain by abandoned coal mine workings. The earlier sections of this report consider the mining and mine water parameters across the whole borough to rank areas by reference to an opportunity classification system (**Figure 6.1**). This summary section overlays the opportunities on populated settlement areas to provide a steer on localities where mining aspects and surface development may present the most likely places to further investigate and potentially deploy mine water heat.

The opportunity areas are set out in **Table 6.1** and their locations in **Figure 6.2**.

Table 6.1: Mine water heat opportunities within Neath Port Talbot CBC area

No./ Area	Opportunity name	Opportunity type	Category	Potential MW _{th}
1	Neath north /Rhydding/Bryncoch	Borehole scheme	Good	Subject to further testing
2	Seven sisters	Borehole scheme	Good	Subject to further testing
3	Ystalfera	Borehole scheme	Possible	Subject to further testing
4	TATA	Borehole scheme	Possible	Subject to further testing
5	Glyncastle	Treatment scheme	Possible	0.3 – 0.4*
6	Whitworth No.1	Treatment scheme	Possible	0.1*
7	Gwenffwrdd / Whitworth A and B	Treatment scheme	Possible	0.5 – 0.8
8	Cymmer	Gravity discharge	Possible**	0.3 – 0.5

* Whitworth No.1 and A and B may potentially be combined to deliver 0.6 to 0.9MW_{th}.

** For gravity discharges:

- **Good** means heat potential 0.5MW and above with uncomplicated capture and uncomplicated heat transfer.
- **Possible** means heat potential 0.5MW and above with complicated capture or complicated heat transfer.
- **Challenging** heat potential 0.5MW and above with complicated capture and complicated heat transfer.

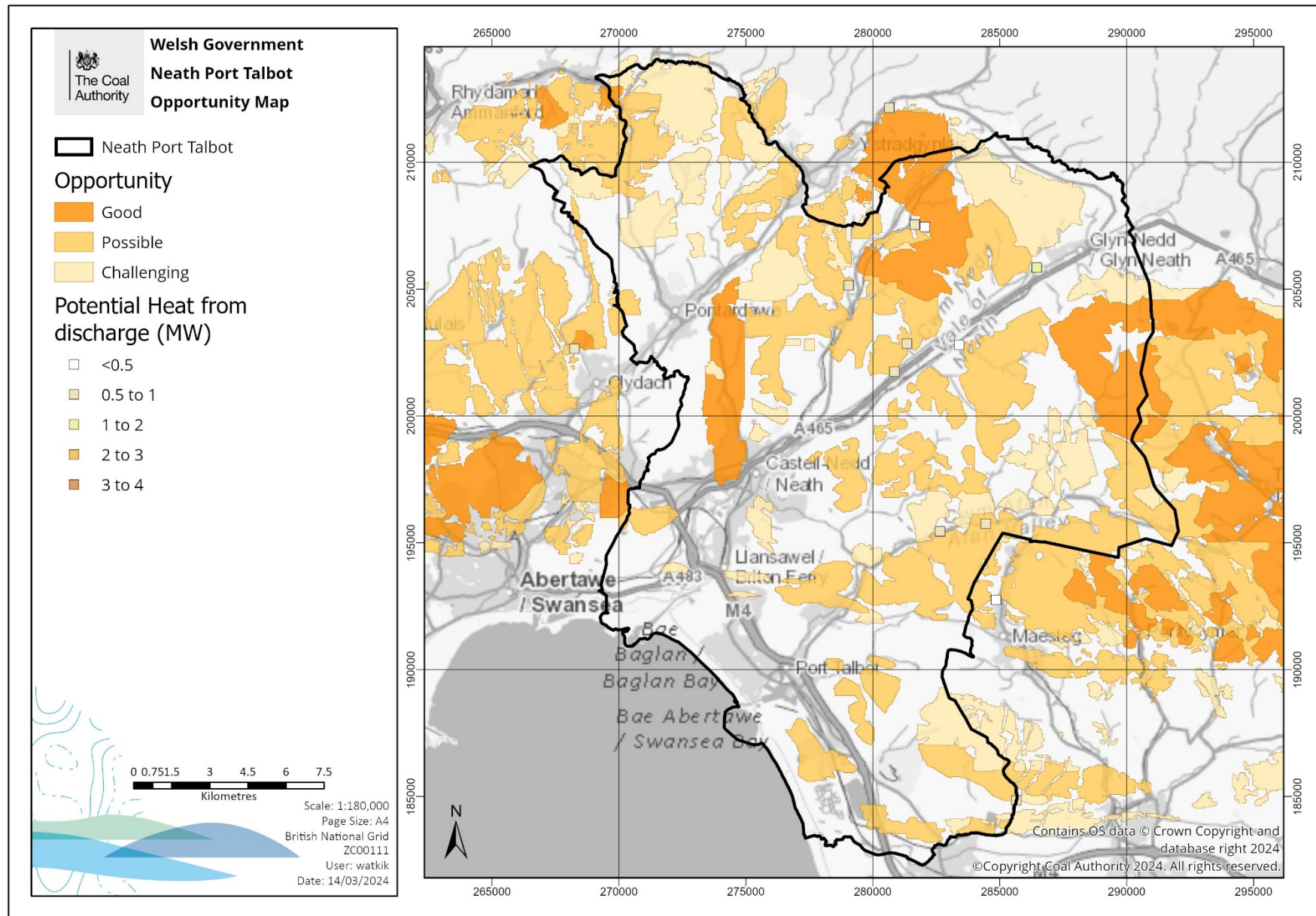


Figure 6.1: Combined mine water heat opportunity map

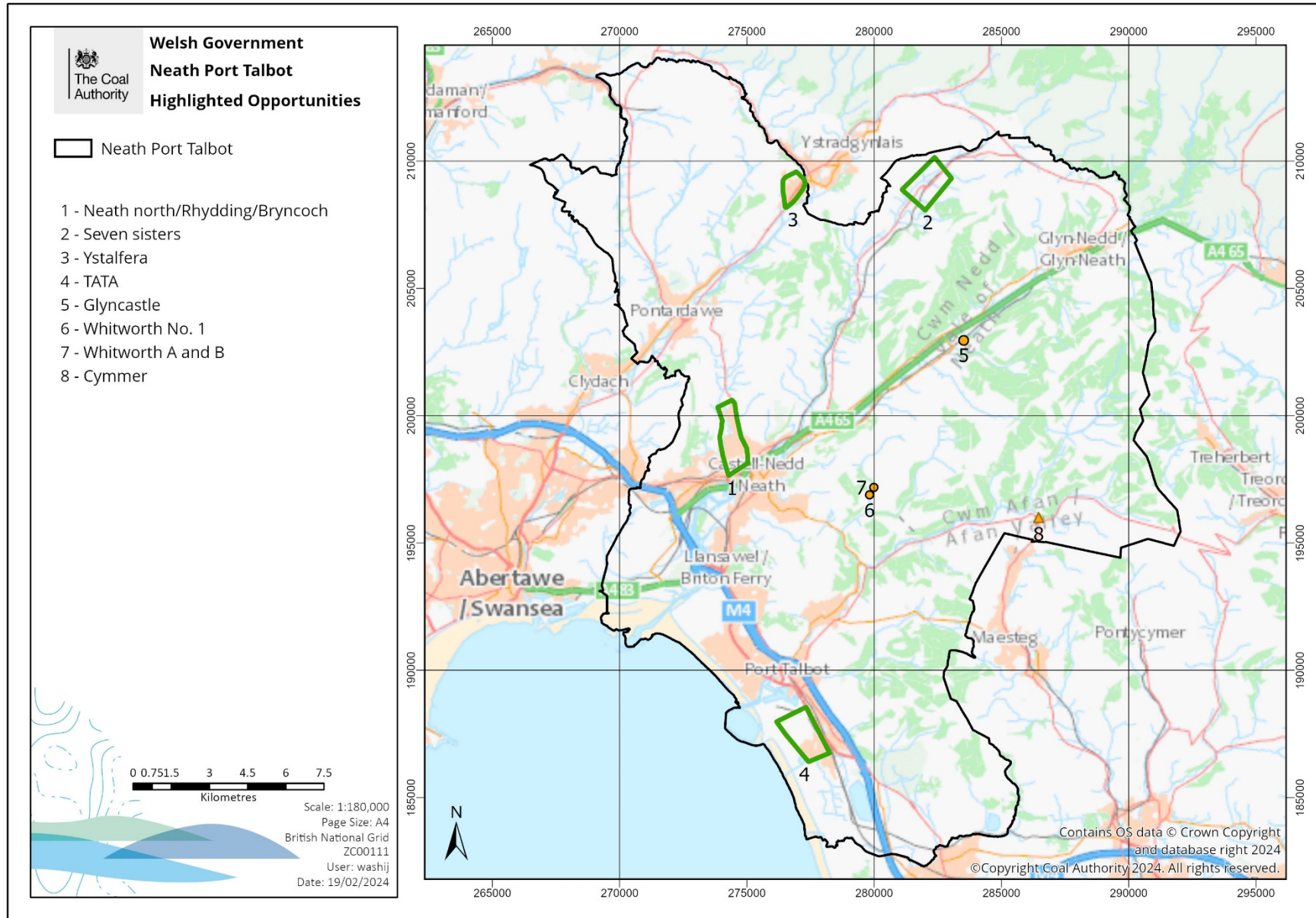


Figure 6.2: Highlighted opportunity areas within Neath Port Talbot area

6.1 Borehole schemes

6.1.1 Good opportunities

The principal 'good opportunity' area in the borough extends from northern part of Neath extending northwards as far as Rhos. This area includes the built up areas of northern **Neath** town, **Caewern**, **Rhydding** and **Bryncoch**. Workings exist beneath the developed area which is shown as **area 1** in **Figure 6.2** and includes **Neath College**, **Dwr yr Felin School** and **Neath Sports Centre** at the southern end of the area.

The village of **Seven Sisters** lies in the centre of a good opportunity area in the north east of the borough although the heat demand is likely to be relatively small and consist of largely residential properties. Shown as **area 2** in **Figure 6.2**.

6.1.2 Possible opportunities

Workings exist in several seams at **Ystalfera** to the north-west of the A4067 highway shown as **area 3** in **Figure 6.2**. The locality is largely residential but some commercial/public buildings exist just to the south of the worked area which may be served by mine water heat.

A considerable area of multi seam working exists in the locality of the Port Talbot TATA Steel plant shown as **area 4** in **Figure 6.2**. Given the proximity to the steel plant this area may be worth exploring as a heat storage opportunity.

6.2 Mine water treatment schemes

While seven Coal Authority mine water treatment schemes are present within the Neath Port Talbot CBC boundary, some of these are situated some distance from built up areas and potential heat loads and so are unlikely to serve a mine heat scheme. However three schemes are relatively close to built-up areas and may be worth more detailed investigation:

At **Resolven** the Glyncastle scheme annotated **5** in **Figure 6.2** is situated only 100m to the north east of the built up area and has an estimated heat potential of $0.34\text{MW}_{\text{th}}$

The Whitworth No.1 scheme annotated **6** in **Figure 6.2** is approximately 200m from the edge of the built up area of **Tonmawr** and may have a heat potential of 0.5MW_{th} .

The Whitworth A/B scheme annotated **7** in **Figure 6.2** is close by to the north of **Tonmawr** and may potentially be developed in conjunction with Whitworth No.1 to deliver up to $0.84\text{MW}_{\text{th}}$.

6.3 Mine water discharges

Many mine water discharges are known to exist in the area, currently 8 of these have been considered as offering mine water heat potential of between 0.3MW_{th} to 0.8MW_{th} without the need for boreholes and associated deep pumping. However with one exception these are situated some distance from the nearest built-up area and potential heat loads so are unlikely to be viable projects.

The exception is the gravity discharge at **Cymmer**, annotated **8** in **Figure 6.2** which has heat potential of 0.3 to 0.5 MW_{th} and is situated close to the village and associated NPT CBC owned community buildings.

6.4 Next steps

A number of Good, possible and challenging mine water heat opportunity areas have been identified across the Neath Port Talbot CBC region as illustrated in **Figure 6.2**.

However much of the Neath Port Talbot CBC area is rural with little or no surface development. The opportunity areas have been considered against the major developed areas in the borough to seek to identify places where good heat supply opportunities may coincide with significant heat demand. It is suggested that the opportunities covered in this section and listed in **Table 6.1** and shown in **Figure 6.2** are further considered for more detailed study.

The heat potential of the borehole schemes cannot be estimated to any degree of certainty until more detailed and localised study is undertaken.

It is suggested that a survey of the main heat loads, particularly potential large 'anchor' loads such as hospitals or larger public buildings is undertaken in the opportunity areas in **Table 6.1** to establish synergies between potential heat supply and heat demand. This may identify good opportunities to further investigate pilot mine water heat projects through more detailed feasibility work, initially involving desktop studies and subsequent investigative drilling should the potential be attractive.

7 References

Farr, G., Busby, J., Wyatt, L., Crooks, J., Schofield, D.I., Holden, A. 2020. The temperature of Britain's coalfields. *Quarterly Journal of Engineering Geology and Hydrogeology* (2021); **54**(3). pp.1-14. <http://dx.doi.org/10.1144/qjegh2020-109>